Pacific Lamprey 2018 Regional Implementation Plan *for the*

Snake River Region: Lower Snake, Clearwater and Salmon Regional Management Units

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Projects proposed and discussed within this Regional Implementation Plan are in accordance with direction provided within the *Conservation Agreement for Pacific Lamprey in the States of Alaska, Washington, Idaho, Oregon and California, 2012.* Cooperative efforts through the Agreement intend to: a) develop regional implementation plans derived from existing information and plans; b) implement conservation actions; c) promote scientific research; and d) monitor and evaluate the effectiveness of those actions.

Projects identified in this Regional Implementation Plan do not imply or intend a funding obligation or any related activity from any of the government agencies, tribes or non-governmental entities discussed within this document.

I. Status and Distribution of Pacific Lamprey in the RMU

A. General Description of the RMU

The Snake River Region includes the Snake River and all waters draining into it downstream of Hells Canyon Dam (river km 397) to its confluence with the Columbia River (Figure 1). There are three Regional Management Units (RMUs): the Lower Snake Basin, the Clearwater River Basin, and the Salmon River Basin (Figure 1) with five major tributaries: Imnaha, Salmon, Grande Ronde, Clearwater, and Tucannon rivers. Within these RMUs there are 23 Hydrologic Unit Code (HUC) 4 subbasins. The watersheds within this region that are still accessible to Pacific Lamprey range in size from 552-6,242 km^2.

The HUC 4 subbasins include: Lower Clearwater (17060306), Middle Fork Clearwater (#17060304), South Fork Clearwater (#17060305), Lochsa (#17060303), Lower Selway (#17060302), Upper Selway (#17060301). Lower Salmon (#17060209), Little Salmon (#17060210), South Fork Salmon (#17060208). Middle Salmon-Chamberlain (#17060207), Lower Middle Fork Salmon (#17060206), Upper Middle Fork Salmon (#17030505), Middle Salmon-Panther (#17060203), Lemhi (#17060204), Pahsimeroi (#17060202), Upper Salmon (#17060201); Lower Snake-Asotin (17060103), Lower Grande Ronde (#170602105), Upper Grande Ronde (#17060104), Wallowa (#17060105), Mainstem Snake Hells Canyon (#17060101), and Lower Snake Tucannon (#17060107).

