

# Upper Chewaucan Watershed Restoration Project



Applicant:

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## Executive Summary

- **The date, applicant name, city, county, and state**

- January 23, 2024
- Lake County Umbrella Watershed Council
- Lakeview, Lake County, Oregon

- **Applicant Category** - Category B applicant

The Lake County Umbrella Watershed Council (LCUWC) is a non-profit 501(c)(3) organization that was established in 2007 when representatives from the five existing watershed councils merged. The LCUWC is coordinating this proposal with the Upper Chewaucan Watershed Partnership (Partnership) which includes the Lakeview Soil and Water Conservation District (LSWCD), U.S. Forest Service (USFS), U.S. Bureau of Land Management, Oregon Department of Fish and Wildlife, and three private landowners. The Partnership will collaborate with the existing Upper Chewaucan Strategic Implementation Area (SIA) partners, which include Partnership members plus the Oregon Department of Agriculture, Oregon Watershed Enhancement Board, and Oregon Department of Forestry. Department of Environmental Quality and Lake County Commissioners recently joined the SIA partners.

LCUWC is an eligible applicant as a non-profit organization that is acting in partnership with Category A partners (LSWCD, USFS, and private landowners). The Partnership's Memorandum of Understanding is included as an attachment.

- **Application Area** - Task Area A: Study and Design

- **Project Summary** - LCUWC is leading the Partnership in the pursuit of a watershed restoration design project to improve watershed function and ecological resilience for endemic Chewaucan redband trout. The project area includes the Chewaucan River and thirteen tributaries that provide cold water habitat for Chewaucan redband trout, winter range for mule deer, habitat for migratory waterfowl, recreational opportunities for visitors from across the country, and thousands of acres of irrigated meadows and rangeland that economically support ranching families. The Partnership includes local producers, resource agencies, and non-governmental organizations dedicated to watershed restoration in the Upper Chewaucan. Partnership members have collaborated on past watershed projects to restore ecological processes affected by drought and catastrophic fires which have burned over 60 percent of the watershed since 2018. Additionally, road and irrigation infrastructure, historical removal of riparian vegetation, and grazing practices have affected ecological systems. To address these concerns, the Partnership will complete plans to replace fish passage barrier culverts, modify irrigation diversions for fish passage, increase aquatic and riparian habitat complexity, enhance rangeland, and restore burned uplands. Through this multi-tiered approach, we will accelerate aquatic habitat recovery from recent fires and increase redband trout population resilience in the Upper Chewaucan watershed.

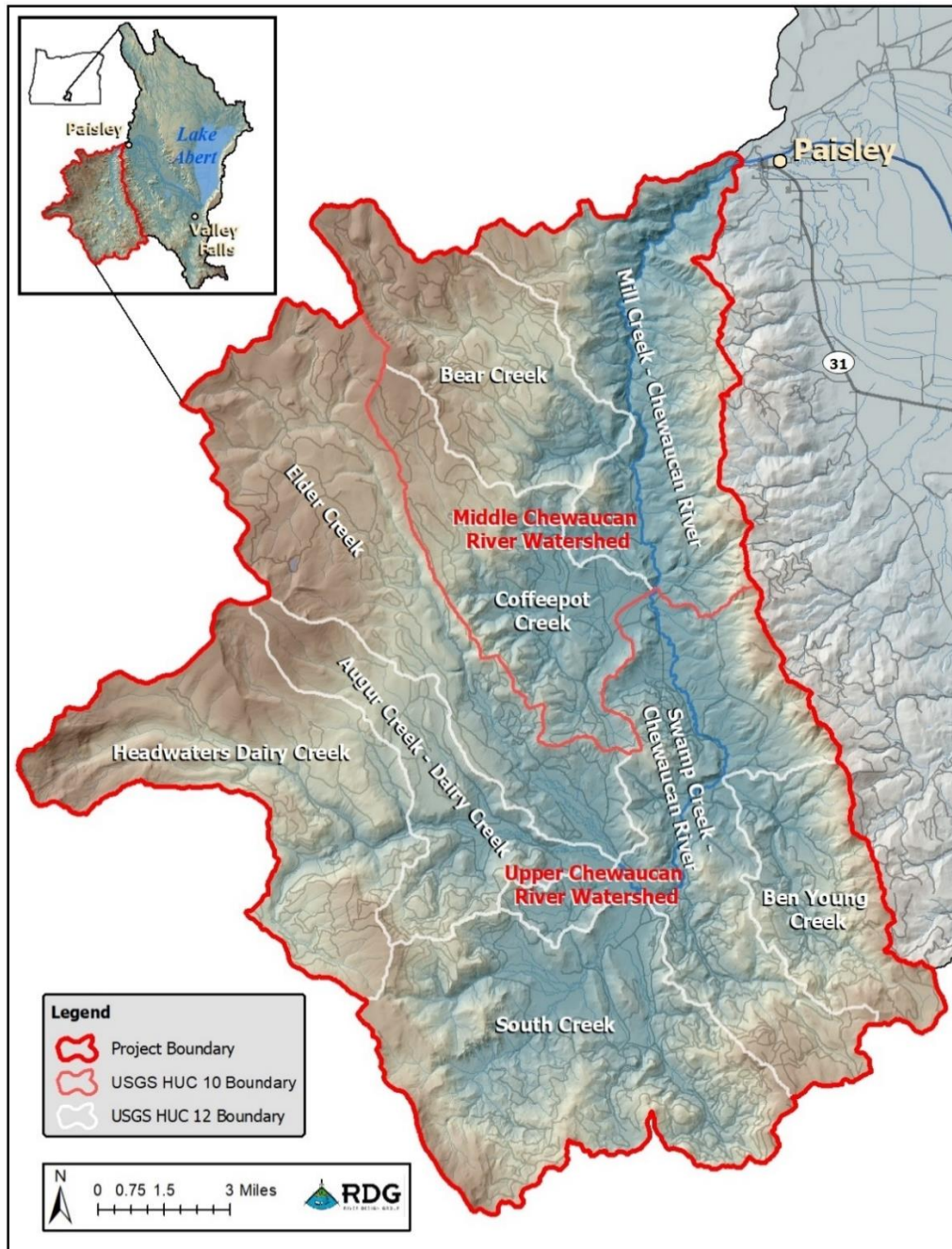
- **Proposed project length of time and completion date** – 3 years, September 30, 2027.

- **Federal land status** – The project will include design work on Federal land.



## Project Location

The Chewaucan River is the main tributary to the Lake Abert Basin, an 820 square mile endorheic basin in the extensional-tectonic setting of the northwestern Great Basin. The project is located in Lake County in south-central Oregon, west of the town of Paisley, Oregon. The proposed project includes sites located in the Upper and Middle Chewaucan HUC-10 watersheds.



**Figure 1.** An overview map of the Upper Chewaucan Watershed Restoration Project area in south-central Oregon. The inset map includes the project area within the Lake Abert Basin. The Upper and Middle Chewaucan River Watersheds are HUC-10 watersheds.

## Technical Project Description

The Lake County Umbrella Watershed Council (LCUWC) is proposing a Task A: Study and Design project to design fish passage improvements, increase stream corridor habitat complexity, enhance rangeland, and restore post-fire upland forest health with the goal of improving ecological function and watershed resilience in the Upper Chewaucan watershed. LCUWC and the Upper Chewaucan Strategic Implementation Area (SIA) Partnership recently completed the *Upper Chewaucan River Strategic Implementation Area Reconnaissance and Recommendations* (SIA Report; RDG, 2023). LCUWC is also currently preparing the *Upper Chewaucan River Watershed Assessment* (in draft), a broader watershed assessment effort funded by a U.S. Bureau of Reclamation's Cooperative Watershed Management Program grant. The SIA Report (an abbreviated document is attached) included a thorough investigation of private lands in the Upper Chewaucan watershed and a list of prioritized projects to improve water quality, aquatic and riparian habitat, and fish passage. The forthcoming Watershed Assessment is underway and includes a more holistic view of the watershed including both privately owned and publicly managed properties throughout the Upper Chewaucan watershed.

The SIA Report and the Watershed Assessment, with input from Partnership members, identify numerous projects that when implemented, will improve aquatic habitat conditions, watershed connectivity, and ecological resilience in the Upper Chewaucan watershed. The financial support provided through the WaterSMART funding will facilitate the planning, assessment, engineering, and design of high priority projects and move projects closer to implementation. Funding will provide critical momentum that the Partnership will also use to leverage other funding sources to meet the Upper Chewaucan watershed restoration goal.

The Partnership will implement the following project approach to prepare the study and design deliverables.

- **Stakeholder Coordination and Engagement** – LCUWC will coordinate with private landowners and federal land managers in the Upper Chewaucan watershed. We will organize and meet with private landowners and federal land managers to review project opportunities. Because the landowners and managers are participating in the Partnership and they have been involved with identifying project opportunities, they will be familiar with the program goals. We will meet with the stakeholders throughout the project to ensure stakeholder concerns are addressed and their input is reflected in the project designs.
- **Site Surveys and Field Assessments** - We will complete sites surveys and field assessments to characterize existing site conditions. We will use newly acquired U.S. Geological Survey (USGS) LiDAR data for broad topographic characterization, and we will use RTK GPS to collect finer data and to characterize infrastructure like culverts, roads, and diversions. We will collect flow measurements and characterize channel bed

sediment. We will use our small unmanned aerial vehicle (sUAV) to collect low altitude air photos for site visualization and monitoring.

We will also meet with the private landowners and resource agencies to review grazing management and rangeland enhancement strategies. We will use peer-reviewed and develop field-ready assessment tools to characterize upland areas for priority restoration goals. We will prepare electronic field maps and forms to be used with GPS-enabled tablets for identifying fence lines, stream crossings, potential off-channel water locations; and site conditions including groundcover suitability, invasive grasses and forb impacts on erosion potential, and restoration treatments for wet and dry meadow restoration.

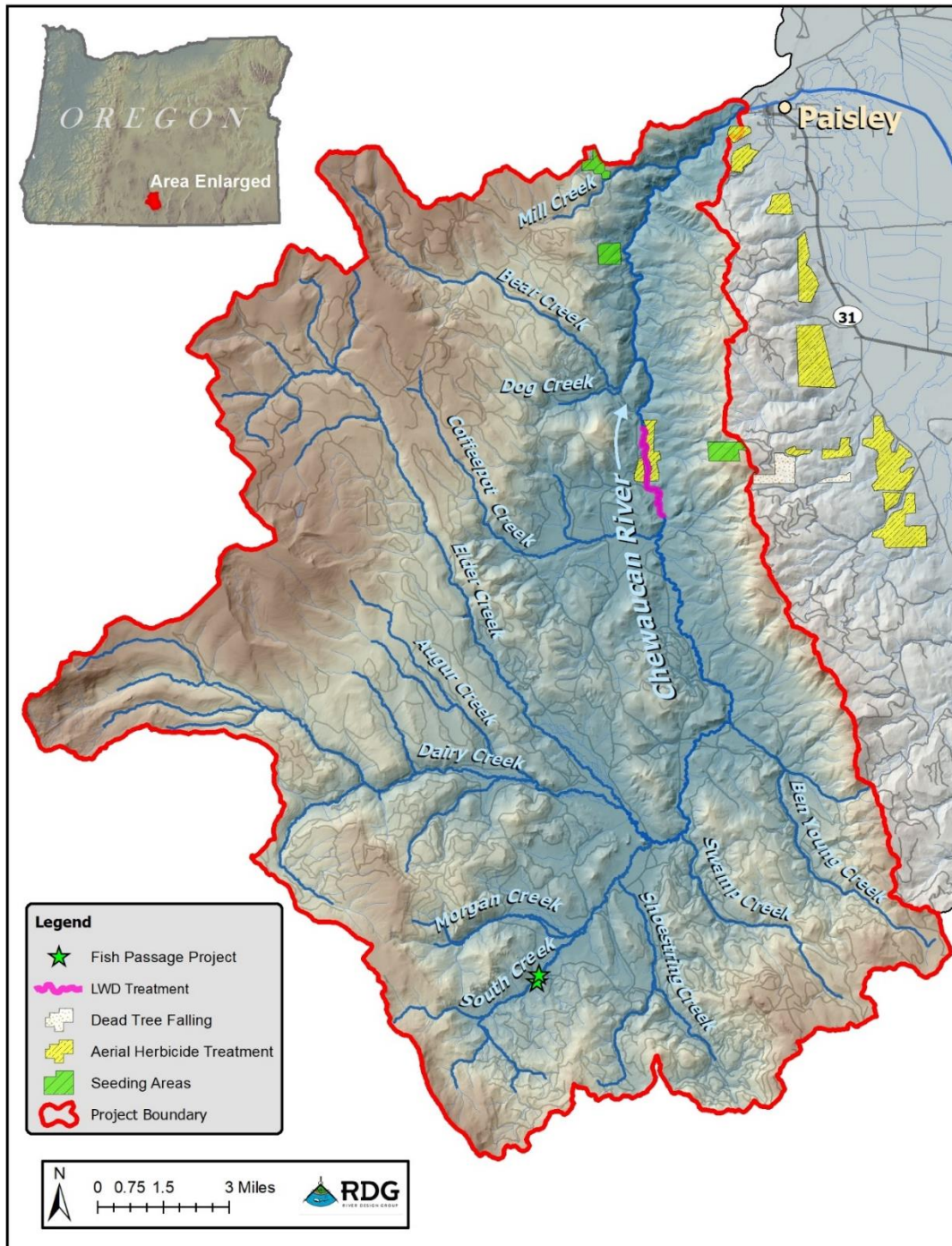
- **Engineering and Progressive Design** – We will consolidate field survey and LiDAR data to create digital terrain models (DTM) for each project site. DTMs will form the basis for the existing condition analysis and proposed project design for culvert replacements, irrigation diversion modifications, and habitat enhancements. We will complete hydrologic analysis using the USGS StreamStats program. We will prepare 1D/2D HEC-RAS hydraulic models corrected using measured flows and water surface profiles, to assess hydraulic conditions and to prepare the project designs. Measured sediment data will be used to inform sediment transport calculations and channel bed stability.

