

## DWMP APPENDIX E\_8.5

### System Operations Narrative

The objective of this narrative is to give perspective to the history and development of the China Camp Creek Project (C3P) and the Winter Lake Restoration Project (WLRP) as well as explain the expected operation and management of the Beaver Slough Drainage District's infrastructure in the future.

The purpose of the Beaver Slough Drainage District (District) is to protect the land within the District boundaries from daily high tides and facilitate drainage of associated landowner parcels and China Camp Creek.

The project design and development process has brought to the forefront that, given the sheer size and scale of the projects, the complexity of the interrelated parts, and the dynamic nature involved, we must realize the limits of our planned actions as well as the potential unintended consequences. Pragmatic and cautious implementation and adjustments are vitally important. Every attempt has been made to deal with issues as they have been raised, resolve conflicts, and maximize the benefits to all stakeholders. Since 2008 to date, over three hundred contacts, events, meetings, tours, and presentations have allowed opportunities to educate, inform, and gather additional input from District landowners, stake holders and the public. The process has been transparent and great care has been taken to address all issues raised and then making design adjustments as practical and necessary.

Factors that came to light during the design process include:

- Land subsidence, estimated to be six to eight feet, within the District over the last one-hundred plus years due to the lack of silt retention, decomposition of organic soils, and reduction of vegetative recovery dramatically increases the volume of water associated with these projects. Modeling studies reveal the larger volumes could impact tide levels and time intervals throughout the Coquille River system, affect neighboring properties, and contribute to erosion. Target fish passage velocities and tide gate open time durations are also affected. The ability of the proposed infrastructure to control water levels will allow mitigation of the negative impacts as well as adaption to conditions on the ground in the future.
- Pooling of water over different tide cycles could result in fish stranding with an associated potential for predation, favorable conditions for uncontrolled mosquito population increases, and degradation of water quality. The ability to adjust interior water level set points will facilitate management of these issues.

- The possibility that ground water movement to adjoining properties would be of concern. Analysis of soil types, monitoring of pre-project conditions, which reveal a loss of ground water during the dry season and the canal structure surrounding Unit 2 with twice daily low tide cycles and large reservoir capacity all point to ground water movement not being a significant factor.
- The idea that restoration efforts would be at the expense of agriculture and family farms has been difficult to address. Central to this issue is the fact that any replacement or major repair of the culvert/tide gate structures is a “trigger event” for fish passage. Any new infrastructure must be in compliance with current law and regulations. Failure of District infrastructure would result in the reversion of the lands to an unmanaged wetland with a complete loss of agricultural production.
- The agricultural operations cannot generate sufficient income from the land to pay all of the costs associated with fish passage compliance. Participation and co-operation from entities focused on supporting and enhancing fish populations is both necessary and fitting to bring additional resources to balance the cost of the projects. Creation of workable partnerships is necessary for success.
- Early in the design process there was not enough focus on the seasonal nature of achieving a balance between agricultural production and ecological function. The needs of both are not mutually exclusive. Looking for “win win” possibilities is important to the successful implementation of the projects and future operation of the District infrastructure and drainage system.

There are several examples of the synergy available to all:

- The highest, most important value for agricultural production is grazing from spring (April) to fall (October). There is minimal grazing activity during the winter high water season. The highest, most important value for fish production is over winter habitat for the ESA endangered juvenile Coho salmon from fall (October) to spring (April). Access to the area is not a major factor for the juvenile Coho salmon in the summer dry season. The result being no conflict and a win for both values with minimal conflict.
- Inclusion of additional bridge structures for canal crossings has multiple benefits for the District and various landowners. These crossing will allow cost savings in the project construction process as well as operations and maintenance opportunities in the future. Additionally, more resources will be available to address repair and improvement of the north dike. Details of these crossings are currently being developed. See 8.2 Appendix B

- The original culvert/tide gate design contemplated an array of 8' wide 10' tall side hinged tide gates controlled by muted tidal regulators. This design concept presented several difficult engineering problems, including dampening the impact of the gates closing with a head of water pushing them from the Coquille River, absorbing the energy of the closing so as to not damage the gates or the culvert structures, and how to maximize the time open with reduced velocities to accommodate fish passage. With the tide gates default closed during a rising river and high water events a major challenge was how to provide for fish passage during a critical time for juvenile Coho salmon to have access to the off channel areas.

