



DUCKS UNLIMITED

Leader in Wetlands Conservation

October 15, 2014

Oregon Watershed Enhancement Board
c/o Linda Burnett
775 Summer Street NE
Salem, Oregon 97301

SUBJECT: Proposed Focused Investment Partnership Priority Response – “SONEC Closed Basin Floodplains”

Dear OWEB Board,

On behalf of Lake County Conservation Partners and the SONEC Regional Partnership, please find attached our proposal for “*Southern Oregon / Northeastern California (SONEC) Closed Basin Floodplains*” to be considered as an OWEB Focused Investment Partnership Priority. For ten years this robust and effective partnership has worked in the SONEC waterfowl priority region to bring awareness to, increase understanding of, and restore function to the flood-irrigated historic floodplains that are critically tied to continental waterfowl populations, maintenance of federally protected fisheries, and the viability of a \$170 million rural economy.

Within the SONEC landscape, historic floodplains have been converted to flood-irrigated wet meadows and native pastures to support livestock operations. Those flood-irrigation practices now mimic the historic floodplain processes that support continentally significant proportions of North American waterfowl and waterbirds, federally protected fish species, and values and services depended upon by producers for viable operations. Maintenance and enhancement of these practices is critically urgent to protect the ecological, economic, and social resources inherently tied to the SONEC floodplains.

The SONEC partnership, made of up local, state, regional, and national conservation partners, has made recent investments in science, capacity, and federal funding to support the momentum of landowner interest and strategically implement restoration actions. Recognition of SONEC Closed Basin Floodplains as a FIP Priority is ideally timed to fully maximize ecological outcomes for the benefit of these critical fish and wildlife resources while protecting the social and economic integrity of rural southern Oregon.

Please feel free to contact me directly with questions or requests for additional information. The SONEC Regional Partnership would welcome the opportunity to provide a presentation to the OWEB Board on the SONEC Closed Basin Floodplains. Thank you in advance for consideration of our proposed priority. We look forward to hearing from you.

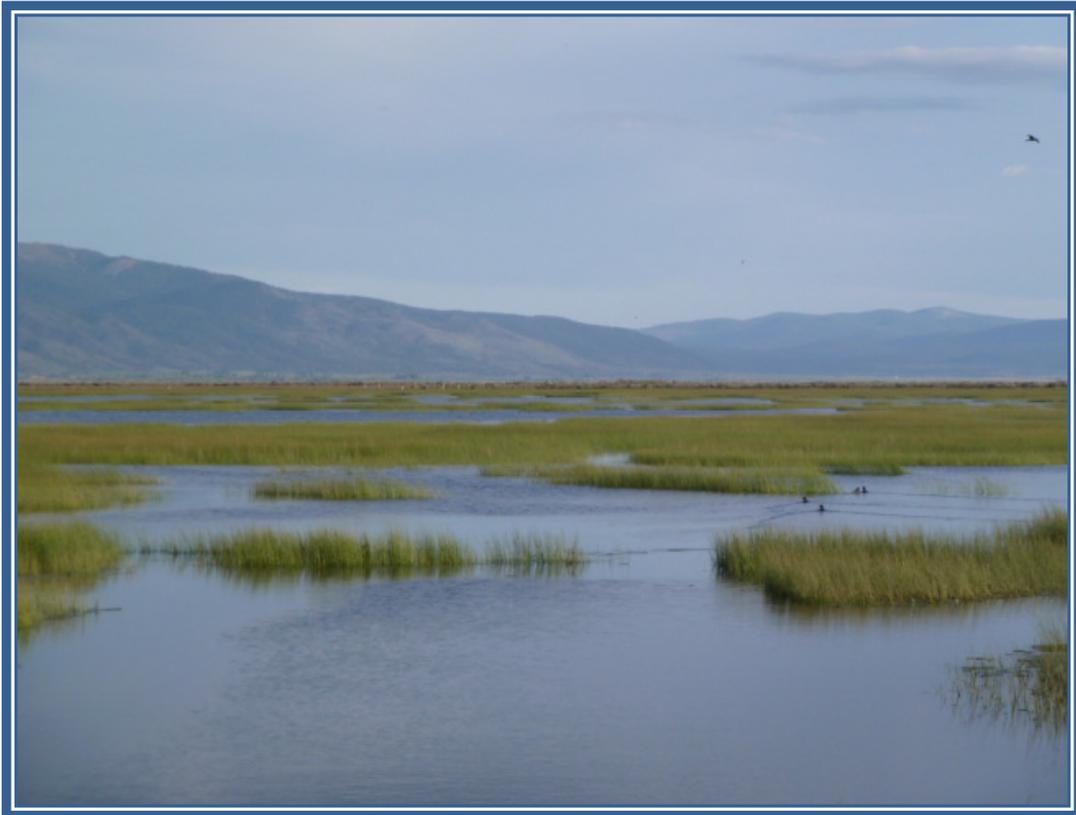
Respectfully submitted,

Chris Colson
Regional Biologist

SOUTHERN OREGON / NORTHEASTERN CALIFORNIA (SONEC) CLOSED BASIN FLOODPLAINS

OWEB Focused Investment Priority Proposal

October 15, 2014



Submitted on Behalf of:

Lake County Conservation Partners of the SONEC Regional Partnership

1. PROPOSED PRIORITY DESCRIPTION

The interior closed basin floodplains of Southern Oregon and Northeastern California are continentally recognized as the SONEC waterfowl priority region (**Figure 1**). The SONEC is a unique landscape of the Intermountain West with a dense spatial concentration of wetland habitat exclusive to the remote high desert region of Oregon and California. The majority of the habitat historically existed as natural riverine and lacustrine floodplain systems that are now predominantly in private ownership and managed with flood-irrigation to produce forage for livestock operations; a **\$170 million** industry in Klamath, Harney and Lake Counties, (USDA 2012). These managed floodplains, or working wetlands, serve as the socioeconomic foundation for rural southern Oregon communities while providing continentally critical habitat for waterfowl, maintenance of cool and enduring in-stream flows for at-risk aquatic species, and brooding and rearing habitat for Greater Sage-Grouse.

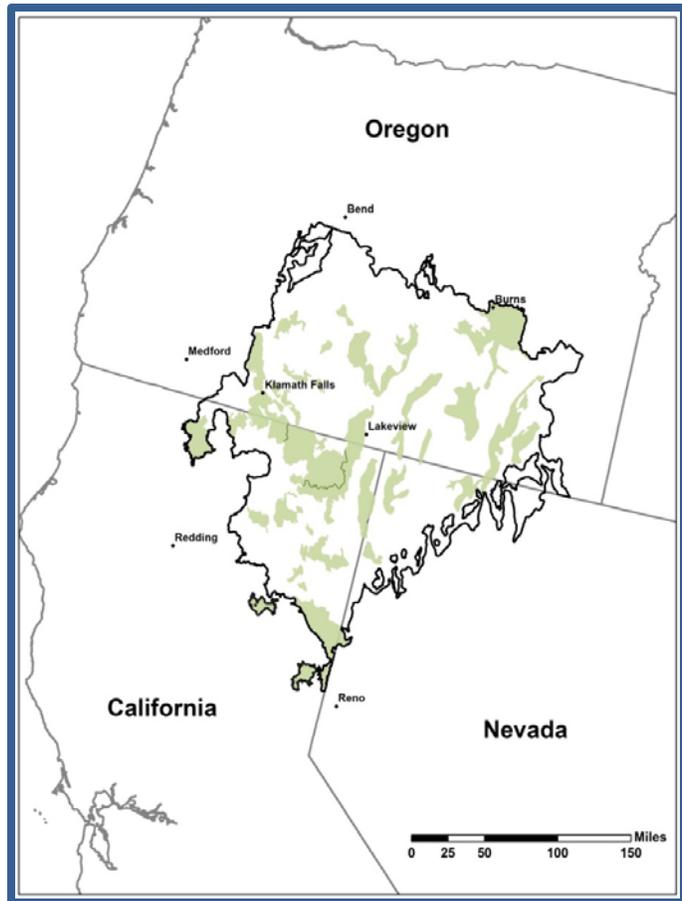


Figure 1. Extent of SONEC and prioritized sub-basins.

The SONEC landscape in southern Oregon includes 19 sub-basins constituting 2,844,496 acres of floodplain habitat across Oregon (**Table 1**). The Intermountain West Joint Venture (www.iwjv.org) (IWJV), in conjunction with goals established in the North American Waterfowl Management Plan (NAWMP 2012), has identified an acreage objective of 64,700 acres in the SONEC to support continental waterfowl population goals (IWJV 2013). This acreage objective was developed, in part, with consideration of the bioenergetic demands (i.e. *energy required to migrate from wintering areas to breeding grounds in sufficient health to breed successfully*) of spring migrating waterfowl in the Pacific Flyway. Estimates of waterfowl food densities in flood-irrigated wet meadows were used to calculate the amount of wetland habitat required to meet the population energy demands in each SONEC sub-basin (Dugger et al 2007). Efforts are underway (to be discussed later) to leverage federal funding for implementing conservation efforts on approximately 31,280 acres over the next five years.

