

Excerpted below are the goals, objectives, strategy performance indicators, and references from Part I of the draft 2020 Program Addendum. For ease of use during the workshops, staff relocated all strategy performance indicators to a single table that follows the goals and objectives. Also included herein are comments and suggested edits that the Council received during the public comment period on the draft addendum. Suggested edits are reflected in track changes where practicable; otherwise, all comments and suggested changes are identified in the comment boxes. Unless identified through track changes, no additional edits or revisions were made to the goals, objectives and strategy performance indicators from what was in the draft out for public review.

## GOALS AND OBJECTIVES FROM 2020 DRAFT ADDENDUM

### Anadromous Salmon and Steelhead (S)

#### Goal

*Increase total adult salmon and steelhead runs, with an emphasis on those above Bonneville Dam, by 2025 to an average of 5 million annually.*

Increasing the total salmon and steelhead runs to five million began as an interim program goal in 1987 to “double the runs.” This total abundance target is lower than the Council’s estimates of the losses of anadromous fish due to the development and operation of the Columbia River hydroelectric facilities. See the program’s [Compilation of Information on Salmon and Steelhead Losses in the Columbia River Basin](#) and Numerical Estimates of [Hydropower-Related Losses](#). The program aims to achieve this goal in a manner that emphasizes populations that originate above Bonneville Dam, supports tribal and non-tribal harvest, and encourages biological diversity. While the program has always assumed artificial production will be one of the strategies used to achieve this goal, the proportion of wild fish contributing to this goal should increase as natural production increases.

The program provides a flexible approach to mitigation for loss of anadromous fish in blocked areas that historically had runs of anadromous fish, including passage and habitat improvements, reintroduction of anadromous fish where feasible, and/or the provision of increased harvest opportunities through fish propagation, and by enhancing other species. See the Anadromous Fish Mitigation in Blocked Areas Strategy, Part Four IV(C)(2) of the 2014 program.

## Biological Objectives

S1 - Contribute to achieving the following near-term provisional goals for salmon and steelhead adults originating from the following areas of the basin and returning to the Columbia River mouth, as well as harvested in the ocean (hatchery and natural origin), calculated on a 10-year rolling average. The following includes delisting values for ESA and non-ESA populations, but we expect that some populations, in particular healthy and non-listed populations, will regularly exceed these values.<sup>1</sup>

- (1) Lower Columbia: achieve or exceed 790,700;
- (2) Mid-Columbia: achieve or exceed 344,300;
- (3) Upper Columbia: achieve or exceed 636,800;
- (4) Snake River: achieve or exceed 463,570;
- (5) Willamette River: achieve or exceed 160,000.

S2 - Contribute to achieving a smolt-to-adult return ratio (SAR) in the 2-6 percent range (minimum 2-percent; average 4-percent) for listed Snake River and upper Columbia salmon and steelhead, as well as for non-listed populations. The beginning point (smolt) and the ending point (adult) used in calculating SARs are determined by fisheries managers.<sup>2</sup>

S3 - Contribute to maintaining and improving habitat quality on land purchased or managed to mitigate for hydrosystem impacts on anadromous fish by developing and using approved land management plans for all parcels purchased under the program.

## Ecological, Communication, Assessment and Coordination Objectives

The ecological objectives and related strategy performance indicators, plus the communication, assessment and coordination objectives and related strategy performance indicators also apply to this goal. See page 9.

# White Sturgeon (WS)

## Goal

Protect and mitigate for the adverse effects of the hydrosystem on white sturgeon and endangered Kootenai River white sturgeon.<sup>3</sup>

## Biological Objectives

WS1 – For Lower Columbia River sturgeon, contribute to maintaining a stable healthy population and support sustainable fisheries. For the other seven sturgeon population management units, halt declining trends and make progress toward healthy populations to support sustainable subsistence and recreational fisheries.<sup>4</sup> Healthy populations are defined as abundant, productive, genetically diverse, and spatially distributed in areas of historic sturgeon range within the Columbia River Basin.<sup>5</sup>

White Sturgeon Objectives	
White sturgeon population abundance. <sup>6</sup> Compare abundance to the following targets: (WS1-1)	
Management Unit	Target
	Maintain and/or exceed a rolling three-year average abundance of 300,000 sub-adult (>38 inches and < 54 inches fork length) and eventually exceed 368,000 sub-adult white sturgeon.
Lower Columbia Management Unit	Maintain and/or exceed a rolling three-year average abundance of 6,250 adult white sturgeon and eventually exceed 16,250 adult white sturgeon
Upper and Lower Mid-Columbia Management Unit	Increase abundance of white sturgeon, contributing to restoration of viable populations and fisheries.
Transboundary Upper Columbia Management Unit	Ensure interim adult populations of 2,000 in the Canadian Transboundary Reach and 5,000 in the US Transboundary Reach. Maintain a subsistence and recreational fishery harvest objective of 2,000 fish per year.
Kootenai Management Unit	The number of Kootenai sturgeon wild recruits (offspring that survive to sexual maturity at 25 years) that are added to the adult (25 years or older) population annually should average at least 250 individuals per year over 10 years. In addition, the population should include at least 10,000 wild juveniles, ages 3 to 24 years.” (for delisting). For down-listing: population demonstrates natural production of at least 700 wild age-3 juveniles in at least three of 10 consecutive years,
Lower Snake Management Unit	Abundance of white sturgeon is maintained or increasing, contributing to restoration of viable populations and fisheries for white sturgeon in mid-Columbia River reservoirs between Bonneville and Priest Rapids dams.

Middle Snake Management Unit	Maintain natural, stable aged-structure population with a minimum of 2,500 adult fish from Lower Granite to Hells Canyon.
Upper Snake Management Unit	Provide stable to increasing trends in sturgeon abundances (greater than 23.6 inches (60 cm)) for the following reach abundance targets: Bliss to CJ Strike, 2,900 fish; CJ Strike to Swan Falls, 1,340 fish; Lower Salmon Falls to Bliss, 630 fish; Swan Falls to Brownlee, 7,100 fish; Upper Salmon Falls to Lower Salmon Falls, 340 fish.
Sturgeon hatchery objectives are tracked and compared to the hatchery management plan and a reviewed and approved master plan. <sup>7</sup> (WS1-2)	



### **Ecological, Communication, Assessment and Coordination Objectives**

The ecological objectives and related strategy performance indicators, plus the communication, assessment and coordination objectives and related strategy performance indicators also apply to this goal. See page 9.

## Pacific Lamprey (L)

### Goal

Protect and mitigate for the adverse effects of the hydrosystem on Pacific lamprey through structural and operational changes at federal and FERC-licensed hydropower facilities and increasing abundance throughout the historic range, in numbers that contribute to ecological integrity and sustainable tribal harvest of Pacific lamprey.<sup>8</sup>

### Biological Objectives

L1

L2 - Improve passage efficiency for adult Pacific lamprey to an interim standard of 80% at each facility. For juvenile lamprey, improve passage efficiency progressing toward standards approaching juvenile salmonid passage.<sup>10</sup>

L3 - Adult Pacific lamprey Bonneville Dam count. Compare to the three-year rolling average of 200,000 by 2025 progressing toward 1,000,000 in the near-term,<sup>11</sup> (L1-2) moving toward historical distribution and range.

L4 – Contribute to reducing risk of extirpation in the six Regional Management Units (RMU) of the Columbia Basin, measured every five years.

### Ecological, Communication, Assessment and Coordination Objectives

The ecological objectives and related strategy performance indicators, plus the communication, assessment and coordination objectives and related strategy performance indicators also apply to this goal. See page 9.

## Resident Salmonids (R)

### Goal

Protect and mitigate for the adverse effects of the hydrosystem on native focal resident salmonids. These resident salmonids include bull trout, cutthroat trout, kokanee, and redband trout.<sup>12</sup>

### Biological Objectives

When mitigating for hydrosystem impacts on native focal resident salmonids, the program relies on a diversity of strategies to address those losses, including habitat mitigation, hatcheries, and modifying hydrosystem operations. Information other than population abundance estimates are frequently employed by fisheries managers to assess progress in mitigating impacts on these native focal resident salmonids.

R1 - For bull trout, contribute to achieving geographically widespread and interacting groups of fish across their native range, providing for genetic integrity and exchange, with stable and/or increasing fish populations capable of sustaining harvest.<sup>13</sup>

R2 - For cutthroat trout, contribute to achieving self-sustaining populations, geographically widespread and interacting groups of fish across their native range, providing for genetic integrity and exchange, with stable and/or increasing fish populations capable of sustaining harvest.<sup>14</sup>

R3 - For kokanee, contribute to maintaining stable and increasing, broadly-distributed populations in the 11 subbasins, capable of sustaining harvest where they are identified as a focal species.<sup>16</sup>

R4 - For redband trout, contribute to achieving self-sustaining populations, geographically widespread and interacting groups of fish across their native range, providing for genetic integrity and exchange, with stable and/or increasing fish populations capable of sustaining harvest.<sup>17</sup>

.<sup>18</sup>

R5 - Contribute to maintaining and improving habitat quality on land purchased or managed to mitigate for hydrosystem impacts on resident fish by developing and using approved land management plans for all parcels purchased under the program.

## **Ecological, Communication, Assessment and Coordination Objectives**

The ecological objectives and related strategy performance indicators, plus the communication, assessment and coordination objectives and related strategy performance indicators also apply to this goal. See page 9.



