

**North Umpqua Hydropower Mitigation Fund  
Critical Project Nomination Form**

Project Name: **Lemolo Reservoir Tui Chub trapping and Creel Survey.**

Total Mitigation Funds Requested For this Fiscal Year: **\$26,250**

Submitted by: Jason Wilcox

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Type of Project (mark one that applies):

Wetland/stillwater habitat   X  

Vegetation management     

Terrestrial species connectivity     

Riparian/aquatic species connectivity     

Erosion control     

Explanation of why this project is time critical:

**Water quality in Lemolo Reservoir has declined in recent years. The invasive fish species, tui chub, are thought to be contributing to the degraded water quality. There is a need to continue monitoring fish populations and removal of tui chub.**

Description of hydropower project caused impacts that project is addressing (aquatic, terrestrial and natural resource related including wetland, aquatic & terrestrial connectivity, vegetation management, soil loss/erosion, etc.). Be specific how/what the project mitigates:

**Lemolo Lake is an impoundment of the North Umpqua River created by PacifiCorp’s Lemolo 1 diversion dam for hydropower production. Converting a river to a lake and manipulating it’s outflow and storage elevation creates habitat for aquatic macrophytes, brown trout, kokanee, rainbow trout, tui chub, phytoplankton and zooplankton that didn’t historically occur in the North Umpqua River. This “conversion” from river to reservoir can also create water quality issues. Reported blue-green algae blooms in the reservoir in 1993, and 1996, and documented blue-green algae blooms from 2006 to 2013 have impacted fish and wildlife habitat, recreation, and threatened public health. Water quality advisories because of heavy blue-green algae blooms have greatly reduced recreational use at Lemolo Lake and increased expenditures due to the need to post/unpost signing and increase monitoring/sampling. PacifiCorp has been impacted by having to haul water to supply some of their domestic housing units. Fish populations and their associated nutrient inputs can be an important factor in promoting conditions that may lead to a cyanobacteria bloom. While there are also brown trout and kokanee in Lemolo Lake, tui chub populations continue to be the priority non-game invasive fish species that is being targeted as a**



**contributing factor to these algal blooms and overall imbalanced nutrient cycling in the lake. Tui chub populations have been continually declining since trapping efforts began in 2008. An additional year of tui chub trapping is anticipated to establish a sufficient population trendline to inform decisions regarding future levels of focus on managing this species relative to other potential lake management priorities.**

Point of hydropower induced impact	Location of proposed mitigation project
Legal: T 26 S, R 5 E, Sect. 11-14	Legal: T 26 S, R 5 E, Sect. 11-14
6th field subwatershed: Lemolo	6th field subwatershed: Lemolo
5th field watershed: Headwaters North Umpqua	5th field watershed: Headwaters North Umpqua
Administrative Unit: Diamond Lake R. D.	Administrative Unit: Diamond Lake R. D.

Description of project objectives, activities, *measurable* benefits, and expected accomplishments:

**This project will continue removal of the invasive fish species, tui chub, and also allow for the continuation of data collection and monitoring of the fishery in Lemolo Lake to better understand and reduce impacts on water quality and recreation. This approach will contribute to a long-term data set required to calibrate current modeling efforts of fishery impacts to zooplankton, algae, and water quality through analysis of trophic level interactions analysis. It will contribute to improved water quality via continued removal of tui chub, minimizing negative impacts to recreation and the local economy.**

**This project will continue a successful program of fishery monitoring and management on this hydropower reservoir for relative fish abundance, species composition, and removal/control of non-native tui chub. This will be accomplished using the following methods:**

- **Trap Netting-** Set trap net(s) in various locations within Lemolo Reservoir to collect data on the following fish species: brown trout, rainbow trout, and kokanee. Continued trap netting and removal of tui chub at a similar effort to those of 2013, from May-August or until brown trout catch becomes higher than the tui catch. It is thought that once the population has been reduced to a certain point, that predation by the lake's brown trout population may very well control the chub population. Approximately 245,000 chub have been removed from the lake thus far.
- **Creel Surveys-** Creel conducted by Lemolo Lake Resort and statistically extrapolated creel by ODFW could begin at the end of April and continue through the end of October, with June and July being targeted as peak chub spawning months. Surveys would be both pressure counts and angler interviews and be conducted randomly throughout the season in order to estimate Catch Per Unit of Effort (CPUE), estimated harvest and species harvested.



