

Pacific Lamprey 2020 Regional Implementation Plan *for the* Snake River Region: Lower Snake, Clearwater and Salmon Regional Management Units



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Regional Implementation Plans are written annually to document activities benefiting lamprey that were done in the previous year, activities that will occur in the current year, and to present project proposals seeking funding. They also highlight any changes in status or threats and activities related to those documented in the Pacific Lamprey *Entosphenus tridentatus* Assessment, 2018 (USFWS 2018).

Projects that are 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) watersheds in 4 subbasins. The watersheds within this region that are still accessible to Pacific Lamprey range in size from 552-6,242 km².

The HUC 4 subbasins are: 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 (17060205), Middle Salmon-Panther (17060203), Lemhi (17060204), Pahsimeroi (17060202), Upper Salmon (17060201); Lower Snake-Asotin (17060103), Lower Grande Ronde (17060105), Upper Grande Ronde (17060104), Wallowa (17060105), Mainstem Snake Hells Canyon (17060101), and Lower Snake Tucannon (17060107).

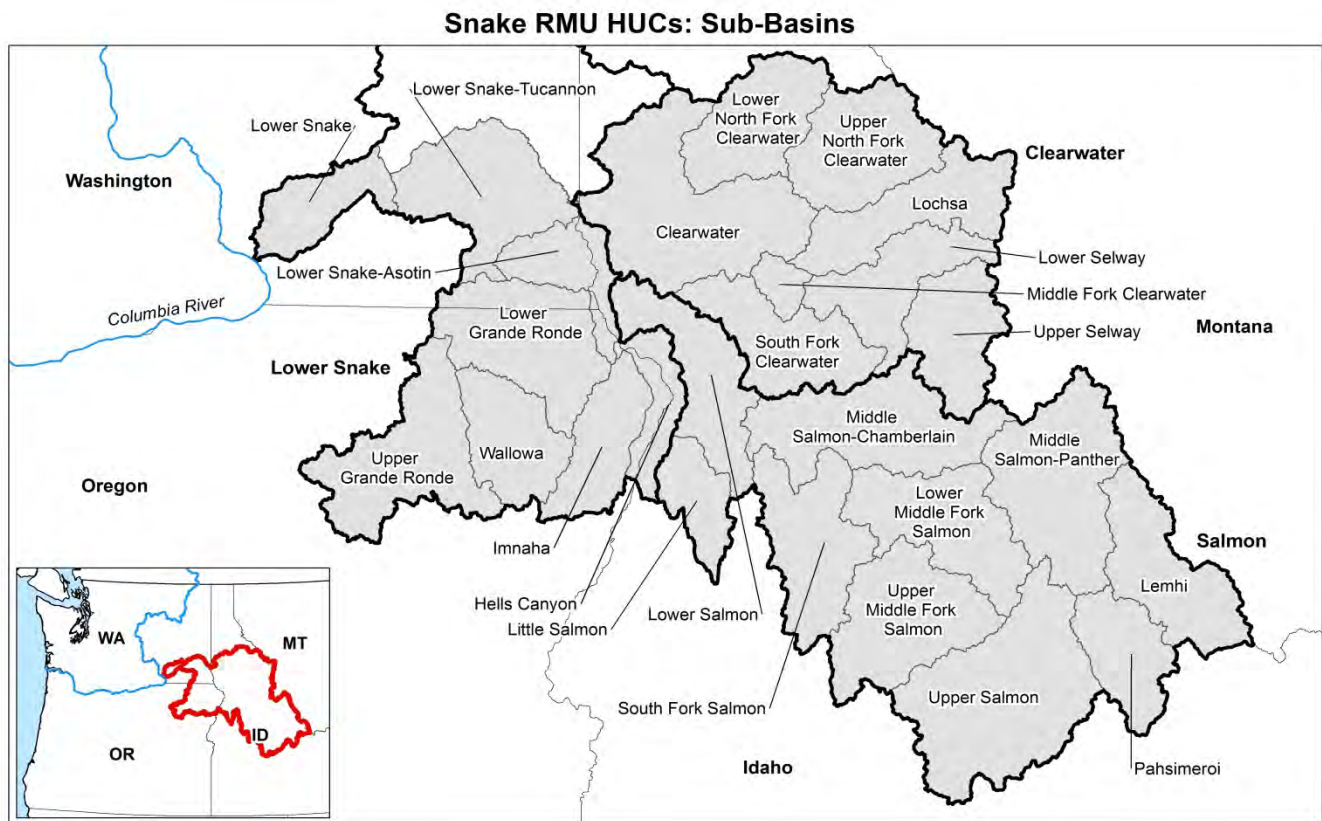


Figure 1. Map of 4th Code watersheds within the Snake River Region.

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, Payette, Bruneau River, Owyhee, Malheur, Burnt, Powder rivers). Current population size is still unknown in most areas of historic occupancy, but the current distribution is reduced from historic ranges (Luzier et al. 2011; USFWS 2018). The knowledge of current lamprey distribution has come from an increase in recent sampling effort as well as an active adult supplementation program ongoing by the Nez Perce Tribe (NPT) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) whereby adult lamprey collected from locations downstream in the Columbia River are released into Snake basin tributaries. 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>).

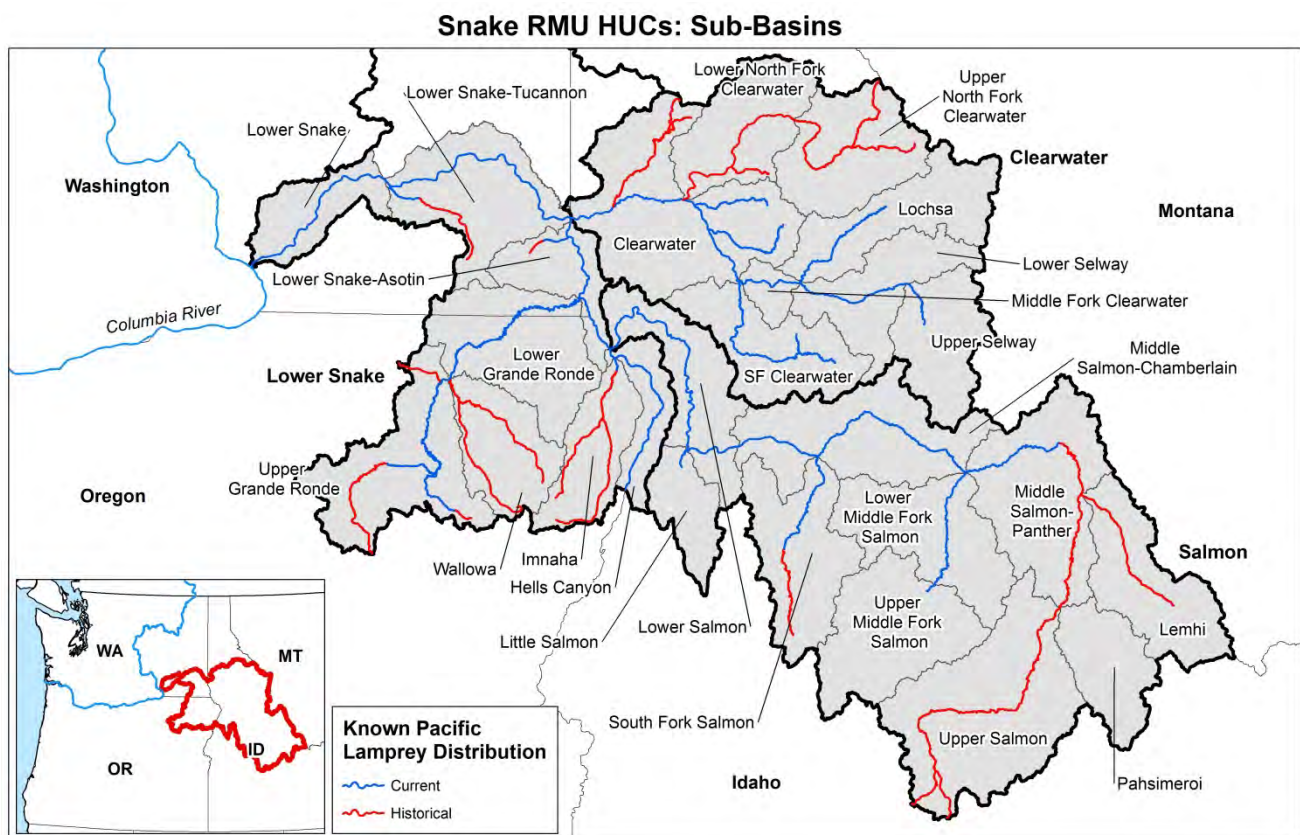


Figure 2. Current and historic known distribution for Pacific Lamprey in the Snake Regional Management Units: Lower Snake, Clearwater and Salmon (USFWS Data Clearinghouse 2018). Not depicted is historic distribution in the Snake River and tributaries above the Hells Canyon Dam Complex to Shoshone Falls.

Distribution and Connectivity

Upstream passage to the Snake River Region is restricted by four Federal Columbia River Power System (FCRPS) dams in the Columbia River (Bonneville, Dalles, John Day and McNary). Within the Snake River Region another four FCRPS dams on the Snake River (Ice Harbor, Lower Monumental, Little Goose and Lower Granite) impede upstream passage in the lower portion of the basin. The Hells Canyon Complex (Brownlee, Oxbow and Hells Canyon dams) on the Snake River as well as Dworshak Dam on the North Fork Clearwater River completely block 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 threat on the natural distribution and connectivity for Pacific Lampreys in most of the HUCs. Total annual counts (daytime and nighttime) of adult Pacific Lamprey at Lower Granite Dam have been declining since 2017, where a peak of only 2,894 adults passed (Figure 3).

