

Swan Lake Wetland Mitigation: Restoration/Enhancement Concept

Ducks Unlimited Canada

August 2017

Background:

DUC has been contracted by MOTI to compensate for 2,500 m² (0.62 ac) of disturbed cattail marsh at a 3 to 1 ratio by conducting two restoration/enhancement projects at its Swan Lake Vernon project. We conducted consultative meetings and site visits with various project partners (e.g. North Okanagan Naturalists Club) stakeholders, regional district and provincial government staff, and identified two locations (wetland ponds 1 and 2) for wetland excavation which would provide enough new wetland area to exceed the mitigation targets. Should conditions prove difficult to develop to such extents as drawn, then an additional small wetland pond (3) could be created to the south.

DUC also plans to repair a breached bank of BX Creek to restore flows to section of the historic creek bed. (This will have the ancillary benefit of restoring a backwater “fish pond” which was created under a separate mitigation activity and is therefore not included among the compensatory acres offered by this project.)

DUC completed a topographic survey of the property in March 2017, and has been preparing and submitting information to acquire regulatory approvals (e.g. WSA Section 11). However, a high water event in May and June had some impacts that changed the original design/proposal and timing of the project. The following are the current habitat prescriptions.



Figure 1: Proposed restoration and enhancement works

Prescription 1: Create wetlands

Concept: Excavate 2-3 shallow wetlands (Figure 1). Excavations will not be connected to the lake via ditching (hydrologic connections will be sub-surface). The northern two wetland ponds are located on DUC property. The southernmost site is on land owned by RDNO, and we've acquired permission to work on their lands as well.

Planned Dimensions:

- Wetland Pond 1 = 4,370 m² (1.08 ac)
- Wetland Pond 2 = 4,050 m² (1.00 ac)
- Wetland Pond 3 = 1,080 m² (0.27 ac)

All wetland ponds are to be developed with varying side slopes (e.g. 3:1, 5:1, 10:1) to provide gentle and steep transitions from land into water. The wetland pond depths will vary with average depth between 1.2m to 2.4m, providing characteristics to allow for submergent vegetation to establish as well as to retain areas of open water. The most northern wetland pond may have a small island.

Benefits to "Fish Pond": For several years after its breach, BX Creek ran unimpeded through the small fish pond and backwater channel that was constructed south of the riparian corridor by the City of Vernon in 2009. This pond was built to create rearing and overwintering habitat for fish, and habitat for other wildlife. By eliminating the flow-through, the original functions of the wetland will be restored. The pond will also be used by breeding waterfowl and other wildlife groups including shorebirds, waterbirds, songbirds and various mammals, and potentially also some species identified as provincially blue-listed such as Painted Turtle and Western Toad. Healthy wetlands also provide "ecological goods and services" such as the buffering of flooding and provision of recreational viewing opportunities.

Prescription 2: Restore BX Creek

Concept: The original concept was to trim and thin a corridor through the riparian area, adjacent to the traditional creek alignment, including removal of all large overhanging trees. Then the historic creek channel would be excavated (to pre-2012 conditions), the eroded banks would be repaired, and creek flow would be reintroduced.

However, during a spring high water event this year, almost all of the BX Creek channel filled with granular material, and there is essentially no historic channel visible anymore. The creek actually jumped its banks in two new locations (one to the north of the creek; one to the south) almost immediately downstream of the railway tracks, and the creek is currently still running into both fields.

Due to the lack of a discrete channel and the likelihood of a recurrence of this siltation event, we have decided to modify our plans to follow a recommendation by Water Stewardship: we will now install a low berm on the south bank of the creek, outside the riparian zone, and allow the creek to migrate into and through the riparian area and north field as it wishes.

Area Affected: The berm will be approximately 1650 metres in length, and will tie in to the existing berm around the 'fish pond'. On the east, it will end at the confluence of the creek, the DUC property line and the CNR property line. The area of current riparian zone which will be restored is approximately 26,000 m².

Regulatory Aspects of Project:

Water Sustainability: DUC has been working with the water licensing authority, and conducted a field visit with Water Stewardship staff in early May. During the field visit, their staff recommended that we avoid the planned re-channelization of BX Creek, because similar siltation and breach events are likely to recur every few years. They recommended that we instead install a low berm or dike along the south side of the historic creek channel (just outside the established riparian corridor) and allow the creek to migrate to the north of the berm. A Section 11 notification is required for both prescriptions, and it has been submitted.

Ecosystems: FLNRO staff also attended the field visit in May and were supportive of the project. After the high water event, numerous small fish were observed in BX Creek, and in the channels running through the fields. This information has been communicated to FLNRO.

Heritage Conservation (Archaeology): There is one known archaeological site within the planned project area (EbQt-6). According to correspondence received from the Heritage Branch, such sites are "protected under the *Heritage Conservation Act* and must not be altered or damaged without a permit from the Archaeology Branch. If work is planned that is outside of [the circular area in Figure 1], the Archaeology Branch cannot require the proponent to conduct an archaeological study or obtain a permit prior to development. In this instance it is a risk management decision for the proponent."

DUC has decided to work well outside the identified circular boundary of the site. If an archaeological site is encountered during development, activities will be halted and the Archaeology Branch contacted for direction and permitting.

Construction:

Excavation: We will push construction a little later in the fall to help the fields dry. Equipment access and spoil handling will be considerably more difficult given the redirection of the creek into the fields. We're exploring the use of a drag-line or similar equipment to reduce the amount of times we have to move the spoil.

All work will be done by professional contractors, and supervised by a DUC Eng. Tech. Environmental Monitoring will be done by DUC qualified professional staff. Appropriately-sized machines will be used to maximize efficiency and minimize disturbance on site. Ideally, tracked dozers and excavators will be used. Access on either side of the creek will be via the control road to the south, or via the gated access off Stickle Road to the north. Pre-testing of planned excavations will be done in August or September, depending upon conditions.

Spoil and Revegetation: Spoil material excavated from the wetland pond areas will be moved away as conditions and equipment allow. Two upland areas, one on each side of BX Creek, have been identified where the spoil can be wasted. The sites were chosen as they allow for the material to be blended into the adjacent slopes and, once vegetated, shall look to be a natural part of the landscape.

It is likely some spoil will need to be wasted immediately adjacent to the new wetland ponds and where that is required the spoil will be leveled to a uniform height of no more than 600mm and revegetated with tame grass species to eliminate weed establishment.

Post-Construction Monitoring and Maintenance:

DUC biological and engineering staff will conduct regular inspections of hydrological conditions and biological productivity/wildlife use on these projects in the first 3 years. These inspections will be additive to traditional monitoring of the DUC-owned Swan Lake properties. Some noxious weeds are expected on disturbed areas, and these will be monitored annually and controlled as needed.

DUC has contracted with a drone operator to collect photos and video of the property before and after the construction works. This information will be made available to MOTI as part of the deliverables for this project.



Next Steps:

Task:

Engineered Design
Concept/Design Revisions
Regulatory Approvals
Pre-construction drone survey
Construction
Post-construction drone survey
Reporting/As-builts
Monitoring
Weed control

Time:

by May 30, 2017
by Aug 1, 2017
by Sept 15, 2017
August-September 2017
September-October 2017
October-November 2017
by December 31, 2017
Annually for first 3 years
Annually as needed

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