Northwest Stream Center
Wetland Boardwalk

Project Update April 30, 2014

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1.0 INTRODUCTION

While the wetland boardwalk project for the Northwest Stream Center has been Tom Murdoch's dream for many years, in early January 2014 Tom Murdoch, Larry Gearhart and I (Marian Hanson) began the work to make this boardwalk a reality. Since then, we have marked the route and made some changes (several times) due to conditions, obstacles, and a desire to provide the best experience for the visitor. In March, Navy volunteers joined us once a week to help provide some muscle to the effort. We have dismantled campsites and removed the garbage left behind by the campers. We have cleared some large woody debris, hazard trees (with the help of others), and some native plants from the route, and have begun removing invasive plants. Larry and Tom have been working with the manufacturers to obtain building materials and develop the plans for the actual construction of the boardwalk. I have been remarking the route when changes are needed, providing work plans for the volunteers, directing plant removal (native and invasive), and determining where the native plants are needed. It is a large project and we have been busy, however we are making progress. The idea behind the project is to maintain wetland function and wildlife habitat, while providing a wetland educational center for the human visitors to develop an appreciation through understanding and experiencing the site.

2.0 BOARDWALK ROUTE

2.1 Overall Design Description

As mentioned above, we have had to make adjustments to the route since January to accomodate the conditions. The following diagram (fig. 2.1) shows the current route of the boardwalk. The black lines are the existing routes, the blue is the proposed route, dotted lines are where the path was rerouted since January's plan, and the green line is the alternative route in case we need it, due to the Alderwood Water District easement that runs along the old road on the west side of the duck pond. This area will be discussed in section 7.4. The route was shortened in the southeast due to finances and its proximity to the east property line. The "Beaver's Tale" extention may not happen for financial reasons also. Consequently, the scrub-shrub wetland type is under-represented along the route, except with salmonberry. Minor changes will no doubt occur before the project is completed, but this is the overall plan for now.

2.2 Route Features

The boardwalk route is an effort to provide the visitor with a wide range of experiences while maintaining wetland function and habitat value. Views of several ponds, the Trout Stream exhibit, and North Creek (photo right) can be seen along the route as it passes through wetland forests, scrub-shrub, and emergent wetlands, as well as drier forest areas.

The Diagram (fig. 2.1) of the route shows the vegetation types in the background, as well as the ponds and North Creek in relation to the proposed boardwalk.

A view of North Creek (right) can be seen from the proposed boardwalk route as it passes through the "Cedar Cathedral". >

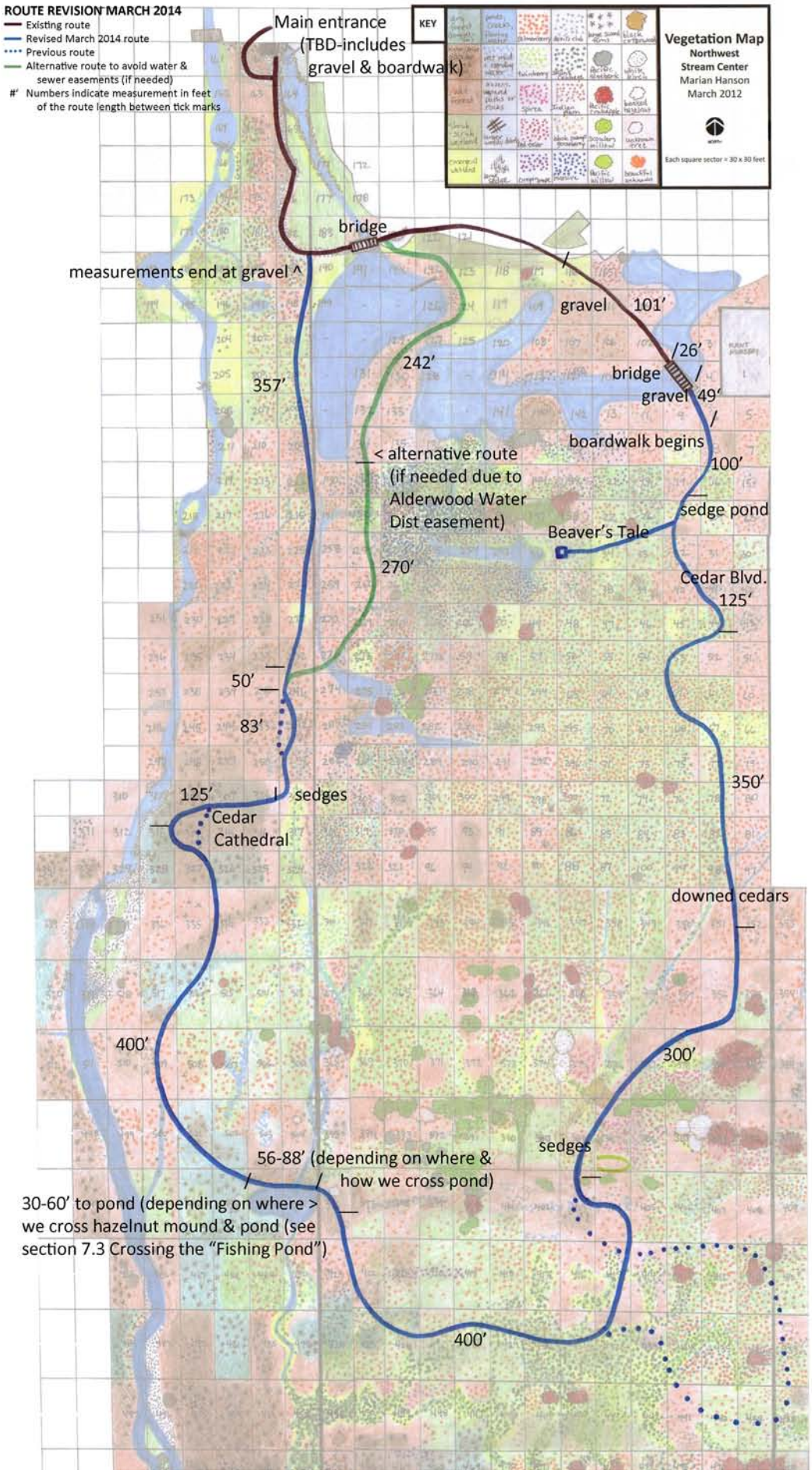


Figure 2.1: Current Proposed Route of Northwest Stream Center Wetland Boardwalk (Hanson 2014)

3.0 BOARDWALK CONSTRUCTION

3.1 Boardwalk Materials

Pin foundations, pipe pins, various fasteners, and diagrams of construction are being determined and drawn by Larry Gearhart who has experience with manufacturing. Larry has begun measuring and installing the first section of pin foundation to help determine our needs, per instructions from the pin foundation company representatives. I estimate that he has installed the pin foundations for the first 300 feet of the route.

The recycled plastic lumber has been ordered. It takes 4-6 weeks to have it made and delivered, and the first delivery is scheduled for approximately June 3rd. The total order has been broken up into five delivery dates with approximately three weeks between each. The color choice is dark brown as the lighter the color, the more expensive, and the more the dark mud shows. It would be really nice to be able to build and use some of it while working on the rest if the boardwalk.