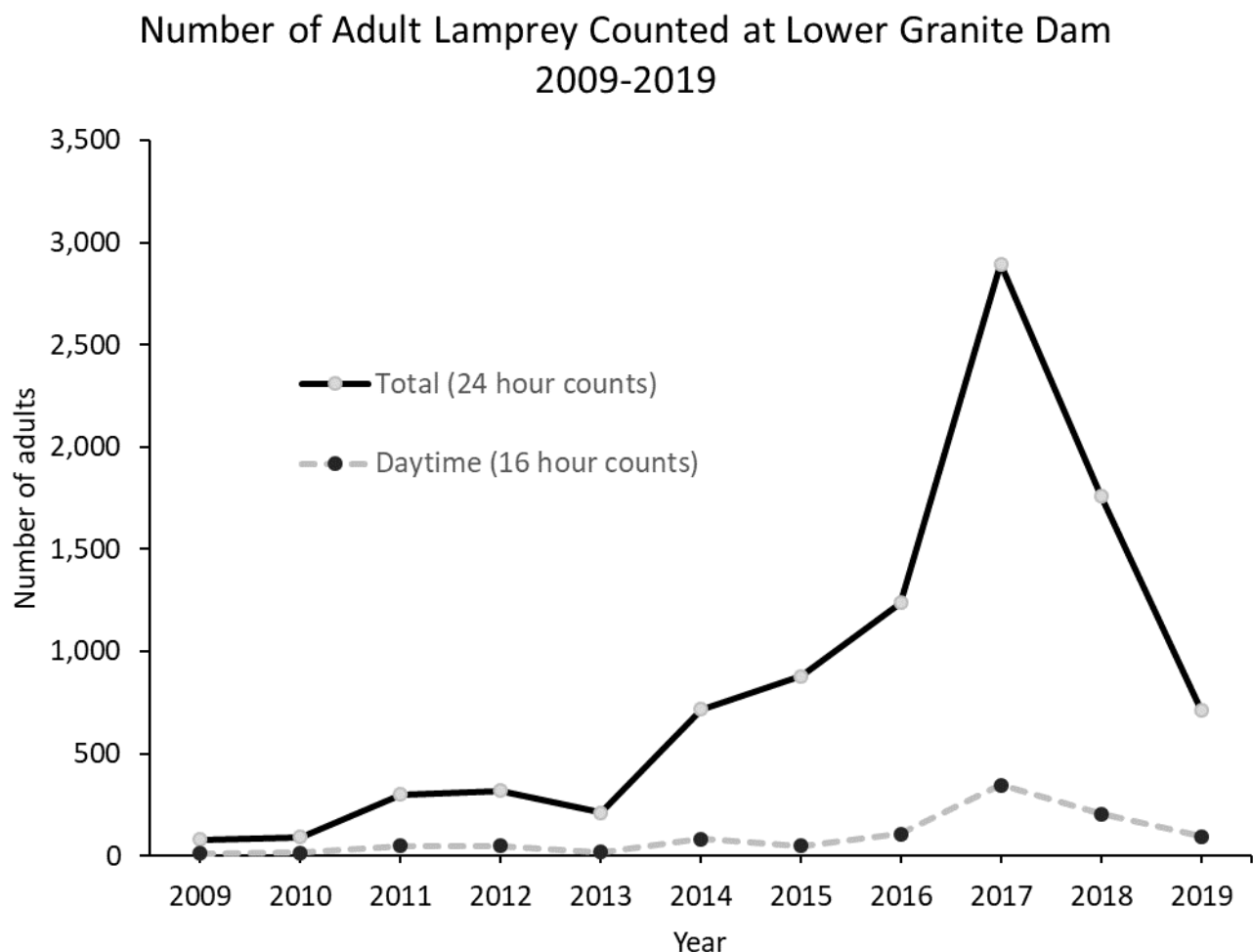


Figure 3. Number of adult Pacific Lamprey counted at Lower Granite Dam, 2009-2019. Data obtained from <http://fpc.org> on June 15, 2020.

Since 2000, surveys for larval Pacific Lamprey have been conducted in the Clearwater, Salmon, Selway and Lochsa subbasins of Idaho. Recent (2015-2019) surveys have confirmed the continued presence of larvae in the Mainstem, Middle and South Forks of the Clearwater River, the Lochsa and Selway rivers (Figure 2). In 2019, larval lamprey were detected in a few locations near the edge of their current distribution where they have not been recently documented. Idaho Power collected larval lamprey about 10 km's below Hells Canyon Dam and IDFG documented larval lamprey in the mainstem Salmon River near Salmon, ID.

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 larvae in locations that received adult lamprey but had previously not contained larvae in recent years. The adult supplementation program has expanded throughout the years to include more tributaries throughout the basins (Table 1). CTUIR began supplementing adults in the Snake River Basin in 2016. The adult supplementation program has successfully reintroduced lamprey into extirpated tributaries and sustained these populations through annual releases.

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). Table 2 summarizes the known key threats that ranked Medium and High within the Snake River Region tributaries. The Supplement to the Mainstem Lower Columbia River and Columbia River Estuary Subbasin Plan (NPCC 2004) recommends improving 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.

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) supplementation program. Asterisk denotes CTUIR releases. Data supplied by the Nez Perce Tribe and The Confederated Tribes of the Umatilla Reservation.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019 summer	Total
Clearwater River (ID)															
Lolo Cr.	50	28	30	24	0	40	31	10	50	57	65	90	89	50	614
Newsom Cr.	50	26	45	23	0	40	30	10	50	56	61	95	80	0	566
Orofino Cr.	49	25	30	22	0	40	24	0	51	56	0	90	80	0	467
Little Canyon Cr.	0	0	0	0	0	17	12	0	32	41	0	0	13	0	115
Red R.	0	0	0	0	0	0	0	0	0	0	0	91	81	0	172
East Fork Potlatch R.	0	0	0	0	0	0	0	0	0	0	0	0	0	50	50
Lochsa River	0	0	0	0	0	0	0	0	0	0	0	0	15	0	15
Clearwater mainstem	0	0	0	0	0	0	0	0	0	0	0	212	14	9	235
Subbasin Total	149	79	105	69	0	137	97	20	183	210	126	578	372	109	2234
Salmon River (ID)															
South Fork Salmon R.	0	0	0	0	0	40	30	11	50	56	62	90	81	0	420
Johnson Cr.	0	0	0	0	0	0	0	0	51	48	60	89	80	0	328
Secesh R.	0	0	0	0	0	0	0	0	0	50	65	90	92	0	297
Subbasin Total	0	0	0	0	0	40	30	11	101	154	187	269	253	0	1045
Lower Snake (WA)															
Asotin Cr.	28	27	35	22	29	40	30	10	43	56	61	90	80	50	601
Grande Ronde River (OR)															
Minam R.	0	0	0	0	0	0	0	0	25	55	35	90	77	0	282
Wallowa R.	0	0	0	0	0	40	30	10	25	55	30	90	80	0	360
Chesnimnus (Joeseeph Cr.)	0	0	0	0	0	0	0	0	0	56	64	90	78	0	288
*Catherine Cr.	0	0	0	0	0	0	0	0	0	167	250	212	233	0	862
*Upper Grande Ronde R.	0	0	0	0	0	0	0	0	0	400	201	527	539	0	1667
*Lookingglass Cr.	0	0	0	0	0	0	0	0	0	175	150	151	300	0	776
*Little Lookingglass Cr.	0	0	0	0	0	0	0	0	0	0	150	0	0	0	150
*Indian Cr.	0	0	0	0	0	0	0	0	0	0	0	92	123	0	215
*Meadow Cr.	0	0	0	0	0	0	0	0	0	0	0	82	135	0	217
*Sheep Cr.	0	0	0	0	0	0	0	0	0	0	0	82	209	0	291
*Five Points Creek (new 2019)	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100
*Wenaha River (new 2019)	0	0	0	0	0	0	0	0	0	0	0	0	109	0	109
*Subbasin Total	0	0	0	0	0	40	30	10	50	908	880	1416	1983	0	5317

* Denotes CTUIR Releases

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 (USFWS 2018). H – High, M – Medium, L – Low, I – Insignificant.

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

Idaho Department of Fish and Game (IDFG)

Idaho Department of Fish and Game does not have a dedicated Pacific Lamprey monitoring program but does target juvenile lamprey via electrofishing on wilderness float trips, and encounters Pacific Lamprey incidentally in screw traps and occasionally in stream electrofishing surveys. The majority of IDFG sampling occurs somewhat regularly on wilderness float trips in the Selway River and Middle Fork Salmon River. The Selway River float did not occur in 2019. Staff surveyed 18 sites on the Middle Fork Salmon River, and detected larval Pacific Lamprey at 9 of those sites (Figure 4).

In 2019, an interesting detection of a larval lamprey occurred at a fish screen in an irrigation ditch just downstream of the town of Salmon, Idaho. This is one of the furthest upstream detections in the Salmon River for quite some time. There was some discussion that this fish was potentially a Western Brook Lamprey based on photos, based on communication with Ralph Lampman who is a lamprey biologist for the Yakama Nation. The US Fish and Wildlife Service have plans to survey potential lamprey habitat near the area where this detection occurred in 2020 or 2021, and will collect genetics samples if any lamprey are encountered.

Pacific Lamprey are also encountered by IDFG in rotary screw traps operated primarily to monitor Chinook Salmon and steelhead emigrant abundance. Trap operators collected genetic samples from a subset of encountered lamprey and sent them to the genetics lab at the Columbia River Inter-Tribal Fish Commission (CRITFIC). In 2019 crews observed unusually large numbers (1,113) of juvenile lamprey in the South Fork Salmon River screw trap. This is likely a result of Nez Perce Tribe (NPT) translocations of adult lamprey into the South Fork Salmon River, although it is worth noting that translocations have been occurring for years and this is the first case where such a large number of lamprey were encountered in the trap.