Iterative designs will typically begin at the concept level and progress through 60 percent designs. We will meet with the project team and stakeholders to review the project designs. Comments and additional analysis will be incorporated into the 30 and 60 percent project designs. We will also prepare a complementary basis of design report, materials quantities and specifications, and a construction cost estimate that will accompany the 60 percent design plans. These deliverables will be used to acquire final design, permitting, and construction funding.

- **Rangeland Enhancement Prescriptions** – Like other high desert ecosystems, rangeland in the Upper Chewaucan watershed have been impacted by the rapid expansion of invasive grasses and western juniper (*Juniperus occidentalis*). We will complete field assessments of dry and wet meadow habitats in the Upper Chewaucan watershed to determine the degree and diversity of invasive species encroachment. We will take a multi-prong approach to enhancing rangeland including herbicide application to manage invasive grasses, removing juniper for hydrologic release, seeding burned and treated areas to promote native species colonization, and installing off-channel watering facilities to draw livestock away from riparian corridors. We will work with private landowners and public land managers to implement these strategies across the Upper Chewaucan watershed.
- **Post-fire Restoration** - Four large scale fires have impacted the Upper Chewaucan watershed since 2018. Post-fire recovery work in the Lake Abert Basin has included removing hazard trees, cross-contour felling of burned trees on erodible slopes, treating non-native invasive species, and reseeding and replanting burn areas (Figure 2).



Expanding replanting areas will accelerate forestland revegetation, ameliorate slope erosion, and slow sediment delivery to streams. We will also repurpose burned timber by placing wood in tributaries and the mainstem Chewaucan River to enhance stream and riparian habitat complexity. We will work with our federal land manager partners to prioritize upland restoration sites.



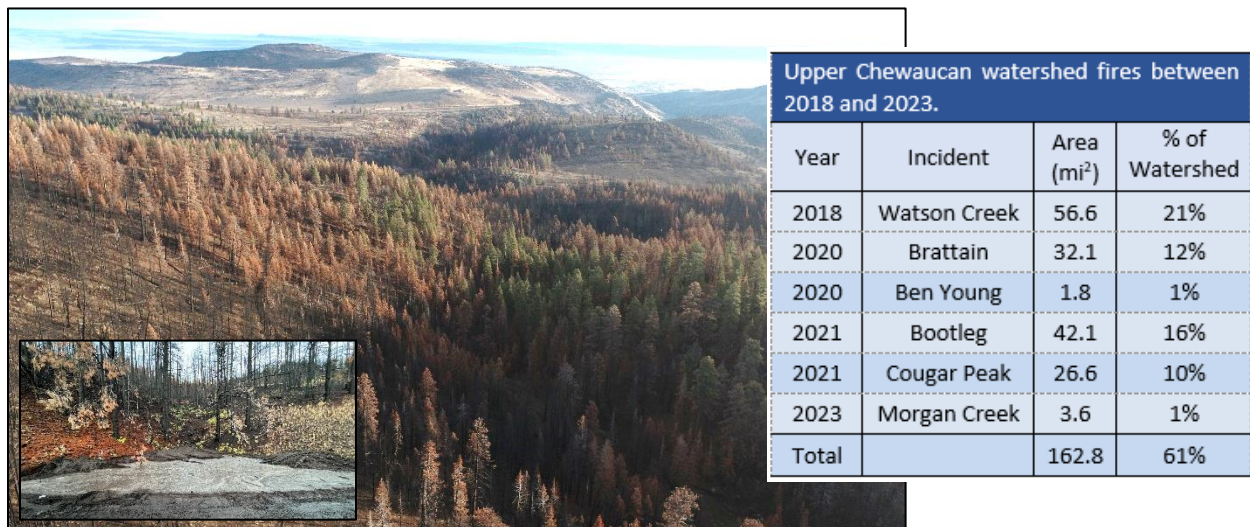
**Figure 2.** Completed and on-going restoration projects funded by the Oregon Watershed Enhancement Board in the Lake Abert Basin. Projects include post-fire recovery, fish passage, and large wood projects.

## Evaluation Criteria

### Sub-Criterion A.1. General Project Benefits

- What are the critical issues of concern in the watershed?

The critical issues of concern in the Upper Chewaucan watershed are focused on water quality, habitat quality, and watershed connectivity. This proposal focuses on the need for stream corridor habitat restoration and watershed connectivity to sustain native fish populations, particularly Chewaucan redband trout, following basin-wide catastrophic fires (Figure 3) and a future that will be increasingly influenced by drought and water uncertainty.



**Figure 3.** An aerial view of the Mill Creek watershed burned during the 2020 Brattain Fire, and an example fine sediment pulse from a burned colluvial drainage (inset). The table includes a summary of fires in the Upper Chewaucan watershed between 2018 and 2023.

We have used historical reports and contemporary investigations to document the critical issues in the watershed. The Upper Chewaucan Watershed Assessment (USFS, 1999) was a foundational document that analyzed existing conditions, stated desired future conditions, and provided recommendations to achieve ecological goals established by a consortium of private landowners and public land managers with a vested interest in creating a healthy watershed for future generations.

Periodic environmental assessments and less formal priority lists have been prepared and maintained by state and federal resource agencies. Forest health and fire prevention strategies, and replacing fish passage barrier culverts have been two top resource agency priorities, while maintaining rangeland forage productivity and access, and managing irrigation networks have been private landowner goals. USFS and ODFW collaborated on a culvert review and replacement prioritization (Miles, 2017).



In 2021, LSWCD secured a Strategic Implementation Area (SIA) grant from the Oregon Watershed Enhancement Board. The focus of the grant was to develop a baseline for water quality parameters in the Upper Chewaucan watershed. Combined with WaterSMART grant funding, the Partnership assessed rangeland and stream crossings on both federally-managed and privately-owned properties, and identified potential restoration project opportunities (RDG, 2023), many of which mirror recommendations in the Upper Chewaucan Watershed Assessment (USFS, 1999).

Our proposal focuses on five priorities, including: 1) replacing fish passage barrier culverts, 2) providing fish passage and screening at irrigation diversions, 3) increasing stream and riparian habitat complexity, 4) rangeland enhancement, and 5) post-fire upland restoration.

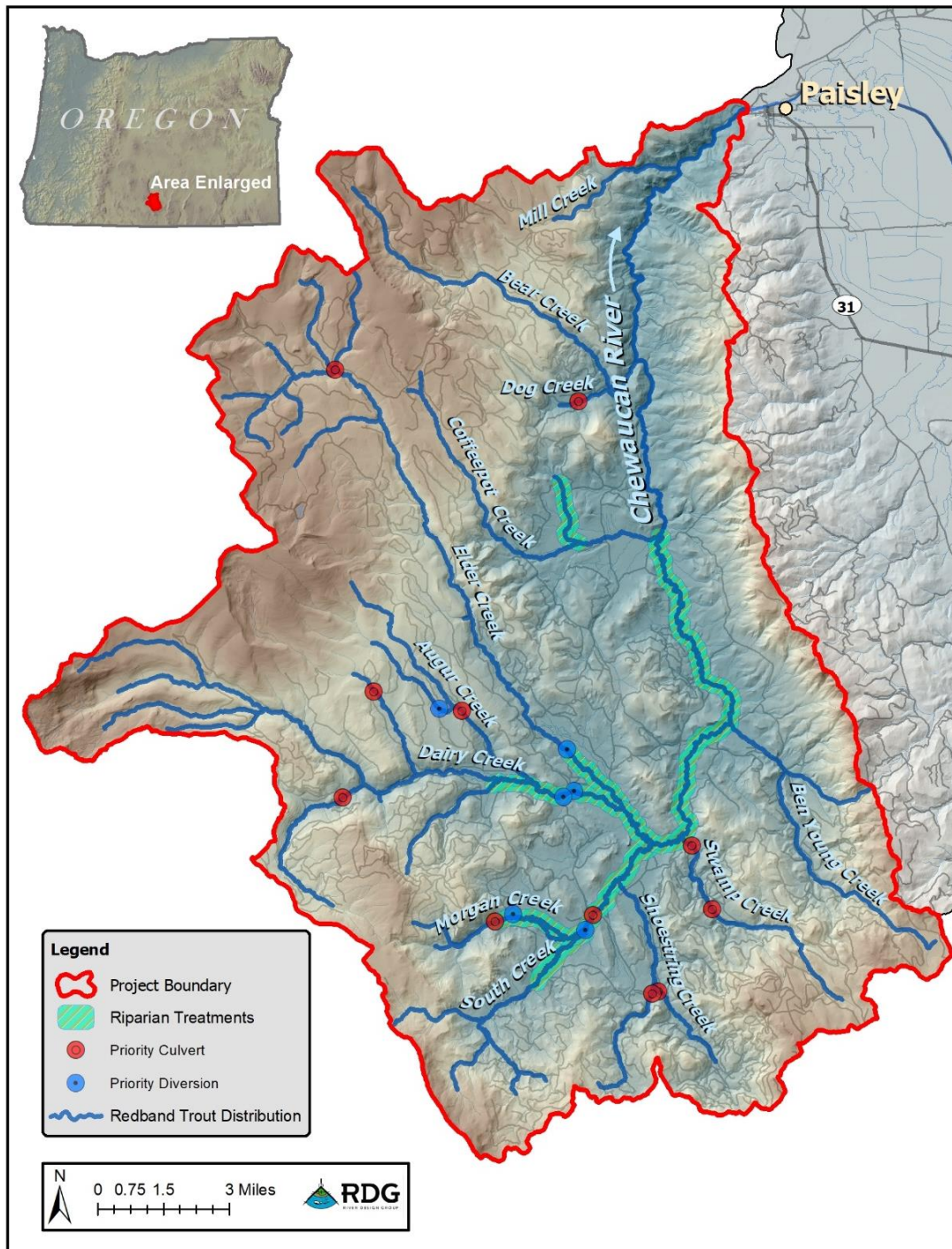
- Explain how your project will benefit aquatic ecosystems, including benefits to plant and animal species, fish and wildlife habitat, riparian areas, and ecosystems.

Chewaucan redband trout is a unique species of trout genetically and phenotypically differentiated from other trout species in and beyond the Northern Great Basin. Across their range, redband trout are excluded from 71 percent of their historical range in the Northern Great Basin and Columbia Plateau, strong populations occur in 9 percent of their potential range, and only 3 percent of their strongholds are within protected areas (Thurrow and others, 2007). Habitat fragmentation and related genetic isolation caused by human-constructed infrastructure is one of the major threats to unique redband trout groups in the Northern Great Basin (Currens and others, 2009). Our project focuses on improving watershed connectivity and ecological integrity with the goal of improving the long-term resilience of Chewaucan redband trout.

The following section presents information on the types of projects we intend to pursue for the project. Fish passage and habitat enhancement project locations are included in Figure 4.

**Replacing fish passage barrier culverts** - We will prepare aquatic organism passage (AOP) culvert replacement designs that will restore watershed connectivity at priority locations on primary tributaries that support important redband trout spawning and rearing habitat. Replacement culverts will also increase conveyance capacity for sediment and debris, reducing road crossing maintenance that will be important in the post-fire environment.

**Fish passage at irrigation diversions** - Irrigation diversions create partial passage barriers that limit watershed connectivity during the irrigation season. Active diversions also have the potential to route adult and juvenile fish into diversion networks when streamflow is blocked by the diversion. Diversions can also create year-round barriers due to stoplogs not being fully removed, or that have steep floor slopes or perched that create high velocities, shallow depths, and physical obstructions. Fish ladders or other nature-like fishways provide fish passage solutions. Fish screens on irrigation canals exclude fish from entering diversion networks.



**Figure 4.** Proposed culvert replacement, diversion improvement locations, and habitat enhancement reaches.

**Stream and riparian habitat complexity** - We have identified lower tributary and mainstem Chewaucan River reaches for restoring habitat complexity to increase capacity for native fish. We will design projects that are appropriate to site conditions. For example, on lower gradient tributaries, we will design low-tech process-based restoration (LTPBR) projects to increase

channel-floodplain connectivity, to slow run-off, and to encourage beaver population expansion. Slowing flood flows and connecting incised streams with adjacent historical floodplains will increase aquatic and riparian productivity, reduce erosion, and increase instream habitat complexity. We will also incorporate large wood and boulders in both tributary and mainstem river designs to increase instream habitat complexity. Riparian plantings and willow cuttings will be a component of each project design to increase riparian community complexity over time. Restoring the frequency of large wood in the system is essential. The large quantity of available burned wood in the watershed, as well as juniper that is generated through thinning projects, will be available to increasing habitat complexity.

