

After substrate is removed to rough out the desired contour, the remaining substrate will be top dressed with high quality top soil starting at the farthest point from the road and working back to the road. Planted areas must be protected from all construction and foot traffic once seeding and erosion control measures have been implemented. Damage resulting from foot traffic should be re-seeded. The property owner will be responsible for the repair of any disturbed areas, i.e. the replacement of topsoil and vegetation in all peripheral wetland and buffer areas impacted by the earthmoving process.

5.5 Detailed Planting Plan for the North Mitigation Site

Grass Seed Mix:		Bunch or Sod	PLS (lb/acre)
Common Name	Scientific Name		
Nebraska sedge	<i>Carex nebraskensis</i>	S	2
beaked sedge	<i>Carex rostrata</i>	S	2
Torry rush	<i>Juncus torreyi</i>	S	1
Baltic rush	<i>Juncus balticus</i>	S	0.2
western mannagrass	<i>Glyceria occidentalis</i>	B	7
fowl mannagrass	<i>Glyceria striata</i>	S	7
spike rush	<i>Elocharis palustris</i>	S	4
Total			23.2

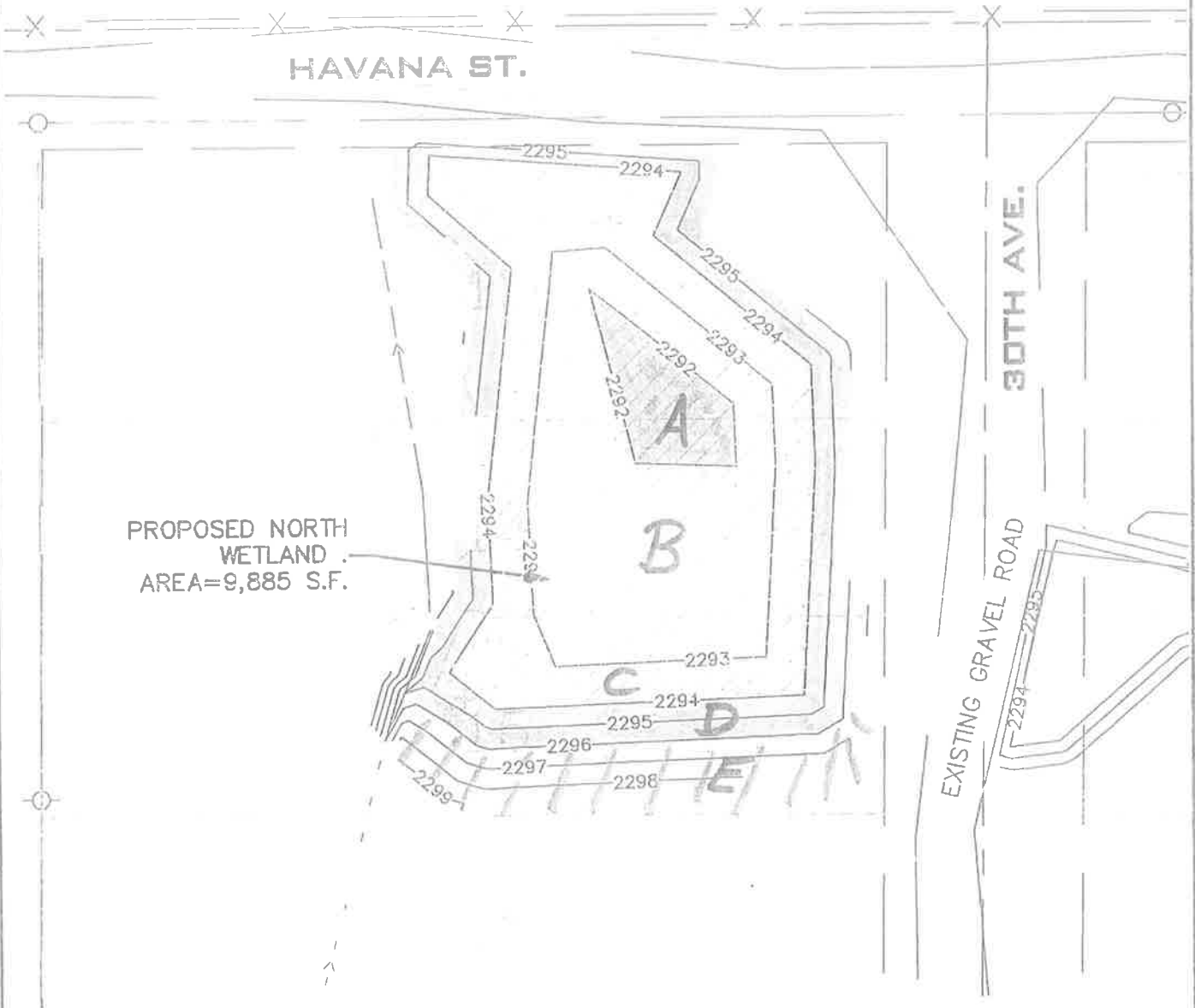
Woody vegetation will be planted inside the edge of the created wetland. **One-gallon container stock** shall be planted in the quantities specified below.