Identify any previous work completed (prior year accomplishment of multi-year project, planning, design work, etc.):

**2007- Formation of Lemolo Lake Algae Technical Work Group (TWG)**  
**2008- Research and Development Grant (ODFW) to Lemolo Lake Resort for chub trapping. Water quality monitoring by USFS and PacifiCorp.**  
**2008-2010 - Kokanee and Brown trout spawning surveys conducted by ODFW**  
**2009- USFS/PacifiCorp funding to Lemolo Lake Resort for chub trapping. Water quality monitoring by USFS and PacifiCorp.**  
**2010- Title II grant for chub trapping. Water quality monitoring by USFS and PacifiCorp.**  
**2011- Title II grant for chub trapping. Water quality monitoring by USFS and PacifiCorp. ODFW kokanee redd surveys.**  
**2007-2011- Lemolo Lake Algae TWG analysis/consultation**  
**2012- Water quality monitoring by USFS and PacifiCorp. Tui chub trapping by USFS contract.**  
**2013- Water quality monitoring by USFS and PacifiCorp. Tui chub trapping by USFS contract. ODFW recreational use sampling and intensive Kokanee spawning surveys via USFS contract.**  
**2008-2013- Approximately 1,800 volunteer hours of tui chub trapping through Lemolo Lake Resort.**

Umpqua National Forest, PacifiCorp, Oregon Department of Fish and Wildlife (ODFW), U.S. Fish and Wildlife Service (USFWS), Oregon Department of Water Resources (OWRD), Lemolo Lake Resort, and the Oregon Department of Environmental Quality (ODEQ) have combined funds and effort to provide for chub trapping and monitoring of lake water quality (see funding contributions below), with the goal of improved water quality at Lemolo Lake and in the North Umpqua River. The Umpqua National Forest continues to cooperate through the North Umpqua Lakes Working Group with PacifiCorp, Lemolo Lake Resort, and the other Federal and State agencies to trap, monitor and further understand the dynamics of water quality issues in the lake. Technical expertise has been provided by MaxDepth Aquatics, a hydrological consulting firm that also provided assistance with Diamond Lake water quality issues in the past.

Chub trapping and water quality monitoring started in 2008 and has continued through the current time with a variety of partners funding the effort. Continued trapping and monitoring is recommended by ODFW, PacifiCorp, and Lemolo Lake Resort. It is also recommended by State and Federal agencies through the North Umpqua Hydropower Fish Habitat Studies Technical Working Group (FHS TWG). PacifiCorp has committed to providing funding in the future for lake modeling using the successful model developed for Diamond Lake. ODFW has always supported trapping of tui chub in Lemolo Lake.



Proposed budget:

<i>Activity</i>	<i>Personnel</i>	<i>Contract/Materials</i>	<i>Vehicles</i>	<i>Total</i>
<b>Planning/NEPA</b>				
<b>Engineering design &amp; Contract preparation</b>	<b>\$3,000</b>			<b>\$3,000</b>
<b>Contract costs</b>		<b>\$20,000<sup>1</sup></b> <b>[\$26,000<sup>2</sup>]</b>		<b>\$20,000<sup>1</sup></b> <b>[\$26,000<sup>2</sup>]</b>
<b>Contract Administration</b>	<b>\$2,000</b>	<b>\$1,250<sup>4</sup></b>		<b>\$2,000</b>
<b>Non-contract implementation</b>				
<b>Monitoring</b>				
<b>Totals</b>	<b>\$5,000<sup>3</sup></b>	<b>\$21,250</b>		<b>\$26,250</b>

<sup>1</sup>Funds to support tui chub trapping by contractor.<sup>2</sup>Lemolo Lake Resort volunteer in-kind tui chub trapping/monitoring, creel surveying, and associated personnel and equipment not funded by others.<sup>3</sup>USFS contracting overhead<sup>4</sup>5% Mitigation Fund burden

Identify other funding (includes appropriated funds) or confirmed, external partnerships of project

Source	Value of contribution	Description of contribution
<b>PacifiCorp</b>	<del>\$85,000</del> 45,000	<b>(Pre-2012) Water quality investigation, Staff time (North Umpqua TWG coordination, fisheries biologist technical services), tui chub trapping funding and staff time</b>
<b>PacifiCorp</b>	<b>5,000</b>	<b>(2012-2013) In-kind- Labor, project development, contract consultation/development, historical document research</b>
<b>ODFW</b>	<b>\$40,000</b>	<b>(Pre-2012) Fisheries biologists consultation/technical services and coordination, R&amp;E Grant for tui chub trapping, Scientific Collection Permit, electrofishing equipment, coordination and assistance with invasive species prevention</b>
<b>ODFW</b>	<b>5,000</b>	<b>(2012-2013) In-kind- Labor, project development, contract consultation/development, scientific collection permit, Sykes Act contract admin.</b>



<b>USF&amp;WS</b>	<b>5,000</b>	<b>(Pre 2012) In-kind- Project development, contract consultation/development</b>
<b>USF&amp;WS</b>	<b>2,500</b>	<b>(2012-2013) In-kind- Project development, contract consultation/development</b>
<b>ODEQ</b>	<b>2,500</b>	<b>(Pre 2012) In-kind- Project development, contract consultation/development</b>
<b>ODEQ</b>	<b>2,500</b>	<b>(2012-2013) In-kind- Project development, contract consultation/development</b>
<b>Lemolo Resort</b>	<b>\$90,000</b>	<b>(2008-2013) Volunteer tui chub trapping/monitoring, personnel and equipment not funded by others.</b>

Proposed project schedule and timeline, including projected date of accomplishment:

**The project would be initiated in April 2014. Trapping would begin as early as May 2014 depending upon water temperatures and associated spawning activity, and continue until the first week in August 2014. Creel surveys would continue until October 2014.**

