

Quadra Hill Wetland Restoration

Post Construction Report, October 6 - 19, 2025



Summary

In October and November of 2025, the Galiano Conservancy Association (GCA) completed primary restoration treatments across a disturbed seasonal drainage of the Beaver Creek watershed contained within the Quadra Hill and Great Beaver Swamp Nature Reserves. Impacts arising from a legacy of logging and small-scale agricultural activities were addressed, with the goal of recovering forested wetland ecosystems. Improvements in hydrological function and habitat value are already apparent, while the recovery of native vegetation communities and carbon stocks will require longer term stewardship and monitoring. The project took place within the context of a larger effort to protect and restore ecosystems and carbon stocks across the Quadra Hill Nature Reserve.

Project Team:

Project Lead

Adam Huggins - R.P.Bio (Author)
Restoration Coordinator, Galiano Conservancy

Wetland Restoration Specialists

Sara Yeomans - R.P.Bio (implementation)
Robin Annschild (design & supervision)
Rewilding Water & Earth

Cultural Monitors

Marya Sylvester
Geraldine Sylvester
Penelakut Tribe

Restoration Technicians

Brontë Elphick-Miner (Co-Author)
Lúthien Teel



Site Description

Quadra Hill Nature Reserve

Site conditions suggest that the project area within the Quadra Hill Nature Reserve was historically a rich forested wetland. The area has been significantly altered by settler land use over the past century, including logging, small-scale agriculture, livestock grazing, off-grid settlement, and gravel extraction. Much of the primary forest was likely harvested prior to the 1930s, and a series of clearcuts in the 1940s, 1980s, and 1990s resulted in a landscape of young,



Figure A1: Quadra Hill Nature Reserve project site prior to restoration

dense Douglas-fir (*Pseudotsuga menziesii*) plantation forests, stunted pole-sapling broadleaf forests dominated by senescing red alder (*Alnus rubra*), and a network of skid trails and logging roads. Starting in the 1960s, approximately 3 ha of forest was cleared for agricultural use, and eventually a homestead was established with a small fruit and nut orchard, a dwelling, several outbuildings, and an extensive network of fenced garden beds and goat paddocks. Three dugout ponds and a series of ditches and roads were constructed after 1993 to facilitate homesteading activities. These features drained the cleared field downslope into a disturbed swamp/marsh complex, which appears to have been flattened and drained using a bulldozer or tractor. In the early 1990s, a gravel pit was excavated and continued to expand for a couple decades before being partially filled with concrete and levelled with soil. When the GCA acquired the property in 2023, the homestead site had been abandoned and a significant amount of garbage, fencing, irrigation lines, and dilapidated structures remained on the site; introduced species were the dominant cover in open areas.

Great Beaver Swamp Nature Reserve

The alterations to the swamp/marsh complex on the Quadra Hill property may have accentuated the bifurcation of the watershed, directing seasonal outflow underneath the main access road to the northwest onto neighbouring private lands off Melissa Road, and the rest of the outflow onto the Great Beaver Swamp Nature Reserve, draining down an old logging road into the eastern end of the “Great Beaver Swamp”, a 6-ha shallow-water wetland ecosystem. The road forks when it reaches the wetland margin, leading to the east and to the west along the shoreline. The eastern branch runs very close to the shoreline until it crosses the wetland on fill that has since become saturated, vegetated, and broken in places, no longer acting as a barrier to water flow. The canopy along the eastern branch is largely composed of young red alder. The western branch runs through a stand of mature Douglas-fir and western redcedar (*Thuja plicata*) along the shoreline slightly upslope of the wetland and onto neighbouring private land. Prior to restoration, the southern section of the road was showing signs of channelized flow and soil erosion. Apart from a few patches of salal (*Gaultheria shallon*) and sword fern (*Polystichum munitum*) the roadway was primarily populated by grasses and mosses or was completely unvegetated. Several side branch skid roads were mapped off the main road network.

Methods

Overview

Our restoration approach builds upon methods developed by Dave Polster for the restoration of drastically disturbed sites^{1,2}, incorporating wetland construction techniques developed by Tom Biebighauser³, and integrating the specific habitat requirements of target species, which for this site included the northern red-legged frog (*Rana aurora*) and associated wetland species. A Change Approval under Section 11 of the Water Sustainability Act was secured prior to fall 2025 treatments and work was completed as outlined.

Table A1: Timeline of restoration activities performed on the Quadra Hill and Great Beaver Swamp Nature Reserves

Data Range	Activity
February - March, 2024	Site assessment and restoration planning with Rewilding Water & Earth
April, 2024 - September, 2025	Derelict structure, sheep fence, and garbage removal
October 6 - 17, 2025	Logging / skid road removal, ditch decommissioning and plugging
	"Rough and loose" soil decompaction, distribution of coarse woody debris
	Shallow-water wetland pool creation, core trench installation
October 18-19, 2025	Outplanting and mulching of first round of nursery stock (450+ plants)
November 2025	0.85 ha area fenced to exclude deer