Shrubs	Common Name	Scientific Name	# Planted
	Red osier dogwood	<i>Cornus stolonifera</i>	45
	golden current	<i>Ribes aureum</i>	34
	indigenous willow sp.	<i>Salix ssp.</i>	30
Trees	alder	<i>Alnus tenuifolia</i>	20
	hawthorn	<i>Crataegus douglasii</i>	10
Total			139

Ten inch Plugs for the North Mitigation Area

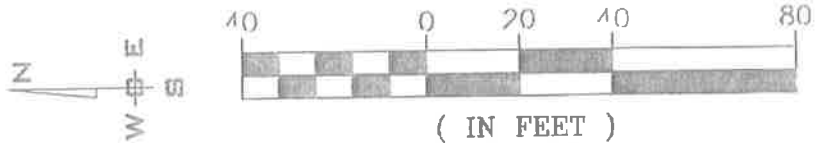
In addition to the seed mix that will be applied in all wetland locations, 60 ten inch plugs shall also be installed in the wetland. The plugs shall be planted in specific zones according to position along the moisture gradient as shown in Figure 15. As specified by DOE, the project biologist must be on site during the installation of plant materials to insure that every species is planted in the correct position along the moisture gradient. This vegetative planting plan is not concerned with where each plant will be installed on the ground because conditions in the field at the time of planting will dictate where the plants should be positioned relative to existing vegetation, rocks, and other physical features that cannot be anticipated behind the authors desk. However, it is critical that each species be planted at the correct position along the moisture gradient. For that reason, the planting plan consists of zones where particular species shall be planted. Woody vegetation shall also be planted in specific zones. The following list defines which species shall be planted in each zone depicted in Figure 15.

Figure 15 Wetland Zone



PROPOSED NORTH WETLAND .
AREA=9,885 S.F.

GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.

WCE

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**WETLAND MITIGATION
TRADITIONS AT SOUTH HILL
PROPOSED NORTH WETLAND
SPOKANE, WASHINGTON**

PROJ #: 10-747
DATE: 07/18/11
DRAWN: JCR
APPROVED: TRW

NUMBER
6 OF 7

Zone A	number of	Number of one gallon
Species	10 inch plugs	container stock
<i>Juncus balticus</i>	4	0
<i>Elocharis palustris</i>	8	0

Zone B	number of	Number of one gallon
Species	10 inch plugs	container stock
<i>Carex nebraskensis</i>	5	
<i>Carex rostrata</i>	5	
<i>Juncus balticus</i>	5	
<i>Elocharis palustris</i>	5	
<i>Cornus stolonifera</i>		15

Zone C	number of	Number of one gallon
Species	10 inch plugs	container stock
<i>Carex nebraskensis</i>	4	
<i>Carex rostrata</i>	4	
<i>Juncus balticus</i>	4	
<i>Elocharis palustris</i>	4	
<i>Cornus stolonifera</i>		15
<i>Ribes aureum</i>		17
<i>Alnus temifolia</i>		10
<i>Crataegus douglasii</i>		5