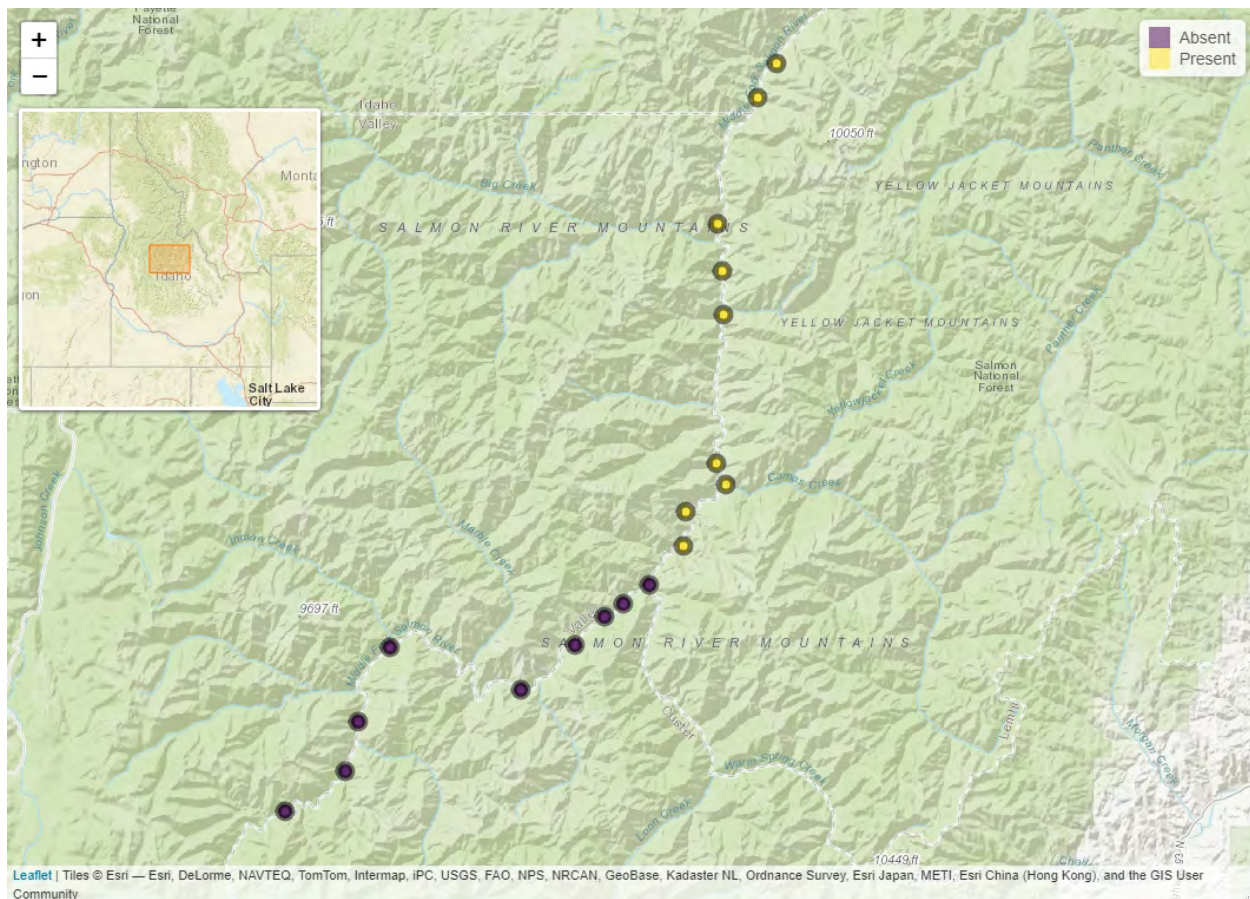


Figure 4. Sampling locations for lamprey larvae in the Middle Fork Salmon River as surveyed by the Idaho Department of Fish and Game, 2019.

U.S. Fish and Wildlife Service Idaho Fish and Wildlife Conservation Office (IFWCO)

The Idaho Fish and Wildlife Conservation Office dedicates effort annually to assist partners with lamprey work within the Snake River RMU as well as conduct monitoring and research to gain knowledge and understanding of the spatial distribution and to identify key threats. IFWCO assists NPT with monitoring tributaries that are supplemented with translocated adults by collecting density data and genetic samples.

Durng 2019, IFWCO, with help from NPT and CRITFC, conducted larval electrofishing surveys in the mainstem of the South Fork Clearwater River. Larval lamprey (n=276) were captured at seven of eight sites sampled. Densities were higher below the mouth of Newsome Creek (RKM 83), which is a stream where NPT supplements adult lamprey annually. Only four individuals were collected above the mouth of Newsom Creek at one site (at RKM 90). From these sites, 187 fin samples were collected and given to CRITFC for genetic analysis.

The Idaho Fish and Wildlife Conservation Office conducted a radio telemetry study on 29 adult lamprey in the Clearwater Drainage to locate spawning tributaries and areas. Most (11/14) of the adults released into the mainstem Clearwater River (released on 04 March 2019) migrated quickly into the South Fork Clearwater and then slowly moved upstream. Most fish stopped moving by mid-July and remained in the mainstem of the South Fork Clearwater below Newsom Creek (Figure 5). A few fish were still migrating upstream, however, in early August. Most of the fish released in

the Lochsa River (13/15) remained in the Lochsa River and migrated slowly upstream. All fish were last detected in the mainstem and no fish entered tributaries. Future genetic samples of larvae will be used to confirm spawning success. The IFWCO office is continuing to monitor adult lamprey radio tagged and released in the summer of 2019.

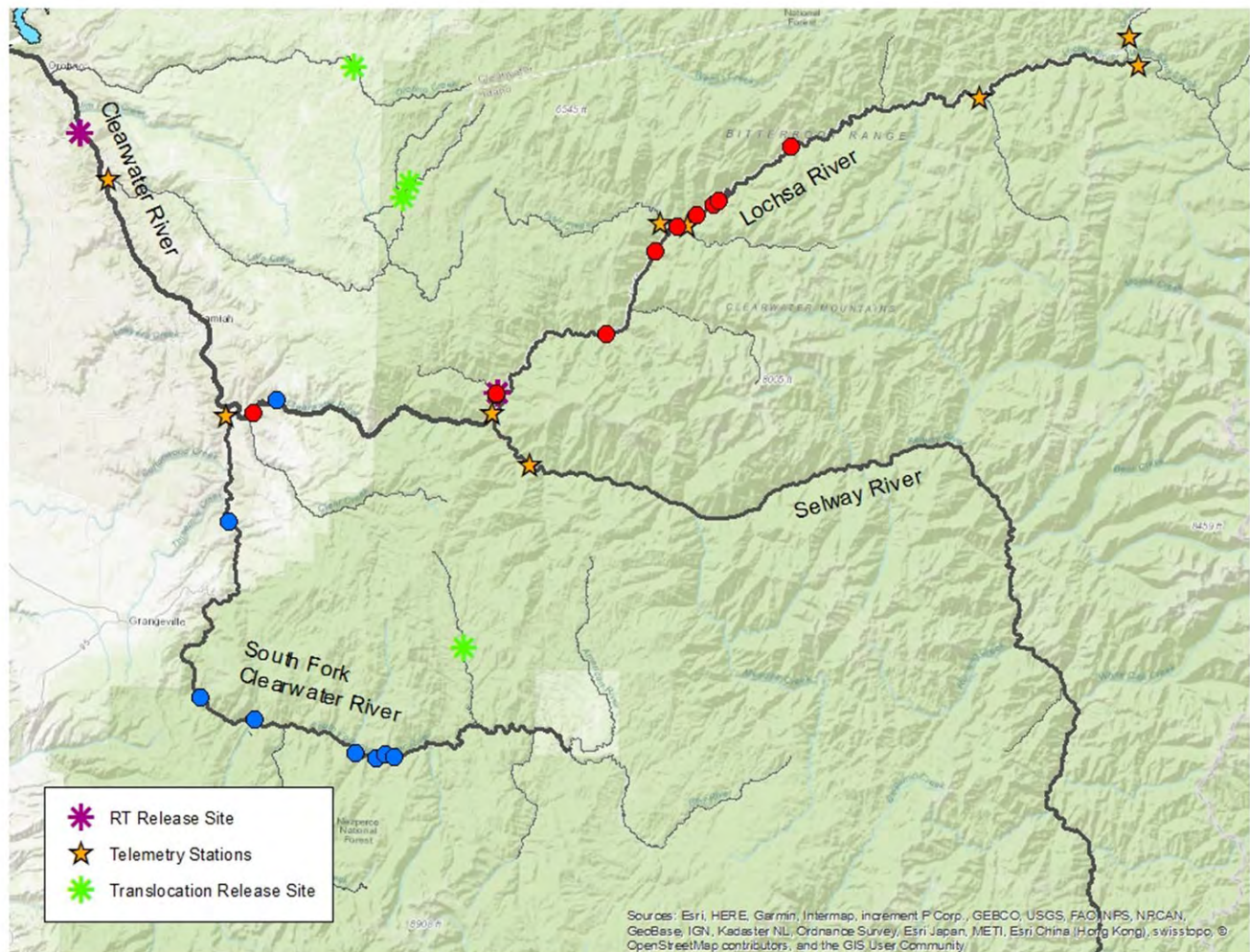


Figure 5. Locations of radio tagged adult Pacific Lamprey on July 17th, 2019. Red circles are fish released into the Lochsa River and blue circles are fish released into the mainstem Clearwater River. These are final locations of most fish.

Oregon Department of Fish and Wildlife (ODFW)

The Snake, Columbia and Coastal Conservation Plan for Lampreys in Oregon has been recently completed. The plan covers Pacific Lamprey, Western River Lamprey, Western Brook Lamprey and Pacific Brook Lamprey.

