

**Winter Lake Phase III Team
Response to Coos County Development
Staff Report on File # ACU-23-074/FP-23-012**

Date of Coos County Staff Report
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Prepared by

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Introduction

The Winter Lake Phase III Project Team (Project Team) has prepared this response feedback in regard to the 04/10/24 County Planning Staff Report. The Project Team has found that four findings submitted in the County Staff Report on 03/21/24 (below) are repeated verbatim in the 04/10/24 Staff Report. The Project Team fully addressed these items previously on 03/26/24; regardless, the four findings were repeated. Our Project Team response to the 04/10/24 County Planning Staff Report maintains previous responses and are presented below. It is important to note that County Planning staff have determined that the sum of applicable criteria were appropriately addressed through the Conditional Use permit application materials submitted as noted in the County Planning staff report (Staff Report 03/21/24).

- Policy #14 – General Policy Uses within the Rural Coastal Shorelands
- Policy #18 – Protection of Historic, Cultural, and Archaeological Sites
- Policy #19 – Management of “Wet-Meadow” wetlands within Coastal Shorelands
- Policy #22 – Mitigation Sites: Protection against Pre-emptory Uses
- Policy #23 – Riparian Vegetation/Streambank Protection
- Policy #27 – Floodplain Protection within Coastal Shorelands

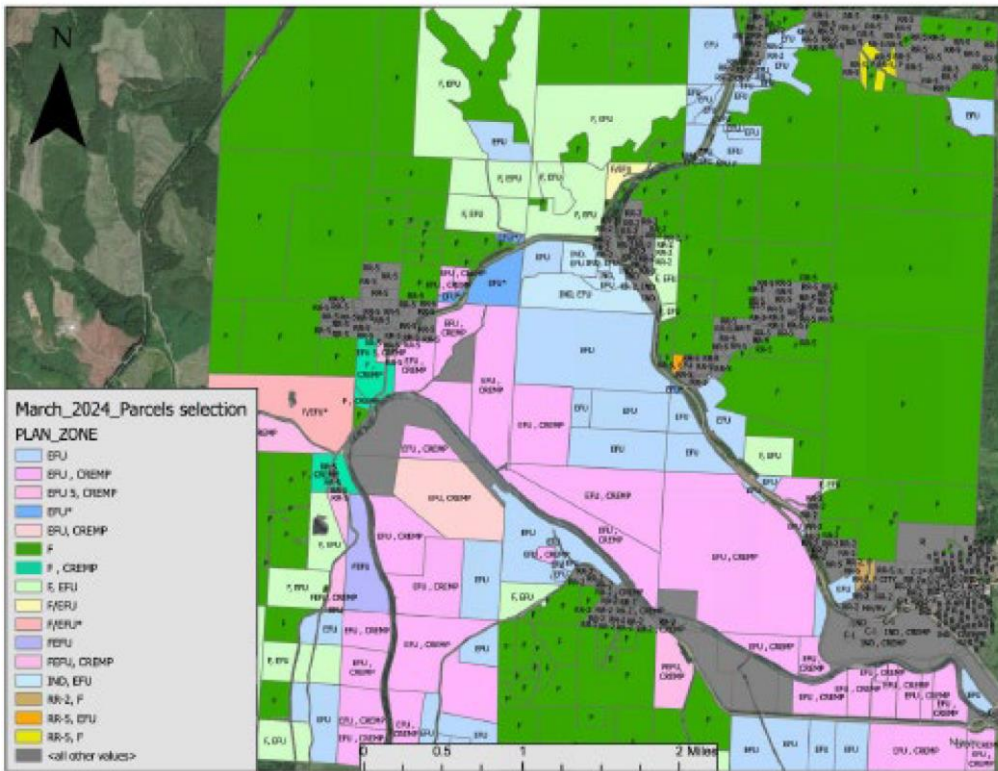
County Planning Finding in 03/21/24 Staff Report (pg. 20) repeated by County Staff Report on 04/10/24 (pg. 24).

FINDING: The applicant is required to do an impacts analysis showing that the proposed use will not force a significant change in accepted farm or forest practices on surrounding properties zoned and devoted to farm or forest. The applicant shall address how the proposal will not increase the cost of accepted farm or forest practices on lands devoted to farm or forest use. The analysis is required to define the study area, look at current practices within that area and then make a determination if the current proposal will significantly force a change in accepted farm and forest practices and if it would increase the cost of accepted farm or forest practices. The applicant submitted this information on March 19, 2024. The full results of the study are found at Attachment A, Application Submittal.

The methodology used by the applicant is as follows:

The Geographic Scope of this analysis includes all parcels within an approximate 1-mile radius of the project area. For this analysis, only lands zoned for farm and/or forestry practices were considered. Properties with industrial, commercial, rural residential, or other zoning were not evaluated for impacts unless combined with a farm or forest plan zoning. It should be noted here that most of the Garden Valley area parcels are zoned RR-5 and were not analyzed according to the selected evaluation criteria.

The results provided a total of 234 parcels for consideration, 15 of which are already included in the proposed project area. Project Area parcels were evaluated separately (see applicants Appendix A. Winter Lake Phase III Project Area and Surrounding Lands Impacts Analysis Tables 1. And 2.) as well as in combination with surrounding land parcels.