Zone D	number of	Number of one gallon
Species	10 inch plugs	container stock
<i>Carex nebraskensis</i>	4	
<i>Carex rostrata</i>	4	
<i>Juncus balticus</i>	4	
<i>Cornus stolonifera</i>		15
<i>Ribes aureum</i>		17
<i>Salix ssp.</i>		30
<i>Alnus temifolia</i>		10
<i>Crataegus douglasii</i>		5

Total Number of Ten inch Plugs for the North Mitigation Area

<i>Carex nebraskensis</i>	12
<i>Carex rostrata</i>	12
<i>Juncus balticus</i>	16
<i>Elocharis palustris</i>	20
Total	60

5.6 Detailed Planting Plan for the South Mitigation Site

Grasses:		Bunch	
Common Name	Scientific Name	or Sod	PLS (lb/acre)
Nebraska sedge	<i>Carex nebraskensis</i>	S	2
beaked sedge	<i>Carex rostrata</i>	S	2
Torry rush	<i>Juncus torreyi</i>	S	1
Baltic rush	<i>Juncus balticus</i>	S	0.2
western mannagrass	<i>Glyceria occidentalis</i>	B	7
fowl mannagrass	<i>Glyceria striata</i>	S	7
spike rush	<i>Elocharis palustris</i>	S	4
Total			23.2

Woody vegetation will be planted inside the edge of the created wetland. **One-gallon container stock** shall be planted in the quantities specified below.

Shrubs	Common Name	Scientific Name	# Planted
	Red osier dogwood	<i>Cornus stolonifera</i>	40
	golden current	<i>Ribes aureum</i>	40
	indigenous willow sp.	<i>Salix ssp.</i>	30
Trees	alder	<i>Alnus tenuifolia</i>	10
	hawthorn	<i>Crataegus douglasii</i>	10
Total			130

Ten inch Plugs for South Mitigation Area

In addition to the seed mix that will be applied in all wetland locations, 60 ten inch plugs shall also be installed in the wetland. The plugs and woody vegetation shall be planted in specific zones according to position along the moisture gradient as shown in Figure 16.

Zone D	number of	Number of one gallon
Species	10 inch plugs	container stock
<i>Carex nebraskensis</i>	25	
<i>Carex rostrata</i>	25	
<i>Juncus balticus</i>	10	
<i>Cornus stolonifera</i>		30
<i>Ribes aureum</i>		10
<i>Salix ssp.</i>		15
<i>Alnus tenuifolia</i>		5
<i>Crataegus douglasii</i>		5

Zone E	number of	Number of one gallon
Species	10 inch plugs	container stock
<i>Cornus stolonifera</i>		10
<i>Ribes aureum</i>		30
<i>Salix ssp.</i>		15
<i>Alnus tenuifolia</i>		5
<i>Crataegus douglasii</i>		5