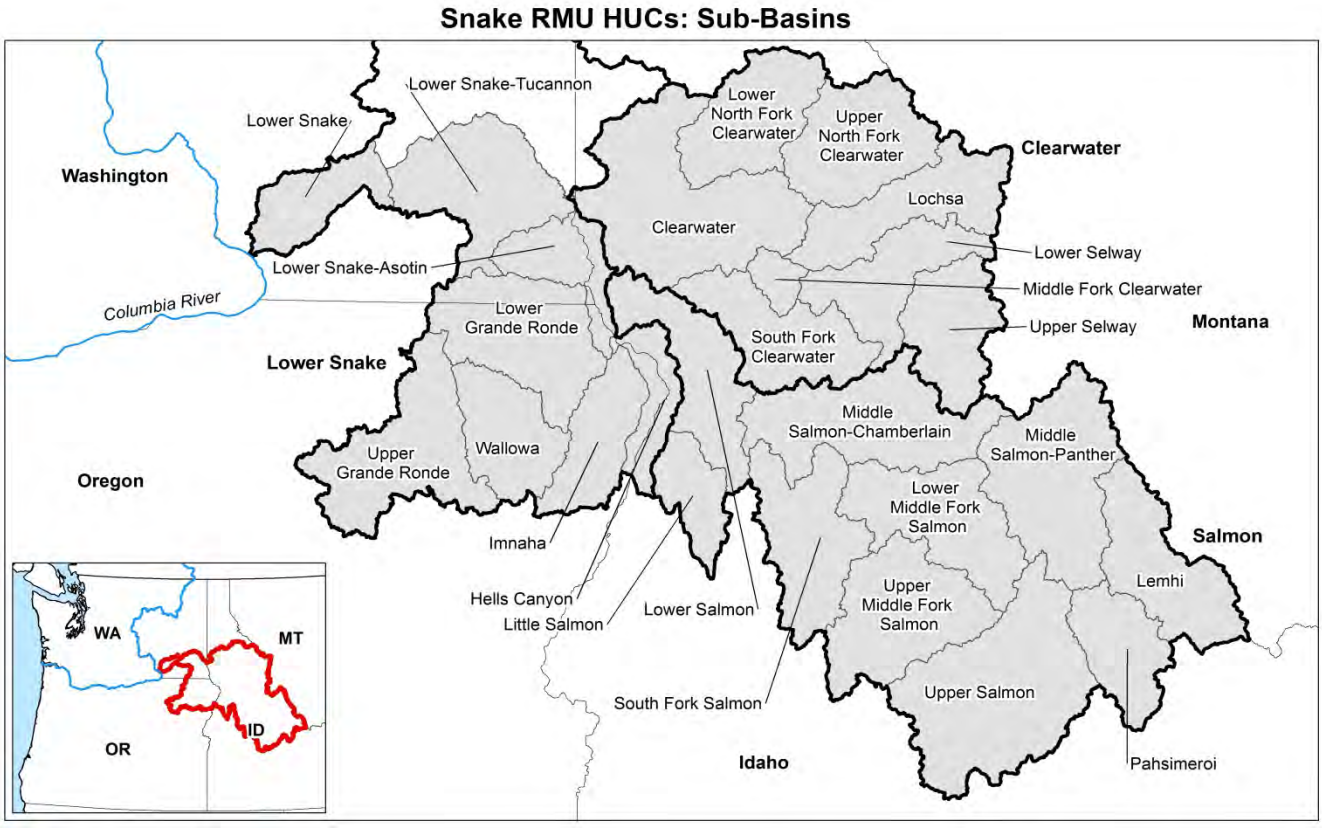

Figure 1. Map of 4th Code watersheds within the Snake River Region.

B. Status of Species

Conservation Assessment and New Updates

Historic occupancy of Pacific Lamprey is believed to have been extensive in all watersheds depicted in Figure 2 as well as the Snake River up to Shoshone Falls, and all major tributaries between the Hells Canyon Dam Complex and Shoshone Falls (Weiser River, Payette River, Bruneau River). Current population size is still unknown in most areas of historic occupancy, but the current distribution was assessed to be reduced from historic ranges (Luzier et al. 2011) with revisions in 2018 (Table 17-x USFWS 2018 draft). Recently changes to known presence of lamprey in the Snake River have been significantly affected by an active supplementation program ongoing by the Nez Perce Tribe (NPT) whereby adult lamprey collected from locations downstream in the Columbia River are released into Snake basin tributaries. The current information describing known occurrences of Pacific Lamprey is displayed in Figure 2 a product of the U.S. Fish and Wildlife Service (USFWS) data Clearinghouse https://www.sciencebase.gov/catalog/item/53ad8d9de4b0729c15418232).

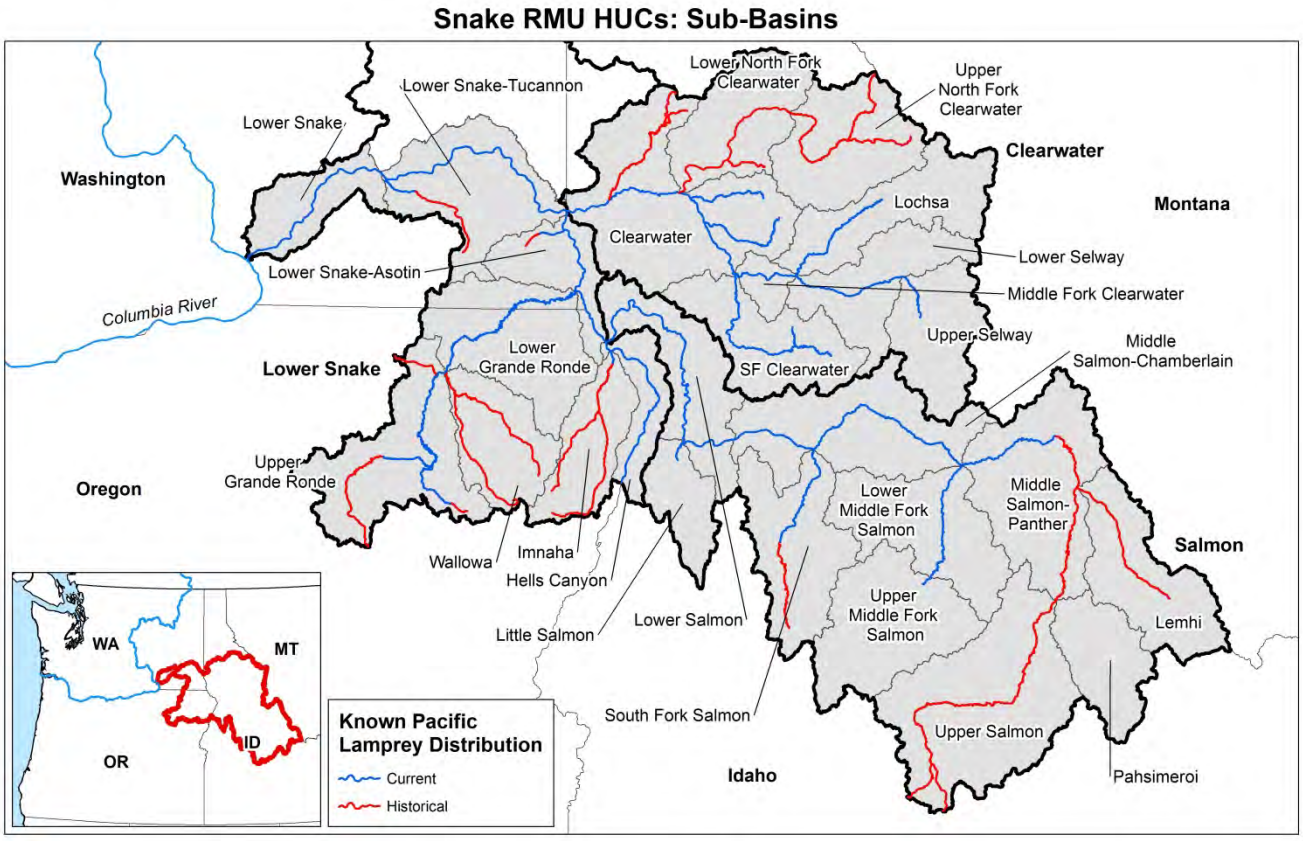

Figure 2. Current and historic known distribution for Pacific Lamprey in the Snake Regional Management Units: Lower Snake, Clearwater and Salmon (USFWS Data Clearinghouse 2018).

