PROJECT PROPOSAL

April, 2024

LAKE EWAUNA WELLNESS

A project to strengthen, beautify and unify the Klamath Basin.

PREPARED FOR:

KLAMATH COUNTY BOARD OF COMMISSIONERS Dave Henslee, Chair Kelley Minty, Vice Chair Derrick DeGroot, Commissioner

PREPARED BY:

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SANDHILL CONSULTING



COVER & CLOSING PHOTO: Curtesy of Discover Klamath

PROJECT PARTNERS

Klamath County intends for this project to be a dynamic and unifying partnership between public and private entities, working together to strengthen and beautify a key natural resource within our community. Current project partners include:









KLAMATH WATERSHED PARTNERSHIP









CONTENTS







PROJECT BACKGROUND

PROJECT AREA

The project area described in this Proposal is focused an approximate 400 acre body of water in Klamath County called **Lake Ewauna**. Located on the western edges of Klamath Falls, Oregon, Lake Ewauna is fed by Upper Klamath Lake, via the Link River, and serves as the headwaters to the Klamath River.







PROJECT BACKGROUND

LAKE EWAUNA HISTORY

Lake Ewauna is a historic body of water holding nearly 2.5 miles of Klamath River slack water, and central to the interconnected waters of the Klamath River Basin, often referred to as the "Everglades of the West" because of its biological diversity and importance to the Pacific Flyway. The Klamath River is estimated to have been one of the largest salmon-producing rivers on the West Coast, making Lake Ewauna once part of the life force of the Native Americans who relied on its generous abundance of salmon and trout. Beginning in the early 1900's, the Lake served as the mill pond for nine different sawmills, each owning shoreline property in order to have rights to store logs in the waters. By 1970, much of the log storage had been removed, with final logging operations ceasing by 1995. Today, it remains one of the few undeveloped downtown lakefronts in the country.

THE PATH FORWARD

Due to historical activities along it's shores, Lake Ewauna is part of the damaged ecological infrastructure in our area, with poor water quality and degraded riparian habitat. It is well-considered that a healthy functioning landscape can more effectively and efficiently cycle water through the system. Due to the Basin's current water-related conditions, multiple local, regional and federal partners have identified the need for ecosystem restoration along the Klamath River Basin. Restoration and nature-based infrastructure solutions can improve both water quality and quantity, helping to make more resources available for the environment and community, helping "the people" and wildlife alike.





A CULMINATION OF EFFORTS TO DATE

In 2022, Klamath County Commissioners and Klamath County Economic Development Association (KCEDA) began the process of *cleaning* Lake Ewauna by pledging \$1 million towards an adaptive management system to 1) alleviate deoxygenation and high levels of ammonia, and 2) reduce cyanobateria and E.coli in the southern portion of Klamath Lake, thus enhancing Lake Ewauna's water quality and aesthetics, which in turn improves endangered species habitat and the usability of the Lake for the community.

In fall 2023, KCEDA identified the opportunity to partner with Klamath Watershed Partnership and US Fish & Wildlife Services for their Phase IV of the Klamath River Restoration Allocation, which restores the existing Wing Watchers Wetland and develops a new Wetland "Park" on the western shores of Lake Ewauna. KCEDA facilitated Klamath County's procurement of private, agricultural land for this development. This project will enhance, restore and develop over 65 acres of wetland, providing new educational and recreational opportunities for the Community and travelers alike.

Discussions have begun for Link River habitats by adding additional rock features to restore "the falls", creating eddies for fish refuge and new recreational opportunities. Not only would this improve the up-Lake ecosystem, but also create additional recreational tourism with kayak and SUP surfing opportunities. The existing stave pipe (the wood structure adjacent to the Link River) is also under discussion for removal to add additional flow to the River; however impact to the existing habitat established by the century-old leaking pipe would need to be vetted.





PROJECT BACKGROUND

The Timbermill Shores development area has recently completed over 2000 feet of walking path along the Lake's north-eastern short.

