

Construction Report: Gordon's Brook Phase III Adaptive Management



Submitted to:
Metro Vancouver Regional Parks
Environment and Climate Change Canada
BC Ministry of Forests, Lands and Natural Resource Operations
World Wildlife Fund Canada

By:
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Fraser Valley Conservancy
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Fraser Valley Conservancy

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Summary

Gordon's Brook wetland complex is a series of wetlands designed and built by Monica Pearson of Balance Ecological (BE) in partnership with the Fraser Valley Conservancy (FVC). Her vision built upon the works completed by Mike Pearson of Pearson Ecological (PE) in the western portion of Aldergrove Regional Park that restored a degraded portion of Pepin Brook while concurrently building wetlands as habitat for the endangered Salish Sucker (see Figure 1). It was Monica's vision to extend these wetlands throughout the southern corner of Aldergrove Regional Park to reclaim the now fallow agricultural fields in order to improve habitat for amphibians and fish alike. She achieved this vision in 2017 when she completed construction of Phase III of the project. No restoration project is ever completed after the excavator leaves and plants are installed. Ongoing monitoring and adaptive management are paramount for the success of any restoration project. The works described in this document outline the importance of adaptive management in combatting unforeseen changes that result from restoration projects.

Acknowledgements

We would like to acknowledge the financial contributions from Environment and Climate Change Canada, WWF Canada, Loblaws Companies Limited, TD Friends of the Environment Fund, and Pacific Parklands Fund. Contributions from Metro Vancouver Parks include labour and consultation. The Ministry of Forest Lands Natural Resource Management and Rural Development provided expertise, volunteer time and equipment to make this project a success. We would also like to acknowledge the time and expert advice provided by Pearson Ecological. Finally, a great thank you, goes out to all of the community volunteers and groups that dedicated time to make this project a success.



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Ce projet a été réalisé avec l'appui financier du gouvernement du Canada.



Background

The Fraser Valley Conservancy has an established partnership with Pearson Ecological, Metro Vancouver Parks (MVP), Balance Ecological, and the Ministry of Forest Lands, Natural Resource Operations and Rural Development (FLNRO). Over the past six years these entities have been working together to construct and adaptively manage a complex of wetlands referred to as Gordon's Brook. This year's work focused on adaptive management for Phase III. Originally constructed in 2017, the hydrology of Phase III did not behave as anticipated. Water levels rose above expected levels over the course of the winter allowing the movement of fish in and out of the wetland. In the spring the water level dropped rapidly resulting in fish becoming stranded in the wetland pools, unable to return to the ditch and subsequent habitats. Monitoring conducted in spring 2018 showed that important species including Salish Sucker, Coho, Rainbow and Cutthroat trout were all utilizing the wetland after water connectivity had been severed. This spurred the FVC to implement a salvage program and begin planning for construction works in late summer 2018 to address the problem. As 2018 progressed it became apparent that late summer storms in combination with beaver dams across the 0 Avenue ditch caused water levels to fluctuate in both the ditch and in Phase III. As these two systems underwent subsequent reconnection, fish were again able to move in and out of the wetland. All of this information informed the construction plan for 2018.

The goals for the adaptive management of the Phases III wetland were as follows:

1. Prevent ongoing fish stranding.
2. Improve fish passage.
3. Improve water quality in wetlands.



Figure 1: Site nomenclature for Gordon's Brook construction phases and original construction Pearson Ecological construction areas.

Personnel, Timeline, Work Zones

Work was directed by Natasha Wilbrink, conservation technician of the Fraser Valley Conservancy under the guidance of Mike Pearson (R.P.Bio). Additional labour was provided by the FVC as needed to complete site preparation and planting. The Fraser Valley Watershed Coalition (FVWC) was contracted to provide 14 days of labour to help with plant installation and layout. Planting plans were reviewed by Metro Vancouver Parks staff and Rachel Drennan of the FVWC. Contractors and personnel are listed in Table 1.

Table 1: Personnel and contractors.

Task	Company	Personnel
Project Management	Fraser Valley Conservancy	Natasha Wilbrink
Project Supervision	Pearson Ecological	Mike Pearson
Equipment Operator (Construction)	Magna Terra Civil (MTC)	Calvin Park
Labour	Fraser Valley Conservancy (FVC)	Jon Blais
Planting	Fraser Valley Conservancy Fraser Valley Watershed Coalition	Natasha Wilbrink, Jon Blais Winter Moon

Planning, design and implementation phases of this project spanned from September 2017 to January 2019. Planning for a fish salvage began in September 2017 when concerns over fish stranding were first realized. In April 2018 when site conditions made it apparent that electrofishing and netting would not be possible in-depth adaptive management planning occurred. Design proposals and permitting were completed in partnership with the landowner, Metro Vancouver Parks, from February 2018 to June 2018. Site preparation, hydrologic restoration and planting activities commenced September 2018 and will continue until January 2019 (Table 2). Invasive species control began in January 2015, continued throughout construction, and will be ongoing through biological control methods. All earth-moving works occurred in September 2018 during the in-stream works window. Planting occurred in October through November to allow shrubs, trees and whips to establish roots through the winter to maximize survivorship during dry summer months.