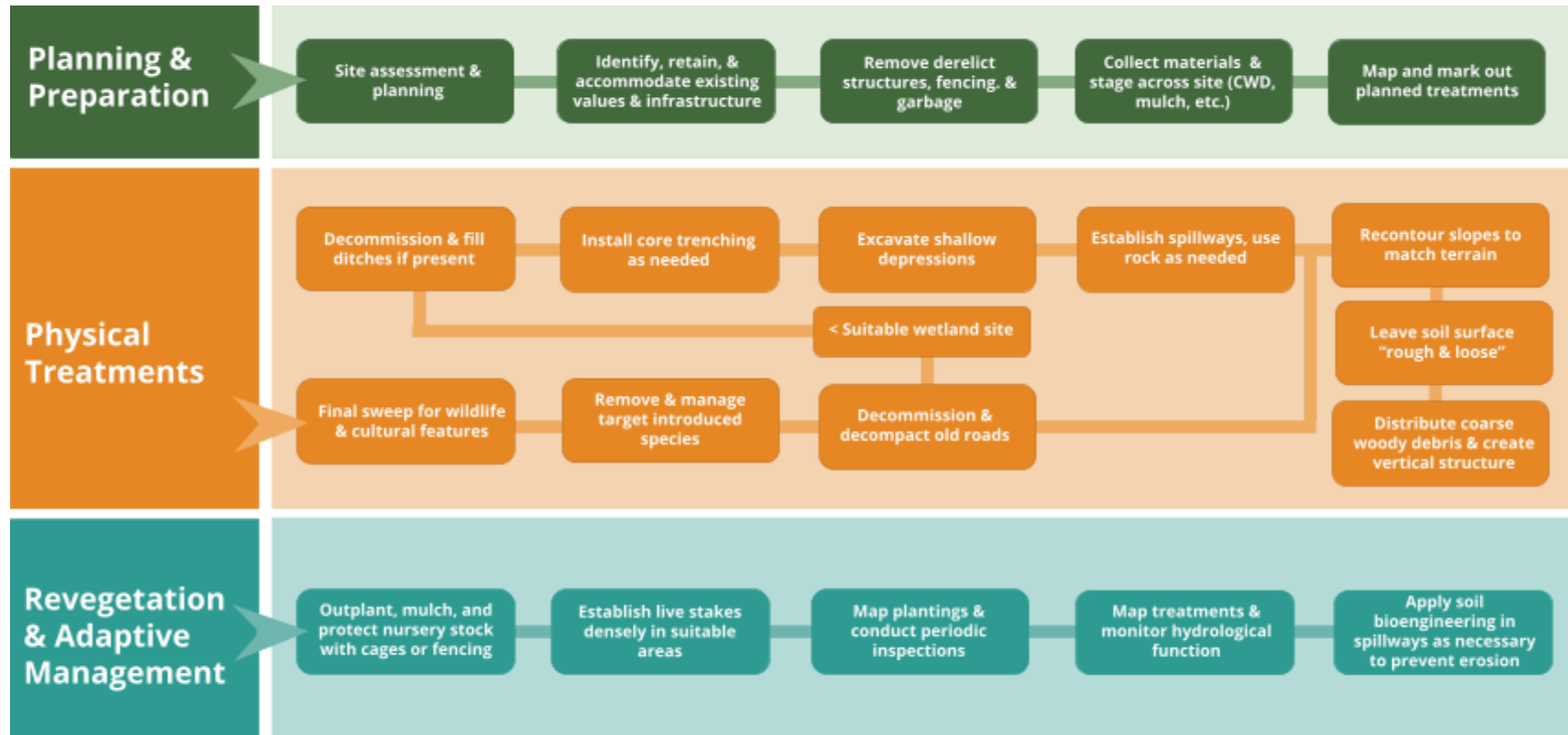
Figure A2: Construction underway on the final wetland and core trench features for the project

¹ Polster. 2009. [Natural Processes: The Application of Natural Systems for the Reclamation of Drastically Disturbed Sites.](#)

² Polster. 2013. [Making Sites Rough and Loose: A Soil Adjustment Technique.](#)

³ Biebighauser. 2015. [Wetland Restoration and Construction: A Technical Guide.](#)

Figure A3: Simplified approach to restoration of drained wetland ecosystems applied on Galiano Island





Physical Treatments

The removal of derelict structures and garbage took place in stages over several years as time and resources allowed. All materials removed from the site were sorted and, whenever possible, donated, repurposed, or recycled. Stucco wire from goat fencing was salvaged and repurposed as cages for plantings. Untreated, non-composite wood from derelict structures was left on site and buried during recontouring of the ridge along the eastern edge of the field. Coarse woody debris, generated during forest restoration, fuel management, and danger tree removal activities elsewhere on the Quadra Hill Nature Reserve property, was staged in piles across the site.

Primary physical treatments were applied by a CAT 315 excavator operated by Stuart Callison of Galiano Excavating Ltd under the supervision of wetland restoration specialist Sara Yeomans. All areas were swept for wildlife prior to excavation, with particular care taken in areas surrounding existing dugout ponds and disturbed wetlands. Roadways and areas compacted by livestock or machinery were decompacted down to 1 m using the “rough and loose” soil treatment. Large residual soil piles were redistributed, borrow pits from road construction were filled, and decommissioned roadways were regraded to match natural slope and topography as much as possible. Many of the roads on site were acting as ditches and resulting in channelized flow and soil erosion. Coarse woody debris, rock features, small ridges, and pools were added along restored roadways to slow and disrupt the flow of water. All agricultural ditches on site were decommissioned by excavating down to mineral soil and then plugging the ditch with fine sediments to prevent reestablishment.

