



# R & E Grant Application 13 Biennium

Project #:  
13-062

## *McDonald Slough Reconnection Project*

### ***Project Information***

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**R&E Project Request:** \$35,000.00  
**Match Funding:** \$578,370.65  
**Total Project:** \$613,370.65  
**Start Date:** 5/1/2014  
**End Date:** 6/30/2015  
**Project Email:** Inwc@nehalem.tel.net  
**Project Biennium:** 13 Biennium  
**Organization:** Lower Nehalem Watershed Council

### ***Fiscal Officer***

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### ***Applicant Information***

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### ***Past Recommended or Completed Projects***

Number	Name	Status
09-258	Jetty Creek Fish Passage Technical Assistance	Completed
11-010	God's Valley Meadows Fish Passage Improvement	Approved
13-042	Jack Horner Creek LWD Enhancement	Approved

### ***Project Summary***

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This project is part of ODFW's 25 Year Angling Plan.

**Activity Type:** Miscellaneous (Restoration)  
**Summary:** McDonald Slough is part of the Nehalem estuary and North Fork Nehalem River

system. The slough is one of the largest in the estuary and is part of an important local fishery. Currently, it is disconnected from the river by 2 default closed, top-hinged tide gate structures which are crucial to the operation of the surrounding farmland. These gates impede both fish access to and tidal exchange within the slough. The project proposes to install a new tide gate system consisting of two 6'x6' concrete box culverts equipped with default open, muted tidal regulator (MTR) devices. This new system offers increased tidal flushing and fish passage to the slough and will aid native fish stocks within a major fisheries river by improving salmonid access to over 1.5 miles of adult/juvenile high quality slough and wetland refugia habitat.

**Objectives:**

**TIDEGATE REPLACEMENT WILL:**

(1) provide restoration of tidal exchange into an area with high habitat value, (2) restore fish access to the slough for both salmonids and marine species using the slough as a nursery, (3) maintain adequate conditions for forage crop production on adjacent lands for livestock during growing season, and (4) effectively pass the 100-year flood event at the newly installed culverts

**LARGE WOOD INSTALLATIONS WILL:**

(1) provide sufficient wood in and along the channels throughout the slough and southern tributary to provide adequate cover for juvenile and adult salmonids across the range of tidal fluctuations, (2) increase growth and survival of juvenile salmonids passing downstream through the estuary, and (3) increase survival and reduce the stresses on returning adult salmonids as they acclimate to fresh water while they pass through the estuary

Preliminary tidegate designs have been reviewed by Gerg Apke and Ryan McCormick (engineer) of ODFW Fish Passage Program and have been identified as meeting fish passage requirements (letter attached).

**Fishery Benefits:**

McDonald Slough Reconnection Project is proposing the installation of a modern side hinged tide gate with a muted tidal regulator. McDonald slough is currently disconnected from the North Fork Nehalem River by 2 side-by-side tide gate structures which are crucial to the operation of the surrounding farmland as they protect agricultural land from flooding with saltwater. The existing gates are considered to be default closed (closed at any time there is no outbound differential pressure) which means there is no conveyance, fish passage or opening unless substantial water pressure pushes the gates open. The mechanics of this type of tide gate restricts fish access for significant periods of time until flows are strong enough to open the gates. The gates close on incoming tides, preventing inflow and tidal exchange within the slough. The gate system can also trap fish in the slough when the gates shut and can stay closed for long periods of time in the summer, thereby losing those fish from the fishery. Ultimately, these gates disconnect the river from a significant portion of the off channel habitat in the Nehalem estuary system, a system listed as a high priority for restoration by ODFW and Brophy and So (Tidal Wetland prioritization for the Nehalem River Estuary 2005) and part of an important fishery within the watershed.

The new system proposed here is NOT dependent on differential pressure and remains open until a predetermined level of inundation is reached in the slough needed to protect the farm's productivity while providing the most access to both fish and tidal exchange. This new technology would greatly extend the time and quality of fish passage especially during dry periods and low flows. The muted tidal exchange will reestablish a working "ecotone area" where salt and fresh water meet and mix, improve water quality, and reduce predation on fish that may have been stuck behind the gates doors with the traditional system.

The proposed actions outlined in this grant application will work to enhance the natural production of fish stocks and aid in ODFW's goal to restore fish to levels that allow for more recreational fishing opportunities. It cannot be stressed enough how limited Off Channel Tidal Habitats are within the Nehalem system. Chinook, especially, depend upon this habitat during their juvenile stage, to obtain the growth and protection needed before entering the ocean. Enhanced fish passage to this area will provide benefit to a broad range of fish species important to the local fishing community. The slough will also see an improvement in water quality with additional flushing and habitat enhancement work. Overall, the benefit to fish important to both recreational and commercial fisheries would be great.

#### BACKGROUND ON MCDONALD SLOUGH, OFF CHANNEL TIDAL HABITAT WITHIN THE WATERSHED, AND THE IMPORTANCE TO FISHERIES:

McDonald Slough is connected to the North Fork Nehalem River just northeast of the intersection of North Fork Road and McDonald Road in Nehalem, OR. McDonald Slough is one of the largest sloughs in the estuary and is part of an important fishery river. The slough is located close the bay and just up from the mouth of the North Fork Nehalem. Nehalem Bay and lower rivers see hundreds of boats plying the waters adjacent to McDonald Slough each fishing season.

McDonald Slough drains an area of approximately 0.8 sq. miles and is connected to 3 small tributaries. This slough houses a significant portion of the Off Channel Tidal Habitat (OCTH) for the Nehalem system. OCTH is prime wildlife habitat for a number of fish species and other wildlife. Tillamook County has seen a 90% decrease in fresh and saltwater wetlands from what was historically available in this region. Sloughs like McDonald are extremely critical for juvenile salmon to make the transition from fresh to salt water and as nursery areas for many marine fish species. The slough, if in the historic condition, would see near year round use by sea run cutthroat trout, coho, chinook, and chum (see Figure 1 and summary in Attachment 1, "Summary of Potential Fish Use of McDonald Slough", ODFW Michele Long, 2012). Additionally, ODFW biologists recognize that the slough would also support three-spined stickleback (documented as currently using McDonald Slough), lamprey, starry flounder, staghorn sculpin, shiner perch, surf smelt, Pacific herring, Dungeness crab, Yellow perch and cottid species.

The connected tributaries, according to an ODFW biologist, would support fish use. Winter and tidal refugia areas are critical for increasing productivity and survival of salmonids and are also critical nursery areas for many marine sport fishing

species. After some field reconnaissance and review of orthoimagery, and LiDAR, there is excellent potential for winter refugia within the tributaries downstream of HWY 53, and likely upstream from Highway 53 for cutthroat in the southern tributary. These tributaries meander through forested and emergent freshwater wetlands between the highway and the slough channel mainstem. There are defined channels as well as associated wetlands. The tributaries are essentially small streams through a forested and shrub/scrub wetland area. The forested wetland area associated with these tributaries downstream of the highway is an excellent source for food production and nutrient sources for the slough and estuary. Historically, these tributaries and associated wetlands provide valuable habitat and food production for wildlife utilizing the slough.

Tide gates greatly affect the behavior of both adult and juvenile salmonids looking for refugia from high flows or other negative factors. Giannico and Souder (2005) note the following, "An understanding of fish behavior at the tidegate culvert outlet is important. Adult salmonids are attracted to outgoing flows when migrating; but not when looking for refugia (habitat or protection in the estuaries). Same goes for juveniles. When looking for refugia, both adult and juvenile salmonids will also move during the incoming flows. Tide gates typically close when the incoming tide is higher than the outgoing flows, thus being a barrier to fish." Sloughs are important refugia regions for both adult and juvenile salmon. The mechanics of traditional, default closed tide gates severely limit access to these areas. The design we propose will provide for fish access during both incoming and outgoing tides throughout the year, during both high flow winter and low flow summer periods.

The loss of tidal habitats has likely had some effect on the current status of Chinook runs in the Nehalem watershed since these fish spend much of their freshwater life history within the estuary. Upon entering the estuary, Chinook feed on a wide range of invertebrate prey. Within estuaries and bays, juvenile chinook utilize shoreline areas extensively, with larger fish preferring deeper waters. While no specific studies have been conducted in the Nehalem, studies in similar waterways have shown Chinook salmon reside in inner estuarine salt marshes before emigrating farther out in the estuary. Smolts congregate in tidal streams, such as this, at low tide, with the majority of fish observed in deep, slow water over soft substrates. This location provides this type of habitat.

In addition to the proposed gate replacement, the landowner is also open to restoration effort on the rest of the slough housed on his property. This includes agreeing to and providing large woody debris (fell trees from past storms) for placement in the slough channels, fencing the entire slough, planting native conifers to help augment the riparian area (provide shade and future large wood recruitment). The landowner will work in cooperation with the Tillamook SWCD and the Council on developing a planting plan for the property separate from this proposal.

**Watershed  
Benefits:**

Installation of a fish friendlier tide gate will improve access to 1.5 miles of freshwater and forested/shrub and freshwater emergent wetland habitat to benefit coho, chinook and steelhead. The MTR tide gates will allow for more tidal flushing resulting in greater dissolved oxygen, decreased water temperatures and improved water quality in the slough. This new tide gate system will also provide improved fish passage. The tide gate will be open for a longer period with reduced velocities allowing fish more freedom of movement between the river and slough.

Improved connectivity during spring, summer and fall between the slough and river will benefit Nehalem juvenile coho salmon and Chinook. Research in other estuaries and sloughs in Oregon has shown that juveniles utilize a rearing strategy whereby they utilize the slough habitat, particularly the edge habitat, during late spring, summer and early fall before returning upstream to overwinter prior to smolting.

McDonald Slough will provide rearing habitat for migrating and resident salmonids upon revision of the tide gate configuration. There is ample edge and backwater slough habitat, found to be important for salmon rearing in other Oregon Coast sloughs. Access to these areas, however, is currently limited due to the tide gate. The habitat complexity/cover within the mainstem of the slough from the forest down to mouth is affected by lack of instream wood. The restoration will provide an opportunity to recover potentially valuable shallow water, rearing habitat, and to document the importance of this habitat type in the early life history of salmonids in the Nehalem River watershed. This slough may be of high relative importance in the regional landscape as habitat for fish, as much of the nearby area has been impacted by agriculture. This project is an opportunity to recover habitat for fish and other species, and improve our understanding of how impacted habitat functions and potentially contributes to rehabilitation of depressed populations.

The Nehalem Basin is repeatedly cited as an important region for native salmonids. The North American Salmon Stronghold Partnership has identified the Nehalem Basin as a key basin with one of the strongest and most diverse wild runs in Oregon. The Summary of the Watershed Health Indicators for the Oregon Coast Coho ESU identified winter and summer rearing habitat as a moderate limiting factor with moderate to high variability in the Lower Nehalem Watershed. Reconnection of this slough to the North Fork Nehalem River will provide access to essential off channel tidal habitat that is severely lacking in this region. As reported earlier (see Attachment 1/Figure 1), the slough will support year round use by a multitude of both sport, and non-sport fish species, including coho, chinook, chum and searun cutthroat.

**Current  
Situation:**

McDonald Slough is a large slough housed within the Nehalem Estuary River system, an important fishery in the North Coast. As stated previously, this slough is disconnected from the North Fork Nehalem River by 2 top-hinge, tide gate structures which are crucial to the operation of the surrounding farmland. Recent evaluations of the slough have listed it as a high priority for restoration by both ODFW and in a study by Brophy and So (Tidal Wetland Prioritization for the Nehalem River Estuary, 2005). Both recognize the valuable wildlife habitat available in McDonald Slough and see potential for high use by salmonids, pacific and brook lamprey if better connectivity were provided. The ideal scenario for this slough is to restore the natural function. However, full reconnection is not possible due to social and economic conditions relating to the agricultural use of the surrounding lands. Therefore, this proposal is recommending a partial reconnection with the installation of two modern, side hinged tide gates equipped with muted tidal regulating devices. These devices remain open for longer periods of time, allow for more water exchange and fish passage between the river and slough, and improve water quality (See Figures 2-10).