## Native Aquatic Focal Species (NF)

### Goal

Protect and mitigate for the adverse effects of the hydrosystem on native aquatic focal species including eulachon, burbot, Oregon chub, freshwater mussels, and other native aquatic focal species.<sup>20</sup>

### Biological Objectives

Information other than population abundance estimates are frequently employed by managers to assess progress in mitigating impacts on these native aquatic focal species in the Columbia River Basin.

NF1 - Contribute to maintaining a stable and increasing population trend for eulachon, burbot, Oregon chub, freshwater mussels, and other native aquatic focal species.<sup>21</sup>

### Ecological, Communication, Assessment and Coordination Objectives

The ecological objectives and related strategy performance indicators, plus the communication, assessment and coordination objectives and related strategy performance indicators also apply to this goal. See page 9.



## Ecological, Objectives for Fish and Aquatic Species



**Goal:** Contribute to environmental conditions and processes that support ecosystem functions necessary to restore healthy, self-sustaining and harvestable populations of native resident and anadromous fish and wildlife. **The following objectives and related indicators apply to the goals** related to these species and their related spawning grounds and habitats: Anadromous Salmon and Steelhead, White Sturgeon, Pacific Lamprey, Resident Salmonids, and Native Aquatic Focal Species

### Ecological Objectives (E)

E1 - Contribute to maintaining and improving habitat and water quantity, quality, connectivity and normative river function while taking into account climate change.<sup>22</sup>

E2 - Contribute to reducing predators, avian, mammalian and fish that negatively impact the habitat and populations of focal fish species in order to improve abundance and survival.<sup>24</sup>

E3 - Contribute to management, prevention or eradication of non-native species and invasive species in order to improve abundance and survival of focal species.,

E4 – Provide flows through the hydrosystem of sufficient quality and quantity to improve production, migration, and survival of fish.<sup>26</sup>

### Communication, Assessment and Coordination Objectives



**GOAL:** Inform the public about the program to encourage involvement. Encourage considering the program within a social and ecological context. Achieve open public access for all program-related data.

### Communication, Assessment, and Coordination Objectives (C)

C1 - Annually report on progress toward program objectives, program strategy performance indicators, and addressing research critical uncertainties.<sup>27</sup>

C2 – Refine the objectives to review progress toward objectives and strategy performance indicators and refine program objectives and program strategy performance indicators as needed.<sup>28</sup>

C3 - Track FERC hydroelectric project applications with respect to the program's protected areas.<sup>29</sup>

C5 - Improve access to information to inform decisions about program investments, operation and maintenance, and factors that affect program activities and success.<sup>31</sup>

C6 - Advance efforts to complete remaining loss assessments.<sup>32</sup>

C7 - Complete the analysis required for the phased approach to investigating the reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams, including juvenile and adult passage at the dams.<sup>33</sup>



## Wildlife (W)

### Goal

Mitigate for wildlife losses caused by the development and operation of hydropower dams.<sup>34</sup>

### Ecological Objectives

Mitigation for wildlife losses under the program has been expressed and implemented in terms of habitat area and not species numbers; the only objectives identified for the wildlife goal are ecological objectives and coordination/communication objectives.

W1 - Mitigate for dam construction and inundation losses as identified in the program's wildlife loss assessments by acquiring and protecting the following in either habitat units (HUs) or acreage (acres) amounts.<sup>35</sup>

Willamette projects (Willamette River Basin MOU – ODFW and BPA)	25,537 Acres
Bonneville Dam	21,411 HUs
The Dalles Dam	2,442 HUs
John Day Dam	36,555 HUs
McNary Dam	23,545 HUs
Lower Snake projects	26,774 HUs
Dworshak Dam (Wildlife Mitigation Agreement – BPA, Idaho and Nez Perce Tribe)	70,000 Acres
Upper Snake projects ( Southern Idaho MOU – Idaho and BPA)	16,645 Acres
Anderson Ranch	9,619 HUs
Black Canyon	2,238 HUs
Deadwood	7,413 HUs
Minidoka	7,604 HUs
Palisades	32,857 HUs
Chief Joseph Dam	8,833 HUs
Grand Coulee Dam	147,143 HUs
Albeni Falls Dam (Kalispel Tribe MOU)	12,794 HUs
Albeni Falls	20,046 HUs
Albeni Falls Dam Northern Idaho MOU – BPA and Idaho)	4,225 Acres
Libby and Hungry Horse Dams (Wildlife Mitigation Agreement – Montana and BPA)	56,700 Acres

W2 - Mitigate for the assessed operational losses of wildlife associated with the ongoing operations of Hungry Horse Dam by acquiring 26,321 acres and Libby Dam by acquiring 35,571 acres.<sup>36</sup>

W3 - In the interim, until other assessments are complete, mitigate for operational losses as identified in settlement agreements as follows: the Willamette Projects, 1,000 acres (Willamette River Basin MOU); Upper Snake Projects including Deadwood, 665 acres (Southern Idaho MOU); Albeni Falls, 2,002 acres (Northern Idaho MOU).<sup>37</sup>

W4 - Contribute to maintaining and improving habitat quality on land purchased or managed to mitigate for hydrosystem impacts on wildlife by developing and using approved land management plans for all parcels purchased under the program.<sup>38</sup>



### **Coordination, Assessment, and Communication Objectives**

W5 - Coordinate with managers to complete remaining operational loss assessments.<sup>39</sup>

W6 - Improve access to information to inform decisions about program wildlife land investments, operation and maintenance, and factors that affect program activities and success.<sup>40</sup>

W7 - Annually report on progress toward program objectives and program strategy performance indicators, and progress toward addressing research critical uncertainties.<sup>41</sup>


W8 - Review progress toward objectives and strategy performance indicators and refine program objectives and program strategy performance indicators as needed.<sup>42</sup>

W9 - Track FERC hydroelectric project applications with respect to the program's protected areas.<sup>43</sup>

# STRATEGY PERFORMANCE INDICATORS FROM 2020 DRAFT ADDENDUM

[Organized by Strategy]

The following table contains the strategy performance indicators (indicators), organized by program strategy, that contribute to achieving the objectives. The code in parenthesis at the end of each indicator statement identifies the linkage between the objective and the indicator number; for example, S1-1 refers to objective S1 and indicator number 1. These indicators are not adopted into the program. The order of the strategies reflects the order in the 2014 Program.


<b>Habitat Strategy Indicators</b>
Amount of protected and restored aquatic, riparian, and wetland habitat utilized by target focal fish species, including, but not limited to, miles of increased channel complexity, quantity of water acquired or progress toward instream flow target, and acres of functioning floodplain protected and/or restored. <sup>44</sup> (E1-1)
Increase in habitat access and longitudinal/lateral connectivity for anadromous and resident focal fish species. Quantity includes, but is not limited to, number of barriers removed, miles of fish habitat made accessible, and acres of additional available habitat. <sup>45</sup> (E1-2)
Program-funded benefits to streamflow and groundwater, including, but not limited to, quantity of water acquired, progress toward instream flow targets, or changes in groundwater levels. <sup>46</sup> (E2-1)
<b>Non-Native and Invasive Species Strategy Indicators</b>
Number of watercraft inspected and decontaminated for zebra/quagga mussels. <sup>47</sup> (E3-1)
Ratio of positive detections of zebra/quagga mussels to number of inspected watercraft. <sup>48</sup> (E3-2)
<b>Predator Management Strategy Indicators</b>
The number of breeding pairs of Caspian terns and availability of suitable nesting habitat on East Sand Island. <sup>49</sup> Compare the breeding pairs to the target range of 3,125 to 4,375, and the suitable nesting habitat to the target of one acre. (E3-3)

Exploitation rate on Northern pikeminnow measuring nine inches or greater in total length (228 mm fork length).<sup>50</sup> Compare the exploitation rate to the 10-20 percent annual target. (E3-4)

Emigration, spatial distribution, and abundance of non-native Northern Pike in the Columbia River Basin.<sup>51</sup> Evaluate trend to determine if the numbers and range are reducing over time. (E3-5)

Counts of sea lions observed in the lower Columbia River and estuary. Proportion of the adult salmon and steelhead run consumed by sea lions in the lower Columbia River and estuary, with emphasis on upper Columbia spring Chinook and wild winter steelhead. Number of adult salmon and steelhead, white sturgeon, and Pacific lamprey consumed by sea lions in the lower Columbia and estuary.<sup>52</sup> Compare trend to determine if the impacts are decreasing over time. (E3-6)

**Protected Areas and Hydroelectric Development and Licensing Strategy Indicator**

Number of preliminary permits issued by FERC in protected areas; draft license applications submitted to FERC for hydroelectric projects in protected areas; licenses granted by FERC in protected areas; proposed exclusions from protected areas; and exclusions granted by the Council.<sup>53 54</sup> (C3-1, W9-1)

**Water Quality Strategy Indicators**

Water temperature conditions for program-funded habitat projects with a focus on water quality. Determine if actions are contributing to meeting water quality standards.<sup>55</sup> (E2-2)

Number of days above lethal fish temperatures for each species at fixed monitoring sites in the mainstem.<sup>56</sup> (E2-3)

Percent exceedance of state and tribal water quality temperature standards at fixed monitoring sites in the mainstem.<sup>57</sup> (E2-7)

Potential impacts of toxic contaminants on focal fish species are considered in project development and implementation.<sup>58</sup> (E2-4)