**Rangeland enhancement** - The local economy is largely supported by agriculture and timber harvest. Generational ranches manage cattle on private land and ranchers also have leases on federal forest land in the Upper Chewaucan watershed. We will work with managers to assess off-channel watering, fencing, and grazing rotation strategies to reduce livestock reliance and impacts on tributaries. Managing livestock access to streams will improve aquatic and riparian habitat, and also provide livestock with more reliable water sources.

The Upper Chewaucan watershed is also experiencing the rapid expansion of western juniper and non-native invasive grasses that if left unchecked, will degrade the ecological integrity of the watershed. Juniper have high transpiration rates and water demand, affecting surrounding plant communities and potentially compromising ecological condition. Juniper removal has shown to restore shallow groundwater hydrology and increase water availability for other plants and wildlife (Mata-Gonzalez and others, 2021). Invasive grasses are displacing native upland plant communities across western rangeland (Averett and others, 2020), forming non-native monocultures, typically with shallow root systems, that crowd out beneficial native species, increase fire risk, and may compromise soil stability in certain areas. Managing invasive grasses is becoming a necessity for preserving the ecological integrity of our native grasslands.

**Post-fire restoration** - Four large scale fires have impacted the Upper Chewaucan watershed since 2018. Expanding areas for reseeding and replanting will accelerate forestland revegetation, ameliorate slope erosion, and slow sediment delivery to streams. We will also repurpose burned trees by placing wood in tributaries and the mainstem Chewaucan River to enhance stream and riparian habitat. We will work with our federal land manager partners to prioritize upland restoration sites.

- Does the project affect water resources management in 2 or more river basins (defined as a minimum HUC-10 level)?

Yes, the project will affect water quality in the Upper Chewaucan River, Middle Chewaucan River, and Lower Chewaucan River HUC-10 basins. We included the Upper Chewaucan River and the Middle Chewaucan River HUC-10 basins on Figure 1 as they comprise our project area. We also group both basins into the “Upper Chewaucan watershed”. The project is expected to improve



water quality in the Chewaucan River within the three river basins but may only marginally influence water availability.

- Does the project provide regional benefits, in addition to fish or habitat restoration, including:
  - Supporting water needs for multiple water uses (i.e., agricultural, municipal, Tribal, environmental, recreational)?

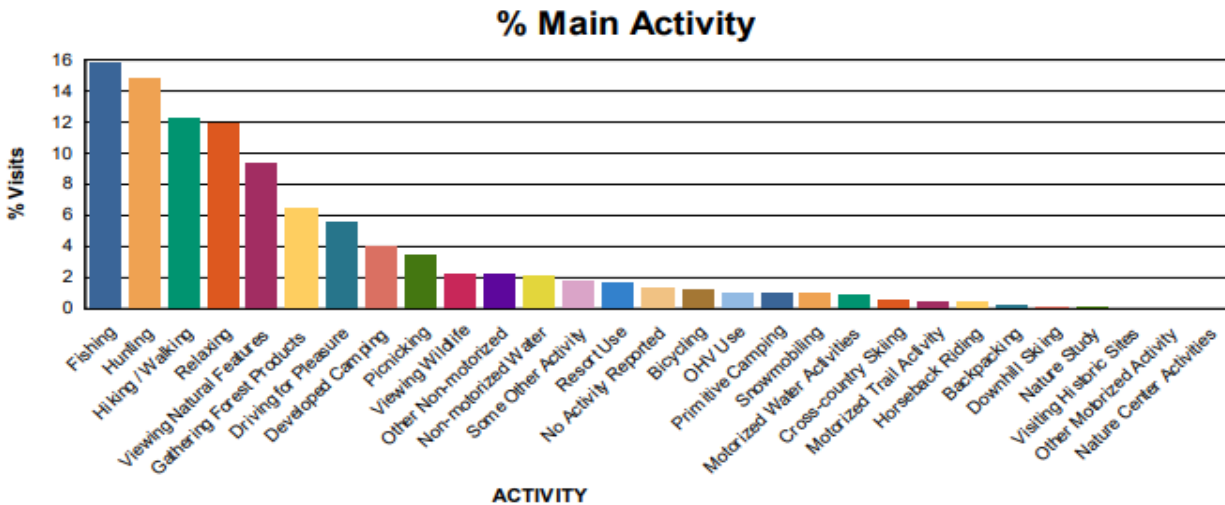
Multiple water users rely on the Chewaucan River to meet water needs. In the Upper Chewaucan watershed, water use is primarily for irrigated pasture and livestock drinking water, to support aquatic and riparian ecosystems, and to provide recreational opportunities such as boating and fishing. Secondary uses include water availability for road maintenance and fire prevention. There are similar water uses in the Lower Chewaucan watershed, plus domestic water use.

- Reducing water conflicts?

The Oregon high desert is defined by water availability. In above average years, there is sufficient water to support aquatic ecosystems, agricultural producers, and recreators. In drought, water supplies are diminished by reduced snowpack and lowered groundwater. Water levels in Lake Abert and their associated impacts on migratory waterbirds is an area of national concern. Stream and riparian habitat enhancement projects seeks to increase natural water storage in the Upper Chewaucan. Increasing floodplain storage and the slower release of water from floodplains and headwater streams to the Chewaucan River has the potential to increase streamflow duration and volume. Grazing management strategies will also complement habitat restoration projects, improving floodplain storage capacity over time, with a resulting slow but more consistent release of water to tributaries and the Chewaucan River.

- Providing other regional benefits, such as job creation or public safety benefits?

The proposed project will support 10+ years of project implementation opportunities for local contractors. Local contractors will spend money in the local communities of Paisley and Lakeview, resulting in benefits to small businesses that are the economic foundation of these rural communities. WaterSMART funding will also support the burgeoning restoration economy that has developed a strong foothold in Lake County. Local community members recognize the benefits of the restoration economy and the recreational dollars that ecological restoration brings to small communities in the form of tourism and enhanced fish and wildlife resources. As an example of Forest uses, visitors to the Fremont-Winema National Forest listed 28 different activities they participated in while visiting the Forest (Figure 3). On average, visitors spent \$324 per trip, and 30 percent of trips included an overnight stay on the Forest (USFS, 2018). Forest visits help support local economies and diversify revenue sources for Paisley and Lakeview.



**Figure 3.** Primary visitor activities reported by visitors to the Fremont-Winema National Forest (USFS, 2018).

The project will have a direct and immediate impact on economic activity with long-term benefits through the investment in land and water. Like many other rural communities, Lake County’s economic stability is heavily reliant on the natural resources sector which is one of the largest industries in the county. According to a recent report from the Oregon Employment Department, job growth from 2001 to 2018 in rural Oregon (6 percent) was considerable slower compared to metro areas (21-23 percent). Over that time period, for each job added in rural Oregon, 23 jobs were added in metro areas (WIOA, 2018) . Employment within the county leads to a higher rate of spending which benefits other businesses that depend on consumer sales. The multiplier effect at the local level is substantial and projects such as this hold high economic value and community benefit.

- Is this project a component of a broader strategy or plan to replace aging facilities with alternate facilities providing similar benefits?

The Upper Chewaucan Watershed Assessment (USFS, 1999) and the SIA Report (RDG, 2023) identified fish passage barrier culverts that fragment the watershed. USFS and ODFW also maintain culvert replacement priority lists so that culverts can be replaced as funding is available (Miles, 2017). A primary portion of our proposed project will prepare designs to replace the highest priority culverts in the Upper Chewaucan watershed, thereby restoring fish access to historical habitat and restoring watershed processes. We anticipate that with 60 percent designs in-hand, acquiring funding for project implementation will be substantially easier. We will continue to work with our agency partners to replace fish passage barrier culverts.

Irrigation diversion weirs on three tributaries similarly affect fish population connectivity in the basin. To encourage water users to incorporate fish passage, we will work with them to determine if their structures can be operated more safely or efficiently with modifications. Given

the advanced age of the structures, providing water users with design and construction assistance may incentivize them to improve fish passage.

- Describe the status of the species and/or habitat that will benefit from the project:

Three native fish species occur in the Lake Abert/Chewaucan basin. Species include the Chewaucan redband trout (*Oncorhynchus mykiss newberrii*), speckled dace (*Rhinichthys osculus*), and tui chub (*Siphateles obesus*; Harris, 2000).

### **Chewaucan redband trout**

Redband trout is a flagship species in the Lake Abert Basin. Redband trout inhabiting Oregon's inland desert basins are recognized as *O. mykiss newberrii* by Behnke (2002), but redband trout are typically referred to as *O. mykiss* ssp. by management agencies. Redband trout are believed to have evolved over the past 70,000 years during and following the Pleistocene, the last glacial epoch that was associated with large basin-scale lakes (Behnke, 2002). A commonality of all Northern Great Basin redband trout is their greater number of gill rakers, a relict of their common lacustrine (lake) evolutionary heritage (Behnke, 2007), compared to other *O. mykiss* that evolved outside of the Northern Great Basin. Morphological and genetic similarities among redband trout in the Chewaucan, Warner, and Goose Lake basins suggest a linkage to the diverse complex of Sacramento redband trout *O. mykiss stonei* (Currens and others, 2009). There is also evidence that redband trout have a higher metabolic capacity, an adaptation to persisting in higher water temperatures than other salmonids (Rodnick and others, 2004).

Compared to adjacent basins, the Chewaucan has the simplest fish community, suggesting the long period of basin isolation compared to the Warner and Goose Lake basins (Behnke, 2007; Currens and other 2009). Behnke (2007) also noted that despite a history of stocking rainbow trout in the Upper Chewaucan watershed, redband trout had largely maintained genetic and phenotypic characteristics that are similar to pre-development museum specimens. Other genetic markers suggest Elder Creek has redband trout most similar to historical redband trout. Redband trout genetics evolved over thousands of years, increasing Chewaucan redband trout population resilience in the face of a more dynamic climate influenced by more frequent drought and warmer water temperatures. As Behnke (2007) noted:

*Redband trout in the Goose Lake, Warner Lakes, and Chewaucan basins are the most distinctly differentiated form of redband trout and best conform to the classic definition of a subspecies: that is, populations confined to a defined geographic region and clearly differing from all other subspecies of the species.*

### **Speckled dace**

Speckled dace is a common minnow found throughout the western United States (Hoekzema and Sidlauskas, 2014). Speckled dace populations vary geographically in meristics (geometrical relation of body parts), color, size, and body proportions (citations in Hoekzema and Sidlauskas, 2014). Genetic studies of speckled dace in Oregon and California have led to differentiation of



speckled dace into distinctive evolutionary lineages (Hoekzema and Sidlauskas, 2014; Moyle and others, 2023). Of speckled dace sampled from the Northern Great Basin, three evolutionary lineages are believed to have diverged during the Pliocene or early Pleistocene (Hoekzema and Sidlauskas, 2014). Sidlauskas and others (2024) recently found genetic differentiation among three populations of speckled dace within the neighboring Warner Basin. Speckled dace from the Goose Lake, Silver Lake, Lake Abert, and Warner Lake (not including Foskett Spring), were genetically similar.

### ***Tui chub***

The genus *Siphateles* is one of the most geographically widespread groups of minnows in western North America, extending from the Columbia Basin in the north to the Mojave Desert in the south and from eastern Nevada west to the Klamath drainage in south-central Oregon and northern California (Harris, 2000). Tui chub typically inhabit low velocity habitats associated with low gradient water bodies often low in the drainage network. Tui chub in the Abert Lake – Chewaucan Basin are included in the species *Siphateles obesus* (Harris, 2000).

Harris (2000) noted that tui chub had been extirpated from the lower gradient reaches of the Chewaucan River by introduced, non-native predatory fish species that have overlapping habitat requirements. More recent sampling completed by ODFW found tui chub located throughout the lower Chewaucan River and in the upper Chewaucan River to at least near the South Creek confluence with the Chewaucan River (J. Miles, ODFW Assistant District Biologist, *pers. comm.*).

- Does the project contribute to the restoration of species listed under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.)?

The project will indirectly benefit listed, candidate, and proposed species that could use the Upper Chewaucan watershed. Species that the U.S. Fish and Wildlife Service recognizes as potentially occupying habitat in Lake County and that could benefit from the project include Gray Wolf (*Canis lupus*), North American Wolverine (*Gulo gulo luscus*), Yellow-billed Cuckoo (*Coccyzus americanus*), Northwestern Pond Turtle (*Actinemys marmorata*), Monarch Butterfly (*Danaus plexippus*), and Whitebark Pine (*Pinus albicaulis*). We expect these species would benefit from denser riparian areas, more open forest stands, and increased soil moisture resulting from stream, rangeland, and forest restoration projects.

- **Does the project contribute to the restoration of listed anadromous fish?**

No, the Chewaucan River is a closed basin and there are no anadromous fish species.

- **Are the species subject to a recovery plan or conservation plan under the ESA?**

There are no recovery plans under the ESA for species in the Chewaucan basin.

- **Has there been a designation of critical habitat? If so, how does the proposed action benefit such critical habitat?**

Critical habitat has only been designated for Gray Wolf, but there is no critical habitat in Oregon.

- If the species are not listed under the ESA, please describe their status.

Inland redband trout were reviewed for possible listing under the Endangered Species Act (ESA), but USFWS determined that listing was unwarranted (USFWS, 2000). USFWS manages inland redband trout as a Species of Concern, the State of Oregon recognizes Great Basin redband trout as an Oregon Conservation Strategy species and a Sensitive-Vulnerable species. According to ODFW (2021),

*“Sensitive” refers to fish and wildlife that are facing one or more threats to their populations and/or habitats. “Sensitive Species” are defined as having small or declining populations, are at-risk, and/or are of management concern. Implementation of appropriate conservation measures to address existing or potential threats may prevent them from declining to the point of qualifying for threatened or endangered status.*

The Sensitive Species List serves as an early warning system to help ensure that conservation actions are prioritized, cost-efficient, and effective (ODFW, 2021).