3.2 Measuring for Boardwalk Materials

I have measured the boardwalk route again per Tom's request. The measurements can be seen on the map (figure 2.1). While this can give us a figure to determine a rough estimate of quantities of supplies needed, this does not represent an exact amount. The measurements and material needs are affected by the choices we make. We are much closer to a final route, but it still gets readjusted too often to give final numbers. I have had to redesign and remark the route several times over the course of this project, and there are still outstanding issues that need to be addressed before the final product can be determined. Now that the lumber has been ordered and several pin foundation materials have been delivered, we will soon be able to start building the boardwalk sections on the east side, while we continue to firm up the final overall design.

3.3 Other Materials

In addition to the primary boardwalk route, the main entrance, replacement bridges, fences, and other projects will need to be designed and built. Some of this is discussed later in section 7.0. Tom has also mentioned some other structures that need to be purchased and working before the site can be opened such as a backup generator, signage, etc. These will all need planning, funds, materials, construction, volunteer efforts, time and space.

3.4 Large Tree Roots

Large tree roots can be found along the route that can be in the way of placing the pin foundations for the boardwalk particularly near groups of western redcedar. The advantages and disadvantages of building the boardwalk through some of the forested areas has been discussed several times, and the route has been marked and remarked also several times due in part to these discussions. The forests are beautiful, while the salmonberry is hard to see over and has its own difficulties. The following photos show three ways that Rotary Community Park in Woodinville handled tree root obstacle problems with their boardwalk foundations. On the left they used gravel for the path (which we could do in the higher/drier areas). The middle photo shows the block is above the root, and on the right a small root was cut. I personally feel we should do very little root cutting so as not to injure the large trees. If a root greater than two inches in diameter does need cutting, we should consult the arborist. Using a smaller cement block where possible, or a post in cement were also suggested. Lately, Larry seems to be making better progress with placing the pin blocks in the first section of trees on the east side near the plant nursery. Hopefully, this will continue.

Gravel was used for the path at the base of this large tree.

The pier block here was placed more superficially above these tree roots.

A smaller tree root above was cut & the larger one retained to make room.

3.5 Moving Large Woody Debris

There has been a lot of woody debris left along the route where hazard trees have been felled, or logs have been cut to blaze the trail for the boardwalk. While some wood naturally falls from the trees, leaving large chunks of human-cut wood along the trail is an eyesore. There are many uses for this wood, and we have begun using it. However, the larger, heavier pieces of wood will be moved much easier after the boardwalk has begun, since we can use wheelbarrows then. Some of the decayed wood has been used as organic matter for planting and mulching. Other wood has been used on the muddy path to provide more solid areas for stepping. Much of it however, can be used for habitat and educational purposes while being aesthetically pleasing and should not be wasted. The site itself provides many examples of this.

We moved & planted this nurse log with native plants

Interesting woody debris should be retained for wildlife habitat & rugged beauty

3.6 Moving Other Large Heavy Objects

Other large and heavy objects need to be moved along the trail including the pier blocks, equipment, and plants to be moved. These are hard to move in the two-foot deep mud where a wheelbarrow cannot go. It will be much easier to move them when a wheelbarrow can be used on the boardwalk. Consequently, it would be helpful to build the boardwalk in sections so we can use part of it to wheel materials through rather than carrying them by hand through the mud. While woody debris has been placed on the mud to help stabilize the footpath in areas, this is not always a great choice. The debris can be hard to see under the muddy surface and has been known to trip the volunteers as they are trying to move objects along the route.

4.0 INVASIVE PLANT REMOVAL

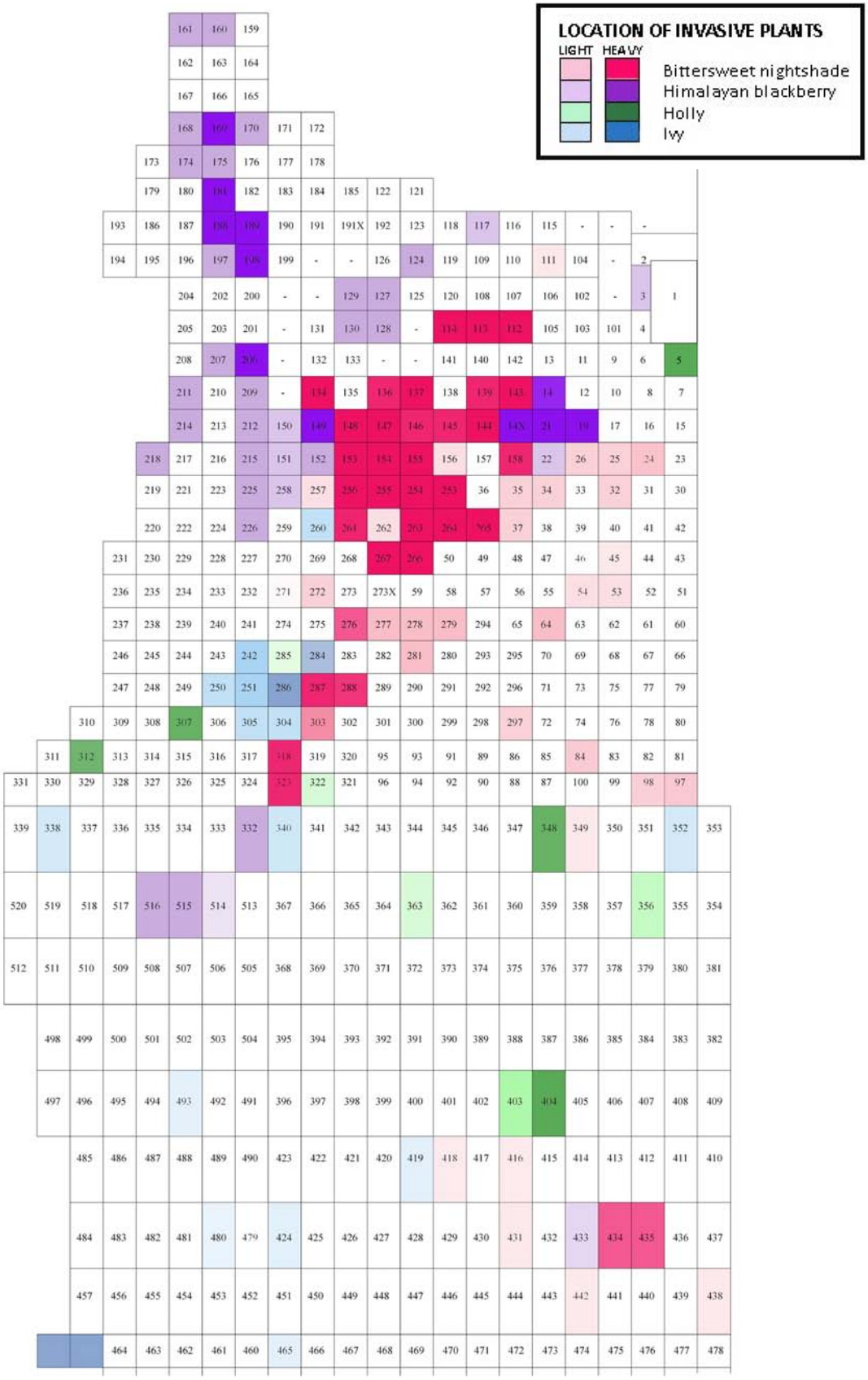


Fig. 4.1: Location of Invasive Plants (reed canary grass not included) from 2012 map, field notes & recent observation (Hanson 2014)

Areas of invasive plant locations can be seen on the map (fig. 4.1). I have noticed that the invasives have spread since I mapped them 2 years ago. The nightshade patches are larger and thicker, and isolated holly and ivy plants are scattered in more areas than marked on the Vegetation Map of 2012. We have begun invasive plant removal at the site and the following is a summary of what I estimate we have removed.