Table 2: Timeline for works completed for 2018/2019.

	Dates	Task	Zone	Equipment	Personnel
	Site Preparation				
May 2018	2-18	Fish Salvage	GB III	Gee traps and Feddes traps	Natasha Wilbrink Mike Pearson
September 2018	14	Beaver Dam removal	0 Ave ditch	Hand tools	Township of Langley
	17-18	Drainage Management	0 Ave ditch	Hand tools	Natasha Wilbrink Jon Blais

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<i>October 2018</i>	16-17	Fish Trapping	Phase III	Gee traps and Feddes traps	Natasha Wilbrink
	Dates	Task	Zone	Equipment	Personnel
Hydrologic Restoration					
<i>September 2018</i>	18-19	Lay out design, move in machinery, safety briefings. Trench deepest portions of eastern-most ponds to tie-in point. Lower level tie-in. Re-contour berm with spoil.	Eastern ponds	Link-belt 210 Swamp pads	PE, MTC
	19-21	Trench deepest portions of eastern-most ponds on west side to tie-in points. Lower level of shelf separating north and south ponds. Lower level tie-ins. Trench to southern portion of western ponds to establish an additional 0Ave ditch connection point. Re-contour with spoil.	Western ponds	Link-belt 210 Swamp pads	FVC, PE, MTC
	24	Recontour spoil from middle tie-in point. Excavate additional tie-in point to 0 Ave ditch on western side of GBIII.	Western ponds	Link-belt 210 Swamp pads	FVC, MTC
Revegetation					
<i>July 2017</i>	5	Planting design development	GBIII		FVC
<i>Sept 2018</i>	26-27	Site preparation: thistle removal, water level marking	South-east corner, Throughout GBIII	Hand tools	FVC
<i>Oct 2018</i>	1-19	Plant layout, planting, volunteer group planting.	GBIII	Hand tools	FVC, FVWC, FLNRO

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	13	Celebration event, community planting Funder recognition	GBI, GBIII	Hand tools	FVC
Nov 2018	27-28	Willow harvest from Pepin Brook. Whip installation GBIII	GBIII	Hand tools	FVC
Planned 2019		Beaver Guarding. Additional willow staking	GBIII	Hand tools	FVC

Pre-existing Conditions

Topography and Hydrology

Gordon's Brook Phase III existed as a 6.4 ha fallow agricultural field in the south-western corner of Aldergrove Regional Park within the boundaries of the Township of Langley prior to 2017. After significant restoration works completed in July 2017 this site consisted of floodplain, marsh, and deep pool complexed habitats (see Figure 3). The wetlands in this site are driven by precipitation; flooding in the winter and quickly drying out in the spring. Water levels are maintained by the level of the 0 Avenue ditch when it is sufficiently high to breach tie-in points and fill ponds. In low precipitation years, such as seen in 2018, water levels will decrease such that only deep pool portions will retain water. Groundwater inputs into this system are minimal. Areas identified in the as-built from 2018 as marshes were found to be largely dry throughout the summer due to low precipitation and therefore unable to support aquatic or semi-aquatic vegetation (see Figure 3).

Vegetation

Due to the seasonal flooding of this site in conjunction with historical nitrogen inputs from fertilizers invasive Reed canarygrass is prolific throughout Phase III, growing to greater than 2m in height. Chemical treatment of the site with glyphosate-based herbicides took place over three years (2015-2017) prior to construction. It became apparent in September 2017 that this was not sufficient to control the RCG on site, as resurgence of RCG began after construction was completed through both growth from roots and seed.

Canadian thistle is prolific throughout the drier upland portions of Phase III. We have seen the sudden increase of Canadian thistle on other restoration projects in the first and second year after disturbance from restoration activities. We expect this will decline as other vegetation becomes established.

Purple loosestrife was not recorded in pre-construction surveys of Phase III however, it has a history within this area of the park. After construction in 2017, the seed bank was exposed and consequently it has extensively colonized the south-east marsh. This area has warm shallow water levels in the late spring becoming dry in spots throughout the summer. No loosestrife was seen in any other area of Phase III.

Fish and Wildlife

This site has become an important site for fish and wildlife habitat. The monitoring results outline the extensive use by birds, odonates, amphibians, and fish (see Figure 2, monitoring results available upon request), including use by federally and provincially listed species at risk. Mammal tracks have been seen throughout the site including deer and beaver signs.

