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Two Mile Meadow Stream and Wetland Restoration Project

East Fork Potlatch River, Latah County, Idaho
Annual Report – 2018
Work Completed on Phase 1 During the 2018 Field Season

Report prepared by Trish Heekin, Conservation Planner, Latah SWCD, December 28, 2018

The Two Mile Meadow Stream and Wetland Restoration Project (Project) is located in Latah County, Idaho, in sections 13 and 24 of Township 40 North, Range 01 West (vicinity map attached, page 4). The project area is located along the East Fork of the Potlatch River approximately 3 miles east of Helmer, Idaho. Access to the site is via USFS Road 3227, off Forks Road (USFS Road 3332). The Project is located on federal land managed by the Palouse Ranger District of the Nez Perce – Clearwater National Forest (NP-CNF) and is being implemented through a partnership between the NP-CNF and the Latah Soil and Water Conservation District (Latah SWCD).

In the early decades of the 20th century several tributaries in the Potlatch River were diverted from their historic channels to accommodate logging and associated railroad construction. In some reaches the diversion was deliberate, done as part of the construction. In other reaches the diversion was inadvertent, a consequence of flow captured in the ditches created when the railroad berms were constructed. Through Two Mile Meadow, the flow was moved from its sinuous channel through the wet meadow into a ditch along the southeast edge of the meadow, at the bottom of the timbered slope. On the northwest edge of the meadow the railroad berm prevented the hillslope runoff from reaching most of the floodplain. These anthropogenic alterations degraded the channel morphology, reduced floodplain connectivity, converted the plant community, and dehydrated the meadow. The existing channel was over-deep, straightened, and continued to experience severe bank erosion. As a consequence of the simplified channel morphology, dropped water table, and loss of late-season baseflow, the

quality of over-winter and late-summer rearing habitat for juvenile steelhead (*Oncorhynchus mykiss*, ESA-listed threatened) had been degraded and diminished.

The purpose of this Project is to restore meadow hydrology to a state that supports healthy native meadow and riparian conditions and habitat for fish and wildlife. This restoration is to be accomplished by restoring the stream to its historic channel and elevations through construction work done in 3 phases. Phase 1 was completed in 2018. The project is designed to slow water and enhance groundwater recharge, prevent introduction of sediment into the East Fork of the Potlatch River from excessive streambank and bed erosion, promote re-establishment of native riparian vegetation, and return hydrologic function to the riparian and wetland areas.

Work done in 2018, Phase 1 of the Project, consisted of the following components: development of two temporary access routes; harvest of trees, logs, and slash, removal of several hundred feet of railroad berm; construction of a channel diversion structure, and six ditch plugs; excavation of constructed channel segments, installation of streambank treatments; construction of habitat structures; placement of logs and slash on the floodplain; installation of livestock exclusion fencing; construction of livestock ramps; and removal of debris. During construction the Contractor also salvaged and clump-planted shrubs; harvested and re-planted sod; and harvested and stored sod for placement by the Latah SWCD Crew. Construction began on July 9th and ended October 15th, 2018. Revegetation work by the Latah SWCD Crew began on July 10 and ended on December 13, 2018.

During the beginning of the construction season, biologists, technicians, and youth corps workers from the NP-CNF surveyed, salvaged, and transported aquatic organisms, including freshwater mussels and steelhead trout. All salvage/transport work was completed before the contractor commenced the de-watering operation.

Once the fish salvage work was finished, the existing channel was de-watered, the channel diversion structure was completed, and flow was returned to the historic channel. Prior to diversion of the flow, the contractor excavated new channel to reconnect historic channel segments and built instream bank features such as double vegetated soil lifts, brush fascines, and log habitat structures. Willow cuttings (5,700) were installed in the bank features and along the design/historic channel. Instream work also included construction of pool, riffle, run habitat and placement of alluvium on the channel bottom to create spawning habitat. The contractor also installed a temporary bridge across the historic channel and, following diversion of flow into the design channel, all equipment used the bridge to cross the channel. About 2,160 feet of the railroad berm, which blocked slope runoff from reaching the wetland, was excavated and the material from the berm was used to build the channel diversion structure and six ditch plugs. The Contractor harvested sod and placed it on vulnerable sites, such as banks above the streambank structures (approximately 39,200 square feet). Contractor also constructed 280 linear feet of stick berms and scattered logs and slash across the floodplain to slow water

velocities, increase infiltration, and reduce erosion. Log V-weirs were installed in the lower end of the design channel where flow was returned to the existing channel pending Phase 2 construction. Abandoned channel length is 1,361 linear feet; length of the new Phase 1 channel is 1,558 linear feet.