The largest holly tree has been removed, as have several smaller ones that were seen while clearing the route. Most of the holly trees are small (under 1.5 feet) and thinly scattered.

The largest ivy "tree" has been girdled and much removed nearby. Some remains scattered around the site. A large area of ivy remains on a private chainlink fence just SW of the site and west of North Creek.

Some of the Himalayan blackberry has been removed from the area southwest of the Duck Pond, and southeast of the detention pond. Some still remains here as well as in the other sectors marked on the map (fig. 4.1).

Reed canary grass is widespread in the center of the east side, as well as scattered in other areas. We have pulled small amounts where we are working, but have not pulled the central area as this is a difficult situation to maneuver within without the boardwalk, and will be a large task to be tackled later.

We have begun removing the invasive bittersweet nightshade (see photos below), but it is thick and extensive just south of the 2 large ponds and around the beaver pond.

My rough estimate is that we have removed 30% of the holly, 20% of the ivy, 20-25% of the nightshade, 15% of the Himalayan blackberry, and less than 1% of the reed canary grass. This estimate is by area, and does not reflect the amount of time it will take, as some areas are difficult to work within.

Bittersweet nightshade has covered most of the plants just south the the two large ponds.

A week later (April 3), the Navy volunteers and I began tackling the nightshade.

5.0 TRANSPLANTING NATIVE PLANTS

5.1 Transplanting Plan

While it is tempting to dig up all the plants that need moving from the route before they get trampled, it would be easier to remove some of them and transplant them at the same time, rather than potting, lugging through the mud, labeling, storing and watering them until a space is found (especially the rooted cedar branches that are rather large for pots). Consequently, we have begun invasive plant removal, and will work on transplanting the native plants as space opens up for them. We have been able to clear approximately 780 feet of the route to get ready for the boardwalk construction, but that still leaves around 1860 feet of the half-mile to clear, although some plants have already been removed in those places. It would also be easier to move them when we can use the wheelbarrows as we are building the boardwalk. The pots can be heavy and require several trips to move, which also increases the foot-traffic damage and wastes time manuevering around the site in the mud. This is especially true for the large skunk cabbage plants at the south end of the site. They are heavy, cumbersome and difficult to dig up. As they mature, they will get larger and heavier. We will not be able to salvage all of them, but will try to get what we can while still making progress in other areas.

The photo (right) of this skunk cabbage shows what happens when these plants are not properly dug up for transplanting. I found a few of the skunk cabbages like this missing their roots sitting in pots. It is important to take the time to show our volunteers how to properly dig up these difficult plants. The roots are deep, there are tree roots or woody debris packed around them, and they break easily just above the roots. Even us seasoned volunteers can have a tough time removing them from the trail.

On the southwest quadrant of the site, we have a narrow path that we have been using to mark the route the boardwalk will take, but the route has not been fully determined in this area yet. I do not want to move or damage plants here until I know a firm decision has been made on the route location, as some of these plant species do not take transplanting well. In the meantime, there is plenty of other native plants to move and invasives to remove.

The following site map (fig. 5.1) diagrams a plan for moving native plants. Plants removed along the route (solid-colored lines adjacent to the black route line) can be transplanted either in the nearby open spaces, or moved to the appropriate plant community areas that have had invasives removed and require native plants (circled areas in color). The solid color areas show where mature shrubs of red-osier dogwood, Pacific ninebark and Pacific willow are found that can be used as sources for shrub cuttings. The colors on the transplanting map correspond to the plant communities found here (see key). It may be best in some areas to plant along the route after a boardwalk section has been completed, as some plants and transplants have been damaged by large woody debris, blocks and moving people in the process of working on the trail. I really feel it is important to do a particularly good job of planting and staging the areas along the perimeter of the boardwalk, as these are the areas people will experience the most, and areas that will be damaged the most by our construction efforts.

5.2 Native Plant Propagation

In the following table A, plant propagation techniques are listed for plant species found at this site. This information will help to determine which plants will be easier or more difficult to transplant, and which we can take cuttings from to fill in where invasive plants are removed.