Distribution and Connectivity

Passage to the Snake River Region is restricted downstream by four Federal Columbia River Power System (FCRPS) dams in the mainstem Columbia River (Bonneville, Dalles, John Day and McNary). Within the Snake River Region another four FCRPS dams on the mainstem Snake River impede passage in the lower portion (Ice Harbor, Lower Monumental, Little Goose and Lower Granite). The Hells Canyon Complex (Brownlee, Oxbow and Hells Canyon) on the Snake River as well as Dworshak Dam on the North Fork Clearwater River have permanently blocked upstream access for all native aquatic species. Culverts, irrigation diversions and smaller dams are widespread throughout the watersheds of the Snake River Region.

The combined impacts from this series of passage impediments are the most significant impact on the natural distribution and connectivity for Pacific Lampreys in most of the HUCs. Recent (since 1996) annual counts of adult lamprey at Ice Harbor Dam are low, ranging from 5 to 1,702 with even fewer adults seen at Lower Granite Dam (Figure 3).

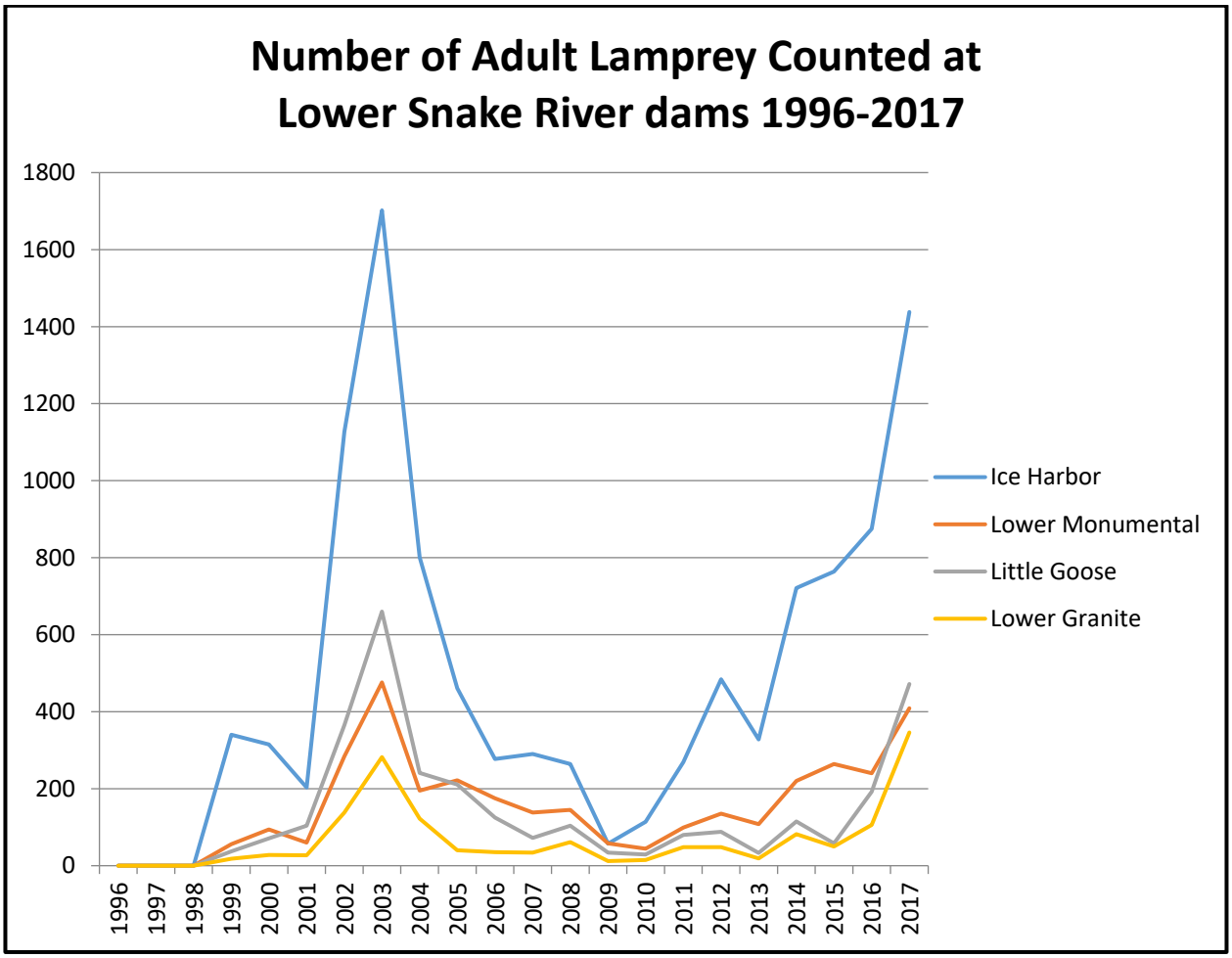

Figure 3. Number of adult Pacific Lamprey counted at Lower Snake River Dams, 1996-2017. Data obtained from http://www.cbr.washington.edu/dart on July 11, 2018.