Based on the provided details of this enhancement project within the Beaver Slough Drainage District and the Coaledo Drainage District, here are the anticipated significant changes in accepted farm or forest practices and associated costs for adjacent landowners that have been raised:

1. Altered Drainage Patterns and Loss of Water Sources: The replacement and consolidation of pasture culverts, installation of new drainage channels, and repair of failing berms may alter the drainage patterns within the affected areas. This could impact the way adjacent landowners manage water on their properties, potentially requiring adjustments to irrigation systems, drainage infrastructure, water sources or land grading practices. Landowners may need to invest in new equipment or infrastructure to adapt to the changed drainage conditions.

Project Team Response from 03/26/24 (pg. 3); retained in this document addressing the 04/10/24 County Planning Staff Report (pg. 25), which included #1 above from 03/26/24 Response.

The project is specifically designed to establish more natural pathways of drainage in the low-lying elevations. This process incorporated using LiDAR and contracted engineering in the ground surveys. The new and reconstructed channel density will be roughly 2x the existing density per acre over the current and with extended distribution in order to both deliver water during irrigation effectively, however, more importantly to provide for greatly improved drainout in spring and following rainfall or irrigation. These advancements in the channel layout will have strongly positive effects for water management and pasture irrigation on the action area lands. Adjacent lands are not affected by the Phase III actions. The Winter Lake C3P main tidegate controls water delivery to the project area in the Beaver Slough Drainage District (BSDD) and the Coaledo Tidegate serves as the control in the Coaledo Drainage District (CDD). The proposed Phase III work is subservient to the main tidegates and the 39 culverts that will be installed serve internal pastures, not main delivery routes to adjacent properties. The pastures served by the Phase III culverts and tidegates are within pastures with berms. Surrounding lands of pastures within the project area are largely upslope (above elevation 8.0ft) or not directly connected hydrologically in a manner where project actions have potential to cause water delivery effects. Berm repairs are aligned along interior project land parcels. These repairs are not

boundary berms between adjacent lands and thus are only control features for irrigation and floodwater controls on the project area.

Through the past 25+ yrs no channel cleaning has occurred in the action area. This has resulted in the filling of channels through time. The pasture areas have become very difficult to drain in some locations with strong increases in non-palatable pasture plants. Without reestablishing the drainage within the project area EFU pasture operations are economically decreasing in productive capacity. The continued inability to implement Phase III proposed actions will incur an undue forced economic decline on the project area ranchers. All landowners within the project area are ground level advocates for the actions that will provide for improved water management.

The drainage networks that will be reconstructed through Phase III are not directly connected to adjacent lands. The project will install 9 new watering locations for livestock in the project area that has 4 watering locations currently, thus an overall increase. Water delivery to other off-project lands for livestock is not hydrologically connected at the summer elevations and thus unaffected. Irrigation on the project lands is through passive tidal inflow. Neighboring off-project area lands do not irrigate currently or where it does occur are not using either the Coaledo or BSDD C3P tidegate. No new infrastructure will be necessary for off-site landowners related to current and future actions within the Phase III project area.

2. Increased Maintenance Responsibilities: The installation of new infrastructure, such as tidegates, drainage channels, and watering site troughs, may require ongoing maintenance by adjacent landowners. This could involve tasks such as cleaning debris from channels, inspecting and repairing tidegates, or managing vegetation around watering sites. Landowners may need to allocate resources for regular maintenance activities and potentially invest in equipment or labor to ensure the proper functioning of the infrastructure.

Project Team Response on 03/26/24 (pg. 4); retained in this document addressing the 04/10/24 County Planning Staff Report (pg. 25), which included #2 above from 03/26/24 Response.

The Phase III project will install advanced culverts with new long-life HDPE materials (as noted in the 404 Fill and Removal permit application). These culverts have a 50yr lifespan, which is 100% longer than any existing steel culverts on site and roughly 40% longer than the ADP culverts in use currently. The new side-hinged aluminum tidegates are aircraft grade aluminum with a 50yr life expectancy. As is shown in the image on the cover sheet of this document, the existing wooden infrastructure is undersized and largely wooden tidegate materials with a lifespan of 10-12yrs maximum. The project is anticipated to result in a greatly reduced maintenance effort on the project area.

The existing channel networks on the project area are largely linear and do not follow the low-lying topography alignment with acuity. This results in areas following rainfall, irrigation, or flooding where fish can become stranded, and water stagnate unmoving with potential for mosquito production. Sticklebacks, mosquitofish, and juvenile coho all eat mosquito larvae. However, with the current channel networks largely filled with years of sediment and failing to follow topography, fish instinctively will not leave canals where they reside continuously and travel long distances to interior pasture locations. Additionally, the low-lying areas where water ponds currently are not connected to main and secondary interior channels with fish present. The deteriorating infrastructure on the project area (channels filled with sediment/vegetation, failing tidegates, degrading berms) are all components that are not providing adequate water management for agricultural actions on the project land area. A notable number of the interior culverts are perched, which does not allow for the current channel networks to be on-grade with the low point at the downstream delivery to main canals. Accordingly,

there is greatly reduced ability to provide for both drainout and delivery of irrigation waters. These perched pipes also reduce the time period for fish passage during tidal and flooding cycles. All culverts on site are currently undersized for hydrology. Without addressing these issues economic output for the landholders will continue to be damaged and in decline. The new/reconstructed channel networks are designed with on-grade slope from interior locations to the main canals. This was not the original construction design in 1908. The on-grade designs will allow for transport of sediment that accumulates to prevent premature clogging of channels.