Nez Perce Tribe (NPT)

The Nez Perce Tribe continues to supplement adult Pacific Lamprey that are collected from three lower mainstem Columbia River dams, overwintered at the NPT Tribal Hatchery on the Clearwater River at Cherry Lane, and released into target tributaries in the Snake, Clearwater and Salmon basins. In 2019, NPT expanded their efforts and began releasing adult lamprey into the East Fork of the Potlatch River. These adults were not overwintered but directly released in the fall.

Additional summer releases occurred in the Lolo, Orofino, Newsome, Johnson Creek, and the Red, South Fork Salmon and Secesh River drainages in central Idaho, as well as the Wallowa and Minam River and Joseph Creek drainages of northeast Oregon. Additional releases occurred in the Asotin Creek drainage of southeast Washington. NPT and CRITFC are monitoring movements of the supplemented adults using PIT tags and detections at PIT tag arrays. See Table 1 for a summary of releases through 2019.

Columbia River Inter-Tribal Fish Commission (CRITFC)

The CRITFC Hagerman Genetics Laboratory is the primary processor of lamprey genetic samples collected in the Columbia Basin. They conduct genotyping of all life stages of lamprey collected for monitoring supplementation within the Snake River basin, which includes larvae and juveniles sampled within and outside of supplementation areas and samples collected at mainstem dam juvenile collection facilities. They are finishing up 2019 Snake River Basin genotyping, and are starting analysis for 2020.

Confederated Tribes of the Umatilla Indian Reservation (CTUIR)

The Confederated Tribes of the Umatilla Indian Reservation continued adult supplementation in the Snake River Basin during 2019. 1,748 adult lamprey, captured at Columbia River Dams, were released into 8 locations in the Grand Ronde River Drainage. Two new tributaries (Five Points Creek, Wenaha River) were added in 2019. See Table 1 for a summary of releases through 2019.

University of Idaho

The University of Idaho's Department of Fish and Wildlife Sciences is involved with several facets of research and evaluation of adult Pacific Lamprey migration and behavior at mainstem Columbia River and Snake River dams. During 2019, updated technical reports were completed on various projects:

1. A final report was completed on evaluating fish ladder modifications to improve lamprey passage at Ice Harbor Dam (Wright et al. 2020). Evaluations were made using acoustic imaging techniques (DIDSON).
2. A report was updated that evaluates systematic reductions in nighttime fishway velocity at Bonneville Dam and experimental reduction in nighttime fishway velocity at The Dalles Dam. The report also evaluates the use of a Lamprey Passage Structure inside the Washington shore fishway downstream of the count station at Bonneville Dam (Clabough 2020) and lamprey migration patterns at larger scales (Keefer et al. 2019)

United States Forest Service (USFS)

The USFS works with tribal and agency partners as needed to facilitate supplementation efforts as well as eDNA sampling.

The Rocky Mountain Research Station, through the eDNA Basinwide Lamprey Inventory and Monitoring Project (eBLIMP) (<https://www.researchgate.net/project/eBLIMP-The-eDNA-Basinwide-Lamprey-Inventory-Monitoring-Project>) has developed an eDNA marker for Pacific Lamprey and a preliminary set of rangewide occurrence probability maps to assist with future

surveys. They have been actively collecting eDNA samples throughout Idaho and the Pacific Northwest to detect presence of lamprey species and map their distribution. Figure 6 shows sampling locations and areas with positive results in Idaho, Washington and Oregon for all samples collected since December 2019. Figure 7 shows the Snake River RMU in more detail.

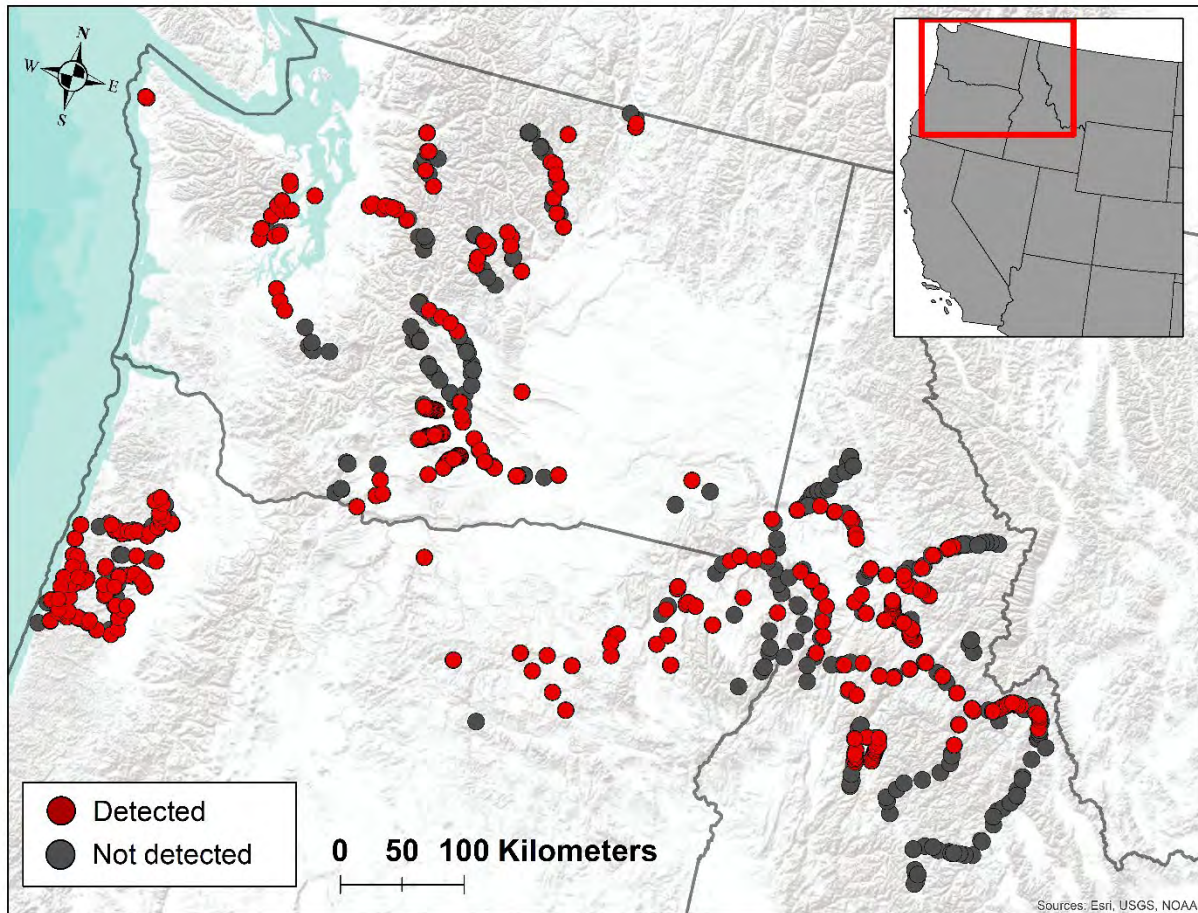


Figure 6. Environmental DNA detections of Pacific Lamprey in Idaho, Washington and Oregon. All samples were collected as a part of the analyzed by the eDNA Basinwide Lamprey Inventory and Monitoring Project and were analyzed at the National Genomics Center for Wildlife and Fish Conservation in Missoula, MT.

