

# Baker River Alluvial Fan Enhancement

## BACKGROUND

The Baker River Alluvial Fan area at the confluence with the larger Skagit River is located partly within the Town of Concrete and partly in unincorporated Skagit County. For more than a decade, various stakeholders including user groups, landowners, local governments, and other interested parties have been considering habitat and recreational improvement opportunities along the lower Baker River and its associated alluvial fan.

Given the ecological significance of the confluence area of the Baker and Skagit Rivers and the existing level of shoreline, in-stream, and riparian function impairment, the lower portion of the Baker River channel downstream of SR-20 was identified by the Town of Concrete's Shoreline Master Program update as the area within its jurisdiction that would most benefit from restoration activities.

## EXISTING CONDITIONS

The lowermost portion of the Baker River channel has undergone significant straightening and is now maintained in a channelized condition. The length of the lower river channel has likely been reduced due to the straightening of the original channel. The profile has also likely been lowered to accommodate fish capture and passage around the Baker River dams and tribal drift net fisheries. The channel is generally void of in-stream wood, and native streambank and riparian vegetation is sparse.

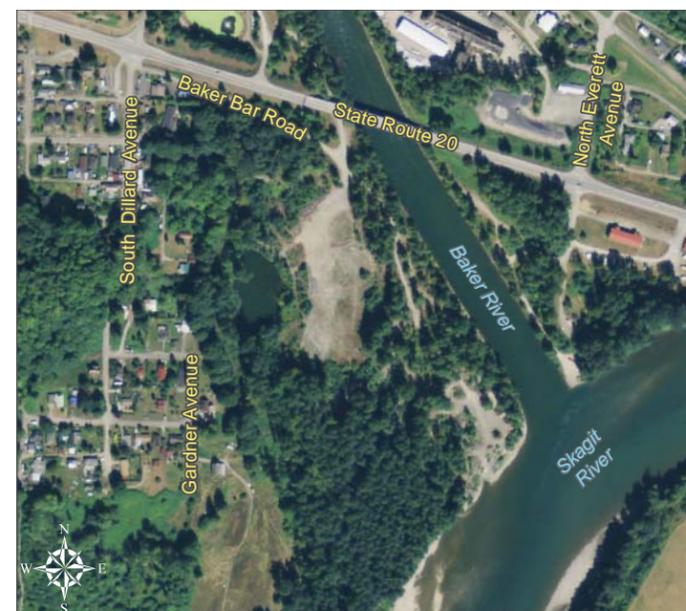
Public access along both banks of the Baker River below the SR-20 Bridge is provided via gravel access roads which contribute to the impairment of ecological functions along the lower river. Both banks are also heavily armored with rock. The confluence area is undeniably significant as a restoration site, and has been used for shoreline access and recreation for many years.

## PROJECT GOALS

Restore riverine, shoreline, and riparian functions to provide fish and wildlife habitat while at the same time providing shoreline access and low-impact recreational opportunities.

## RESTORATION STRATEGY

1. Increase off-channel rearing habitat by excavating a channel connecting the mainstem Skagit with an off-channel pond.
2. Improve instream complexity by adding large woody debris.
3. Substitute pervious pedestrian trails for impervious vehicular access road and parking areas where feasible in areas adjacent to the Baker and Skagit Rivers.
4. Remove invasive plant species and replace them with native trees and shrubs to provide riparian functions over the long term.
5. Provide for monitoring and maintenance of restoration actions to assure success over the long term including provisions for replacement plantings as needed.
6. Improve shoreline and river access and other recreational opportunities by identifying and developing an appropriately sited boat launch, as well as picnic, camping, and other recreational facilities. Enter into intergovernmental, interagency, and/or landowner agreements to provide for shoreline and river access and other recreational facility improvements, as well as for maintenance of these facilities over time.



Existing conditions figure. (Data Credit: Skagit County; Imagery Credit: USDA FSA NAIP)

## CONCEPT ELEMENTS

1. Replace the existing shoreline stairway
2. Reduce imperviousness of vehicular and pedestrian access along river banks
3. Replace invasive plant species with native trees and shrubs.
4. Improve the existing WDFW boat launch site
5. Improve sinuosity of lower Baker River, establish floodplain benches and meanders.
6. Substitute pervious, natural-surface pedestrian shoreline access trails for impervious road surfaces.
7. Provide channels to link habitats of the historic Little Baker River channel and alluvial fan as a backwater channel.
8. Provide low-impact recreational improvements such as campgrounds outside the floodway.
9. Place boulders, log structures, and/or engineered log jams to increase low-flow complexity and improve salmonid fish habitat for juvenile rearing and adult holding life stages.



Project vicinity (inset) and site plan showing the proposed project elements. (Imagery Credit: USDA FSA NAIP, ESRI, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster, NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community)



## Baker River Alluvial Fan Enhancement

*Three-dimensional depiction of the proposed restoration project after implementation*

Rendering by The Watershed Company, June 2013.