City of Klamath Falls has completed Phase 1 of 3 of shoreline restoration along the Lake's north eastern shore. In another critical partnership, US Fish & Wildlife Services and Trout Unlimited assisted in the funding, design and execution of removing invasive plant species, and restoring the shoreline with native plants, improving the area's beauty and providing vital habitat for pollinators, birds and fish alike. Phase 2 of this project, an extension of the restoration area, is slated to begin summer of 2024. Phase 3 includes additional shoreline restoration, interpretive and wayfinding signage, as well as new water docks along the walking trail.

Additionally, City of Klamath Falls Wastewater Division intends to reduce ammonia and phosphorus loads by 2030, thus improving output water quality into Lake Ewauna.





THE LAKE EWAUNA WELLNESS PROJECT

As previously illustrated, the efforts to clean Lake Ewauna have already been extensive and span an impressive array of Agencies, Organizations and private entities. However, this project now goes deeper than just *cleaning* the Lake. **After a national pandemic, devastating droughts and polarizing politics, The Lake Ewauna Wellness Project now embodies a mission for Klamath County: To strengthen, beautify and unify the Klamath Basin.**

PROJECT GOALS:

- To restore and strengthen the ecological health of the Klamath River Basin water system
- To improving the habitat of vegetation and wildlife alike
- To re-establish historical ecosystems, land and wildlife lost or threatened
- To re-establish the cultural significance of the Lake and the areas it's water serves
- To provide significant recreation opportunities for the community and generate unique tourist attractions
- To improve the physical and mental health of our community
- To beautify and improve the aesthetics of one of the community's most precious resources
- To unify resources, agencies, partners, and our community in the restoration of the Klamath River Basin





PROJECT OVERVIEW

With that mission in mind, **Klamath County Board of Commissioners is taking the lead on providing a holistic view of Lake Ewauna to develop long-term treatments and restorations that will result in successful projects and outcomes for ecosystems, wildlife and the community alike.** As a result, we have developed a schematic overview of the project area, potential phases, schematic designs on the most eminent phases, and preliminary project budgets in the pages that follow.



PHASE 1

NORTHERN SHORELINE RESTORATION



Existing North Shoreline & Boat Dock - Photo Curtesy of Discover Klamath

PHASE 1 - NORTHERN SHORELINE RESTORATION

As part of the City of Klamath Falls' commitment to creating aesthetically pleasing and environmentally responsible surroundings, they have partnered with US Fish & Wildlife Services for plans to remove invasive vegetation such as blackberry bushes and canary grass along parts of the the existing Lake Ewauna Trail. These have been, and will be, replaced with native foliage that enhances the area's beauty and provides suitable habitat for butterflies, birds, and fish. Additional interpretive and wayfinding signage is also planned.



Restoration Rendering from City of Klamath Falls Project Website

PHASE 1 - NORTHERN SHORELINE RESTORATION

As part of a three-phased approach, the following illustrates the work planned, and sections completed and forthcoming. For more information and collaboration opportunity, please visit the City's website.



PHASE 2

WING WATCHERS WETLAND RESTORATION



Existing Wing Watchers Wetland - Photo Curtesy of Discover Klamath

PHASE 2 - WING WATCHERS WETLAND RESTORATION

PROJECT OVERVIEW

As first in a two-part project lead by Klamath Watershed Partnership and US Fish & Wildlife Services within their Phase IV of the Klamath River Restoration Allocation, the Wing Watchers Wetland Restoration intends to restore approximately 15 acres of Klamath County-owned, and soon-to-own, wetland along the existing 1/2 mile Klamath Wing Watchers Trail. Located on the north western shores of Lake Ewauna, the existing wetland is extremely impaired, with poor habitat quality throughout, little-to-no wetland vegetation existing within the southern cells and stabilized water levels.



PHASE 2 - WING WATCHERS WETLAND RESTORATION

PROJECT GOALS & NEXT STEPS

This project will restore the existing wetland hydrology, increase productivity and function of the semipermanent wetland habitat, and therefore enhance waterbird benefits. Additional elements of this wetland could include rearing of juvenile suckers and providing habitat for fisheries.