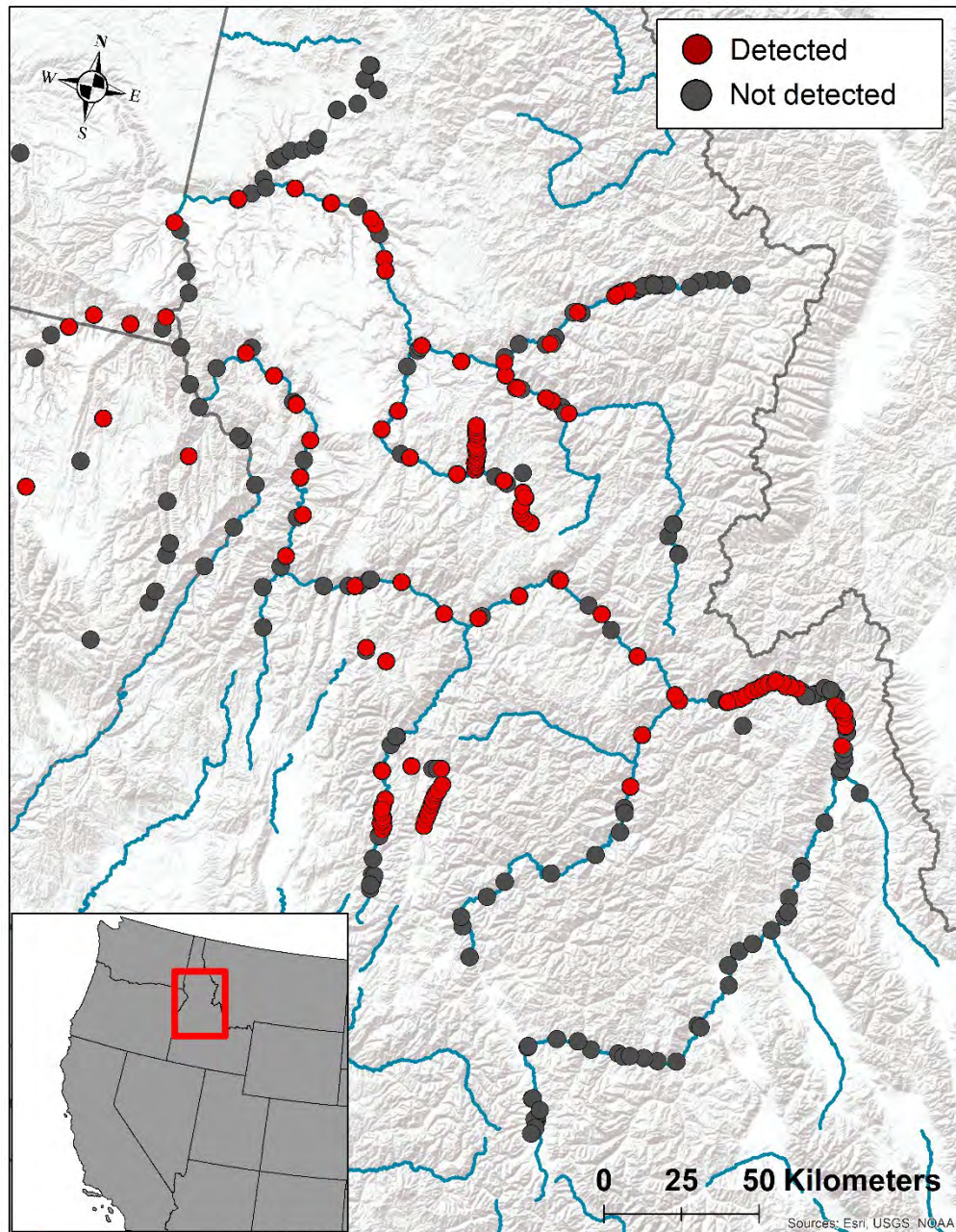


Figure 7. Environmental DNA detections of Pacific Lamprey in the Snake River Regional Management Unit. All samples were collected as a part of the eDNA Basinwide Lamprey Inventory and Monitoring Project and were analyzed at the National Genomics Center for Wildlife and Fish Conservation in Missoula, MT.

U.S. Army Corp of Engineers (COE)

Lamprey passage research and improvements have been ongoing by the COE on mainstem Columbia and Snake river dams, and activities are captured in the Columbia and Snake River Regional Management Unit Regional Implementation Plan. The COE is in the process of drafting a summary report of Pacific lamprey passage improvements from 2008-2018. Passage improvements have recently been made to Ice Harbor Dam, with the University of Idaho monitoring lamprey

passage through the ladder. Lamprey specific improvements, including attachment plates at orifices, flow diffusers, lamprey orifices on weir walls and removal of right angles and hanging structures are being made at several facilities. Changes at the juvenile salmonid bypass facilities are being implemented to facilitate juvenile lamprey return to the river, rather than into barges. If funding allows, research on juvenile distribution in the migration corridor will be implemented.

E. High Priority Proposed Project Information

Participating members of the SRMU met in June 2020 to discuss ongoing conservation actions and identify research needed to address threats and uncertainties within the unit. A priority project was identified by several partners and further discussion occurred in early July. This project proposes to assess lamprey distribution in the Snake River below Hells Canyon Dam and address several key threats in the RMU (e.g. Lack of awareness, dewatering and flow management, mainstem passage, small population size). The complete application for this project is attached (Appendix A).

An additional priority proposal was identified that would aid the Nez Perce Tribes translocation and monitoring efforts that are currently being conducted with limited resources. The complete application for this project is attached (Appendix B).

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Appendix A

Project Title: Snake basin larval Pacific lamprey collaboratory (Mainstem Snake)

Project Applicant/Organization: Nez Perce Tribe

Contact Person: Tod Sween

Email: Tods@nezperce.org

Phone: (208) 621-3582

Project Type:

Assessment

Lamprey RMU population(s):

Snake River RMU

Watershed (5th HUC Field):

NPCC Subbasin (4th HUC Field) name:

17060101	Hells Canyon
17060103	Lower Snake-Asotin

Project Location: Mainstem Snake River (between Hells Canyon Dam and Lewiston, ID)

Project Coordinates (latitude and longitude, decimal degrees, NAD 1983): Upper mainstem point at Hells Canyon Dam (45.243269, -116.700935) and lower mainstem point at Asotin Creek confluence (46.344633, -117.05397).

Total Requested funds: Budget for Collaboratories in both 2021 and 2022 = \$47,200; Budget for just the 2021 Collaboratory = \$23,600.

1. Short Project Summary (200 words or less):

- Provide a brief overview of your project including goals
- This information will be used to describe your project to potential funding entities

Larval Pacific lamprey have recently been detected in the mainstem Snake River. This project will support collaborative assessment of larval Pacific lamprey distribution and habitat use in the mainstem Snake River below Hells Canyon Dam (HCD), with emphasis

Page

on understanding (and managing) effects of seasonal and daily flow fluctuations. The mainstem Snake River flow environment changes significantly both seasonally and daily as influenced by magnitude of water years, Columbia Basin flood control mandates, flow augmentation and diurnal load-following operations from HCD which dewater habitat associated with channel margins. Flow changes may preclude larval rearing or result in stranding. We will sample the mainstem Snake River below HCD downstream to Asotin, WA (~164 km). Larval distribution will be evaluated in shallow-water, deep-water, and small tributary habitats using electrofishing and eDNA techniques. Genetic analysis will be performed on larvae to determine whether they are offspring of translocated or volitional-returning adults. A Lamprey Collaboratory (20 people, representing at least six entities) will be hosted with goals of data collection, habitat and sampling technique familiarity, and lamprey information sharing. The first year will occur during stable flow conditions (October), with funding for a second year of sampling concurrent with daily flow fluctuations (September).

2. Detailed Project Description (500 words or less):

- Describe the proposed work including specific objectives (subcomponents of your stated goals)

This project will support Snake Basin Larval Pacific Lamprey Collaboratories in 2021 and 2022¹. Collaboratories cover four days; including access/transportation to remote lodging and sampling locations, field data collection, and group presentations.

Day 1

- Travel and transportation into Hells Canyon.
- Information sharing with presentations on mainstem Snake River habitat, Hells Canyon Dam operations and regulations, and Nez Perce tribal history.

Day 2

- Sampling and data collection from Hells Canyon Dam down to Kirby Creek (28 river miles^{2,3}).
- Information sharing with presentations and discussion about Pacific lamprey ecology.

Day 3

- Sampling and data collection from Kirby Creek down to Salmon River confluence (31 river miles).
- Information sharing with presentations and discussion about critical uncertainties and potential study designs relative to mainstem Pacific lamprey larval rearing and load-following effects.

¹ Funding request is for Collaboratories in both 2021 and 2022 (\$47,200), with acknowledgement that funding may be limited to a single year in 2021 (\$23,600)

² Exact number and distribution of sampling sites will be honed once a statistically-balanced survey design is developed and aligned with suitable (fish and sampling) habitat.

³ Three eDNA samples per tributary (mouth, 1 rkm, and 2 rkm).

Day 4

- Sampling and data collection from Salmon River confluence down to Asotin Creek confluence (43 river miles).

Objective 1: Document presence/absence and relative distribution of Pacific lamprey larva in the mainstem Snake River from Hells Canyon Dam to Asotin, Wa.

Task 1: Backpack electrofishing² – NPT lead,

- Conduct shallow-water surveys during stable flow conditions in October, 2021.
- Conduct shallow-water surveys during load-following conditions in August or September of 2022¹. Sampling at each site replicated during high flow and low flow periods.

Task 2: Deepwater electrofishing² – USFWS lead.

- 2021 sampling will serve as a pilot level to determine the feasibility of deep-water shocker in this reach, 2022 sample contingent upon 2021 effectiveness.

Task 3: Analyze data and compare distribution, occupancy, and habitat use during hydropeaking and non-hydropeaking - CRITFC lead.

Objective 2: Document presence/absence of Pacific lamprey larva in lower reaches of tributaries to Snake River between Hells Canyon Dam the Salmon River confluence (limited to 2020 Collaboratory).

Task 1: eDNA sampling

- Day 1 - Deep, Granite, Saddle, Sheep, Temperance, and Kirkwood creeks.
- Day 2 – Getta, Wolf, Deep, Divide, and Knight creeks, and Imnaha River.

Objective 3: Provide key staff working on Pacific Lamprey Restoration from multiple entities direct observation of Snake Basin mainstem habitat and experience with larval sampling techniques.

Task 1: Participation in Collaboratories targeting/capped at 20 individuals.

- CRITFC (3), CTUIR (1), IDFG (1), IPC (4), NPT (4), ODFW (2), USFWS (2), YN (1), TBD (2).

Objective 4: Establish strong working relationships, effective communication, and collaborative initiatives relative to Pacific lamprey restoration in the Snake River basin.

Task 1: Provide opportunities for Snake Basin lamprey partners to share knowledge and perspectives.

Task 2: Provide opportunities for Snake Basin lamprey partners to discuss critical

uncertainties.

Task 3: Provide opportunities for Snake Basin lamprey partners to prioritize restoration actions relative to the Snake River Regional Implementation Plan (USFWS 2019).