As stated previously, the slough drains an area of approximately 0.8 sq. miles and is connected to 3 tributaries. The slough is part of a 227 acre flood cell functioning as a key drainage point during North Fork Nehalem and lower Nehalem River flood events. This slough houses a significant portion of the Off Channel Tidal Habitat (OCTH) for the Nehalem system. OCTH is prime wildlife habitat for a number of fish species and other wildlife. Tillamook County has seen a 90% decrease in fresh and saltwater wetlands from what was historically available in this region.

The land surrounding the slough is an active dairy farm and drainage is currently managed with the use of two tide gate structures near the mouth of the slough. The gates are both top hinge, one composed of wood and the other aluminum. Although these gates were expected to last 70 years, they did not hold up in the saltwater environment. Recently, both gates and associated culverts have experienced failures. The north gate was repaired in 2009 and the south gate was sealed off after it failed during the winter of 2012 and underwent a similar emergency repair in 2013 before it was reopened. There is a strong need to further address these gate structure as soon as possible to provide both drainage and flood control. The existing structure is considered default closed (closed any time there is no outbound differential pressure) which means there is no conveyance, fish passage or opening unless substantial water pressure pushes the gates open. These gates, when in working order, disconnect the river from a significant portion of the off channel habitat in the Nehalem estuary system. Traditional tide gates, like the ones currently installed at McDonald Slough, are documented to be associated with increased fish predation and create fish passage barriers. They provide narrow windows of opportunity for fish passage and, when open, may have extended periods of time where water velocities are too great to allow passage, blocking fish from and/or trapping them within the slough. Predators take full advantage of this situation and predate heavily in these areas. Additionally, traditional tide gate systems promote slough conditions that lead to poor water

quality including: high summer temperatures, low dissolved oxygen, very low complexity, and extremely poor tidal exchange.

Tide gates are part of the management system for the Neahring's dairy. The farm is a well-managed facility promoting low impact grazing to reduce impacts to the slough. The slough has a healthy riparian area containing native trees and shrubs. The Neahring dairy manages its tidally influenced pastures with a system of rotational grazing known as strip grazing. The farm is seasonally run and matches the lactation schedule of the cows with grass growth. The farm is dry (and the cows are not lactating) in the winter from Dec - Feb. Strip grazing controls where the cows are grazing in each field. Cattle graze in each field for approximately 9 days, 2-3 days per strip and then that field is not grazed again for 20 to 30 days (depending of the rate of grass growth). Typically, cattle graze in a field once the grass is ~6-8 inches tall and are removed when it is 2-3 inches tall. The majority of the slough is fenced and the cows rarely access it. There are sections where the heifers can get to the slough but the farm has a water storage system that supplies the cattle with drinking water, so they have little interest in obtaining water from the slough. The SWCD will assist the landowner with fencing and planting the small sections of the north side of the slough that do not have an intact riparian buffer. Additionally, the farm runs a composting machine that removes fiber from compost which is then used for bedding; recycling the waste created on the farm.

**Alternatives:**

(1) The do nothing scenario was considered. However, the existing tide gates system is not providing adequate fish passage. In addition, the system is in need of attention after two emergency repairs. Most recently, the south culvert/gate failed during winter 2011-12 and partially collapsed causing the farmer to seal the culvert to prevent the pipe from failing entirely and threatening the integrity of the existing levy. This led to the 2nd emergency repair of the gate structure. The functionality of these repairs over a long period of time is unknown. This is not a long-term viable option for the property owner. Without adequate drainage, the fields will no longer be able to support the pasture grass used to feed his dairy cattle operation. Additionally, the council sees this as an opportunity to work in collaboration with the agricultural community to find a mutually beneficial solution that will allow the farmer to operate as needed while also benefitting wildlife. These are the types of relationships and projects the Council strives to cultivate. It is our opinion that working with the community in this way increases the likelihood of making changes with the most impact to wildlife.

(2) Full reconnection of the slough, by removing the tide gates entirely, was considered. However, due to the landowner's agricultural needs, and the community of landowners who own property and homes drained by this slough, this is not an option.

(3) The project also considered pursuing an OWEB Technical Assistance grant to provide hydraulic analysis and a thorough biological and ecological assessment of the slough. The Council obtained cost estimates from WEST Consultants to develop the hydraulic model and from Ayesha Gray (South Slough Estuary Project) for the biological conditions assessment. The total cost for the data collection and analysis is over \$90,000. The proposals included costs to examine the following: review of existing data and ODFW, USFWS, NMFS/NOAA passage criteria; conduct a thorough topographic and bathymetric field survey; develop site hydrology to use in hydraulic model (including tidal and riverine flow scenarios); assess tide gate alternatives and develop hydraulic modeling scenarios to determine which tide gate alternatives best meet fish passage criteria while also meeting landowner objectives. The Council and landowner decided against pursuing this alternative because of the high cost and need to address the failing tide gate more expediently. A TA grant potentially puts construction into 2015. Additionally, with the OWEB TA cap at \$50,000, the project does not have sufficient cash match to meet the total projected cost.

(4) Removal of the tide gates at the slough opening, and installation of a series of tide gates at each tributary to the slough was also considered. However, this option will not work because the storage required to accept the water out of the ditches and from surface flow will be lost. During the bulk of the time the interior slough accepts water from the interior system and stores it until the next low tide discharge. If the slough's tide gates were removed, and the ditches gated, the ditches would quickly fill and inundate the agricultural ground. In addition, this alternative would require building a complete set of new interior levees and tide

gates up to the control level (about 13 or 14' NAD 88), a cost prohibitive option.

(5) Replacing the existing tide gates with another similarly sized culvert/tide gate system was also considered. This option was evaluated by state, local, and federal natural resource agencies and all agreed that replacing the existing system with a similar system did not address the fish passage concerns or improve the salt water/fresh water exchange. Top hinged tide gates do not allow tidal exchange because they do not open very wide. This also contributes to poor fish passage. The narrow opening, combined with the velocity of the flows, precludes most fish passage.

(6) The shape of the pipe, rectangular box culverts instead of round pipes was made to avoid the phenomenon known as a "water hammer". A water hammer occurs when a culvert is flowing pipe-full and the tide gate closes suddenly. The energy associated with the momentum of the moving water in the culvert going to zero results in a water hammer and creates negative pressure in the culvert, usually causing the culvert to collapse. Nehalem Marine has observed water hammers occur more frequently in round pipes and not at all in rectangular box culverts. In addition, concrete is a much longer lasting material in a marine environment when compared with aluminum. This shape was also selected based on on-the-ground observations of 0 and over year coho which show that fish passage is almost always against the flow with movement achieved eddy to eddy. The box culvert design provides lower velocities and much closer eddy to eddy patterns. It is expected that fish expend less energy navigating a box culvert design versus a traditional round culvert system.

(7) The project design firm considered several locations for the new tide gate installation. The current tide gate location was evaluated and rejected. The project needs to provide water exchange during construction. The project could not dewater the construction cell and maintain water exchange. A temporary gate would have to be installed, which is no less of an impact than installing the new tide gates in a new location. The other site considered for construction was the historic opening to the slough. This location is also problematic for construction. Because the slough is continuously underwater, the underlying soils are highly saturated, making equipment access difficult. In addition, the footings for the culvert installation would require extensive excavation to reach suitable subgrade.

**Designer:** Leo Kuntz, Nehalem Marine, INC - developed project design. Don Porior, Porior Engineering, LLC - field evaluation/modeling. ODFW Fish Passage staff, Greg Apke & Ryan McCormick - provided fish passage approval (PA-01-0047 – see attachments).

**Methods:** TIDEGATE REPLACEMENT

Methods & procedures:

- Conduct geotechnical investigation of the site. This will be conducted to sample the subsurface soils to establish its compressibility and strength to determine what depth the site will need to be excavated to in order to support the weight of the tide gate installation.
- Remove two existing tidegates. Each tide gate is 5' diameter, one with a wood door, the other with an aluminum door, both open via top hinge. Both culverts are round, 40' long, aluminum and are rated with the capacity to pass 150 cfs fully opened
- Replace tidegates with model NRSG6Xrc gates. These light-weight, epoxy coated, marine aluminum gates are rectangular and side hinged. They will be installed on two 6'x6' concrete box culverts 24 feet in length (see attached Figures 15-17: Design Documents).
- Muted tidal regulators will be installed to regulate the time of openness of the gates. New system is a "default open" tide gate system. Tide gate will be in an open condition at all times that the interior inundation level allows up to 4.5' of inundation. The inundation mapping was reviewed with the landowner and staff from ODFW to determine the new proposed water elevation the project will be managed to achieve. The MTR system makes it possible to adjust the timing and length of openness to increase or decrease drainage. The elevation agreed upon as a target is 4.5 feet. By managing the tide gate operations to provide this water elevation, all of the slough and tributary habitat is wetted, but there is no overland flow onto the agricultural fields (See attached Figures 11-14).
- Proposed gates have already met ODFW fish passage criteria and will be reviewed by NOAA for permitting reasons.
- A management plan will be developed for tide gate operations in cooperation with ODFW and the landowner. The management plan will include guidelines for the structure's annual inspection and recommended annual maintenance actions to keep the MTR at its optimal functionality.
- Project construction will occur during the time period determined in cooperation with ODFW.
- Excavators working from atop the existing levy will construct a closed cell. Sheet piles will be driven into the sediment and will isolate the work area from the active channel/slough. Work to prepare the site's subgrade will occur within this cell.
- Once the subgrade is established, steel rebar will be installed to provide the frame for the concrete installation. Concrete will be poured on-site to construct the base slab, tide gate walls, wing walls, and bridge over the top of the structure (See Figures 15-17 for the construction plan set).

## LARGE WOOD INSTALLATION ON MAINSTEM SLOUGH

### Methods and procedures:

The project will include placement of logs and overlapping trees at 13 sites within the mainstem of the slough channel, starting just upstream of the tide gate and extending 2700 feet (0.5 mi) upstream to the relic oxbow at the upstream extent. The intent is to improve ecological functioning primarily for juvenile salmonids (see attached Figures 18-20).

The locations are selected to optimize benefit to the aquatic ecosystem by placement at existing bends, pools, and shaded locations, and are limited by excavator accessibility. The final designs will be reviewed by a licensed engineer, with consultation by a geo-fluvial morphologist:

There is not a need for bank protection along the slough, so the goal of the wood is to:

- Add wood to channel currently lacking instream large wood
- Create cover complexity
- Encourage pool scour in the shallow, glide dominated habitat of the mainstem of the slough
- Provide hard surfaces for aquatic insects to establish and increase insect diversity and quantity within the mainstem of the slough where there is less instream vegetation and hard surfaces for insects to colonize
- Provide additional wildlife benefits for basking and perching, feeding and habitat for other terrestrial and aquatic species.

This information is presenting a conceptual plan for large wood placement in the slough. Once grant funds are approved, further design will be done to complete the plans for implementation.

Site locations were chosen based on the following criteria:

- Equipment access – most access points are situated where there is a break in the bank vegetation, usually through existing cattle trails between field and slough. Access from both banks will be necessary.
- Donated large root wads will be salvaged from the landowner's property. The spruce blew down in a coastal storm event in 2007. When they were bucked, the weight being taken off the roots allowed the remaining mass of the tree to spring back upright. These rootwads have 10-20' of stem with 10-15' root fans.
- Shallow trenches may be excavated in the bank to anchor the stems. These trenches will be filled back in with the excavated material upon installation of the large wood.
- Placement of the wood will be field fit based on the type of material available. Design for the project will include trees installed vertically to hold the rootwads in place. No rebar, pins or cables will be used in the project implementation.
- Trees will have a minimum size of 30" dbh.

Any areas with soil disturbance from construction activities will be planted with

native vegetation (trees and shrubs)

## LARGE WOOD SOUTHERN TRIBUTARY

Methods and procedures:

500 feet – 5 sites – more of the typical style of LWD placement – pool scour – complexity, encourage beaver. (See details above).

## RIPARIAN PLANTINGS AND FENCING

Methods and procedures:

- Planting plan will be developed by the landowner in cooperation with the Tillamook County SWCD.
- Plantings will be designed to provide low, overhanging vegetation along the bank and for future large wood recruitment and shade from tree and shrub planting – conifer and deciduous trees.
- Planting and fencing will happen separate from this restoration project. No ODFW RE funds will be requested to help with this activity.