Image Credit: Google Earth, USDA Farm Service Agency  
Imagery Date: Not specified

# Barney Lake / Logan Creek Restoration

## BACKGROUND

Skagit Land Trust (SLT), in partnership with Ducks Unlimited (DU) and other conservation partners, has acquired 255 acres of the core wetland area of Barney Lake and key floodplain habitats near the confluence of Nookachamps Creek and the Skagit River, east of Mt. Vernon. The site includes the confluence of Nookachamps and Logan Creeks.

## EXISTING CONDITIONS

While much of the property is in good ecological health, Logan Creek currently flows through a straightened, channelized ditch dating from the early 1900s. The length of the creek on-site has been substantially reduced due to the straitening of the original meandering stream alignment, and the channel profile was also lowered to provide drainage for agricultural uses. The Creek is void of in-stream wood and native streambank and riparian vegetation.

Barney Lake is a large wetland and river oxbow complex consisting of forested, scrub-shrub, and emergent wetlands. It is one of the largest freshwater wetlands remaining in Skagit County. It provides important habitat for a variety of avian wildlife as well as native amphibians and salmonids. It is well-used by passerines (songbirds) and is home to three bald eagle nests and a great blue heron rookery. Thousands of waterfowl, including dabbling ducks and Trumpeter swans, can be found there in winter. Areas to the south and east of the lake have been cleared of scrub-shrub and forested plant communities for use as pasture.

## PROJECT GOALS

1. Restore Logan Creek on-site to a naturalized, low gradient stream/wetland complex within a native riparian forest.
2. Restore the scrub-shrub and forested vegetation components which formerly existed around and upslope from Barney Lake.

## RESTORATION STRATEGY

**Stream alignment restoration (Logan Creek):** The project will involve grading a new channel that mirrors the historic profile, section, and planform, also placing woody debris and planting a substantial number of native trees and shrubs. Restoring the stream channel and adjacent riparian corridor will restore (increase) riparian wetland hydrology, decrease instream temperature, improve water quality, and in the process provide valuable habitat for salmonid fish and a myriad of other wildlife species. The downstream section of the old, ditched channel will remain as a backwater, and the rest will be plugged at various locations to form a series of ponded wetland areas.

**Wetland Enhancement (Barney Lake):** The project is intended to restore scrub-shrub and forested vegetation components which are no longer present along the south and east sides of the lake by extensively planting locally native vegetation adapted to the current hydrologic regimes.

**Enhance Wildlife Habitat:** Wildlife species that currently use the site rely heavily on the existing pasture and managed grasslands. These include grazing waterfowl species like Trumpeter swans and American wigeon. The proposed enhancement project would enhance remnant areas of pasture to improve waterfowl habitat. This work may entail noxious weed control, disking, reseeding, and/or mowing to maintain desirable forage and weed control.



Existing conditions figure. (Data Credit: Skagit County; Imagery Credit: USDA FSA NAIP)

## CONCEPT ELEMENTS

- 1 Provide for a new meandering channel alignment away from the old channel.
- 2 Widen existing channel cross section to include a low-flow channel and readily-activated floodplain.
- 3 Fill short sections (only) of the existing channel to create backwater areas.
- 4 Unfilled areas of existing channel enhanced to create off-channel wetlands.
- 5 Install large woody debris including snags along the new channel.
- 6 Revegetate new channel with native trees, shrubs, and emergents.
- 7 Manage remnant pasture areas for the wildlife and grazing waterfowl species such as trumpeter swans and American wigeon.
- 8 Replant native vegetation around Barney Lake. (Labeled on next sheet)



Project vicinity (inset) and site plan showing the proposed project elements. (Imagery Credit: USDA FSA NAIP, ESRI, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster, NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community)

8 (from previous sheet)



## Barney Lake / Logan Creek Restoration

Three-dimensional depiction of the proposed restoration project after implementation

Rendering by The Watershed Company, June 2013.

Image Credit: Google Earth  
Imagery Date: 8/25/2011

# Samish Island Tidal Restoration

## BACKGROUND

A sea dike protecting private farmland south of Samish Island along Puget Sound is susceptible to erosion and potential failure. If breached, the flooding would impact several hundred acres of farmland and county roads. An alternative to reduce the likelihood of flood damages in this area is to raise Samish Island Road so it doesn't get overtopped if the dike breaks. If this were to occur, it would open up the opportunity to purchase private land, build a cross-dike, and re-create an estuary connected to both Samish Bay and Padilla Bay.

## EXISTING CONDITIONS

The dike along Puget Sound is not constructed to Army Corps of Engineers standards and not maintained regularly. The land between Samish Island Road and the dike is low, wet, and difficult to drain. Samish Island Road is just a few feet higher than surrounding grade, and would flood if the dike breached in a storm. The property is drained with ditches flowing to the west, and drain via culverts with tidegates. At low tide, the water drains out. At high tide, the gates close until the tide goes out again and positive gravity drainage can resume.