A series of shallow wetland pools were created across the project area on heavily disturbed sites with suitable hydrology, substrate, and grade. To create a pool, the excavator first removed and set aside vegetation for replanting (such as sedges and ferns) and extracted invasive species for disposal. Woody debris that obstructed the path of the excavator was removed and later incorporated into the pool. Next, the topsoil was scrapped away and set aside and a depression was excavated in the mineral soil. Depressions featured a less than 30cm in rise from the downslope edge to the upslope edge to avoid creating a headwall on the high end of the pools, and were between 0.5 m and 1.5 m deep at centre depending on the size of the pool to ensure gentle slopes throughout. Once a depression was established, topsoil was redistributed in a rough and loose layer across the depression. At this point the salvaged vegetation and staged woody debris was reincorporated into the site. Woody debris was added in the form of half-buried and surface-level logs and root balls as well as standing snags to add vertical structural complexity. The woody debris for this project was partially sourced during the process of excavation; however, the majority of the material originated from forest restoration activities conducted on other portions of the Quadra Hill Nature Reserve property. Many pocket pools were added throughout the process of decompaction. A pocket pool is a small pool meant to simulate microtopographical features such as a pool that forms in the depression left by the root mass of a fallen tree. These pools can be added during the application of rough and loose treatments and usually only involve surface-level excavation.

Several of the pools were paired with the installation of a core trench (see **Figure A7**). Core trenches were added on the downslope edge of pools to act as subsurface dams, slowing the percolation of groundwater to promote surface storage and slow aquifer recharge. To construct the core trenches, test pits were excavated to determine whether the necessary fine sediments, ideally hydrated clay soils, were available. When the materials were available, a trench was excavated until a restricting mineral soil layer was reached, generally about 1 m deep. A pit would be excavated beside the trench to mine for fine sediments. After the construction of the core trench these pits were converted into pools by refilling the depressions with mineral soil to the desired depth



and then covering with topsoil. The core trenches were filled with the fine sediments in 6-inch layers and compacted by the excavator. Core trenches were generally filled up to ground level but in some cases were built up slightly higher to raise the lower edge of the pool and ensure that the pool remained below 30 cm of rise. Topsoil and woody debris were applied on top of the core trench and blended with surrounding terrain.

Target introduced species extracted throughout this project were removed from the site whenever possible. When removal was not feasible, the fruits were collected and the vegetative structures were relocated to a site where re-establishment would not be possible. Much of the remaining material was burned in a biochar kiln. Target introduced species removed from the site included: Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*Rubus laciniatus*), Scotch broom (*Cytisus scoparius*), English holly (*Ilex aquifolium*), English hawthorne (*Crataegus monogyna*), teasel (*Dipsacus fullonum*), burdock (*Arctium lappa*), tansy ragwort (*Jacobaea vulgaris*), and sweetbriar (*Rosa rubiginosa*). The suite of introduced agronomic grasses and weeds that formed the dominant cover in cleared areas was broken up through soil decompaction treatments, but is expected to recover rapidly.

Covenant and Cultural Monitors

The roadways bordering the beaver wetland and along the seasonal drainage on the Great Beaver Swamp Nature Reserve property were flagged as areas of potential archaeological significance due to the mapping of 'high potential' polygons nearby based on Provincial Data (RAAD). A conservation covenant has been registered on a portion of the property (including part of the project area) to protect the existing wetland complex. Both covenant holders, Habitat Acquisition Trust (HAT) and Island Trusts Conservancy (ITC), provided waivers for the restoration to proceed in the covenant area. As a condition for restoration work to proceed in the Great Beaver Swamp covenant area, ITC stipulated that Cultural Monitors be present.

Prior to excavation, all team members were familiarized with the "Cultural Protocol for Chance Finds and Ancestral Remains within Islands Trust Area", and archeologist Colin Grier visited the site to provide his impressions and advice on how to proceed with cultural sensitivity. The Penelakut Tribe provided two Cultural Monitors to observe all work taking place on the Great Beaver Swamp Nature Reserve property. They were given a tour of the site and a description of the proposed work. The Cultural Monitors approved of the work and stated that they felt that there were no sensitive cultural areas or remains on the site, in part due to the lack of CMTs. One of the monitors,



Figure A4: Penelakut Cultural Monitors pose with Brontë and Sara

Marya Luby, expressed that her impression of the area was that it was the site of a trail and was utilized by Penelakut people who would occasionally set up temporary camps there. The Cultural Monitors requested that balsam firs on the site not be disturbed as they are an important medicine and slow to recover. The Cultural Monitors remained on site and observed the work until the project was complete. No remains or cultural items were recovered and the final work received very positive feedback from the Cultural Monitors.

Revegetation Treatments

The day after physical restoration treatments were completed, a student group from the UVic Environmental Restoration Club arrived on site to help outplant nursery stock. Over 450 plants were established across the site from nursery stock grown in the GCA's nursery, representing 40 species of native trees, shrubs, and herbs. Planting density and site selection were determined by a planting plan⁴, and adjusted on site based on post-construction conditions, material availability, professional experience, and analysis of past planting successes and failures. Approximately 250 of the individual plants were provided with a biodegradable burlap sack groundcover, with a slit cut through the middle to accommodate the stem. All plants were topdressed



Figure A5: Site conditions immediately following primary physical restoration treatments

with a 5 gallon bucket of wood chips and provided with roughly a cup of topsoil from a donor site to aid with soil inoculation. Plants were mapped individually with an Arrow GPS and added to the GCA's plant monitoring database for future inspections.