The Latah SWCD Crew was on site approximately 4,400 hours (does not include hours for crew leads, planner, restoration engineer, or NP-CNF staff). The Latah SWCD Crew placed and staked 292 wetland sod mats over the channel diversion structure and ditch plugs and on vulnerable locations on the floodplain; coverage was approximately 15,000 square feet. The Contractor also harvested and stored approximately 13,070 square feet of sod for the Latah SWCD crew to place on additional vulnerable sites, such as on ditch plugs, travelways, and streambanks. The Latah SWCD Crew seeded and mulched disturbed floodplain and upland areas with weed-free straw mulch (350 bales); placed logs and slash on the ditch plugs and floodplain; and planted 525 willow cuttings and 1,858 containerized woody riparian plants. The Latah SWCD Crew also spent quite a bit of time managing the willow cuttings, watering wetland sod, repairing damage, and clearing burlap and other debris from the site.

Best management practices implemented during and following construction included the following: pre-construction conferences to inform Contractor and Latah SWCD Crew of permit requirements and best management practices; use of biodegradable hydraulic fluid in excavator; inspection of equipment before mobilization to site; daily inspection of equipment; identification of staging and refueling areas; placement of pumps in leakproof tubs, with absorbent pads; screening of pump hose intakes; use of water for dust control; removal of litter and debris; placement of spill kits in all vehicles; installation of erosion control materials; turbidity monitoring; protection of high quality vegetation by limiting travel and using ground protection mats; salvage and replanting of sod and shrubs; decompaction of travelways; use of native species for revegetation; seeding and mulching all bare and disturbed areas; placement of weed-free straw bales for erosion control; placement of slash and logs on the floodplain to reduce erosion; installation of wetland sod mats on new structures to preserve structural integrity and present erosion; and construction of water bars on the meadow access routes. Contractor also developed and submitted a Stormwater Pollution Prevention Plan and a Spill Prevention and Response Plan.

Table 1. Summary of Phase 1 Construction, Two Mile Meadow Stream and Wetland Restoration Project.

Construction Features	Quantity	Units
Floodplain shrub removal and clump planting	50	each
Sod harvest and replant	0.9	acres
Sod harvest and store	0.3	acres
Railroad berm removal	2,157	linear feet
Channel diversion structure, 1	450	cubic yards
Ditch plugs, 6	1,100	cubic yards
Constructed channel	599	linear feet
Log V weirs	3	each
Double vegetated soil lift (bank treatment)	200	linear feet
Brush fascine (bank treatment)	564	linear feet
Habitat structures (instream habitat)	7	each
Fencing (livestock exclusion)	4,100	linear feet
Livestock ramps, 2 (provide off-channel water)	66	linear feet
Stick berms (floodplain roughness feature)	280	linear feet

Table 2. Wetland grass mix used for Phase 1 revegetation, Two Mile Meadow Stream and Wetland Restoration Project. Seed (2,000 pounds) applied to bare and disturbed areas on the floodplain and along the streambanks.

Wetland Grass Species	
Scientific Name	Common Name
Agrostis exarata	Spike bentgrass
Beckmannia syzigachne	American sloughgrass
Bromus carinatus	California brome
Bromus marginatus	Mountain brome
Calamagrostis canadensis	Bluejoint reedgrass
Danthonia californica	California oatgrass
Deschampsia cespitosa	Tufted hairgrass
Deschampsia elongata	Slender hairgrass
Glyceria styriata	Fowl mannagrass
Hordeum brachyantherum	Meadow barley
Triticum aestivum x secale	QuickGuard

Table 3. Wetland and woodland forb species (350 pounds) used for Phase 1 revegetation, Two Mile Meadow Stream and Wetland Restoration Project. Seed purchased from local native seed nursery or hand-collected from meadows of the Potlatch River Watershed.

Forb Species	
Scientific Name	Common Name
Achillea millefolium	Western yarrow
Agoseris grandiflora	Grand agoseris
Camassia quamash	Common camas
Collomia grandiflora	Grand collomia
Epilobium brachycarpum	Autumn willowherb
Epilobium ciliatum	Watson's willowherb
Eriophyllum lanatum	Oregon sunshine
Gaillardia aristata	Blanketflower
Gallium boreale	Northern bedstraw
Gentiana affinis	Prairie gentian
Geum triflorum	Prairie smoke
Helianthella uniflora	Little sunflower
Heracleum maximum	Cow parsnip
Linum lewisii	Lewis flax
Lomatium triternatum	Nineleaf lomatium
Penstemon attenuatus	Taperleaf penstemon
Penstemon globosus	Globe penstemon
Potentilla arguta	Tall cinquefoil
Potentilla gracilis	Slender cinquefoil
Potentilla gracilis var fastigiata	Slender (fatty fingers) cinquefoil
Prunella vulgaris	Selfheal
Senecio integerrimus	Western groundsel
Sidalcea oregana	Oregon checkermallow
Solidago canadensis	Canada goldenrod
Solidago missouriensis	Missouri goldenrod
Symphyotrichum spathulatum	Western aster
Veratrum californicum	California false hellebore

Table 4. Woodland grass mix (700 pounds) used for Phase 1 revegetation, Two Mile Meadow Stream and Wetland Restoration Project. Woodland grass mix was applied to bare, disturbed areas associated with rehabilitation of FS Road 3227 and the temporary meadow access routes.