The project lands are installing internal infrastructure that is within bermed topography. No actions through Phase III will occur at the BSDD C3P main tidegate or the Coaledo tidegate. Winter flooding eliminates all controls as berms are overtopped and thus the 39 culverts/tidegates are irrelevant with flooding above elevation 5.0ft. The infrastructure that will be installed in the project area serves internal pastures of project area lands and these channels do not serve as through pathway infrastructure to other adjacent lands. Thus, no costs are maintenance changes are possible for adjacent lands through Phase III actions. There are no tidegates within the Winter Lake Phase III interior pasture network culverts or tidegates that are not being replaced through the project. Few if any tidegates are presently in operation on any adjacent lands. No allocation need for additional maintenance on adjacent lands infrastructure will be incurred by Phase III.

3. Potential Pest and Invasive Plant Management: Wetlands can serve as breeding grounds for mosquitoes and other pests, which may pose a nuisance to adjacent landowners, particularly during certain times of the year. The change to the land may also bring in invasive plants and that can spread to adjacent properties. Landowners may need to implement pest and/or invasive plan management strategies to mitigate the impact of increased pest or plant populations on their farming or forestry activities. This could involve measures such as insecticide application, pesticide applications, habitat modification, or the installation of mosquito control devices, which may entail additional costs.

Project Team Response on 03/26/24 (pg. 5); retained in this document addressing the 04/10/24 County Planning Staff Report (pg. 25), which included #3 above from 03/26/24 Response.

Many tidal wetlands inherently do not produce many mosquitoes. This is due to the factors needed to produce mosquitoes. In order for a water feature to provide habitat suitable for mosquito production three factors are necessary:

- a). Water must remain non-moving in a stagnant state during warmer months for the life-cycle of larvae.
- b). The location where larvae are hatched must remain fishless until pupae transform into adults after stage-5, otherwise they will be predated on as mosquito larvae are a high value food item for fish;
- c). The water must not dry up or soak into the ground prior to fly-off following stage-5. This is a minimum 7-8 days and at a maximum under cooler conditions 14-20 days.

If any of the conditions are not met, larvae may hatch, however, then be consumed by fish or the habitat will dry up prior to sufficient time for them to become adults or moving water will reduce algae/food production or egg hatching. The Winter Lake Phase III project will address all three factors linked to mosquito production. The extended and on-grade channel networks will prevent ponding of rainwater/floodwater/irrigation water in locations where currently there are ponding conditions. The new and reconstructed channel networks will provide for movement of water, which will disrupt the life-cycle. The project is also designed to allow for much greater distribution of native three-spined sticklebacks and non-native mosquitofish to potential locations where mosquitoes might hatch and then be consumed. The Winter Lake Phase III project is directly engineered to address mosquito production

habitats eliminating the need for direct chemical pest management actions. Overall, the Winter Lake Phase III project will directly improve conditions for pasture grass production, which is benefitted by actions that reduce ponded water areas where mosquitoes are able to be successful.

It has been noted that other invasive species such as Brazilian Water-Milfoil, a.k.a. parrot feather (*Myriophyllum aquaticum*), may colonize the Winter Lake project area. None of the project actions will enhance the ability for this plant or other non-native invasive plant. Parrot feather has been present in the Coquille Valley since at least 2009 in a lake in the lower Coquille River. Likely released as from a home aquarium. In the Coquille River basin it has been noted as heavily established in Johnson Mill Pond. Photos from 2002 identified Milfoil sp. in mid-winter in Johnson Mill Pond with stem features typical of parrot feather during winter (Applicant Figure 1), however, positive I.D. was not made at the time. Brazilian Water-Milfoil is known to be heavily present in Johnson Mill Pond currently (Applicant Figure 2). Brazilian Milfoil is spread only by vegetative reproduction when a portion of stem is broken, such as during floodwaters and transported to a new location where it roots. The population of Brazilian Milfoil in Johnson Mill Pond is located where floodwaters are able to carry broken stems to all lands downstream of that location that are connected to the main Coquille River.

The Winter Lake Phase III recognizes that Brazilian Water-milfoil (a.k.a. parrot feather) has been documented in Johnson Mill Pond likely as early as 2002. Parrot feather is spread by stem transport through water flow, bird transport, water craft, and other means, followed by vegetative establishment of those stems. Winter Lake did not have any restoration actions until 2017-2018. Parrot feather was first noted by ODFW staff within the Winter Lake lands in 2020. Extensive surveys of the property in 2010-2019 did not detect the plant on the property. Pfeifer and Randall 2024 documents parrot feather in Johnson Mill Pond as well as Fat Elk Drainage District in addition to Winter Lake.



Applicant Figure 1. Milfoil sp. in Johnson Mill Pond, image taken December of 2002.



Applicant Figure 2. Brazilian Water-Milfoil in late winter emergent stage. Johnson Mill Pond, March 23, 2024.

4. **Loss of Agricultural Lands:** The project could contribute to the ongoing loss of agricultural lands due to various factors. Firstly, the installation of new infrastructure and drainage systems may require the conversion of agricultural land into construction sites or water management areas, directly reducing the available acreage for farming activities. Additionally, alterations in drainage patterns and the introduction of wetlands as part of the project may render certain portions of agricultural land less suitable for cultivation, further diminishing the overall area available for farming. Furthermore, the potential increase in maintenance responsibilities for adjacent landowners could divert resources and attention away from agricultural activities, leading to reduced productivity or abandonment of agricultural land.

Project Team Response on 03/26/24 (pg. 7); retained in this document addressing the 04/10/24 County Planning Staff Report (pg. 25-26), which included #4 above from 03/26/24 Response.