Figure 14 Planning 001

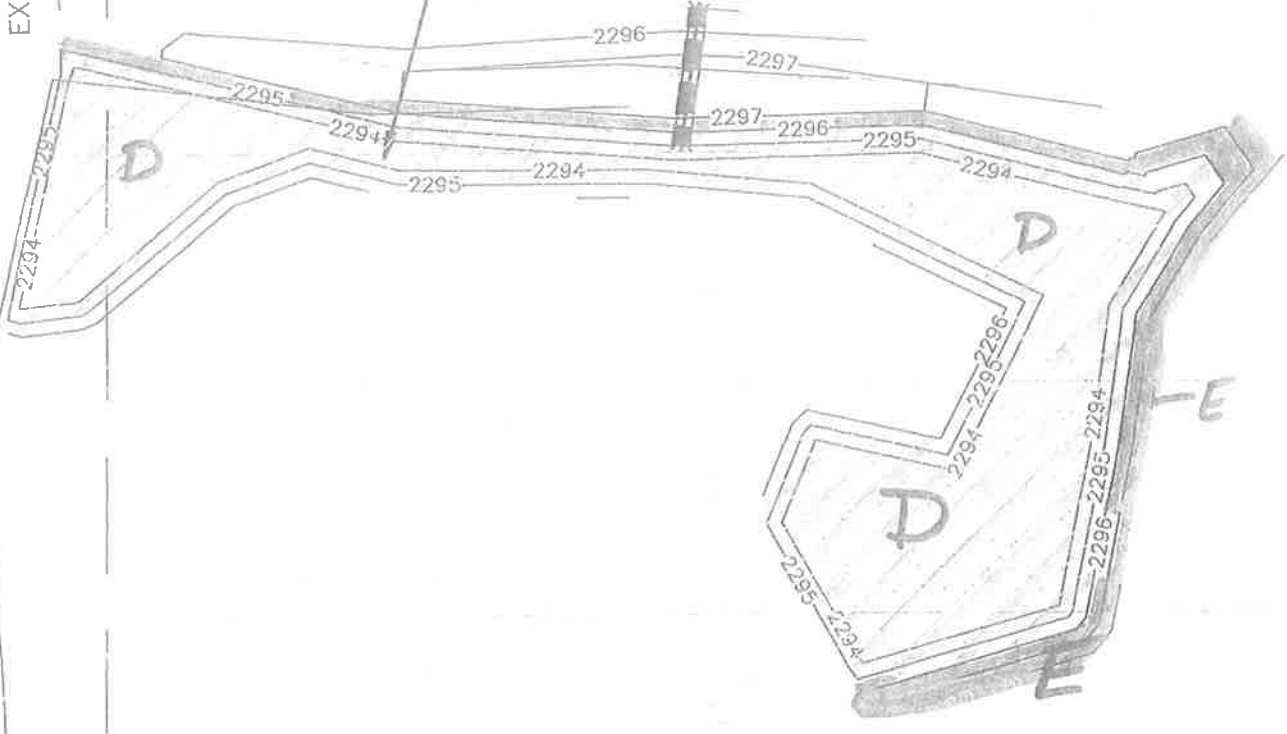
HAVANA ST.

30TH AVE.

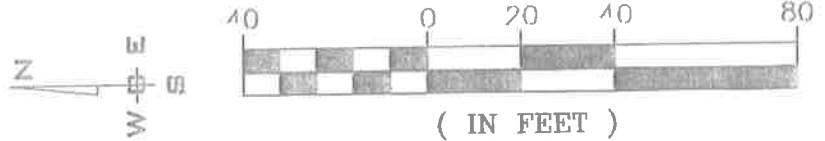
EXISTING GRAVEL ROAD

PROPOSED SOUTH WETLAND
AREA=8,683 S.F.

(2)18" CMP STORM
CULVERTS.
IE(W)=2295.13
IE(E)=2295.00
S=0.0044 FT/FT



GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.



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PROJ #: 10-747
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DRAWN: JDR
APPROVED: TSW

NUMBER
7 OF 7

Total Number of Ten inch Plugs for the South Mitigation Area

<i>Carex nebraskensis</i>	25
<i>Carex rostrata</i>	25
<i>Juncus balticus</i>	10
Total	60

6.0: Components of the Buffer Mitigation Plan

6.1 Baseline Information

Havana and 30th Avenue were built on fill material placed in the wetland where mitigation is proposed. These roads will never be improved for vehicle traffic, but must be preserved to provide emergency maintenance to the sewer lines under those roads. Fill material was placed in the wetland on the north side of 30th to create seven lots where houses could be constructed. Two house were built on the south side of 30th on fill material at the very wetland edge. All of these impacts occurred to the same wetland. There is great potential to mitigate wetland impacts on site, but there is little opportunity for buffer mitigation on the site. The buffer at the Traditions South site had low functions and values due to the low species diversity and the extent of historical disturbance. However, there was an 80 foot buffer around the wetland. Some functional mitigation must compensate for that lost function.