A 0.85-ha area encompassing the former pasture and garden clearing was exclosed with 6.5-ft. graduated steel deer fencing. Plants established outside of the exclosure area were protected from deer browse with individual stucco wire cages.

Outplanting was concentrated on former pasture, garden, and gravel pit areas on the Quadra Hill Nature Reserve. Restored roadways cut through otherwise intact native vegetation on both properties were left to revegetate passively from the margins, and will be monitored to assess whether additional revegetation treatments will be required. Follow-up outplanting and live-staking activities will be undertaken in 2026 to increase the density of native cover and accelerate the establishment of a canopy of native trees and shrubs to shade out agronomic grasses and weeds across the site. Planting areas will be monitored and maintained annually for several years, with infill planting conducted as needed. Particular attention will be paid to spillways and areas with seasonal surface water flow. If erosion is detected in these areas, it will be addressed through soil bioengineering treatments, applied and monitored annually.



Figure A6: UVic ERC Club participant establishing a native shrub

⁴ Peterson et al. 2025. Quadra Hill Planting Plan.

<https://galianoconservancy.ca/wp-content/uploads/2025/09/Peterson-et-al.-2025-Quadra-Hill-Wetland-Planting-Plan.pdf>

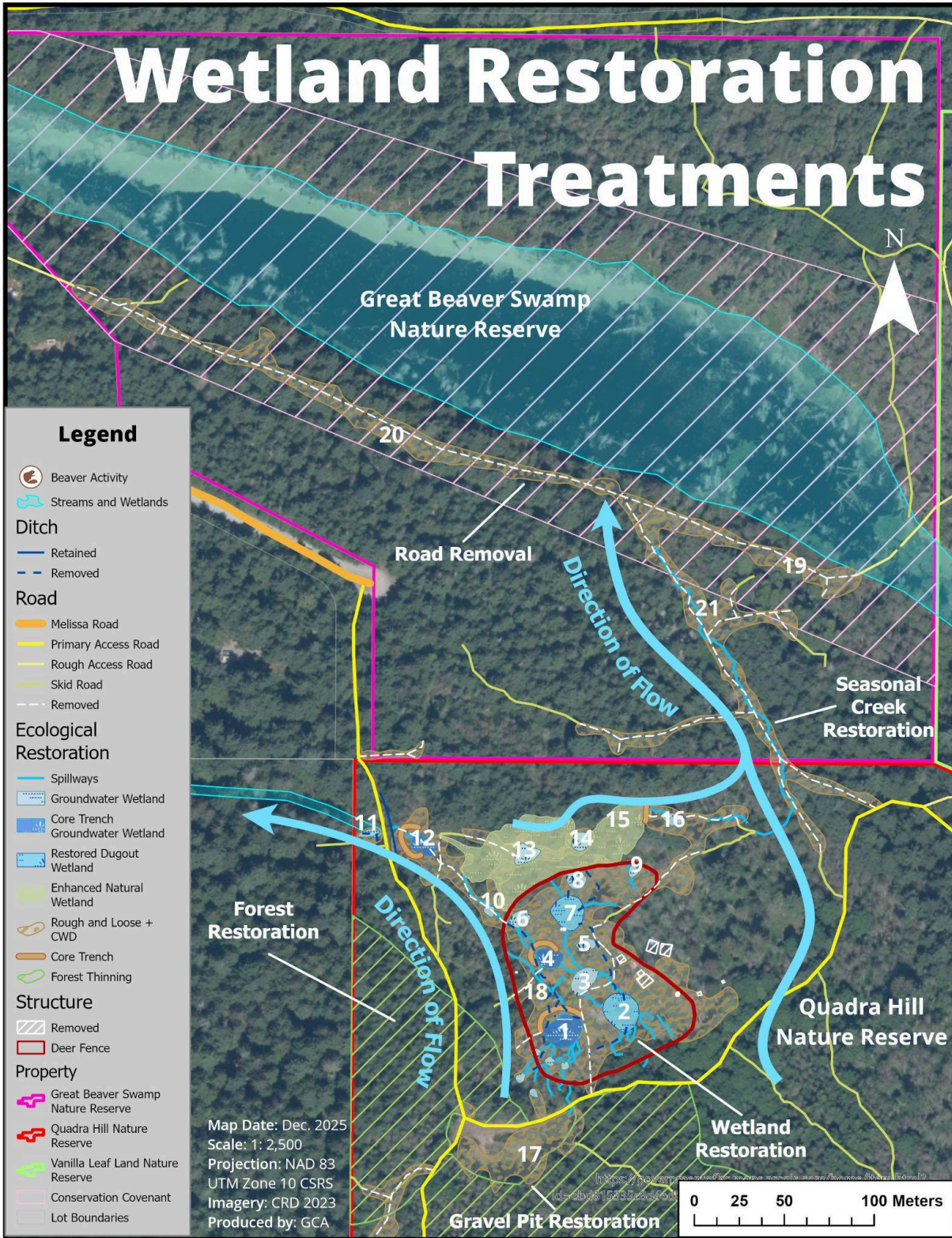


Figure A7: Primary wetland restoration treatments on the Quadra Hill and Great Beaver Swamp Nature Reserve