The Winter Lake Phase III project has been specifically designed to provide strong economic benefits for agricultural landowners within the project area and with special consideration to eliminate effects/impacts to adjacent landowners. The new channel on-grade design and installation on the landscape will provide for invigorated improvement in pasture grass production without substantive effects to total acreage of grass. Without the new channel networks and cleaning of the remainder, existing sediment filled channels will continue to fail to provide for proper drainage. Pasture grasses are struggling on large areas of the action area due to excessively wet conditions into early summer from poor transport channel capacity and connectivity to main outflow canals. The project will also provide strong access for overwintering juvenile coho into high value rearing habitat. During winter drainout is impossible due to higher river levels and thus use by fish is considered a strong and collaborative “Working Lands” benefit. Recreational fisheries are estimated to generate \$280 per adult salmon caught to the Oregon economy through angler purchase of motels, food, fuel, boats, vehicles, and fishing equipment.

The project will not implement any actions on adjacent non-participating landownerships. The action area construction sites are temporary staging areas, most of which are upland off of North Bank Lane or Highway 42, where there currently is not EFU pasture production. No long-term effects/impacts to pasture production will occur due to staging areas. Troughs installed for livestock watering will provide enhanced livestock health due to higher quality water for their consumption compared to current conditions.

The lands within the Phase III Project area are all currently classified as wetlands under the USFWS National Wetlands Inventory (<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>) . The wetland pasture grass production from these sites is due to species of grass (bent grass and reed canary grass), predominating, which are facultative wetland plants. The project is unable to and will not create any new wetlands as the project is already wetland.

Channel networks will provide more natural hydrology similar to historical that will enhance the vigor of these wetland adapted pasture grasses. The new/reconstructed channel networks are specifically aligned in a manner different “altered drainage patterns” than existing in some locations to enhance the drainout, which will improve quantifiably the pasture grass production, while protecting ecology of the lands within the CREMP for the specified goals and values. Without this project the lands will continue to decrease in economic viability due to increased retention of water, which yields more unpalatable plant species such as smartweed and Pacific silverweed.

The project action areas are within surrounding berms to elevation 5.0ft. Culverts/tidegates/channels that will be installed are not directly connected to adjacent lands and thus will not be impacting hydrology or productive capacity of those lands. The culverts/tidegates that will be addressed with Phase III are subservient to delivery of water through the main BSDD C3P and Coaledo tidegates. No actions will occur through Phase III at those main tidegate locations.

The Winter Lake Phase III Project Team here restates that Phases I and II projects within the Beaver Slough Drainage District (BSDD) and Winter Lake floodplain in 2017 and 2018 respectively are separate from Winter Lake Phase III. Phase I was a tidegate only reconstruction with Phase II occurring only within Unit 2 (Applicant Figure 1). The Phase III applicant is BSDD with CoosSWCD and ODFW as the core additional project team members. Phase III will occur in Units 1, 3, and a small portion of the Coaledo Drainage District. It is critical to note that no work to date addressing reconfiguration of channels, installation of new culverts, cleaning of channels from years of sedimentation, and installation of new tidegates has occurred in Units 1 and 3. Dysfunctional hydrology that can produce mosquito habitat will be addressed with Phase III. Unit 2 (the Restoration Unit) has not been producing substantive numbers of mosquitoes as has been documented through ODFW staff monitoring using dipper methods and adult trapping. Similar to the work above limited mosquito production in Unit 2 is largely in part due to the reconfiguration of channel networks and measures included in the designs to prevent areas of ponded water when the project was implemented in 2017.

County Planning Staff Report of 04/10/24 (pg. 26, paragraph two, line two), “*In the applicant’s testimony, it is suggested that there may have been unintentional creation of mosquito habitat during phases I and II of the project, as indicated in Exhibit 11 and 12.*”

Project Team Response; New Materials

Phase I was rehabilitation of the C3P main tidegate (<https://www.youtube.com/watch?v=G6jAmfR2qp4>) at the river connection of BSDD main canals with the Coquille River. County Planning has indicated in the above note that this effort may have developed unintentional creation of mosquito habitat. Mosquito habitats are typified by stagnant ponded water areas that persist for at least 7-14 days during warm weather. These locations must also be absent of predatory fish that will otherwise eat mosquito larvae. The C3P tidegate Phase I structure is a 7-bay concrete culvert structure. No other work was completed with that Phase other than to connect to the main canals. No ability exists for this action (installation of concrete culverts) to in itself to establish habitat for mosquitoes.

- Phase II was fully within Unit 2 (see applicant Figure 1). Unit 2 is hydrologically isolated up to elevation 6.5ft NAVDD88. Part of the project was reconstruction of all dikes/berms to elevation 6.5ft that provide for isolation of the land area hydrology. If waters rise above elevation 6.5ft NAVDD88 Unit 2 hydrologically then connects to Units 1 and 3 (see applicant Figure 1). In the months of June through October when the mainstem Coquille River is at moderate or lower flows and there is control of water into Unit 2. There is never purposeful delivery of irrigation water that would hydrologically reach an elevation above elevation 6.5ft during summer months.