Stream surveys conducted in the Clearwater River 2000 to 2002 (Cochnauer and Claire 2009) reported that larval Pacific Lamprey were present in the mainstem and Middle Fork Clearwater River up to and including the Lochsa and Selway rivers, in the South Fork Clearwater River and in the Red River but not American or other tributaries of the South Fork Clearwater River. Similar surveys conducted in the Salmon River 2006 confirmed the presence of larval Pacific Lamprey in the mainstem Salmon River downstream of the North Fork Salmon River and in the lower segment of the Middle Fork Salmon River but in no other tributaries or segments of the Salmon River upstream of the North Fork (IDFG 2011). This section of the Salmon River was surveyed again in 2017 and larval Pacific Lamprey were detected at low relative abundance at all 13 sites surveyed (E. Felts, IDFG, pers. com). Recent (2015-2017) surveys have confirmed the continued presence of larval lamprey in the Mainstem, Middle and South forks of the Clearwater River and Lochsa and Selway rivers but lamprey are no longer present in the Red River of the South Fork Clearwater River (C. Peery, USFWS, pers. com.). In eastern Oregon, larval Pacific Lamprey were found in the Minam and Wallowa rivers during 2015 surveys (C. Peery, USFWS, pers. com.).

Beginning in 2007, the NPT began releasing adult Pacific Lamprey, collected from downstream areas in the Columbia River, into tributaries of the Snake River as a means to supplement natural production (Table 1; see Ward et al. 2012). Subsequent stream surveys confirmed the presence of larval lamprey in locations receiving adult lamprey but had previously not contained larval or juvenile lamprey in recent years. These sites include Lolo, Orofino, and Newsome creeks in the Clearwater River, Asotin Creek, the South Fork Salmon River and Wallowa River. In 2015 the Confederated Tribes of the Umatilla Reservation initiated releases into the Upper Grande Ronde River and it's tributaries (Table 1).

C. Threats

Summary of Major Treats

The highest priority threat in the Snake River Region is the Federal Columbia River Power System dams on the mainstem Snake and Columbia rivers, which results in small effective population size in each of the watersheds still accessible to Pacific Lamprey (USFWS 2018 draft). Table 2 summarizes the known key threats that ranked Medium and High within the Snake River Region tributaries (H – High, M – Medium, L – Low, I – Insignificant). The Supplement to the Mainstem Lower Columbia River and Columbia River Estuary Subbasin Plan (NPCC 2004) in Strategy to Protect and Restore Habitat; recommends to improve dam passage for Pacific lamprey. Translocation is now called Supplementation, to better represent the range of actions that occur when Pacific Lamprey are moved from one place to another.

New Threats

No new threats have been identified since 2011 (USFWS 2018 draft)

Table 1. Releases of adult Pacific Lamprey into the Clearwater, Salmon, Grande Ronde and Asotin subbasins, 2007-2018, as part of the Nez Perce Tribe (NPT) and Confederated Tribes of the Umatilla Reservation (CTUIR) translocation program. Asterisk denotes CTUIR releases. Data supplied by the Nez Perce Tribe and The Confederated Tribes of the Umatilla Reservation.

	Year												
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Clearwater River (ID)													
Lolo Cr.	50	28	30	24	0	40	31	10	50	57	65	90	475
Newsome Cr.	50	26	45	23	0	40	30	10	50	56	61	95	486
Orofino Cr.	49	25	30	22	0	40	24	0	51	56	0	90	387
Little Canyon Cr.	0	0	0	0	0	17	12	0	32	41	0	0	102
Red R.	0	0	0	0	0	0	0	0	0	0	0	91	92
Subbasin Total	149	79	105	69	0	137	97	20	183	210	126	366	1542
Salmon River (ID)													
South Fork Salmon R.	0	0	0	0	0	40	30	11	50	56	62	90	339
Johnson Cr.	0	0	0	0	0	0	0	0	51	48	60	89	248
Secesh R.	0	0	0	0	0	0	0	0	0	50	65	90	205
Subbasin Total	0	0	0	0	0	40	30	11	101	154	187	269	792
Snake-Asotin (WA)													
Asotin Cr.	28	27	35	22	29	40	30	10	43	56	61	90	471
Grande Ronde River (OR)													
Minam R.	0	0	0	0	0	0	0	0	25	55	35	90	205
Wallowa R.	0	0	0	0	0	40	30	10	25	55	30	90	280
Chesnimnus Cr (Joseph Cr)	0	0	0	0	0	0	0	0	0	56	64	90	210
Catherine Cr.	0	0	0	0	0	0	0	0	0	167	250	212	629
*Upper Grande Ronde R.	0	0	0	0	0	0	0	0	0	400	201	527	1128
*Lookingglass Cr.	0	0	0	0	0	0	0	0	0	175	150	151	476
*Little Lookingglass Cr.	0	0	0	0	0	0	0	0	0	0	150	0	150
*Indian Cr.	0	0	0	0	0	0	0	0	0	0	0	92	92
*Meadow Cr.	0	0	0	0	0	0	0	0	0	0	0	82	82
*Sheep Cr.	0	0	0	0	0	0	0	0	0	0	0	82	82
Subbasin Total	0	0	0	0	0	40	30	10	50	908	880	1416	3334
Total Snake River Region	177	106	140	91	29	257	187	51	377	1328	1254	2141	6139

