

Pacific lamprey
2015 Regional Implementation Plan
for the
Mid-Columbia
Regional Management Unit



Draft

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I. Status and Distribution of Pacific lamprey in the RMU

A. General Description of the RMU

The Mid-Columbia River Regional Management Unit (RMU) includes the Walla Walla, Umatilla, Willow, Middle Columbia-Hood, Klickitat, Upper John Day, North Fork John Day, Middle Fork John Day, Lower John Day, Lower Deschutes, Upper Deschutes, Little Deschutes, Beaver-South Fork, Upper Crooked, Lower Crooked and Trout watersheds. The region is comprised of five Level III Ecoregions described by the Environmental Protection Agency (EPA) (http://www.epa.gov/wed/pages/ecoregions/level_iii.htm). The watersheds within this RMU ranged in size from 772–3,600 km². The spatial arrangements of these HUCs are displayed in Figure 1 and sizes of HUCs are in Table1.

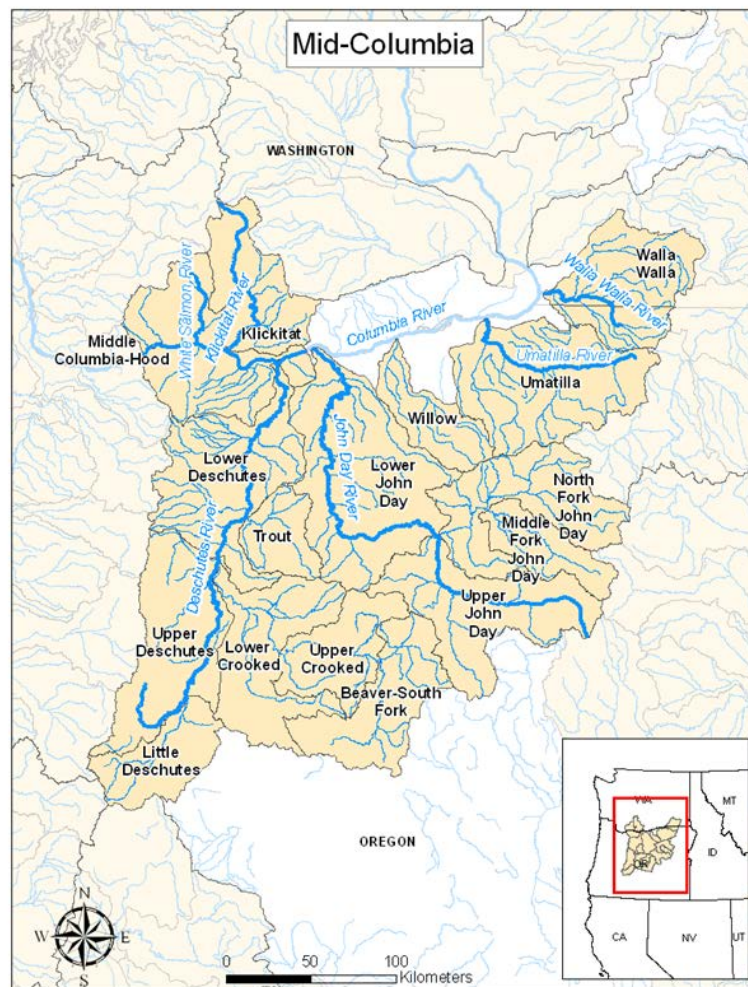


Figure 1. Map of the Mid- Columbia Regional Management Unit (taken directly from the USFWS Conservation Assessment).