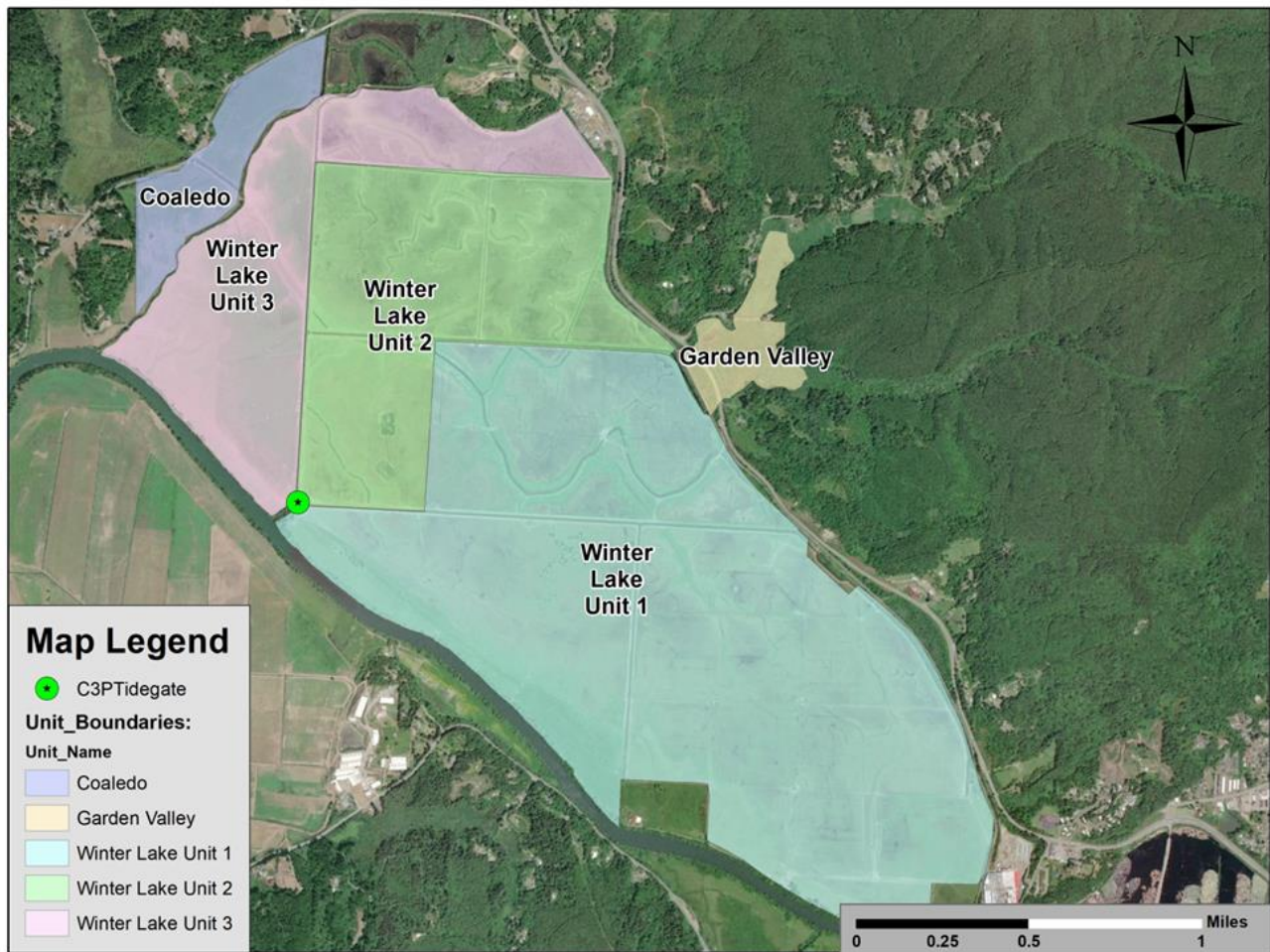
ODFW owns 286 acres of Unit 2 on the northern section and the China Camp Gun Club owns the southern leg at 122 acres. In 2018, 6.3 miles of channel was constructed in Unit 2. These channels connected to another 1.8 miles of existing tidal channels. Specific design criteria to directly reduce the pre-project undulations and swales that were likely to create ponded water were incorporated into the designs to address potential for those locations to produce mosquitoes and reduce fish stranding. Dan Markowski (with Vector Disease Control International VDCI, now with the American Mosquito Control Association, exhibit 11) was consulted in 2015 on site as to methodologies and adjustments needed to address channel construction layout for minimization of mosquito habitat. This feedback was incorporated into the designs prior to construction in 2018. Unit 2 is now plumbed to reduce the potential for mosquito production.

The Water Management Plan during summer months (June through October) is to maintain water at the channel bank height below intrusion onto pastures in Unit 2. Channels that maintain water in Unit 2 in the summer all have numerous mosquitofish (*Gambusia* sp.) and three-spined sticklebacks (*Gasterosteus aculeatus*) present, which are strong mosquito larva predators. In summer Unit 2 is kept in a dry state other than channels where those fish are present, other than the very Northeast corner where on ~5.0 acres some water creeps out through matted vegetation. ODFW conducts dipper surveys following VDCI and the Center for Vector Biology (O’ Malley 1995) protocol for larva in ponded areas of water within ODFW owned lands. Dipper surveys have been conducted during summer in 2019, 2021-2023 where substantive ponded water occurs within ODFW owned Unit 2 lands where fish are not present. Some locations where fish are present are occasionally sampled as a control. Mosquito larva have never been captured in waters with fish present despite hundreds of samples. Larval sampling in the Restoration Unit 2, has yielded few larvae on the ~5 acres where some water is present without fish during summers. Capture of larva through dipping methods over an average of 1.0 larvae per dip remains within a low range, but minimum threshold for evaluation if treatment is needed.

Larval dipping in the Restoration Unit 2 ODFW lands in 2019, 2021, 2022, and 2023 has documented densities that have remained mostly below 0.5 larvae per dip with the peak reaching 0.92.