Engineering specifications are in process for this development and can be found in the attached **Exhibit A**, noted as the "East" and "West Wetlands". Per the FWS Work Plan, land owners (Klamath County) will need to seek funding to complete the project elements and facilitate project management. See "Project Budget" and **Exhibit B** for more information and costs associated with this portion of the Project.



PHASE 3

NEW WETLAND PARK & EDUCATION TRAIL



PHASE 3 - NEW WETLAND PARK

PROJECT OVERVIEW

As second in a two-part project lead by Klamath Watershed Partnership and US Fish & Wildlife Services within their Phase IV of the Klamath River Restoration Allocation, the new Wetland Park intends to develop approximately 58 acres of former agricultural land into a new, thriving wetland. Klamath County is in process of procuring this western property for the project. **The property will provide up to 1.5 miles of education-based walking trail, create new wetland habitat, enhance waterbird benefits, and create a one-of-it's-kind "park", providing a water trail among the wetland for kayak/canoe and stand up paddleboard recreation.**



PHASE 3 - NEW WETLAND PARK

PROJECT GOALS

This project is an innovative, well-balanced approach to wetland development - considering both habitat and humans, generating health and wellness for both. This project will generate new wetland hydrology and ecosystems, improve overall water quality within the Lake, reduce the water budget of the former agricultural property, provide unique recreation and tourism for the region, and offer significant educational opportunities. Additional elements of this wetland could include rearing of juvenile suckers and providing habitat for fisheries.



View from Greensprings Drive of East and South Wetlands

PHASE 3 - NEW WETLAND PARK

NEXT STEPS

Prior to developing this property, the western Lake shore must be cleaned up and restored. Additionally, the existing levy - the boundary between Lake Ewauna and this property - must be repaired to ensure structural stability for the new wetland and education trail development. Lastly, dredging the Lake Ewauna should be vetted; this could not only improve Lake water quality, but also the spoils could be used for the construction of the new wetland. Engineering specifications are in process for this development and can be found in the attached **Exhibit A**, noted as the "South Wetland". Per the FWS Work Plan, land owners (Klamath County) will need to seek funding to complete the project elements and facilitate project management. See "Project Budget" and **Exhibit B** for more information and costs associated with this portion of the Project.



PHASE 4

LINK RIVER FALLS RESTORATION



Link River - Photo Curtesy of Discover Klamath

PHASE 4 - LINK RIVER FALLS RESTORATION

PROJECT BACKGROUND

The Link River is found in a scenic canyon, connecting the Upper Klamath Lake to Lake Ewauna, and the historic site of the Link River Falls. Bordered by both riparian and brushland habitat, the River canyon is home to many species of birds, river otters, deer, turtles, and plants.

PROJECT OVERVIEW

Discussions have begun about adding additional rock features to restore "the falls". Not only could this provide additional refuge habitat for migrating fish, but also create recreational tourism with kayak and SUP surfing opportunities. Options to create a more navigable waterway during most flow levels would also improve recreational opportunities and wellness. The existing stave pipe (the wood flume adjacent to the Link River) is also under discussion for removal, adding additional flow to the River; however it appears the near century-old leaking pipe may have created additional riparian habitat, so removal would need to be vetted further.

NEXT STEPS

It is important to identify Project stakeholders to further discuss the elements and needs of this body of water. Once Phase scoping is better defined, developing Engineering specifications for the selected restoration endeavors for proper budgeting can begin. Important partnerships could include City of Klamath Falls, US Fish & Wildlife Services, Trout Unlimited, Pacific Corps, Klamath Trails Alliance and Healthy Klamath to further solidify the goals of this project to unify environment and recreation as one.

PHASE 5

EASTERN SHORELINE RESTORATION



Existing Lake Ewauna Walking Trail - Photo Curtesy of Klamath Alerts/Oregon Air Photos

PHASE 5 - EASTERN SHORELINE RESTORATION

PROJECT OVERVIEW

The City of Klamath Falls currently owns approximately 60 acres of land along the eastern shore of Lake Ewauna. The interior of this property has potential for wetland development, with the exterior levy in need of shoreline restoration and ripe with opportunity to extend the existing a 1/2 mile Lake Ewauna Walking Trail. Even more exciting opportunity lies with a potential foot traffic water bridge to connect Phase 3 and 5, providing nearly 3 miles of one way trail system.