As noted in the interim report for Gordon's Brook provided for 2017-2018, fish stranding was an explicit concern for Phase III. Monitoring conducted in the spring of 2018 demonstrated that Salish sucker and Salmonids were present in the ponds once water levels had receded sufficiently to prevent movement out of the site. Concurrently, water quality was degrading, temperatures were rising, oxygen was quickly depleting, and algal blooms were exacerbating the problem. A fish salvage was implemented immediately, and steps taken to minimize mortality (see Fish Salvage section below).



Figure 2: Organisms captured in Phase III. A. Giant Water Bug. B. Northwestern Salamander. C. Sandpiper eggs. D. Western Toad tadpoles. E. Cutthroat Trout.

Monitoring

The monitoring protocol for Gordon's Brook is undergoing extensive revision in 2018/2019. Ongoing water level monitoring is being conducted. Fish, odonate, and bird monitoring has also been completed for 2018. See monitoring report for details (available upon request).

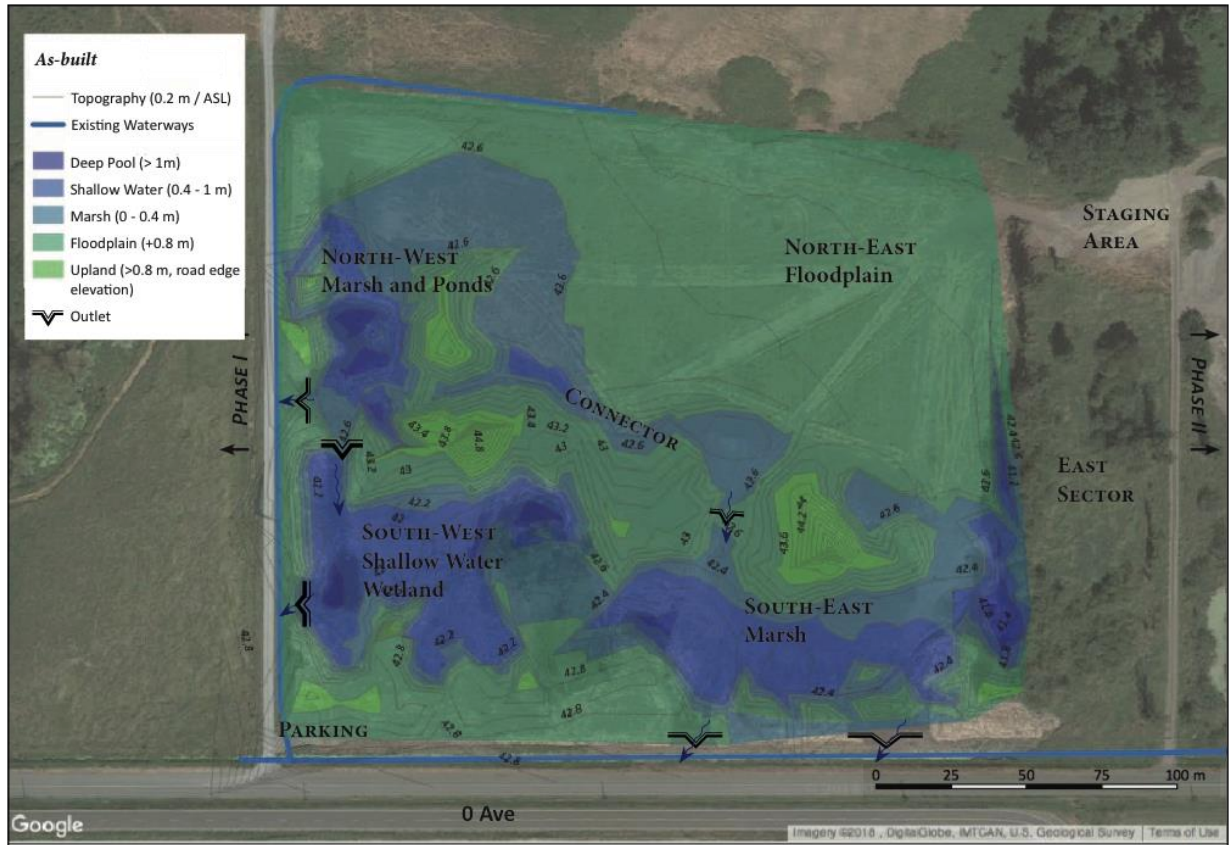


Figure 3: Pre-existing site conditions demonstrated by the as-built prepared after 2017 restoration works.

Site Preparation

Fish Salvage

Phase III was inundated throughout the winter of 2017-2018. Water levels receded quickly in spring disconnecting Phase III from the 0 Avenue ditch. This is important as the ditch system serves as a conduit for organisms moving to and from the site. As soon as this connection was severed FVC staff and PE moved in to assess water quality and presence/absence of fish and amphibians. It became clear that important fish species were present and water quality would not sustain these organisms. In response personnel began a salvage program to remove these animals. Fish salvage was carried out between May 2nd - 18th. Feddes traps and Gee traps were baited with roe and dog food as per protocols for trapping Salish Sucker (Pearson 2015). All suckers and salmonids caught were anesthetized with MS222, sexed and measured for fork length and mass. All fish and amphibian species were identified, counted, and released into 0 Avenue ditch at the Pepin Brook input. All fish trapping followed Department of Fisheries and Oceans and provincial guidelines with appropriate permits held by Pearson Ecological.