Table 1. Distribution and Acreage of Sub-basins in Oregon Counties Across the SONEC Waterfowl Priority Region					
Klamath		Lake		Harney	
Subbasin	Acres	Subbasin	Acres	Subbasin	Acres
Klamath Marsh	79,505	Alkali Lakes	117,210	Catlow Valley Coyote Lake Basin Harney Basin Peublo Valley	291,785 138,087 647,015 305,862
Lower Klamath Basin	166,248	Chewaucan Marsh	76,456		
Sprague River Valley	61,381	Goose Lake Basin	164,897		
Swan Valley	25,724	Guano Valley	44,927		
Upper Klamath Basin	182,782	Lake Abert	60,819		
Yonna / Langell Valleys	50,022	Paulina Marsh / Silver Lake	36,717		
		Summer Lake Basin	156,169		
		Sycan Marsh	23,257		
		Warner Valley	215,633		
TOTAL ACRES	565,662		896,085		
					2,844,496

The SONEC landscape has been clearly defined by the IWJV (2013) (Figure 1). It is also recognized and identified in all four continental bird plans (NAWMP 2012, Rich et al 2004, Kushlan et al 2002, Brown et al 2001). Within the SONEC landscape, the specific sub-basins have also been identified. Specific to Northern Pintail, radio telemetry studies have demonstrated the prevalence of bird use within these basins (Figure 2) (Fleske and Yee 2007, Fleske and Gregory 2010). This decision-support tool does not account for other important waterbird species in SONEC. For instance, highly saline wetlands such as Lake Abert provide foraging and breeding habitat for Snowy Plovers and Wilson’s Phalarope. Evaluations of unique habitat use by specialist species have been initiated by the NRCS and IWJV (Donnelly and Vest 2014). This science investment will further refine where strategic efforts will yield the greatest ecological outcomes.

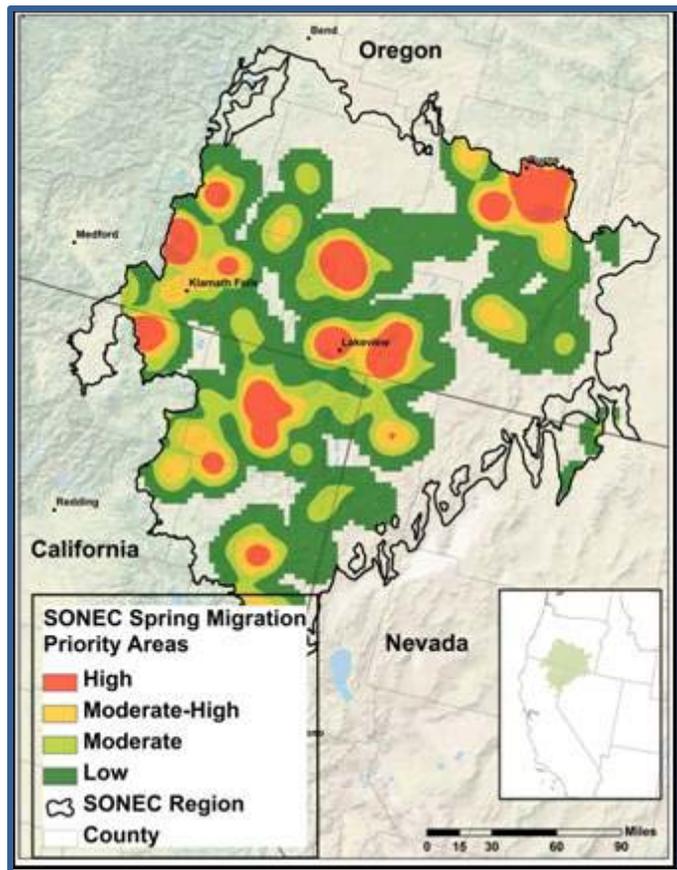


Figure 2. Density and distribution of Northern Pintails in the SONEC region.

2. SIGNIFICANCE TO THE STATE

SONEC annually supports 70% of the Pacific Flyway’s waterfowl population during spring migration. Research has shown that over 6 million waterbirds annually pass through SONEC on their way to breeding grounds in Canada and Alaska. It is recognized by the IWJV as one of the two most important geographic priorities for wetland dependent birds in the Intermountain West (Donnelly and Vest 2012).

The SONEC's attraction to migrating birds is tied to its high concentration of wetland habitat. The IWJV landscape covers eleven Western states and SONEC comprises a mere 0.2% of the total land mass area. However, a demonstrable 15% of all wetland habitat in the IWJV occurs in SONEC. Among the 6 million birds, continentally significant proportions of many species are dependent upon SONEC:

- **30% of the continental population of Northern Pintail**
- **21% of the continental population of White-faced Ibis**
- **20% of the continental breeding populations of Cinnamon Teal**
- **50% of the Pacific Flyway population of Greater White-Fronted Geese**
- **18% of the Pacific Flyway breeding population of Mallards and Redheads**
- **80% of the western population of Tundra Swans**



Applied research by the USGS has identified the pivotal role SONEC habitats play in the annual cycle of migratory waterfowl by serving as key stopover habitat between primary wintering areas in California and breeding areas throughout North America (Miller et al. 2005, Fleskes and Yee 2007, Fleskes and Gregory 2010). Failure to conserve this habitat resource could result in adverse continental implications to wetland dependent birds.

