Draft

Columbia River Lamprey Program Summary

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Prepared for the
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DRAFT: This document has not yet been reviewed or approved by the Northwest Power Planning Council

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Program Description

Purpose of Program

Background: Roughly 23 species of lampreys occur in North America (Vladykov and Kott 1980). Of this number only three species occur in the Columbia River Basin. These species are the western brook lamprey (*Lampetra richardsoni*), river lamprey (*Lampetra ayresi*), and Pacific lamprey (*Lampetra tridentata*). Pacific lampreys are an important component of the freshwater ecosystem in the Columbia River Basin. They continue to be an important cultural food for tribes in the interior Columbia River Basin. In the last 30 years, however, Pacific lampreys have declined in the interior Columbia and Snake Rivers (Table 1). Recent radio-telemetry studies by NMFS have shown poor passage success at main stem hydroelectric dams. These studies from 1997 to 2000 found that 52 to 62% of radio-tagged lampreys did not pass Bonneville Dam (pers. comm. M. Moser, 2000, National Marine Fisheries Service). Severely declining Pacific lamprey populations throughout the Columbia River Basin has recently elevated the interest and concern of various entities. The tribes have expressed the most concern due to the cultural significance and lost traditional fishing opportunities.

In 1994, the Northwest Power Planning Council (NPPC) approved the first lamprey project in the Fish and Wildlife Program. The project proposed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), called for research and restoration of Pacific lamprey throughout tribal ceded lands. In 1995, an initial product (Status Report of the Pacific Lamprey in the Columbia River Basin) was completed. Since that time, the CTUIR has continued the lamprey project with efforts directed at mainstem abundance monitoring, NE Oregon tributary population abundance documentation (past and present), development of genetic baseline information, basic migratory behavior, and artificial propagation techniques (capture, transport, holding, spawning). This information has been essential for development of a pilot pacific lamprey restoration plan in the Umatilla Basin. CTUIR hopes the plan will lead to lamprey restoration in the Umatilla and ultimately other subbasins.

Additional lamprey studies have been proposed which created uncertainties regarding what are priority lamprey needs and projects. The NPPC approved FY 99 funding for the ongoing CTUIR project but not others that were proposed, due to these uncertainties and also due to potential project duplication. This document is intended to help clarify the various lamprey project purposes and needs and assist the NPPC in making FY 2002 funding decisions.

Since the initiation of the CTUIR lamprey research and restoration project, a Columbia Basin Pacific lamprey technical work group has been formed to discuss current issues and findings, coordinate ongoing project efforts, and define future project needs as requested by the NPPC. Numerous state, federal, university, and tribal entities have met each year to prioritize research. The most recent meeting (entitled "Columbia Basin Pacific

Lamprey Workshop") took place in Mission, Oregon in 2000. This report will utilize information resulting from the work groups meetings and information from FY 2002 proposals to discuss all ongoing and proposed Pacific lamprey research and restoration efforts and will identify what are believed to be priority needs.

Table 1. Pacific lamprey counts at Columbia and Snake River dams

Dam	Former counts	1997 counts
Bonneville	350,000 in early 60's	22,830
The Dalles	300,000 in early 60's	14,835
John Day	----	14,845
McNary	25,000 in early 60's	4,213
Ice Harbor	50,000 in early 60's	1,454
Lower Monumental	----	217
Little Goose	----	245
Lower Granite	----	1,274
Rock Island	----	2,321
Rocky Reach	17,500 twice in 60's	1,405
Wells	----	773

Principle problems impacting populations

Main stem passage at dams - Similar to anadromous salmonids, hydroelectric dams along the Columbia and Snake rivers also create passage impediments for Pacific lamprey. Recent NMFS studies (funded by COE) utilizing radio telemetry in the lower Columbia River indicates more than 50% of adult Pacific lamprey migrating to Bonneville Dam do not move upstream past the fishways. This problem multiplied by several dams is likely the main reason for the severe declines or possibly extirpation of Pacific lamprey in most mid to upper Columbia and Snake river tributaries. Juvenile lamprey outmigrants are also subjected to high mortality rates at hydroelectric projects. Although mortality percentages are not known, it is believed to be higher than salmonids due to lesser swimming ability of lamprey and resultant poor avoidance and increased impingement on bypass screens.