## PROJECT PLANNING AND PERMITTING

Methods and procedures:

- Develop SOW, bid books and contracts for engineering/construction.
- Submit project permits and coordinate their review. Provide additional clarification and answer questions on proposed project.
- Coordinate SHPO review of project site.
- Continue development of complementary project activities in cooperation with ODFW/NRCS/SWCD including large wood placement and riparian planting.
- Put project out to bid.
- Select preferred contractor and develop construction contract.
- Provide project updates on design and implementation schedule to affected landowner, Port of Nehalem and other interested stakeholders.
- Review final project design.
- Coordinate fish salvage with ODFW.
- Document project construction (photo points).
- Coordinate construction oversight with ODFW.
- Provide Lower Nehalem Watershed Council board and members with project updates.
- Update Council web-site with project photos and description of project work.
- Coordinate media outreach for project.
- Prepare and submit all final reports and documentation.

See attached document for references.

**Inspector:** LNWC, ODFW

**Funding Elements:** We are requesting funds to assist with the purchase of the Muted Tidal Regulating device to be used on the gates and the associated hardware.

**Partners:** Yes

Steve Neahring, Landower  
Lower Nehalem Watershed Council volunteers  
ODEQ  
USFWS  
ODFW biologist (Michele Long and Chris Knutsen)  
ODFW fish passage (Greg Apke and Ryan McCormick)  
Port of Nehalem  
Nehalem Marine, INC  
Don Porior Engineering  
NOAA  
USACE

**Existing Plan:** Yes

The Lower Nehalem Watershed Council takes a strategic approach to implementing restoration actions. The Council recognizes the importance of engaging landowners in the agricultural community who own much of the lowland estuary habitat in the basin. This project is the Lower Nehalem Watershed Council's first attempt to address restoration in brackish water environments. The Council is engaged in a new effort to conduct restoration in the lower watershed to address problems in estuaries and brackish water environments which are of vital importance to salmonids. This project is listed on the council 2013-2015 Work Plan.

Additionally, LNWC played a large role in the development of the Nehalem Conservation Action Plan published by the Nature Conservancy. The vision of this recently developed document is "To develop the relationships and stewardship strategies necessary to ensure a future for the Nehalem Watershed that includes ecologically connected, functional, and productive landscapes, viable economies, and vibrant human communities." Restoring McDonald Slough fits the vision of the Nehalem Conservation Action Plan by restoring critical slough habitat values while providing critical protection to the lower Nehalem River valued dairy related enterprises, economically connected, functional and productive landscapes, viable economies, and a vibrant human Nehalem community. The economics and social benefits are wide spread. From providing flood control for residential areas and emergency access during high river flows, reduced road maintenance costs, increased sport and commercial opportunities and increased tourism to name a few.

The Nehalem watershed has been evaluated and studied by numerous partners. This project fits with the Oregon Conservation Strategy framework that seeks to prevent future ESA listings and examines ecosystems in whole, rather than focusing on individual species. The Nehalem River Estuary is specifically cited as containing key estuary and freshwater wetland habitat (Oregon Conservation Strategy, ODFW, 2006, CR-07, pg 144). Additional data summaries and findings can be found at the Council's webpage:

[http://www.nehalemtel.net/~lnwcouncil/1\\_About.html](http://www.nehalemtel.net/~lnwcouncil/1_About.html)

**Affected** Yes  
**Contacted:**

**Affected** Yes  
**Supportive:**

**Project Schedule/Participants/Funding**

Activity	Date	Participants
Permit Applications	6/1/2014	LNWC, ODFW, NOAA, NMFS, USFWS, Tillamook Co., others
Material Acquisition	9/1/2014	LNWC & partners
Bid Solicitation	5/1/2014	LNWC & partners
Construction - TBD - ODFW approved time frame	1/1/0001	LNWC, ODFW, partners
Project Inspections - TBD - ongoing during implementation	1/1/0001	LNWC ODFW
Post Implementation Inspection and Review - 2-3 visits post project construction	1/15/2015	LNWC, ODFW
Project Maintenance - ongoing for life of installation	1/1/0001	Landowner, LNWC, ODFW

**Affected Species:**  
 Chinook Salmon  
 Chum Salmon  
 Coho Salmon  
 cottid species  
 river lamprey  
 shiner perch  
 staghorn sculpin  
 starry flounder  
 Steelhead  
 three-spinned stickleback

**Project Permits**

Name	Issued By	Secured?	Date Secured	Date Expected
Regional General Permit	US Army Corps of Engineers	No	1/1/0001	8/1/2014
Endangered Species Act Consultation	NOAA/NMFS	No	1/1/0001	8/1/2014
General Authorization for waterways	OR Dept of State Lands	No	1/1/0001	8/1/2014
Fish Passage Approval - PA-01-0047	ODFW	Yes	6/1/2013	6/1/2013
Section 106 review	State Historic Preservation Office	No	1/1/0001	8/1/2014
Development Permit	Tillamook County Community Development	No	1/1/0001	8/1/2014

**Project Monitoring**

Organization	Address	Activity	Frequency
LNWC and/or contracted firm or technician	PO BOX 249 Nehalem, OR 97131	Pending grant approval/funding - water quality monitoring (DO, pH, Salinity, Temperature, velocity)	Both pre and post - 2 times per week during spring/summer season for up to 60 sample days. 2 times per month sampling farther up slough near tributaries.

ODFW	Tillamook District Office Tillamook, OR 97141	Fish Sampling	2 times per season (spring and fall) both prior to and after implementation. Duplicated in neighboring slough for comparison.
ODFW	Tillamook District Office Tillamook, OR 97141	Habitat Evaluation	2 times per season (summer and winter) both prior to and after implementation.

***Project Maintenance***

Organization	Address	Activity	Frequency
Landowner	Neahring Farm , OR	Visual inspection of the gate and inundation levels	1 per month or greater.

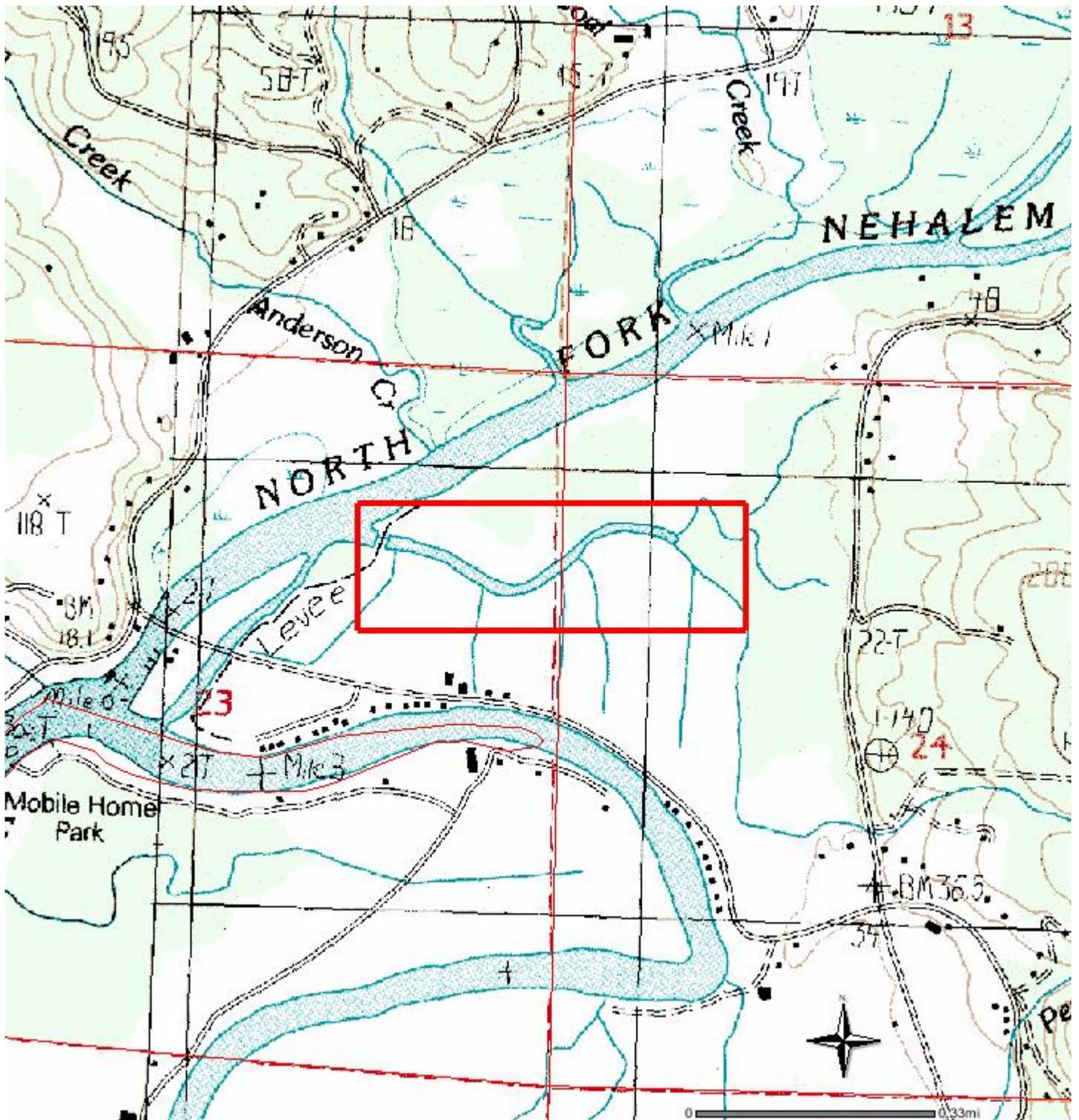
## Project Match Funding

Funding Source	Cash	In-Kind	Other	Description	Total	Secured?	Conditions?	Comments
R&E Request	\$35,000.00	\$0.00	\$0.00		\$35,000.00	No	No	
NFWF Community Solutions	\$50,000.00	\$0.00	\$0.00		\$50,000.00	No	No	
Port of Nehalem	\$25,000.00	\$0.00	\$0.00		\$25,000.00	No	No	
OWEB	\$358,893.00	\$0.00	\$0.00		\$358,893.00	No	No	
LNWC Volunteers	\$0.00	\$7,700.00	\$0.00	Assistance with pre-project monitoring	\$7,700.00	No	No	
Pacific Shellfish Institute	\$0.00	\$6,000.00	\$0.00	Andy Suhrbrier - labor, travel, and monitoring equipment rental donation	\$6,000.00	No	No	
ODEQ-S.Hanson, Water Quality Monitoring Program	\$0.00	\$2,006.15	\$0.00	Training, equipment loan	\$2,006.15	Yes	No	
Tillamook Co. Soil & Water Conservation District	\$0.00	\$6,496.00	\$0.00	Project development, grant writing	\$6,496.00	Yes	No	
Tillamook Co. Soil & Water Conservation District	\$0.00	\$6,496.00	\$0.00	Project development, grant writing	\$6,496.00	Yes	No	
Nehalem Marine, INC	\$0.00	\$30,000.00	\$0.00	pre-engineering and project development	\$30,000.00	Yes	No	
Technical Team member participation	\$0.00	\$2,400.00	\$0.00	Reps from ODFW, USFWS, NOAA, Port of Nehalem, USACE	\$2,400.00	Yes	No	
ODFW Fish biologist	\$0.00	\$16,800.00	\$0.00		\$16,800.00	No	No	
Steve Nearing, Landowner	\$4,000.00	\$11,780.00	\$0.00	Contributions toward structure, access road improvements, and LWD material	\$15,780.00	No	No	
ODEQ	\$0.00	\$1,800.00	\$0.00	Assistance with post project monitoring	\$1,800.00	No	No	
Nehalem Marine, INC	\$0.00	\$14,000.00	\$0.00	Donation (loan) of monitoring equipment	\$14,000.00	No	No	
USFWS	\$35,000.00	\$0.00	\$0.00		\$35,000.00	No	No	
				Total Match Funding:	\$613,371.15			