The Chewaucan redband trout species management unit (SMU) consists of four populations, three in Lake Abert Basin and one in Summer Lake Basin. The Chewaucan population is one of the three Lake Abert Basin populations. Chewaucan redband trout exhibit resident and migratory life history strategies. Resident fish remain in tributary streams. Fluvial fish migrate between tributaries and the mainstem Chewaucan River. Adfluvial fish migrate downstream to the Rivers End Reservoir where they grow rapidly in the productive shallow reservoir environment. Adfluvial fish have the greatest reproductive potential and potential for repopulating historical habitat.

Degraded habitat conditions and barriers to migration are the most persistent threats to populations in the SMU. The SMU met four of the six interim criteria and is classified as ‘potentially at risk’. The Chewaucan population passes all six of the interim criteria, although only limited sampling has been completed since the basin-wide fires over the past five years and the redband trout population could now be at higher risk. Fish passage at the three mainstem diversions on the lower Chewaucan River have been addressed with fish passage facilities, although facility operations may still limit upstream passage in some years.

## **Sub-Criterion A.2. Quantification of Specific Project Benefits**

### **What are the types and quantities of aquatic ecosystem benefits provided?**

The proposed project will prepare designs that will lead to projects that support the Chewaucan redband trout population. Projects will increase population resilience, productivity, and abundance by:

- Restoring aquatic connectivity and access to historical habitat blocked by fish passage barrier culverts and diversions.
- Improving water quality and habitat quality through increased aquatic habitat complexity, rangeland enhancement, and post-fire restoration.

Aquatic ecosystem benefits are quantifiable through fish population sampling, water quality monitoring, and measuring habitat characteristics pre- and post-treatments.

- **Species and Habitat Health**
  - Provide information regarding the current status of species and habitat health in the planning area.

There are no long-term, continuous data sets for species and habitat health in the Upper Chewaucan watershed. However, there have been numerous planning documents that highlight the current status of Northern Great Basin redband trout, and watershed connectivity and habitat concerns. The following sections highlight the most informative and applicable of these planning documents.

**Conservation Strategy for Interior Redband (ICRT, 2016)**

Completed by the Interior Redband Conservation Team (ICRT), the Conservation Strategy assessed existing conditions and prepared recommendations for improving long-term resilience for redband trout populations. The ICRT outlined goals, objectives and actions for Oregon Closed Basin redband trout populations, including the Chewaucan SMU. Table 1 includes the information most applicable to the Chewaucan SMU. The proposed project includes designs for the types of actions proposed by the ICRT.

Table 1. Goals, objectives, and actions to address representation, resilience, and redundancy in Oregon		
Goal	Objective	Action
<b>Representation –</b> Improve spatial structure and ecological diversity.	Improve natural distribution by improving fish passage for all life stages.	<ul style="list-style-type: none"> <li>• Assess and address fish passage barriers.</li> <li>• Remove barriers on private and public land.</li> </ul>
	Maintain and improve life history diversity through reconnecting fragmented watersheds.	<ul style="list-style-type: none"> <li>• Implement passage improvements.</li> </ul>
<b>Resilience –</b> Improve population productivity.	Restore and maintain channel structure and complexity.	<ul style="list-style-type: none"> <li>• Restore redband trout habitat.</li> <li>• Discourage habitat preferred by non-native fish species.</li> </ul>
	Restore riparian conditions and large wood debris recruitment.	<ul style="list-style-type: none"> <li>• Incorporate large wood as part of aquatic and riparian habitat restoration designs.</li> <li>• Remove juniper from riparian areas.</li> </ul>
	Restore and maintain floodplain connectivity and functions.	<ul style="list-style-type: none"> <li>• Implement stream-floodplain connectivity projects.</li> </ul>
	Restore and maintain water quantity to support populations.	<ul style="list-style-type: none"> <li>• Work with water users to improve efficiencies where possible.</li> </ul>



**Table 1.** Goals, objectives, and actions to address representation, resilience, and redundancy in Oregon Closed Basin redband trout populations including the Chewaucan redband trout SMU.

Goal	Objective	Action
	Restore degraded upland processes to address unnatural rates of erosion and runoff.	<ul style="list-style-type: none"> <li>• Improve degraded upland processes to minimize unnatural erosion rates.</li> <li>• Coordinate with federal agencies and private landowners to encourage management actions that will address degraded upland processes.</li> <li>• Reduce impacts to riparian vegetation by following progressive grazing strategies that promote riparian health.</li> </ul>
	Determine if beavers are an appropriate habitat enhancement tool.	<ul style="list-style-type: none"> <li>• Identify areas to promote beaver activity.</li> <li>• Promote the role of beaver in stream habitat.</li> </ul>
<b>Redundancy –</b> Repopulate redband trout in historical habitat where they have been extirpated.	Repopulate previously extirpated areas.	<ul style="list-style-type: none"> <li>• Complete assessments especially in burn areas above passage barriers to determine presence.</li> <li>• Identify and prioritize areas for reintroduction, including cold water assets.</li> </ul>

### Density and Abundance of Redband Trout in the Northern Great Basin (ODFW, 2014)

ODFW completed systematic sampling in Northern Great Basin watersheds from 2007 through 2012. The Chewaucan was included in the sample frame. Redband trout abundance was intermediate in the Chewaucan relative to other sampled watersheds, and had similar abundances to the Goose Lake and Warner Lakes SMUs. Over the six sampling years, the Chewaucan SMU mean population size ranged from 106,662 to 168,776 fish, and mean densities ranged from 0.4361 to 0.6165 redband trout per square meter.

### Adfluvial Redband Trout in the Chewaucan and Goose Lake Basins (Tinniswood, 2005)

Tinniswood described the adfluvial redband trout life history strategy (e.g., life stage development and growth), spawning locations and migration timing, and problematic infrastructure that resulted in passage constraints that delayed or precluded upstream spawning migration and post-spawn return of fish to Rivers End Reservoir. Tinniswood's work remains the most comprehensive analysis of adult redband trout passage and highlighted the apparent importance of low gradient, gravel bed reaches of the Chewaucan River, Bear Creek, Dairy Creek, and Elder Creek for adfluvial redband trout spawning. Based on Tinniswood's work, Elder Creek may have an outsized influence on the adfluvial Chewaucan redband trout population as 10 of 34 tagged redband trout migrated to Elder Creek during the spawning period. If adfluvial redband trout home to their natal stream, Tinniswood's results point to the importance of this primary tributary to the Chewaucan redband trout population. This information was in part used to prioritize fish passage and habitat enhancement projects for this proposal.

**Upper Chewaucan River Watershed Assessment (USFS, 1999)**

The Watershed Assessment provides an informative review of existing watershed conditions, concerns, and opportunities for improvement. LCUWC is currently updating the watershed assessment with Reclamation funding.

**Oregon Great Basin Redband Trout Status by Basin – Chewaucan Basin (ODFW, 1998)**

The Status by Basin report offers insights to redband trout habitat in the Upper Chewaucan watershed in the late 1990s. Stream habitat surveys noted rapid bank erosion on the mainstem Chewaucan River, channel incision, and sediment delivery to the aquatic environment. Poor riparian condition and wide, shallow channel dimensions of the mainstem Chewaucan River contributed to high water temperatures and extreme water temperature fluctuations. Degraded spawning habitat conditions in lower Dairy Creek and the Chewaucan River were caused by high fine sediment concentration in spawning gravels. Poor spawning habitat conditions were linked to depressed juvenile redband trout recruitment. The authors surmised that spawning habitat higher in the Dairy Creek system and in other stable tributaries likely produced more juvenile redband trout than the unstable habitats in lower valley reaches affected by grazing and flood impacts.

ODFW conducted backpack electrofishing sampling in reaches on Dairy Creek and the Chewaucan River. Redband trout densities were greatest in the lower sections of the Chewaucan River with habitats characterized by pools, clean gravel, instream cover, and habitat complexity. The absence of young-of-year redband trout was attributed to the lack of suitable nursery habitat (e.g., low velocities, complex cover) in the sampled reaches, but could have also been explained by young-of-year fish using other portions of Dairy Creek, the Chewaucan River, and other tributaries that had higher quality juvenile rearing habitat.

The report also noted the habitat and water quality benefits of bioengineering bank stabilization completed in the mid-1980s. Redband trout counts increased from 2 to 115 redband trout in reaches treated with juniper and rock revetments and in-channel boulders. Later work conducted by USFS biologists included extensive streambank stabilization with juniper rootwads, boulders, willow clump transplants, and willow plantings.

**Chewaucan River Fish Management Plan (ODFW, 1983)**

The oldest reviewed ODFW fish management plan for the Chewaucan River documented rainbow trout stocking practices and concerns with spawning habitat quality due to sedimentation. ODFW stocked hatchery rainbow trout into the Chewaucan River from 1948 through 1998 when the practice was discontinued. In the early 1980s, approximately 9,000 hatchery rainbow trout were released into the Chewaucan River and Dairy Creek on an annual basis. The authors noted good numbers of redband trout in river sections characterized by steeper channel gradients, in-stream cover, and pools. Lower gradient meadow reaches that lacked complex habitat, cover, and pools were largely devoid of redband trout except where cover occurred. The low number of hatchery rainbow trout remaining from previous years' releases suggested low survival of

hatchery fish in the Chewaucan watershed. The report noted the reduction in redband trout numbers in the Lake Abert Basin, which the authors attributed to poor grazing management, exacerbated by drought and severe floods.

In summary, the reviewed reports provide perspectives over time about the Chewaucan redband trout population. Consistent concerns include fragmented habitat due to road crossings and diversions; impaired spawning habitat (siltation) and redband trout rearing habitat due to land management practices, drought, and periodic high magnitude floods; high water temperatures due in part to deficient riparian canopies; and the historical release of hatchery rainbow trout into the Chewaucan watershed. Over time, there has been a growing appreciation for these impacts by managers and landowners. Grazing practices have improved, hatchery rainbow trout are no longer stocked, and land managers recognize the impacts of the road network and irrigation infrastructure on redband trout. Our proposed project will address the focal concerns, thereby increasing the long-term resilience of Chewaucan redband trout.

- Describe how your conceptual project will address these issues and how your study and design efforts will inform your approach. If you are able to quantify the expected species and habitat benefits of the project you are studying and designing, please do so.

Our proposed project will directly address the concerns raised in the planning documents. Additionally, since most of the planning documents were completed before the basin-wide catastrophic fires of the last five years, our proposed assessment and design plans will also target rangeland and post-fire upland restoration. The following project types reference how they address the redband trout population goals (e.g., representation, resilience, and redundancy) and objectives presented in The Conservation Strategy for Inland Redband (ICRT, 2016).

**Replacing fish passage barrier culverts** - Culvert replacement designs will address watershed connectivity and redband trout resilience issues highlighted in previous studies. Restoring redband trout access to historical habitat, especially in stream reaches where redband trout may have been extirpated by catastrophic fires, will increase population representation, resilience, and redundancy (ICRT, 2016).

**Fish passage at irrigation diversions** - Diversions on the lower Chewaucan River that historically excluded upstream fish passage, have been improved, allowing the upstream migration of adfluvial redband trout to spawning reaches in the Upper Chewaucan watershed. Diversions on Elder Creek and Dairy Creek have the greatest potential to delay or preclude upstream passage of migratory redband trout during spring spawning. Stoplog installation in the diversions at the start of irrigation season may also route downstream migrating post-spawn adult redband trout, and outmigrating juvenile redband trout into irrigation canal networks. Improving passage at diversions and excluding fish from irrigation networks would improve population representation and resilience.



**Stream and riparian habitat complexity** - Impaired habitat conditions reduce carrying capacity, spawning success, and juvenile recruitment into the adult population. The proposed project includes design work for increasing riparian and aquatic habitat complexity through large wood and boulder placement, LTPBR projects that promote beaver colonization, and riparian revegetation. The proposed design elements target the population resilience-productivity goal and habitat-focused objectives.