Emerging spatial research has further established the critical role interior wetlands play in the sagebrush steppe to the Federal Candidate Species Greater Sage-Grouse for brooding and rearing of young (Donnelly et al. 2014). Observations have demonstrated that >80% of breeding distributions of Greater Sage-Grouse are clustered within 10km of wetlands, suggesting hens will lead their broods overland to forage in these productive wetland habitats. The concentration of wetlands in the SONEC is likely correlated to the relatively dense populations of Greater Sage-Grouse in southeastern Oregon.

Within the SONEC, 75% of the wetland habitat is in private ownership and managed as flood-irrigated hay and pasture lands (IWJV 2013). These working wetlands mimic the historic floodplain function by artificially flooding from in-stream points of diversion. Long-term sustainability of these floodplain mimicking practices requires the refurbishment of aging irrigation infrastructure. The use of public funds to repair these poorly designed structures allows conservation practitioners the opportunity to install fish passage and screening mechanisms. Migration obstacles and entrainment are the limiting factors to the recovery of the federally threatened Warner Sucker and the endangered Modoc Sucker in Lake County, and the 'species of concern' Northern Great Basin Redband Trout in eastern Oregon. Maintenance of the floodplain function by means of flood-irrigation is critical in ameliorating stream temperature and increasing seasonal stream flow duration by way of groundwater recirculation. Water seeks to balance with ambient environmental temperature. Subterranean temperatures generally are

much cooler than surface air temperatures. Arresting and restoring stream entrenchment corrects the French drain effect occurring in many streams and respective floodplains in Lake County and across the SONEC.

SONEC wetlands are predominately associated with historic riverine and lacustrine floodplains. These floodplains were valued by settlers for their highly productive soils and relatively abundant hydrology within an arid landscape. Ideally suited for livestock operations, landowners quickly sought to domesticate the water - reducing the variable impacts of spring floods and late season drought. The landscape was consequently transformed to a highly complex and intensively managed system of flood-irrigation infrastructure. Nonetheless, the fish and wildlife habitat and ecological processes associated with these floodplains remains relatively intact.

However, failing infrastructure threatens to eliminate the resource values and services of these working wetlands. Above and beyond the adverse impacts to fish and wildlife resources, the economic viability of operations has also suffered. Maintenance of flood-irrigation practices in historic floodplains is critical to the natural and socioeconomic resources inherent to the SONEC landscape. With 75% of SONEC wetlands occurring on private working lands, the economic viability needs to be addressed in conjunction with ecological priorities. Fortunately the solutions are not mutually exclusive.

It should be noted that this is in contrast to water conservation efforts in the uplands where converting to sprinkler irrigation is preferred. The absence of the floodplain bathtub and historic groundwater recirculating substrates in the uplands does indeed make flood-irrigation imprudent. Typically conversion to sprinkler irrigation in the uplands does result in gains in water use efficiency and agriculture viability, specific to those upland operations.

As previously mentioned, the SONEC landscape is recognized in the four major continental bird plans (NAWMP 2012, Rich et al 2004, Kushlan et al 2002, Brown et al 2001). These bird plans were developed by consortiums of avian scientists, conservation practitioners, and land managers to identify habitat threats and limitations to guilds and species of birds across North America. The specific recognition of the SONEC landscape within these international plans is a testament to its critical role in maintaining continental waterbird *and* landbird populations.

To reiterate, SONEC is recognized by the IWJV as one of the two most important geographic priorities for wetland dependent birds in the Intermountain West (Donnelly and Vest 2012, IWJV 2013). In response, the Oregon NRCS has developed the Working Lands for Waterbird Conservation Implementation Strategy (CIS) (2014). This CIS recognizes the urgent need to maintain and enhance flood-irrigation practices on private working lands in the SONEC region. Locally, in Lake County, the Lake County Umbrella Watershed Council's (LCUWC) Strategic Action Plan (2012) and the Goose Lake Fishes Working Group (1995) recognize the need to restore stream reaches for the benefit of floodplain functions and processes and aquatic resource habitat.

3. LIMITING FACTORS

Undoubtedly, the most important limiting factor to the maintenance of SONEC floodplains is the continued and future unidirectional loss of flood-irrigation practices on private lands. Once landowners invest in sprinkler irrigation, the associative costs and ancillary operational investments make return to flood-irrigation cost prohibitive. To restate the urgency of addressing this trend, the conversion to sprinkler is unidirectional and seldom, if ever, reversed. Total abandonment of agriculture and the establishment of residential infrastructure also threaten flood-irrigation practices. Where this has occurred, there is little tolerance for flooding and traditional operators must restrict their flood-irrigation practices. This in turn often leads to additional losses of flood-irrigated lands. As flood-irrigation acres are converted or lost, the ability to meet IWJV bioenergetic and acreage habitat objectives becomes increasingly difficult.