## PROJECT GOALS

The project would be expected to restore estuary conditions to approximately 115 acres in the project area. There would be intertidal channels connecting Samish Bay and Padilla Bay beneath the roadway. Eelgrass beds would likely form within the restored tidal areas, as would mudflats, vegetated saltmarsh, driftwood beaches, and riparian corridors. The project would benefit salmonids, primarily outmigrating smolts, as well as shorebirds, crab larvae, and waterfowl. The project would decrease the length of dike to maintain, and eliminate the threat of flooding Samish Island Road in this vicinity.

## RESTORATION STRATEGY

Project elements involve property acquisition and construction of a new cross dike between Puget Sound and Samish Island Road on the southern boundary of the project. Samish Island Road would be raised above the high tide and river flooding elevations. Culverts under Samish Island Road, or bridges, will be installed to connect intertidal channels between Samish Bay and Padilla Bay. New intertidal channels would be constructed in the acquired properties to facilitate flows in and out of the area during tidal cycles. The old dike would be breached in key locations for tidal connection, with sections remaining as islands of upland vegetation to provide habitat diversity. Native riparian species would be planted in the areas with appropriate elevation.



Existing conditions figure. (Data Credit: Skagit County; Imagery Credit: USDA FSA NAIP)

## CONCEPT ELEMENTS

- 1 Raise Samish Island Road and install culverts.
- 2 Acquire private properties
- 3 Construct cross-dike and breach old dike
- 4 New intertidal channels
- 5 Install large woody complexes
- 6 Plant native vegetation



Project vicinity (inset) and site plan showing the proposed project elements. (Imagery Credit: USDA FSA NAIP, ESRI, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster, NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community)



## Samish Island Tidal Restoration

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Image Credit: Google Earth  
Imagery Date: 8/25/2011

# South Fork Skagit River Side Channel and Riverine Wetland Restoration

## BACKGROUND

The Nature Conservancy holds low-lying, floodplain property along the South Fork Skagit River which includes existing open-water wetlands and a number of historic side channels which have been partially de-activated due to sediment blockages at their mouths. The Skagit Program office of The Conservancy is considering a salmon habitat enhancement project at the site which would largely restore these side channels and associated floodplain wetlands in form and function as fish and wildlife habitat, including as rearing habitat for listed juvenile Puget Sound Chinook salmon.

## EXISTING CONDITIONS

The property is situated along the inside of a bend in the South Fork Skagit River. It can be characterized as a historic or remnant point bar, however the river at and near the site is severely confined by levees. Most of the property is densely forested with mixed age stands including very mature cottonwood and a few cedars. The entire property falls within a depositional and low-energy river zone, and it appears that the channel configuration is very stable. The property is largely protected at its upstream end from channel migration by levee position which trains the river away from the property. There is evidence that the river is actively building point bars through ongoing deposition; however, it is constrained by levees on the opposite bank and not able to migrate away from these point bars.

Relatively clear water flows through a narrow outlet channel at the downstream end of the property and into the Skagit River at normal flows. This indicates that there is substantial groundwater flow into the lower elevations of the property where wetland enhancement is proposed.

## PROJECT GOALS

Restore or create a network of interconnected side channels and off-channel wetland habitat for beneficial

use by a variety of fish and wildlife habitat species, with emphasis on rearing habitat for juvenile Puget Sound Chinook salmon.

## RESTORATION STRATEGY

*Create off-channel rearing habitat:* Preliminary analyses (topographic and hydrologic) indicate a favorable environment for creation of substantial off-channel rearing habitat in the form of a constructed wetland/slough feature on the downstream half of the property. Construction could be accomplished with the simple excavation of open-water habitat within existing low elevation areas, with minor modifications to the existing outlet channel to provide fish passage to and from the Skagit River during all flows. However, if design analyses indicate benefits from regular or sustained flow through the project, the elevation of the river bank upstream lends well to installation of an inflow headgate with minimal or no necessary topographic reconstruction.

*Improve wetland connectivity:* Based on preliminary topographic information, connect existing wetlands into a single wetland/slough area in the southern half of the property along the eastern margin of the site. Depending on availability of groundwater sources, the proposed wetland/slough design will be self-sustainable with or without an inflow channel.



Existing conditions figure. (Data Credit: Skagit County; Imagery Credit: USDA FSA NAIP)

## CONCEPT ELEMENTS

- 1 Excavate partially-deactivated side channels near their mouths to reconnect them and associated floodplain areas to the river.
- 2 Reconnect and enhance floodplain wetlands.
- 3 Lower and otherwise reconstruct and enhance the existing wetland outlet channel to provide juvenile fish passage over the range of river stages and flows.
- 4 Install an engineered log jam to provide habitat and a scour pool to help keep the side channel open.



Project vicinity (inset) and site plan showing the proposed project elements. (Imagery Credit: USDA FSA NAIP, ESRI, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster, NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community)



## South Fork Skagit River Side Channel and Riverine Wetland Restoration

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Image Credit: Google Earth  
Imagery Date: 8/25/2011