Table A2: Nature and dimensions of design features established during primary physical restoration treatments

Wetland Restoration Design Features - Dimensions and Details							
Site #	Feature Type	Feature area (m ²)	Pool depth (cm)	Core trench depth (m)	Core trench width (cm)	Increased height of low edge (cm)	Date of build
1	Core Trench Wetland	287	80-100	1	120	n/a	Oct 13-14
2	Restored Dugout Wetland	323	-	n/a	n/a	30	Oct 10, 13
3	Groundwater Wetland	157	50	n/a	n/a	n/a	Oct 10
4	Core Trench Wetland	129	-	1	80	20	Oct 8-9
5	Groundwater Wetland	58	-	n/a	n/a	30	Oct 9
6	Groundwater Wetland	81	20	n/a	n/a	n/a	Oct 8
7	Restored Dugout Wetland	267	≈ 100	n/a	n/a	n/a	Oct 6-7
8	Groundwater Wetland	90	20	n/a	n/a	n/a	Oct 6
9	Groundwater Wetland	28	45	n/a	n/a	15	Oct 6
10	Groundwater Wetland	28	20	n/a	n/a	n/a	Oct 8
11	Groundwater Wetland	36	-	n/a	n/a	n/a	Oct 17
12	Core Trench Wetland	117	120	1	150	20	Oct 7-8
13	Groundwater Wetland	114	30-45	n/a	n/a	n/a	Oct 8
14	Groundwater Wetland	84	-	n/a	n/a	n/a	Oct 8
15	Enhanced Wetland	3024	30	-	≈ 80	40	Oct 6
16	Groundwater Wetland	57	25	n/a	n/a	n/a	Oct 6
17	Restoration	1,411	n/a	n/a	n/a	n/a	Oct 14
18	Restoration	50	n/a	n/a	n/a	n/a	Oct 9
19-21	Road removal	7,441	n/a	n/a	n/a	n/a	Oct 16-17

Results

Design Features

Site 1	Wetland Pool - "The Orchard"	Before Restoration - January 2022
<p>Located in the southwestern corner of the field, Site 1 consisted of a senescing orchard drained by shallow ditches prior to restoration. The walnut trees within the orchard were removed, as they were beginning to spread. The healthiest and most productive apple tree, on the eastern edge of the proposed pond, was retained. A large core trench was installed on the downslope, northern side of the pool. The core trench was approximately 1 m deep and 1.2 m wide and was filled to ground level. The pool, which had been mined for fine sediments to construct the core trench, was filled until it reached a final depth between 80 cm and 1 m at the centre. A vegetated spillway was established to the east of the large western redcedar directly downslope of the pond. All ditches surrounding the pond were cleaned and filled. A stand of unhealthy red alder upslope of the pond received rough and loose treatment between trees, and dead trees were knocked down as CWD. Four pocket pools were added within the alder stand. This feature was constructed on days 6-7 of restoration, October 13-14, 2025.</p>		
Core Trench construction - October 13, 2025		After Restoration - November 2025
		

Site 2

Wetland Pool - "Snaggy shack"

Site 2 is situated in the southeast portion of the field and was one of three existing dugout ponds on the site. The pond held water prior to restoration but had very steep banks. The banks were regraded to create a more gradual slope down to the water. Additionally, the low edge of the pond was raised 30 cm to prevent the formation of a headwall. All ditches surrounding the restored pool were removed. Additional materials from the regrading of the margins were used to recontour the southern portion of the ridge that runs along the eastern edge of the field. A vegetated spillway was retained through the stand of cedars on the southeastern corner of the pool. Prior to restoration a rutted road that provided access into the field ran directly beside Site 2. This road was decommissioned back to the primary access road and left rough and loose. This feature was constructed on days 5-6 of restoration, October 10 & 13, 2025.



Before restoration - January 2022



After restoration - November 2025





Site 3

Wetland Pool - "Between two cedars"

Site 3 is located in the center of the field, upslope of Sites 4 and 5. The slope on this portion of the field was gradual, so the low edge of the pool was not raised. The pool was excavated to approximately 50 cm deep. Excavated soil was used to help recontour the ridge along the eastern edge of the site. There were several live and standing dead cedars in this area that were all retained. One standing dead cedar was transplanted into the center of the wetland. A vegetated spillway was established through the cluster of live cedars on the western side of the pool. Several ditches surrounding the pool were removed and filled. This feature was constructed on day 5 of restoration, October 10, 2025.



Before Restoration - January 2022



After Restoration - November 2025



Site 4

Wetland Pool - "Rootball"

Site 4 is found in the lower western portion of the field, upslope of Site 6. Because this portion of the field has a more significant slope and coarser soils, a core trench was installed beneath the bottom edge of the pool. The trench was dug 1 m deep and 80 cm wide. The available fines at this site were dry. Moisture was added from the nearby ponds to produce a more suitable material for filling the core trench. The trench was built to ground level and then covered with 20 cm of topsoil to raise the lower edge of the pool slightly, accommodating for the slope. The hole from mining materials for the core trench was converted into a pool. A large stump was salvaged from the margin of the treated area and added to the pool. This feature was constructed on days 3-4 of restoration, October 8-9, 2025.