Poor habitat conditions in tributaries - Reduced instream flows in many tributaries has greatly impacted the natural production potential of Pacific lamprey. Dewatering or low flows in late spring and summer impacts adult upstream migration into tributaries. Low flows, poor riparian conditions and resultant high water temperatures have also reduced the quality and quantity of adult spawning and juvenile rearing areas.

Benefits to fish and wildlife

The Columbia River Inter-Tribal Fish Commission's restoration plan Wy-Kan-Ush-Mi-Wa-Kish-Wit states the goal: within 25 years, increase lamprey populations to naturally

sustainable levels that also support tribal harvest opportunities. The CTUIR is utilizing the Umatilla Basin as a pilot project to test lamprey restoration techniques with the ultimate goal of reestablishing self sustaining natural producing populations which also provide for tribal fishing opportunities at traditional locations within the subbasin. Pacific lampreys are also covered under Section III.C.2.a).1. of the *2000 Columbia River Basin Fish and Wildlife Program.* This states "Obtain the information necessary to begin restoring the characteristics of healthy lamprey populations." Pacific lampreys are again covered in the National Marine Fisheries Service's Biological Opinion (NMFS 2000), section 7.3 'Tribal Actions' state, 1) Halt the decline of salmon, lamprey, and sturgeon populations above Bonneville Dam within 7 years, and 2) Increase lamprey and sturgeon to naturally sustaining levels within 25 years in a manner that supports Tribal harvest.

Project funding to date

Table 2. BPA funding to date.

BPA Project #	Project Title, Sponsor	Cost to date (12/4/01)
1994-026-00	Pacific Lamprey Research and Restoration, CTUIR	$2,075,301
2000-014-00	Evaluate Habitat Use and Population Dynamics of Lampreys in Cedar Creek, USFWS	$323,269
2000-028-00	Status of Pacific Lamprey in the Clearwater River Drainage, IDFG	$147,966
2000-029-00	Identification of larval Pacific lampreys (*Lampetra tridentata*), river lampreys (*L. ayresi*), and western brook lampreys (*L. richardsoni*) and thermal requirements of early life history stages of lampreys, USGS	$235,587
2000-052-00	Upstream migration of Pacific lampreys in the John Day River: behavior, timing, and habitat use, USGS	$199,495

Table 3. Corps of Engineers funding to date.

COE Project #	Project Title, Sponsor	Cost to date (1/28/02)
RPA Measure 118, 119 ADS-P-00-8, ADS-P-00-10	Evaluation of Adult Salmon, Steelhead, and Lamprey Migration Past Dams and Through Reservoirs in the lower Columbia River and into Tributaries, NMFS	$750,000
RPA Measure 119 ADS-P-00-9	Swimming Performance and Exhaustive Stress in Pacific lampreys: Implications for Upstream Migration Past Dams, USGS	$400,000
RPA Measure 119 ADS-P-00-8	Assessment of Steel Floor Plates Installed on Diffuser Gratings to Facilitate Passage of Adult Lamprey Through Fish Ladders, COE	$200,000
BPS-W-00-4, BPS-W-00-15	Juvenile Lamprey Evaluation of the Modified Extended Length Submerged Bar Screens at John Day Dam, COE	$500,000

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Ongoing projects

The Columbia Basin Pacific Lamprey Workshop identified the ongoing lamprey projects, sponsors, general tasks, and funding sources (see Table 4).

Proposed projects

The Columbia Basin Pacific Lamprey Workshop also identified information relevant to proposed lamprey projects. This information in addition to that provided in the FY 2000 BPA lamprey proposals is presented in Table 5.

Critical uncertainties/lamprey project needs

Attendees at the Columbia Basin Lamprey Workshop identified the following regarding Columbia Basin Pacific lamprey (all are priorities, no order identified):

1) Estimate upstream migrant abundance at mainstem dams
2) Upstream migration - mainstem passage success
3) Downstream juvenile migration - mainstem passage success
4) Genetic database for population structure
5) Species identification techniques
6) Juvenile and adult life histories - habitat requirements
7) Artificial propagation success - hatchery practices
8) Pilot restoration actions in a tributary with associated M & E

To help assess the need for ongoing and proposed Pacific lamprey projects, a column was added in Tables 1 and 2 indicating which critical uncertainty or need listed above is addressed by each project.