PROJECT BUDGET

The following total project budget is to be considered preliminary in order to align funding opportunities, stakeholders and resources. The following reflects the information and project scope provided in this document, based on rough order of magnitude professional estimates.

Project:	LAKE EWUANA WELLNESS			
Date:	4/15/2024			
	56 S.A			
EXPENSE CAT	COST ESTIMATE			
SOFT COSTS				
Engineering & Environmental Services 9% of construction cost			\$	440,244
Cultural & Environmental Studies			\$	80,000
Project Management, Administration & Public Relations 4% of total cost			\$	225,012
Permit Fees 3% of construction cost		3% of construction cost	\$	146,748
Soft Cost Contingency 10%		\$	66,699	
		Soft Cost Subtotal	\$	958,703
CONSTRUCTION COSTS				
Phase 1 - North				
Part 1 - CO		COMPLETED		
Part 2 - Inprogress				Funds Awarded
Part 3 - Ap	\$	287,692		
Phase 2 - Wing	ć	2 801 450		
Phase 3 - Wetland Park Development				2,891,490
Phase 4 - Link F	\$	1,000,000		
Phase 5 - Appro	\$	394,548		
NOTE: Cost				
Construction C	ontingency	10%	\$	317,914
	00 9#	Construction Subtotal	\$	4,891,604
TOTAL PROJEC	T COST		\$	5,850,307

PLEASE NOTE: It is recommended to add 3% for each year after 2024

NEXT STEPS

We recommend Klamath County consider the following as "next step" actions to move forward with this project:

- Continue to foster existing stakeholder relationships to provide continued project partnership and leverage resources, knowledge and funding
- Identify a Project Manager to administer all Project activities, including coordinating with project partners and stakeholders, refining the Project scopes, designs and budgets, creating a Project Plan, and manage and execute all project phases of construction.
- Seek all required funding, including State and Federal Grant awards, Infrastructure funding, private partner contribution requests, etc.
- Identify additional community, private, State and Federal stakeholders
- Because of it's unique characteristics and positive impact to the Klamath River Basin, this project will likely be a high-profile project and have major implications for outreach. We recommend the Project Manager/Administrator works with an community partner, such as Discover Klamath, and enlists a professional marketing firm to create digital media/marketing and to assist in coordinating public outreach and relations with all Project stakeholders.
- Consider holding a Project "summit", inviting all existing and potential stakeholders (including the Community at large) to provide information about the Project and gain momentum.
- Update the project budgets based on current year economics





THANK YOU.

Please let us know if there is anything we can do to help you further with this project.

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Kelsie Randall + Randy Cox kelsie@sandhillconsults.com 541-891-9057

PHASE 2 & 3 CONCEPTUAL DESIGN

EXHIBIT A





PHASE 2 & 3 CONCEPTUAL COST ESTIMATE

EXHIBIT B



April 12, 2024

Klamath Watershed Partnership Attn: Mark Johnson 205 Riverside Drive, Ste. C Klamath Falls, OR 97601

RE: Lake Ewauna Wetland Restoration Conceptual Cost Estimate Narrative

Dear Mark,

We have prepared wetland restoration concepts for the Wing Watcher property and the adjacent property to the south of the Wing Watcher property (hereafter, project area). We retained Method LA (Method), to prepare graphical renderings of potential wetland restoration actions within the project area. We provided Method with input on the project goals, extent, anticipated project elements, and site grading parameters that we anticipate would support native wetland vegetation and achieve other project goals which include:

- Creating accessible recreation opportunities near Klamath Falls. Recreation elements include an improved walking trail network, a canoe trail network, observation platforms, and educational storyboards.
- Creating a complex wetland system that supports native fish (including Lost River and shortnose suckers), wildlife, and migratory water birds.
- Establish a wetland vegetation community that will sequester nutrients and store fine sediment.
- Increase the stability of an existing levee located between the project area and Lake Ewauna by equalizing the water surface elevation between Lake Ewauna and the project area and constructing a bioengineering treatment on the Lake Ewauna side of the levee.
- Ensure water control between Lake Ewauna and the project area to allow managers to periodically drawdown water in the project area for vegetation management.