Total dissolved gas (TDG) levels during spill events at Dworshak, Libby, Grand Coulee, Hungry Horse, Albeni Falls, and at Columbia River and Snake River dams.<sup>59</sup> Compare to the following standards: (E2-5)

Projects	TDG Standard
Dworshak	110% as set by Idaho State
Libby	110% as set by Montana State
Grand Coulee	Operate to minimize TDG production

Hungry Horse	110% as set by Montana State
Albeni Falls	110% as set by Idaho State
Columbia River and Snake River Dams	TDG levels as described in the 2019-2021 Spill Operation Agreement

### Climate Change Strategy Indicators

Project managers are using available information, including stream temperatures, changes in stream flow, and location of cold-water sources, in developing restoration projects to account for climate change impacts, and are describing and documenting how climate change information is refining restoration prioritization and implementation.<sup>60</sup> (E1-3, E2-6)

Climate change information, data and models that support development and implementation of restoration projects are organized and accessible through regional information services such as StreamNet Regional Library and StreamNet.<sup>61</sup> (C5-3)

Council and project managers work together to advance efforts to incorporate climate change impacts in decision making in anticipation of emerging state and tribal policies.<sup>62</sup> (C5-6)

### Mainstem Hydrosystem Flow and Passage Strategy Indicators

Annual juvenile fish dam passage survival for spring Chinook and steelhead (spring migrants) and Snake River fall Chinook subyearling (summer migrants) at each Snake River and lower Columbia River dam.<sup>63</sup> Compare to the following performance standards: (S2-1)

ESU	Juvenile Performance Standard
Spring Chinook and steelhead (spring migrants)	Achieve at least 96% dam passage survival
Snake river fall Chinook subyearling (summer migrants)	Achieve at least 93% dam passage survival

Power house encounter rates are compiled when available.<sup>64</sup> (S2-3)

Annual adult salmon and steelhead survival for the Bonneville Dam to Lower Granite Dam reach and the Bonneville Dam to McNary Dam reach.<sup>65</sup> Compared to the following performance standards: (S2-2)

ESU	Adult Performance Standard	Reach
Snake River fall Chinook	81.2%	BON to LGR
Snake River spring-summer Chinook	91.0%	BON to LGR
Snake River sockeye	Use Snake River spring/summer chinook salmon and steelhead as surrogate until a standard is developed	BON to LGR
Snake River steelhead	90.1%	BON to LGR

Upper Columbia River spring Chinook	90.1%	BON to MCN
Upper Columbia River steelhead	84.5%	BON to MCN
Middle Columbia River steelhead	Use Snake River steelhead as surrogate until a standard is developed	Variable
Columbia River chum	None; assume survival is adequate if Snake River chinook BON to LGR standard is met	None
Lower Columbia River Chinook	None; assume survival is adequate if Snake River spring/summer chinook and Snake River fall chinook standards are met	None
Lower Columbia River coho	None; assume survival is adequate if Snake River fall chinook standards are met	None
Lower Columbia River steelhead	None; assume survival is adequate if Snake River steelhead standards are met	None
Upper Willamette River Chinook	None	None
Upper Willamette River steelhead	None	None

Annual passage for adult Pacific lamprey trends. Compare to the interim standard of 80%.<sup>66</sup> (L2-1)

Seasonal flows at specified Columbia and Snake River dams. The flow objectives come from the Action Agencies' proposed action analyzed and recognized in the Columbia River System biological opinion, with limitations and adjustments on meeting these targets as described by the Action Agencies. Compare to the following flow objectives:<sup>67</sup> (E4-1)

Location	Dates	Spring	Dates	Summer
		Objective (kcfs)		Objective (kcfs)
Snake River at Lower Granite Dam	4/03 to 6/20	85 to 100 <sup>(1)</sup>	6/21 to 8/31	55 to 55 <sup>(1)</sup>
Columbia River at McNary Dam	4/10 to 6/30	220 to 260 <sup>(1)</sup>	7/01 to 8/31	200
Columbia River at Priest Rapids	4/10 to 6/30	135	N/A	N/A
Columbia River at Bonneville Dam	11/1 to emergence	125 to 160 <sup>(2)</sup>	N/A	N/A

(1) the kcfs objective varies according to value forecasts.

(2) the kcfs objective varies based on actual and forecasted water conditions.

Kcfs: thousand cubic feet per second



### Estuary Strategy Indicator

Acres of estuary floodplain protected or restored. Compare to target of no net loss of native habitats and recovery of 40 percent of historic extent for priority habitats.<sup>68</sup> (E1-4)

### Plume and Nearshore Ocean Strategy Indicator

NOAA's stop light indicator chart of ocean conditions is accessible on the Program Tracker.<sup>69</sup> (C5-5)

### Wildlife Mitigation Strategy Indicators

Annual contribution toward unmitigated target wildlife construction and inundation losses.<sup>70</sup> The total mitigation responsibilities are in W1.

Dam	Unmitigated Loss in HU	Unmitigated Loss in Acres
Bonneville	18,187	
The Dalles	24	
John Day	0	
McNary	0	
Libby		0
Hungry Horse		0
Dworshak		2,424
Willamette Dams (Detroit, Big Cliff, Cougar, Foster, Green Peter, Lookout Point, Dexter, Hills Creek)		7,554
Lower Snake (Ice Harbor, Lower Monumental, Little Goose, Lower Granite)	0	
Anderson Ranch (Shoshone Paiute and Shoshone Bannock)	6,133	
Black Canyon (Shoshone Paiute and Shoshone Bannock)	2,238	
Deadwood (Shoshone Paiute and Shoshone Bannock)	7,413	
Minidoka (Shoshone Bannock)	4,479	
Palisades (Shoshone Bannock)	24,507	
Upper Snake (IDFG) (Anderson Ranch, Black Canyon, Minidoka, Palisades)		7,173
Chief Joseph	0	
Grand Coulee	45,385	
Albeni Falls (Kalispel Tribe)	1,463	0
Albeni Falls (IDFG)		

Albeni Falls (KTOI and CDA Tribe)	13,655
Annual contribution toward wildlife operational losses for Libby and Hungry Horse dams. <sup>71</sup> Compare to targets in loss assessments: (W2-1)	
Dam	Mitigation Responsibilities in HU Mitigation Responsibilities in Acres
Libby	35,571
Hungry Horse	26,321
Annual contribution toward wildlife operational losses for Willamette dams, Deadwood dam, and Albeni Falls dam. <sup>72</sup> Compare to targets in settlement agreements: (W3-1)	
Dam	Mitigation Responsibilities in HU Mitigation Responsibilities in Acres
Deadwood (IDFG)	655
Willamette Dams (Detroit, Big Cliff, Cougar, Foster, Green Peter, Lookout Point, Dexter, Hills Creek)	1,000
Albeni Falls (IDFG)	1,378
Each land parcel funded by the program has an updated stewardship agreement that is evaluated on a five-year cycle to verify that it is being managed as required by the applicable agreement. <sup>73</sup> (W4-1)	
Options for addressing remaining wildlife losses are discussed and evaluated with managers to determine whether a settlement, agreement, or loss assessment is the best approach. <sup>74</sup> (W5-1)	
Maintenance needs for program-funded wildlife lands are addressed annually as supported by the Asset Management Strategic Plan. <sup>75</sup> (W6-1)	
<b>All Strategies Indicators</b>	
Program objectives and program strategy performance indicators are refined, as needed, with tribal, state, and federal managers and other experts using the best available information. <sup>76</sup> (C2-1)	
Progress toward program objectives and strategy performance indicators is reviewed with managers prior to program amendment during the Regional Coordination Forum. <sup>77</sup> (C2-2)	

## Fish Propagation Including Hatchery Programs Strategy Indicators

Progress toward the regionally agreed-upon provisional goal for hatchery-origin fish releases and the hatchery-origin adult fish (HOF) returns for the 22 groups of populations, based on interim regionally agreed-upon provisional goals as calculated at the Columbia River mouth. The program recognizes the provisional mid-term and long-term hatchery goals developed through the collaborative regional effort but focuses, in the interim, on contributing to the following near-term hatchery fish target calculated as a 10-year average:<sup>78</sup> (S1-2)

Group	Current Hatchery Production	Future Total Hatchery Production	HOF return to the mouth near-term 10-year average	HOF return to the mouth mid-term 10-year average	HOF return Long-term 10-year average
Lower Columbia Chum group (note that return goals include hatchery and natural origin fish combined)	473,000	750,000	21,000	51,000	102,000
Lower Columbia Coho group	11,108,600	10,969,000	374,000	374,000	374,000
Lower Columbia Fall Chinook (tules) group	41,441,500	37,441,500	163,000	151,000	139,000
Lower Columbia Late Fall Chinook (bright) group	0	0	0	0	0
Lower Columbia Spring Chinook group	7,056,000	9,650,000	17,000	21,000	25,000
Lower Columbia Steelhead group	3,205,000	3,396,000	77,000	77,000	77,000
Mid-Columbia (upriver) Coho group	8,750,000	7.20-8.45 million	374,000	374,000	374,000
Mid-Columbia Sockeye group	Limited releases, no value provided	Limited releases, no value provided	none provided	none provided	none provided
Mid-Columbia Spring Chinook group	3,540,000	4,060,000	47,200	49,700	52,200
Mid-Columbia Steelhead group	1,535,000	865,000	58,000	45,300	32,700
Mid-Columbia Summer/Fall Chinook group	21,400,000	22,400,000	none provided	none provided	none provided

