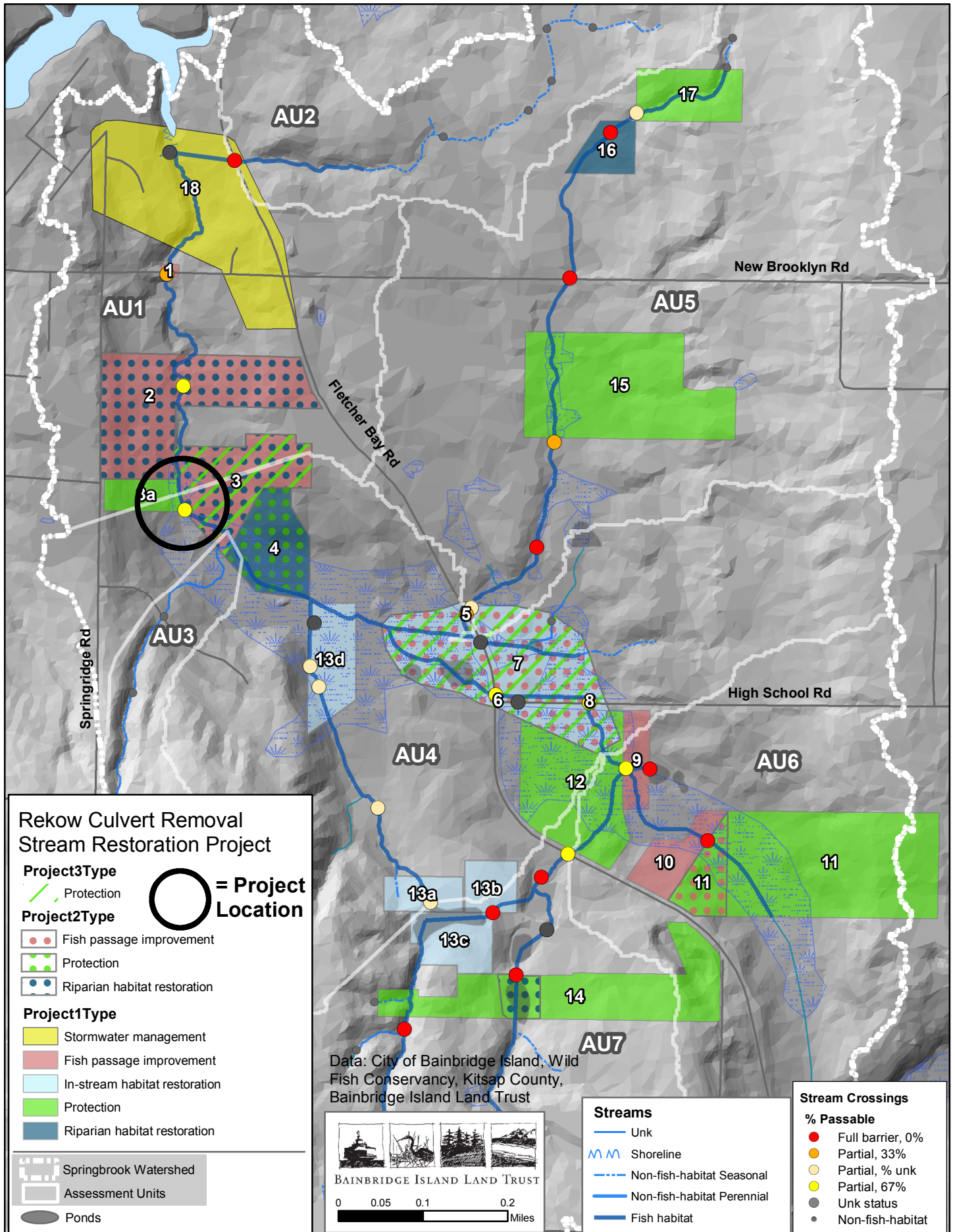


Appendix III Project 3

Rekow Stream and Riparian Restoration

Conceptual Design



Rekow Stream and Riparian Restoration

Site Description

At river mile 0.33 Springbrook Creek crosses under a derelict field access road on the western edge of an 8.48 acre parcel belonging to Kenneth Rekow. At this crossing the top of a culvert is now fully exposed yet it still passes 100% of stream flow. The culvert is a 2 ft. round concrete pipe 9 ft. in length. There is a 3 ft. square concrete box at the culvert inlet which has become disconnected from the pipe. The combined length of the inlet box, the three inch gap, and the culvert is 13.3 ft. The combined slope of the culvert and the inlet box is 1.38% making it 67% passable. Washington Department of Fish and Wildlife has assigned a priority index of 21.82 to this culvert. A small type F stream feeds into the left bank of Springbrook Creek at the culvert outlet. Above the culvert crossing Springbrook Creek meanders down an unconfined valley bottom through adjacent forested wetlands with a bankfull of 6.8 ft. Below the culvert crossing the valley becomes more confined. The left bank of the downstream valley below the culvert is forested with a mixed stand of conifers and deciduous trees. The right bank valley below the culvert is primarily a grassy field with scattered pockets of skunk cabbage and other wetland vegetation, trees and a thin strip of shrubs growing along the creek. Some reed canary grass and other invasive plants are mixed in with native vegetation. Some native vegetation has been mowed or reduced on the right bank (perhaps by past livestock use).

Specific Goals

The primary objective of this project is to restore stream processes by removing the derelict culvert from the stream channel. The secondary objective is to improve the riparian habitat along the right bank of the stream by removing invasive plants and planting native tree and shrub species.

Limiting Factors Addressed: This project lies within Reach SB01-1 in the middle section of Springbrook Creek. Restoring channel complexity and fish passage and providing for stream complexity are addressed through the implementation of this project.

Design Development: Stream assessment and on site topographical surveys were conducted by Wild Fish Conservancy with permission of the landowner. Site visit with the landowners and review of stream history and land use took place with Bainbridge Island Land Trust. Conceptual plans were reviewed by the landowner. Adjustments to the proposed concepts were made after landowner input received.