3. Descriptive Photographs-Illustrations-Maps (limit to three total):

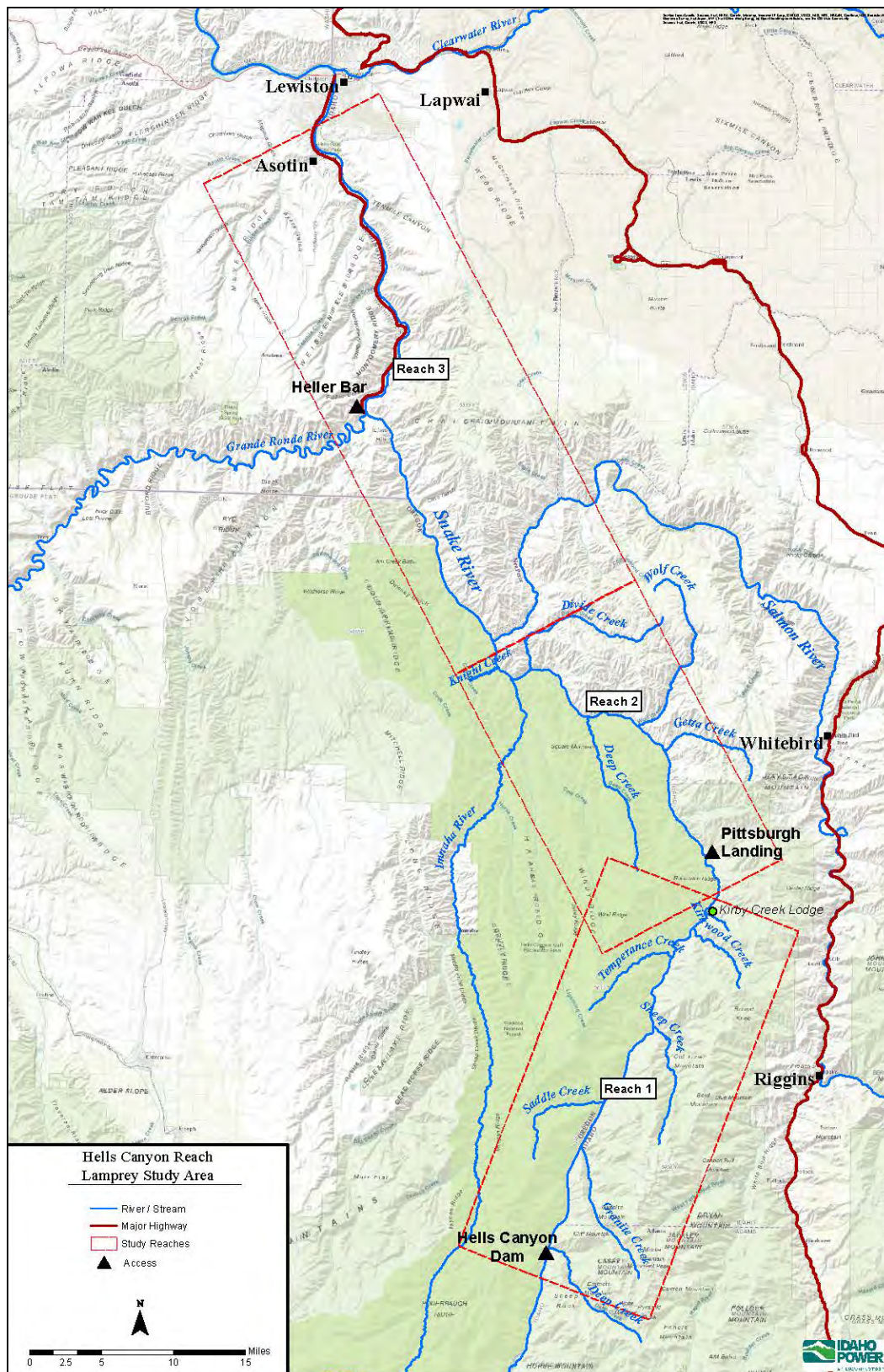


Figure 1. Study area for 2021 Hells Canyon Lamprey survey. Sampling reaches, access points, and stream locations for eDNA sampling are shown. Note: Study area covers 102 river miles, with jet boat transportation required to access sampling sites upstream of Heller Bar (79 river miles).

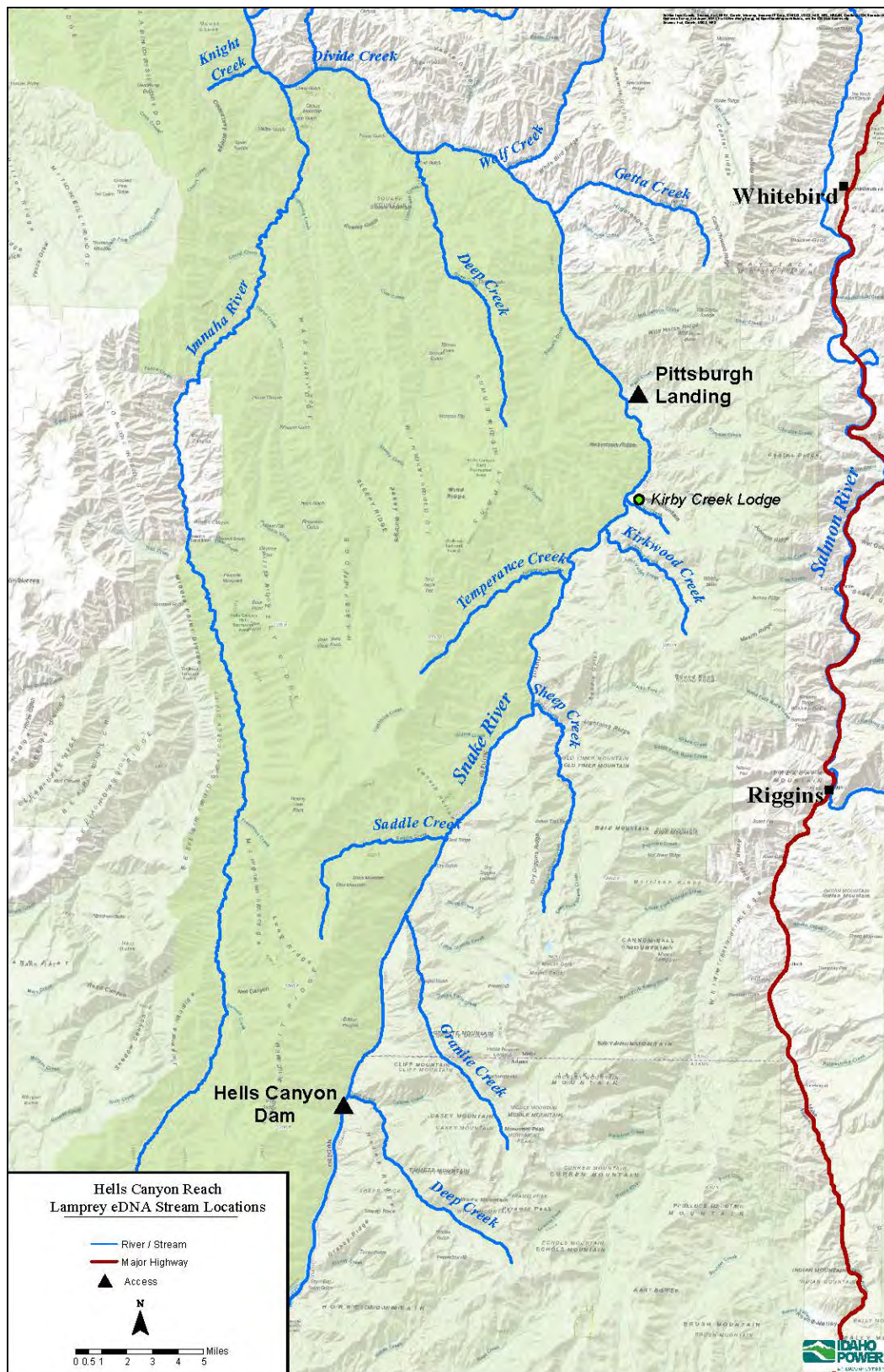


Figure 2. Locations of streams for eDNA sampling in the Hells Canyon Reach, 2021.

4. Linkage of Actions to Identified Threats for Lampreys in RMU(s) (300 words or less):

- What threat(s) to lampreys does this project address? (See your [RIP\(s\)](#) for key threats)

Lack of awareness, dewatering and flow management, mainstem passage, small population size

- Does this project address threat(s) to lampreys specific to this RMU only, or does the project address the threat(s) prevalent in multiple RMUs?

Single RMU x Multiple RMUs X ☐ list additional RMUs:

Snake River Region RMU

- Describe how this project addresses key threat(s) to lampreys within the HUC(s) where project is proposed.

This project addresses the lack of awareness of Pacific lamprey by filling data gaps in the distribution and habitat use of larvae of this species in the mainstem Snake in relation to seasonal and daily flow changes. Seasonal flows can vary substantially from high spring flow periods to low summer flow periods and operations (load-following) of Hells Canyon Dam can repeatedly dewater the shoreline of the mainstem Snake. Flow changes may impact distribution and survival of lamprey progeny of translocated adults and of progeny of adults that have volitionally passed Lower Granite Dam. Hence this project also addresses dewatering and flow management.

Mainstem passage and small population size are addressed via genetic analyses of larvae to determine the proportion of larvae that are the progeny of adults translocated from the mainstem Columbia to the upper Snake vs. the proportion of progeny of adults resulting from volitional passage above Lower Granite Dam.

Species/Habitat Benefits (200 words or less):

- Provide citation of literature, distribution maps, and/or surveys demonstrating lampreys are currently and/or were historically present in the project area.
- How will the project provide meaningful measureable results to improve lamprey populations and/or their habitat conditions?
- What life stage or stages will benefit from action? How?
- What other species may benefit from action?

Pacific lamprey historically occupied the uppermost reaches of the Snake River and its tributaries above what is now the Hells Canyon Dam (HCD), which completely blocks anadromous fish access, and reduced available habitat by over 55% (Saul et al. 2001; IDFG, 2011). Prior to European settlement, approximately 500,000 adult lamprey migrated through the Hells Canyon region to reach spawning habitats in the Snake River (IDFG, 2011). Lamprey were documented by Gilbert and Evermann (1894) at the Lower Salmon Falls and lamprey harvest occurred at Shoshone Falls. The Hells Canyon Complex (Brownlee, Oxbow and Hells Canyon projects) stretches a 154 km reach of the Snake River and is undergoing FERC relicensing, with anticipation of the issuance of a new long-term license by 2022. The complex currently operates on an annual license under the terms of an Interim Settlement Agreement relative to ESA species since the license expired in July 2005. This is an opportunity to determine larval lamprey occupancy and use of the littoral zone below HCD, and to understand how flow fluctuations may contribute to the distribution,

displacement or stranding of larvae lamprey. This research may provide guidance towards flow management to benefit Pacific lamprey, and potentially juvenile fall Chinook.