Discussion of proposed project needs and priorities

If we assume that our long-range goal is to rehabilitate the population of Pacific lampreys in the Columbia River basin to self sustaining natural producing populations which also provide for fishing opportunities at traditional locations, the following general actions will need to be implemented:

1. We must identify the numbers and distributions of what we have currently.

2. We must identify the relative importance of factors limiting reproduction, primarily passage through dams (upstream and downstream) and habitat requirements of all life stages.
3. We must develop rehabilitation plans that include methods for collecting, transporting, and culturing Pacific lampreys
4. We must demonstrate rehabilitation is feasible by conducting controlled, designed studies in one stream.
5. We must initiate a long term monitoring program on the numbers of Pacific lampreys entering the Columbia River to assess our success or failure to increase the population.

The project critical uncertainties, I through VIII above, identified at the workshop are the subject of several ongoing and proposed projects. The workshop attendees agreed that all projects have a high priority considering the current status of lamprey populations.

Table 3 was developed to help the NPPC and project reviewers understand Columbia River Pacific lamprey project critical needs and ties to ongoing and proposed projects. There are more critical needs than there are approved projects. Also, one ongoing project listed does not mean it entirely meets the general objective need.

Restoration of Pacific lampreys and fisheries in the Columbia River basin will require a substantial effort in terms of dollars and time. Total restoration of Pacific lampreys is probably closely linked with restoration of salmon populations and all of the complexities of habitat changes both in the rivers and in the ocean. However, if we make a few assumptions about Pacific lamprey populations based on what we know of other species, we can develop plans and implement demonstration projects where individual tributaries to the Columbia River could have rehabilitated populations of Pacific Lampreys. At the workshop, there seemed to be a consensus that priorities of future work should be based on both the information needs for large scale rehabilitation and for rehabilitation of lampreys in the Umatilla River. Conducting studies that will benefit both objectives should be given highest priority. A systematic, logical progression of studies needs to be continued to make the best use of limited research dollars leading to the most complete rehabilitation of Pacific lampreys that we can achieve.

Changes in aquatic habitats in the Columbia River Basin have resulted in declines in populations of several desirable fishes including Pacific lampreys. Because the wellbeing of Pacific lampreys is closely tied to the wellbeing of salmonids in other systems, it follows that if we improve conditions for salmonids in the Columbia River Basin, we will see an increase in the Pacific lamprey populations.

Passage of upstream migrating Pacific lamprey through fishways designed to pass salmonids is one issue that needs to be examined early in our plans. Problems encountered by downstream migrating Pacific lampreys might be similar to problems juvenile salmonids encounter.

This report represents an initial assessment at what needs to be done concerning Pacific lampreys to facilitate their rehabilitation. As we conduct studies and learn more about lampreys in the Columbia River, we will likely need to modify our approach. Having a workshop periodically should allow that to happen. Having a meeting of researchers and others working on Pacific lampreys on an every other year schedule would keep the

planning and evaluation process in an efficient mode. Producing list such as those in Tables 1, 2 and 3 on an annual basis will provide an index of how much progress we are making. An additional table should be included that lists reports and publications that have been produced since the Pacific lamprey rehabilitation effort was begun. Eventually this information could be set up in a WEB site that would allow frequent updating of lists.

Table 4. Ongoing (currently funded) Columbia Basin Pacific Lamprey projects

Sponsor	Funding	Project title	General project actions	Critical uncertainties and needs addressed
CTUIR	BPA	Pacific Lamprey Research & Restoration (project #9402600)	• Develop a genetic database for determination of lamprey population structure in the Columbia Basin • Document presence/absence and distribution of lamprey in NE Oregon & SE Washington subbasins • Develop and periodically update pilot lamprey restoration plan for Umatilla subbasin • Begin initial restoration plan actions: 1) trap adults from John Day river; 2) evaluate lamprey hatchery practices while holding adults at USGS Cook, WA lab; 3) monitor Umatilla River for juvenile survival and growth; 4) monitor lamprey migratory pheromone in water samples from the Umatilla & John Day rivers to better understand adult lamprey attraction into tributaries. • Model larval lamprey habitat in the Umatilla River	• Umatilla River adult abundance monitoring • Adult homing behavior • Genetic database • Life histories & habitat req. • Hatchery practices • Pilot restoration actions - • M & E
USGS CRRL	CTUIR	Olfactory sensitivity of Pacific lampreys to Petromyzonol sulfate (#9402600)	• To measure the temporal variations in the responses of upstream migrating Pacific lampreys using electo-olfactogram (EOG) techniques.	• Life histories • Upstream migration
USGS CRRL	BPA	Identification of larval Pacific lampreys, river lampreys, and western brook lampreys and thermal requirements of early life history stages of lampreys. (#2000-029)	• Spawn three species in captivity & determine diagnostic characteristics of each • Collect ammocoetes and hold through metamorphosis to verify identification techniques • Evaluate temperature effects on the survival	• Species identification • Life histories & habitat req.