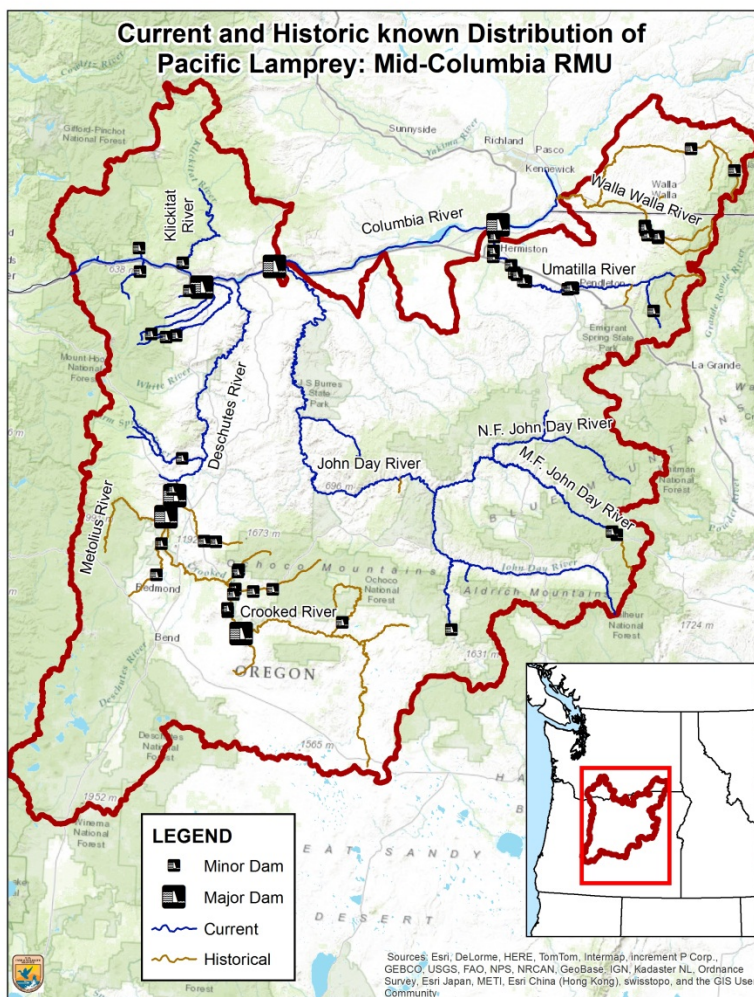
Table 1. Drainage size and Level III Ecoregions of the 4th Field Hydrologic Unit Code (HUC) watersheds located within the Mid-Columbia Region.

| Watershed | HUC Number | Drainage Size (km ²) | Level III Ecoregion(s) |
|----------------------|------------|----------------------------------|--|
| Walla Walla | 17060102 | 4,533 | Columbia Plateau, Blue Mountains |
| Umatilla | 17060103 | 6,579 | Columbia Plateau, Blue Mountains |
| Willow | 17060104 | 2,282 | Columbia Plateau, Blue Mountains |
| Mid-Columbia – Hood | 17060105 | 5,620 | Cascades, Eastern Cascade Slopes, Columbia Plateau |
| Klickitat | 17060106 | 3,445 | Cascades, Eastern Cascade Slopes, Columbia Plateau |
| Upper John Day | 17070201 | 5,517 | Blue Mountains |
| North Fork John Day | 17070202 | 4,740 | Blue Mountains |
| Middle Fork John Day | 17070203 | 2,033 | Blue Mountains |
| Lower John Day | 17070204 | 8,184 | Columbia Plateau, Blue Mountains |
| Upper Deschutes | 17070301 | 5,543 | Cascades, Eastern Cascade Slopes, Blue Mountains |
| Little Deschutes | 17070302 | 2,642 | Cascades, Eastern Cascade Slopes |
| Beaver-South Fork | 17070303 | 3,963 | Blue Mountains, Northern Basin |
| Upper Crooked | 17070304 | 2,979 | Blue Mountains, Northern Basin |
| Lower Crooked | 17070305 | 4,766 | Cascades, Eastern Cascade Slopes, Blue Mountains, Northern Basin |
| Lower Deschutes | 17070306 | 5,957 | Cascades, Eastern Cascade Slopes, Columbia Plateau, Blue Mountains |
| Trout | 17070307 | 1,800 | Columbia Plateau, Blue Mountains |

B. Status of Species

Conservation Assessment and New Updates

During the development of the USFWS Assessment and Template for Conservation Measures (Luzier et al. 2011) (Assessment), there was a high level of uncertainty in population status. According to the Assessment, historic occupancy was extensive in tributaries of the Mid-Columbia. Current population size is still unknown in most areas of historic occupancy, but the current distribution was assessed to be reduced from historic ranges (see table 4-2 of Luzier et al. 2011). New distribution information for the Mid-Columbia HUCs indicates with more certainty that populations have declined from historic levels. The present state of knowledge on information describing known occurrences of Pacific Lamprey are displayed in Figure 2, which is a product of the USFWS data Clearinghouse (<http://www.fws.gov/pacific/fisheries/sphabcon/lamprey/lampreyCI.html>).