Water rights and management decisions are also impacting wetland resources on wetland-managed public lands. In 2013, the Klamath Basin Restoration Agreement resulted in only 1/3 of the Lower Klamath National Wildlife Refuge's 30,000 acres of wetlands receiving water. As it relates to the IWJV's acreage objectives, this represents an approximate 20,000 wetland acre deficit that may never be perennially realized in the future. Birds are fortunate in that they can take wing to accommodate temporal and spatial fluctuations in resource availability, provided they can find those resources elsewhere on the staging landscape, specifically in Lake and Harney Counties. The urgency of increasing floodplain conservation efforts in SONEC is imperative.

The Oregon SONEC partnership, including the IWJV, NRCS, DU, U.S. Fish and Wildlife Service, Lake County Umbrella Watershed Council (LCUWC) and Lake County Soil and Water Conservation Districts (SWCD), and Oregon Department of Fish and Wildlife, is working diligently in both Lake and Harney Counties to maintain and enhance flood-irrigation practices. However, invasive carp in the Harney Basin further limits acre objectives in that subbasin. The spawning habits of invasive carp destroy emergent vegetation that migrating waterbirds are critically dependent upon. While the partnership is developing and implementing strategies to overcome the negative influence of carp, the occurrence of this species in the basin presently exists as a detriment to the biological demands of waterfowl.

The SONEC partnership will also continue to work towards conserving and restoring the unique wetland habitats of the SONEC region for the benefits of specialized wetland dependent birds. These habitats include the perennial wetland sources that can be limited during fall migration and overwintering in the arid Intermountain West. Many of these features are also in public ownership including Summer Lake Wildlife Area, Warner Wetlands Area of Critical Ecological Concern, and Malheur National Wildlife Refuge. The partnership, led by the IWJV, will continue developing the science (Donnelly and Vest 2012) that identifies conservation priorities such as limited saline habitats found exclusively at Lake Abert.

The IWJV Implementation Plan (2013) and NRCS "Farm Bill Conservation Programs Can help Meet the Needs of Spring-Migrating Waterfowl in Southern Oregon-Northeastern California" Conservation Effects Assessment Project (CEAP) (2013) both define the present urgencies and threats and outline respective

approaches to provide for the identified resource need. **Maintenance and enhancement of flood-irrigation practices in historic floodplains is the primary foundation of each respective strategy.**

4. THREATS AND BENEFITS

Flood-irrigation continues to be a cost-effective agricultural practice for producing livestock forage. Spreading water across wet meadows and native pasture recharges floodplain aquifers and maintains stream flows. Decades of overgrazing in the stream systems and channeling has resulted in pervasive entrenchment and widening of channels. Stream entrenchment in floodplains functions as a French drain ultimately lowering the groundwater table. The resulting losses in groundwater elevations decrease water-use efficiency of irrigation practices requiring more water to maintain the same vegetative production. Over the past decade, operators have resorted to the conversion to pivot/sprinkler irrigation. In fact, between 2000 and 2005, 16% of flood-irrigated acres in the West have been lost while sprinkler irrigation has increased by 9% (Kenny et al 2009). This trend is unidirectional – once converted, landowners typically do not return to flood-irrigation – their investment is too great to abandon. The investment of the pivot and annual costs associated with pumping water and running the pivot result in expenses not previously incurred by the operation. The landowner must now respond accordingly with the selection and management of commodities being produced. Typically the selected crops and their respective management is rarely conducive to fish and wildlife habitat.

The conversion to sprinkler irrigation also presents a variety of problems in the managed floodplain:

1. Sprinklers are typically sourced from pumped groundwater further decreasing groundwater elevations and reducing their neighbor's ability to flood-irrigate efficiently.
2. A conversion to non-grain annual agriculture typically accompanies the sprinkler. Producers are typically less tolerant of flooding with these commodities often restricting their neighbor's ability to continue flood-irrigation.
3. Pivots installed adjacent to stream systems remove the facility of the stream to migrate and recover its historic sinuosity as landowners often armor streambanks to protect their investment.



Oregon partnerships in the SONEC focus their efforts on conservation measures to maintain and enhance flood-irrigation practices for the benefit of the economic stability of the rural communities, maintenance of floodplain values and services, and habitat for fish and wildlife species. If these threats are not addressed, unidirectional abandonment of flood-irrigation practices will persist, imposing negative impacts to fish and wildlife habitat and community economic viability. Continentally, waterfowl and waterbird populations dependent on SONEC wetland resources will be negatively impacted. The loss of flood-irrigation may compel Endangered Species Act implications for these declining birds. As

conversion occurs locally on the landscape, anecdotal observations across the Intermountain West suggest that the conversion rates are increasing exponentially. Failure to address stream stabilization issues will encourage continued entrenchment of streams further restricting efficient and effective flood-irrigation practices. Forsaking fish passage and screening at points of diversion will continue to imperil aquatic species-at-risk.