## Project Budget

Item	Item Type	Units	Unit Cost	R&E Funds	Match Funds	Total
LNWC Coordinator - reporting	Administration	30	\$30.00	\$0.00	\$900.00	\$900.00
LNWC Fiscal Agent (S.Kalkhoven)	Administration	400	\$20.00	\$0.00	\$8,000.00	\$8,000.00
Permit - Tillamook County	Administration	1	\$150.00	\$0.00	\$150.00	\$150.00
Access road improvements	Contracted Services	1	\$14,780.00	\$0.00	\$14,780.00	\$14,780.00
Geotechnical Investigation and engineering	Contracted Services	1	\$40,000.00	\$0.00	\$40,000.00	\$40,000.00
Large Woody Debris Placement	Contracted Services	1	\$20,000.00	\$0.00	\$20,000.00	\$20,000.00
Monitoring - contract, equipment install	Contracted Services	1	\$47,471.00	\$0.00	\$47,471.00	\$47,471.00
Monitoring Services -Pacific Shell Institute	Contracted Services	1	\$6,000.00	\$0.00	\$6,000.00	\$6,000.00
Nehalem Marine, INC	Contracted Services	1	\$30,000.00	\$0.00	\$30,000.00	\$30,000.00
ODEQ, Steve Hanson, monitoring	Contracted Services	1	\$2,006.15	\$0.00	\$2,006.15	\$2,006.15
ODFW Fish Biologist	Contracted Services	560	\$30.00	\$0.00	\$16,800.00	\$16,800.00
Permit Development Assistance	Contracted Services	75	\$65.00	\$0.00	\$4,875.00	\$4,875.00
Structure Installation	Contracted Services	1	\$222,873.00	\$0.00	\$222,873.00	\$222,873.00
SWCD, Bob Pederson	Contracted Services	203	\$32.00	\$0.00	\$6,496.00	\$6,496.00
Technical Team Meeting	Contracted Services	80	\$30.00	\$0.00	\$2,400.00	\$2,400.00
LNWC Coordinator	Personnel	300	\$35.00	\$0.00	\$10,500.00	\$10,500.00
LNWC Volunteers	Personnel	370	\$35.00	\$0.00	\$12,950.00	\$12,950.00
Access road improvements materials (fabric, rock)	Supplies/Materials /Services	1	\$10,000.00	\$0.00	\$10,000.00	\$10,000.00
Large Woody Debris (trees)	Supplies/Materials /Services	1	\$8,000.00	\$0.00	\$8,000.00	\$8,000.00
MTR System & hardware	Supplies/Materials /Services	1	\$63,371.00	\$35,000.00	\$28,371.00	\$63,371.00
Structure - Construction Materials	Supplies/Materials /Services	1	\$41,211.00	\$0.00	\$41,211.00	\$41,211.00
Structure - Equip & Sheet Pile Rental	Supplies/Materials /Services	1	\$44,531.00	\$0.00	\$44,531.00	\$44,531.00
LNWC Coordinator	Travel	100	\$0.57	\$0.00	\$56.50	\$57.00
					Total Budget:	\$613,371.15

**Project Map**



## ***Additional Files***

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Click a link to view that particular file.

[Attachment1/Figure1: ODFW Summary Fish](#)

[Figures 02-10: Project visuals](#)

[Figures 11-14: Inundation Maps of McDonald Slough](#)

[Figures 15-17: Tide Gate Design Documents](#)

[Figures 18-20: Large Woody Debris](#)

[LNWC Tax Exempt Documentation](#)

[LOS LANDOWNER SNearing](#)

[LOS McDonald ODFW](#)

[LOS McDonald SWCD](#)

[LOS Multiple Agencies](#)

[ODFW Fish Passage Approval Letter](#)

[References](#)

[Signature\\_Authorization\\_Page-public](#)

## Summary of potential fish use of McDonald Slough

Prepared by Michele Long (ODFW), September 21, 2012

Information on fish use of the Nehalem Bay estuary is very limited. The following table and summary information is an estimate of the fish use times for McDonald Slough. These species and life stages would be within the mainstem North Fork Nehalem and enter the slough. The adults will use the slough for temporary refugia, and the juveniles for refugia and rearing.

The information in the table below and the following summaries was extrapolated from: 1) known Nehalem Bay run timing; 2) research from Salmon River estuary; research from South Slough; research from Young's Bay and research from Washington's estuaries.

**FIGURE 1**

Life Stage/Activity/Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Upstream Adult Migration</b>												
Winter Steelhead												
Spring Chinook salmon												
Cutthroat Trout - Searun												
Fall Chinook salmon												
Coho salmon												
Chum salmon												
<b>Juvenile Rearing</b>												
Winter Steelhead												
Spring Chinook salmon												
Cutthroat Trout - Searun												
Fall Chinook salmon												
Coho salmon												
Chum salmon												
<b>Downstream Juvenile Migration (fry to smolt)</b>												
Winter Steelhead												
Spring Chinook salmon												
Cutthroat Trout - Searun												
Fall Chinook salmon												
Coho salmon												
Chum salmon												

	Represents periods of peak use based on professional opinion.
	Represents lesser level of use based on professional opinion.
	Represents periods of presence, either with no level of use OR uniformly distributed level of use indicated

### Summary

Juvenile movement into the estuary typically begins in April, but can be as early as February. Adult movement is year round, depending on the species. It can be expected that some use of the slough could be used by adults for refugia or holding, while others may spawn in the upper reach of the slough, and associated with the three feeder streams.

Downstream movements of salmon fry have been documented in research done in sloughs in both Washington State and in Oregon, likely due to physical displacement by high stream flows during the period of fry emergence. But it can also be attributed to carrying capacity and limited stream rearing

habitat (summer and winter). Fish have been recorded moving downstream to the estuary during periods when stream flows were not very high.

Studies done in South Slough and the Salmon River of Oregon, suggest that juvenile salmon that move to the estuary as presmolts, may form a significant portion of total production and that the estuary provides rearing habitat for extended periods of time. Tide gates which allow natural tidal fluctuations and fish passage at all times provide the best access, and otherwise will alter the behavior and survival of estuarine rearing salmon.

### **Coho**

The slough has the potential for almost year round use, from migrating adults through emigrating fry through smolts. Studies from Washington to southern Oregon have seen coho fry moving into sloughs in April. Some coho salmon appear to be adapted to rear in tidal habitats as sub-yearlings.

Extensive studies done in South Slough, Oregon have found that some coho salmon move to the estuary soon after emergence and spend much of their rearing time in sloughs and that the upper intertidal zone is an important rearing habitat for age-0 coho salmon. Movement in and out of South Slough is believed to occur, but may be tied to freshets, when salinities decrease due to large input of fresh water. Residence of coho is dependent on how much freshwater is available in the slough.

Studies from the South Slough suggest that juvenile salmon that move into the estuary as presmolts may form a significant portion of total production. Downstream movements of age 0 coho have been documented in both northern and southern systems, likely due to physical displacement by high stream flows during fry emergence. But it can also be attributed to carrying capacity of stream habitats. This is especially the case with spawning areas near the estuary, where rearing habitat is limited. Fish have been recorded moving downstream to the estuary during periods when stream flow was not very high.

One can extrapolate that use would be highest from late fall through spring. Depending on salinity levels of water entering the slough and how far up the slough it extends, as well as the amount of freshwater input from the feeder streams to the slough. It is not known at this time how much fresh water is available throughout the year within McDonald slough, but it has good potential year-round habitat. This can especially be the case with the amount of instream large wood seen in the upper portion of this slough and the remnant oxbow, and beaver dams which could be present through habitat enhancement. Spawning habitat is very limited, but there is a potential for some spawning in the system. If there is freshwater input age 0 fish that move to the slough during spring may live within it for up to 8 months (March to October). Then they will move even further upstream in the slough, to the feeder streams if possible. Or they will leave the slough as freshwater flows to the slough decrease from the feeder streams.

### **Chinook**

A visual confirmation of the presence of juvenile Chinook in McDonald Slough was made during a site visit by ODFW on August 14, 2012. The fall and summer Chinook salmon spend time in the estuary, as

both adults and juveniles, and juveniles rely on access to slough habitats for rearing and refugia. Adult Chinook are in estuaries only during migration. After emergence, fry and juveniles move into the transitional zone of the estuary in May. They can spend several weeks to months in the estuary, but typically leave by the first fall rains.

Sampling done in the Salmon River estuary in Oregon show that Chinook were found to spend at least four months, and possibly more, within tidal channels and sloughs. Emigrating salmon have been found to move tidally into and out of marsh habitats for several weeks and obtain significant growth while rearing in tidally accessible habitats.

### **Coastal Cutthroat Trout**

Research done in the Salmon River estuary in Oregon found that coastal cutthroat trout will use slough channels similar in size to McDonald Slough. The Salmon River cutthroat trout were found to rear in that estuary for much of the year.

McDonald slough has good potential year-round habitat in the upper portion of the slough, within the spruce swamp and near Highway 53. Spawning habitat is very limited, but there is a potential for some spawning in the system. The slough has the potential for year round use, from migrating adults through emigrating smolts.

### **Steelhead**

The estuary is primarily migration corridor for winter steelhead although limited rearing may occur. Use of McDonald Slough by steelhead is expected to be very limited.

### **Other species**

Other species which would use McDonald Slough include the following: Three-spined stickleback, river lamprey (transforming), starry flounder, staghorn sculpin, shiner perch, and cottid sp.

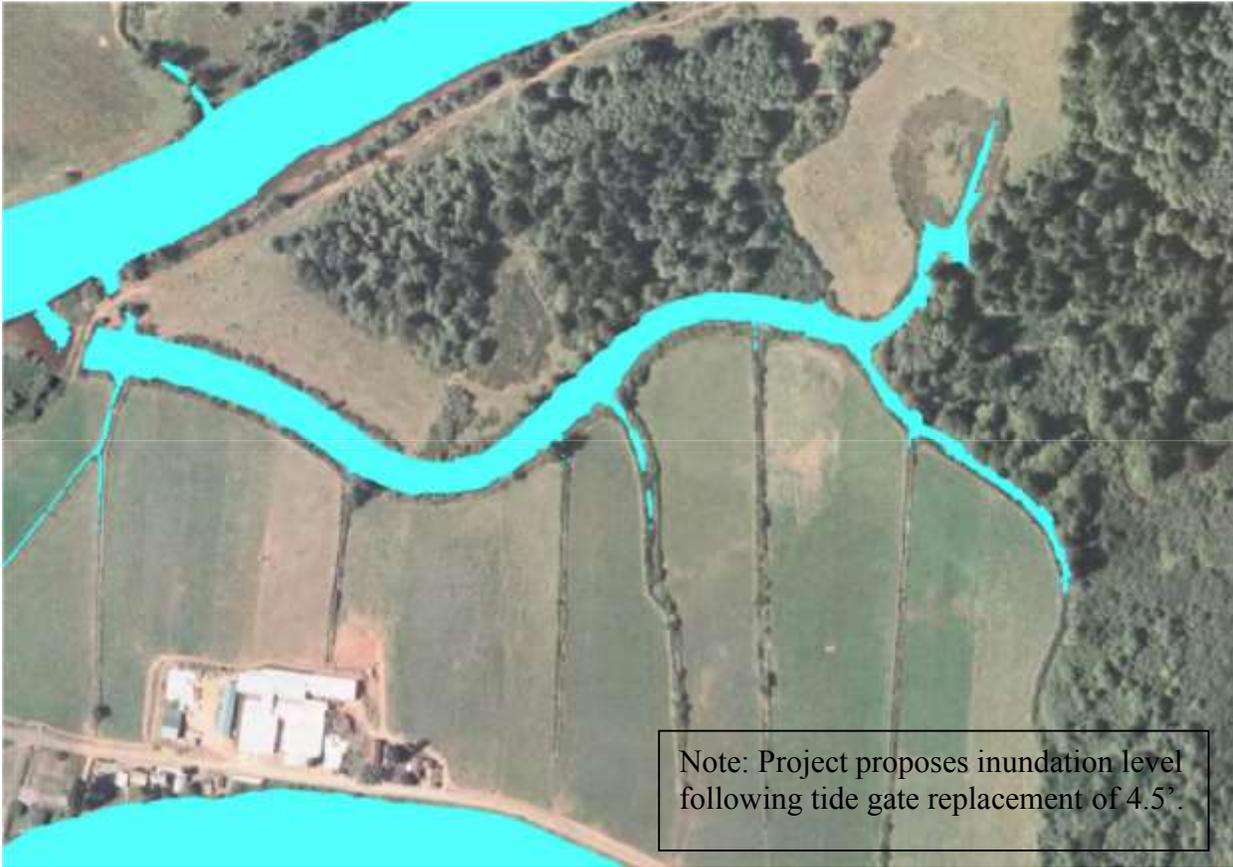
The threespine stickleback appears to reside in the slough at large numbers and their movement patterns are not known very well. Studies in other areas have found stickleback using estuarine habitats from April through August. A visual confirmation of stickleback use was made by ODFW during a site visit to McDonald Slough on August 14.