Sponsor	Funding	Project title	General project actions	Critical uncertainties and needs addressed
			and early development of three species	
USFWS	BPA	Evaluate Habitat Use and Population Dynamics of Lamprey in Cedar Creek (#20121)	• Estimate adult abundance & determine migration timing • Determine larval lamprey distribution & habitat use • Determine outmigrant timing & abundance • Eval. homing fidelity, surv. rates & ocean residence with CWT's • Rear ammocoetes to verify species identifications • Evaluate effects of PIT tagging juveniles in lab • Evaluate adult spawning habitat requirements • Sample & cap redds to determine egg & larvae survival & developmental timing	• Life histories & habitat req. • Adult homing behavior • Species indentification • Juv. tagging/migration success
NMFS/ U of Idaho	COE	Radio Telemetry of Adult Pacific Lamprey in the Lower Columbia River	• Evaluate passage of radio tagged adults below and at Bonneville Dam • Conduct laboratory evaluations of upstream movement through various augmented adult fishway structures	• Adult upstream migration success
USGS CRRL	COE	Characteristics of Upstream Migration of Pacific Lamprey in the Columbia River	• Evaluate adult maturation & physiology of adult lamprey collected at Bonneville Dam	• Adult upstream migration success • Life histories
USGS CRRL	USGS	Validation of Statolith - based aging Techniques for Pacific Lamprey Ammocoetes & Macropthalmia	• Validate statolith-based aging techniques in laboratory & compare results to wild lamprey samples.	• Life histories
IDFG	BPA	Evaluate Status of Pacific Lamprey in the Clearwater River Drainage, Idaho	• Determine life history characteristics of adult and juvenile/larval lamprey. • Determine habitat requirements of adults and juvenile/larval lamprey. • Determine distribution of adult and	• Life histories • Habitat requirements

Sponsor	Funding	Project title	General project actions	Critical uncertainties and needs addressed
			juvenile/larval lamprey. • Develop and implement strategies to protect adult and juvenile/larval habitat.	
CTWSRO	BPA	Lamprey distribution, abundance, and habitat use in the lower Deschutes River, Oregon	• Determine larval distribution and associated habitat in the lower Deschutes R. sub-basin. • Determine species composition of *Lampetra* in the lower Deschutes R. sub-basin. • Estimate the numbers of lamprey emigrants, by developmental stage, from Warm Springs R. and Shitike Cr. • Evaluate the feasability of estimating the escapement of adult lamprey in the Deschutes River upstream of Sherar's Falls and estimate lamprey harvest at Sherar's Falls.	• Life histories • Upstream migration • Downstream migration
Battelle PNNL	COE	Evaluate juvenile lamprey passage at John Day Dam	• Assess juvenile lamprey impingement and injury during screening/bypass and turbine passage	• Juvenile downstream migration success
ODFW	ODFW/ PGE	Monitor and restore lamprey populations in the Willamette River subbasin	• Estimate the proportion of the lamprey population harvested each year (exploitation rate)	• Upstream migration • Juvenile/adult life histories-habitat requirements