The overwhelming beauty of the priority being presented is that the collective solution has significant and measurable mutual benefits for a broad range of economic, social, *and ecological* interests. The SONEC region, and its working wetlands, is the cornerstone for more than a century of historic livestock culture. The region, and much of the irrigation infrastructure that serves as its bloodline, was developed almost solely by a handful of enterprising cowboy icons such as Bill Kitt and Peter French. Their recognition of the landscape's value and their inherent ability to influence it has endured for more than a century, establishing a string of communities ripe with generational grit and affection for the land. The continued loss of this \$170 million habitat resource (USDA 2012) will result in the diffusion and dispersal of this traditional landscape and the families that define it. Maintenance and enhancement of flood-irrigation practices will ensure the persistence of this cultural landscape replete with skies full of waterfowl, streams full of fish, and floodplains full to the rim.



To date, the SONEC partnership has seen great success in addressing the priority. As a partner, OWEB has already invested \$2,314,349 in wetland habitat related projects across Harney, Klamath, and Lake Counties. In Lake County, DU has worked primarily with the LCUWC, the Lakeview SWCD and the Fort Rock / Silver Lake SWCD to leverage \$1,123,075 in OWEB funds establishing four standard North American Wetland Conservation Act (NAWCA) grants totaling \$4 million in federal funds being spent locally for wetland habitat projects addressing more than 18,371 acres. DU and its partners have

recently submitted their fifth Lake County standard NAWCA grant requesting \$1 million in federal funds where OWEB funds totaling \$660,467 were matched to address more than 9,255 acres. On Thomas Creek alone, the major floodplain vein of the Goose Lake Basin, the LCUWC has removed 20 tons of tires, replaced three major points of diversion and restored fish passage at two of them, planted 6000 willows along 8 miles of stream, excluded livestock along 10 miles of stream, and stabilized 4000 feet of stream while arresting 6 headcuts and reconnecting 300 feet of channel.

More recently, programmatic efforts initiated by the IWJV have resulted in a partnership with the NRCS, DU, and USFWS to fund two SONEC Strategic Watershed Action Team positions to enhance delivery capabilities in Lake and Harney Counties of Oregon. This is in response to the NRCS CEAP and CIS previously mentioned and in preparation for the NRCS Regional Conservation Partnership Program (RCPP) proposal prepared by the IWJV and partners for the SONEC region. The proposal requests \$5,554,000 in federal funds leveraged against \$7,438,161 in partner contributions to implement conservation projects on 22,025 acres in the SONEC. OWEB is recognized in this proposal as a major partner.

Within the RCPP, the federal funding request was leveraged in-part with a \$3 million contribution from OWEB through their competitive grants over the next five years. Within the proposal, federal funds are requested to address 14,725 acres through Farm Bill programs. The partnership has challenged itself to implement the remaining 7,300 acres with OWEB funds. Envisioned through the successful awards of multiple restoration grant proposals over five years, the \$3 million in OWEB is necessary to achieve the 22,025 acre objective and to maintain the proposed contribution ratio of the requested funds. The IWJV and SONEC partners that developed the proposal considered the OWEB contribution in concert with the Lake and Harney County respective FIP proposals. Assuming both the RCPP and NAWCA proposals are successful, and OWEB contribution estimates are realized, it is reasonable to assume that projects consistent with priority objectives and acreage goals will be realized over five years. This timeline is consistent with expectations within both the RCPP and NAWCA proposals.

5. OPPORTUNITIES

As previously discussed, efforts undertaken by the USGS, IWJV, and DU have identified the acreage necessary to meet the bioenergetic demands of the waterbird population goals identified in international bird plans. While the SONEC partnership is still developing the mechanisms to identify measureable outcomes for floodplain processes and socioeconomic factors, it is generally believed that addressing greater than 30,000 acres over the next five years will result in a positive impact to these ecological and social resources.

Prior to the determination of acreage goals, DU alone had conserved, restored and/or enhanced greater than 36,000 acres in the SONEC over the last 10 years. While the NAWCA, RCPP, and OWEB contributions are being sought to address only half of the 64,700 acreage goal, the SONEC partnership momentum is stronger than ever and achieving the remaining acres over the next 10 years is deemed readily attainable.

This is due in part to the implementation of successful projects where landowner appreciation and public perception has experienced exponential growth in the region. The successes, continued developments in science, and establishment of private landowner conservation programs have been presented and distributed to the public in media productions such as the “Making Hay in the Flyway” video and the recent “Keeping Ranchers and Birds in Business” pamphlet.

The SONEC partnership will maintain momentum by continuing to engage private landowners and operators in the landscape. Promotion of the priority has enabled landowners to better understand their connection to the land and the delicate balance between landscape production, tolerance, resiliency and degradation. We have been observing increases in landowner investment in conservation efforts. They understand that a well-functioning floodplain translates to a viable and sustainable economic operation.