The river lamprey has been found in studies in Washington sloughs. They were found to be residing in the bottom sediment of tidal sloughs during their transforming phase. No further information is known about their residency length and migration and emigration patterns in sloughs. It is likely that there could also be brook lamprey which use the upper portion of the slough and feeder streams, although the spawning habitat may be limited.

The staghorn sculpin is commonly found in estuarine environments. Sloughs are one area in which they can spawn, from October through April, peaking in January and February. They commonly burrow into the sandy bottom and are occasionally found in the lower reaches of freshwater streams. Juveniles will

also recruit to sloughs after metamorphosis and moving into fresh water in the spring. Staghorn sculpin can reside the rest of its life within a slough.

The starry flounder (*Platichthys stellatus*) is similar to the staghorn sculpin, in that the distinction between resident and transitory use of an estuary or slough habitat can be hazy, they both are generally considered estuarine resident fish. McDonald Slough would be expected to be used by the starry flounder.



**Figure 11.** Inundation level at 4', nav 88.



**Figure 12.** Inundation level at 5', nav 88.



**Figure 13.** Inundation level at 6', nav 88.



**Figure 14.** Inundation level at 7', nav88.

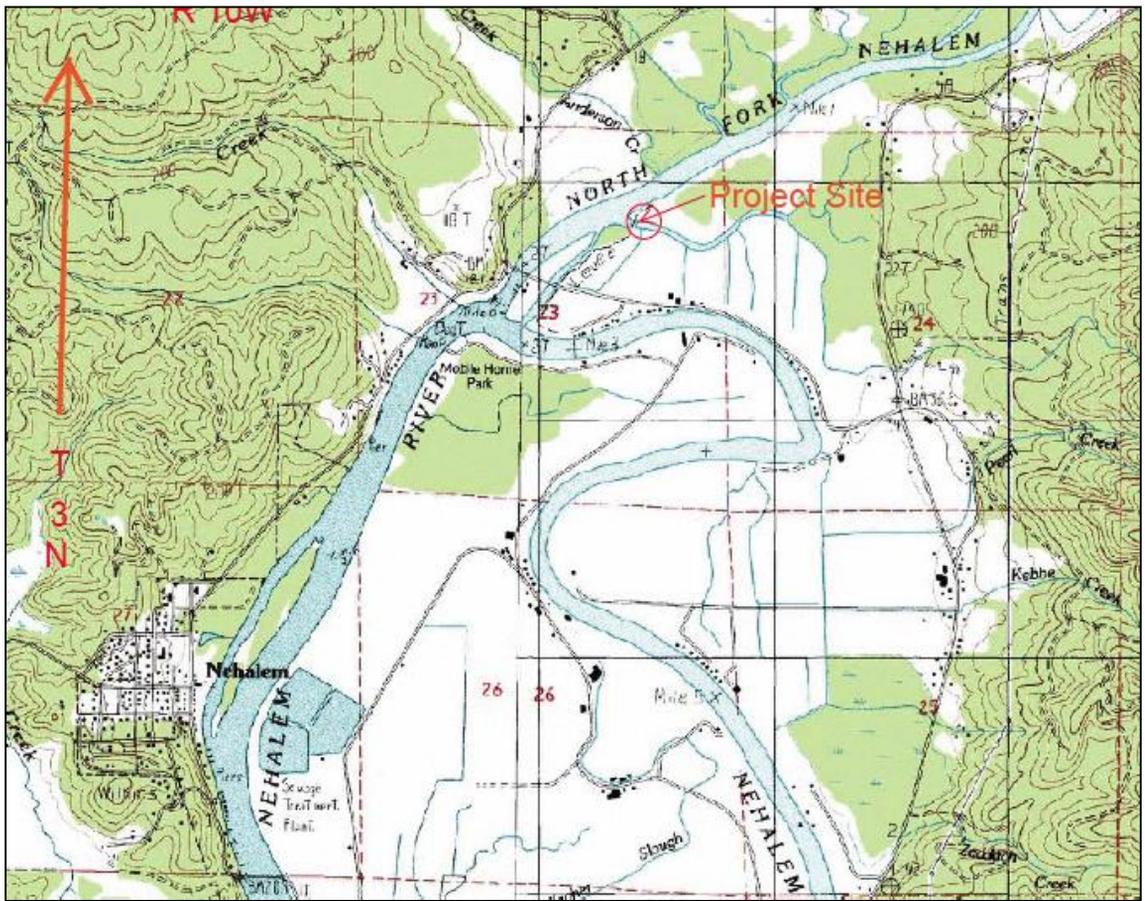


Figure 2. Topographic view of project area

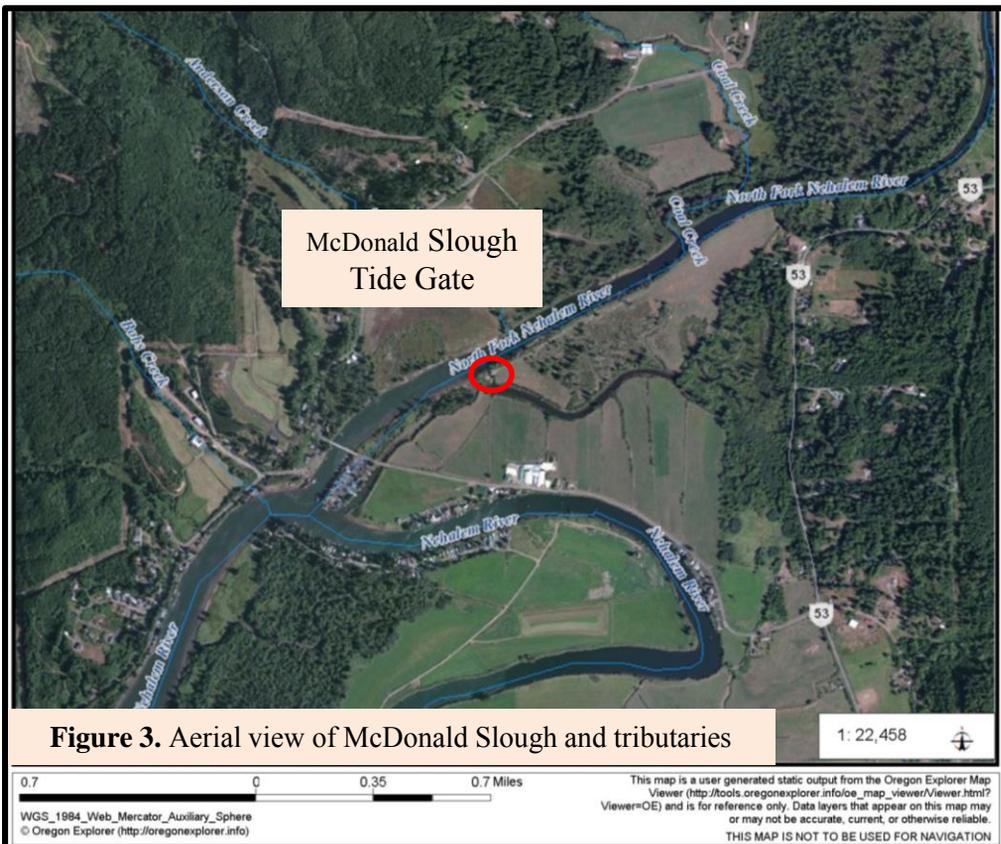
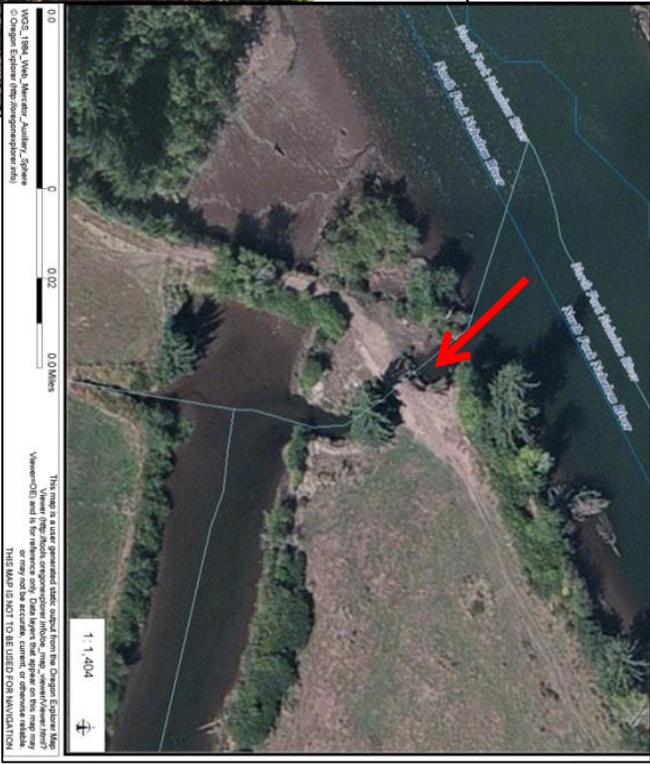


Figure 3. Aerial view of McDonald Slough and tributaries

0.7 0 0.35 0.7 Miles  
 WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
 © Oregon Explorer (http://oregonexplorer.info)  
 This map is a user generated static output from the Oregon Explorer Map Viewer (http://tools.oregonexplorer.info/og\_map\_viewer/viewer.html?Viewer=OE) and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.  
 THIS MAP IS NOT TO BE USED FOR NAVIGATION



Figure 6. View of tide gates from river looking toward slough



- Two 5' diameter tide gates
- Gates equipped with 1 wood & 1 aluminum lid
- Rated at 150 cfs fully opened
- Tide gates installed 20 years ago
- Life expectancy in marine system was ~70 years
- North gate was repaired in 2009
- South gate was sealed off after it failed during winter of 2012

Figure 7. View from levy looking east up slough

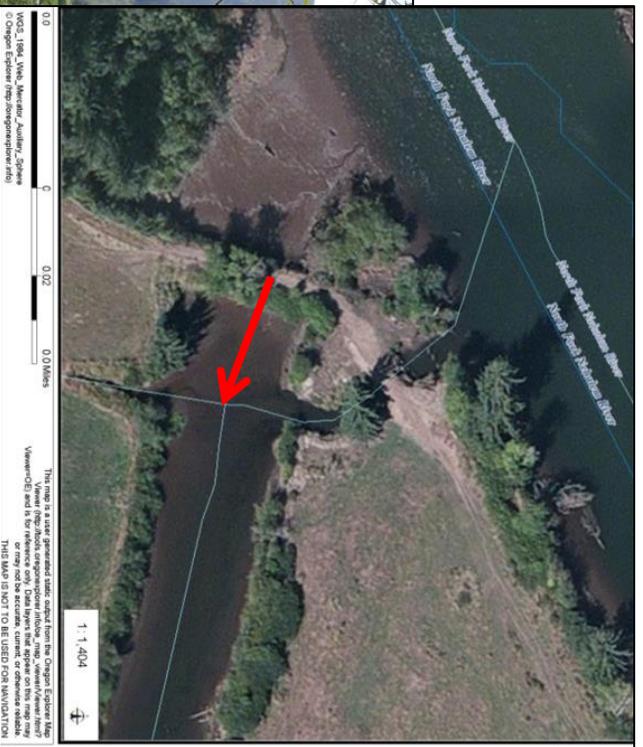
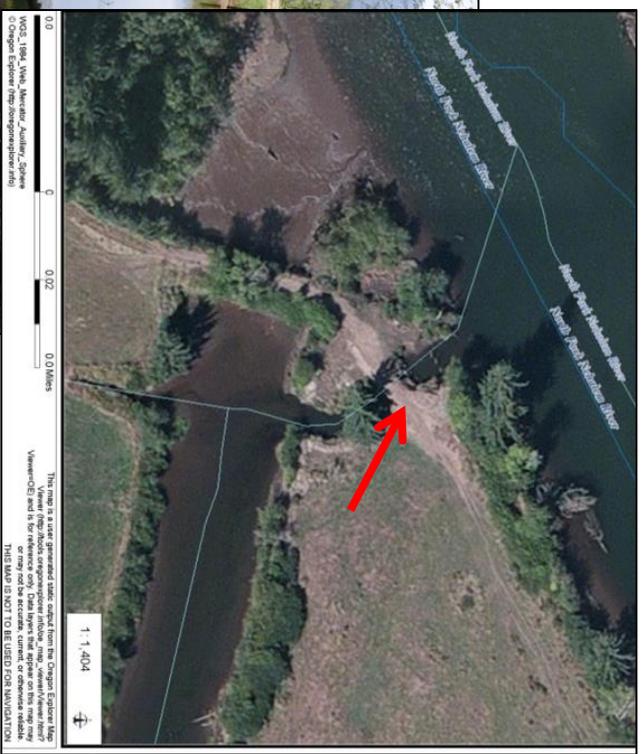