Hydrological Preparation

August 2018 was a dry month. Total precipitation was between 8mm (Environment Canada: Abbotsford weather stations respectively). During this time the Township of Langley (ToL) was working in the 0 Avenue ditch replacing a culvert running under 272nd St. They set up pumps and dams (also utilizing a beaver dam in the ditch) to prevent water from entering the construction site. Rain storms at the beginning of September dropped 98 mm of rain (Environment Canada: Abbotsford weather station) in nine days. Water backed up from this construction site due to the dams in place. Pumps were not sufficient to move water around the blockage because they were set up to combat low water levels that had been seen on site until this point. Water flooded Phase III once again connecting it to the ditch. The ToL pulled their dams as well as the beaver dam on September 14th. It became apparent that drainage issues were present within the ditch when a connection between the ditch and the wetlands remained. FVC staff began clearing the Reed canarygrass from ditch with hand tools to improve drainage thereby decreasing water level. Conveyance was improved sufficiently to reduce water levels to the tie-in levels as desired.

Construction: September 2018

Construction began September 18th on the east side of Phase III. Swamp pads were used throughout the site to allow access in high water level areas. Steps were taken to determine the necessity of silt screening by testing the disturbance created digging in the water. Turbidity increased slightly in immediate proximity to disturbance, but clarity remained consistent 1m from digging site. MTC operators were given a briefing on overall site plans and timelines. Specific details were given for each individual site as the machine moved between sites. A stop call was made whenever more clarification was needed.

PE and FVC staff utilized a canoe, surveying rod, and laser level to measure depth of the invert (the lowest point when looking at the cross-section of the ditch) of the 0 Avenue ditch and set a target depth for the wetlands. Throughout construction this method was used to locate the deepest portions of the wetlands and carve a channel at ditch invert level to the tie-in points (see Figure 4). Dams were built on the north and south sides of the tie-in points in order to allow bulk excavation of material in dry conditions. When the tie-in points were as deep as the ditch invert the dams were removed on the wetland side to allow water to inundate the tie-in point. This ensured sediment disturbance would be concentrated in the wetlands. After water settled dams were removed on the ditch side to establish a connection point. Spoil was integrated into existing berms and re-contoured.



Figure 4: The majority of construction works were completed from swamp pads, while digging in the water.

This method was used for all existing tie-in points (two on the east side of Phase III and one on the west side see Figure 5). In a similar fashion the shelf separating the north and south ponds in the western side of the site was lowered to ditch invert height to allow for fish passage between these ponds. Deep pools on the eastern-most side of the wetland were connected to the eastern-most tie-in point. Deep pools on the eastern side of the copse of trees were connected to the western tie-in point. The ditch running along the driveway on the west side of Phase III does not connect to the O Avenue ditch. As such, deep pools in the north-west pond were tied into this ditch but the channel was also continued south, connecting to the deepest pools in the south-west pond and continued to the southern extent of Phase III (see Figure 5). Here a new tie-in point was created utilizing the same method as lowering existing tie-in points. Excavation occurred bailing spoil to the east as much as possible to minimize the accumulation of spoil in a small area in the south-west corner of the site. The machine moved to this corner prior to connecting this tie-in to the wetland. Whenever possible shelves and pools were created at varying heights to add habitat features to the site.