Woodland Grass Species	
Scientific Name	Common Name
Bromus carinatus	California brome
Bromus marginatus	Mountain brome
Elymus glaucus	Blue wildrye
Festuca idahoensis	Idaho fescue
Pseudoroegneria spicata	Bluebunch wheatgrass
Triticum aestivum x secale	QuickGuard

Table 5. Wetland sod mats used for Phase 1 revegetation, Two Mile Meadow Stream and Wetland Restoration Project. Wetland sod mats are installed on new structures to protect them from erosion, provide floodplain roughness, and enhance rapid re-establishment of native herbaceous vegetation. A total of 292 wetland sod mats (approximately 15,000 square feet) were installed and staked on structures.

Wetland Sod Mats	
Scientific Name	Common Name
Carex nebrascensis	Nebraska sedge
Carex utriculata	Beaked sedge
Juncus arcticus	Arctic rush

Table 6. Harvested wetland sod placed by Latah SWCD Crew and by Contractor; used to cover banks and structures to improve and accelerate revegetation to reduce erosion and protect constructed features during first over-winter and high-flow events.

Wetland Sod – Harvested and Placed	
Placed by	Quantity
Contractor	Approximately 39,200 square feet
Latah SWCD Crew	Approximately 13,070 square feet
Total Coverage	Approximately 52,270 square feet

Table 7. Willow cuttings (5,700 poles) used for Phase 1 revegetation, Two Mile Meadow Stream and Wetland Restoration Project. Cuttings (6 to 8 ft poles) were inserted into double vegetated soil lifts and brush fascines; additional cuttings were inserted into the stream bank of the design/historic channel.

Willow Cuttings	
Scientific Name	Common Name
Salix bebbiana	Bebb willow
Salix drummondiana	Drummond willow
Salix prolixa	MacKenzie willow

Table 8. Native riparian woody plants (1,858 containerized plants) used for Phase 1 revegetation, Two Mile Meadow Stream and Wetland Restoration Project. Plants were all tall one gallon size.

Riparian Plants	
Scientific Name	Common Name
Alnus incana	Thinleaf alder
Cornus sericea	Redosier dogwood
Salix drummondiana	Drummond willow
Salix prolixa	MacKenzie willow

Harvested sod stored on tarp; stored sod was covered with burlap and watered daily to maintain quality and viability until placement by the Latah SWCD vegetation crew.

Logs, rootwads and slash harvested from slope; to be used in brush fascines, instream habitat structures, and for floodplain roughness.

Latah SWCD vegetation crew laying and sealing harvested/stored sod. Placed sod was covered with burlap and watered daily to improve survival, establishment, and growth.

Salvaged sod planted by contractor using excavator. Sod placement is on the top of bank on the right bank of the newly constructed channel segment. View is looking upstream.

Double vegetated soil lift on left bank of new/design channel. Note willow cuttings inserted in both lifts.
Also note alluvium placed in channel bottom in both photos.

Above: Newly-constructed channel with brush fascine on left of photo, double vegetated soil lift on right, alluvium in channel bottom. View is looking upstream. In background, water truck driver is watering replanted sod.

Below: Building coffer dam to begin de-watering, in preparation for construction of channel diversion structure.

Crew using waterjet stinger to plant willow cuttings along banks of new/design channel. Planted cuttings are marked with red flags so they can be re-located for watering.

Below First delivery of wetland sod mats.

Right: Latah SWCD crew placed and staked wetland sod mats on upstream slope of ditch plug.

Above: Wetland sod was watered daily to encourage rooting and promote growth.

Channel diversion structure (now left bank of design channel) immediately following construction.

Below: Ditch plug 6, covered with staked-down wetland sod mats.

Above: Floodplain covered with slash and logs. Heavily slashed linear area in foreground is excavated railroad berm. At right is new fenceline.

Below: Logs and slash spread across the floodplain.

Above: Two Mile Meadow before restoration project, looking downstream. Photo taken September 28, 2017.

Below: Two Mile Meadow after 2018 restoration work (photo taken October 30, 2018), looking downstream. Railroad berm has been removed. Flow is restored to historic channel and off-channel habitat on the floodplain. Ditch pugs installed in previous degraded channel (left side of photo) have created a series of wetland cells.