Figure 8. View of North Fork Nehalem River from top of levy





**Figure 9 (top).** View into remnant oxbow

**Figure10 (bottom).** View of Slough bank with alder and cottonwood

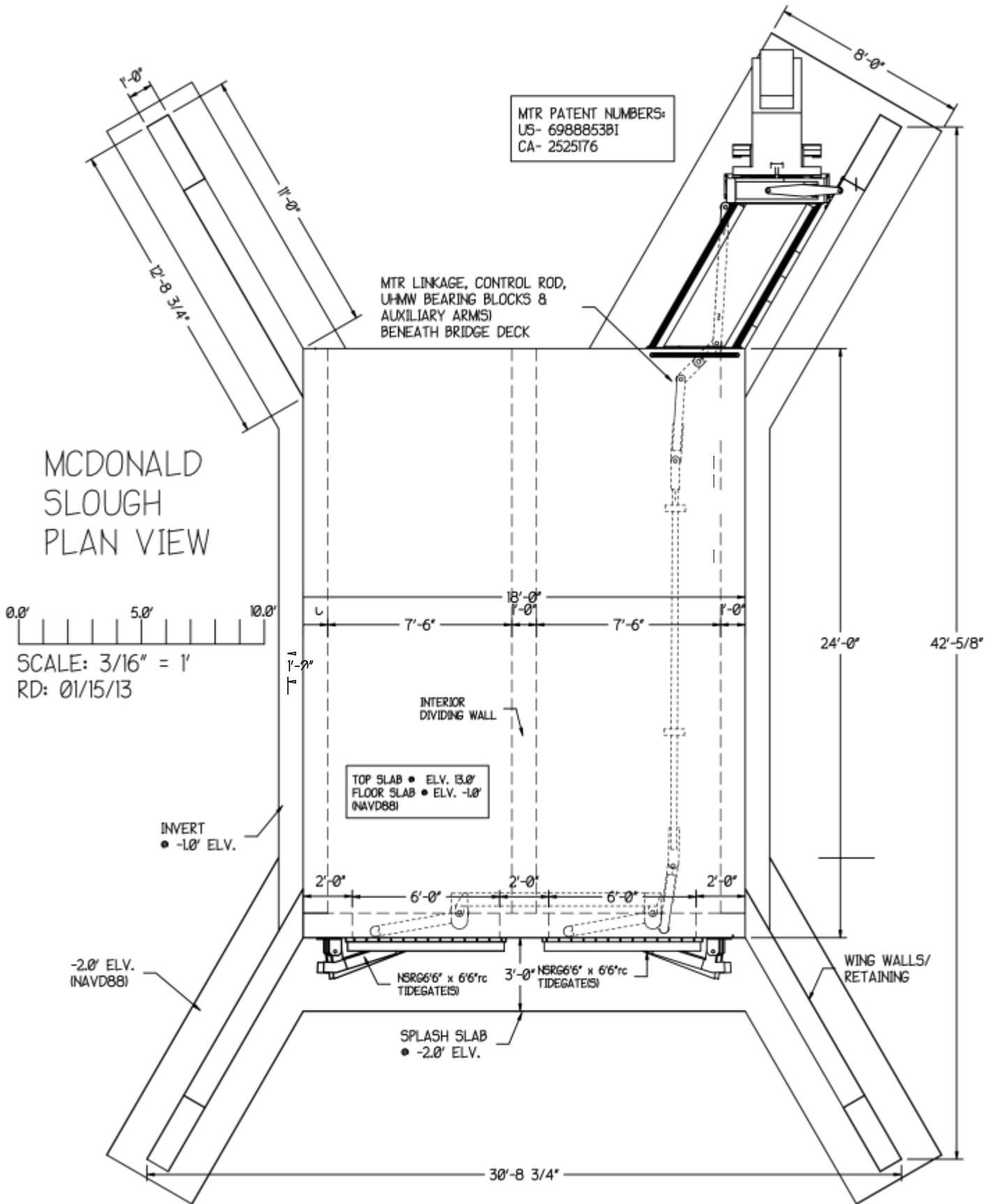


FIGURE 15

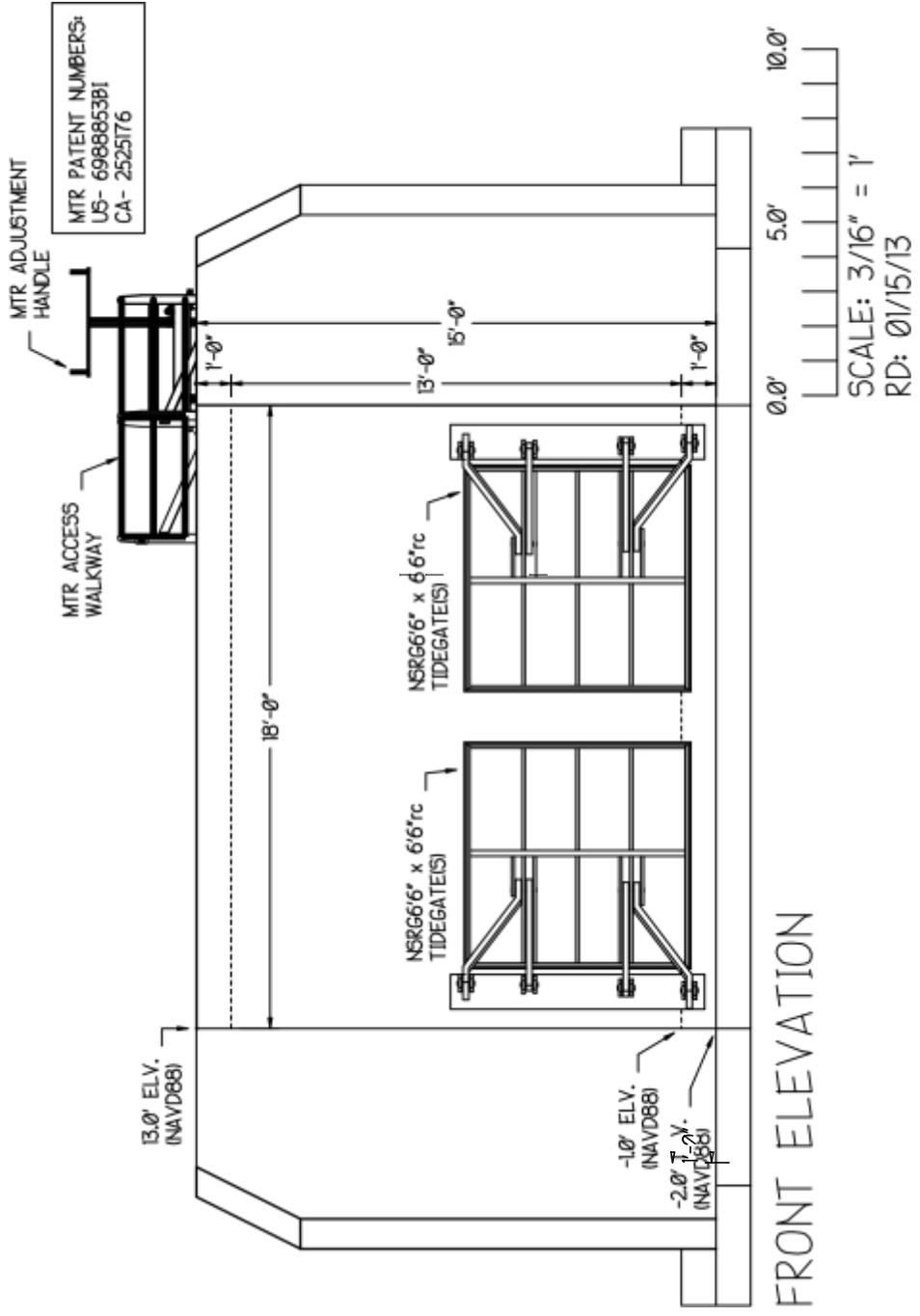


FIGURE 16

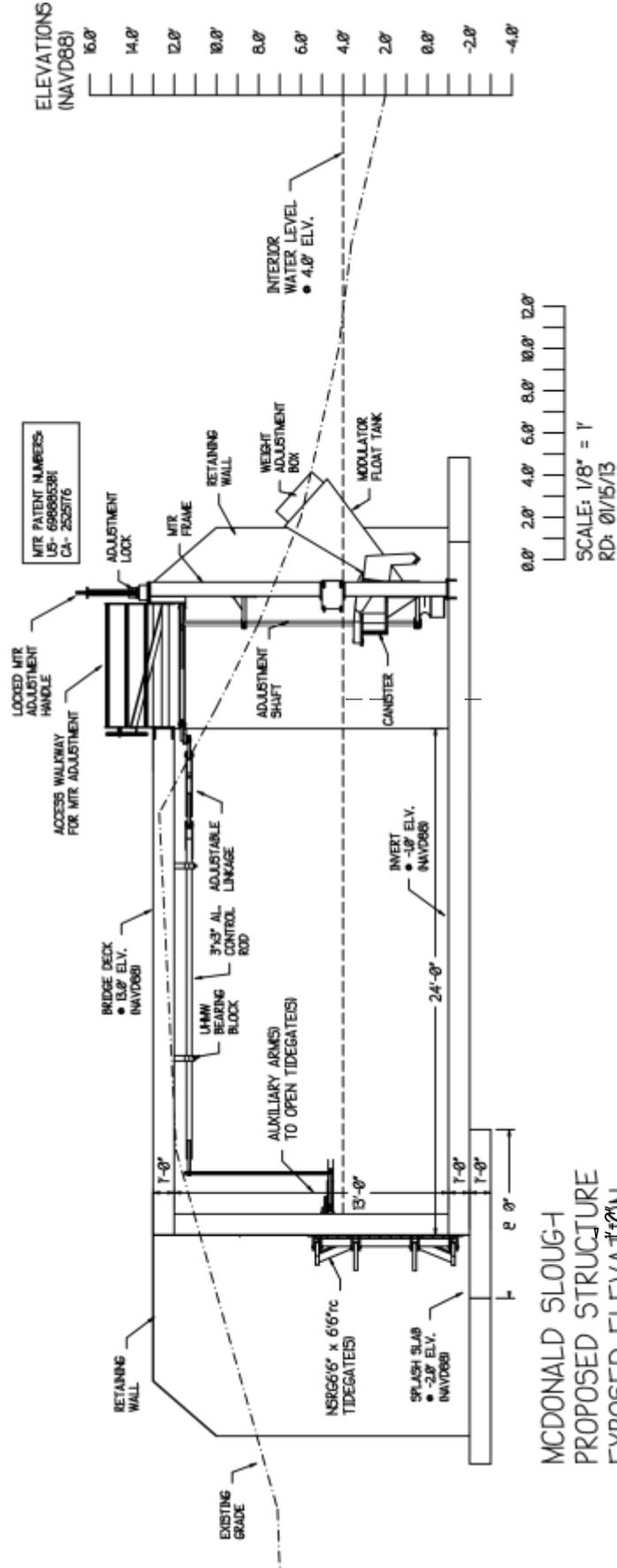


FIGURE 17

# Potential LWD Sites

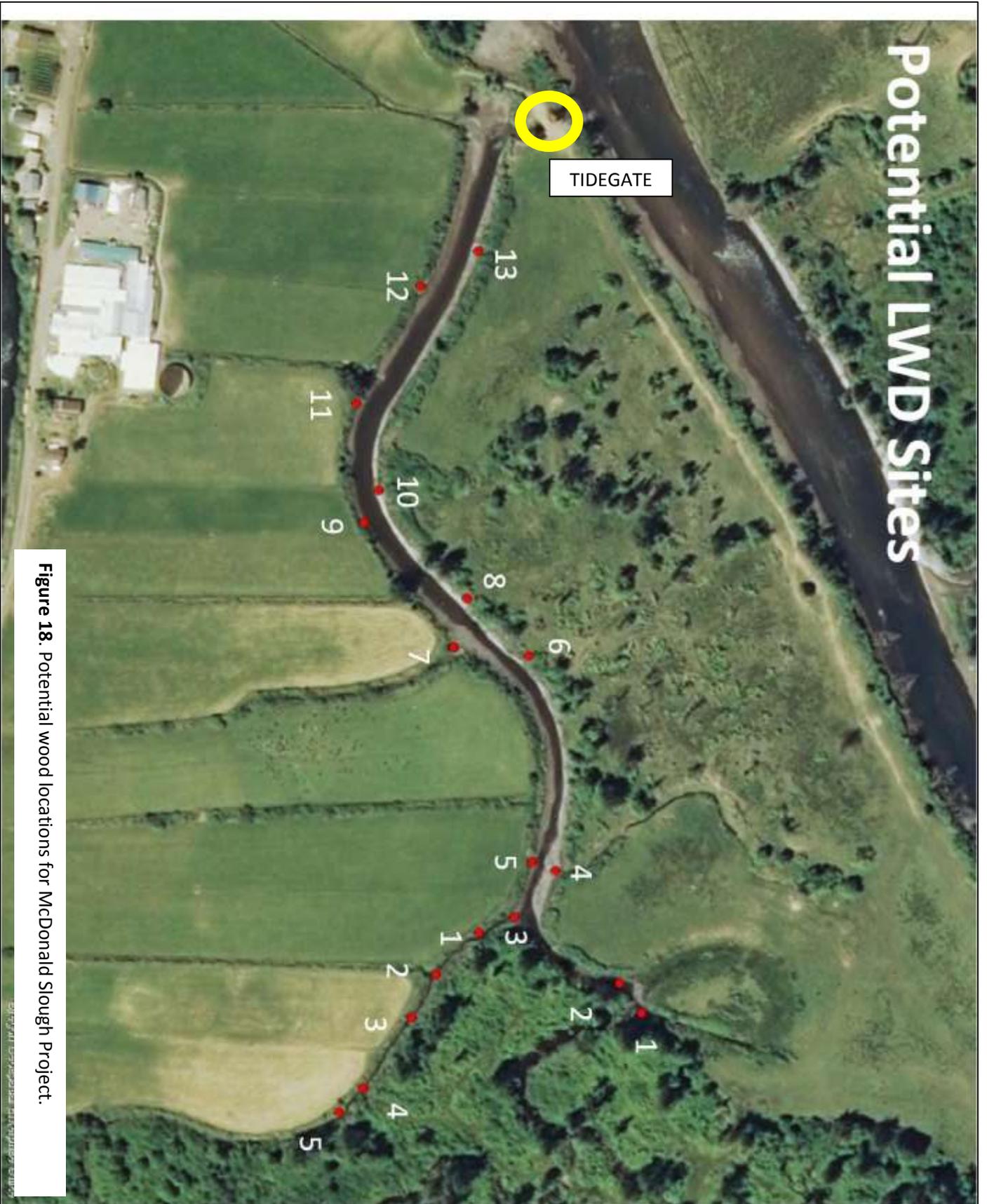
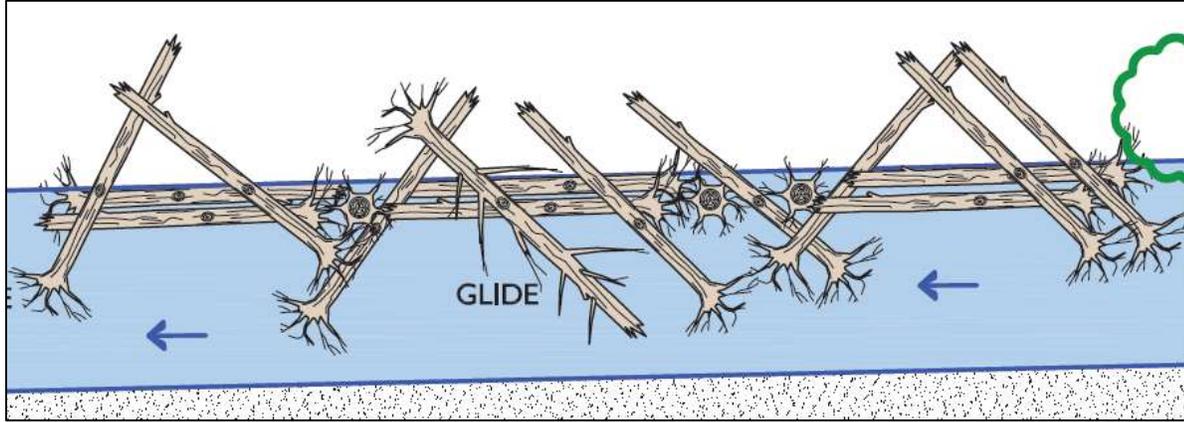


Figure 18. Potential wood locations for McDonald Slough Project.



**Figure 19.** Conceptual diagram for large wood installation in McDonald Slough



Over 30 spruce trees with root wads and 10-15 feet of the stem are available for placement in the slough. Landowner, Steve Nearing is donating them to the project.

**Figure 20.** Spruce rootwads available on property for placement in slough.

April 17, 2013

To Whom It May Concern;

My wife and I own the dairy on McDonald Rd. in Nehalem and have owned it for 34 yrs. We milk 200 cows and farm with two sons and one other full time employee. We also have two part-time employees who help in spring and summer. We are a seasonal dairy which means that our herd is dry in the winter and we start calving Feb. 1<sup>st</sup>. We utilize rotational grazing with a rotation that varies from 20-30 days between grazing cycles depending on rain and grass growth. Our milk goes to the Tillamook County Creamery Association where I served on their board of directors for 21 years. I currently serve on the Oregon Dairy Products Commission board of directors.

We have been working with Nehalem Marine on replacing our current tide gates with fish friendly tide gates. We are optimistic that fish friendly tide gates will allow us to continue dairying and also help with salmon restoration. We have agreed to contribute access for construction and monitoring and will also help with hauling materials with our dump truck and any other machine work that we can provide. We will also donate some large spruce stumps to provide habitat in the slough. These contributions were valued by LNWC at \$11,780.

We are in full support of the project but can't afford it on our own. Thank you for your consideration.

Steve and Lynda Neahring





**Subject: Letter of Support – McDonald Slough Reconnection Project**

Lower Nehalem Watershed Council (LNWC), in partnership with Nehalem Marine INC and Soil and Water Conservation District (SWCD), is seeking funds in support of the McDonald Slough Reconnection Project to reconnect McDonald Slough to the North Fork Nehalem River System. Sloughs offer juvenile salmon the essential habitat needed to undergo the transition from fresh water to salt water. Without access to sloughs, juveniles are transported quickly to estuaries where there is less protection from predation while they undergo this sensitive transition. Tillamook County is a well developed agricultural area. To meet the needs of the farmers utilizing land in this region, a majority of the off channel tidal habitat, like sloughs, has been severely diminished or modified with the introduction of levees and non-fish friendly tide gates.

LNWC and its partners understand the value of farm land and the important role agriculture plays in our local economy. The McDonald Slough Restoration Project aims to reconnect McDonald Slough to the North Fork Nehalem River by installing a muted tidal regulated side hinge tide gate near the historic opening of the slough. This modern gate would replace the existing structure and would allow for more exchange between the river and the slough while allowing the surrounding farmlands to function as needed. The result would also allow for more fish passage/use and improve the water quality of the slough. Furthermore, the gates on this property are failing and have an unknown life expectancy. These gates also function to drain flood waters within the surrounding residential areas and their proper functioning is critical during large flood events.