The solution was to rotate the gates ninety degrees to 10' wide and 8' high providing for twenty-five percent more low water capacity and reduced water velocities. The side hinged gates will be mounted on a frame that can move vertically, eliminating the issues involved with dampening the gate closing. The muted tidal regulator (MTR) is used to control the vertical rise and fall of the tide gate frame which acts as a typical slide gate such as used in dams and waterway applications. Using a hydraulic system to control the action of the slide gate allows energy from the MTR or a supplemental energy source to be used to ensure open time objectives are met. Additional to the ability to enhance fish passage conditions is the bonus of faster equalization and the opportunity for greater silt retention.

- Many other benefits may accrue from the ability to manage water levels throughout the District.
  - Other fish and wildlife species have additional access to improved habitat.
  - The intense forage grazing in the dry season provides high quality feed for the migratory water fowl that use the Coquille Valley in the wet winter season.
  - Improved water quality benefits the entire Coquille River system.
  - Greater water movement and flushing reduces maintenance dredging in the District's drainage system and vegetation growth.

- Larger infrastructure capacity can extend both the grazing time available, because of faster drain out, and access to habitat due to improved fish passage conditions.
- Recreational opportunities are enhanced both within the District and the region.
- All economic sectors are supported and have the ability to take advantage of greater opportunities.
- Property values and the local tax base are supported and maintained.
- Faster water level equalization and reduced erosion during winter high water events.
- Increased opportunities for silt retention and reversal of subsidence.

District landowners have had three primary objectives from the onset.

- ❖ Landowners through the Drainage District will own the District infrastructure and operate it for the benefit of all.
- ❖ No landowner will be subject to an unreasonable negative impact to their property because of the proposed C3P or WLRP.
- ❖ Every District landowner will have the ability to meet their management objectives for their property to the greatest extent possible within applicable statutes, rules, and regulations.

The complexity and dynamic nature of the projects as well as the operation of the district going forward, which could well include additional agricultural and habitat improvements, requires the DWMP to have a process for review and amendment that is responsive to conditions on the ground. As the projects mature there will be changes in the roughness and the R factor with in the restoration areas, channels may resize, and growth of vegetation will necessitate changes in the operation of the District infrastructure and amendments to the DWMP.

Essential to the process is transparency and inclusion of input from all stakeholders (landowners, regulatory agencies, funders, other governmental agencies, and the public). Responsibility and authority for the operation of the District infrastructure and administration of the DWMP will be with the landowners through the Beaver Slough Drainage District.

Project funding and permit approval is dependent on the District having permanent, legal access to landowner properties for the purpose of efficient and effective operation, maintenance, repair, and improvement of District infrastructure as well as administration

of the DWMP. The District has reached agreement with affected landowners on the primary access route to the District infrastructure.

Implementation of the DWMP and activation of the various improvements and changes to parts of the District Infrastructure will need to be done in a measured manner to enable a better understanding of how the system will react and to avoid unintended consequences. Given the size, scale, distances, and dynamic nature of the District infrastructure and landowner parcels, the operating levels are defined in ranges rather than absolute values. Given the inherent variability of tides and weather as well as the distances and time involved in the movement of water, the cost and effort to achieve a consistent set point on a given daily tide is not feasible. Operation within the target ranges for different seasons and operational modes will take time to develop, being a work in progress for some time. Based on the information available at this time, the assumption is made that interior water levels greater than 5.5 feet are to be considered a high water event with the focus being on protecting District and landowner infrastructure until the Coquille River system drops to levels that allow the District infrastructure and drainage system to return to scheduled operating parameters.

The District is committed to maintaining water loggers to monitor water levels and temperatures both in the Coquille River and each management unit to document the effects of implementing and administering the DWMP. The District has been collecting this data since March of 2011 and understands the importance of continuing into the future. Individual parcel owners and other stakeholders are encouraged to do more extensive monitoring and data collection as may fit their individual needs. The District will be co-operative in sharing data, providing access, and locating monitoring equipment.