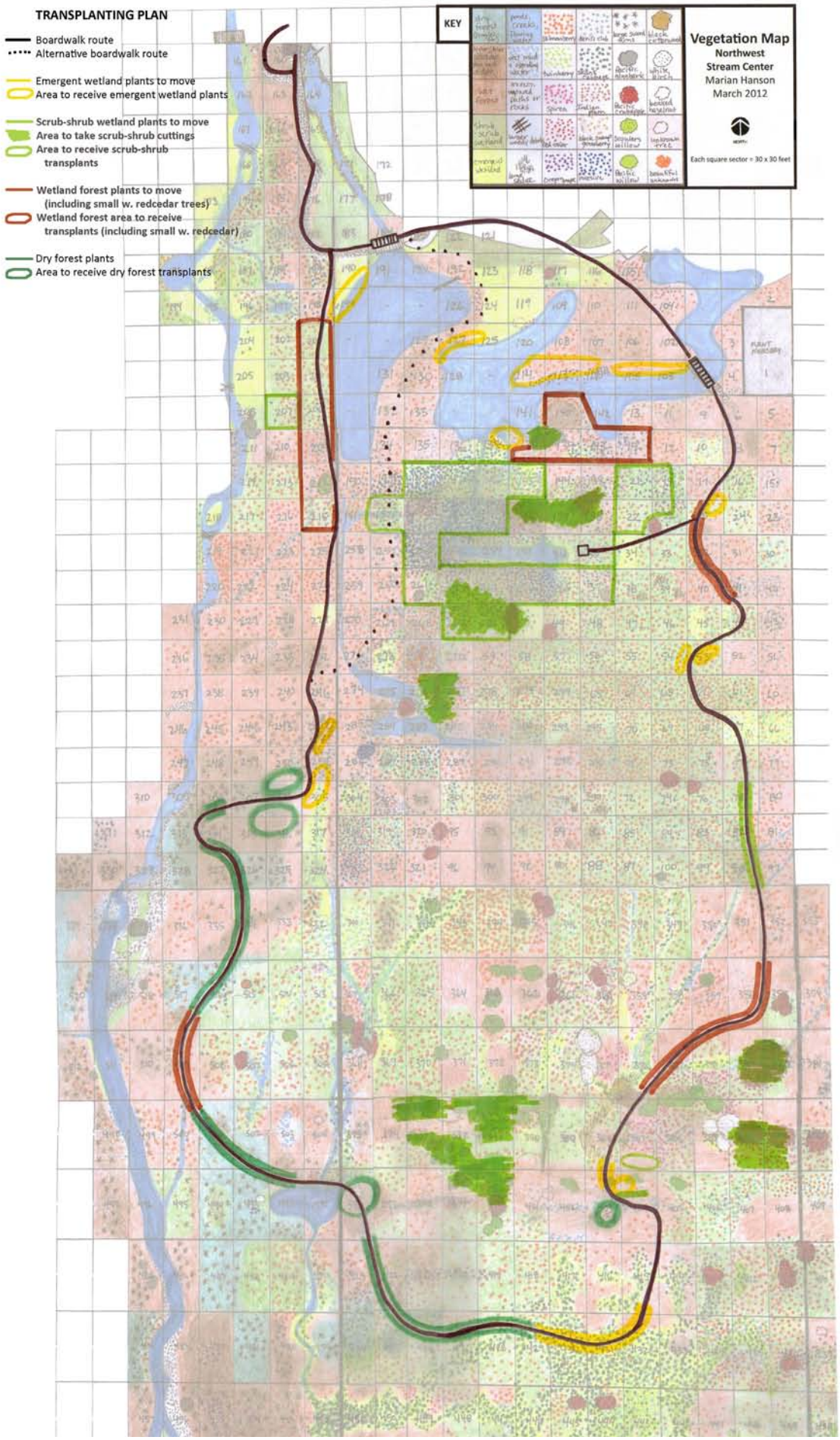


Figure 5.1: Transplant Plan (from boardwalk route and source plants) (Hanson 2014)

VEGETATION		PROPAGATION TECHNIQUES				
Botanical Name	**Common Name**	**Cuttings**	**Layering**	**Transplant**	**Division**	**Seeds**
Tree Canopy:						
Alnus rubra	Red alder			x - small		**X**
Betula papyrifera	White birch					**X** - easiest
Picea sitchensis	Sitka spruce	**X** - maybe		x - small		**X**
Populus balsamifera ssp. trichocarpa	Black cottonwood	**X** - hdwd or livestakes		**X** - suckers		**X**
Pseudotsuga menziesii	Douglas-fir	**X** - varies		x - small		**X**
Thuja plicata	Western red cedar	**X** - slow		x - small		**X** - easy
Tsuga heterophylla	Western hemlock	**X**	**X**	x - small		**X** - easiest
Shrubs & Small Trees						
Acer circinatum	Vine maple		**X**	**X** - seedings-large		**X**
Cornus stolonifera aka *C. sericea*	Red-osier dogwood	**X** - hdwd or livestakes		x		**X**
Corylus cornuta var. californica	Beaked hazelnut	**X** - semi-hdwd	**X** - fall best	**X** - suckers		**X** - easiest
Gaultheria shallon	Salal	**X** - semi-hdwd	**X** - spring	**No** - difficult		Not easy
Holodiscus discolor	Oceanspray	**X** - semi-hdwd & hdwd		x		Low germ
Ilex aquifolium	Holly	INVASIVE - REMOVE				
Lonicera involucrata	Black twinberry	**X** - hdwd & young stem				**X**
Mahonia nervosa aka *Berberis nervosa*	Dwarf Oregon grape	Difficult bud or hdwd	Difficult	**No** - difficult		**X** - easiest
Malus fusca	Pacific crabapple		**X** - slow			**X** - slow
Oemleria cerasiformis	Indian plum	**X** - hdwd & root	**X**	x		**X** - easy
Oplopanax horridus	Devil's club	**X** - hdwd easy				**X** - slow
Physocarpus capitatus	Pacific ninebark	**X** - hdwd easy				**X** - low germ
Ribes lacustre	Swamp gooseberry	**X** - semi-hdwd & hdwd				**X**
Ribes sanguineum	Red-flowering currant	**X** - semi-hdwd & hdwd				**X**
Rosa nutkana	Nootka rose	**X** - woody rhizomes or roots (stems more difficult)				**X** - rosehips
Rubus laciniatus	Evergreen blackberry	INVASIVE - REMOVE				
Rubus procerus aka *R. discolor*	Himalayan blackberry	INVASIVE - REMOVE				
Rubus parviflorus	Thimbleberry	**X** - semi-hdwd & hdwd		x	**X** - rhizomes	**X**

AASF Plant Propagation - Page 1

Table A: Native Plant Propagation (another option for source plants for replanting cleared invasive plant areas)
X - Info taken from Robson, Richter & Filbert 2008; **x** - info taken from my experience or derived from Pojar et. al 2004

Botanical Name	Common Name	Cuttings	Layering	Transplant	Division	Seeds
Shrubs & Small Trees continued						
Rubus spectabilis var. *spectabilis*	Salmonberry	X - semi-hdwd & hdwd		x	X - rhizomes	X
Rubus ursinus	Trailing blackberry			x		X
Salix lucida var.*lasiandra*	Pacific willow	X - easy hdwd or live stake		X - rooted sucker		X
Salix scouleriana	Scouler willow	X - easy hdwd or live stake		X - rooted sucker		X
Sambucus racemosa ssp. *pubens*	European red elderberry	X - easier hdwd		**No** - long roots		X
Spiraea douglasii	Douglas spirea	X - other cuttings			X - rhizomes	X
Vaccinium parvifolium	Red huckleberry	X - semi-hdwd & hdwd				X
		X - tip & semi-hdwd	X	X - only small		X
Herbs						
Aster subspicatus	Douglas aster			x	X	X
Cornus canadensis aka *C. unalaschkensis*	Dwarf dogwood or bunchberry					X - easiest
Epilobium ciliatum aka *E. watsonii*	Watson willowherb			x		X
Galium aparine	Cleavers bedstraw					X
Geum macrophyllum	Large-leaf avens				X - clumps	X
Impatiens capensis or *Impatiens noli-tangere*	Spotted touch-me-not					X
Iris pseudacorus	Yellow iris				x - rhizomes	
Lemna minor	Small duckweed					X
Lotus corniculatus	Birdsfoot trefoil				X - rhizomes	X
Lysichiton americanum	Skunk-cabbage				X - rhizomes	X
Maianthemum dilatatum	False lily-of-the-valley		X - nodes root			X
Oenanthe sarmentosa	Water-parsley (poisonous)					X
Ranunculus repens var. *repens*	Creeping buttercup			X	X	X
Solanum dulcamara	Bittersweet (climbing) nightshade	INVASIVE - REMOVE				
Tolmiea menziesii	Piggy-back plant			X	X - plantlets	X
Urtica dioica ssp. *gracilis var. lyallii*	Stinging nettle			x	x - rhizomes	x?