This project will provide protection for valuable Lower Nehalem River agricultural lands and residential areas while restoring access and improving habitat quality within McDonald Slough. LNWC strives to implement cooperative restoration projects compliment local businesses including dairy farms and this project is a great example of how this can be achieved. The signatures below represent community members and organizations that are in support of this project and understand the value restoration provides to our environment and economy.

Print Name & Title	Signature	Organization	Date
<u>Chris Knutsen, Bullyd</u>		<u>OPFW</u>	<u>2/11/13</u>
<u>Steve Neahring</u>		<u>Landowner</u>	<u>2-15-13</u>
<u>Rudy Fenk</u>		<u>Tillamook Soil &amp; Water</u>	<u>2-15-13</u>
<u>GEORGE HENNINGSON Chair</u>		<u>LNWC</u>	<u>2/15/13</u>
<u>DON H. CAMERON</u>		<u>PORT OF NEHALEM</u>	<u>2/16/2013</u>



**Tillamook County Soil and Water Conservation District**

6415 Signal Street - Tillamook, Oregon 97141 Phone (503) 842-2240 / Fax (503) 842-2760  
Website - <http://www.tbcc.cc.or.us/~tcwrc/swcd> E-Mail: [tcswcd@oregoncoast.com](mailto:tcswcd@oregoncoast.com)

The Tillamook County Soil and Water Conservation District highly supports the Lower Nehalem Watershed (LNWC) NOAA Coastal and Marine Habitat Restoration Project Grant application. The McDonald Slough Restoration Project to reconnect McDonald Slough to the North Fork Nehalem River would restore some of the most important type of salmonid rearing habitat in the North Fork Nehalem River System. This ecotone habitat is extremely critical for juvenile salmon to make the transition from fresh to salt water. This habitat type has been reduced and/or modified through the installation of levees and non-fish friendly tide gates in past years.

Today, there are over 200 tide gates in Tillamook County. Most all have a potential to be replaced with modern side hinged tide gates with a muted tidal regulator. This modern tide gate will restore and improve the water quality and habitat conditions conducive to reestablish the natural slough processes. McDonald Slough proposal is the first slough being considered in Tillamook County for replacing the common round, top hinged, cast iron tide gate that restrict fish passage to the historical slough.

This project will provide protection for valuable Lower Nehalem River agricultural lands, residential area while returning the historical McDonald slough to former conditions. This project will bring agricultural and fish habitat restoration partners together for a common goal in the Lower Nehalem River Area. It will undoubtedly lead to greater Tillamook County achievements in restoring the lower river slough systems and the critical rearing habitats for the listed under the Endanger Species Act and the Chinook salmon managed under the Magnuson-Stevens Fishery Conservation and Management Act.

Sincerely;

  
Rudy Fenk, Chairperson  
Tillamook County  
Soil and Water Conservation District



# Oregon

John A. Kitahaber, M.D., Governor

## Department of Fish and Wildlife

Northwest Region  
4907 3<sup>rd</sup> Street  
Tillamook, OR 97141  
(503) 842-2741  
Fax (503) 842-8385  
www.dfw.state.or.us



April 18, 2013

Oregon Watershed Enhancement Board  
775 Summer St. NE Ste 360  
Salem, OR 97301-1290

**RE: McDonald Slough OWEB Restoration Grant**

To Whom It May Concern:

This letter is intended to show Oregon Department of Fish and Wildlife's (ODFW) support for the McDonald Slough Restoration Proposal. We feel that the McDonald Slough project is a good candidate for restoration funding. The project will benefit fall chinook, coho, chum, coastal cutthroat trout and both brook and pacific lamprey.

The adjacent freshwater wetland upstream of the slough contains the three tributaries feeding it and the wetlands of this location. There is significant habitat and rearing potential within this forested wetland complex, not only for salmonids but for numerous aquatic and terrestrial species. An additional key role of McDonald Slough is in providing temperature refugia for salmonids during the summer months; while in the winter, access to the slough will provide significant overwintering refugia.