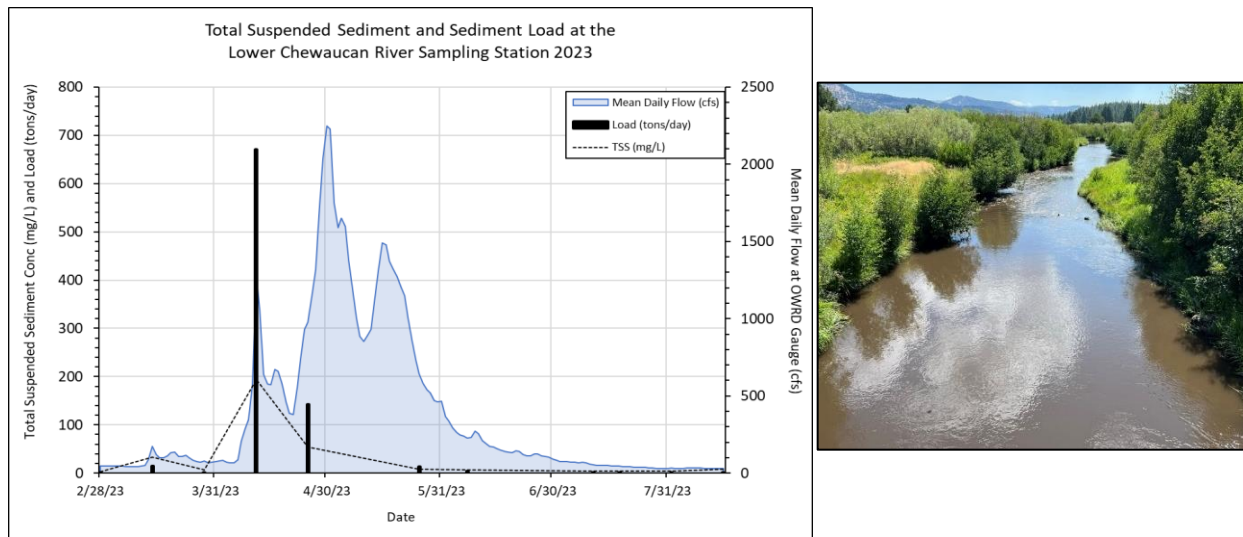
**Rangeland enhancement** - Improved grazing management and assessing and managing invasive grasses and conifer encroachment in meadow systems are suggested strategies for improving aquatic systems in high desert basins (Renner and others, 2023). Strategies will aim to restore normative processes in rangelands to address accelerated runoff and erosion rates. These strategies will address the resilience-productivity goal and the upland habitat-focused objective.

**Post-fire upland restoration** - Catastrophic fires have damaged Upper Chewaucan watershed landscapes and caused reversion in some areas to seral states without deep-rooted perennial species. Proposed treatments include cross-contour felling of burned trees, invasive species treatments, and seeding and replanting impacted areas. Replacing undersized culverts will restore watershed connectivity, facilitate debris transport and reduce long-term road maintenance and road sediment delivery to stream networks. These strategies will address the resilience-productivity goal and upland habitat-focused objective presented in the Conservation Strategy.

We will be able to quantify expected species and habitat benefits through monitoring and evaluation. We anticipate developing a monitoring program with ODFW, USFS, and BLM. Possible monitoring methods that would assess direct and indirect benefits to Chewaucan redband trout include the following activities:

- Pre- and post-project backpack electrofishing upstream of replaced culverts would document subpopulation characteristics associated with improved watershed connectivity.
- Pre- and post-project aquatic habitat surveys would document habitat conditions following habitat project implementation. Fish surveys in control and treatment reaches would be completed to detect redband trout response to increased habitat complexity.
- Remote sensing and ground surveys in treated rangeland and upland areas will monitor plant communities and assess native and invasive plant communities.
- Continuation of the existing water quality monitoring program would track suspended sediment concentrations and sediment loads over time.
- Watershed Benefits
  - Provide information regarding the current status of water quality, ecological function, and ecological resiliency in the planning area.

**Water Quality Status** - LSWCD is continuing water quality monitoring in the Upper Chewaucan watershed until June 2025 through an ODA grant. The Reclamation water quality laboratory is processing the water quality samples and providing sediment concentration data to LSWCD. Through two years of water quality monitoring, we have found suspended sediment levels quickly respond to summertime precipitation events in burned subwatersheds and as expected, sediment loads increase on the rising limb of the spring flood and diminish as flows receded from the peak (Figure 5). High sediment concentrations negatively impact aquatic life and impair aquatic habitat. Fine sediment deposition in streambed gravels lowers inter-gravel porosity negatively affecting spawning gravel condition, and fine sediment further reduces habitat space for aquatic macroinvertebrates and juvenile fish. ODFW (J. Miles, ODFW fish biologist, *pers. comm.*) anecdotally noted fewer caddis larvae in monitoring reaches in the watershed perhaps due to post-fire sediment delivery to the stream network.



**Figure 5.** High turbidity in Dairy Creek following a summer thunderstorm over the burned headwaters (top). Suspended sediment loads on the mainstem Chewaucan River increased in advance of peak runoff in 2023 (lower).

**Ecological Function and Resilience** - As noted in the **Species and Habitat Status** section, the ecological function and ecological resiliency of the Upper Chewaucan watershed are affected by the road network, irrigation diversions, grazing management, invasive grasses and conifer encroachment, and recent fires that burned over 60 percent of the Upper Chewaucan watershed. Our proposed project will address these critical issues in the Upper Chewaucan watershed.

- Describe how your conceptual project will address these issues and how your study and design efforts will inform your approach. If you are able to quantify the expected watershed benefits of the project you are studying and designing, please do so.

**Water Quality Status** – LSWCD is currently collecting water quality in tributaries and on the mainstem Chewaucan River. These data will be helpful in establishing baseline suspended sediment and total phosphorus concentrations following catastrophic fires in the Upper

Chewaucan watershed. Our project will implement upland treatments to slow erosion and reduce sediment delivery to streams. We are proposing to restore burned areas by cross-contour felling trees, seeding disturbed soils, managing invasive grasses, and removing juniper and small diameter trees from dense stands. We are planning to remove juniper and manage invasive grasses on rangeland. These actions are expected to increase infiltration rates, reduce overland flow and erosion, and reduce sediment delivery to streams. Improved grazing management and increasing riparian conditions will further buffer streams from overland sediment delivery and sediment from bank erosion.

**Ecological Function and Resilience** - We have previously identified priority culverts for replacement, diversions for fish passage modification, stream reaches for aquatic habitat enhancement, and rangeland and uplands for vegetation treatment and enhancement. Attachment A includes the priority culvert metrics. We used GIS tools to measure the channel length and watershed area for each subwatershed and then the portion of the subwatershed upstream from the barrier. For watersheds with other upstream barriers, we reduced the study area to the upstream barrier location. Table 2 includes the stream length and watershed area that would be made accessible with culvert replacements. Most of the culverts are partial barriers, but likely block passage most of the year due to high velocities during spawning period flows, and shallow depths during summer flows.

**Table 2.** Restored access to stream habitat and watershed area associated with culvert replacements.

Culvert	Barrier Type	Restored Access Stream Length (mi)	Percentage of Subwatershed Total Stream Length	Restored Access Drainage Area (mi <sup>2</sup> )	Percentage of Subwatershed Total Area
Swamp Creek NF-3509 <sup>a</sup>	Partial	3.3	31%	2.9	25%
Swamp Creek NF-3608	Total	6.9	66%	8.3	72%
Morgan Creek	Total	6.6	38%	5.2	45%
Deer Creek	Total	10.5	95%	7.6	93%
South Creek <sup>b</sup>	Partial	42.5	66%	24.8	57%
Dead Horse Creek	Total	4.7	67%	4.3	68%
Witham Creek	Partial	6.5	99%	5.1	99%
WF Shoestring Creek	Partial	4.3	99%	3.2	99%
Shoestring Creek <sup>c</sup>	Partial	6.9	42%	7.6	52%
Augur Creek <sup>d</sup>	Partial	3.9	62%	2.6	68%
Dog Creek	Total	5.2	35%	3.1	34%
Total		101.3	60%	74.7	58%
Watershed Total		384.0	26%	268.0	28%

<sup>a</sup>Includes only the stream length and watershed area upstream to NF-3608. <sup>b</sup>Includes Morgan Creek subwatershed. <sup>c</sup>Includes WF Shoestring Creek subwatershed. <sup>d</sup>Includes Augur Creek and NF Augur Creek to next upstream fish passage barrier culverts.

Table 3 includes a summary of the irrigation diversions that create partial barriers on critical tributaries. The diversions are complete barriers when stoplogs are in place, and when high velocities or shallow water depths occur through the weirs. The diversions are likely passable during between late winter and spring before irrigation season.

Table 3. Restored access to stream habitat and watershed area associated with diversion					
Diversion Location	Barrier Type	Restored Access Stream Length (mi)	Percentage of Subwatershed Total Stream Length	Restored Access Drainage Area (mi <sup>2</sup> )	Percentage of Subwatershed Total Area
Elder Creek <sup>a</sup>	Partial	48.3	83%	35.1	89%
Dairy Creek - North <sup>a</sup>	Partial	69.5	96%	51.9	98%
Morgan Creek	Partial	6.7	62%	5.3	83%
South Creek <sup>b</sup>	Partial	25.2	39%	15.6	36%
Augur Creek <sup>c</sup>	Total	4.8	76%	3.0	78%
Total		154.5	73%	110.9	76%
Watershed Total		384.0	40%	268.0	41%

<sup>a</sup>: Calculations include stream length and watershed area upstream from barriers on tributaries. <sup>b</sup>: Percentages include Morgan Creek subwatershed. <sup>c</sup>: Percentages reflect smaller watershed area due to upstream passage barriers.

We prioritized aquatic and riparian enhancement projects for 30.1 miles of tributaries and mainstem Chewaucan River reaches where adfluvial redband trout have been known to spawn in the past, or where we identified habitat enhancement opportunities during the SIA project. Habitat enhancements would include large wood and boulder placements, LTPBR treatments, and riparian revegetation. Treatments will likely be discontinuous and will be tailored to the existing site conditions, habitat needs, and landowner/land manager goals.

Rangeland enhancement and post-fire restoration projects will be prioritized for Ben Young Creek (675 acres), Mill Creek (1,131 acres), and the mainstem Chewaucan River from Burford Canyon upstream to the Dairy Creek-Elder Creek confluence (15,866 acres).

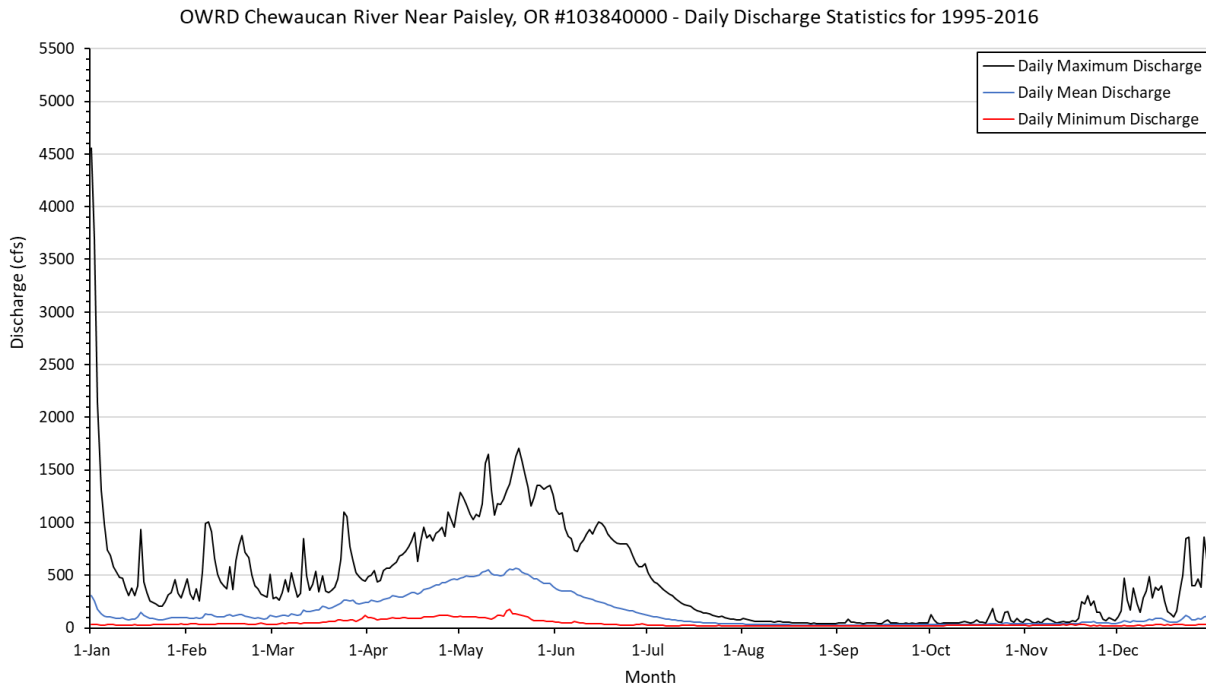
### Water Supply Benefits

- Provide information regarding the current status of water availability for aquatic ecosystems. Are there issues with sufficient water availability for ecosystems seasonally or year-round?

Water availability concerns associated with Lake Abert are largely related to larger diversions on the lower Chewaucan River downstream from Paisley. Proposed diversion improvement projects will primarily address fish passage, but would also provide a small increase (3-5 cfs) in streamflow downstream of the diversions in order for the fish passage structures to function while diversions are used.



The Oregon Water Resources Department (OWRD) maintains the Chewaucan River near Paisley, OR gage (#103840000). The gage has been operational since 1912, summary data are available through 2016. Figure 6 includes the mean annual hydrograph based on flows from 1995 to 2016. Flows increase in late winter and spring, typically peaking in mid-May before declining to baseflow by early August. The daily maximum discharge of 4,560 cfs occurred on January 1, 1997.



**Figure 6.** Minimum, mean, and maximum mean daily discharge for the OWRD Chewaucan River gage from 1995 to 2016.

Table 4 includes watershed and hydrologic properties for the key subwatersheds in the project area.

**Table 4.** Flood frequency estimates for tributaries in SIA units from prediction regression equations (Cooper

Stream/River	Q2	Q5	Q10	Q25	Q50	Q100
Dairy Creek	314	585	818	1,180	1,490	1,840
Elder Creek	244	447	622	889	1,120	1,380
Morgan Creek	94	160	214	292	356	425
South Creek	240	429	587	824	1,020	1,240
Upper Chewaucan River	443	842	1,190	1,740	2,210	2,750
Middle Chewaucan River	930	1,690	2,340	3,360	4,260	5,300

- Describe how your conceptual project will address these issues and how your study and design efforts will inform your approach.