5. Priority Objectives and Goals:

- Indicate the strategies, and/or restoration/management plans are addressed by this project (when available relevant documents/websites are hyperlinked below for reference):
 - [PLCI Conservation Agreement](#) **X**
 - [National Fish Habitat Partnership National Conservation Strategies](#) ☐
 - [USFWS Climate Change Strategies](#) ☐
 - [Bonneville Power Administration Northwest Power and Conservation Council Columbia River Basin Fish and Wildlife Program](#) ☐
 - [CRITFC Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin](#) **X**☐
 - [US Army Corps of Engineers Pacific Lamprey Passage Improvement Implementation Plan](#) ☐
 - [PUD Management Plan \(please name below\)](#) ☐
 - [Other \(please name below\)](#) **X**
[Hells Canyon Complex FERC relicensing plan](#)
- Clearly describe how the project addresses the goals and objectives in the strategies, restoration/management plans indicated above (200 words or less).

This project addresses the goals and objectives of various management plans by conducting research on occupancy and behavior of larval Pacific lamprey in the shoreline (littoral zone) of the Snake River below Hells Canyon Dam to identify data gaps and need of further research towards developing recommendations to IPC and the region regarding the impact of flow management on larval rearing habitat. The goals and objectives of the various management plans include achieving long term persistence, supporting traditional tribal cultural use, halting population declines, restoring lamprey to sustainable, harvestable levels, maintaining and restoring populations, etc.

6. Project Design / Feasibility:

- Have the designs for the project been completed already or will they be completed before planned project implementation? **Yes X** The designs will be completed before planned project implementation.
- Are the appropriate permits (e.g., ESA consultation, Scientific Collection, fish health/transport, etc.) in place already or will they be in place before planned project implementation? **Yes X** The plans will be in place before planned project implementation. The permits will be obtained through the NPT and USFWS.
- Can the project be implemented within the defined timeframe? (See BPA & NFHP requirements in the accompanying PLCI RIP Priority Project Guidance document). **Yes X**
- Please provide a brief description (200 words or less):

Because of the exploratory nature of this proposal, the project will target accessible areas that

can achieve sampling objectives with an intent to distribute the sampling over a spatially-balanced area to assess the probability of occupancy of larval Pacific lamprey in the mainstem Snake from Hells Canyon Dam ~160 km downstream in relation to Hells Canyon Dam. Random sampling is logistically challenging in the mainstem Snake River. There are just areas that cannot be fully accessed with the entire contingent of boats and staff and much of the habitat is not conducive for established sampling techniques.

7. Partner Engagement and Support (200 words or less):

- What partners are supporting the project? Partner support is primarily in the form of In-kind contributions. Columbia River Inter-Tribal Fish Commission will supply additional monetary support (up to \$3,600) for additional participants or unanticipated costs.
- What partners are active in implementing the project? All collaboratory participant entities will be active in project implementation. The Nez Perce Tribe will be the lead entity for organizing the Collaborative(s). Idaho Power Company will serve as the lead contractor.
- What partners are providing matching funds or in-kind services that directly contribute to the project?

Partner/Entity	In-Kind Staff Time	In-Kind Boat Transportation	In-kind gear	In-Kind Laboratory Analysis
Columbia River Inter-Tribal Fish Commission	X			Parental-Based Tagging
Confederated Tribes of the Umatilla Indian Reservation	X			
Idaho Department of Fish and Game	X			
Idaho Power Company	X	2 Boats		
Nez Perce Tribe	X	1 Boat	1 backpack shocker	
Oregon Department of Fish and Wildlife	X		1 backpack shocker (~\$10,000) and sampling gear	
U.S. Fish and Wildlife Service	X	1 Boat and Boat shocker	4-6 backpack shockers	
U.S. Forest Service				eDNA
Yakama Nation	X			

8. Monitoring and Reporting (200 words or less):

- How is completion of the project going to be documented? (See BPA and NFHP requirements in the accompanying PLCI RIP Project Proposal Guidance document)

Completion of the project will be documented through a report and potentially a peer-reviewed journal article.

- How will the project's benefits to lampreys be monitored over time?

Identification of potential data gaps and information needs to establish subsequent monitoring of larval lamprey distribution and habitat use in the mainstem Snake River, with potential focus on understanding the role of flow management on the distribution, habitat use and survival of Pacific lamprey in the mainstem Snake River.

9. Project Budget (including overhead):

- See last page.

The total budget request for this proposal is \$47,200. This would support two years of activity, covering sampling in stable flow conditions (Year 1) and diurnally fluctuating flows (Year 2). The budget for Year 1 is \$23,600.

10. Timeline of major tasks and

milestones:

<i>Workflow</i>	<i>Start Date/Month</i>	<i>End Date/Month</i>	<i>Responsible Party</i>
Environmental compliance/permits	January 2021	July 2021	Nez Perce Tribe, ODFW, and USFWS
Pre-project preparation	January 2021	September 2021	Idaho Power Company and Nez Perce Tribe
Field Survey (2021)	October 2021	October 2022	All participants
Field Survey (2023)	August 2022	September 2022	All participants
Data analysis	January 2022	December 2022	Columbia River Inter-tribal Fish Commission and Oregon Department of Fish and Wildlife
Reporting (Year 1)	May 2022	May 2022	CRITFC et al
Reporting (Year 2)	May 2023	May 2023	CRITFC et al

11. References (if applicable):

Federal Energy Regulatory Commission. 2007. Final environmental impact statement for hydropower license. Hells Canyon Hydroelectric Project Idaho/Oregon. FERC Project No. 1971-079. FERC/FEIS-0199F. 1,274 p.

Gilbert and Evermann (1894). Report of the Commissioner of Fish and Fisheries on Investigations in the Columbia River in Regards to Salmon Fisheries. United States. Bureau of Fisheries. McDonald, Marshall, 1835-1895. Gilbert, Charles H. (Charles Henry), 1859-1928. Evermann, Barton Warren, 1853-1932. Washington, Govt. print. off., 1894.

IDFG, 2011 The Status of Pacific Lamprey (*Entosphenus tridentatus*) in Idaho.

Idaho Power Company. 2003. New License Application, Exhibits and Technical Appendices: Hells Canyon Hydroelectric Project. Idaho Power Company, Boise, ID.

Saul, D., A. Davidson, S. Lewis, T. Cichosz, and D. Rollins, Writing team. 2001. Draft Lower Middle Snake Subbasin Summary. Prepared for the Northwest Power Planning Council. October.

USFWS (U.S. Fish and Wildlife Service. 2019. Pacific Lamprey 2019 Regional Implementation Plan for the Snake River Region: Lower Snake, Clearwater and Salmon Regional Management Units. Available:
<https://www.fws.gov/pacificlamprey/Documents/RIPs/2019/2019%20Snake%20RIP.pdf>. Accessed 27 July 2020.

Project Budget: Line item budget amounts are limited to 2021 costs (\$23,600). Full funding of the proposal for 2021 and 2022 would double line item expenses estimates (\$47,200).

	Items	# Hours or Units	Cost per Unit (\$)	RIP Funds Requested (\$)	Cost Share (\$)	Total Cost (\$)
A	<i>Personnel:</i>	-	-	\$6,000	\$48,000	\$54,000
	a. NPT	200	75	6,000	9,000	15,000
	b. CRITFC	120	75	0	9,000	9,000
	c. CTUIR	40	75	0	3,000	3,000
	d. IDFG	40	75	0	3,000	3,000
	e. IPC	120	75	0	9,000	9,000
	f. ODFW	80	75	0	6,000	6,000
	g. USFWS	80	75	0	6,000	6,000
	h. YN	40	75	0	3,000	3,000
B	<i>Equipment & Supplies:</i>	-	-	\$3,200	-	\$3,200
	a. Boat Fuel	800 gal	4.00	3,200	0	3,200
C	<i>Travel:</i>	-	-	\$14,400	\$3,600	\$18,000
	a. Lodging and food	25 people for 3 nights = 75	240	14,400	3,600	18,000
D	<i>Other:</i>	-	-	-	\$35,000	\$35,000-
	a. eDNA analysis (USFS)	36		0	TBD	TBD
	b. PBT analysis	1,000	35	0	35,000	35,000
E	<i>Administrative:</i>	-	-		-	-
	Overhead (%)					
	Indirect Costs (%)					
	Total (Sum of A - E)	-	-	\$23,600		\$105,200

Appendix B

FY21 Regional Implementation Plan - Project Proposal Template

Project Title: Nez Perce - Lamprey Legacy Internship

Project Applicant/Organization: Nez Perce Tribe

Contact Person: Tod Sween

Email: Tods@nezperce.org

Phone: (208) 621-3582

Project Type:

Assessment

Lamprey RMU population(s):

Snake River RMU

Watershed (5th HUC Field):

NPCC Subbasin (4th HUC Field) name: Blue Mountain, Hells Canyon, Clearwater, Salmon

Project Location: Snake River Basin

Project Coordinates (latitude and longitude, decimal degrees, NAD 1983):

Total Requested funds: \$33,000

12. Short Project Summary (200 words or less):

- Provide a brief overview of your project including goals
- This information will be used to describe your project to potential funding entities

Nimiipúu (Nez Perce People) and héesu (lamprey) have an intertwined relationship since time immemorial. Currently, the Nez Perce Tribe is taking an active role, working collaboratively with others, to restore héesu (lamprey) throughout the Snake Basin. With limited resources (three partial FTE staff), the Tribe is translocating adult lamprey into vacant habitat, documenting larval lamprey production and habitat use, and working collaboratively to identify (and resolve) limiting factors and critical uncertainties. Continuing the Nez Perce – lamprey legacy will benefit from intentional involvement of tribal member students; funding

of a Nez Perce – Lamprey Internship will advance both the intern’s knowledge of héesu and advance the Tribe’s (and region’s) restoration efforts. The goals of the Nez Perce – Lamprey Internship are (1) increase the Tribe’s capacity for conducting héesu field work, (2) provide direct ‘experience’ between a Nez Perce tribal member and héesu, and (3) support training/education of tribal members for professional level fisheries employment.