Distribution and Connectivity

Passage in the Mid-Columbia Region is impeded by four Federal Columbia River Power System dams (Bonneville, The Dalles, John Day, and McNary). It is also affected by smaller dams such as Powerdale and Lawrence Lake Dam on the Hood River and Hemlock Dam on Wind River. Condit Dam, on the White Salmon River, was removed in 2011. In addition there are many low elevation diversion dams in the Hood, John Day and Umatilla basins (operated by the Bureau of Reclamation). The combined impacts from this series of passage impediments appear to impose a significant impact on distribution and connectivity for Pacific lamprey in most of the HUCs.

Hundreds of smaller water diversions throughout the Mid-Columbia Region, and in particular in the Walla Walla and Umatilla basins, have inadequate screening especially for ammocoetes. Flow is altered from reservoirs of the above mentioned dams. McKay Reservoir in the Umatilla does provide cool water in the summer but restricts passage of summer adults. Specifically, water diversion for irrigation purposes has a serious effect on the Walla Walla, Umatilla and John Day basins.

Larval lamprey surveys have been performed in several of the sub basins including the Umatilla, Deschutes, John Day, Hood and Klickitat. The Confederated Tribes of the Umatilla Indian Reservation has an active Pacific lamprey translocation program, ongoing over the past 15-years. Increases have been seen in rearing ammocoetes and returning adults since the program's inception (Jackson et al. 1997, Close et al. 2003, Howard et al. 2004). Pacific lamprey are believed to be extirpated in the Walla Walla basin. A compilation of all larval and adult lamprey occurrences in the Mid-Columbia RMU has been assembled through the USFWS data clearing house project (web link), and is displayed in Figure 2.

A number of recent studies have been conducted in the mainstem Willamette, Columbia and Snake rivers to document use by larval lamprey (Jolley et al. 2012; Jolley et al. 2014).

C. Threats

Summary of Major Treats

The following table summarizes the known key threats within the Mid-Columbia RMU tributaries (H – High, M – Medium, L – Low). The highest priority threat in the Mid-Columbia watersheds is mainstem passage followed by climate change (This information was taken from the USFWS Assessment Luzier et al. 2011, and has not been fully vetted by the RMU Group).

| Key Threats | Walla Walla | Umatilla | Mid-Col. Hood | Klickitat | Upper John Day | North Fork John Day | Middle Fork John Day | Lower John Day | Lower Deschutes |
|---------------------------------|-------------|----------|---------------|-----------|----------------|---------------------|----------------------|----------------|-----------------|
| Tributary Passage | M | H | M | I | M/H | L | L | M | L/M |
| Dewatering & Flow Mgmt. | M/H | M/H | H | I | M/H | L/M | L | H | L |
| Stream & Floodplain Degradation | M | H | H | L | H | L/M | L/M | M/H | L/M |
| Water Quality | M | M/H | H | M | H | L/M | M | H | L/M |
| Predation | L | L | L | L | L | L/M | I/L | M | I |
| Small Population Size | H | M | L/M | | L | L | L | I | L |
| Mainstem Passage | H | H | H | H | H | H | H | H | H |
| Climate Change | M/H | M/H | H | M | M/H | M/H | M/H | M/H | M/H |

New Threats

A review of current threats for the Mid-Columbia by the RMU Group shows they are consistent with those identified in the Assessment. Mainstem and tributary passage as well as flow and stream degradation and concerns about temperature are still the major threats in this RMU. See Table 10-4 in the Assessment (Luzier et al. 2011) for a list of actions needed in the Mid-Columbia RMU.

Restoration Actions

Within the mainstem Columbia River, improvements to Bonneville, The Dalles, John Day and McNary hydroelectric dam fishways have occurred to increase adult passage success. Instream and floodplain habitat restoration activities have been implemented in the Mid-Columbia subbasins, although these actions have been designed / funded primarily for salmonid recovery. To date, the primary lamprey restoration activities that have occurred within this RMU include translocation of spawning adults (Umatilla Basin) and recent efforts towards adult passage (Three Mile Dam, Feed and Westland Diversions in Umatilla Basin). Initial efforts have begun in artificial propagation (Yakama Nation, Umatilla Tribes and USFWS) and in the evaluations of juvenile entrainment mechanism and potential methods to prevent entrainment. The Columbia Basin Water Transactions Program (CBWTP) has been instrumental in water savings in several tributaries in the Mid-Columbia Region and the Umatilla Tribes have purchased irrigation rights in both the Walla Walla and Umatilla basins.