Option 1

Option 1 is to remove the derelict culvert as it no longer serves as a functional crossing structure. We recommend removal take place during the summer dry season, after fish

have been excluded from the vicinity using block nets and electrofishing. If necessary, flows should be routed around the site so work can be performed in the dry. We recommend breaking the culvert into manageable pieces using hand tools avoiding the need for heavy equipment. The refuse will be removed from the site utilizing the adjacent field access road. Using hand shovels the stream banks will be pulled back to match the natural stream bankfull. The raw banks will be revegetated in early winter during the plant dormant season. We recommend invasive plants be removed within 200 feet of the stream and extending the planting area to encompass a 100 ft. buffer of Springbrook Creek on the entirety of the Rekow Property. This would result in a planting area of approximately .60 acres at the culvert site and below the culvert on the right bank valley. We also recommend removing a derelict pump and other metal debris by hand within the project reach.

Pros

Removing this culvert benefits fish migration and restores stream migration, and natural wood and sediment transport processes at a very low cost. The riparian planting will benefit the stream by increasing shade, providing a future source of large woody debris, and protecting the channel from future erosion. Native vegetation will help shade out and compete with invasive plants. The project location within the watershed attends to a number of limiting factors within this assessment unit. The landowner is supportive of the restoration efforts and is willing to adopt land use practices in support of the health of the stream and to consider protection options in the future.

Cons

This culvert is 67% passable and not as high of a fish passage priority as other man-made barriers in the Springbrook Creek basin. Maintaining planted vegetation and managing invasives long-term will take ongoing resources.

Selected Option

The project team and the landowner preferred the conceptual channel modifications described in Option 1. This relatively inexpensive restoration project will remove derelict culverts and debris from the stream and riparian area, and will substantially revegetate the affected project reach, while addressing a number of limiting factors within this stream reach.