Table 5. Proposed Columbia Basin Pacific Lamprey projects

Sponsor	Funding	Project title	General project actions	Critical uncertainties and needs addressed
CTWSRO	BPA	Lamprey distribution, abundance, and habitat use in the lower Deschutes River, Oregon	• Determine larval distribution and associated habitat in the lower Deschutes R. sub-basin. • Determine species composition of *Lampetra* in the lower Deschutes R. sub-basin. • Estimate the numbers of lamprey emigrants, by developmental stage, from Warm Springs R. and Shitike Cr. • Evaluate the feasability of estimating the escapement of adult lamprey in the Deschutes River upstream of Sherar's Falls and estimate lamprey harvest at Sherar's Falls.	• Life histories • Upstream migration • Downstream migration
USGS CRRL	BPA	Determination of prey preference of parasitic-phase lampreys.	• Assess feasibility of determination of prey preference of ocean-caught parasitic phase Pacific lampreys using molecular tools to examine gut contents of parasitic-phase Pacific lampreys.	• Life histories • Ecological relationships with other species
Battelle PNNL	BPA	Use of mainstem habitats by juvenile Pacific lamprey (*Lampetra tridentata*). #25101	• Characterize and quantify mainstem habitats of juvenile lamprey. • Identifiy restoration options consistent with geomorphic characteristics of the Columbia and Snake rivers	• Juvenile life histories-habitat requirements. • Refine restoration objectives for the basin, if applicable.
USGS CRRL	BPA	Identification of larval Pacific lampreys, river lampreys, and western brook lampreys and thermal requirements of early life stages of lampreys (#2000-029)	• New Objective: Determine molecular tool to identify sympatric lamprey species in Columbia River Basin	• Species identification • Life histories & habitat requirements.

Sponsor	Funding	Project title	General project actions	Critical uncertainties and needs addressed
USGS CRRL	COE or BPA	Effects of Swimming & Exhaustive Stress in Pacific Lamprey: Implications for Upstream Migration Past Dams	• Evaluate swimming performance, metabolic condition, and exhaustive stress to assess efficacy of current upstream fish passage facilities at Bonneville Dam.	• Adult upstream migration
USGS CRRL	BPA	Upstream migration of Pacific lampreys in the John Day River: behavior, timing, and habitat preferences (#2000-052)	• Trap adults and use radio telemetry to determine lamprey movement to spawning. • Describe overwintering & spawning habitat of radio tagged fish	• Adult upstream migration • Life histories & habitat requirements.
ODFW	BPA	Monitor and restore lamprey populations in the Willamette River subbasin	• Determine maximum exploitation rates that will allow a continued healthy population. • Evaluate passage rate and passage routes at Willamette Falls. • Survey spawning and rearing areas in the Willamette River subbasin so these areas can be protected or restored. • Determine the proportion of lamprey at Willamette Falls that continue up the Willamette River, and the proportion the move to other Columbia River subbasins.	• Upstream migration • Juvenile/adult life histories-habitat requirements
NMFS/ U of Idaho	COE	Radio Telemetry of Adult Pacific Lamprey in the Lower Columbia River	• Evaluate passage of radio tagged adults below and at Bonneville Dam • Conduct laboratory evaluations of upstream movement through various augmented adult fishway structures	• Adult upstream migration success
USFWS CRFPO	BPA	Distribution and life history characteristics of	• Identify and survey additional streams in the lower Columbia River basin complementary to	• Life histories & habitat req. • Adult homing behavior

Sponsor	Funding	Project title	General project actions	Critical uncertainties and needs addressed
		lampreys in tributaries of the lower Columbia River basin	lamprey work in Cedar Creek • Determine larval lamprey distribution & habitat use in two streams selected for further study • Investigate feasibility of estimating timing and abundance of emigrating juvenile lamprey • Investigate feasibility of estimating timing, abundance, and biological characteristics of immigrating adult lamprey • Evaluate spawning habitat requirements of adult lamprey and egg development	• Species indentification • Juv. tagging/migration success

Table 6. Critical uncertainties, goals and objectives for Columbia Basin Pacific Lamprey projects

Critical questions/uncertainties	Goal statement	General objectives	Applicable projects[1/]
I. Current abundance	A. Annually determine numbers & distribution of current populations	1. Coordinate with entities conducting salmonid counts at mainstem dams to expand counts for adult lamprey abundance 2. Estimate upstream migrant abundance in major tributaries 3. Survey ammocoete populations in major tributaries and mainstem 4. Analyze population trends and distribution and develop a long term monitoring program to assess restoration success	O: 9402600 P: ODFW – BPA Much more needed
			O:9402600 O: 20121 P: ODFW – BPA
			O: 94002600 P: 20019 O: 20121 P: 25101 P: ODFW – BPA
			P: ODFW – BPA More needed
II. Upstream migration - passage success.	A. Provide for safe adult passage at mainstem dams	1. Evaluate passage of radio tagged adults in mainstem 2. Conduct laboratory evaluations of upstream movement through various augmented adult fishway structures 3. Evaluate swimming performance, metabolic condition, and exhaustive stress to assess efficacy of current upstream fish passage facilities 4. Identify upstream passage impediments at mainstem dams 5. Determine what devices or operational procedures will allow adult migration through dams without excessive mortality 6. Implement appropriate passage improvements at mainstem dams	O: U of I/NMFS - COE
			O: U of I/NMFS - COE
			O: USGS - COE
			O: U of I/NMFS- COE More needed
			O: U of I/NMFS - COE More needed
			Needed
	B. Provide for safe adult passage in major tributaries.	1. Identify upstream passage impediments in major tributaries 2. Determine solutions for passage impediments 3. Implement passage improvements in major tributaries.	O: 9402600 (Umatilla)
			Needed
			P: ODFW – BPA More needed