The proposed culvert/tide gate structure at the Coquille River is designed to combine proven components, concrete box culverts, side hinged tide gates, sliding flood gates, muted tidal regulators, and hydraulic power, with the objective being to regulate water levels independently between units 1, 2, and 3. This structure will enable landowners to meet their various management objectives, protect the entire District from daily high tides, provide drainage capacity, and the capability during high water events to open access to the Coquille River for the purposes of fish passage, inside/outside water level equalization, and silt retention. The new structure will be capable of moving over three times the volume of water as the current culvert/tide gates.

A typical tide cycle would see the side hinge gates open as the water level in the Coquille River drops below the interior water level during an outgoing tide. As the water levels drop, energy harvested from the Muted Tidal Regulator (MTR) is used through the hydraulic system to raise the slide gate frame, allowing the full culvert capacity to be utilized. As the tide changes at low tide the incoming water will begin to flow from the

Coquille River back into the District the side hinge gates can easily close with no significant head or impact on the structure. Water continues to flow in through the entire culvert width as the slide gate frame is in a raised position until the interior set point is reached. At the set point the slide gate frame, with the side hinge gates already closed, slides down, closing the culvert opening and stopping the inflow of water. The gates will remain closed through the remainder of the high tide cycle until the Coquille River water level again drops below the interior water level, allowing the side hinged gates to open again. During a high water event the slide gates can be raised using supplemental power to the hydraulic system to allow the culverts to be open through the entire high water event until it is possible to return to working water levels. Please note that tide levels and times change each tide.

The District has applied for a Fish Passage Exception as provided for in OAR 635-412 and authorized by ORS 496.138. This exception request may be accessed at

[www.coquilleworkinglandscapes.com](http://www.coquilleworkinglandscapes.com)

An additional mitigating factor with regard to fish passage is the twice daily high and low tides provide a slack water opportunity four times a day for fish passage as opposed to the continuous flows in one direction in non-tidal conditions.

Development of a management plan for the Garden Valley unit on the East side of Highway 42N is dependent on the landowners in that area coming to agreement on how they wish to operate their properties. In the late 1960's the area was sub-divided, resulting in eleven parcels with land inside the District's boundaries, where there had been only two parcels since the District formation in 1906. The sub-division plan had no requirement or provision for maintenance of the China Camp Creek channel in the Garden Valley area East of Highway 42N. Historical accounts suggest there have been no organized efforts by Garden Valley landowners to do any comprehensive maintenance on the China Camp Creek channel since the mid 1980's. Currently the Garden Valley area properties within the District are experiencing poor drainage due to China Camp Creek and associated drainage ditches being bank full of sediment as well as numerous beaver dams and other obstructions. Historically, the District has maintained the China Camp Creek channel to the West end of the ODOT culvert under Highway 42N while protecting the Garden Valley area from daily high tides with the culvert/tide gates and protective berm at the Coquille River. The 6' X 6' concrete box culvert carrying China Camp Creek under Highway 42N is undersized and does not meet current fish passage criteria. At some point in the future, when this culvert is upgraded to comply with fish passage criteria, the impact on the Garden Valley area will be significant both from a drainage and back flood standpoint. Current District infrastructure design, West of Highway 42N, will route China Camp Creek through Unit 1 and meet fish passage criteria.

Management choices for landowners within the Garden Valley Unit range from full restoration, partial restoration with agricultural components, conservation easements, to complete agricultural production. Because of their location in the flood plain and subsidence over time, the first properties in Garden Valley are some of the lowest elevations in the District. The District is committed to protecting these properties from the effects of tidal influence and water management practices in Unit 1.

Depending on the management and operating choices selected by Garden Valley landowners, the District will have to develop appropriate water control capability. This water control capability could range from a fish passage compliant tide gate structure, a modified seasonal water control structure, or no water control structure at all.

Because of active litigation between six landowners within the Garden Valley Unit and the District, it is not possible to move forward with the development of a management plan for the Garden Valley management unit until the legal issues are resolved.

The intent of the DWMP is to provide a framework for the operation of the District's infrastructure. The key factors for success are the ability to manage water levels independently in the different management units and the capability to change water levels to react to conditions on the ground.

The District appreciates the efforts and inputs from all stakeholders. We welcome the opportunity to move forward with the C3P and WLRP for the benefit of our landowners and other stakeholders.