Our project will not address water availability, however, juniper thinning that will be completed as part of the rangeland enhancement will reduce transpiration rates and increase instream flows in treated subwatersheds (Mata-Gonzalez and others, 2021).

### **Other Quantifiable Benefits**

- Provide information regarding the other critical issues of concern in your project planning area.

There are over 500 miles of roads in the Upper Chewaucan watershed. Stream crossings with undersized culverts are at greater risk of failure due to debris plugging and road overtopping. Overtopped roads can quickly erode and contribute substantial quantities of sediment to the stream network. Road failures are expensive to repair and impacts to aquatic systems are typically not addressed due to expense. Undersized culverts in burned landscapes are also more susceptible to plugging and failure due to dead trees recruit stream corridors.

- Describe how your conceptual project will address these issues and how your study and design efforts will inform your approach.

Replacing undersized culverts with larger spans will reduce the potential for culvert plugging and failure. Over time, the proposed projects will reduce road network maintenance demands and cost.

Paisley and Lakeview are underserved rural communities with agricultural-based economies. The design phase and ultimately, the implementation phase, would provide a significant infusion of funds into the regional and local economies. The “habitat restoration economy” is recognized as a stimulant for rural economies and one study found that many of the jobs that support the restoration economy are held by unemployed loggers (Kellon and Hesselgrave, 2014). Kellon and Hesselgrave (2014) noted:

*The jobs created by restoration activities are located mostly in rural areas, in communities hard hit by the [2008] economic downturn. Restoration activities bring a range of employment opportunities for people in construction, engineering, natural resource sciences, and other fields. The job creation potential of restoration activities compared with investments in other sectors of the economy is favorable.*

We could estimate the economic benefits of the project design phase and the project construction phase to the local and regional economies. In rural communities like Paisley and Lakeview, outside funding supports small businesses and local families.

Forest, meadow, riparian, and aquatic systems will benefit from the project. Improving ecosystem function will benefit wildlife, fish, and bird communities and thereby increase recreational interests, tourism, and visitor spending in Paisley and Lakeview.

### E.1.1.1. Evaluation Criterion B - Prior Restoration Planning and Stakeholder Involvement and Support

#### Sub-Criterion B1: Task A: Study and Design Stakeholder Involvement and Support and Restoration Planning

##### Prior Planning and Design:

- Describe any prior planning efforts related to your proposed project, i.e., planning that took place before you submitted your proposal.
  - Describe the specific planning, strategy, study, and any design document(s) (plan(s)) that support your project. Explain when the plan was prepared and for what purpose.
  - What was the scope of the planning effort that supports your project?
  - Was the plan developed collaboratively? If the referenced plan was not developed collaboratively, please explain why, for e.g., the planning effort is focused on a very small area or concerns internal to the applicant.
  - Explain how any prior planning effort relates to your current proposal and how your current proposal adds value and builds on any prior planning efforts.

There have been three primary planning documents specific to the Upper Chewaucan watershed (listed below). Other broader regional planning documents were reviewed in Sub-Criterion A.2. Additionally, natural resource agencies have published post-fire recovery reports to facilitate burn area recovery.

##### **Upper Chewaucan Watershed Assessment (USFS, 1999)**

The assessment included detailed subwatershed summaries for the major tributaries and the Chewaucan River. Authored by the USFS, the watershed assessment was a collaborative process that involved local landowners, natural resource agency staff, and NGOs. The goal of the document was to assess existing conditions and determine best practices for preserving the Upper Chewaucan Basin. The planning team reviewed historical and existing conditions; concerns and opportunities to improve forest health, redband trout habitat and population viability; and how best to preserve and protect the Chewaucan Basin for future generations. The watershed assessment has been an excellent resource for understanding ecological processes and human influences in the project area. Pivotal recommendations that we intend to implement with this project include the following.

**Upland forests** – Thin unnaturally dense forest stands to reduce fire risk and associated soil erosion, reduce transpiration and effects on water supplies, and preserve meadow systems.

**Road system** – Obliterate redundant roads, relocate roads to minimize stream interactions, and improve road drainage to facilitate better infiltration of water into forest soils to slow release into stream channels. South Creek and the Chewaucan River subwatersheds should be prioritized for road obliteration.

**Riparian plant communities** - Thin encroaching conifers from riparian areas and use prescribed fires to reduce conifers and maintain riparian species. Better manage riparian grazing, promote beaver recolonization, and address channel incision. Promote overstory riparian species recovery to increase stream shading especially in open meadow reaches including Dairy Creek, Elder Creek, South Creek, and the mainstem Chewaucan River.

**Aquatic habitat** – Add large wood to streams to increase habitat complexity and pool development, emphasis streams include Bear Creek, Dairy Creek, and Elder Creek. Increase buffer widths in forested stream reaches to ensure long-term large wood contributions to streams. Reduce channel width to depth ratios through active restoration and grazing management.

**Fish passage** – Only two of the eight watersheds were functioning appropriately for fish passage due to road culvert barriers. At the time of the assessment, there were 567 identified stream crossings in the upper watershed, although not all crossings occurred on fish-bearing streams. Replace undersized and perched culverts with larger structures that are appropriately sized for the respective stream.

**Redband trout population viability** – For the assessment, redband trout viability was used as an indicator for watershed health, being linked to upland, riparian, and channel conditions. At the time of the assessment, six of the eight subwatersheds were functioning appropriately but-at-risk for the long-term viability of redband trout populations. Subwatersheds of concern included Bear Creek, Coffeepot Creek, Ben Young Creek, Swamp Creek, Dairy Creek, and Elder Creek. South Creek and the Chewaucan River were functioning inappropriately.

Based on the assessment's recommendations, USFS and other collaborators embarked on an extensive streambank bioengineering and habitat improvement program on the mainstem Chewaucan in the mid-2010s. At least 43 projects were completed to narrow reaches of overwidened channel, to add large wood for pool habitat complexity, and to transplant willows to facilitate stream shading and riparian habitat complexity on the upper Chewaucan River.

#### **Upper Chewaucan River Strategic Implementation Area – (RDG, 2023)**

With funding provided by OWEB, LSWCD contracted RDG to complete a stream reconnaissance and develop recommendations for improving water quality in the Upper Chewaucan watershed. The goal of the SIA program was to document baseline water quality values and to determine how agricultural practices can be modified in areas that negatively affect water quality. RDG focused on eight private properties enrolled in the SIA program. RDG completed a remote sensing analysis of upper watershed and subwatershed conditions, and walked over 25 miles of valley bottom meadow stream reaches. RDG documented existing stream and riparian conditions, fish passage concerns, and opportunities for improving water quality and habitat. Recommendations provided in the report were used to inform this proposal. SIA assessment results were shared with the SIA Partnership during meetings and the final document is available for members.



LSWCD, through the SIA program, is also conducting an extensive water quality sampling effort to document suspended sediment and phosphorus in the tributaries and the mainstem Chewaucan River. LSWCD staff complete biweekly water quality sampling and samples are shipped to the USBR Columbia-Pacific NW Regional 9 laboratory in Boise, Idaho for sample processing. RDG has assisted LSWCD with two data summary reports, a final report will be prepared in 2025 at the end of the three-year project. Preliminary findings suggest burned subwatersheds are the primary source areas for suspended sediment contributions in the upper watershed. Peak suspended sediment loads have been associated with isolated summertime thunderstorms in burned headwaters of Dairy Creek and Mill Creek. The water quality data should provide a valuable dataset for assessing post-fire watershed recovery.

### **Upper Chewaucan Watershed Assessment Update (RDG, in draft)**

LCUWC was awarded a WaterSmart Watershed Assessment grant in 2021 and contracted with RDG to complete an update to the Upper Chewaucan Watershed Assessment (USFS, 1999). RDG has completed remote sensing and updated watershed condition maps, completed site assessments, and reviewed fish passage barrier culverts in the watershed. RDG has also conducted additional research and coordinated with Partnership agencies to update information on fish passage barrier culverts, Chewaucan redband trout status, and post-fire recovery actions. RDG is currently preparing the assessment document which will be completed in 2024. We anticipate the watershed assessment update will be informative for guiding the next generation of watershed restoration in the Upper Chewaucan watershed.

The Upper Chewaucan Watershed Partnership will continue to build on these past and recent planning efforts and the Partnership will coordinate on securing project funding for future design and project implementation.

- **Stakeholder Involvement and Support for Task A: Study and Design Projects**
  - Describe what sector(s) the participating stakeholders represent and how they will engage in this effort, e.g., will they contribute funding or in-kind services, or otherwise engage in the study and design process?

The Upper Chewaucan Watershed Partnership includes local, state, and federal resource agencies, local landowners, and LCUWC. The Partnership has been formalized by a Memorandum of Understanding (attached). Member agencies who have not signed on to the MOU or provided a letter of support could not do so due to conflicts, or higher-level policies. Essentially, all agencies, primary landowners, and NGOs operating in the region are participating in the Partnership. Partners contribute funding, provide in-kind services such as technical assistance and regulatory permitting coverage, provide access to private property, and have confirmed their willingness to undertake project design work and eventual project implementation.

- **Provide documentation of the commitment by stakeholders to participate in the study and design process.**

We have included letters of support and the MOU for the Upper Chewaucan Watershed Partnership. The letters of support and the MOU provide stakeholders’ commitments to the Upper Chewaucan watershed and the restoration program.

▪ **Are any stakeholders contributing to the cost-share?**

Yes, the Oregon Watershed Enhancement Board is contributing to the cost-share. Private landowners including J-Spear Ranch, O’Leary Ranch, and Murphy Ranch will contribute juniper and burned trees during the project construction phase.

- Describe stakeholders in the project area who have expressed their support for the study and design process, whether or not they have committed to participate.
  - **Supporting documentation for this sub-criterion could include letters of support from stakeholders or a description of feedback from interested stakeholders.**

Table 5 includes Partnership stakeholders and their roles in the Study and Design phase.

Table 5. Stakeholders and their respective roles in the Partnership.								
Stakeholder	Project Coordination	Stakeholder Engagement	Technical Assistance	Data Sharing	Design Review	Regulatory Assistance	Funding/Cost Share	Public Support
Lake County Umbrella Watershed Council	•	•	•	•	•			•
Lake SWCD	•	•	•	•	•			•
Private Landowners	•	•						•
Lake County Commissioners	•	•						•
U.S. Forest Service	•		•	•	•	•		
U.S. Bureau of Land Management	•		•	•	•	•		
Oregon Department of Fish and Wildlife	•		•	•	•	•		
Oregon Department of Agriculture	•		•		•		•	•
Oregon Department of Forestry	•		•	•	•			
Oregon Department of Environmental Quality	•							
Oregon Watershed Enhancement Board	•						•	•

- What will the applicant do during the study and design process to ensure participation by a diverse array of stakeholders?

LCUWC will be responsible for maintaining stakeholder engagement throughout the project. Engagement and Partnership member coordination will include organizing meetings, ensuring access to properties, follow-up on design and permitting needs, and preparing proposals for project construction funding. LCUWC will hold quarterly calls and annual field meetings to review project sites with stakeholders. This approach has worked very well to keep partners engaged with the SIA program.

- **If some sectors are not yet represented, explain how this will be accomplished.**

We have engaged public agencies and organizations with an interest in the Upper Chewaucan watershed. We are currently working with three of the largest private landowners in the watershed. These landowners manage critical low gradient meadow systems in tributaries and the mainstem Chewaucan River. There are other landowners who we have not engaged with yet, but plan to do so with additional capacity funding. Additional landowners include private timber companies and landowners with smaller private holdings in key subwatersheds.

- Is there opposition to the proposed project effort?

We have not encountered any opposition to the proposed project during the project planning. We have letters of support from agencies and private landowners. Given that the proposed project will improve the road network, fish habitat, rangeland, and forest health, and bring outside funds into the local economy, we do not anticipate there being opposition to the project.

## **E.1.2. Evaluation Criterion C - Project Implementation and Readiness to Proceed**

### **Sub-Criterion C1: Task A: Study and Design Project Implementation**

- Describe the implementation plan for the proposed study and design project. Please include an estimated project schedule that shows the stages and duration of the proposed study and design work, including major tasks, milestones, and dates.

We foresee five primary work tasks for project implementation. Although no design activities have been completed, we have identified priority project sites for culvert and diversions, stream and riparian treatments, and subwatersheds for rangeland enhancement. We will work with Partnership members to prioritize areas for post-fire recovery restoration. A summary schedule is included in Table 6, milestones are included below.

**Table 6.** The proposed project schedule including the primary project tasks to be completed over the three year project.

Task	2024	2025				2026				2027		
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Stakeholder Coordination and Engagement												
Site Surveys and Field Assessments												
Engineering and Progressive Design												
Rangeland Enhancement Prescriptions												
Post-fire Recovery Restoration												

**Stakeholder Coordination and Engagement** - We will kick off the project with a Partnership meeting to discuss the project goals, schedule, member responsibilities, and deliverables. Since we have already been engaged with Partnership members, we will be able to hold our initial meeting following project award. We will hold quarterly meetings to discuss the project with Partnership members. We anticipate that quarterly meetings will be remote, but one meeting a year will be held in-person in Paisley. The in-person meeting will include site visits to review proposed project sites. LCUWC will be responsible for setting meeting dates, inviting Partnership members, and overseeing meeting logistics. Stakeholder coordination and engagement will be conducted over the entirety of the planning and design project.