The statement above by the County is not supported with any of the language of Exhibits 11 or 12 or other materials in the Phase III application. Exhibit 11 notes “I do understand the past and current concern that this restoration project may have to produce excessive mosquito production,” however, Exhibit 11 and 12 make no reference indicating concerns with Phase I and II actions that might have had effects that resulted in increased mosquito production. The Phase III Team is unclear as to the incongruity as there are no materials provided supporting the pathway for the County Planning staff conclusion/statement: ***“In the applicant’s testimony, it is suggested that there may have been unintentional creation of mosquito habitat during phases I and II of the project, as indicated in Exhibit 11 and 12.”***

The Phase III project has been developed to reduce floodplain ponding features that were a result of the 1908 linear cross-elevational channel reconfiguration drainage project for Winter Lake. Those early channel construction efforts by early land speculators simplified the tidal channel configuration. These designs were invoked due to limited economic capability/feasibility in 1908. Little change has occurred since 1908 in the design layout. This discontinuity that currently contributes to ponding of water that can stagnate, reduce pasture production, and produce mosquitoes, has been targeted for remediation in the current designs of Phase III. Phase III actions will get at the root habitat features within the project area to produce mosquitoes. The restoration of proper flow from the land areas has also been inhibited by 20+yrs of the inability to excavate accumulated sediments in channels, partially related to permitting processes. These obstructed flow paths are in dire need of reexcavation in order to reduce ponding of water following rainfall, flooding, and irrigation events.



Applicant Figure 3. Winter Lake Phase III project area, denoting individual units.

The Winter Lake Phase III Project Team has a high degree of knowledge for developing restoration projects with considerations to reduce habitat capability for production of mosquitoes. All core Team members have direct mosquito habitat elimination experience. Caley Sowers (CoosSWCD) has sampled for mosquitoes serving the data to Coos Health and Wellness Rick Hallmark. Sowers also served as project manager in 2018-2024 on the Lower Coquille River Working Landscapes tidal restoration project where development of tidal channels to address fish passage limitations also included design features to prevent formation of mosquito habitat.

Christopher Claire (ODFW) served on the 22-person interstate team to develop habitat modifications in 2013-2015 to remediate mosquito production on Bandon Marsh following the initial restoration. Claire has also served as the mosquito monitoring staff lead for the ODFW Winter Lake Coquille Valley Wildlife Area for the past seven years, also conducting monitoring across the center of Coos County at over 17 locations. Claire has 15yrs of tidal and floodplain restoration experience on six tideland projects, which all included consideration for design development that improved conditions over existing for reduction of mosquito habitats.

Fred Messerle (BSDD Manager) served as the project manager for Winter Lake Phase I and BSDD project coordinator for Winter Lake Phase II and has had full exposure to mosquito habitat reduction designs for wetland restoration projects. In 2020 Claire and Messerle worked collaboratively to restore water control on lands east of Lillian Slough where failure of a tidegate resulted in heavy inundation of

pastures and production of high levels of mosquitoes. The Team has a strong interest and background in improving hydrology in a manner that reduces the habitat areas that can serve as mosquito habitat. This is in part as there is a direct and strong correlation to: 1) Improving pasture drainage for agriculture; 2). Eliminating locations where fish may become stranded; 3). Improving overall wetland/pasture health and function accentuating the Coos County Coquille Estuary Management Plan goals.

Mosquito Trends

Coos Health and Wellness has documented that mosquito production is occurring in a number of locations within Coos County outside of Winter Lake. Mosquitoes can, but largely don't move more than 7-10 miles from the location of hatching. In 2020 project team member Christopher Claire (ODFW) assisted training the Coos Health and Wellness intern Michael Dudle with dipper and adult trapping methods to sample mosquitoes. Claire and Dudle sampled two locations in 2020 1.5 miles upstream of the Chandler Bridge on Coos River and just off East Bay Drive near Echo Springs Creek. Traps were set overnight using a standard light/CO² trap. At the Coos River site 1,405 adult mosquitoes were captured with 268 at the East Bay drive location. The Coos River site was 430% higher in adult abundance per trap night than any other of the 17 total locations sampled in Coos County in 2020. This high number was reflective of a pasture where a tidegate had failed with tidal inflow in a pasture where channel networks were highly altered.

Mosquito numbers in Coos County for all locations where there is habitat, likely reflect a general trend evident in Oregon and the western United States. A longer number of warm weather days during summer months in the past 10 years are contributing to a greater number of "mosquito days" annually. Mosquito-days, are defined as days per year being within a desired temperature and humidity for production of mosquitoes. The Climate Central organization (<https://www.climatecentral.org/graphic/mosquito-days-2023?graphicSet=Local+Mosquito+Days&location=Portland,+OR&lang=en>) has noted that "Mosquitoes thrive in warm and humid conditions that are becoming more frequent in 173 U.S. locations." Applicant Figures 4, 5, 6, and 7 demarcate the trend in the capacity of climactic conditions to contribute to mosquito production for Bend, Eugene, Portland, and Medford Oregon. Although Coos County is not a selected zone for the study, there are ramifications for local mosquito production as well.