Table 2. Summary of the identified key threats of the Snake River Region, by RMU and Watershed, 2018. Harvest, Predation, Supplementation (formerly Translocation), Disease, Lack of Awareness and Climate Change were assessed and ranked Low or Insignificant in most HUC's.

RMU/Watershed	Mainstem Passage	Small Population Size	Tributary Passage	Dewatering and Flow Management	Stream and Floodplain Degradation	Water Quality	Lack of Awareness	Climate Change	Predation
Lower Snake RMU	**H**	**H**	**M**	**L**	**M**	**L**	**H**	**M**	**L**
Lower Snake-Asotin	H	H	L	L	M	M	H	H	M
Lower Grande Ronde	H	H	L	I	L	L	H	H	L
Upper Grande Ronde	H	H	M	M	H	M	H	M	L
Imnaha	H	H	M	M	H	M	H	M	L
Wallowa	H	H	M	M	M	M	H	M	M
Lower Snake-Hells Canyon	H	H	M	M	L	L	M	M	M
Lower Snake-Tucannon	H	H	M	L	M	M	H	M	L
Clearwater RMU	**H**	**H**	**L**	**I**	**L**	**L**	**L**	**L**	**I**
Lower Clearwater	H	H	L	L	M	M	M	M	L
Middle Fork Clearwater	H	H	L	L	L	L	M	L	L
South Fork Clearwater	H	H	L	L	M	L	M	L	L
Lochsa	H	H	L	I	L	I	L	I	I
Lower Selway	H	H	I	I	I	I	L	L	I
Upper Selway	H	H	I	I	I	I	L	I	I
Salmon RMU	**H**	**H**	**L**	**L**	**L**	**L**	**M**	**L**	**L**
Lower Salmon	H	H	L	L	L	L	M	L	L
Little Salmon	H	H	L	L	L	M	M	L	L
South Fork Salmon	H	H	L	I	L	L	M	L	L
Middle Salmon-Chamberlain	H	H	I	I	L	L	M	L	L
Lower Middle Fork Salmon	H	H	I	I	I	I	L	I	I
Upper Middle Fork Salmon	H	H	I	I	I	I	L	I	I
Middle Salmon-Panther	H	H	M	M	M	L	M	L	I
Lemhi	H	H	M	M	M	M	M	L	I
Pahsimeroi	H	H	M	M	M	L	M	I	I
Upper Salmon	H	H	L	L	M	L	M	I	I

D. Restoration Actions

Ongoing or planned restoration efforts in the Snake Basin are intended to improve anadromous and native resident salmonid production and connectivity. These projects will also benefit Pacific Lamprey but as lamprey production is primarily limited by low escapement, habitat improvement projects will have limited effect on Snake River lamprey population in the near future. Recovery of Pacific Lamprey in the Snake River will instead depend on actions taken within the Columbia and Snake rivers mainstem regional implementation plans. In the near term, translocation of adult Pacific Lamprey into Snake River sub-basins, coordinated stream monitoring for larval lamprey and target restoration efforts will comprise restoration actions. Actions that have been completed or are ongoing are in Table 3.

Table 3. Conservation actions specifically for or substantially benefitting lampreys that were initiated or completed in the Snake RMU from 2012-2017.

HUC	Threat	Action Description	Type	Status
RMU	Population	Environmental DNA, smolt trapping and occupancy sampling to better understand lamprey distribution.	Survey	Ongoing
Upper and Lower Grande Ronde	Population	Oregon DFW drafting a conservation plan for 4 species of lampreys.	Assessment	Ongoing
Clearwater	Population	Translocation of adult Pacific Lamprey in Little Canyon, Orofino and Lolo creeks. (NPT)	Instream	Ongoing
South Fork Clearwater	Population	Translocation of adult Pacific Lamprey in Newsome Creek. (NPT)	Instream	Ongoing
South Fork Salmon	Population	Translocation of adult Pacific Lamprey in South Fork Salmon River and Johnson Creek. (NPT)	Instream	Ongoing
Lower Grande Ronde	Population	Translocation of adult Pacific Lamprey in Wallowa River and Minam Creek. (NPT)	Instream	Ongoing
Upper Grande Ronde	Population	Translocation of adult Pacific Lamprey in Upper Grande Ronde River and Catherine Creek. (CTUIR)	Instream	Ongoing
Lower Snake-Asotin	Population	Translocation of adult Pacific Lamprey in Asotin Creek. (NPT)	Instream	Ongoing
South Fork Clearwater	Passage	Aquatic Organism Passage restoration in American River. The project improved access to 10+ miles of potential lamprey habitat.	Instream	Complete
South Fork Clearwater	Stream and Floodplain	Over 3 miles of channel reconstruction and riparian restoration in a previously dredged mine section of Newsome Creek	Instream	Ongoing
South Fork Clearwater	Stream and Floodplain	Three miles of stream and riparian area in Red River were restored from conditions created with past dredge mining activity.	Instream	Completed
South Fork Clearwater	Stream and Floodplain	Over three miles of stream and riparian area in Crooked River are being restored from impacts of past dredge mining activity.	Instream	Ongoing
Lower Clearwater	Stream and Floodplain	One mile of stream in the Collette Mine area of Lolo Creek is being reconstructed and the floodplain restored.	Instream	Ongoing