Before Restoration - January 2022



Core Trench construction - October 8, 2025



After Restoration - November 2025



Site 5

Wetland Pool - "Raindrop"

Site 5 is situated directly upslope of Site 7, to the south. Once the ditch connecting Site 7 to the upslope portion of the field was removed, a small pool was excavated. A core trench was not constructed for this pool because the mineral soil in this area was finer than other areas in the field. The lower edge of the pool was raised 30 cm to accommodate the slope of the site. The area surrounding the pool was decompacted and the excess material from excavating the pool was used to recontour the ridge along the eastern edge of the field. An additional wetland, located to the east of wetland 5, was removed from the design as it was determined that it would result in significant disruption to the root systems of mature western cedar and sitka willow (*Salix sitchensis*) on site. This feature was constructed on day 4 of restoration, October 9, 2025.



Before Restoration - January 2022



After Restoration - November 2025





Site 6

Wetland Pool - "Above the belt"

Site 5 is located just within the fenceline, at the edge of the field on the upslope end of a bulldozer track that captured and drained surface flows into the lower alder stand. The end of the roadway was decompacted and left rough and loose. A small pool was created with a final depth of 20 cm. A ditch leading down towards the roadway was cleaned and filled. This feature was constructed on day 3 of restoration, October 8, 2025.



Before Restoration - October 2025



After Restoration - November 2025





Site 7

Wetland Pool - "Primordial Stu"

Situated on the northern, lower edge of the open field, Site 7 featured one of the existing dugout ponds. When surveyed prior to excavation on 6 October, 2025, this pond held 1 m of water at its deepest point. Plastic pipe had been installed to drain the pond into the disturbed marsh. Plastic pipe was also installed upslope within a ditch to drain the upper portions of the site into the pond. Both the outlet and the input pipes were removed and the ditches were cleaned and filled. The pond was improved by making the slope of the banks more gradual and excavating small 'bays'. The existing Sitka and Pacific willows were preserved, as they will provide valuable live-stake material for the site. Because the bank surrounding the willows could not be excavated backwards without disturbing the willows, it was re-graded by backfilling towards the pond. A vegetated spillway was retained draining down towards the sedge marsh. The field surrounding the pond was decompacted and left rough and loose, and woody debris was incorporated throughout the area. The unhealthy alder stand below the pool was also made rough and loose, dead alders were removed, and a pocket pool was added. This feature was constructed on days 1, 2, & 3 of restoration, October 6, 7, & 8, 2025.



Before Restoration - October 2025



After Restoration - November 2025



Site 8

Wetland Pool - "Cabbage patch"

Site 8 is found on the southern edge of the disturbed swamp and marsh complex, to the east of Site 7. The legacy of grazing and the use of heavy machinery on the landscape had left a stark border between the sedge marsh and the open field. Site 8 was designed to extend the sedge marsh into the field and disrupt the linear border between the features. A 20 cm deep pool was dug into the field, extending back into the marsh. In the surrounding area, the slope down to the marsh was regraded to make the transition between features more gradual. The sedge wetland was made rough and loose wherever it was possible to reach through the line of cedar and alder on the southern edge of the marsh with the excavator, and a small pool was created. Several dead alders were felled to facilitate access to the marsh, and these were incorporated into the pond as woody debris. The slough sedge (*Carex obnupta*) removed during decompaction was salvaged and incorporated into Site 8 to facilitate the regeneration of wetland species within the open field. Fallen alders and woody debris from forest thinning activities were incorporated into the pool. These features were constructed on day 1 of restoration, October 6, 2025.



Before Restoration - October 2025



After Restoration - November 2025





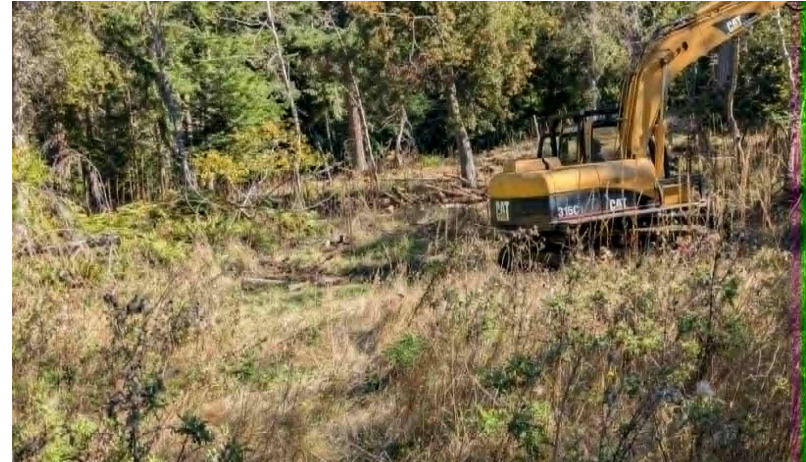
Site 9

Wetland Pool - "Debutant"

Site 9 is located upslope and to the south of the sedge swamp and marsh complex, in the northeast corner of the field. A 45-cm deep pool was created at this site. Because this pool is located on a slope, the lower edge was raised approximately 15 cm. All open field areas surrounding the pool were decompacted and given a rough and loose treatment by the excavator. Sweet-briar and Scotch broom were removed by the excavator and significant woody debris was added to the site. A large spoil pile covered in thistles near the pool was recontoured. This feature was constructed on day 1 of restoration, October 6, 2025.