Snake River Fall Chinook group	5,500,000	5,500,000	49,200	49,200	49,200
Snake River Sockeye group	700,000	1,000,000	1,170	0	0
Snake River Spring/Summer Chinook group	15,340,500	18,115,500	85,500	98,000	110,000
Snake River Summer Steelhead group	10,328,000	10,328,000	203,400	203,400	203,400
Upper Columbia Fall Chinook group	13,210,000	24.5-29.6 million	118,100	118,100	241,800
Upper Columbia Sockeye group	4,500,000	14,100,000	45,000	45,000	141,000
Upper Columbia Spring Chinook group	3,094,000	3.8-16.6 million	19,400	23,900	104,200
Upper Columbia Summer Chinook group	4,495,000	5.4-22.5 million	47,000	96,000	146,000
Upper Columbia Summer Steelhead group	1,005,300	1.0-4.1 million	21,000	40,000	58,000
Willamette River Spring Chinook group	5,241,000	5,817,000	48,000	51,000	53,000
Willamette River Winter Steelhead group	600,000	550,000	0	0	0
All program-funded hatcheries have a final management plan and a reviewed and approved master plan, with specific objectives to track performance. <sup>79</sup> (S1-1)					
Cutthroat trout hatchery objectives are tracked and compared to the management plan and a reviewed and approved master plan. <sup>80</sup> (R2-1)					
Kokanee hatchery objectives are tracked and compared to the management plan and a reviewed and approved master plan. <sup>81</sup> (R3-1)					
Burbot hatchery objectives are tracked and compared to the management plan and a reviewed and approved master plan. <sup>82</sup> (NF1-1)					
Maintenance needs for program-funded artificial production facilities and fish screens are addressed as recommended in the Asset Management Strategic Plan. <sup>83</sup> (C5-4)					
Support and develop a solution that addresses similar issues with the operation/maintenance, and capital construction/improvements of other hatchery					

programs supported indirectly through BPA or other funding sources (e.g., LSRCP hatcheries).

### Wild Fish Strategy Indicators

Progress toward the target 10-year geometric mean of natural origin spawner (NOS) escapement abundance for the 22 groups of populations, based on interim regionally agreed-upon provisional goals. The table includes delisting values for ESA and non-ESA populations, but we expect that some populations, in particular healthy and non-listed populations, will regularly exceed these values. The program recognizes the provisional medium and high escapement abundances developed through the collaborative regional effort but, for ESA-listed stocks, near-term focus will be on contributing to the following low natural-origin spawner escapement target:<sup>84</sup> For unlisted stocks that are already exceeding the low goal, the focus will be on achieving medium and high targets. (S1-3)

Group	NOS Escapement Low, 10-year geometric mean	NOS Escapement Mid, 10-year geometric mean	NOS Escapement High, 10-year geometric mean
Lower Columbia Spring Chinook group	9,800	21,550	33,300
Lower Columbia Chum group	16,500	33,000	49,500
Lower Columbia Coho group	60,925	122,550	184,400
Lower Columbia Fall Chinook (tules) group	28,050	54,100	82,000
Lower Columbia Late Fall Chinook (bright) group	11,100	16,700	22,200
Lower Columbia Steelhead group	25,570	35,650	45,050
Mid-Columbia (upriver) Coho group	24,000	57,800	96,900
Mid-Columbia Sockeye group	2,500	5,000	7,500
Mid-Columbia Spring Chinook	15,750	26,875	38,000
Mid-Columbia Steelhead group	21,250	43,350	69,150
Mid-Columbia Summer/Fall Chinook group	4,000	13,000	16,000
Snake River Fall Chinook group	4,200	9,280	14,360
Snake River Sockeye group	2,500	5,750	9,000
Snake River Spring/Summer Chinook group	31,750	79,375	127,000
Snake River Summer Steelhead group	21,000	63,000	105,000
Upper Columbia Fall Chinook group	9,200	62,215	87,835
Upper Columbia Sockeye group	49,000	620,000	2,235,000

Upper Columbia Spring Chinook group	11,500	19,842	30,138
Upper Columbia Summer Chinook group	9,000	78,350	131,300
Upper Columbia Summer Steelhead group	7,500	31,000	47,000
Willamette River Spring Chinook group	28,891	47,832	66,773
Willamette River Winter Steelhead group	16,292	27,809	39,325

### The Use of Hatcheries for Reintroduction Strategy Indicator

Abundance and distribution of Pacific lamprey throughout their native range in the Columbia River Basin.<sup>85</sup> Compare trend to determine if the numbers and range are increasing over time. (L1-1)

### Anadromous Fish Mitigation in Blocked Areas Strategy Indicator

Information regarding fish passage, fish reintroduction approaches, upstream/downstream passage options and costs, and habitat suitability is completed and available on the Council's website.<sup>86</sup> (C7-1)

### Resident Fish Mitigation Strategy Indicators

Bull trout populations abundance.<sup>87</sup> Compare to the following targets for the five recovery units in the Columbia River Basin: (R1-1)

Recovery Unit	Target
St Marys Recovery Unit	A stable or increasing trend for at least 2 generations.
Columbia Headwaters Recovery Unit	Exceed a 10-year rolling average adult abundance of 8,500
Mid-Columbia Recovery Unit	Exceed a 10-year rolling average adult abundance of 46,454
Snake River Recovery Unit	Exceed a 10-year rolling average adult abundance of 27,350
Coastal Recovery Unit	Exceed a 10-year rolling average adult abundance of 2,900


Cutthroat trout populations' genetic integrity is protected by program-funded actions by contributing to maintaining isolation from invasive trout and enhancing occupancy across its historical range, including but not limited to, maintaining physical barriers between species.<sup>88</sup> (R2-2)

Redband trout populations' genetic integrity is protected from non-native hatchery trout by program-funded hatchery actions.<sup>89</sup> (R4-1)

Redband trout distribution within their native range in the basin.<sup>90</sup> Compare to the following historical occupancies within each of the five geographic management units: (R4-2)

GMU	Stream length miles (km) historical	Lake Area acres (ha) historical
Deschutes River Redband GMU	2,650.1 (4,265)	30,767 (12,451)
Kootenai Redband GMU	1,184.9 (1,907)	879.7 (356)
Snake River Redband GMU	22,503.6 (36,216)	2.5 (1)
Clearwater Redband GMU	712.7 (1,147)	1,924.9 (779)
Upper Columbia-Spokane Redband GMU	5,987.5 (9,636)	9,128.1 (3,694)

Hungry Horse Dam impacts on westslope cutthroat and bull trout are partially mitigated.<sup>91</sup> Compared to the following targets: (E1-5)

-  protecting or restoring 448 miles (721 km) of suitable habitat that is closely equivalent to the habitat blocked by Hungry Horse Dam with the Flathead River watershed.

Libby Dam impacts on westslope cutthroat and bull trout are partially mitigated.<sup>92</sup> Compared to the following targets: (E1-6)

- protecting or restoring 87 miles (140 km) of suitable stream habitat in the Kootenai River by 2028.
- making accessible 60 miles or more of previously blocked suitable streams


Status and trend of burbot, Oregon chub, kokanee and native freshwater mussels.<sup>93</sup> (C4-1)

Distribution of native freshwater mussels.<sup>94</sup> (C4-2)

Discussions with fish managers are undertaken to evaluate and identify the best approach to assess remaining native focal fish losses.<sup>95</sup> (C6-1)

### White Sturgeon Strategy Indicators

White sturgeon population abundance.<sup>96</sup> Compare abundance to the following targets: (WS1-1)

Management Unit	Target
	Maintain and/or exceed a rolling three-year average abundance of 300,000 sub-adult (>38 inches and < 54 inches fork length) and eventually exceed 368,000 sub-adult white sturgeon.
Lower Columbia Management Unit	Maintain and/or exceed a rolling three-year average abundance of 6,250 adult white sturgeon and eventually exceed 16,250 adult white sturgeon
Upper and Lower Mid-Columbia Management Unit	Increase abundance of white sturgeon, contributing to restoration of viable populations and fisheries.