The wetland buffer at the south mitigation site is pristine on the east, south and west sides and would not benefit from enhancement. The north side of that wetland is defined by 30th Avenue so there is little potential for buffer mitigation at the south mitigation site. However, some vegetative plantings will be interspersed among existing trees and shrubs at the discretion of the project biologist during planting.

The wetland buffer at the north mitigation site consists of private property along its north edge. The wetland extends east onto private property so no buffer enhancement can occur in that direction. The south edge of the wetland is defined by 30th Avenue so there is no mitigation potential there. At the west end of the City property the wetland abuts private property again. However on the west end of the proposed wetland creation area at the north mitigation site there is potential for some high quality vegetative plantings so buffer mitigation will be concentrated there.

The goal of the proposed mitigation plan is to undo historical damage inflicted on the wetlands. The removal of fill material and remnants of old homesteads goes a long way to reversing historical impacts. The proposed vegetative plantings will enhance the existing wetland. Since the mitigation site does not offer much potential for buffer creation or restoration, additional wetland creation is proposed to offset the lost buffer function at the impact site. Mitigation at a 2:1 replacement ratio requires that a minimum 14,890 sq. ft. wetland to be created. BSW proposes the creation and planting of an additional 2000 sq. ft. of wetland to compensate for the lost buffer function. A minimum area of 16,890 sq. ft. of wetland will be created to compensate for the combined wetland and buffer impact. An additional 1,678 sq. ft. is being created as insurance that the total required wetland area is achieved. BSW concludes that vegetative plantings prescribed for the created wetland will duplicate and surpass the wetland and buffer functions and values lost at the wetland impact area. An additional 140 one-gallon containers of upland woody plants shall be planted as necessary to vegetate newly graded buffer areas and, at

the discretion of the project biologist, to fill in gaps in the existing vegetative canopy and in the zones specified in Figure 17.

6.2 Buffer Functions

The Buffer Planting Plan will incorporate as many design features as possible for each function in order to increase the value for that function. Native trees, shrubs and grasses will be planted in the buffer around the wetland edge to stabilize slopes, prevent erosion, and provide food and cover for wildlife. The vegetation will be planted in patches, have curving edges, and will not be planted in a uniform manner. The native tree and shrub species will increase structural and species diversity, increase bird and small mammal habitat values, and increase water quality functions in the buffer. Although the area with potential for buffer enhancement is small, the existing buffer will benefit from the proposed enhancement.

6.3 Planting Rationale

Structural complexity refers to the arrangement and degree of interspersions of plant community types throughout the system. Complex structural patterns (such as variable patch size, curving edges, and high degree of interspersions between species) increase the value of a system for wildlife. Good wildlife habitat consists of open areas interspersed with clusters of vegetation, several horizontal layers, and a variable structural pattern.

Vertical stratification describes a community with good structural diversity and several horizontal layers (logs, woody debris, forbs, shrubs, and trees). Woody debris provides travel routes, perch sites, cover, and thermal refuge for a variety of small mammals and ground nesting birds.