1.



Photo 1: Culvert Outlet.

Photo 2: Culvert inlet – box is disconnected from concrete culvert pipe.

Photo 3: Riparian Stream condition below culvert

Photo 4: Reed canary grass on right bank of stream below culvert

2.

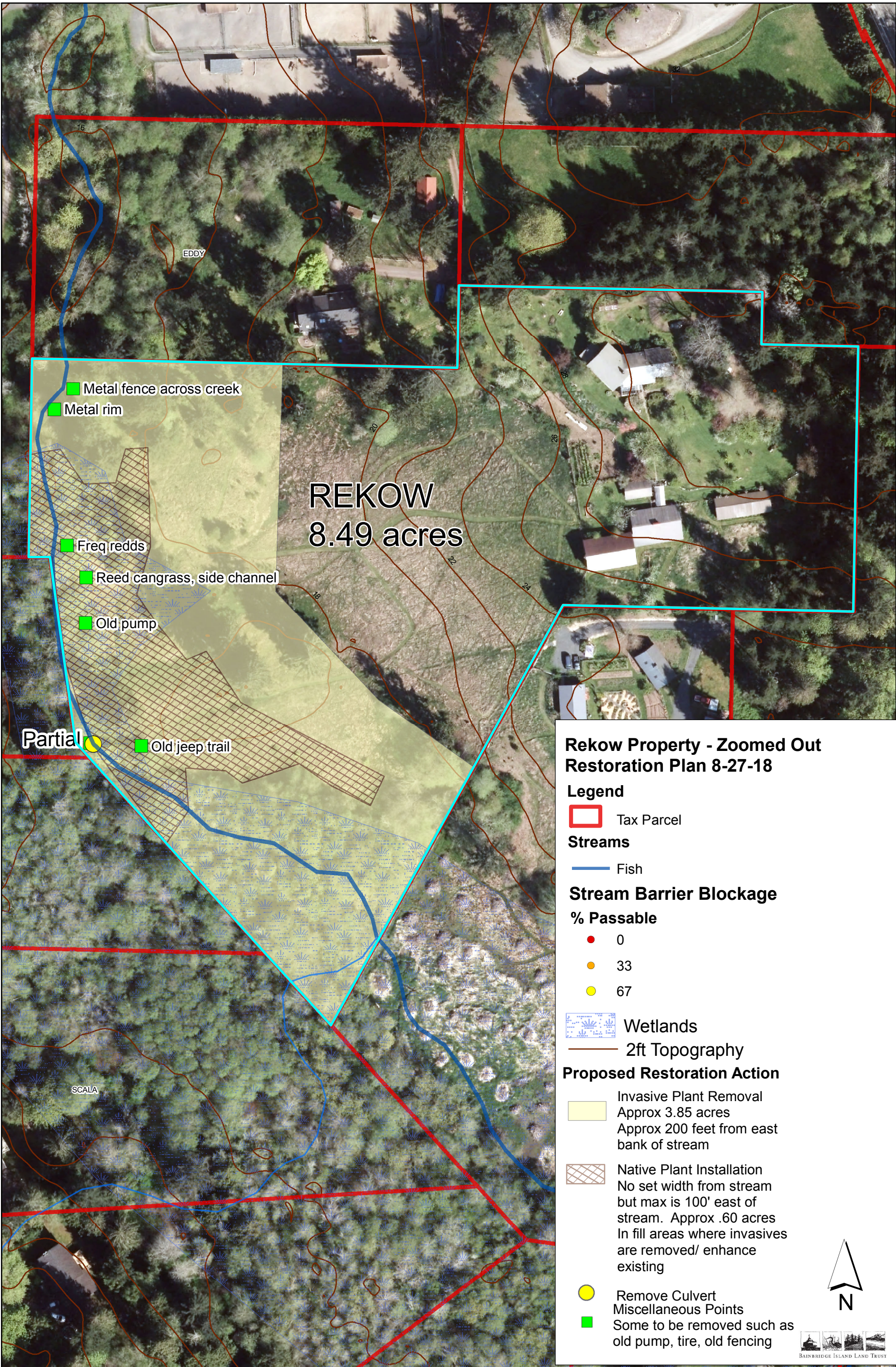


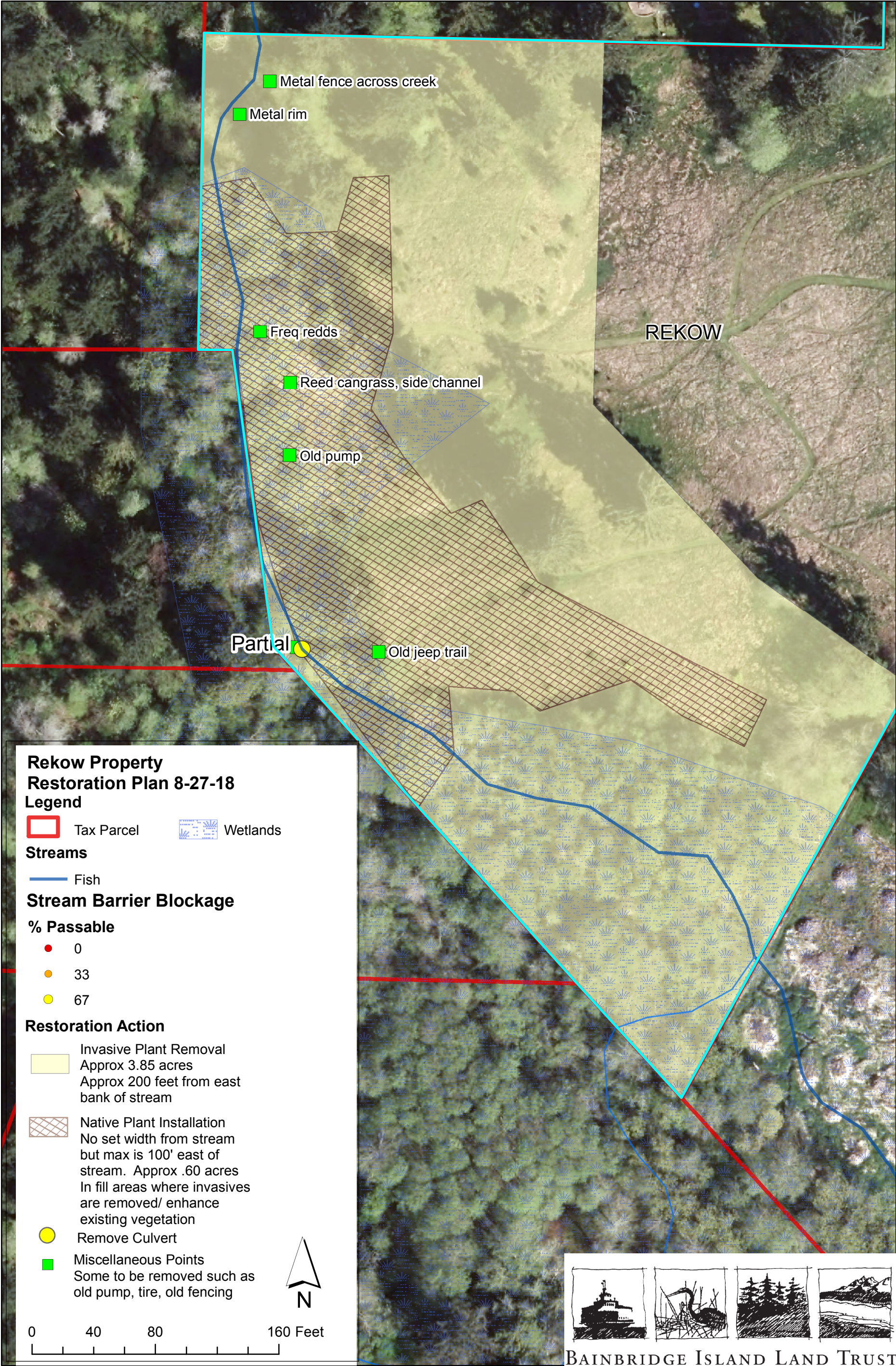