We have prepared a conceptual cost estimate that will provide you and other project stakeholders with a potential cost to complete the project elements included in the conceptual renderings. The following section includes a brief explanation of each cost item.

1. Project Area Dewatering

Project implementation will require site dewatering in order to implement site grading, structure installation, and revegetation. We have included a cost for initial site dewatering as well as two additional dewatering efforts to facilitate site revegetation. Dewatering would be completed by using the existing pump station (which may require rebuilding), and/or with one or more portable pumps.

2. Site Grading

We used the 2010 and 2018 LiDAR data, topographic survey, and bathymetric survey to create a preliminary digital elevation model for the project area. We used Method's planview rendering, target ground slopes and elevation classes to develop a grading surface. The grading effort sought to generate all fill material on-site to minimize the need for more costly imported soil. We used a \$9/cubic yard (cy) cost which is based on comparable projects in the region and the anticipated challenges associated with project construction. Due to the challenging site conditions (high water table and soil types), we expect most of the site grading will be completed with tracked excavators rather than motorized scrapers although using towed scrapers may be possible if soil conditions allow. Based on the existing topography (additional data collection is scheduled for the Wing Watcher pond) and the rendering concept, we estimated 154,000 cy of soil will be graded.

3. Site Revegetation

Site grading will create surfaces at varied elevations relative to the Lake Ewauna water surface elevation which is relatively static. Elevations and associated water depths are intended to support different types of native wetland vegetation based on inundation preferences. Our cost estimate is based on a multiphase planting effort that would rely on plants and plugs that are grown out in a nursery in advance of the project. Planting would be phased over two or three growing seasons which would also require pumping down the project area to enable planting crew access. This is a high cost approach that we anticipate would result in the most expedient coverage of the project area. A considerably lower cost option would be to primarily rely on seeding and natural recruitment. A concept-level seeding cost is \$12,075. An intermediate effort could include planting and seeding in one season, as well as natural recruitment over time.

4. Pedestrian Bridge

The project concept includes two pedestrian bridges that would be located at water control structure locations positioned at the project area inlet and outlet connections with Lake Ewauna. We requested pedestrian bridge costs from Contech and Bridge Brothers. The pedestrian truss bridges have a 20 ft span and 10 ft width. The bridges are made from weathered steel (corten) and would be set on concrete abutments. Figure 1 is an example Connector truss bridge from Contech. Bridge dimensions and materials could be revised to meet stakeholder needs and costs. The pedestrian bridges would be installed with a crane or appropriately outfitted tracked excavator.



Figure 1. An example Connector Pedestrian Truss bridge from Contech.

5. Vehicle Bridge

The vehicle bridge would be located on the earthen levee that currently separate the Wing Watcher pond from the southern property. The bridge would allow for continued vehicle access to the property for future maintenance activities. Contech provided a cost for a Big R rolled girder modular bridge with a 20 ft length and 10 ft width (Figure 2). The bridge would be load rated to 80,000 lbs which should be sufficient for transporting a tracked excavator on a lowboy trailer. A crane would be used to set the vehicle bridge on concrete abutments.



Figure 2. An example Big R rolled girder modular bridge from Contech.

6. Pipe Arch Culvert

A pipe arch culvert would be placed on the west side of the project area where the West Wetland drains to the South Wetland. The pipe arch culvert would provide pedestrian and vehicle access to the western trail network (Figure 3).



Figure 3. An example pipe arch culvert.

7. Observation Platforms

We included two observation platforms in the project area to provide visitors with opportunities to view water birds and wildlife (Figure 4). Platforms would be pile supported and composed of composite decking. Story boards with educational information could also be placed on the platforms. Railings could be installed for safety. Platform size and materials would be finalized during the design process.



Figure 4. An example observation platform with storyboard.