There are merited reasons to divide the priority into multiple geographic areas. As described in their respective FIP proposal, the Harney Basin is plagued by invasive carp. This issue must be taken into consideration and will strongly dictate conservation actions in that basin. Conversely, Lake County has three at-risk aquatic species. Ten years of conservation efforts in Lake County were initially undertaken in an opportunistic approach in order to develop momentum with landowners. Now, landowner demand exceeds available funding and the Lake County partnership is afforded the opportunity to be more strategic with project implementation. The LCUWC will continue their effective stream assessment efforts to identify in-stream priorities while the IWJV will continue to develop their wetland focal priorities across the landscape. As strategic projects are identified within focal areas, it will be feasible to focus on individual floodplains to achieve cost-effective maximum outcome. Initial consideration among the Lake County partnership has identified the Thomas Creek watershed within the Goose Lake Basin as its likely focus.

As made evident by discussion of the priority thus far, a robust and effective partnership of local, state, and regional entities is firmly established within the SONEC region of Oregon. The broad partnership has been addressing this problem for greater than ten years and has an extensive portfolio of positive outcomes on the ground. Science partners are developing the methods to correlate habitat accomplishment to measurable ecological outcomes (i.e. *number of acres needed to meet bioenergetic demands of migrating waterfowl population objectives*). Partners have used the science to promote the engagement of additional partners and the development of conservation programs to fund future projects. SONEC partners have come together time and again on OWEB and NAWCA proposals to successfully leverage funds to collective ecological gain. Most recently the partnership has once again combined efforts to develop the RCPP proposal to request more than \$5 million in federal funds. More importantly, the SONEC conservation community is effectively engaging the agricultural community to increase the pace of floodplain restoration for the benefit of multiple ecological and socioeconomic resources.

Landowner recognition of their role in the landscape is in the midst of transition. The SONEC partnership has spent considerable energy educating landowners that **1) continental waterfowl populations are critically dependent on their flood-irrigation practices; 2) the endemic fish species that**

occur exclusively in their streams are dependent on them keeping the floodplain alive; and that 3) their actions directly affect the economic viability of their neighbors. This is a message that landowners and operators are readily taking responsibility for and engaging with the partnership on solutions. Recently, a private landowner in Lake County accompanied a contingent of IWJV and DU staff to Washington D.C. to discuss the SONEC priority with legislators and national NRCS staff. The previously mentioned accomplishments of the LCUWC and DU over the last ten years were almost wholly on private working lands. These accomplishments and the momentum it has generated are unprecedented. Furthermore, the downstream nature of the resources being addressed needs urgent and strategic action. Efforts taken to restore floodplain processes, fish passage, stream stability, and water-use efficiency are both strengthened and limited by the state of affairs upstream. It is critically urgent to respond to the present landowner interest in order to maximize opportunities affording downstream gains.

The anticipated educational benefits of designating SONEC as a Focused Investment Priority are significant. There is an opportunity to demonstrate that collaboration between the private livestock industry and conservation organizations can have positive natural resource outcomes. Over the past few decades, livestock grazing has been viewed as an abusive practice on our landscape, particularly affecting aquatic resources. There is no denying the adverse effects overutilization imposes on riparian areas and streambank stability. However, SONEC livestock producers are increasingly aware that their flood-irrigated wet meadows and pastures are closely tied to stream condition. Most stream stabilization projects in Lake County have included the implementation of livestock fencing to enable pasture rotation, riparian flash grazing, and exclusion. The recognition of flood-irrigation in the historic floodplains and the benefits it returns to waterfowl and aquatic species is unique – few other human land uses adequately mimic historical ecological functions as flood irrigation in floodplains. Application of these principles and replication of the solutions will be critical across the entire Intermountain West as water becomes increasingly limited. The SONEC landscape in Oregon is well positioned to serve as the educational template for promoting the role that working wetlands play in maintaining floodplains across the West.

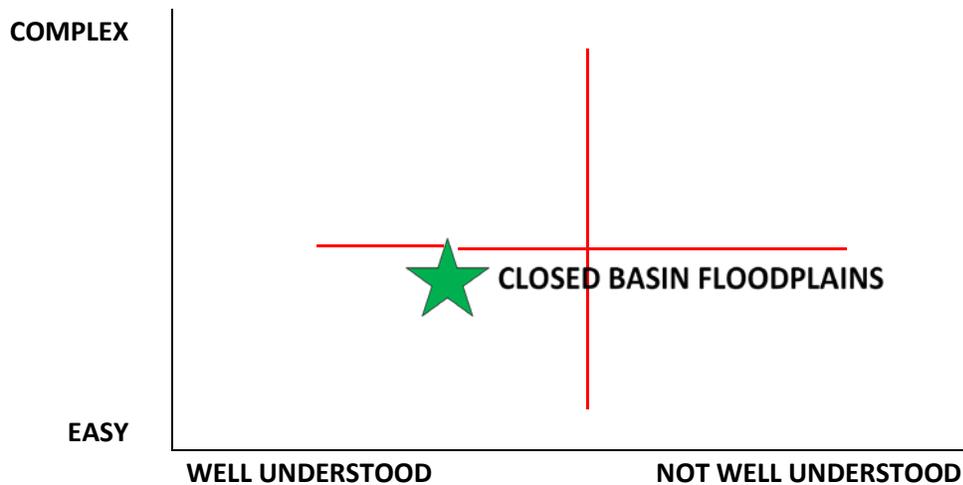
The recent efforts to leverage federal funding to this priority have already been presented. To date, the majority of funding applied to the SONEC landscape has been rooted in fish, wildlife, and watershed interests. The SONEC partnership intends to promote the priority to a wider audience and garner additional support. For instance, in Harney County, FEMA has committed to fly LiDAR across the Silvies River floodplain. Malheur NWR has invested in this opportunity by adding refuge lands to this survey effort. LiDAR will serve as an invaluable tool for broad conceptual planning.