Table A (part 2): Native Plant Propagation

X - Info taken from Robson, Richter & Filbert 2008; **x** - info taken from my experience or derived from Pojar et. al 2004

6.0 NATIVE PLANT COMMUNITIES

The native plants found on the site largely fall into four plant community groups. The drier higher forest areas include western redcedar, Douglas-fir, vine maple, Indian-plum, salal, sword fern, Oregon grape, piggy-back plant, and evergreen blackberry. Western hemlock, red huckleberry and salal can be found on nurse stumps and logs. The wetter forested areas include western redcedar, red alder, salmonberry, red elderberry, wood/sheild ferns, and false lily-of-the-valley. Heavy moss and false lily-of-the-valley can be seen on nurse stumps and logs with red huckleberry. The scrub-shrub wetlands are predominately Pacific crabapple, Pacific willow, salmonberry, spirea (hardhack), red-osier dogwood, twinberry, and Pacific ninebark. The emergent wetlands consist of mostly skunk cabbage, small-fruited bulrush (*Scirpus microcarpus*), horsetails, and buttercups. Some of the emergent wetlands are almost entirely reed canary grass, while others contain none. There are other plant species scattered around the site, however, they are not numerous and will probably not be involved much in the transplanting process.

6.1 Drier Forest Plant Community

This plant community is found on the higher mounds that drain. In the Transplant Plan (fig. 5.1) these plants are representated by the dark green color. In the following photos, are two examples of the drier forest areas on this site, while table B lists the native plants of this community and their growing conditions.

^ The "Cedar Cathedral" has good examples of the drier forest plant community.

< East of the "Fishing Pond" a former campsite and garbage dumpsite caused damage to the native understory plants. Those found in the drier forest community would do well here..

DRIER FOREST PLANT COMMUNITY

Common Name	Botanical Name	Height*	Growing Conditions*
Douglas-fir	*Pseudotsuga menziesii*	300'	Full sun, well-drained, dry to moist soil
Western redcedar	*Thuja plicata*	230'	Full sun to part shade, moist soil
Vine maple	*Acer circinatum*	6 to 30'	Full sun to part shade; well-drained, fairly moist
Beaked hazelnut	*Corylus cornuta*	15' x 15'	Full sun to full shade, well-drained, moist to dry
Indian plum	*Oemleria cerasiformis*	15'	Part shade (tolerates full sun), moist to rather dry
Oregon grape	*Mahonia nervosa*	1'	Full shade to part sun, moist to rather dry soil
Western sword fern	*Polystichum munitum*	5'	Part sun to full shade, moist to dry soil (w/OM)
Salal	*Gaultheria shallon*	2 to 10'	Part shade (tolerates sun & shade), moist to dry
Piggy-back plant	*Tolmiea menziesii*	1'	Full shade to part sun, moist soil w/OM

* 2008 Robson, Richter, & Filbert

Table B: Drier Forest Plant Community Growing Conditions

6.2 Wetland Forest Plant Community

This community is found in the lower, wetter areas, or in the slightly mounded western redcedar forests surrounded by small pools of water. In the Transplant Plan (fig. 5.1) these plants are representated by the brown color. In Table C the plants of this community and their growing conditions are listed.

WET FOREST PLANT COMMUNITY

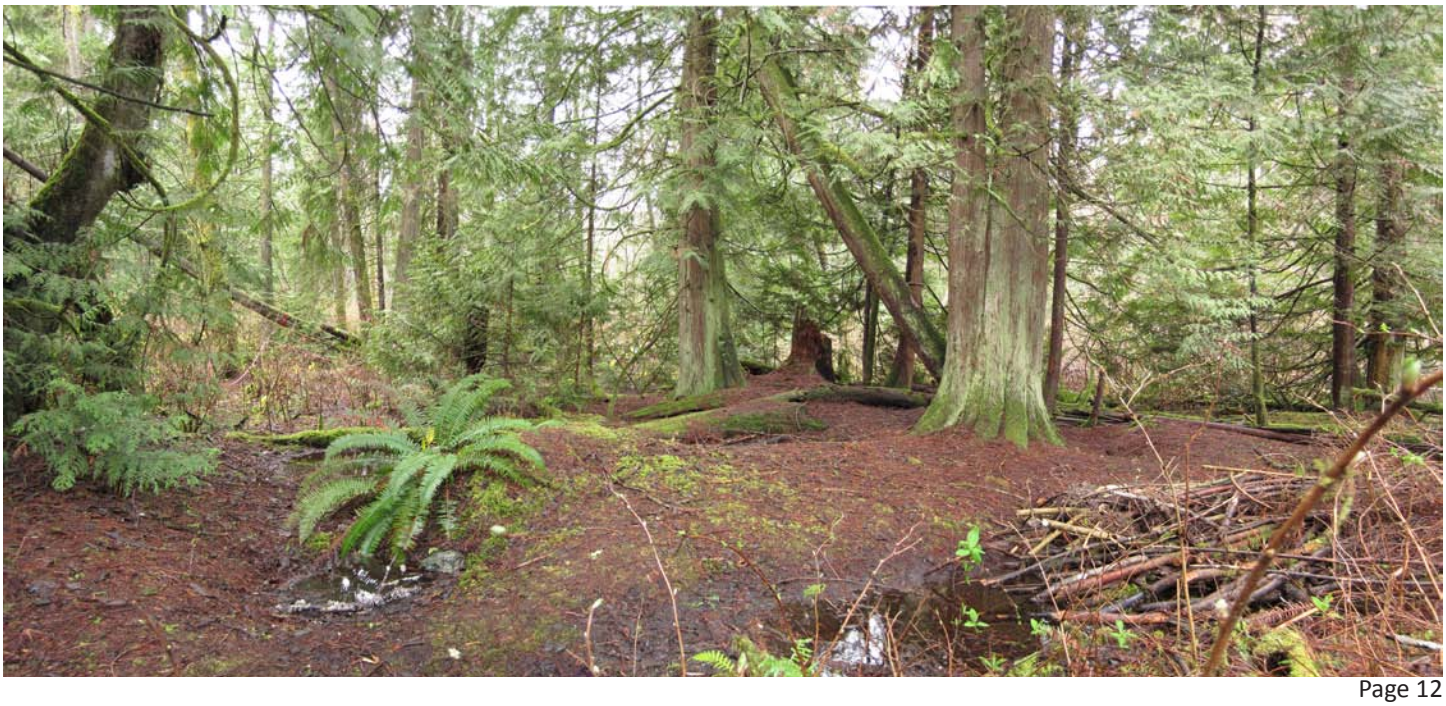
Common Name	Botanical Name	Height*	Growing Conditions*
Western redcedar	*Thuja plicata*	230'	Full sun to part shade, moist soil
Red alder	*Alnus rubra*	75'	Full sun to part shade, rather dry to seasonally flooded
Red elderberry	*Sambucus racemosa*	10'	Full sun to full shade, moist to rather wet soil
Salmonberry	*Rubus spectabilis*	10' +	Full sun to full shade, moist to rather wet soil
Devil's club	*Oplopanax horridus*	10'	Part to full shade, wet to very moist w/drainage
Shield (wood) ferns	*Dryopteris expansa*	3'	Full shade to mostly sun, moist soil
False lily-of-the-valley	*Maianthemum dilatatum*	0.5 to 1'	Full shade to part sun, moist soil w/organic matter
Piggy-back plants	*Tolmiea menziesii*	1'	Full shade to part sun, moist soil w/organic matter

* 2008 Robson, Richter, & Filbert

Table C: Wetland Forest Plant Community Growing Conditions

The following photos contain examples of the wetland forest plant communities found here. The photo at right of sector 403 was taken when I did the inventory of this site in 2011.