E. High Priority Proposed, Implemented or Funded Project Information:

Prioritization Process

The highest priority threat for Snake River Region RMU's is mainstem passage in the Snake and Columbia rivers. The four proposed projects below are stakeholder priorities, as they are beneficial to, and increase our understanding of, populations. There has not been an attempt to prioritize one over the other. The two Translocation projects are meant to complement each other, and it is expected that the project proponents will coordinate so that efforts are not duplicated.

Proposal from RIP / RMU to the Conservation Team **Translocating Lamprey Past Snake River Dams**	**Reviewer's Category Score 2, 1, 0**
Project Rationale: In response to the dire status and extirpation trend of Pacific lamprey in the Snake Basin, and the association of this downturn to passage at mainstem Columbia/Snake River Dams, the Nez Perce Tribe Department of Fisheries Resources Management (NPTDFRM) began an adult Pacific lamprey translocation initiative in 2006. The NPTDFRM translocation effort consists of obtaining adult lamprey from the lower Columbia River dams (Bonneville, The Dalles and John Day) and transporting them upstream past the dams to the Nez Perce Tribal Hatchery (NPTH), located on the Nez Perce Reservation within the Clearwater Subbasin of the Snake River. The adult lamprey over-winter at NPTH and are released the following spring, typically mid- to late-May, into Snake Basin streams. Translocation is specifically identified in the Columbia River Inter-Tribal Fish Commission (CRITFC) Tribal Pacific Lamprey Restoration Plan (2011). The NPT considers adult translocation an emergency stop-gap measure, and perhaps the only immediately available management tool, to partially address the limiting factor of adult mainstem passage and the threat to their continued existence that the mainstem dams pose. The purposes of the translocation initiative are to: • Maintain some level of production in the Snake Basin until mainstem passage improves • Thwart further local extirpations • Prevent loss of pheromone migration cues to migrating adults from larval lamprey • Restore lamprey related ecosystem values to promote diversity, productivity and ecosystem health • Preserve cultural values associated with lamprey. Larval (ammocoete) and juvenile (macrophthalmia) are sampled in translocation and non-translocation streams to gauge effectiveness of the translocation actions. In coordination with the CRITFC Hagerman Genetics Laboratory, Hagerman, Idaho, parentage analysis is conducted for samples collected via electro-fishing and rotary screw trapping. • Please provide NPCC Subbasin name and Watershed 6th or 5th Field HUC; o Clearwater (#17060306) HUC 4 Subbasin o Middle Fork Clearwater (#17060304) HUC 4 Subbasin o Lower Selway (#17060302) HUC 4 Subbasin	

- Lochsa (#17060303) HUC 4 Subbasin
- Lower Salmon (#17060209) HUC 4 Subbasin
- South Fork Salmon (#17060208) HUC 4 Subbasin
- Lower Middle Fork Salmon (#17060206) HUC 4 Subbasin
- Lower Snake (#17060107) HUC 4 Subbasin
- Lower Snake-Asotin (#17060103) HUC 4 Subbasin
- Hells Canyon (#17060101) HUC 4 Subbasin
- Imnaha (#17060102) HUC 4 Subbasin)
- Wallowa (#17060105) HUC 4 Subbasin
- Lower Grande Ronde (#17060106) Subbasin
- Upper Grande Ronde (#17060104) Subbasin
- Middle Columbia-Hood (#17070105) Subbasin
- Middle Columbia-Lake Wallula (#17070101) Subbasin

- Land ownership, regulatory responsibilities.

The Columbia River mainstem dams (Bonneville, The Dalles and John Day) from which adult Pacific lamprey will be collected and transported for translocation are owned by the Federal government, U.S. Army Corps of Engineers.

The Nez Perce Tribal Hatchery, Lenore, Idaho, where the translocated lamprey overwinter, is owned by the Nez Perce Tribe.

In Idaho, streams to which adult lamprey will be translocated are located primarily within National Forests. In Oregon and Washington, streams to which adult lamprey will be translocated primarily cross private lands.

- What Lamprey RMU population or portion of the river will benefit from action?

The Snake River RMU will benefit from this action.

- What is the RMU HUC4 risk level?

Based on the USFWS 2011 Pacific Lamprey (*Entosphenus tridentatus*) Assessment and Template for Conservation Measures, populations within all 4th Field Hydrologic Unit Codes (HUCs) in the Snake River RMU are ranked either presumed extirpated, possibly extirpated or critically imperiled. A follow-up USFWS five rear re-assessment reported an increase in numbers of Pacific lamprey larvae in translocation streams

- What life stage or stages that will benefit from action? How?