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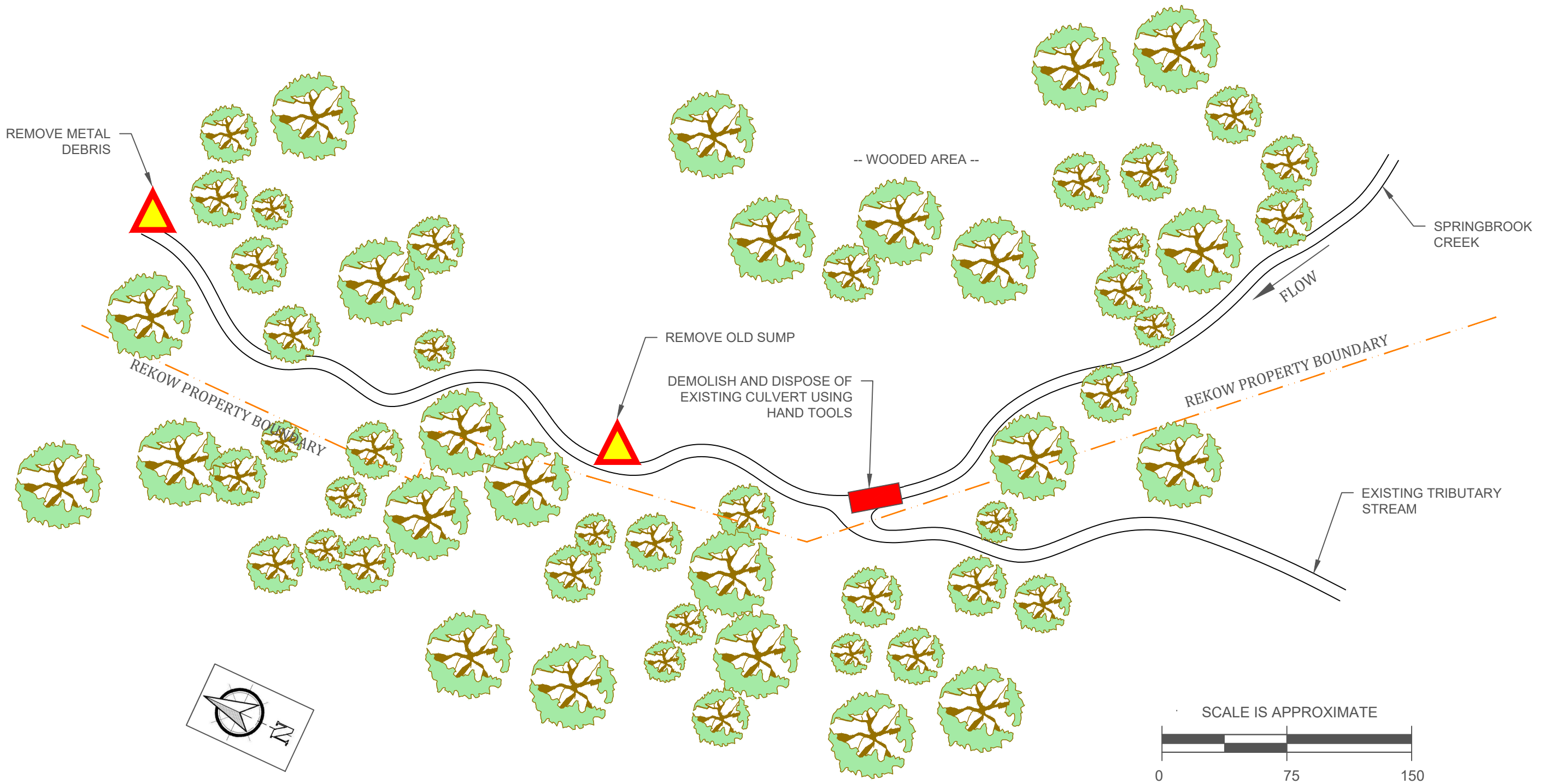
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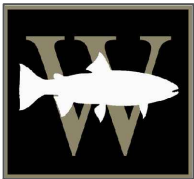