The photo below is of the same area in 2014 after a rather large campsite structure was dismantled. Woody debris piled at right was part of that structure. Groundcover plants in this wetland forest have been damaged from the illicit camping activities. The understory can be replanted with ferns & groundcover plants transplanted from the path of the boardwalk to help repair the damage.



6.3 Scrub-shrub Wetland Plant Community

This community is found in the lower, wetter areas where there may only be scattered red alders or dead tree snags mixed with shrubs to small tree species. In the Transplant Plan (fig. 5.1), these plants are represented by the light green color.

SCRUB-SHRUB WETLAND PLANT COMMUNITY

Common Name	Botanical Name	Height*	Growing Conditions*
Pacific willow	*Salix lucida* var. *lasiandre*	45'	Full sun to part shade, wet to moist
Pacific crab apple	*Malus fusca*	35'	Full sun to part shade, moist to wet
Red-osier dogwood	*Cornus stolonifera*	18'	Full sun to full shade, moist to wet
Pacific ninebark	*Physocarpus capitatus*	12'	Full sun to part shade, moist to wet
Salmonberry	*Rubus spectabilis*	10' +	Full sun to full shade, moist to wet
Twinberry	*Lonicera involucrata*	10'	Full sun to full shade, moist to wet

* 2008 Robson, Richter, & Filbert

Table D: Scrub-shrub Wetland Plant Community Growing Conditions

A good example of a scrub-shrub wetland can be found in the central area of the site, as seen in the photo at right. Here red-osier dogwood mingles with salmonberry under dead tree snags and an occasional red alder. Skunk cabbage and false lily-of-the-valley cover the wet soil under the shrubs. All of the shrubs in the table above grow nearby within this central area.

The photo below shows the scrub-shrub area just north of the first where the nightshade was taking over and is currently being removed. Once nightshade removal is completed and woody debris added, this area will be replanted with shrubs & ground covers.

6.4 Emergent Wetland Plant Community

This community is found in the lower, very wet areas or along the margins of ponds, that have few shrubs and little tree canopy. In the Transplant Plan (fig. 5.1) these plants are representated by the yellow color. Table E lists the plants of the emergent wetland community and their growing conditions. The photos below show three examples of this type of community on this site.

EMERGENT WETLAND PLANT COMMUNITY

Common Name	Botanical Name	Height*	Growing Conditions*
Common horsetail	*Equisetum arvense*	2-3'	Full sun to part shade, moist to wet
Common rush	*Juncus effusus*	3'	Full sun or part shade, wet to moist
Skunk cabbage	*Lysichiton americanum*	3-5'	Shade or part sun, mucky or boggy soil
Small-fruited bulrush	*Scirpus mircrocarpus*	5'	Full sun or part shade, wet soil
Water parsley	*Oenanthe sarmentosa*	3'	Low wet sites, seasonal water

* 2008 Robson, Richter, & Filbert and Pojar 2004

Table E: Emergent Wetland Plant Community Growing Conditions

The southern portion of the boardwalk route is surrounded by skunk cabbage in this emergent wetland.

Small-fruited bulrush (*Scirpus microcarpus*) fills the emergent wetland in sector 388 along the boardwalk route.

Skunk cabbage, shield ferns, *Scirpus microcarpus* and a few salmonberry surround this pothole formed by an overturned tree's roots in a mini-emergent wetland near a western redcedar forested wetland area along the boardwalk. This pothole in sector 25 provides a good example for planting other potholes of this type found along the route.

7.0 Other Design Considerations

7.1 Main Entrance

A decision needs to be made in the near future on the final design of the main entrance so materials can be ordered, as a deck and/or boardwalk will be needed here. Chris Mueller and I have both proposed ideas that can be incorporated into a final design, but the length of the boardwalk varies. Tom mentioned that the slope was too steep for ADA access near the entrance booth. However, the boardwalk starting point elevation, ticket booth window location, and length of the boardwalk can be adjusted to accomodate this, as I mentioned on page 79 of my thesis design proposal (Hanson 2012).

7.2 The Bridges

Two bridges need to be designed and built to replace the exisiting bridges, one located between the "Trout Stream" exhibit and the "Duck Pond" on the west side, and the other between the bioswale and detention pond near the plant nursery on the east side. The design will affect the amount of wood and building supplies required for the overall boardwalk project. Below are two examples of bridges from our precedent sites. In addition, a bridge or boardwalk route is needed through the "Fishing Pond" in the southwest quadrant of the site. This is discussed in the following Section 7.3.

The boardwalk crossing at Rotary Community Park in Woodinville.

The boardwalk crossing at Mercer Island Slough

7.3 Crossing the "Fishing Pond"

7.3.1 The "Fishing Pond"

The "Fishing Pond" got its nickname from the first time I saw it. There was an old campsite on the drier mound to the east with a pit filled with garbage. In the pond was two fishing poles set up as if two invisible fishermen were holding them. (I think the fish are invisible too.)

To the west of the pond is a beautiful dry forest where the ground is covered with salal and sword ferns and a social path from North Creek runs through the middle of it. To the north is a very wet forest where many red alders have fallen and would be a difficult area to put a boardwalk through. To the south, the elevation drops several feet and the pond would not be visible if the boardwalk was placed here.

7.3.2 Pond Site Conditions

The “Fishing Pond” sits in the middle of our proposed boardwalk and we need to find a way to get to the other side. The pond is a beautiful and interesting addition to our route, although we need to be careful not to interrupt the flow of the water into or out of the pond. The diagram (fig. 7.1) shows some of the conditions related to the pond. There is a social path northwest of the pond that we want the boardwalk to connect to and follow up through the dry forest.

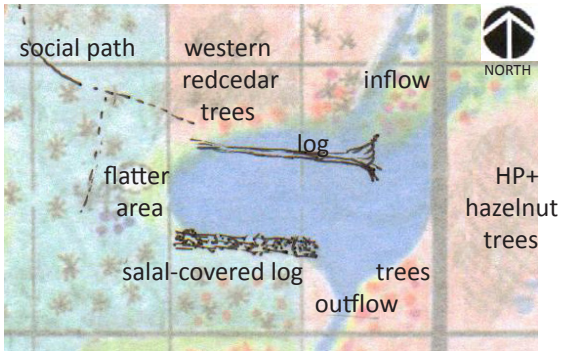


Figure 7.1 Pond Site Conditions

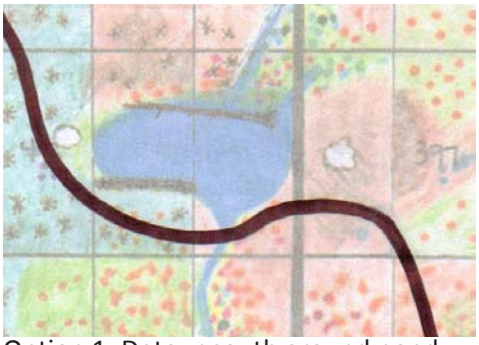
View of the “Fishing Pond” looking north

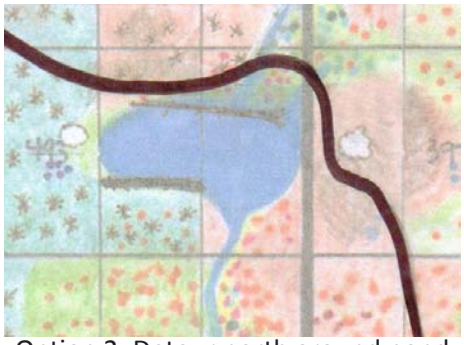
The inflow of the pond is located northeast of the large log that bisects the pond. The northwest bank consists of tightly-spaced western redcedar trees that cover a mound creating a barrier for a boardwalk route. Plants grow up through the water’s surface of the north half of the pond making it look less and less like a pond as time goes by during the growing season.