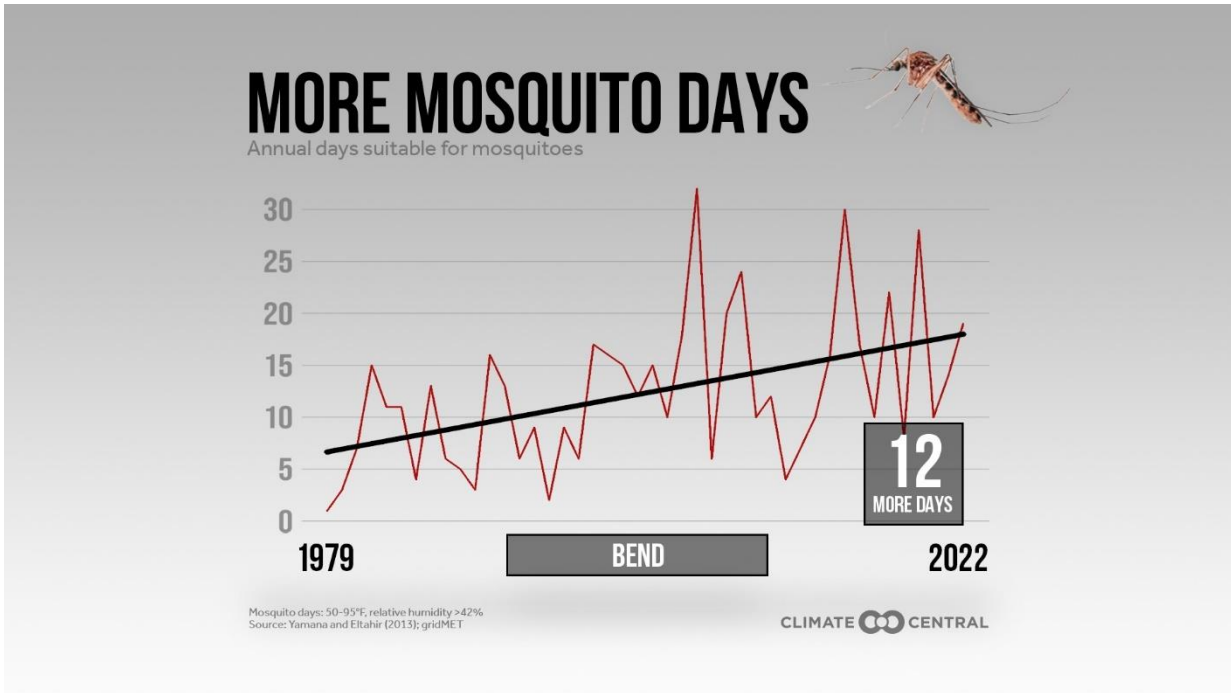


Figure 4. Climate Central mosquito days information for Bend, OR 1979-2022.

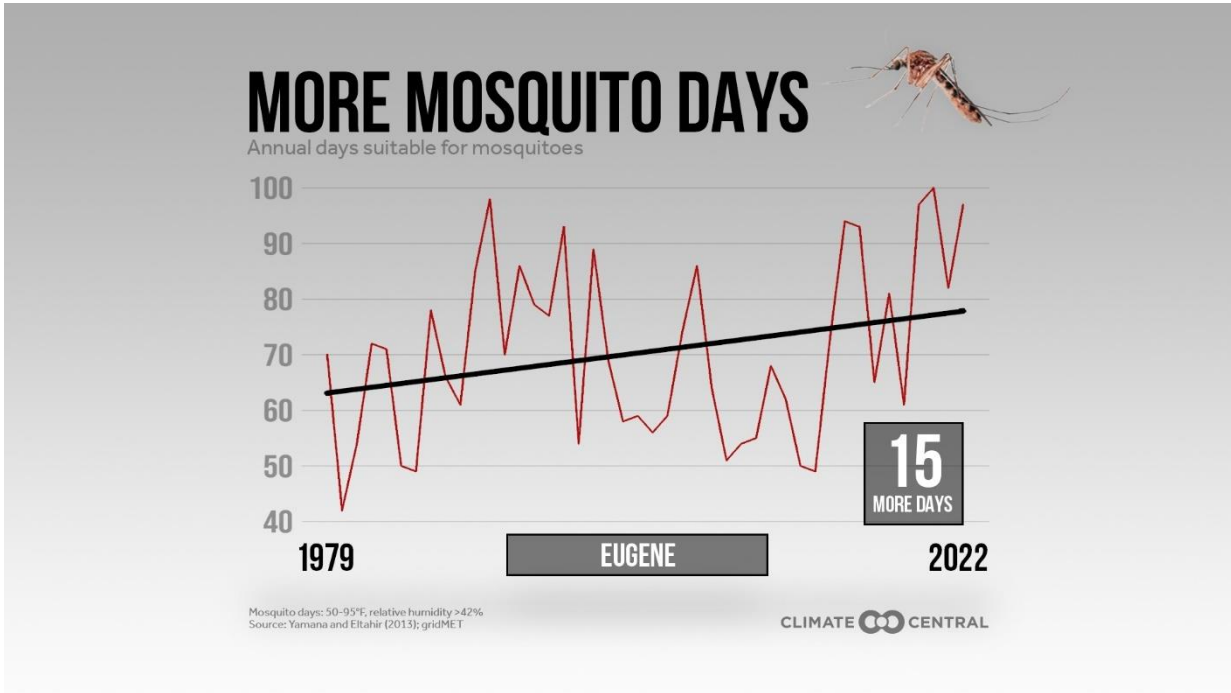


Figure 5. Climate Central mosquito days information for Eugene, OR 1979-2022.