Adults – Migration and spawning - The NPTDFRM has been releasing translocated adult lamprey into Snake Basin streams since 2007. Successful spawning of translocated adult lamprey has been verified by parentage analysis for translocation streams.
Larvae – Distribution and numbers of Pacific lamprey larvae per stream have increased as a result of adult translocation in the Snake Basin. Increased presence of larvae further the goals of augmenting Pacific lamprey production until such time as volitional migration through the mainstem substantively improves, thwarts further local extirpations, prevents loss of pheromone migration cues to migrating adults from larval lamprey, adds to the distribution data base, and restores lamprey related ecosystem values to promote diversity, productivity and ecosystem health.
Macrophthalmia – Parent-based tagging has documented macrophthalmia production from

translocated adults released in Snake Basin streams.

- What other species may benefit from action?

Translocated adults and their progeny reestablish the presence of Pacific Lamprey in streams previously devoid of lamprey. Improved associated ecosystem values include the influx of marine derived nutrients and increased conversion of detritus based energy to biomass assessable as food for a host of aquatic life, including bull trout, cutthroat trout, steelhead and salmon.

- How will the project provide meaningful and measureable results to improve lamprey populations and/or their habitat conditions?

The project leverages efforts among cooperating entities, including the Columbia River Inter-Tribal Fish Commission, US Fish and Wildlife Service, US Forest Service and various Nez Perce Tribe fisheries staff to conduct parentage analysis and parentage-based tagging. This effort documents and measures production from translocated adult lamprey and provides valuable life history data, including larval distribution, length at age of larvae, length at age of macrophthalmia, , age at emigration from natal streams, and size and age of macrophthalmia at various migration points, and relative production of translocated vs. volitional migrated adults.

- Does the action specifically address the Lamprey Strategy and Measures as defined in the 2014 F&W Program? (Specific to BPA Cost Savings $)

Yes, the action addresses the following:
The Northwest Power and Conservation Council, consistent with the Lamprey Strategy and Measures as defined in the 2014 F & W Program approved for funding the Pacific Lamprey Conservation Initiative Columbia River Basin Projects. This project is facilitated by the USFWS and administered through Pacific States Marine Fisheries Commission (PSFMC). Restoration actions in the appropriate RMU's are reviewed and selected by the Agreement Conservation Team based on the following criteria as outlined in the Pacific Lamprey Conservation Agreement Operating Guidelines;

1. Project Rationale
2. Linkage of Actions to Threats
3. Project Feasibility
4. Partner Engagement and Support
5. Monitoring and Evaluation – Contribution to Knowledge Gaps
6. Budget and Timelines

The Agreement Conservation Team's selection criteria are consistent with those of the Council in regard to whether they:

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

Linkage of Actions to Threats:

- What threat(s) does this project address?

Mainstem passage. Mainstem passage has been identified as the most serious limiting factor

affecting Pacific lamprey in the Snake Basin, with mainstem dams being the most serious threat (Luzier et al. 2011).

- How does the project address this key threat(s)?
  Translocation Lamprey Past Snake River Dams bypasses the serious passage problems at the dams via collection and transport. This avoids the loss of, on average, 50% of migrating adult lamprey, per dam. Transported adult lamprey overwinter at the Nez Perce tribal Hatchery and are released the following year into Snake basin streams. The intent is to maximize productive success of translocated adults.
- Does this project address a threat(s) specific only to this RMU or does the project address the threat(s) for multiple RMUs?
  This project addresses adult Pacific Lamprey mainstem passage problems specific to the Snake Basin. Other translocation programs in their respective RMUs address mainstem passage problems posed by dams.

Project Feasibility:

- Have the designs for the project been completed already or will they be completed before planned project implementation (within the period of performance)?
- Designs for the project have been completed.
  The NPTDFRM has been releasing translocated adult lamprey into Snake Basin streams since 2007. Successful spawning of translocated lamprey has been verified by parentage analysis for all translocation streams. Parentage analyses has also provided valuable life history data, such as lengths at age, ages of ammocoetes and macrophthalmia, and age at emigration from the natal stream. Translocation into Snake Basin streams is expected to continue, adding new translocation streams within the Snake Basin, with broader and more intensive larval assessments of translocation and non-translocation streams. This will further the goals of augmenting Pacific lamprey production until such time as volitional migration through the mainstem substantively improves, thwart further local extirpations, prevent loss of pheromone migration cues to migrating adults from larval lamprey, add to the distribution data base, and restore lamprey related ecosystem values to promote diversity, productivity and ecosystem health
- Are the appropriate permits (ESA and environmental compliance) in place already or will they be in place before planned project implementation (within the period of performance)?
  Yes.
- Can the project be implemented within the defined time frame?
  Yes.