Before Restoration - October 2025



After Restoration - November 2025





Site 10

Wetland Pool - "Below the belt"

Site 10 includes a series of small, pocket pools along the former bulldozer track connecting Site 12 to the open field. The track, and additional machine tracks branching off from it, were decommissioned. Soil was made rough and loose and two pocket-pools were added along the roadway, both approximately 20 cm in depth. Two sets of machine tracks were decommissioned and pocket pools were added at the terminus. Common holly, Himalayan blackberry and cutleaf blackberry were removed. These features were constructed on day 3 of restoration, October 8, 2025.

After Restoration - November 2025



Site 11

Wetland Pool - "Outflow"

Site 11 is situated on the west side of the primary access road at the outlet of a culvert that drains a roadside ditch below Site 12. The area below that road had clearly been disturbed by historic road building activity, and material had been piled on the side of the ditch draining the culvert. The outlet of the culvert had been accidentally blocked and buried during road improvements made in May of 2025. The culvert opening was cleared, excess material was moved out of the riparian zone, and a small pool was established on day 9 of restoration, October 17, 2025.

After Restoration - November 2025





Site 12

Wetland Pool - "Ventana"

Site 15 is found directly beside the access road to the east, in the northwest corner of the project area. This area was crisscrossed by tractor and bulldozer tracks, with one predominant track leading down from the field to the access road. Prior to restoration, the roadways and machine tracks were acting as ditches, draining water from the field across a red alder stand and through the culvert to Site 11, before continuing on to the Retreat Cove Farms property to the west.

As with all other sites, the area was surveyed for wildlife prior to excavation and one northern red-legged frog was flushed from the site. A pile of material forming a ridge beside the access road, likely a remnant of the construction of the road, was redistributed and roughened to decrease the severity and homogeneity of the slope. A core trench was installed just upslope of the roadside ditch. The core trench was excavated approximately 1 m deep and 1.5m in width. The fine sediments available for the core trench were drier and had a lower clay content than is generally optimal for core trench builds. The final elevation of the core trench was 20 cm above the undisturbed ground height. The pit used to mine sediment for the core trench was converted into a pool with a final depth of approximately 1.2 m. A vegetated spillway was established. There was no rock available to embed into the spillway for erosion control. As such, this spillway should be monitored on an ongoing basis for erosion. To access the site the excavator removed several dead and live alders. These alders were incorporated into the wetland as woody debris along with an impressive log and stump salvaged from the nearby forest. Several English holly plants and a grey birch tree (*Betula populifolia*) were removed from the area. Fruits were removed from the grey birch but the tree was left on site. Young trees growing on the bank of the access road were removed during this process to improve the longevity of the road. Care was taken to avoid damaging the roots of a mature black cottonwood tree (*Populus balsamifera ssp. trichocarpa*) bordering the pool. This feature was constructed on days 2-3 of restoration, October 7-8, 2025.

Before Restoration - October 2025



After Restoration - November 2025





Site 13

Wetland Pool - "Grow Op"

Site 13 is located in the southwest portion of the sedge marsh at the outlet of the plastic pipe that drained Site 7. This pool was expanded from the original design to further restore the microtopography of the site. Prior to restoration, a small lean-to structure was disassembled at this site. All garbage was removed but the untreated wood used in the structure was left on site and buried below the surface by the excavator. Himalayan and cutleaf blackberry on the site were removed. The final depth of the pool created at this site was 30-45 cm. Care was taken to avoid damaging the roots of a mature black cottonwood tree bordering the pool. This feature was constructed on day 3 of restoration, October 8, 2025.



Before Restoration - October 2025



After Restoration - November 2025





Site 14

Wetland Pool - "Marsh pocket"

Site 14 is situated in the northeast portion of the sedge marsh. This area consisted of almost entirely slough sedge with one skunk cabbage (*Lysichiton americanus*) and a patch of inflated sedge (*Carex exsiccata*). This site was added to the wetland plan because access to this portion of the marsh was easier than anticipated and additional topographical diversity was desired. Prior to excavation the site was swept for wildlife, surveyed, and the boundaries were marked. Wetland boundaries were placed intentionally to preserve the skunk cabbage, inflated sedge, evergreen huckleberry (*Vaccinium ovatum*), western redcedar, and Pacific willows (*Salix lucida*) on site. Given the homogenous species composition of the marsh an emphasis was placed on preserving existing biodiversity. A compromised branch was removed from a Pacific willow bordering the pond and was placed in the wetland as a source of propagules. This feature was constructed on day 3 of restoration, October 8, 2025.