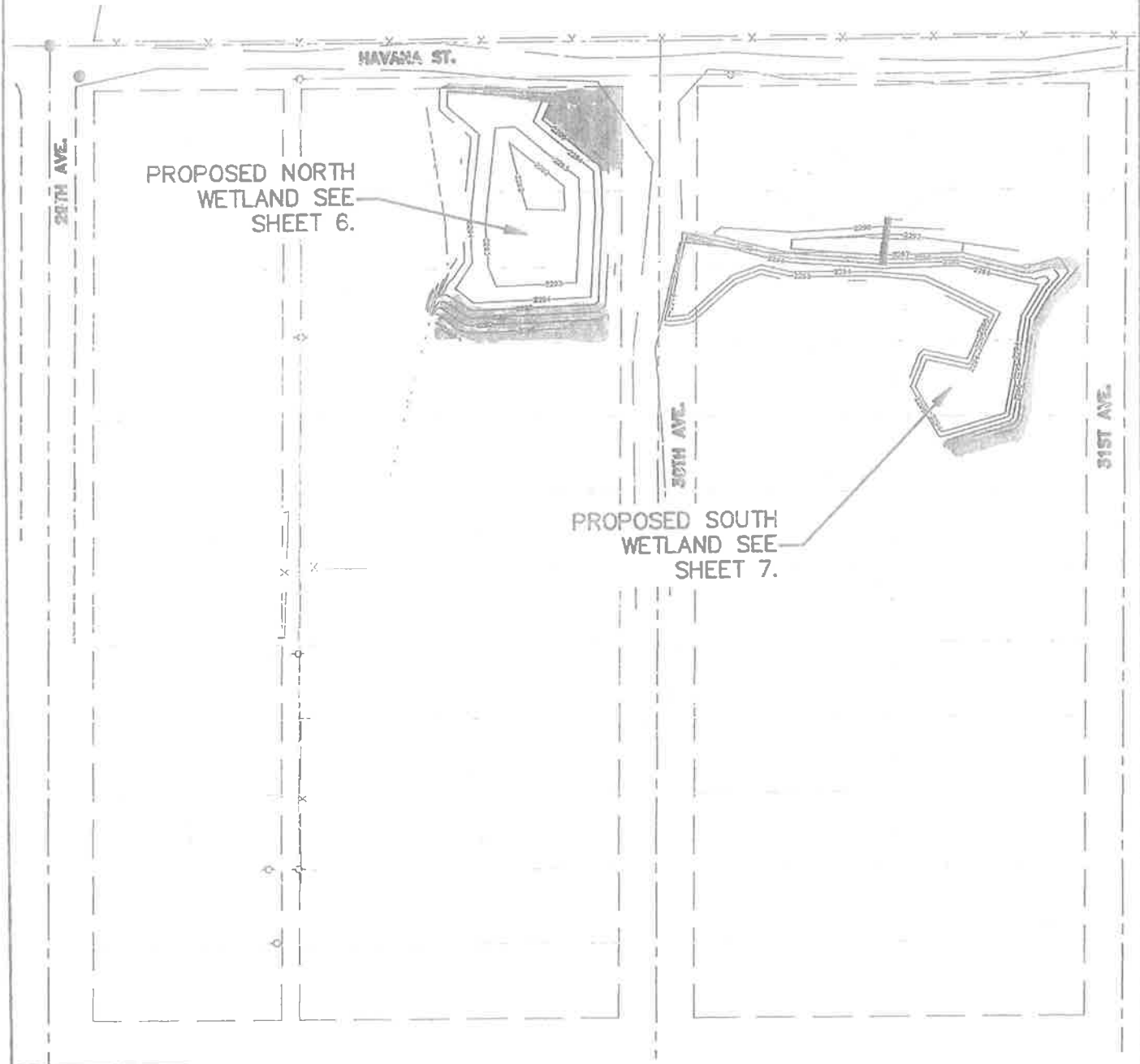
Microhabitat diversity refers to variety in microhabitat types. Examples of microhabitat types include herbaceous cover and shrubs that provide food, habitat, and substrate for a variety of plants and animals.

6.4 Vegetation Plan for the Created Wetland Buffer

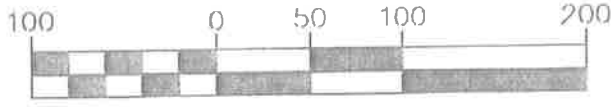
Vegetation from the following list will be planted in the buffer according to the prescribed guidelines. **One-gallon container stock** shall be planted in the quantities specified below.

	<u>Common Name</u>	<u>Scientific Name</u>	<u># Planted</u>
Trees	quaking aspen	<i>Populus tremuloides</i>	30
Shrubs	serviceberry	<i>Amelanchier alnifolia</i>	10
	mock orange	<i>Philadelphus lewisii</i>	20
	chokecherry	<i>Prunus virginiana</i>	20
	Wood's rose	<i>Rosa woodsii</i>	30
	common snowberry	<i>Symphoricarpos albus</i>	30
	total		140

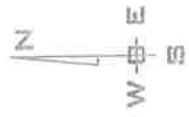
Figure 17: Wetland Footprint at Hillside



GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.



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