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Mod: 08/27/2018, 10:49 | Plotted: 08/27/2018, 10:53 | Layout: 4



DATE: 08-27-2018
DRAWN BY: S. KROPP
DESIGNED BY: A. JORGENSEN
CHECKED BY:
JOB NO. :



**Wild Fish
Conservancy**

15629 Main Street NE
Duvall, WA 98019
Phone: 425-788-1167

EXISTING CONDITIONS

REKOW CULVERT REPLACEMENT

BAINBRIDGE ISLAND, WA

REVISIONS

DATE

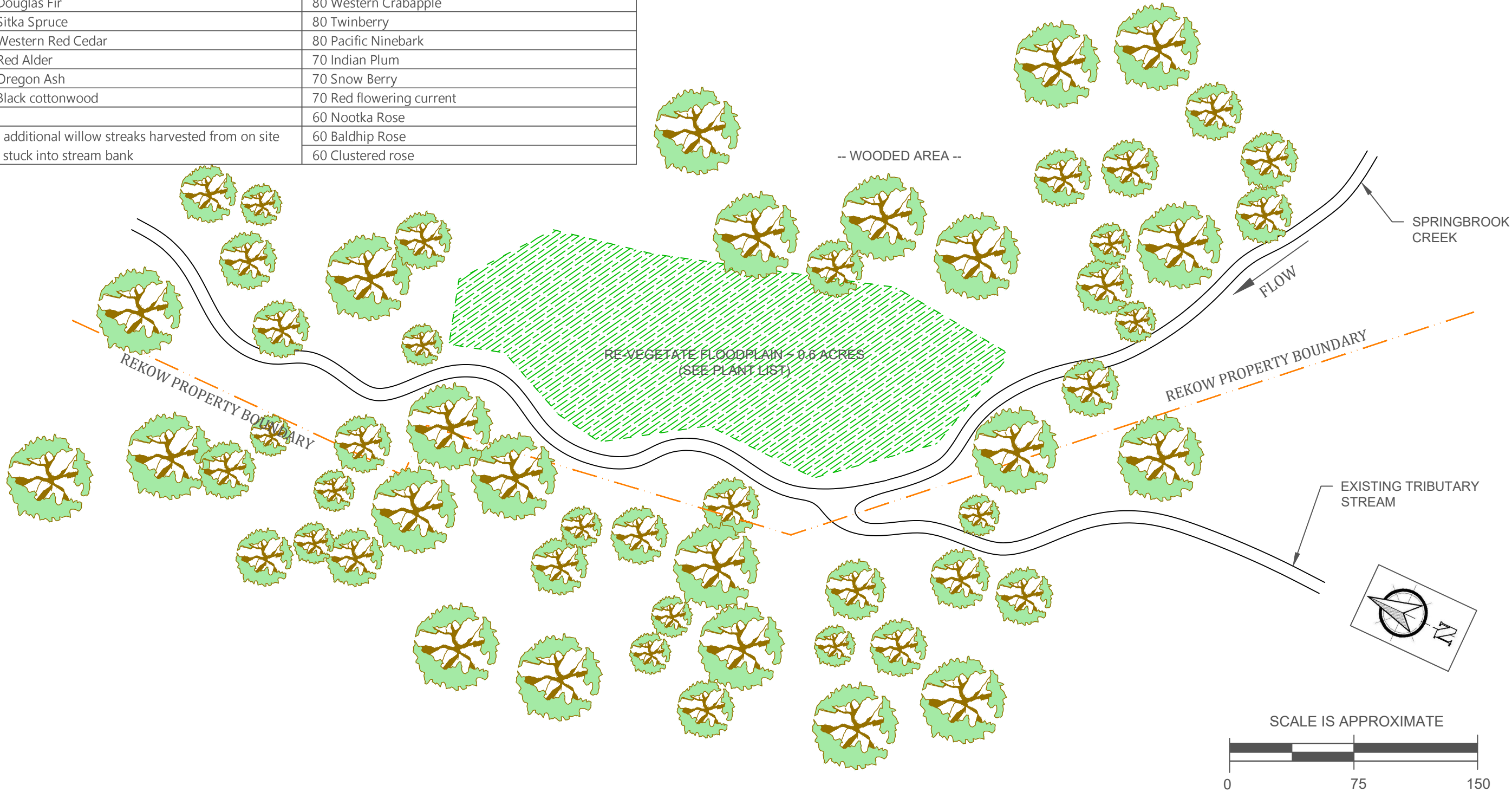
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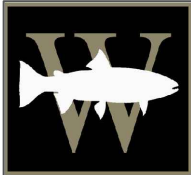
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Mod: 08/27/2018, 10:49 | Plotted: 08/27/2018, 10:53 | Layout: 4