Transboundary Upper Columbia Management Unit	Ensure interim adult populations of 2,000 in the Canadian Transboundary Reach and 5,000 in the US Transboundary Reach. Maintain a subsistence and recreational fishery harvest objective of 2,000 fish per year.
Kootenai Management Unit	The number of Kootenai sturgeon wild recruits (offspring that survive to sexual maturity at 25 years) that are added to the adult (25 years or older) population annually should average at least 250 individuals per year over 10 years. In addition, the population should include at least 10,000 wild juveniles, ages 3 to 24 years.” (for delisting). For down-listing: population demonstrates natural production of at least 700 wild age-3 juveniles in at least three of 10 consecutive years,
Lower Snake Management Unit	Abundance of white sturgeon is maintained or increasing, contributing to restoration of viable populations and fisheries for white sturgeon in mid-Columbia River reservoirs between Bonneville and Priest Rapids dams.
Middle Snake Management Unit	Maintain natural, stable aged-structure population with a minimum of 2,500 adult fish from Lower Granite to Hells Canyon.
Upper Snake Management Unit	Provide stable to increasing trends in sturgeon abundances (greater than 23.6 inches (60 cm)) for the following reach abundance targets: Bliss to CJ Strike, 2,900 fish; CJ Strike to Swan Falls, 1,340 fish; Lower Salmon Falls to Bliss, 630 fish; Swan Falls to Brownlee, 7,100 fish; Upper Salmon Falls to Lower Salmon Falls, 340 fish.
Sturgeon hatchery objectives are tracked and compared to the hatchery management plan and a reviewed and approved master plan. <sup>97</sup> (WS1-2)	
<b>Pacific Lamprey Strategy Indicator</b>	
Adult Pacific lamprey Bonneville Dam count. Compare to the three-year rolling average of 200,000 in near-term progressing toward 1,000,000. <sup>98</sup> (L1-2)	
<b>Eulachon Strategy Indicator</b>	
Spawning stock biomass of Columbia River eulachon. Evaluate to determine if biomass is stable and/or increasing. <sup>99</sup> (NF1-2)	



## Public Engagement Strategy Indicators

Progress toward program objectives and strategy performance indicators, along with the Council's HLIs and contextual information such as ocean conditions and existing strongholds, is reported annually on the Council's Program Tracker and Program Performance & Progress site. Information accessibility is supported through existing collaborative regional information exchange groups and databases, especially program-supported efforts. Examples are: The Coordinated Assessment effort, StreamNet – Coordinated Information System, Fish Passage Center, CRITFC Inter-Tribal Monitoring Data, StreamNet Regional Library, and the Intermountain Province Subbasin Data Management Project.<sup>100 101</sup> (C1-1, W7-1)

Progress toward addressing research plan critical uncertainties is reported in the Council's 2017 Research Plan Uncertainties Database.<sup>102 103</sup> (C1-2, W7-2)

The information presented on the Council's Program Tracker and Program Performance & Progress sites are reviewed by representatives of tribal, state, and federal managers.<sup>104 105</sup> (C1-3, W7-3)

The Council's tracking document for Operation and Maintenance (O&M) needs for hatcheries, fish screens and lands and fish objectives and associated mappers are annually updated.<sup>106 107</sup> (C5-1, W6-2)

Financial and/or in-kind support are provided to existing regional forums contributing to the program's progress, such as the Fish Screen Oversight Committee, lamprey Technical Work Group and Conservation Team, collaborative white sturgeon workshop, Lake Roosevelt Forum, Washington Salmon Recovery Conference, American Fisheries Society local meetings, The Columbia Basin Transboundary Conference, and Council science-policy exchanges.<sup>108 109</sup> (C5-2, W6-3)

Program objectives and program strategy performance indicators are refined, as needed, with tribal, state, and federal managers and other experts using the best available information.<sup>110</sup> (W8-1)

## References

<sup>1</sup> The values for Objective S1 are derived by combining the MAFAC-Columbia Basin Partnership Task Force Phase 1 Report's [Appendix A](#) values for the fish stocks found in the 5 groups: Lower Columbia, Mid-Columbia, Upper Columbia, Snake River, and Willamette. The values summed to derive these near-term provisional goals for salmon and steelhead adults returning to the Columbia River mouth are based on the delisting abundance for ESA-listed populations. For consistency, a delisting abundance was determined for non-ESA-listed populations, such as the populations in the Upper Columbia fall chinook group; however, it is expected that the abundance of non-listed healthy populations, as well as some listed populations (such as Snake River fall Chinook), will regularly exceed this delisting abundance value. See the annotated Appendix A document for specific major population groups and populations that are combined within these 5 groups

<https://nwcouncil.box.com/s/v6nt23o7vl1zi9xa4d766q64asgpbtxi> .

<sup>2</sup> The values for Objective S2 are based on the 2014 Fish and Wildlife Program, Appendix D, Theme 2, objective 2d. This value was first adopted into the 2013 Mainstem Program Amendment, section Mitigation/Passage Conditions for Anadromous Fish as recommended by the Columbia River Inter-Tribal Fish Commission, IDFG, and ODFW. This value is also part of the Council's HLIs ([view HLI table](#)).

<sup>3</sup> The White Sturgeon Goal WS is based on the 2014 Fish and Wildlife Appendix D, Theme 2, Goal #1, objective 1m, objective 1p, goal 2, goal 3, objective 3a, goal 4, and objective 4d.

<sup>4</sup> The Objective WS1 is based on the following sources of information compiled in the Council's Fish Objective mapping tool: (a) 2011 Lower Columbia River and Oregon Coast White Sturgeon Conservation Plan; (b) CBFWA Fish and Wildlife Program

Recommendation;(c) 2004 Draft Lower Mid-Columbia Mainstem Subbasin Plan Includes Rock Creek, Washington; (d) 2004 Columbia Gorge Mainstem Subbasin Plan; (e) Upper Columbia White Sturgeon Recovery Initiative Operational Plan 2013-2017; (f) Upper Columbia White Sturgeon Recovery Plan - 2012 Revision; (g) 2013 Columbia Basin White Sturgeon Planning Framework; (h) 2010 Pres River Native Fish Conservation Aquaculture Program Master Plan; (i) 1995 Wy-Kan-Ush-Mi Wah-Kish-Wit; (j) 2005 White Sturgeon Management Plan in the Snake River between Lower Granite and Hells Canyon Dams; and, (k) 2004 Middle Snake Subbasin Management Plan.

<sup>5</sup> The definition of the term 'healthy' comes from the 2014 Program, Appendix D, Goal 13, footnote #10 which states that: healthy is defined as having abundance, productive, diverse and spatially distributed populations.

<sup>6</sup> The values for the 7 management units included in the Performance Indicator WS1-2 are based on the following sources of information compiled in the Council's Fish Objective mapping tool: (a) Lower Columbia Management Unit: 2011 Lower Columbia

River and Oregon Coast White Sturgeon Conservation Plan; (b) Upper and Lower Mid-Columbia Management Unit: CBFWA Fish and Wildlife Program Recommendation, 2004 Draft Lower Mid-Columbia Mainstem Subbasin Plan Includes Rock Creek, Washington, and, 2004 Columbia Gorge Mainstem Subbasin Plan; (c) Transboundary Upper Columbia Management Unit: Upper Columbia White Sturgeon Recovery Initiative Operational Plan 2013-2017, Upper Columbia White Sturgeon Recovery Plan - 2012 Revision, and, 2013 Columbia Basin White Sturgeon Planning Framework; (d) Kootenai Management Unit: 2010 Kootenai River Native Fish Conservation Aquaculture Program Master Plan; (e) Lower Snake Management Unit: 1995 Wy-Kan-Ush-Mi Wah-Kish-Wit; (f) Middle Snake Management Unit: 2005 White Sturgeon Management Plan in the Snake River between Lower Granite and Hells Canyon Dams; and, (g) Upper Snake Management Unit: 2004 Middle Snake Subbasin Management Plan.

<sup>7</sup> The Performance Indicator WS1-2 is based on the (a) 2014 Fish and Wildlife Program's Fish Propagation Including Hatchery Programs Strategy, and (b) Three-Step Review Process (January 12, 2015) available <https://nwcouncil.app.box.com/file/41663249718>

<sup>8</sup> The Pacific Lamprey Goal, L, is based on the (a) 2014 Fish and Wildlife Program Appendix D, Theme 2 goal 1, objective 1j, goal 2, goal 3, objective 3a, and Theme 3, goal: 1; (b) 2011 Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin; and (c) documents compiled in the Fish Objectives mapping tool including the 2012 Conservation Agreement for Pacific Lamprey (*Entosphenus tridentatus*) in the States of Alaska, Washington, Oregon, Idaho and California.

<sup>10</sup> The Objective L2 is based on (a) 2011 Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin; and, (b) recommendation submitted for the 2014 Program amendment process by BPT, CRITFC, CTGR, CTUIR, Cowlitz, NPT, USRTF, USFWS.

<sup>11</sup> The Performance Indicator L1-2 is based on the 2011 Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin.

<sup>12</sup> The Resident Salmonids Goal, R, is based on the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1m, Objective 1p, Goal 2, Goal 3, Objective 3a, Goal 4, and Objective 4d.

<sup>13</sup> The Objective R1 is based on the (a) the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1m, Objective 1p, Goal 2, Goal 3, Objective 3a, Goal 4, and Objective 4d; and, (b) documents compiled in the Fish Objectives mapping tool including: the 2002 USFWS Bull Trout Draft Recovery Plan.

<sup>14</sup> The Objective R1 is based on the (a) the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1m, Objective 1p, Goal 2, Goal 3, Objective 3a, Goal 4, and Objective 4d; and, (b) documents compiled in the Fish Objectives mapping tool including: the 2002 USFWS Bull Trout Draft Recovery Plan.

<sup>16</sup> The Objective R3 is based on (a) the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1p, Goal 2, Goal 3, Objective 3a; and (b) documents compiled in the Fish Objectives mapping tool including: Montana Statewide Fish Management Plan 2013-2018, IDFG Fisheries Management Plan 2013-2018, 2012 Coeur d'Alene Tribe Integrated Resource Management Plan, 2000 Draft Pend Oreille Subbasin Summary, 2000 Draft SanPoil River Subbasin Summary, 2004 Spokane Subbasin Plan, 2000 Kootenai River Subbasin Management Plan, and MFWP/CSKT Flathead Lake and River Fisheries Co-Management Plan 2001-2010.