Partner Engagement and Support:

- What partners are supporting the project?
  Coordination with relevant stakeholders has been and is expected to continue to be very good. Partners include: the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, CRITFC, Bonneville Power Administration, University of Idaho, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife and Asotin County Public Utility District.
- What partners are actively in implementing the project?
  US Fish and Wildlife Service, US Army Corps of Engineers, US Forest Service (eDNA) and Columbia River Inter-Tribal Fish Commission.
- What partners are providing matching funds or in-kind services that directly contribute to this project?
  Nez Perce Tribe, CRITFC and US Fish and Wildlife Service.
- Are the partners able to contribute to the proposed project in a timely and appropriate manner?

Yes. • Does this action link to other projects in the watershed? Yes. The action links to Implement Tribal Pacific Lamprey Restoration Plan, NPT Lolo Creek Watershed Restoration, Newsome Creek Watershed Restoration, American River Watershed Restoration, Crooked River Watershed Restoration, Red River Watershed Restoration, South Fork Salmon River Watershed Restoration and other watershed restoration efforts.	
Monitoring and Evaluation - Contribution to Knowledge Gaps: • If this is a monitoring or evaluation project or an on the ground project with a monitoring or evaluation component: • Is there a monitoring framework in the proposal? Yes. This proposal is supported by a monitoring framework contained in the Nez Perce tribe Pacific Lamprey Translocation and Assessment project and the CRITFC Larval Lamprey Surveys in the Snake River Basin project. • Does the monitoring framework provide clear objectives and measureable metrics that can be observed over time? Yes. • Does the framework provide a clear description of the expected outcome? Yes. • Does the framework provide a clear description of the expected outcome? Yes. • If this is an on the ground project without a monitoring or evaluation component: No. o How is completion of the project going to be documented? N/A. o Is this project's effectiveness linked to another M&E project? N/A.	
Budget and Timelines: • Is the budget within the guidelines provided by the Conservation Team (project maximum budget is $100,000) (Specific to BPA Cost Savings $)? Yes. • Is there a detailed budget describing personnel, equipment and supplies, travel, publication, overhead needs? Yes. • Does the project describe a reasonable and feasible approach for the project to be completed within the performance period and within budget? Yes. • Does the proposal demonstrate meaningful cost share (cash, equipment, labor)? Yes.	
Total	
2 = Fully Meets Criteria 1 = Needs Some Additional Information 0 = Insufficient	

Proposed and ongoing: Stream Surveys for Larval Lamprey

Associated with the adult translocation program, stream surveys have been conducted to document the presence of larval lamprey in both the streams that have received adult lamprey and nearby streams that would presumably contain only natural production. Surveys are being jointly conducted by the NPT and the USFWS. To date, surveys have been conducted in the Clearwater, Salmon and

Grande Ronde rivers and tributaries of the lower Snake River (see Figure 2 for current presence data). Information is added to the regional database tracking lamprey distribution and abundance.

The Idaho Department of Fish and Game (IDFG) monitors Pacific Lamprey larval distribution in both streams that are presumed to contain natural production and those which may be influenced by the adult translocation programs. Currently, distribution is monitored by electrofishing surveys which are most often conducted during wilderness float trips. Biologists have used the results of recent opportunistic sampling to establish index sites which will be surveyed during each float trip within a given drainage, and will randomly select additional roving sites on future float trips.

In addition to standard electrofishing surveys conducted on wilderness float trips IDFG is currently evaluating sampling efficiency of three different electrofishing protocols. These protocols include two types of electrofishing units: 1) ETS model AbP-2 "Wisconsin" electrofisher, and 2) Smith-Root LR-24 model electrofisher. Electrofisher setting for ammocoete sampling include two wave forms: 1) a low frequency wave to draw ammocoetes out of substrate, and 2) a high frequency wave form to immobilize ammocoetes once drawn out of the substrate. Two protocols using the Smith-Root LR-24 electrofisher are being evaluated, one which uses a standard setup with a single anode pole and a "rat-tail" and a second which uses dual anode poles. These three electrofishing protocols were implemented across 21 sites on the Selway River in 2018, with protocols being randomly selected across sites. Additional sites will be surveyed prior to analysis of sampling efficiency, and results will ultimately be used to recommend standard electrofishing survey methods which maximize efficiency.

Monitoring activities associated with salmonid monitoring bring IDFG staff to many locations throughout Idaho which, if surveyed, could add to understanding of Pacific Lamprey distribution and the effects of the adult translocation program within Idaho. However, IDFG currently has no funding to conduct Pacific Lamprey monitoring. Environmental DNA (eDNA) sampling for Pacific Lamprey is currently being researched and refined by the United States Forest Service Rocky Mountain Research Station, and offers the opportunity to monitor distribution with minimal time investment. This method, along with established electrofishing methods, could be implemented by IDFG staff conducting salmonid monitoring if funding were available. Additional monitoring would involve collaboration of NPT, IDFG and USFWS. Partners would work together to select sampling locations in a manner which would contribute to further evaluation of the adult translocation program and improve assessment of Pacific Lamprey status in Idaho.

Stakeholders will explore the efficacy and details for developing eDNA sampling and processing methods and protocol to facilitate low-cost observations of lamprey distribution. As other eDNA projects are likely to be proposed in other RMU's, stakeholders will coordinate within the region so methods are consistent and replicable with other areas.

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