PLANT LIST	
Potted Trees _ 15 ft. on center	Shrubs_ 6 ft. on center_ all one gallon pots
20 Douglas Fir	80 Western Crabapple
20 Sitka Spruce	80 Twinberry
20 Western Red Cedar	80 Pacific Ninebark
30 Red Alder	70 Indian Plum
15 Oregon Ash	70 Snow Berry
15 Black cottonwood	70 Red flowering current
	60 Nootka Rose
300 additional willow streaks harvested from on site and stuck into stream bank	60 Baldhip Rose
	60 Clustered rose



DATE: 08-27-2018	 <div>Wild Fish Conservancy 15629 Main Street NE Duvall, WA 98019 Phone: 425-788-1167</div>	SITE PLAN			REVISIONS	DATE	SHEET NO. 2 SHEET ____ of __XX__
DRAWN BY: S. KROPP		REKOW CULVERT REPLACEMENT					
DESIGNED BY: A. JORGENSON							
CHECKED BY:							
JOB NO. :		BAINBRIDGE ISLAND, WA					

**Wild Fish Conservancy
Cost Estimate Template**

Revised 8/27/2018

Project Name: **Rekow**
Date: 08/27/18
Estimate By: SK. AS. JG
Stream: Springbrook Creek
Proposed Correction: Remove culvert and debris. Riparian planting
Restore stream channel and add LWD.

Description	Unit	Quantity	Cost	Amount	Sub Total
Mobilization / Site Preparation					
Mobilize	L.S.	1	\$0	\$0	
Bypass	L.S.	1	\$0.00	\$0	
Access	L.S.	1	\$0.00	\$0	
Erosion Control	L.S.	1	\$150.00	\$150	
Utilities	L.S.	0	\$0.00	\$0	
MOBILIZATION SUB TOTAL					\$150
Excavation					
Rmv. & Disp. Culvert	L.S.	1	\$1,000.00	\$1,000	Remove and dispose of culvert
Rmv. & Disp. Debris	L.S.	1	\$375.00	\$375	
EXCAVATION SUBTOTAL					\$1,375
Stream Channel and Bioengineering					
Revegetation	Acres	0.6	\$17,000.00	\$10,200	Costs of invasive control, native plants, and installation included.
STREAM CHANNEL AND BIOENGINEERING SUBTOTAL					\$10,200
CONSTRUCTION TOTAL					\$11,725
Sales Tax	9.60%			\$1,126	
Engineering	10%			\$1,172.50	Includes final designs and construction oversight.
Fish Exclusion				\$350	
Project management				\$1,500	
Indirect costs	25%			\$2,931.25	
Permitting	5%			\$586	
Contingency (construction)	5%			\$586.25	
PROJECT TOTAL					\$19,977