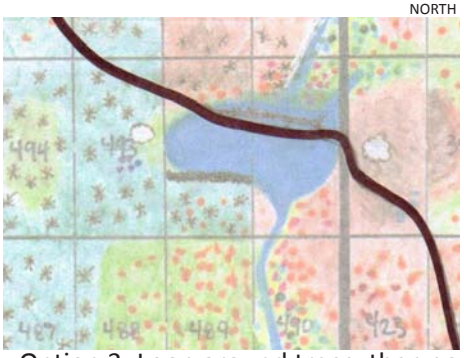
View of the “Fishing Pond” looking southeast

The outflow of the pond is located in the center of the south bank. The west half of this bank consists of a large decaying log covered with salal. The ground south of the log drops a few feet in elevation.

7.3.3 Group Ideas for a Potential Pond Crossing Route


Option 1: Detour south around pond


Option 2: Detour north around pond


Option 3: Loop around trees, then go through north area of pond

Our group has kicked around ideas on how the boardwalk should cross to the other side of the "Fishing Pond", but we have not made a final decision on the route. Our ideas boil down to the following six options.

Option 1 detours south around the pond. This would avoid most of the large western redcedar trees, the eastside mound, damage to the hazelnut trees, and interferring with water flow patterns. It would connect to the social path after it goes around the pond. However, beyond the south bank of the pond, the ground drops a few feet which would place the boardwalk too low to see the pond.

Option 2 detours north around the pond. This area contains a lot of water, mounding topography, tangles of shrubs, and a wall of large western redcedar trees northwest of the pond. This would not be a good choice.

Option 3 loops around the beaked hazelnut trees on the eastside mound and the interesting roots of the north log that are covered with ferns, runs along the south edge of the log as it crosses the pond, then goes around the bulk of the western redcedar trees on the west mound. While it avoids some obstacles, this route would include more corners and mounds, while competing with the view of the north side of the pond.


Diagram 4: North through beaked hazelnuts & north area of pond

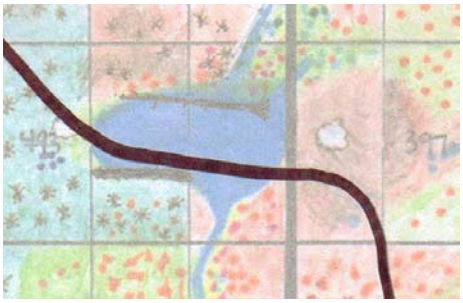


Diagram 5: Straight shot through the south side of the pond

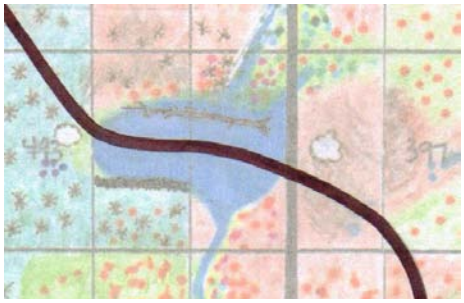


Diagram 6: Straight shot through the middle of the pond

Option 4 bisects the beaked hazelnut mound then goes around the roots of the north log and then heads across the pond in the same manner as option 3. This option would have a few less corners and mounds to go through, but it would plow through the 10-foot clump of hazelnut trees which are few in number on this site.

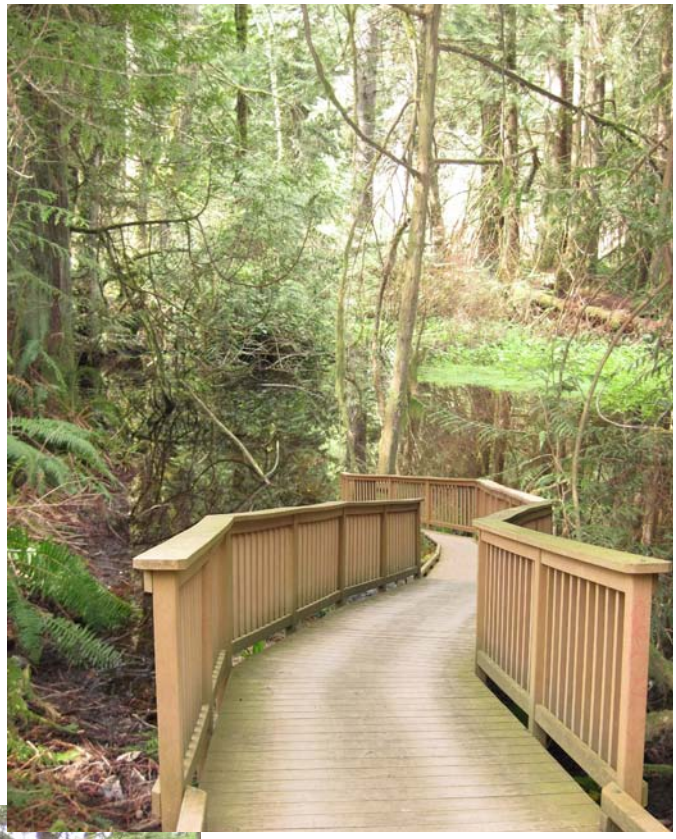
Option 5 is a fairly straight route through the south side of the pond. This route avoids the higher mounds and larger trees on the west and east sides of the ponds, so the boardwalk enters and exits the pond through more level terrain. On the west side, it exits the pond where the water reaches its most western point, then connects to the social trail at a point slightly lower and farther from the pond than options 2-4. The pond is shallow and the soil is firm under the water level, and this route has less obstacles. However, it hugs the south bank of the pond blocking some of view of the beautiful salal-covered log, while getting very close to the dark cave-like area under the log which may make some users uncomfortable.

Option 6 is a fairly straight route through the middle of the pond. The entrance and exit points would be the same as option 5, but it would not hug the banks. This could make the pond look smaller, but it does not block the view of the pond margins as much as options 3-5.