13. Detailed Project Description (500 words or less):

- Describe the proposed work including specific objectives (subcomponents of your stated goals)

This project will support 12 pay periods of college intern work associated with Pacific lamprey (heesu) in the Snake River basin. The internship will target a Nez Perce tribal member, who will be part of a 2-4 person field crew. Field crew work will include shallow-water electrofishing, adult translocation, and adult holding. Objectives for the Nez Perce – lamprey Internship ‘experience’ include:

- Objective 1) Proficiency with electro-fishing methods for larval pacific lamprey in shallow water habitats to document presence/absence and density.
- Objective 2) Site specific experience with larval lamprey habitat in Northeast Oregon, Clearwater, and Salmon river subbasins.
- Objective 3a) Under-graduate student option – Reconnaissance surveying and description of mainstem Snake River shallow-water electrofishing sites to be surveyed during 2021 lamprey Collaboratory.
- Objective 3b) Graduate student option - Develop and initiate a large river system sampling (monitoring) design for larval lamprey in the Snake Basin, sufficient to describe juvenile lamprey use of:
 - Lower Clearwater River (Snake River confluence up to Orofino).
 - Mainstem Snake River
 - Lower Snake reservoirs
 - Asotin up to Heller Bar
 - Heller Bar to mouth of Salmon
 - Mouth of the Salmon to confluence with Imnaha River
 - Imnaha river confluence up to Hells Canyon Dam.
 - Lower Salmon River (Snake River confluence up to Riggins).

14. Descriptive Photographs-Illustrations-Maps (limit to three total):

15. Linkage of Actions to Identified Threats for Lampreys in RMU(s) (300 words or less):

- What threat(s) to lampreys does this project address? (See your [RIP\(s\)](#) for key threats)
 - Lack of awareness, mainstem passage, tributary passage, dewatering and flow management, stream and floodplain degradation, water quality
 - Does this project address threat(s) to lampreys specific to this RMU only, or does the project address the threat(s) prevalent in multiple RMUs?
Single RMU x Multiple RMUs X ☐ list additional RMUs:
 - Snake River Region RMU with potential to create and implement a guideline for other member tribes or organizations to create internship program which would address multiple RMUs
 - Describe how this project addresses key threat(s) to lampreys within the HUC(s) where project is proposed.
-
- This project addresses the lack of awareness of Pacific Lamprey by creating and fostering a relationship between educational advancement and fisheries employment. By creating and implementing an internship program specific to the Nez Perce Tribe's Lamprey Translocation initiative it will ensure the growth of Lamprey knowledge while supporting the Traditional Ecological Knowledge that Nez Perce tribal members hold to Pacific Lamprey.
 - The Nez Perce tribal intern will gain the opportunity to develop skills and knowledge of how to address the key threats such as small population size, mainstem passage, and tributary passage to the Snake River Basin and supporting tributaries by increasing their knowledge of the translocation efforts made by the Nez Perce Tribe. The intern will gain the opportunity to develop knowledge specific to transporting and holding adult lamprey, electrofishing larval habitat, research and monitoring of Nez Perce data (both adult and larval data). The intern will also gain an understanding of the operations of the Nez Perce Tribal fisheries program as well as many of the other agencies supporting Lamprey conservation and restoration efforts.

Species/Habitat Benefits (200 words or less):

- Provide citation of literature, distribution maps, and/or surveys demonstrating lampreys are currently and/or were historically present in the project area.
- How will the project provide meaningful measureable results to improve lamprey populations and/or their habitat conditions?
- What life stage or stages will benefit from action? How?
- What other species may benefit from action?

Pacific lamprey historically occupied tributaries throughout the Snake River basin, including the uppermost reaches of the Snake River above what is now the Hells Canyon Dam (HCD), which completely blocks access by anadromous fishes. Current abundance and distribution of Pacific lamprey in the Snake Basin is severely limited with adult escapement past Lower Granite Dam having a 10-year geometric mean of 492 (range 79 – 2,894). Larval sampling over the past ~10 years has shown frequent absence Pacific lamprey in areas not experiencing outplants of translocated adults. A majority of observed larval lamprey have been linked to translocated adults via Parental-

Based Tagging. Continued monitoring of larval lamprey distribution by the Nez Perce Tribe and USFWS will inform locations for future release sites of translocated adults. Release sites target vacant habitat and avoid habitat seeded by volitionally migrating adults.

Funding this intern position will increase the Tribe's capacity to translocate adults and monitor larval production from translocated and volitional adult escapement.

16. Priority Objectives and Goals:

- Indicate the strategies, and/or restoration/management plans are addressed by this project (when available relevant documents/websites are hyperlinked below for reference):
- PLCI Conservation Agreement X
- National Fish Habitat Partnership National Conservation Strategies ☐
- USFWS Climate Change Strategies ☐
- Bonneville Power Administration Northwest Power and Conservation Council Columbia River Basin Fish and Wildlife Program ☐
- CRITFC Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin X ☐
- US Army Corps of Engineers Pacific Lamprey Passage Improvement Implementation Plan ☐
- Nez Perce Tribal Internship Program Guidelines and Standards – Nez Perce Tribe Human Resources Manual, Appendix A
- Clearly describe how the project addresses the goals and objectives in the strategies, restoration/management plans indicated above (200 words or less).

Simply put, this proposal enables the Nez Perce Tribe's active involvement in Lamprey research and restoration activities in a manner that also supports Tribal member education and employment goals. This project addresses the goals and objectives of various management plans by conducting research on occupancy and behavior of Pacific lamprey. The goals and objectives of the various management plans include achieving long term persistence, supporting traditional tribal cultural use, halting population declines, restoring lamprey to sustainable, harvestable levels, maintaining and restoring populations, etc.

17. Project Design / Feasibility:

- Have the designs for the project been completed already or will they be completed before planned project implementation? Yes X The Nez Perce Tribe has existing Internship policy and procedures. Work tasks will be associated with ongoing field activities. The specific internship project will depend if the intern is an undergraduate or graduate student (see objectives 3a and 3b).

- Are the appropriate permits (e.g., ESA consultation, Scientific Collection, fish health/transport, etc.) in place already or will they be in place before planned project implementation? Yes X No permits specific to the internship are required.
- Can the project be implemented within the defined timeframe? (See BPA & NFHP requirements in the accompanying PLCI RIP Priority Project Guidance document). Yes X
- Please provide a brief description (200 words or less):

This internship project will include direct integration of the intern with actual field crews, with targeted experience conducting all aspects of larval sampling and adult translocation. The intern will work directly with the lamprey restoration project leader and Director of Biological Services.

18. Partner Engagement and Support (200 words or less):

- What partners are supporting the project?
- What partners are active in implementing the project?
- What partners are providing matching funds or in-kind services that directly contribute to the project?

The Nez Perce-Lamprey Intern will assist in field sampling supported by Nez Perce Tribe and Bonneville Power Administration (via CRITFC) funding. Develop strengthened relationship with Universities/Colleges within the Snake River Basin and increase pacific lamprey awareness within the educational institution represented by intern.

19. Monitoring and Reporting (200 words or less):

- How is completion of the project going to be documented? (See BPA and NFHP requirements in the accompanying PLCI RIP Project Proposal Guidance document)

Completion of this project will be documented in an Intern Summary report. Research, Monitoring, and Evaluation for internship shown through research poster to support students with annual opportunity to present at conferences within school setting or work setting.

- How will the project's benefits to lampreys be monitored over time? Direct linkage of this project's contribution to lamprey benefits is not possible. However, funding this project will increase the overall capacity the Tribe to be actively involved in lamprey restoration efforts. We assume providing an opportunity for a Tribal member to gain experience with lamprey and input their TEK within existing the larger efforts of lamprey restoration can only be positive.

20. Project Budget (including overhead):

- See last page.

The total budget request for this proposal is \$33,000. Most of this supports 12 pay

periods of staff time and associated fringe benefits. A minimal amount is included for field gear (\$348). Overhead/indirect rate is 28.1%.

21. Timeline of major tasks and

milestones:

<i>Workflow</i>	<i>Start Date/Mont h</i>	<i>End Date/Mont h</i>	<i>Responsible Party</i>
Adult Translocation	June	August	Intern plus NPT field crew
Collaboratory Prep and Participation	August	October	Intern plus NPT field crew
Larval sampling	August	October	Intern plus NPT field crew
Internship Project	June	May	Intern plus Jay Hesse
Intern Summary Report		June 2022	Intern

22. References (if applicable):

Project Budget:

	Items	# Hours or Units	Cost per Unit (\$)	RIP Funds Requested (\$)	Cost Share (\$)	Total Cost (\$)
A	<i>Personnel:</i>	-	-	\$25,413	-	\$25,413
	a. NPT	960	26.47	25,413	-	25,413
B	<i>Equipment & Supplies:</i>	-	-	\$348	-	\$348
	a. Field Gear			348		348
	b.					
	c.					
	d.					
C	<i>Travel:</i>	-	-	-	-	-
D	<i>Other:</i>	-	-	-	-	-
	a.					
	b.			0		
E	<i>Administrative:</i>	-	-	\$7,239	-	\$7,239
	Overhead (%)					
	Indirect Costs (28.1%)			7,239		7,239
	Total (Sum of A - E)	-	-	33,000		33,000