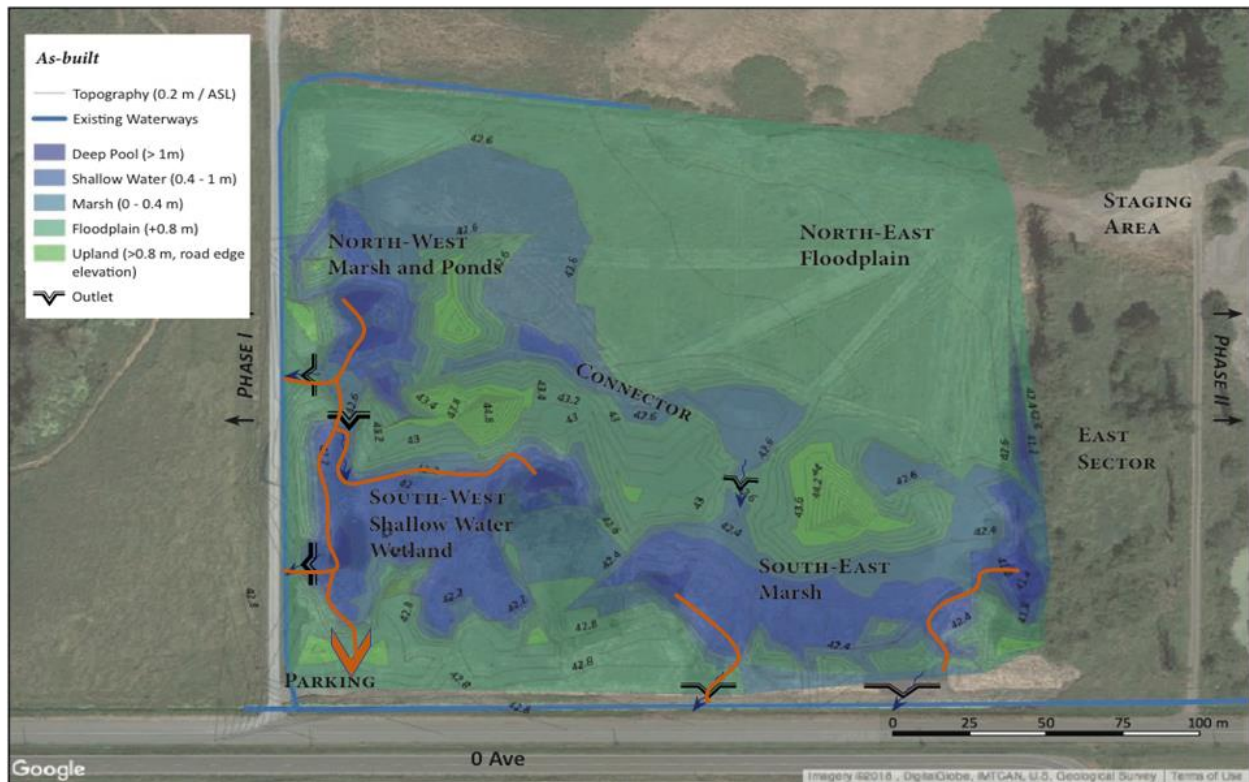


Figure 5¹: Orange lines depict constructed channels and new tie-in point. All channels were dug to ditch invert level.

¹ Due to high water levels surveying this site was not possible. When conditions become favorable for surveying a complete as-built will be created.

Revegetation: October 2018

Site Preparation

Preparation for planting included removing Canadian thistle and reducing Reed canarygrass aboveground biomass. Two days were spent cutting Reed canarygrass and Canadian thistle which had grown to 2m above ground. This allowed for increased visibility when conducting plant layout, improved planting conditions and efficiency, and minimized plant losses. Pin flags were installed to mark out high water levels across the site to provide context for plant layout. This provided necessary information for maximizing success of plants introduced to the site. Plant layout took place over six days. Concurrently planting crews began installation of native vegetation.

Planting

Planting was directed by Natasha Wilbrink of the FVC. Planting design considered the following factors. Drought and flood tolerances, this site is prone to both extremes, extreme prolonged flooding in mid-autumn to early-spring and extreme drought the rest of the year. Habitat value, for both fish and wildlife. Riparian vegetation plays many roles including being a food source as well as providing habitat. MVP requirements included maintaining sight lines and heritage feel for the adjacent property (see Figure 6). In order to work within all of these constraints plants were categorized into drought tolerant for upland areas that would grow quickly and complete with RCG. These plants needed to provide wildlife value via food source or nesting habitat. The second category was flood tolerant species. These are aquatic and semi aquatic species that would flourish in the wettest areas, providing habitat for amphibians and increasing water quality by up taking nutrients. The final category encompassed riparian plants that would tolerate flooding and wet feet but survive the drier parts of the year. The plants in this category were selected based on wildlife value, the ability to grow quickly to shade water, and provide food for the aquatic and terrestrial species using the site. Planning for planting occurred in July, prior to machine works in order to facilitate such a large plant order (see

Appendix A). After earth moving works were completed the planting plan was adapted. Plants were reallocated from lower priority areas (identified on site) and concentrated in newly disturbed areas in order to prevent regrowth of invasive species (see Figure 7).



Figure 6: Sight lines to be maintained when planting as per Metro Vancouver Parks request.