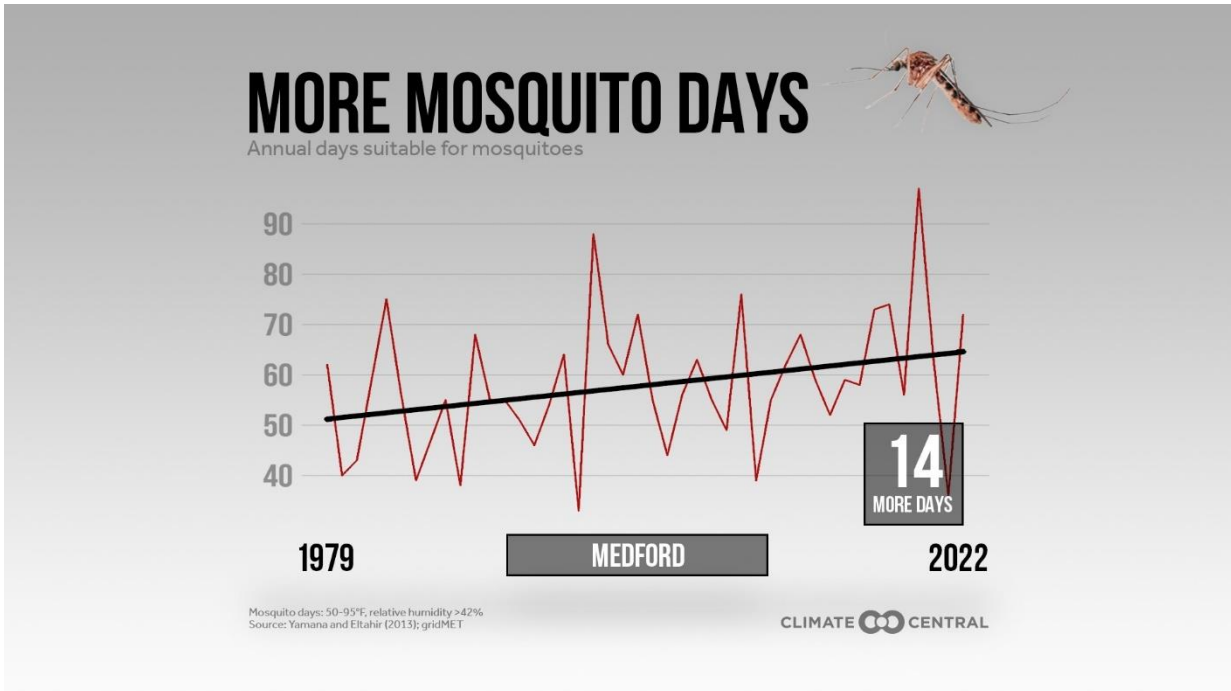


Figure 6. Climate Central mosquito days information for Medford, OR 1979-2022.

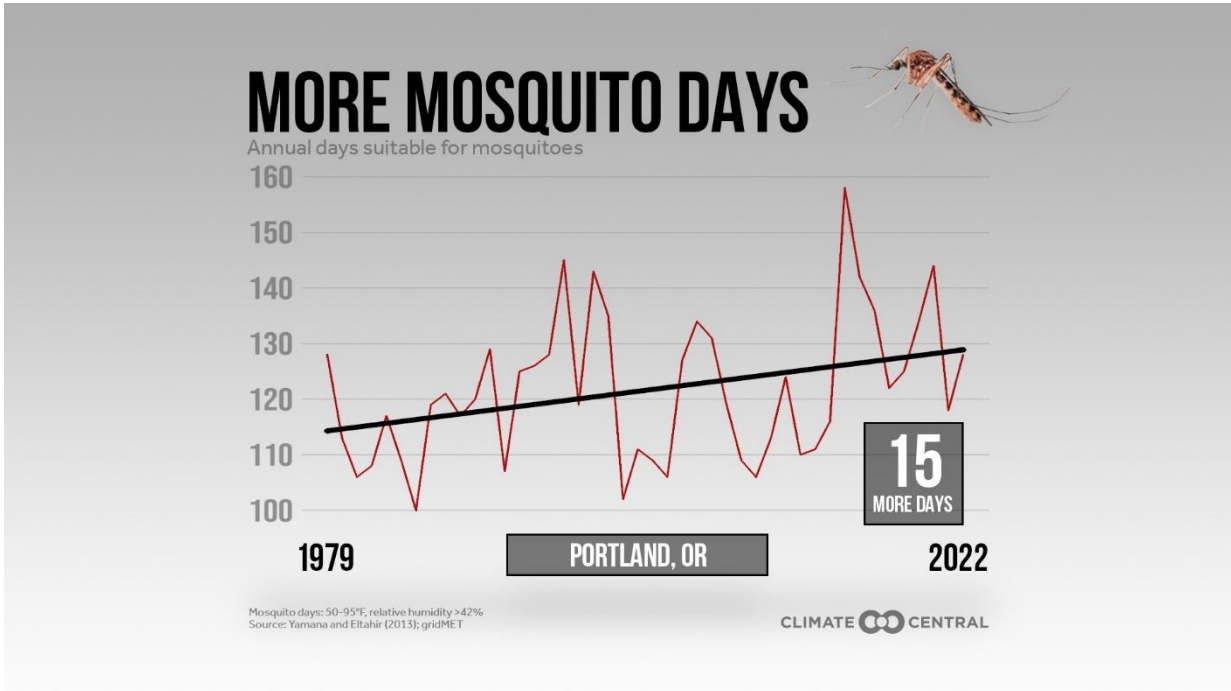


Figure 7. Climate Central mosquito days information for Portland, OR 1979-2022.

Literature Cited

O' Malley, C. 1995. Seven Ways to a Successful Dipping Career. *Wing Beats*, vol 6(4) 23-24.

Pfeifer, A. and I. Randall 2024. *Myriophyllum aquaticum*: Presence and Abundance in the Coquille Watershed, Oregon. Coquille Watershed Association report. 2024:83p.