**Site Surveys and Field Assessments** - We will begin site survey and field assessment planning shortly after project award. Since we have already identified our priority project sites, we will efficiently move into survey and assessment planning. Planning will include acquiring the recently released USGS LiDAR dataset, developing site maps, and preparing a survey schedule with staff assignments. We anticipate making multiple trips to complete culvert and diversion surveys, stream reach assessments, and rangeland and forest assessments during the summer and fall of 2025 and 2026. We will use RTK GPS and total station to collect structure and channel data. We will merge site survey data with clipped LiDAR surfaces to create seamless digital terrain models for culvert/diversion sites. We will collect flow and sediment data, and take low altitude air photos using our sUAV.

RDG and LSWCD staff will conduct field assessments using GPS-enabled tablets, prepared maps, and electronic forms for recording existing site conditions and assigning treatment types and locations.

Any remaining survey and assessment work not completed by the end of the 2026 field season, will be completed in early 2027 to allow for sufficient time to complete 60 percent designs.

**Engineering and Progressive Design** - During quarterly meetings, we will review project progress with the Partnership. We anticipate meeting presentations will include field data collection review, design concepts for member comment, and subsequent design reviews. AOP culvert designs will include structure dimensions, streambed material specifications, construction sequencing, and cost estimates. Structure dimensions and streambed material specifications will be based on the active channel width of the respective stream and hydraulic modeling results. Concepts will be prepared and presented to USFS and BLM road engineers for preliminary approval. We will then progress to the 30 percent design level and incorporate USFS and BLM road engineers' feedback in the design plans. We will present 30 percent designs to the road engineers and incorporate feedback into the 60 percent designs. We will prepare 1D/2D hydraulic models for project sites in order to assess velocities, water surface elevations, and shear stress associated with modeled flows. We anticipate each culvert will have its own design plan set, although nearby culverts (e.g. Shoestring Creek and WF Shoestring Creek culverts) may be grouped for efficiency.

For fish passage designs at fish passage barrier diversions, we will follow a similar framework of preparing concept, 30 percent, and 60 percent designs. Since diversions are on private property, we will meet with LCUWC, private landowners, and ODFW to review fish passage designs.

We will process our riparian and aquatic habitat assessment data and prepare habitat enhancement strategies. Design plans will include reach maps with treatment types and locations, habitat structure details, material specifications and quantities, and cost estimates. A basis of design report will accompany the 60 percent design plans. All 60 percent designs will follow Reclamation's Design Level Guidance for 60 percent design plans included in the NOFO.

We will prepare design reports, 60 percent design and construction cost estimates, and materials quantities and specifications for each project. Final deliverables will include printed and electronic copies of the plans and supporting documents. Design work will be completed from fall through spring in 2025, 2026, and 2027.

**Rangeland Enhancement Prescriptions** - LSWCD will compile field assessment data and develop rangeland enhancement prescriptions. Rangeland includes both federally managed and privately owned land; therefore, these partners will be engaged during prescription development. Prescriptions will be developed in ArcGIS to produce prescription maps. The prescription treatments and acreage will be summarized to develop implementation costs. Final deliverables will include printed and electronic maps, a memo that will summarize treatment types and associated acreages, and cost estimates. Rangeland enhancement prescriptions will be completed by the end of 2026.

**Post-fire Restoration** - LSWCD will compile field assessment data and develop post-fire recovery restoration prescriptions. Burned forest stands include both federally managed and privately owned land; therefore, federal land managers and private landowners will be engaged during



prescription development. Prescriptions will be developed in ArcGIS to produce prescription maps. The prescription treatments and acreage will be summarized to develop implementation costs. Final deliverables will include printed and electronic maps, a memo that will summarize treatment types and associated acreages, and cost estimates. Post-fire restoration plans will be completed by the end of 2026.

### **E.1.3. Evaluation Criterion D—Presidential and Department of the Interior Priorities**

- Climate Change: E.O. 14008 emphasizes the need to prioritize and take robust actions to reduce climate pollution; increase resilience to the impacts of climate change; protect public health; and conserve our lands, waters, oceans, and biodiversity.
  - If applicable, describe how the project addresses climate change and increases resiliency. For example, does the project help communities respond to or recover from drought or reduce flood risk?

In Oregon’s closed basins, projected streamflow and water temperature changes could further increase Northern Great Basin redband trout population viability risk. By 2080, the majority (>98 percent) of redband trout occupied streams will experience more frequent and higher winter peak flows (Halofsky and others, 2019). Peak flows can scour spawning gravel and affect rearing habitat especially in steeper gradient streams or degraded streams that are disconnected from adjacent floodplains. Conversely, by 2080, 23 percent of Northern Great Basin redband trout habitat may not have enough flow to sustain fish habitat from August to October, the driest times of the year. Climate models predict a 7.7 percent decline in headwater habitat during summer in the Upper Chewaucan watershed (Halofsky and others, 2019).

The proposed project will address climate change by addressing fish passage barriers so redband trout can move among habitats to access cooler water temperatures and adequate water depths, by restoring connectivity between streams and floodplains, by promoting beaver activity and floodplain water storage, by better managing grazing in riparian areas, and by restoring riparian vegetation.

- How will the project build long-term resilience to drought? How many years will the project continue to provide benefits?

The project will improve long-term resilience to drought by restoring watershed connectivity, enhancing aquatic and riparian habitat, protecting riparian vegetation, increasing forest health, and restoring burned areas. Reconnecting degraded streams with their floodplains through projects that promote beaver activity, will provide long-term resilience. Planting native riparian vegetation and protecting riparian areas from concentrated livestock grazing will restore robust riparian communities. We anticipate that by installing larger culverts, restoring degraded channels, and protecting riparian vegetation, restoration will be self-perpetuating and provide long-term benefits into the future.

- Will the proposed project reduce greenhouse gas emissions by sequestering carbon in soils, grasses, trees, and other vegetation?

The proposed project will reduce greenhouse gas emissions by sequestering carbon in restored riparian corridors, grasslands, and recovering burned areas as soil carbon will potentially increase. Restoring channel-floodplain connectivity will raise the local water table and support riparian species that form denser and more diverse plant communities than drier upland conditions. Promoting beaver habitation and floodplain water storage will attenuate peak flows and potentially increase summer low flows. Studies have also found an increase in streamflow following juniper thinning projects (Mata-Gonzalez and others, 2021). In sum, we expect the proposed project to increase ecological resilience in a warming climate.

- Disadvantaged or Underserved Communities: E.O. 14008 and E.O. 13985 affirm the advancement of environmental justice and equity for all through the development and funding of programs to invest in disadvantaged or underserved communities.

The consensus tract that includes the Upper Chewaucan watershed is considered a disadvantaged tract due to potential flood risks and environmental hazards. The population is also rated as low income and susceptible to heart disease. Low income residents have access to the Upper Chewaucan watershed and may use the watershed in many ways including for recreation, hunting and fishing, firewood procurement, and camping.

The project has the potential to benefit the disadvantaged community by ultimately improving recreational opportunities, hiring local community members for project construction, and benefitting from an infusion of outside funds for contractor food, fuel, and lodging.

- Tribal Benefits: The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President's memorandum, Tribal Consultation and Strengthening Nation-to Nation Relationships, asserts the importance of honoring the Federal government's commitments to Tribal Nations.

Yes, indigenous peoples whose descendants are part of the Confederated Tribes of Warm Springs, Burns Paiute Tribe, Klamath Tribes, and the Fort Bidwell Indian Community in Northern California, occupied the Chewaucan Basin prior to Western European settlement. Our federal partners actively engage with Tribes on all projects on federally managed property, or if federal funding is associated with a project. Cultural resource surveys and reports are prepared in advance of ground-disturbing activities and LCUWC is responsive to Tribal concerns and requests.

- Does the proposed project support Reclamation's Tribal trust responsibilities or a Reclamation activity with a Tribe?

There are no Tribal properties or Reclamation projects in the Upper Chewaucan watershed. We anticipate that the proposed project would support Reclamation's responsibilities to Tribes in the region.

## Attachment A-1

### References

- Averett, J.P., Morris, L.R., Naylor, B.J., Taylor, R.V., and Endress, B.A., 2020, Vegetation change over seven years in the largest protected Pacific Northwest bunchgrass prairie remnant: *PLoS One*, v. 15, no. 1, p. e0227337.
- Behnke, R.J. 2002. Trout and salmon of North America. The Free Press, New York.
- Behnke, R.J. 2007. Redband trout of the Northern Great Basin. Pages 1–9 in R. K. Schroeder and J.D. Hall, editors. Redband trout: resilience and challenge in a changing landscape. Oregon Chapter, American Fisheries Society, Corvallis.
- Coates, P.S., B.G. Prochazka, M.A. Ricca, K.B. Gustafson, P. Ziegler, and M.L. Casazza. 2017. Pinyon and Juniper Encroachment into Sagebrush Ecosystems Impacts Distribution and Survival of Greater Sage-Grouse, *Rangeland Ecology & Management*, 70(1):25-38.
- Currens, K.P., C.B. Schreck, and H.W. Li. 2009. Evolutionary ecology of redband trout. *Transactions of the American Fisheries Society*, 138(4):797–817, July 2009.
- Harris, P. M. 2000. Systematic studies of the genus *Siphateles* (Ostariophysi: Cyprinidae) from western North America. Ph.D. dissertation, Oregon State University, Corvallis.
- Hoekzema K. and B.L. Sidlauskas. 2014. Molecular phylogenetics and microsatellite analysis reveal cryptic species of speckled dace (Cyprinidae: *Rhinichthys osculus*) in Oregon’s Great Basin. *Mol Phylogenet Evol.* 2014, 77(0):238–250.
- Halofsky, J.E., D.L. Peterson, J.J. Ho, eds. 2019. Climate change vulnerability and adaptation in south-central Oregon. Gen. Tech. Rep. PNW-GTR-974. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 473 p.
- Interior Redband Conservation Team. 2016. A Conservation Strategy for Interior Redband (*Oncorhynchus mykiss* subsp.) in the states of California, Idaho, Montana, Nevada, Oregon, and Washington. 106 p.
- Kellon, C.P. and T. Hesselgrave. 2014. Oregon’s Restoration Economy: How investing in natural assets benefits communities and the regional economy. S.A.P.I.EN.S 7.2, URL: <http://journals.openedition.org/sapiens/1599>
- Mata-González, R.; Abdallah, M.A.B.; Ochoa, C.G. Water use by mature and sapling western juniper (*Juniperus occidentalis*) trees. *Rangel. Ecol. Manag.* 2021, 74, 110–113.
- Miles, J. 2017. Chewaucan Watershed Culvert Replacement Priorities.
- Miles, J. 2023. Oregon Department of Fish and Wildlife, Assistant District Biologist. Personal communication.
- Moyle P.B., N. Buckmaster, Y. Su. 2023. Taxonomy of the speckled dace species complex (Cypriniformes: Leuciscidae, *Rhinichthys*) in California, USA. *Zootaxa.* 2023;5249(5):501–39.
- Oregon Department of Fish and Wildlife [ODFW]. 1983. Chewaucan River Fish Management Plan.
- ODFW. 1998. Oregon Great Basin Redband Trout Status by Basin – Chewaucan Basin. 7 p.
- ODFW. 2014. Use of depletion electrofishing and a generalized random-tessellation stratified design to estimate density and abundance of redband trout in the Northern Great Basin. Information Reports Number 2014-01. 72 p.
- ODFW. 2021. Sensitive Species List – Frequently Asked Questions. 11 p.
- Renner, D. and others. 2023. Threat-based Management for Creeks, Streams and Rivers - A Manager’s Guide for Understanding and Managing Flowing Waters in Sagebrush Ecosystems of the Pacific Northwest. 66 p.
- River Design Group, Inc. [RDG]. 2023. Upper Chewaucan River Strategic Implementation Area – Reconnaissance and Recommendations [SIA Report]. 126 p.
- River Design Group, Inc. [RDG]. In Draft. Upper Chewaucan Watershed Assessment Update.

- Rodnick, K.J., A.K. Gamperl, K.R. Lizars, M.T. Bennett, R.N. Rausch, and E.R. Keeley. 2004. Thermal tolerance and metabolic physiology among redband trout populations in south-eastern Oregon . J Fish Biol. 64 : 310 – 335 .
- Sidlauskas, B.L., S. Mathur, H. Aydogan, F.R. Monzyk, and A.N. Black. 2024. Genetic approaches reveal a healthy population and an unexpectedly recent origin for an isolated desert spring fish. BMC Ecology and Evolution 24(2).
- Thurrow, R.F., Rieman, B.E., Lee, D.C., Howell, P.J. & Perkinson, R.D. 2007. Distribution and status of redband trout in the interior Columbia River Basin and portions of the Klamath River and Great Basins. In: Schroeder, R.K. & Hall, J.D., eds. Redband trout: resilience and challenge in a changing landscape. Corvallis, OR: Oregon Chapter of the American Fisheries Society, pp. 28-46.
- Tinniswood, W.R. 2007. Adfluvial life history of redband trout in the Chewaucan and Goose Lake basins. Pages 00-00 in R.K. Schroeder and J.D. Hall, editors. Redband trout: resilience and challenge in a changing landscape. Oregon Chapter, American Fisheries Society, Corvallis.
- U.S. Fish and Wildlife Service. 2000. Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition To List the Great Basin Redband as Threatened or Endangered. Federal Register 54:14932-14936.
- U.S. Forest Service, Fremont-Winema National Forest. 1999. Upper Chewaucan Watershed Assessment. 177 p.
- U.S. Forest Service, Fremont-Winema National Forest. 2018. Visitor Use Report.  
[https://apps.fs.usda.gov/nvum/results/ReportCache/2018\\_A06102\\_Master\\_Report.pdf](https://apps.fs.usda.gov/nvum/results/ReportCache/2018_A06102_Master_Report.pdf)
- Workforce Innovation Opportunity Act [WOIA]. 2023. Oregon Workforce Analysis.  
<https://wioaplans.ed.gov/node/339136>

## Attachment A-2

### Environmental and Cultural Resources Compliance, Required Permits or Approvals, Overlap or Duplication of Effort Statement, Conflict of Interest Statement

#### H.1. Environmental and Cultural Resource Considerations

- Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)?