II. Selection of Priority Actions

A. Prioritization Process

Among the many threats identified in the Mid-Columbia RMU, some showed a pervasive impact in the entire region, such as “mainstem passage” and “climate change”. Other threats were more location specific, but nevertheless showed severe impacts at the local scale, such as “tributary passage”, “stream and floodplain degradation” and “flow and dewatering”.

“Mainstem passage” is a key threat for this region. There is a multi-agency focused effort to assess and reduce the impact of mainstem passage. It was included in the priority actions as a component of the juvenile outmigration proposal.

“Climate change” is identified as a critical subject for the region, but the feasibility and practicality in making tangible changes for lamprey through restoration actions is somewhat limited and requires large scale institutional changes.

“Dewatering & flow management” was also identified as a key threat in the Mid-Columbia. Restoration actions will require large scale institutional changes involving water rights and salmonid management and is likely a long-term action item. However, the Umatilla Tribes have purchased irrigation rights in both the Walla Walla and Umatilla basins. Two of the proposed projects involve reducing the impact of “dewatering and flow management”.

Based on the Assessment, new monitoring and evaluation and multi-agency coordination meetings

the following four projects were selected as priority projects for the Mid-Columbia RMU: “Characterization of Juvenile Outmigration”, “Development of New Sampling Techniques for Juveniles”, “Development of Screening Criteria”, and “Reduction of Dewatering Mortality.”

B. High Priority Proposed Project Information

Characterization of Juvenile Outmigration

Project Description

Utilize full duplex PIT tags (and receivers) to determine passage routes and timing within the Umatilla River and FCRPS dams.

- **HUC 5:**
- **Facilities Ownership:** CTUIR and USACE
- **Regulatory Responsibility:** USACE has fish passage responsibilities for the mainstem Columbia River. BOR has fish passage responsibilities for the mainstem Umatilla irrigation diversion dams.
- **Rationale and linkage to the watershed:** This action has a clear region/basin-wide application and the products will have region-wide applications to other lamprey related projects throughout the Columbia River Basin. There is concern from Tribal commissioners over lack of juvenile focused studies.
- **Expected outcome (threats addressed):** The goal of this project is to determine timing and routes of juvenile outmigration/passage in both tributaries and the mainstem Columbia River.
- **Identification and coordination with relevant stake holders:** The primary stakeholders are CTUIR and NOAA. Many other partners would facilitate and utilize information gained from this project.
- **Feasibility and expected timeframes:** CTUIR and NOAA would implement project. This project is ready to start.
- **Proponent Role and Responsibilities:** CTUIR and NOAA primarily responsible for coordination and expenditure of funds and activities for tagging. CTUIR , NOAA, USFWS, USACE and other partners would assist with detection.
- **Consensus within the RMU Groups:** The Mid-Columbia RMU Group deferred to CTUIR for selection of priority projects for this round.
- **Expected outcome:** Determination of timing and routes of passage for juveniles migrating out of Umatilla basin and through FCRPS.
- **Budget and identification of potential funding sources:** Existing USBR funding and potentially BPA funding.

Develop New Sampling Techniques for Juveniles

Project Description

Develop new sampling techniques for juvenile lamprey. This project would aid in determining timing and passage of outmigrating juveniles.