<sup>17</sup> The Objective R1 is based on the (a) the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1m, Objective 1p, Goal 2, Goal 3, Objective 3a, Goal 4, and Objective 4d; and, (b) documents compiled in the Fish Objectives mapping tool including: the 2002 USFWS Bull Trout Draft Recovery Plan.

<sup>18</sup> The Objective R4 is based on (a) the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1p, Goal 2, Goal 3, Objective 3a; and, (b) documents compiled in the Fish Objectives mapping tool including: 2016 Conservation Strategy for Interior Redband (*Oncorhynchus mykiss* subsp.) in the states of California, Idaho, Montana, Nevada, Oregon and Washington, 2000 Fifteenmile Subbasin Summary, 2009 Lake Roosevelt Fisheries Guiding Document, IDFG Fisheries Management Plan 2013-2018, 2014 Rangewide Conservation Agreement for the Conservation and Management of Interior Redband Trout, Montana Statewide Fisheries Management Plan 2013-2018, and 2004 Intermountain Province Subbasin Plan.

<sup>20</sup> The Native Aquatic Focal Species Goal, NF, is based on the (a) 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1p, Goal 2, Goal 3, and Objective 3a; (b) 2016 Draft Eulachon Recovery Plan October 2016 Endangered Species Act Recovery Plan for the Southern Distinct Population Segment of Eulachon (*Thaleichthys pacificus*); (c) the 2017 Endangered Species Act Recovery Plan for the Southern Distinct Population Segment of Eulachon (*Thaleichthys pacificus*); (d) 2013 Federal Recovery Outline Pacific Eulachon Southern Distinct Population Segment ; (e) WDFW/ODFW 2001 . Washington and Oregon Eulachon Management Plan; (f) 2004 Lower Columbia Salmon Recovery And Fish & Wildlife Subbasin Plan Volume II – Subbasin Plan Chapter A – Lower Columbia Mainstem and Estuary; (g) 2015 Eulachon: State of the Science and Science to Policy Forum available <https://nwcouncil.box.com/s/9smx3zqt6y8ym5ipw45g10fihillpsme> .

<sup>21</sup> The Objective NF1 is based on the (a) 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1p, Goal 2, Goal 3, and Objective 3a; (b) 2016 Draft Eulachon Recovery Plan October 2016 Endangered Species Act Recovery Plan for the Southern Distinct Population Segment of Eulachon (*Thaleichthys pacificus*); (c) the 2017 Endangered Species Act Recovery Plan for the Southern Distinct Population Segment of Eulachon (*Thaleichthys pacificus*); (d) 2013 Federal Recovery Outline Pacific Eulachon Southern Distinct Population Segment ; (e) WDFW/ODFW 2001 . Washington and Oregon Eulachon Management Plan; (f) 2004 Lower Columbia Salmon Recovery And Fish & Wildlife Subbasin Plan Volume II – Subbasin Plan Chapter A –

Lower Columbia Mainstem and Estuary; (g) 2015 Eulachon: State of the Science and Science to Policy Forum available

<https://nwcouncil.box.com/s/9smx3zqt6y8ym5ipw45g10fihillpsme>

<sup>22</sup> The Objective E1 is based on the 2014 Fish and Wildlife Program Appendix D, Theme 1, Goal 1, Goal 2, Goal 3, Goal 7, Objective 7a, Goal 8, Goal 9, and Goal 10.

<sup>24</sup> The Objective E3 is based on (a) the 2014 Fish and Wildlife Program Appendix D, Theme 1, Goal 1; and, (b) the 2014 program Non-Native and Invasive Species strategy.

<sup>26</sup> The Objective E4 is based on (a) the 2019 CRS Biological Opinion, (b) 2018 Consultation Package related to the 2019 CRS Biological Opinion (c) the 2008 FCRPS BiOP, and (d) 2007 Biological Assessment for Effects of Federal Columbia River Power System and Mainstem Effects of Other Tributary Actions on Anadromous Salmonid Species Listed Under the Endangered Species Act.

<sup>27</sup> The Objective C1 builds on the 2014 program's commitment to adaptive management.

<sup>28</sup> The Objective C2 builds on the 2014 program's commitment to adaptive management.

<sup>29</sup> The Objective C3 is based on the 2014 program Protected Areas and Hydroelectric Development and Licensing strategy.

<sup>31</sup> The objective C5 is based on the 2014 program's (a) section V. Tracking the Status of the Basin's Fish and Wildlife Resources; (b) Public Engagement Strategy; and, (c) Part Four: Adaptive Management.

<sup>32</sup> The objective C6 is based on the 2014 program's (a) Appendix D, Theme Two, Goal 1, and Goal 3; and, (b) Resident Fish Mitigation Strategy.

<sup>33</sup> The objective C7 is based on the 2014 program's (a) Appendix D, Theme 3, Goal 2; and, (b) Anadromous Fish Mitigation in Blocked Areas Strategy.

<sup>34</sup> The Wildlife Goal, W, is based on the 2014 Fish and Wildlife Program Appendix D, Theme 1 Goal 12, and Objective 12a.

<sup>35</sup> The values for the Objective W1 are derived by taking the habitat unit (HU) loss identified in the 2014 Program Appendix C, with mitigation done prior to FY2002 being addressed at a 1:1 ratio, and mitigation from FY2002 on being addressed by doubling the identified remaining HU. If a portion of HUs were addressed through a settlement agreement, the HUs addressed by the agreement are translated into the agreed upon acres and the total HUs adjusted accordingly. These values are described in the Wildlife Strategy Program Mitigation and Remaining Loss Ledger presentation to the Fish and

Wildlife Committee February 2019. Available  
<https://nwcouncil.box.com/s/cmqsI9d88xi652tjulnt7v69j5ebwo2h>

Supporting documents include: (a) Wildlife Mitigation Agreement for Dworshak Dam. Bonneville Power Administration, State of Idaho and Nez Perce Tribe, available <https://nwcouncil.box.com/s/ymah6ng5qej5fvi3r78akzhkfr0m8qgwz>; (b) Idaho and Bonneville Stewardship and Restoration Agreement for Albeni Falls Dam, Final Talking Points, November 7, 2017, available <https://nwcouncil.box.com/s/xsdcuazlh36sevfj22wc4v8va1t3eby6>; (c) Wildlife Mitigation Agreement for Libby and Hungry Horse Dams between the Bonneville Power Administration and the State of Montana (1992). Available <https://nwcouncil.box.com/s/dw1gxvvlb3eqz67q6rqps1i2kgzv0gl4>; (d) Willamette River Basin Memorandum of Agreement Regarding Wildlife Habitat Protection and Enhancement between the State of Oregon and the Bonneville Power Administration, October 22, 2010, available <https://nwcouncil.box.com/s/hzef29x39pn3kqe04oxjo7jluf4595dg>; and, (e) Bonneville Power Administration, Administrators' Record of Decision and Response to Comments Southern Idaho Wildlife Mitigation Memorandum of Agreement, September 2014, Available <https://nwcouncil.box.com/s/kmxmwt8t0rbwkyr0mjhxbferu6ju6nh3>

<sup>36</sup> The values for Objective W2 are described in the Wildlife Strategy Program Mitigation and Remaining Loss Ledger presentation to the Fish and Wildlife Committee February 2019. Available <https://nwcouncil.box.com/s/cmqsI9d88xi652tjulnt7v69j5ebwo2h>

Supporting documents includes 2018 recommendations and comments on the 2014 F&W Program received from Montana Fish, Wildlife & Parks, Confederated Salish & Kootenai Tribes, and Kootenai Tribe of Idaho.

<sup>37</sup> The values for Objective W3 are described in the Wildlife Strategy Program Mitigation and Remaining Loss Ledger presentation to the Fish and Wildlife Committee February 2019. Available <https://nwcouncil.box.com/s/cmqsI9d88xi652tjulnt7v69j5ebwo2h>

Supporting documents include: (a) Idaho and Bonneville Stewardship and Restoration Agreement for Albeni Falls Dam, Final Talking Points, November 7, 2017, available <https://nwcouncil.box.com/s/xsdcuazlh36sevfj22wc4v8va1t3eby6>; (b) Willamette River Basin Memorandum of Agreement Regarding Wildlife Habitat Protection and Enhancement between the State of Oregon and the Bonneville Power Administration, October 22, 2010, available <https://nwcouncil.box.com/s/hzef29x39pn3kqe04oxjo7jluf4595dg>; and, (c) Bonneville Power Administration, Administrators' Record of Decision and Response to Comments Southern Idaho Wildlife Mitigation Memorandum of Agreement, September 2014, Available <https://nwcouncil.box.com/s/kmxmwt8t0rbwkyr0mjhxbferu6ju6nh3>

<sup>38</sup> The Objective W4 is based on the 2014 Fish and Wildlife Program Wildlife Mitigation Strategy.

<sup>39</sup> The Objective W5 is based on the 2014 Fish and Wildlife Program Wildlife Mitigation Strategy.

<sup>40</sup> The Objective W6 is based on the 2014 Fish and Wildlife Program's (a) Wildlife Mitigation Strategy; and, (b) Appendix P. Maintenance of Fish and Wildlife Program Investments; (c) section V. Tracking the Status of the Basin's Fish and Wildlife Resources; (d) Public Engagement Strategy; and, (e) Part Four: Adaptive Management.

<sup>41</sup> The Objective W7 builds on the 2014 program's commitment to adaptive management.

<sup>42</sup> The Objective W8 builds on the 2014 program's commitment to adaptive management.