8. Water Control Structures

We included two water control structures, one at the upstream inlet from Lake Ewauna into the project area, and one at the downstream outlet from the project area to Lake Ewauna. The water control structure would likely be simple concrete weirs with steel angle receivers that would accommodate steel sheets when managers want to isolate the project area from Lake Ewauna (Figure 5). The water control structures would be placed below the pedestrian bridges to improve access to the structures. A third structure could also be added to where the vehicle bridge is planned if additional water control is desired. The structures would be at least wide enough to allow for canoe passage and water exchange between Lake Ewauna and the project area. We have not developed a design for the water control structures and therefore applied a conservative cost estimate for the two structures.



Figure 5. An example weir that would be used to control flow between Lake Ewauna and the project area.

9. Levee Repair

The earthen levee that separates the project site from Lake Ewauna is susceptible to erosion due to the water surface elevation difference between Lake Ewauna and the interior project area, and from winddriven waves that hit the levee especially during winter. To counteract the hydrostatic pressure resulting from the water surface elevation difference, we are proposing to equalize the project area water surface elevation and the Lake Ewauna water surface elevation. We have also included a cost item for a bioengineering treatment on the Lake Ewauna side of the levee to counter wave erosion. The bioengineering treatment would emulate wetland vegetation that has colonized areas of shallow sloping bankline. The proposed treatment would include placing alluvium to flatten lake margin bed slopes, and constructing brush and willow fascines to dissipate wave energy and promote site revegetation. These treatments would be focused on areas that are currently experiencing bank erosion. We provide a cost to treat 25 percent of the 5,500 ft-long levee. The treatment length could be further reduced with additional site investigation.

10. Pump Station Repair

A pump will be required for periodically managing water in the project area. We have included a cost to repair the existing pump, a pump may be rented when needed, or a new pump could be purchased if necessary. Because we are unsure of the manager's preferred direction, we included a cost item that could be revised with stakeholder input.

A concept cost estimate for the project is included as attachment A. Cost items will be refined through the design process.

Respectfully,

Tray h. Kart

Troy Brandt Principal Biologist

Attachment A – Conceptual Design Cost Estimate

Project:	LAKE EWAUNA WETLAND RESTORATION	1			
Date:	4/14/2024				
EXPENSE CATEGORY			COST ESTIMATE		
SOFT COS	TS				
Engineering & Environmental Services 9% of construction cost			\$	260,231	
Cultural &	Cultural & Environmental Studies			\$	30,000
Project Management, Administration & PR 4% of total cost		of total cost	\$	132,245	
Permit Fees		3% (3% of construction cost		86,744
Soft Cost C	ontingency	10%		\$	37,697
			Soft Cost Subtotal	\$	546,916
CONSTRU	CTION COSTS				
Phase 2 W	ing Watchers Wetland Restoration & Phase	3 Wetland Park Dev	elopment		
Cost Ite	im	Units	Unit Cost		Item Cost
1 Projec	t Area Dewatering	1	\$100,000		\$100,000
2 Gradin	g	154,000 cy	\$9 per cy		\$1,386,000
3 Revege	tation	197,000 plants	\$0.85 per plant		\$167,450
4 Pedest	rian Bridge Allowance	2 bridges	\$65,000		\$130,000
5 Pedest	rian Bridge Installation	2 bridges	\$50,000		\$100,000
6 Vehicl	e Bridge Allowance	1 bridge	\$45,000		\$45,000
7 Vehicl	e Bridge Installation	1 bridge	\$50,000		\$50,000
8 Pipe Ar	ch Culvert Installation	1 culvert	\$50,000		\$50,000
9 Observ	ation Platforms Installation	2 platforms	\$125,000		\$250,000
10 Water	Control Structures Installation (Type TBD)	2 structures	\$100,000		\$200,000
11 Levee F	Repair and Stabilization	1,815 ft	\$200 per ft		\$363,000
12 Existin	g Pump Station Repair	1	\$50,000		\$50,000
			Construction Subtotal	\$	2,891,450
Constr	uction Contingency		10%	\$	289,145
TOTAL PH	ASE 2 & 3 PROJECT COST			\$	3,727,511

PLEASE NOTE: It is recommended to add 3% for each year after 2024