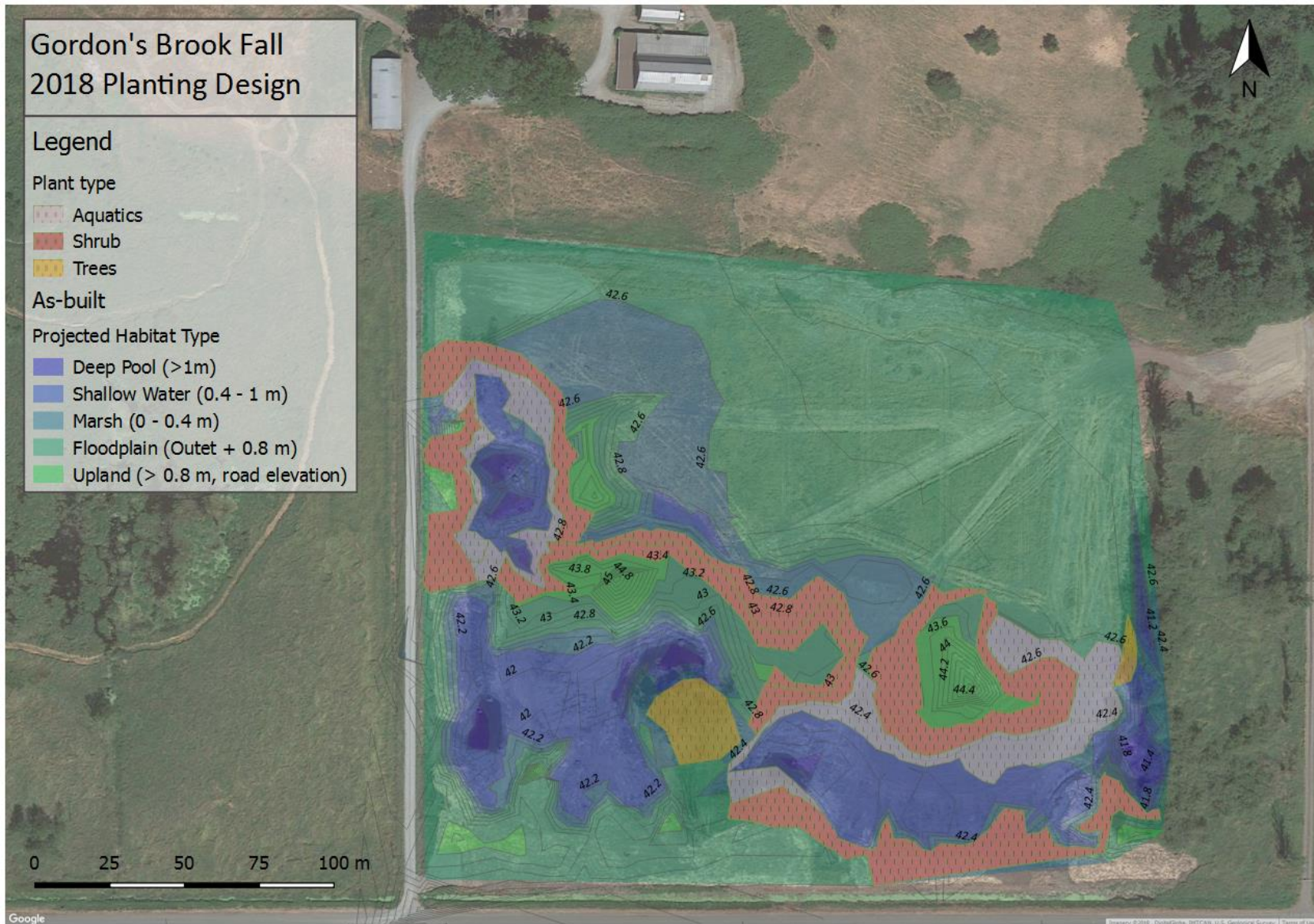


Figure 7: Planting design prior to construction in 2018.

Planting began October 2, 2018 with a contracted crew from the FVWC. 14 person-days of labour were provided over the course of three weeks. Two FVC staff members were on site for the duration of the time to supervise, plant, and preform quality control. All plants were moved throughout the site in canoes. Planting personnel and volunteers were also shuttled around the site in canoes (see Figure 8).



Figure 8: Volunteer planting event October 10, 2018. Plant layout, volunteers, and cleanup of plant pots.

Anticipated Outcomes, Next Steps

Hydrology

The design of the project capitalized on the hydrology of the 0 Avenue ditch. This system holds water year-round and by lowering the tie-in points of Phase III we have ensured that aquatic organisms will have the ability to move in and out of the system as long as water is present. To facilitate this, we carved channels at a depth of the invert of the ditch to the deepest portions of the wetland insuring that fish will no longer become trapped as surface water recedes. By ensuring continual exchange of water from the ditch to the wetland water quality should be maintain throughout the site to a level that is adequate for all species present. Areas identified as marsh habitat in 2017 reports should now behave as marshes: wetted, supporting semi-aquatic species. However, because this is a precipitation driven system, these marshes will behave ephemerally: drying out in the summer as evaporation occurs and holding water during wetter periods. The deeper pools throughout the wetland will provide refuge for aquatic species and the new channels added in 2018 will be a conduit allowing organisms to exit the wetland as needed.

Invasive Species

To combat the presence of Purple loosestrife, biological control will be utilized. A foliar feeding beetle, *Galerucella pusilla*, will be provided by Metro Vancouver Parks as needed for release on the site in summer 2019. This beetle solely targets Purple loosestrife causing extensive damage to the plants through feeding without harming native vegetation (Province of BC 2018).

RCG will continue to be combatted through the maturation of the native vegetation planted in order to prevent recolonization and shade out the plants that are currently present. Improved hydrology should further limit the area that can support RCG.