<sup>43</sup> The Objective W9 is based on the 2014 program Protected Areas and Hydroelectric Development and Licensing Strategy.

<sup>44</sup> The Performance Indicator E1-1 is based on the 2014 Fish and Wildlife Program Appendix D, Theme 1, Goal 1, Goal 2, 3, Goal 4, Goal 5, Goal 7, Objective 7a, Goal 10, and Goal 11.

<sup>45</sup> The Performance Indicator E1-2 is based on the 2014 Fish and Wildlife Program Appendix D, Theme 1, Goal 7, Objective 7a, Goal 8, Goal 9, and Goal 10.

<sup>46</sup> The Performance Indicator E2-1 is based on the 2014 Fish and Wildlife Program - Appendix D, Theme 1, Goal 1, Goal 2, 3, Goal 4, Goal 5, Goal 7, Objective 7a, Goal 10, and Goal 11.

<sup>47</sup> The Performance Indicator E3-1 is based on the 2014 Fish and Wildlife Program Non-Native and Invasive Species Strategy.

<sup>48</sup> The Performance Indicator E3-2 is based on the 2014 Fish and Wildlife Program Non-Native and Invasive Species Strategy.

<sup>49</sup> The Performance Indicator E3-3 is based on (a) the 2014 Fish and Wildlife Program Predator Management Strategy; (b) USFWS 2005 Caspian Tern Management to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary, Final Environmental Impact Statement; (c) USACE 2014 Inland Avian Predation Management Plan Environmental Assessment; and, (d) Roby D.D. et al. 2015 Avian Predation on Juvenile Salmonids: Evaluation of the Caspian Tern Management Plan in the Columbia River Estuary. 2015 Bonneville Annual Project Report, Project No. 1997-024-00.

<sup>50</sup> The Performance Indicator E3-4 is based on (a) the 2014 Fish and Wildlife Program Predator Management Strategy; and, (b) Williams, S.E. et al. 2017 Report on the predation index, predator control fisheries, and program evaluation for the Columbia River Basin Northern pikeminnow sport reward program, 2017 Bonneville Annual Project Report, Project No. 1990-077-00.

<sup>51</sup> The Performance Indicator E3-5 is based on (a) from the 2014 Fish and Wildlife Program Predator Management Strategy; and, (b) Northern Pike Suppression and Monitoring, Bonneville Project No. 2017-004-00, implemented by the Colville Confederated Tribes, Spokane Tribes, and WDFW.

<sup>52</sup> The Performance Indicator E3-6 is based on (a) the 2014 Fish and Wildlife Program Predator Management Strategy; (b) 2011 Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin; (c) Hatch D.R. et al. 2018. Sea Lion Monitoring and Non-Lethal Hazing. 1/1/2017 – 12/31/2017 Bonneville Annual Project Report, Project No. 2008-004-00; and, (d) Tidwell K.S. et al. 2018. Evaluation of Pinniped Predation on Adult Salmonids and other Fish in the Bonneville Dam Tailrace, 2018. USACE Portland District, Fisheries Field Unit. Cascade Locks, Oregon, available <http://pweb.crohms.org/tmt/documents/FPOM/2010/Task%20Groups/Task%20Group%20Pinnipeds/2018%20Pinniped%20Annual%20Report.pdf>

<sup>53</sup> The Performance Indicator C3-1 is based on the 2014 program's Protected Areas and Hydroelectric Development and Licensing Strategy.

<sup>54</sup> The Performance Indicator W9-1 is based on the 2014 program's Protected Areas and Hydroelectric Development and Licensing Strategy.

<sup>55</sup> The Performance Indicator E2-2 is based on the 2014 Fish and Wildlife Program Appendix D, Theme 1, Goal 1, and Goal 3.

<sup>56</sup> The Performance Indicator E2-3 is based on the 2014 Fish and Wildlife Program Appendix D, Theme 1, Goal 1, and Goal 3.

<sup>57</sup> The Performance Indicator E2-7 consists of the standards promulgated or adopted by the five governments with jurisdictions over the Columbia, Lower Columbia and Lower Snake Rivers listed in the February 5, 2018 [draft document](#) for Temperature Water Quality Standards for the Columbia, Lower Columbia, and Lower Snake Rivers prepared by U.S. EPA Region 10. This performance indicator relates to the general measures to address temperature under the 2014 program's Water Quality sub-strategy.

<sup>58</sup> The Performance Indicator E2-4 is based on the 2014 Fish and Wildlife Program Water Quality Strategy.

<sup>59</sup> The Performance Indicator E2-5 is based on (a) the 2014 Fish and Wildlife Program Appendix D, Theme 1 objective #4 a, and, (b) the Kalispel Tribe of Indians 2018/2019 program amendment recommendation to add the Albeni Falls Dam total dissolved gas standard of 110%.

<sup>60</sup> The Performance Indicators E1-3 & E2-6 are based on the 2014 Fish and Wildlife Program Climate Change Strategy.



<sup>61</sup> The Performance Indicator C5-3 is based on the 2014 program's Climate Change Strategy.

<sup>62</sup> The Performance Indicator C5-6 is based on the 2014 program's Climate Change sub-strategy.

<sup>63</sup> The Performance Indicator S2-1 is from the 2014 Fish and Wildlife Program Appendix D, Theme 2, objective #5b. It originates from the 2009 NOAA Fisheries FCRPS Biological Opinion the Reasonable and Prudent Alternative No. 52 - Hydrosystem

Research, Monitoring and Evaluation Strategy 2 of the NOAA Fisheries 2008 FCRPS Biological Opinion, including Table 7 (see details: <https://nwcouncil.box.com/s/j5jpgzb1hpp64w0zb12z91ydc724p73y>), and is included in the Council's HLIs.

<sup>64</sup> The Performance Indicator S2-3 is based on the recommendations submitted by ODFW, WDFW, and Nez Perce Tribe, for the 2018-2019 Fish and Wildlife Program amendment process and the 2019-2021 Spill Operation Agreement.

<sup>65</sup> The Performance Indicator S2-2 is from the 2014 Fish and Wildlife Program Appendix D, Theme 2, objective #5b. It originates from the 2009 NOAA Fisheries FCRPS Biological Opinion the Reasonable and Prudent Alternative No. 52 - Hydrosystem Research, Monitoring and Evaluation Strategy 2 of the NOAA Fisheries 2008 FCRPS Biological Opinion, including Table 7 (see details: <https://nwcouncil.box.com/s/j5jpgzb1hpp64w0zb12z91ydc724p73y>), and is included in the Council's HLIs.

<sup>66</sup> The Performance Indicator L2-1 is based on (a) 2011 Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin; and, (b) recommendation submitted for the 2014 Program amendment process by BPT, CRITFC, CTGR, CTUIR, Cowlitz, NPT, USRTF, USFWS.

<sup>67</sup> The Performance Indicator E4-1 table of values is from the ESA Section 7(a)(2) Initiation of Formal Consultation for the Operations and Maintenance of the Columbia River System on NOAA Fisheries Listed Species and Designated Critical Habitat. Bonneville Power Administration, Bureau of Reclamation, U.S. Army Corps of Engineers, November 2, 2018, available <https://www.salmonrecovery.gov/doc/default-source/default-document-library/proposedaction2019crs.pdf?status=Temp&sfvrsn=0.29652687684318046>. These values are also included in Appendix B.2. - Operations to Benefit Listed Fish (Table B.2.1-1) in the Biological Assessment for Effects of Federal Columbia River Power System and Mainstem Effects of Other Tributary Actions on Anadromous Salmonid Species Listed Under the Endangered Species Act. Bonneville Power Administration, Bureau of Reclamation, U.S. Army Corps of Engineers, August 2007, available <https://www.salmonrecovery.gov/Files/BiologicalOpinions/Appendix.pdf>

<sup>68</sup> The Performance Indicator E1-4 is based on (a) the 2014 Fish and Wildlife Program Appendix D, Theme 1, Goal 2, Goal 7 and objective 7a; and, (b) Corbett, C. et al. in preparation (Lower Columbia Estuary Partnership) that contains the specific percentage stated in E1-4.

<sup>69</sup> The Performance Indicator C5-5 is based on the 2014 program's (a) Appendix D, Theme 1, Goal 7; and, (b) Plume and Nearshore Ocean Strategy.

<sup>70</sup> The Performance Indicator W1-1 see endnote for Objective W1.

<sup>71</sup> The Performance Indicator W2-1 see endnote for Objective W2.

<sup>72</sup> The Performance Indicator W3-1 see endnote for Objective W3.

<sup>73</sup> The Performance Indicator W4-1 is based on the 2014 program Wildlife Mitigation Strategy.

<sup>74</sup> The Performance Indicator W5-1 is based on the 2014 program Wildlife Mitigation Strategy.

<sup>75</sup> The Performance Indicator W6-1 is based on the 2014 program Wildlife Mitigation Strategy.

<sup>76</sup> The Performance Indicator C2-1 builds on the 2014 program's commitment to adaptive management.

<sup>77</sup> The Performance Indicator C2-2 builds on the 2014 program's commitment to adaptive management.

<sup>78</sup> The Performance Indicator S1-2 is derived by combining the values from the MAFAC-Columbia Basin Partnership Task Force Phase 1 report, [Appendix A](#) for these 22 groups of fish. For details about the values and the locations and artificial production programs assigned to these 22 groups view the annotated Appendix A <https://nwcouncil.box.com/s/v6nt23o7vl1zi9xa4d766q64asgpbtxi> .