Before Restoration - October 2025



After Restoration - November 2025



Site 15

Wetland Pool - "Marsh plug"

Site 15 is located north of the field, at the bottom edge of the sedge marsh. An old logging road at this location was channelizing outflow from the marsh towards the Great Beaver Swamp Nature Reserve road network. To spread the flow and help the marsh to retain more water, a core trench was constructed at the lowest extent of the sedge wetland. The core trench was raised 40 cm above base ground level to slow the flow of water and promote infiltration. A pool was established on the upslope side of the core trench to create some topographical diversity within the fairly homogenous and flat sedge wetland. The final depth of the pool was 30 cm. Cobbles and small boulders were embedded into a depression on the north edge of the core trench to establish a spillway leading into Site 16. This feature was constructed on day 1 of restoration, October 6, 2025.

Before Restoration - October 2022



Core Trench construction - October 6, 2025



After Restoration - November 2025





Site 16

Wetland Pool - "Fern pool"

Site 16, found just downslope of Site 15, is located on top of the same road segment at the base of a shallow valley. A soil mining pit and material piles from the construction of the road were present on the southern edge of the site. This site was used to source fine sediments for the core trench at Site 15. The pit created by mining for fine sediments was converted into a small pool, 25 cm in depth. Several dead alders were pushed down and were integrated into the wetland as coarse woody debris. The road was decompacted and given a rough and loose soil treatment by the excavator and the pits and piles created by the original road build were dispersed and filled. Road removal is intended to slow the drainage of the sedge marsh, promoting longer seasonal retention of water and preventing channelization of the flow of water down to the Great Beaver Swamp. English holly and sweet-briar rose in this area were removed by the excavator and disposed of. This feature was constructed on day 1 of restoration, October 6, 2025.



Before Restoration - October 2025



After Restoration - November 2025





Site 17

Restoration - "Gravel pit"

Site 17 is a former gravel pit located on the intersection of the primary access roads for the property. Several piles of topsoil removed prior to gravel excavation were identified along the rim of the pit; a large soil pile covered with Scotch broom and teasel had been left beside the access road. The topsoil piles were redistributed on the site and the slope was recontoured and left rough and loose to create more natural and diverse topography. Stretches of slope with significant vegetation (ferns and conifer saplings) and less severe slopes were retained, creating a series of vegetated strips along the slope. Approximately a quarter of the existing flattened area was retained to be used as parking or gathering space for events. This work was completed on



Before Restoration - January 2022



After Restoration - November 2025



Site 18

Restoration - "Failed Pond"

Site 18, located just upslope of site 4, was one of the 3 existing ponds on site. This pond was very steep and deep, and did not retain water into the summer months, likely due to underlayment by coarse sediments. The material from pond excavation had been piled on the margin. Given that this pond was not retaining water, the depression was backfilled with wood from the structures on site and additional soil from the creation of other pools throughout the field. Ditches leading into and out of Site 18 were removed. This feature was constructed on day 4 of restoration, October 9, 2025.



Before Restoration - November 2022



Image After - November 2025





Site 19

Road removal - "GBH road east branch"

Site 19 consisted of an old logging road running parallel to the margin of the Great Beaver Swamp wetland east of the intersection with the branch road from the Quadra Hill Nature Reserve. This road segment once crossed the swamp, but the crossing has since been flooded and reclaimed by the wetland. The remaining road area was swept for wildlife prior to excavation. A small disturbed clearing was present at the road terminus, and signs of significant recent beaver activity (felled red alder trees) were noted in this area.

The road surface was made rough and loose, with small ridges and pools added across the road to disrupt the previous grading. Wherever possible, the surface was blended back into the existing slope. Approximately ten small and five large pocket pools were roughed in. A large old growth log that crossed the roadway was retained as an important habitat feature and left in place. Selected alders were felled along the roadway and incorporated as woody debris. Throughout this process, all English holly plants in the area were flagged and removed. The final work on all road segments was approved by the Cultural Monitors. This road segment was decommissioned on day 8 of restoration, October 16, 2025.



Before Restoration - October 2025



After Restoration - November 2025





Site 20

Road removal - "GBH road west branch"

Site 20 consisted of an old logging road running parallel to the margin of the Great Beaver Swamp wetland west of the intersection with the branch road from the Quadra Hill Nature Reserve. The western branch of the road was rockier and bordered in places by mature trees. As such, the regrading of the road was less extensive. The area was made rough and loose within the bounds of the existing roadway to avoid causing damage to the root systems of the trees. The pits and mounds in this area were shallower as a result of the rocky soil. Two pocket pools were added to this branch of the roadway as well as several large rock features. A live northern red-legged frog was found on the roadway while recording data the day after excavation. The road segment continued onto the neighbour's property; the restored area stops just short of the property line. This road segment was decommissioned on day 8 of restoration, October 16, 2025.



Image Before - October 2025



Image After - November 2025





Site 21

Road removal - "GBH road south branch"

The branch road from the Quadra Hill Nature Reserve was significantly steeper. The focus in this area was to prevent channelization of the seasonal flow that was being funneled down the roadway. A ditch on the west side of the road was removed and pocket pools, soil mounds, woody debris, and rock features were added to the roadway and surrounding area as it was made rough and loose. These features will disrupt flow and encourage the water to meander as it descends towards the Great Beaver Swamp. Two short lateral branches off of this roadway were also decommissioned, as well as several small upland road segments elsewhere on the Quadra Hill Nature Reserve property. This road segment was decommissioned on days 8-9 of restoration, October 16-17, 2025.

Before Restoration - October 2025



After Restoration - November 2025