- **HUC 5:**
- **Facilities Ownership:**
- **Regulatory Responsibility:** USACE has fish passage responsibilities for the mainstem Columbia River. BOR has fish passage responsibilities for the mainstem Umatilla irrigation diversion dams.
- **Rationale and linkage to the watershed:** This action has a clear region/basin-wide application and the products will have region-wide applications to other lamprey related projects throughout the Columbia River Basin. There is concern from Tribal commissioners over lack of juvenile focused studies.
- **Expected outcome (threats addressed):** The goal of this project is to develop new sampling techniques for juveniles. It would help determine timing and routes of juvenile outmigration/passage in both tributaries and the mainstem Columbia River.
- **Identification and coordination with relevant stake holders:** The primary stakeholders are CTUIR and NOAA. Many other partners would facilitate and utilize information gained from this project.
- **Feasibility and expected timeframes:**
- **Proponent Role and Responsibilities:** CTUIR primarily responsible for coordination and expenditure of funds and activities .
- **Consensus within the RMU Groups:** The Mid-Columbia RMU Group deferred to CTUIR for selection of priority projects for this round.
- **Expected outcome:** Safe and effective tagging methods for juvenile would help determine timing and routes of passage for juveniles migrating out of Umatilla basin and through FCRPS.
- **Budget and identification of potential funding sources:** BPA funding.

Development of Screening Criteria

Project Description

Determine new screening criteria for larval/juvenile lamprey and support defining new lamprey screening criteria from laboratory (and field trials).

- **HUC 5:**
- **Facilities Ownership:** Bureau of Reclamation
- **Regulatory Responsibility:** BOR has fish passage responsibilities for the mainstem Umatilla irrigation diversion dams.
- **Rationale and linkage to the watershed:** Irrigation diversions withdraw a substantial proportion of flow from the Walla Walla and Umatilla Rivers and have the potential to entrain large numbers of larval/juvenile lamprey. Development of screening criteria for lamprey would have a clear region/basin-wide application and the products will have region-wide applications to other lamprey related projects throughout the Columbia River Basin.
- **Expected outcome (threats addressed):** The goal of this project is to develop screening criteria for larval and juvenile lamprey to reduce mortality of lamprey in irrigation diversions.
- **Identification and coordination with relevant stake holders:** The primary stakeholders in the Umatilla subbasin are the BOR, USFWS, CTUIR and associated irrigation Districts.
- **Feasibility and expected timeframes:**
- **Proponent Role and Responsibilities:** CTUIR, NOAA, BOR, BPA and USFWS primarily responsible for coordination and expenditure of funds and activities.
- **Consensus within the RMU Groups:** The Mid-Columbia RMU Group deferred to CTUIR for selection of priority projects for this round.
- **Expected outcome:** Mortality associated with entrainment and dewatering in irrigation diversions will be reduced.
- **Budget and identification of potential funding sources:** It is thought that this project could be cost shared with existing USBR, BPA and private irrigation company funding.

Reduction of Dewatering Mortality

Project Description

Identify ways to reduce mortality of lamprey during dewatering periods and increase salvage efforts.

- **HUC 5:**
- **Facilities Ownership:** Bureau of Reclamation
- **Regulatory Responsibility:** BOR has fish passage responsibilities for the mainstem Umatilla irrigation diversion dams.
- **Rationale and linkage to the watershed:** Irrigation diversions withdraw a substantial proportion of flow from the Walla Walla and Umatilla Rivers and have the potential to entrain large numbers of larval/juvenile lamprey. This action has a clear region/basin-wide application and the products

will have region-wide applications to other lamprey related projects throughout the Columbia River Basin.

- ***Expected outcome (threats addressed):*** The goal of this project is to provide safe, timely and effective juvenile passage past all irrigation facilities that are operated within the Umatilla and Walla Walla basins to provide access to all rearing habitats and migration corridor below each of these Projects.
- ***Identification and coordination with relevant stake holders:*** The primary stakeholders in the Umatilla subbasin are the BOR, USFWS, CTUIR and associated irrigation Districts.
- ***Feasibility and expected timeframes:***
- ***Proponent Role and Responsibilities:*** CTUIR, NOAA, BOR, BPA and USFWS primarily responsible for coordination and expenditure of funds and activities.
- ***Consensus within the RMU Groups:*** The Mid-Columbia RMU Group deferred to CTUIR for selection of priority projects for this round.
- ***Expected outcome:*** Mortality associated with entrainment and dewatering in irrigation diversions will be reduced
- ***Budget and identification of potential funding sources:*** It is thought that this project could be cost shared with existing USBR funding, BPA funding and private irrigation companies.

Consistency with the Conservation Agreement

Each of these Projects are consistent with the Conservation Agreement, specifically with Objective 6. Other parallel activities associated with this Project are also consistent with the Agreement, including translocation, data sharing, public outreach and identification and distribution of Pacific lamprey throughout the Basin.

References

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