<sup>79</sup> The Performance Indicator S1-1 is based on the content of (a) 2014 Fish and Wildlife Program's Fish Propagation Including Hatchery Programs Strategy; and, (b) the revised Three-Step Review Process (January 12, 2015) available: <https://nwcouncil.app.box.com/file/41663249718>

<sup>80</sup> The Performance Indicator R2-1 is based on the (a) 2014 Fish and Wildlife Program's Fish Propagation Including Hatchery Programs Strategy, and (b) Three-Step Review Process (January 12, 2015) available <https://nwcouncil.app.box.com/file/41663249718>

<sup>81</sup> The Performance Indicator R3-1 is based on the (a) 2014 Fish and Wildlife Program's Fish Propagation Including Hatchery Programs Strategy, and (b) Three-Step Review Process (January 12, 2015) available <https://nwcouncil.app.box.com/file/41663249718>

<sup>82</sup> The Performance Indicator NF1-1 is based on the (a) 2014 Fish and Wildlife Program's Fish Propagation Including Hatchery Programs Strategy, and (b) Three-Step Review Process (January 12, 2015) available <https://nwcouncil.app.box.com/file/41663249718>

<sup>83</sup> The Performance Indicator C5-4 is based on the 2014 Program Appendix P. Maintenance of Fish and Wildlife Program Investments.

<sup>84</sup> The Performance Indicator S1-3 is derived by combining the values from the MAFAC-Columbia Basin Partnership Task Force Phase 1 report, [Appendix A](#) for these 22 groups of fish. Please note, that the values for the low natural origin spawner escapement (10-year geometric mean) are based on the delisting abundance for ESA-listed populations. For consistency, a delisting abundance value was determined for non-ESA-listed populations, such as the populations in the Upper Columbia fall chinook group and Snake River fall chinook group; however, the abundance of these healthy populations is expected to regularly exceeds this delisting abundance value. For details about the values view the annotated Appendix A <https://nwcouncil.box.com/s/v6nt23o7vl1zi9xa4d766q64asqpbtxi>

<sup>85</sup> The Performance Indicator L1-1 is based (a) 2014 Fish and Wildlife Program's The Use of Hatcheries for Reintroduction Strategy; (b) 2014 Fish and Wildlife Program Appendix D, Theme 2 goal 1, objective 1j, goal 2, goal 3, objective 3a, and Theme 3, goal: 1; (c) 2011 Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin; and (d) documents compiled in the Fish Objectives mapping tool including the 2012 Conservation Agreement for Pacific Lamprey (*Entosphenus Tridentatus*) in the States of Alaska, Washington, Oregon, Idaho and California.

<sup>86</sup> The Performance Indicator C7-1 is based on the 2014 program Anadromous Fish Mitigation in Blocked Areas Strategy.

<sup>87</sup> The Performance Indicator R1-1 is derived from documents compiled on the Council's Fish Objective mapping tool, specifically the 2002 USFWS Draft Bull Trout Recovery Plan and the CBFWA Fish and Wildlife Program Recommendation 2009 Amendment. The values are derived by summing the adult abundance targets for individual cores located within a recovery unit. The designation of the core and recovery units are based on the 2002 USFWS draft Bull Trout Recovery Plan. No values were found for the St Mary Recovery Unit and thus a generic trend informed by the Fish Objective mapper bull trout content was derived as a performance indicator target.

<sup>88</sup> The Performance Indicator R2-2 is based on documents compiled in the Fish Objectives mapping tool including: Montana Statewide Fish Management Plan 2013-2018; CBFWA Fish and Wildlife Program Recommendation 2009 Amendment; 2007 Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana; and 2000 Fifteenmile Creek Subbasin Summary.

<sup>89</sup> The Performance Indicator R4-1 is based on documents compiled in the Fish Objectives mapping tool including: 2016.Conservation Strategy for Interior Redband (Oncorhynchus mykiss subsp.) in the states of California, Idaho, Montana, Nevada, Oregon and Washington; 2000.Fifteenmile Subbasin Summary; 2009.Lake Roosevelt Fisheries Guiding Document; IDFG Fisheries Management Plan 2013-2018; 2014.Rangewide Conservation Agreement for the Conservation and Management of Interior Redband Trout; Montana Statewide Fish Management Plan 2013-2018; and, 2004.Intermountain Province Subbasin Plan.

<sup>90</sup> The values for the R4-2 performance indicator are derived from the Council's Fish Objective mapper tool for redband trout by summing the historical length and area occupied by redband trout in the subbasins within each of the 5 geographic management units (GMUs) identified in the 2016 Conservation Strategy (Oncorhynchus mykiss subsp.) in the states of California, Idaho, Montana, Nevada, Oregon and Washington.

<sup>91</sup> The Performance Indicator E1-5 is based on the Hungry Horse Mitigation Plan; Fisheries Mitigation Plan for Losses Attributable to the Construction and Operation of Hungry Horse Dam, Bonneville Project No. 1990-2003, Technical Report, Project No. 199301904, available <https://nwcouncil.box.com/s/fqjl4sdeqq6i9mad6bu8j2hfo4wa25pr>

<sup>92</sup> The Performance Indicator E1-6 is based on the Fisheries Mitigation and Implementation Plan for Losses Attributable to the Construction and Operation of Libby Dam, Bonneville Project No. 1995-00400, available <https://nwcouncil.box.com/s/aye1lypekqsy550bnuxf7yn9k7ij6bq>

<sup>93</sup> The Performance Indicator C4-1 is based on the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1p, Goal 2, Goal 3, and Objective 3a.

<sup>94</sup> The Performance Indicator C4-2 is based on (a) the 2014 Fish and Wildlife Program Appendix D, Theme 2, Goal: 1, Objective 1p, Goal 2, Goal 3, and Objective 3a; and, (b) The Confederated Tribes of Grande Ronde 2018 F&W Program Recommendations.

<sup>95</sup> The Performance Indicator C6-1 is based on the 2014 program's Resident Fish Mitigation Strategy.

<sup>96</sup> The values for the 7 management units included in the Performance Indicator WS1-2 are based on the following sources of information compiled in the Council's Fish Objective mapping tool: (a) Lower Columbia Management Unit: 2011 Lower Columbia River and Oregon Coast White Sturgeon Conservation Plan; (b) Upper and Lower Mid-Columbia Management Unit: CFWA Fish and Wildlife Program Recommendation, 2004 Draft Lower Mid-Columbia Mainstem Subbasin Plan Includes Rock Creek, Washington, and, 2004 Columbia Gorge Mainstem Subbasin Plan; (c) Transboundary Upper Columbia Management Unit: Upper Columbia White Sturgeon Recovery Initiative Operational Plan 2013-2017, Upper Columbia White Sturgeon Recovery Plan - 2012 Revision, and, 2013 Columbia Basin White Sturgeon Planning Framework; (d) Kootenai

Management Unit: 2010 Kootenai River Native Fish Conservation Aquaculture Program Master Plan; (e) Lower Snake Management Unit: 1995 Wy-Kan-Ush-Mi Wah-Kish-Wit; (f) Middle Snake Management Unit: 2005 White Sturgeon Management Plan in the Snake River between Lower Granite and Hells Canyon Dams; and, (g) Upper Snake Management Unit: 2004 Middle Snake Subbasin Management Plan.

<sup>97</sup> The Performance Indicator WS1-2 is based on the (a) 2014 Fish and Wildlife Program's Fish Propagation Including Hatchery Programs Strategy, and (b) Three-Step Review Process (January 12, 2015) available <https://nwcouncil.app.box.com/file/41663249718>

<sup>98</sup> The Performance Indicator L1-2 is based on the 2011 Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin.

<sup>99</sup> The Performance Indicators NF1-2 is based on 2019 Briefing on Columbia River Eulachon by Laura Heironimus (Washington Department of Fish and Wildlife) presented to NPCC Fish and Wildlife Committee on 11 May 2019, available [https://www.nwcouncil.org/sites/default/files/2019\\_0409\\_4.pdf](https://www.nwcouncil.org/sites/default/files/2019_0409_4.pdf)

<sup>100</sup> The Performance Indicator C1-1 is based on the 2014 program Public Engagement Strategy.

<sup>101</sup> The Performance Indicator W7-1 is based on the 2014 program Public Engagement Strategy

<sup>102</sup> The Performance Indicator C1-2 is based on the 2014 program Part 4 Adaptive Management.

<sup>103</sup> The Performance Indicator W7-2 is based on the 2014 program Part 4 Adaptive Management.

<sup>104</sup> The Performance Indicator C1-3 is based on the 2014 program Public Engagement Strategy.

<sup>105</sup> The Performance Indicator W7-3 is based on the 2014 program Public Engagement Strategy.

<sup>106</sup> The Performance Indicator C5-1 is based on the 2014 program Public Engagement Strategy.

<sup>107</sup> The Performance Indicator W6-2 is based on the 2014 program Public Engagement Strategy.

<sup>108</sup> The Performance Indicator C5-2 is based on the 2014 program Public Engagement Strategy.

<sup>109</sup> The Performance Indicator W6-3 is based on the 2014 program Public Engagement Strategy.

<sup>110</sup> The Performance Indicator W8-1 builds on the 2014 program's commitment to adaptive management.