The proposed project only includes field data collection and design. Future project construction phases will affect the surrounding environment.

- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

The project will indirectly benefit listed, candidate, and proposed species that could use the Upper Chewaucan watershed. Species that the U.S. Fish and Wildlife Service recognizes as potentially occupying habitat in Lake County and that could benefit from the project include Gray Wolf (*Canis lupus*), North American Wolverine (*Gulo gulo luscus*), Yellow-billed Cuckoo (*Coccyzus americanus*), Northwestern Pond Turtle (*Actinemys marmorata*), Monarch Butterfly (*Danaus plexippus*), and Whitebark Pine (*Pinus albicaulis*).

- Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States”? If so, please describe and estimate any impacts the proposed project may have.

There will be no impacts to wetlands or other surface waters during the Study and Design phase. However, we would acquire appropriate regulatory permits during the final design and construction phase.

- When was the water delivery system constructed?

We do not know the construction date of the existing water delivery systems we are proposing to modify for fish passage. However, water rights associated with the diversions date from 1887 through 1922. Existing diversions may be later generation structures than original structures built at the time of the water right certificate issuance. We will conduct additional research during the Study and Design phase.

- Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

No structures will be modified during the Study and Design phase. We anticipate that implementation of fish passage designs will modify existing diversion weirs.



- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

No structures in the project area are currently listed on the National Register of Historic Places. Although the diversions are likely more than 50 years old, they will be recognized as historical structures. However, the diversions have common designs as we do not believe would qualify as historic. Additional analysis will be completed as part of the Study and Design or during the final design phase.

- Are there any known archeological sites in the proposed project area?

The project sites have not been inventoried for archaeological resources. However, given the historical use of the Upper Chewaucan watershed by indigenous people, we anticipate encountering archaeological sites during the project construction phase. Designs would be modified in the final design phase to avoid cultural resource sites.

### **Required Permits or Approvals**

No agency permits or approvals are required for the Study and Design phase. LCUWC will acquire all necessary permits for future any related Task B construction projects.

### **Overlap or Duplication of Effort Statement**

There is no overlap between the proposed project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel.

The proposed project proposal does not in any way duplicate any proposal or project that has been or will be submitted for Federal or non-Federal funding consideration.

### **Conflict of Interest Disclosure Statement**

There are no conflicts of interest at the time of this proposal.

### **Uniform Audit Reporting Statement**

The Lake County Umbrella Watershed Council did not expend \$750,000.00 or more in Federal Funds during our most recently closed fiscal year 2023 and is therefore not required to submit an A-133 audit to the Federal Audit Clearinghouse..

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**ATTACHMENT A-4**

**LETTERS OF SUPPORT**

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January 17, 2024

United States Bureau of Reclamation  
1849 C Street NW  
Washington DC 20240

Dear Grant Review Team,

The Chewaucan Watershed Collaborative (CWC) would like to express its support for the Lake County Umbrella Watershed Council's (LCUWC) Bureau of Reclamation WaterSmart grant application, titled Upper Chewaucan Watershed Restoration Project.

The Chewaucan Watershed Collaborative was formed on February 25, 2022 to provide a means of local, state, and national representation for the stakeholders in the Chewaucan River, Willow Creek and Crooked Creek basins in Lake County, Oregon on issues that affect water use, supply, and availability in the aforementioned basins. The CWC places a high priority on maintaining and strengthening working relationships with all stakeholders, local, state, and federal agencies, and recognized tribes.

Between catastrophic wildfires, severe drought, and the periodic drying of Abert Lake, the past six years have brought a lot of attention and concern to the Chewaucan Watershed. There has been significant work in the watershed to reduce post-fire impacts, improve water quality, and improve fish passage. However, the Bureau of Reclamation WaterSmart grant provides an enormous opportunity to work with private and federal landowners across large swaths of land, and jurisdictional boundaries in the Upper Chewaucan Watershed. This funding would allow the LCUWC and project partners the time to complete the design phase prior to seeking implementation funding. This two-step process will allow for well researched and thoughtfully prioritized on-the-ground work, when the time comes.

We feel strongly that the partners involved in this endeavor are committed to the restoration of this watershed for the long term and that this funding is key to the lasting health of this watershed. We appreciate your consideration for the Upper Chewaucan Watershed Restoration Project and urge you to fund this application.

Sincerely,



Tom Flynn (Jan 18, 2024 20:12 PST)

Tom Flynn

Chewaucan Watershed Collaborative, Member



**File Code:** 3560  
**Date:** January 18, 2024

United States Bureau of Reclamation  
1849 C Street NW  
Washington DC 20240

Dear Grant Review Team,

The purpose of this letter is to demonstrate the Fremont-Winema National Forest's support of the Lake County Umbrella Watershed Council's (LCUWC) effort to obtain a United States Bureau of Reclamation (USBR) WaterSmart Grant. The grant would fund project designs in the Upper Chewaucan Watershed that were identified in an updated watershed assessment that was funded by a USBR grant. Those projects would further conservation efforts and enhance water quality in the Upper Chewaucan.

The majority of the Upper Chewaucan Watershed has been heavily impacted by wildfire since 2018. Hundreds of thousands of acres have burned, impacting both private and federally administered lands. The scale and severity of wildfire in the Upper Chewaucan has resulted in increased soil erosion and subsequent impacts to water quality.

Landscape restoration efforts have been ongoing across all land ownerships since the fires. As a result, strong working relationships have been established between the stakeholders, including affected private landowners, non-profit organizations, state and federal agencies, and others. But there is a significant amount of important work remaining to establish appropriate native vegetation, reduce erosion, control invasive species, and protect and enhance water quality and aquatic habitat.

The Fremont-Winema National Forest administers a significant portion of the land in the Upper Chewaucan Watershed. Together with the other stakeholders, we are committed to the restoration of the Upper Chewaucan Watershed and urge you to fund the LCUWC's WaterSmart Grant application.

Sincerely,

ERIK J FEY  
Forest Supervisor

cc: Mercury WP FY 2024 - 644100



January 12, 2024

United States Bureau of Reclamation  
1849 C Street NW  
Washington DC 20240

Dear Grant Review Team,

This letter serves to demonstrate private landowner support of the Lake County Umbrella Watershed Council's (LCUWC) efforts to obtain a United States Bureau of Reclamation (USBR) WaterSmart Grant that will assist in the Upper Chewaucan project design for conservation efforts and enhanced water quality, using as a foundation our updated watershed assessment which has been previously funded through a USBR grant.

Between 2018 and 2021 roughly seventy five percent of the Upper Chewaucan Watershed was burned in catastrophic wildfires. These fires spanned hundreds of thousands of acres of private and federal grounds and have resulted in severe consequences to the watershed, including high levels of suspended soils as sediment.

Private landowners subsequently participated in multiple restoration efforts in partnership with the local Soil & Water Conservation Districts (SWCDs) and LCUWC, and have built strong working relationships with these organizations as a result of this work. Despite the recovery efforts to date, there is a significant amount of work to be done that would support upland erosion control, invasive species management, re-vegetation, floodplain connectivity, and aquatic habitat.

It is extremely important that this work be performed across jurisdictional boundaries for the health of the watershed as a whole, which is possible with the joint support of us as landowners and the federal agencies that manage much of this area. We have a strong assemblage of partners at the table and are committed long term as private landowners to invest in this important restoration work in our watershed with the support of grant dollars for project design so we can proceed in the most efficient way.

Sincerely,

*Tom M. Shaw*

Tom M. Shaw (Jan 12, 2024 09:50 PST)

Tom M. Shaw, J-Spear Ranch

*Brady Murphy*

Brady Murphy (Jan 16, 2024 08:52 PST)

Brady Murphy, Murphy Ranch

*Mike O'Leary*

Mike O'Leary (Jan 12, 2024 17:53 PST)

Mike O'Leary, O'Leary Ranch





**OREGON  
DEPARTMENT OF  
AGRICULTURE**

*Protect. Promote. Prosper.*

**Agricultural Water Quality Program**  
635 Capitol St NE, Salem, OR 97301-2532  
503.986.4767 | Oregon.gov/ODA

January 16, 2024

Bureau of Reclamation  
Natural Resources  
Funding Opportunity #R23AS00106

Dear Reviewer,

The Oregon Department of Agriculture (ODA) is pleased to support the “Upper Chewaucan Watershed Restoration Project” proposal. The project will support Strategic Implementation Areas, an ODA priority initiative.

Strategic Implementation Areas (SIAs) are geographic areas selected by ODA in coordination with several other state natural resource agencies and local partners. The purpose is to ensure compliance with Agricultural Water Quality Rules and identify and act on additional opportunities to improve water quality and watershed health. The Upper Chewaucan watershed in Lake County was selected as an SIA in 2019 and the Upper Chewaucan SIA Partnership (Partnership) was formed. The Partnership members consists of Coordinated Streamside Management agencies, local partners, and local landowners.

At the onset of the Partnership, ODA conducted a preliminary evaluation using aerial imagery and public viewpoints to identify opportunities to improve water quality and watershed health in the Upper Chewaucan SIA. The Partnership then developed a monitoring plan and in 2021 began conducting bimonthly water quality sampling at designated sites on the upper mainstem Chewaucan, followed by sampling at tributary junction points with the mainstem. After two years of sampling, data can support priority restoration efforts in certain areas. Lake County Umbrella Watershed Council, a key participant in the Partnership, also sought and was awarded a Bureau of Reclamation (BOR) grant to update a 1999 Upper Chewaucan Watershed Assessment. Concurrently an SIA Report was completed by contractor River Design Group, which outlines recommendations from an on the ground watershed reconnaissance conducted by the contractor and approved by the SIA Partnership. Now the Partnership is ready to transition into study and design planning for priority restoration needs which have been

identified through the updated watershed assessment, SIA Report, and the post fire restoration efforts that began after four catastrophic fires occurred since 2020.

The Partnership's restoration priorities align with most of the priority activities of the aquatic ecosystem restoration grant which are: removal or modification of barriers to fish passage, restoration of connectivity, restoration of aquatic habitat, and improvement of water availability, quality, and temperature. Also, many of the Partnership's restoration priorities align with specific strategies identified in the ODA Goose and Summer Lakes Basin Agricultural Water Quality Management Area Plan such as, restoring hydraulic connection to the floodplain to support riparian vegetation health; restoring and protecting streamside vegetation through off-channel water developments, riparian fencing, and riparian vegetation recovery; and enhancing grazing management strategies to improve and support watershed health. The designs resulting from this proposal will provide the foundation to obtain funding to implement the Upper Chewaucan restoration priorities.

ODA has a long successful history of working with the Lake County Umbrella Watershed Council on projects throughout Lake County. We look forward to continuing work with them in this Partnership and are eagerly anticipating the study and designs for the priority restoration projects in the Upper Chewaucan.

Sincerely,



Isaak Stapleton, Director  
Natural Resources Program Area  
(503) 986-4700





# Oregon

Tina Kotek, Governor

Department of Environmental Quality

Eastern Region Bend Office

475 NE Bellevue Drive, Suite 110

Bend, OR 97701

(541) 388-6146

FAX (541) 388-8283

TTY 711

January 19, 2024

Christina Munoz  
Bureau of Reclamation  
Natural Resources  
Funding Opportunity #R23AS00106

Re: Upper Chewaucan Strategic Implementation Area – WaterSmart Aquatic Ecosystem  
Restoration Projects Grant Opportunity

Dear Ms. Munoz,

This letter is intended to supplement the “Upper Chewaucan Watershed Restoration Project” grant application. The Oregon Department of Environmental Quality (DEQ) supports the Upper Chewaucan Strategic Implementation Area (SIA) Partnership, and their goals of improving the watershed to meet multiple beneficial uses.

This project will build on previous efforts taken by the SIA Partnership to identify and prioritize areas for restoration projects throughout the watershed. These previous data gathering efforts, by a multitude of partners, highlight the commitment of the group to take the important next steps to transition into study and design planning to address these restoration priorities. These priorities align with the goals of the aquatic ecosystem restoration grant which are: removal or modification of barriers to fish passage, restoration of aquatic habitat, improvements in connectivity, and improvements in water availability, quality, and temperature.

The Oregon Department of Environmental Quality intends to continue to be an active partner on the SIA monitoring team and to provide technical assistance and feedback throughout the process. We look forward to further collaboration with numerous agency and local partners to better improve water quality in the Upper Chewaucan watershed.

If I can be of further assistance, please don't hesitate to contact me at 503-875-9830.

Sincerely,

Tyler Dearman  
Oregon DEQ TMDL Basin Coordinator