Since the installation of the tidegates salmonid access to the slough has been reduced. Recently one of the gates was blocked in an open position by debris that kept it from closing and in the summer of 2011 ODFW visually identified juvenile chinook concentrated in a pool under the overhanging cover of a large spruce tree, just upstream of the tidegates.

ODFW will be providing technical assistance towards the project through both our Tillamook District office staff and our Fish Passage Program staff. This in-kind contribution of staff time and resources for the project will be around \$2,400. Approximately \$1,000 of in-kind contribution has already been expended towards this project.

Sincerely,

Chris Knutsen  
District Fish Biologist  
ODFW - North Coast Watershed District



# Oregon

John A. Kitzhaber, M.D., Governor

## Department of Fish and Wildlife

Fish Division  
3406 Cherry Avenue NE  
Salem, OR 97303  
503-947-6200  
Fax: 503-947-6202  
[www.dfw.state.or.us](http://www.dfw.state.or.us)

April 22, 2013

775 Summer St. NE, Suite 360  
Oregon Watershed Enhancement Board  
Salem, OR 97301-1290



Oregon Watershed Enhancement Board Review (OWEB) Team,

The Oregon Department of Fish and Wildlife's (ODFW) Fish Passage Program strongly supports the McDonald Slough Tide Gate Replacement project proposed at Mr. Steve Nearing's property in Tillamook County. We have visited the site on multiple occasions where we have discussed the restoration opportunities associated with this fish passage restoration effort. We encourage and recommend the OWEB Review Team strongly consider funding this tide gate replacement project.

This project will improve rearing, foraging, and off-channel and flood refuge habitat for young-of-year, sub-adult, smolt, and adult salmon species in the Lower Nehalem River estuary by enhancing fish access into and out of these very important estuarine habitats. Similarly, and from a fish habitat perspective, the project will improve and restore estuarine salt-marsh habitat function and floodplain connectivity of McDonald Slough with the Lower Nehalem River.

We are presently and will continue to work closely with Nehalem Marine, the Watershed Council, Mr. Nearing, and other project stakeholders to ensure the project is supported, funded, and constructed. We believe the tide gate design is consistent with fish passage design criteria and will markedly improve fish passage conditions in McDonald Slough. We are in the final design review phase of the project and anticipate ODFW's fish passage approval.

ODFW's Fish Screening and Passage Program has and will continue to support and work closely with the project proponents to ensure the project is implemented and maintained consistent with Oregon's fish passage policies and design criteria. Projects like this, particularly in the Lower Nehalem Watershed, are vital for fisheries and wildlife and local stakeholders, particularly those that promote native migratory fish access to estuarine habitats, while protecting private property from damaging floodwaters. We respectfully encourage the OWEB Review Team give thoughtful consideration to this project proposal.

Sincerely,

  
Greg Apke  
ODFW Statewide Fish Passage Program Leader

Cc. Chris Knutsen, ODFW North Coast Watershed District Fish Biologist

INTERNAL REVENUE SERVICE  
P. O. BOX 2508  
CINCINNATI, OH 45201

DEPARTMENT OF THE TREASURY

Date: SEP 11 2002

LOWER NEHALEM WATERSHED COUNCIL  
PO BOX 249  
NEHALEM, OR 97131-0000

Employer Identification Number:  
91-1826263  
DLN:  
17053096747092  
Contact Person: LARRY W BOTHE ID# 31462  
Contact Telephone Number:  
(877) 829-5500  
Our Letter Dated:  
April 1998  
Addendum Applies:  
No

Dear Applicant:

This modifies our letter of the above date in which we stated that you would be treated as an organization that is not a private foundation until the expiration of your advance ruling period.

Your exempt status under section 501(a) of the Internal Revenue Code as an organization described in section 501(c)(3) is still in effect. Based on the information you submitted, we have determined that you are not a private foundation within the meaning of section 509(a) of the Code because you are an organization of the type described in section 509(a)(1) and 170(b)(1)(A)(vi).

Grantors and contributors may rely on this determination unless the Internal Revenue Service publishes notice to the contrary. However, if you lose your section 509(a)(1) status, a grantor or contributor may not rely on this determination if he or she was in part responsible for, or was aware of, the act or failure to act, or the substantial or material change on the part of the organization that resulted in your loss of such status, or if he or she acquired knowledge that the Internal Revenue Service had given notice that you would no longer be classified as a section 509(a)(1) organization.

You are required to make your annual information return, Form 990 or Form 990-EZ, available for public inspection for three years after the later of the due date of the return or the date the return is filed. You are also required to make available for public inspection your exemption application, any supporting documents, and your exemption letter. Copies of these documents are also required to be provided to any individual upon written or in person request without charge other than reasonable fees for copying and postage. You may fulfill this requirement by placing these documents on the Internet. Penalties may be imposed for failure to comply with these requirements. Additional information is available in Publication 557, Tax-Exempt Status for Your Organization, or you may call our toll free number shown above.

If we have indicated in the heading of this letter that an addendum applies, the addendum enclosed is an integral part of this letter.

Letter 1050 (DO/CG)

LOWER NEHALEM WATERSHED COUNCIL

Because this letter could help resolve any questions about your private foundation status, please keep it in your permanent records.

If you have any questions, please contact the person whose name and telephone number are shown above.

Sincerely yours,



*Lois* Lois G. Léner  
Director, Exempt Organizations

## Signature Authorization Page

I hereby make an application for financial assistance under the terms and conditions of the R&E Program as described in my project application.

I understand that if my project is approved for funding, the following will apply:

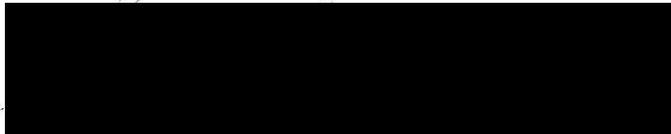
- All project sponsors must sign a grant agreement containing the terms and conditions on which funding will be released.
- Project expenses which occur before the grant agreement is signed or after the expiration date will not be paid by the R&E Program.
- Copies of all necessary permits must be submitted to the R&E Program.
- Project sponsors must certify compliance with local, state, and federal regulations and laws.
- Landowner, monitoring and maintenance agreements must be submitted to the R&E Program.
- Regular progress reports may be required, and at the end of each project a Completion Report must be submitted.
- Educational products resulting from projects are public domain.
- All information submitted to either party under this application is subject to the federal Freedom of Information Act.

Project Title: McDonald Slough Reconnection Project

Applicant: Lower Nehalem Watershed Council

Date: 12/10/2013

Fiscal Officer:



Date: 12/10/13



Oregon  
John A. Kitzhaber, M.D., Governor

Department of Fish and Wildlife

Fish Division  
3406 Cherry Avenue NE  
Salem, OR 97303  
503-947-6200  
Fax: 503-947-6202  
[www.dfw.state.or.us](http://www.dfw.state.or.us)

June 14, 2013

Chrissy Smith  
Lower Nehalem Watershed Council Coordinator  
P.O. Box 249  
Nehalem, OR 973131



Ms. Smith,

The Oregon Department of Fish and Wildlife's (ODFW) Fish Passage Program has thoroughly reviewed the design plans for the fish passage improvement tide gate replacement project located on McDonald Slough, situated in the Lower Nehalem River Watershed. The property is owned and managed by Mr. Steve Nearing, a local dairy farmer in Tillamook, County. We have worked diligently the previous two-years towards viable fish passage alternatives at this project location. Most recently we have worked very closely with Mr. Leo Kuntz (Nehalem Marine) and Mr. Don Porior, PE to analyze and determine that the fish passage restoration project is designed consistent with Oregon Fish Passage rules and regulations (ORS 509.589 and OAR 635-412-0035). ODFW's design goal for this priority fish passage restoration project is to ensure the proposed project successfully maximizes passage conditions for native migratory fish present at this location.

Based on recent collaborative efforts to effectively model and predict the resultant hydraulic performance of the proposed Muted Tidal Regulator (MRT) tide gate and twin-side by side 6' diameter culverts we are confident the proposed project is designed and will perform consistent with ODFW fish passage design criteria. We are convinced the meets our fish passage goals for this fish passage restoration project.

The hydraulic model built by Mr. Porior predicts the proposed water velocities, water depths, and time of tide gate openness at the 5 and 95% exceedence (fish passage design) flows for the Muted Tidal Regulator tide gate facility for two design options. These options include: 1) reinforced concrete box (RCBC), and 2) twin 6' diameter culverts (Culverts). The hydraulic model predicts, as we expected, that the RCBC design solution out performs the Culvert design solution. However, the Culvert design still meets ODFW's design criteria. Based on the predicted outputs of the hydraulic model, ODFW approves the design for the proposed Culverts and associated MTR tide gate facility.

The calculations and assumptions for the hydraulic model include:

- 95% exceedence flow = 0.50 cubic feet per second (cfs)
- 5% exceedence flow = 20.0 cubic feet per second (cfs)
- 8.0' = Maximum elevation of inundation allowed by landowner
- MTR Setting at datum elevation of 4.5 ft

Summary statistics from the hydraulic model built by Mr. Don Porior, under advisement by and with ODFW Fish Passage Program, are as follows:

	6' Dia. RCBC with MRT Tide Gate (old design)		6' Dia. Twin Culverts with MTR Tide Gate	
	95% Exceedence	5% Exceedence	95% Exceedence	5% Exceedence
Water Velocity	.03%	.03%	5.7%	7.1%
Water Depth	0.0%	0.0%	5.2%	5.6%
% of Time Tide Gate is Open	91.50%	91.50	49.6%	71.8%

These percentages represent the % of time ODFW fish passage design criterion for water velocity and water depth are exceeded during a storm event producing 20 cfs.

ODFW Tide Gate Design Criteria for this site include:

- Water Velocity  $\leq$  2 ft/second
- Water Depth  $\geq$  1 ft
- % Time of Tide Gate Openness  $\geq$  51% of the time

We acknowledge the site constraints and the limitations of the 6' diameter twin culvert solution. We have learned that the primary factor that contributes to the percentage of time the tide gate is open is the volume of the freshwater detention basin above the proposed tide gate. To optimize and increase the percentage of time the tide gate is open, the volume of area behind the tide gate would need to increase. To accomplish this, the levee height of Mr. Nearing's property would have to increase or active excavation to increase the volume within the levee would need to be pursued. These may be viable alternatives for future consideration to improve the total time of tide gate openness, but we believe these alternatives are outside the scope of the proposed project at this time.

In summary, ODFW's Fish Passage Program believes the 6' diameter twin culvert muted tidal regulator tide gate is a marked increase compared to the existing in situ tide gate and maximizes fish passage conditions in McDonald Slough. The comparison of the hydraulic performance between the two design alternatives indicates the RCBC with the MTR maximizes fish passage performance, but given the economic considerations associated with the costs of this alternative, we believe the 6' diameter twin culverts with the MTR meets ODFW design criteria and performance goals for this fish passage restoration project.

We appreciate the coordination among the project stakeholders on this restoration project. If you have any further questions, please contact me at 503-947-6228 or by email at [greg.d.apke@state.or.us](mailto:greg.d.apke@state.or.us).

Sincerely,



Greg Apke  
ODFW Statewide Fish Passage Program Leader

Cc. Chris Knutsen, ODFW Mid-Willamette Watershed District Fish Biologist  
Alex Farrand, ODFW North Coast Watershed District Fish Biologist  
Ken Loffink, ODFW Asst. Fish Passage Program Leader  
Alan Ritchey, ODFW Screens and Passage Program Manager  
Ryan McCormick, ODFW Passage Engineer  
Michelle Long, ODFW North Coast Watershed Council Liaison  
Amy Horstman, USFWS-Habitat Restoration Program  
Denise Hoffert-Hay, NOAA Fisheries – American Rivers Funding Program  
Chrissy Smith, Lower Nehalem Watershed Council Coordinator  
Larry Swenson, NOAA Fisheries  
Aaron Beavers, NOAA Fisheries  
Annie Birnie, NOAA Fisheries  
Leo Kuntz, Nehalem Marine  
Don Porior, Engineer  
Steve Nearing, Landowner  
Tom Shafer, OWEB North Coast Program Representative  
ODFW Project File (PA-01-0047)

**McDonald Slough Reconnection Project  
Lower Nehalem Watershed Council**

**References:**

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