Development of the economic connection between floodplain processes and agricultural viability have been discussed. The establishment of this union will encourage landowner investment and financial contribution to restorative projects. Though not being detailed in this document, the contributions of flood-irrigated native pasture to water quality are profound. The mimicking of floodplain function in this land practice and the filtering utility of wet meadow vegetation and groundwater recirculation ensures the return of cool, clean water to stream systems. SONEC practitioners believe there are opportunities to leverage water quality funds that have been minimally applied in the SONEC region to date. The

benefits of floodplain restoration to water quantity have been presented in previous sections above. Continued gains in overturning the misinterpretation of flood-irrigation in historic floodplains as improvident will yield support from water conservation entities. These gains are being realized in other Intermountain West regions and will be discussed in more detail later.

As it relates to landowner interest and the momentum presently observed, few things resonate as profoundly as economic impact to private enterprise. As producers formulate and acknowledge the association that a properly functioning stream and floodplain is directly coupled to the economic viability of their operation, a revolution in land management and stewardship is achieved. The SONEC partnership's habitat restoration has made this demonstration consistently with past projects. The refurbishment of irrigation infrastructure has provided increased water-use efficiency resulting in increased irrigated acres across the floodplain while augmenting in-stream flows. These actions generate higher production in wet meadows and pastures. Juniper cutting has amplified upland spring sources contributing to downstream gains in water quantities. The reduction in exorbitant evapotranspiration rates of encroached juniper typically results in increases in groundwater. Streambank stabilization and the arresting of headcuts have reversed the loss of stream substrate returning groundwater to historic elevations. More water on the landscape for greater duration translates to greater economic return. As previously mentioned, the SONEC partnership has recently initiated efforts with the USDA ARS to quantify the economic return associated with floodplain restoration.

6. COMPLEXITY AND CURRENT UNDERSTANDING



The placement of our priority in the above graphic was based on our consideration of implementing restoration projects to achieve the acreage objectives, identifying and securing funding, the state of and continued efforts with landowner interest and public education, and increasing the current science related to floodplain processes and agricultural economics.

7. ADDITIONAL INFORMATION

As previously alluded to, there are similar efforts in the Intermountain West where the benefits of flood-irrigation in historic floodplains are now recognized as contributive. In eastern Idaho, the plight of the Eastern Snake River Plain Aquifer (ESPA) is related to the over-adjudication of water rights in the region. This historic crisis is primarily associated with groundwater pumping for irrigation of agricultural lands, specifically commodity crops produced in the uplands. In partnership with the Idaho Water Resource Board (IRB) and other water user interests, DU and the Idaho Department of Fish and Game have been working for years to develop the inherent connection with flood-irrigation in the historic Snake River floodplain and its recharging benefits to the ESPA. This practice is strongly recognized and applied by the IRB. The IRB is the Idaho state lead responsible for restoring the ESPA and achieving sustainability of water use and viability in the agricultural industry. Their endorsement of flood-irrigation across native pastures in the historic floodplain is noteworthy. Wasteful water-use in eastern Idaho is not tolerated. The application of this principle as a solution to the ESPA crisis, where considerable investments in groundwater science have been employed, validates the practice of flood-irrigation as not wasteful. The ESPA partnership has submitted a state-based RCPP proposal requesting federal funding from the NRCS.

8. SUPPORTING PARTNERS

- U.S.D.A. Natural Resources Conservation Service
- U.S. Fish and Wildlife Service
- U.S.D.A. Forest Service
- U.S.D.I. Bureau of Land Management
- Ducks Unlimited
- Simplot Land and Livestock
- Intermountain West Joint Venture
- Northwest Rangeland Trust
- Oregon Department of Fish and Wildlife
- Oregon Watershed Enhancement Board
- Lake County Umbrella Watershed Council
- Lakeview Soil and Water Conservation District
- Ft. Rock / Silver Lake Soil and Water Conservation District
- Private Landowners of the SONEC Waterfowl Priority Region

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