Monitoring Plan

A new monitoring plan is currently in development and will be implemented in 2019. This plan aims to streamline monitoring tasks and increase efficiency as continued funding for the site is limited. Maintaining site presence and monitoring changes is an important step in adaptive management and will ensure that we learn from the works that were completed and that the goals for the project were achieved. A photo point monitoring protocol was enacted, with photo point stations set up around Phase III to monitor overall vegetation and site changes (available upon request).

Revegetation

Additional willow staking will be undertaken as water levels recede in spring or fall 2019 in areas that contain steep banks to provide shading to the water and prevent erosion.

Additional works in 2019 will establish beaver guarding around trees and other high-value plants on the site as a result of beaver activity within Phase III.

Expansion

The northern portion of Phase III provides the opportunity to continue restoration on this site. A concept design has been developed to take advantage of the floodplain within Phase III. It suggests additional complexing, creating a number of smaller pond wetlands with channels connecting the new ponds to

established portions of Phase III (see Figure 9). An additional shallow pond is proposed for the eastern section of Phase III targeting an area currently containing dead willows and open RCG areas. This project (Phase IIIB) would complement the deep-water refuge provided by the ponds in Phase III by providing shallower ponds targeting amphibian habitat. Inspiration for the design was obtained when examining historical photos of the Fraser Valley, particularly Sumas Lake (no longer present).



Figure 9: Concept design for Phase IIIB, complexing the north-east corner of the field and constructing additional ponds in the east sector.

Public Engagement

Public engagement for 2018/2019 focused on getting people onto the site and actively participating in ecological restoration while encouraging discussion around the role of restoration. Partnerships were made with other groups interested in working in or near the site and conveying the lessons that we have learned in order to reduce the repetition of mistakes and continue the trajectory of learning through others.

Table 3: Summary of public engagement through site visits and tasks completed.

Date	Group	# Participants	Notes
August 10, 2108	UBC graduate student	1	3-hour meeting with Stephanie Lane of UBC discussing wetland restoration, impacts to pollinators, and measuring success of restoration project: timelines, limitations, and challenges.
October 10, 2018	General Public	14 attendees	5-hour planting event with community members, and consultants. Lead: Natasha Wilbrink (FVC), Kendra Morgan (FLNRO)
October 11, 2018	FLNRO volunteers: Water and Lands permitting officers, Regional Director, UFV student volunteers	6 staff 2 students	5 hours planting native species at Phase III. Educational discussions about the role of wetland restoration took place throughout the event. Lead: Natasha Wilbrink
October 13, 2018	Targeted Langley/Aldergrove residents	120 attendees	Four-hour celebration event with community members and community partners. Three educational tours were completed during the event and a planting event to finish off wetland plant installation. Volunteers planted 300 plants. Langley media was present. Lead: Natasha Wilbrink (FVC)

References

Environment Canada 2018. Historical Data. Retrieved February 28, 2019 from:

http://climate.weather.gc.ca/historical_data/search_historic_data_e.html

Pearson, M. 2015. Guidelines for the Capture, Handling, Scientific Study, and Salvage of Salish Sucker (*Catostomus sp.*). Retrieved March 1, 2019 from:

<http://www.frontcounterbc.gov.bc.ca/pdf/SalishSuckerCollectionGuidelines2015.pdf>

Province of BC 2018. *Galerucella pusilla* (Duft.). Retrieved March 1, 2019 from:

https://www.for.gov.bc.ca/hra/plants/biocontrol/detailed_bioagent_pages/Galerucella_pusilla.htm

Appendix A

Plant List

Table 4: Species list for Fall 2018 planting. Plants listed in green cells will be harvested from the established willow farm. Plants will be ordered from Birch Grove Nursery in Agassiz, BC as well as NATS Nursery in Langley, BC.