Critical questions/uncertainties	Goal statement	General objectives	Applicable projects[1/]
III. Downstream migration - passage success	A. Provide for safe juvenile passage at mainstem dams	1. Evaluate effectiveness of various tag types in juvenile lamprey 2. Identify downstream passage impediments at mainstem dams 3. Determine what devices or operational procedures will allow juvenile migration through dams without excessive mortality 4. Implement appropriate passage improvements at mainstem dams	O: 20121 O: USGS - USFWS P: Battelle - COE (John Day Dam) Needed Needed
	B. Provide for safe juvenile passage in major tributaries.	1. Identify downstream passage impediments in major tributaries 2. Determine solutions for passage impediments 3. Implement passage improvements in major tributaries	Needed Needed Needed
IV. Genetic population structure	A. Develop understanding of Columbia Basin Pacific lamprey population structure.	1. Develop a genetic database for determination of lamprey population structure 2. Determine method to age lampreys	O: 9402600 Needed
V. Lamprey species identification techniques.	A. Develop species identification techniques for larval lamprey (Pacific, river and western brook).	1. Spawn and hold each lamprey species in captivity through metamorphosis to verify identification techniques 2. Determine molecular tool to separate larval specimens of sympatric lampreys.	O: 2000-029 Needed
VI. Life history, behavior and habitat requirements	A. Gain understanding of adult migration/homing behavior.	1. Determine general migration behavior through radio tagging and genetic assessment techniques 2. Investigate adult migration attractant potential of pheromones emitted by larvae 3. Conduct large scale CWT or PIT tag homing/ocean survival study.	O: 9402600 Needed

Critical questions/uncertainties	Goal statement	General objectives	Applicable projects[1/]
	B. Gain understanding of life history and habitat requirements for adult lamprey.	1. Evaluate adult migration and holding & spawning habitat requirements 2. Sample and cap redds to determine egg & larvae survival & developmental timing	O: 2000-052 O: 20121 O: 20121 P: ODFW – BPA Needed

Critical questions/uncertainties	Goal statement	General objectives	Applicable projects[1/]
	C. Gain understanding of life history and habitat requirements for larval lampreys.	1. Validate statolith-based aging techniques 2. Evaluate effectiveness of various tag types in juveniles 3. Sample various tributaries to determine larvae distribution, life history characteristics, and habitat requirements 4. Sample juvenile outmigration in tributaries to determine timing and abundance 5. Sample mainstem riverine habitats to determine larval distribution and relative importance to tributary populations	O: USGS - USFWS O: 9402600
			P: 20121 O: USGS – USFWS
			O: 9402600 P: 20121 P: 20019 P: ODFW – BPA
			O: 9402600 P: ODFW – BPA
			P: 25101
VII. Artificial propagation and transplantation techniques & success	A. Develop transplantation and artificial propagation techniques for lamprey restoration in tributaries	1. Evaluate capture and transport techniques of adults from donor site to hatchery or recipient stream 2. Evaluate hatchery practices for adult holding, spawning, and early rearing of pro larvae	O: 9402600
			O: 9402600 P: 2000-029
VIII. Success of tributary restoration actions	A. Develop successful lamprey reintroduction/ restoration techniques for tributary application	1. Develop pilot restoration plan for Umatilla subbasin 2. Implement and monitor pilot restoration actions in Umatilla subbasin	O: 9402600
			O: 9402600

1/ P = proposed; O = ongoing; for BPA funded projects, the project number is given; for non BPA funded projects, the sponsor precedes the funding source.

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