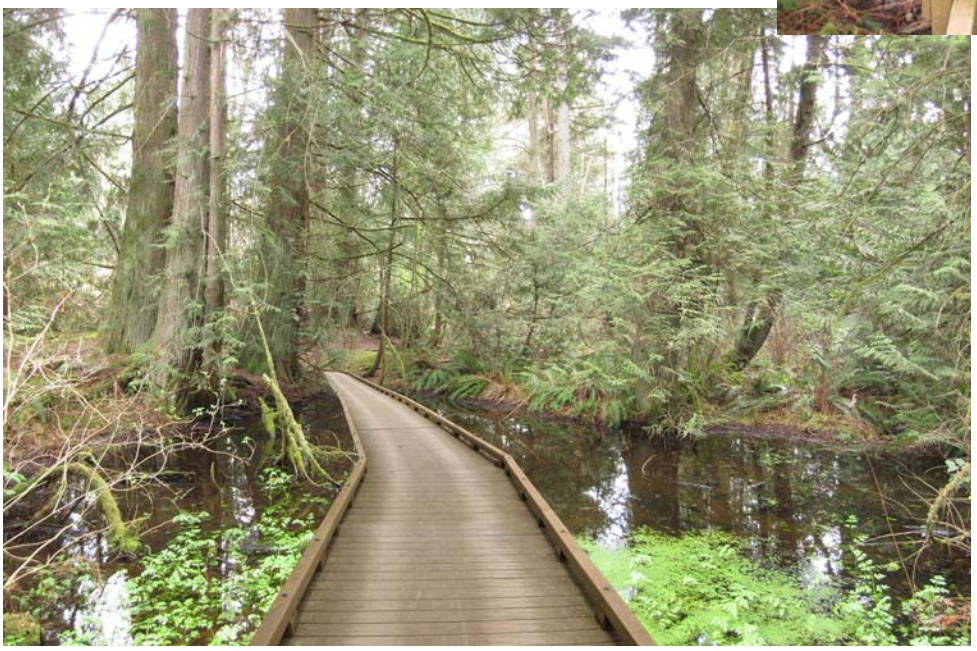
7.3.4 Discussion of Potential Pond Crossing

In the following photos I have added the image of the boardwalk to give an idea of how it would affect the view of the "Fishing Pond". While the design and construction would need to be planned, this does show some examples of curves and railing that would be necessary to cross the pond.

The image above represents options 3 and 4 looking west. The boardwalk crosses the pond while hugging the log in the northern section of the pond.



The boardwalk above (looking west) demonstrates the route that option 5 would take to hug the south bank of the pond. It also shows how a strong railing could affect the view of the pond's south bank. We should consider using materials that are easier to see through, such as a framed and firmly secured metal cattle fence.



The image at left looking southeast represents option 6 which goes through the middle of the pond. We would again need to consider how the choice of railing will affect our view of the pond.

We need to make a decision how we are to cross the pond before we begin construction of the boardwalk in the southwest quadrant of the site. The choices made on the crossing will affect the boardwalk location and transplanting plans on either side of the ponds, as well as the length of the route, choice of materials, quantity and costs. I do not want to move plants here until we know, as some may not transplant well, and this area is a beautiful forest in good shape, and we should minimize damage to it as much as possible.

7.4 Alternative Route Due to Alderwood Water District Easement

Alderwood Water District recently marked the water and sewer easement that is located in the north-west quadrant of the site. It runs south from the "Trout Stream Exhibit", along the west side of the "Duck Pond", continues south along the old parks road to sector 227, where it turns and heads west. In the map (fig. 2.1) I have proposed an alternative route (shown in green) to avoid the easement. This alternative would provide a good view of the many mature shrub species within this site, namely Pacific crabapple, Pacific willow, red-osier dogwood, twinberry, and Pacific ninebark. These shrub species are under-represented along the current boardwalk route, since the route was shortened by approximately 420 feet in the southeast area due to budget constraints and proximity to the east property boundary. This route would also flow through the recently removed nightshade area that will be planted with similar shrubs, skunk cabbage and groundcovers. I

have flagged this entire route in pink at the site. The photo above represents the proposed alternative route going through the nightshade removal area after it has been replanted and shrubs have matured. From this point northward, the route would then go along the isthmus between the "Duck Pond" and the detention pond before exiting at the emergent wetland meadow near the front door of the Northwest Stream Center.

In the photo above, is a scene found on the alternative route that shows the same type of beaver activity that would have been featured on the "Beaver's Tale" branch of the boardwalk, but will probably be another casualty of the budget constraints (see map fig. 2.1).

The alternative route drops down into a beautiful and lush wetland area full of skunk cabbage, ground covers, old tree snags, mature shrubs and potholes of water under a light canopy of red alder, as shown below.

7.5 Future Plant Nursery Design and Storage

The plant nursery storage near the east entrance to the boardwalk needs to be addressed at some point before the project is done. The piles have spread and the forest vegetation has receeded in the last three years, as shown in the photos below. This area is an eyesore to the route and it would be nice to condense the materials and move them into the east side of the plant nursery itself, where it would it could be partially hidden from view. The piles of materials used by the AAS to do stream restoration are even larger near the driveway, and storage space for these materials also needs to be considered. It may be possible to use some of this to educate the public on the type of work the AAS does, but it would need to be a strategic display with the bulk of the mess stored out of site. Otherwise, it sends the wrong message on caring for our forests.

Above is a view of sectors 5-6 showing the plant nursery potting area in April 2014 looking northeast.

This is the same area near the plant nursery looking west in June 2011. If we moved the potting activities to within the plant nursery fenced area, we could replant this area which is next to the boardwalk.

8.0 CONCLUSIONS

While we have had our share of “growing pains” and “educational moments”, the project is moving forward and we have made some accomplishments. That being said, there is obviously still a lot to do. I think it is helpful to break the project down into smaller chunks, while keeping the big picture still in the back of our minds with the help of the following:

First, even though we have generally split up the types of activities that we (Tom, Larry and I) each oversee, the spatial aspect of the project is also large. Except for the special projects mentioned in section 7.0, the entire route needs the same basic things at this point. We have to clear the route, remove invasive plants, set up the foundations of the boardwalk route, build the boardwalk, and then finish the route with clean-up, replanting/restoring efforts, as well as signage and other necessary installations. I think we should break this up into sections spatially, using the five delivery dates of the lumber as a loose guide. This will help us think about the needs of each particular area such as plants to move, obstacles to deal with, order of our individual efforts to keep the project moving, while staying out of each other’s way. It will help us to work smarter and more efficiently, as we could use the wheelbarrows for large or heavy loads, as well as move around easier by building and using the boardwalk sections as we go. It would also be less overwhelming to look at it in smaller chunks when, quite often, we don’t have volunteers to help with the physical labor.

Second, we need to look at the special projects of section 7.0. We can put them off for a while, but the route connects to all of them and the boardwalk route won’t be done until they are done. At some point the materials, costs, and designs need to be accounted for within our financial, permitting, and time restraints.

Third, we should consider the alternative route around the water and sewer easement. It would probably be 155 feet longer than the route that goes straight along the west side of the “Duck Pond” on the old parks road. However, this route would only be about 30 feet longer than the route on the old parks road that turns and goes between the two ponds. If we find ourselves considering the route between the two ponds, the alternative route would be a much more interesting and beautiful choice, although more difficult to build.

9.0 REFERENCES

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