Latin Name	Latin Name	Size	Quantity	Total Price (\$)
Shrubs				
<i>Rubus spectabilis</i>	Salmonberry	1 gal	450	1755
		2 gal	450	3205
<i>Rubus parviflorus</i>	Thimbleberry	1 gal	350	1312.5
<i>Cornus sericea</i>	Red osier dogwood	1 gal	550	2145
		2 gal	50	355
<i>Rosa nootkatensis</i>	Nootka rose	1 gal	475	1852.5
<i>Rosa acicularis</i>	Prickly Rose	1 gal	200	790
<i>Holodiscus discolor</i>	Oceanspray	1 gal	50	355
<i>Physocarpus capitatus</i>	Pacific ninebark	1 gal	400	1560
<i>Myrica hale</i>	Sweet gale	1 gal	550	2145
		2 gal	15	106.5
<i>Lonicera involucrata</i>	Black twinberry	1 gal	340	1333
		2 gal	190	1412
<i>Osnaronia cerasiformis</i>	Indian Plum	1 gal	350	1382.5
<i>Spiraea douglasii</i>	Hardhack	1 gal	450	1755
		2 gal	200	1420
<i>Ribes bracteosum</i>	Stink Currant	1 gal	100	345
<i>Ribes divaricatum</i>	Wild gooseberry	2 gal	30	238.5
<i>Philadelphus lewisii</i>	Mock Orange	1 gal	200	790
<i>Scambucus racemosa</i>	Red elderberry	1 gal	140	581
<i>Lonicera ciliosa</i>	Western honeysuckle	1 gal	30	117
Willows				
<i>Salix lusiandra</i>	Pacific willow	whip		
<i>Salix scouleriana</i>	Scoulers willow	whip		
<i>Salix hookeriana</i>	Hookers willow	whip		
Trees				
<i>Malus fusca</i>	Pacific crabapple	5 gal	10	150
<i>Fraxinus latifolia</i>	Oregon Ash	5 gal	20	300
<i>Betula papyrifera</i>	Paper birch	5 gal	20	300
<i>Prunus virginiana</i>	Choke cherry	5 gal	10	150
<i>Acer macrophyllum</i>	Bigleaf maple	5 gal	5	75
Aquatics				
<i>Sagittaria latifolia</i>	Arrowhead	1 gal	200	1090

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<i>Juncus effusus</i>	Common rush	1 gal	200	830
<i>Carex rostrata</i>	Beaked sedge	1 gal	110	456.5
<i>Carex obnupta</i>	Slough sedge	1 gal	275	1072.5
<i>Carex mertensii</i>	Mertin's sedge	1 gal	75	292.5
<i>Carex densa</i>	Dense Sedge	1 gal	445	1803
<i>Glyceria elata</i>	Tall Mangrass	1 gal	340	1361
<i>Typha latifolia</i>	Cattail	seed		

Appendix B:
Permits



**Metro Vancouver Regional Parks
Research Permit**

Year: 2018-2019
Date: July 24, 2018
Permit #: _____

APPLICANT INFORMATION

First Name:	Joanne	Last Name:	Neilson
Organization:	Fraser Valley Conservancy		
Address:	PO Box 2028	City:	Abbotsford
Province:	BC	Postal Code:	V2T 3T8
Tel #:	804-525-0066	Fax #:	
E-mail:	joanne@fraservalleyconservancy.ca		
Other Contact:	Natasha Wilbrink and Mike Pearson		Contact Tel #: Natasha: 770-245-1579 Mike: 004-780-7246

RESEARCH INFORMATION

Type of Research:	Wetland construction, monitoring, planting and invasive removal	Number of Researchers:	7-10
Project Title:	Restoration and Monitoring of Gordon's Brook and associated wetland complexes		
Objectives:			
Methods: <small>(attach additional pages if necessary)</small>	See attached workplan: Gordon's Brook Marsh Work Plan 2018-19 Beaver Management Plan for Gordon's Brook Water Act Application Gordon's Brook Planting Plan 2018		

PARK INFORMATION

Regional Parks: <small>(attach additional page if necessary)</small>	Aldergrove Regional Park
Specific Locations: <small>(attach a detailed park map(s) if possible)</small>	Southwest corner (see maps in work plan)

TIME LINE

# of days required:	unknown	Date(s) of visit(s):	April 1st 2018 through April 30th 2019
After-hours (Y/N):	no	If yes, what hours:	

Check those that apply (attach copies of relevant permits and approvals):

- Does research involve species at risk? Provincial and/or Federal Permit required?
- Does the research involve in-stream work? Animal Care Committee approval required?

Potential impact to park habitat, vegetation and/or wildlife (describe):

Some initial impact during construction but overall habitat will be improved.

Appendix C:

Safety Signage

Wetland Restoration In Progress

The Fraser Valley Conservancy is in working in partnership with Metro Vancouver Regional Parks to improve this wetland for fish passage and wildlife habitat. For more information call Natasha Wilbrink at 778-245-1379.



This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

MUSTER

In Case of Emergency Call **911**
27541 – 0 Ave, Aldergrove BC

Spill Response

Spills < 100L

Spills less than 100L do not trigger the spill reporting regulation are to be internally documented and reported to Metro Vancouver.

Metro Vancouver Contacts:

East Area Parks Office 604-530-4983
Janice Jarvis 604-530-4983 ext. 5611

Project Mangers:

Natasha Wilbrink 778-245-1379
Joanne Neilson 778-808-5349

Spills > 100L

Spills greater than 100L or spills that trigger the reportable quantities outlined in the Spill Reporting Regulation, must immediately notify the Ministry of Environment and Climate Change Strategy's Provincial Emergency Program (PEP).

External Contacts for spill response:

PEP 1-800-663-3456
Fire Emergency 911
Ambulance 911
Police 911

Work Site

Safety Equipment Required!

Do not enter without:

- Hard Hat
- High Visibility Clothing
- CSA Approved Footwear
- Eye Protection

Hospital: Location

