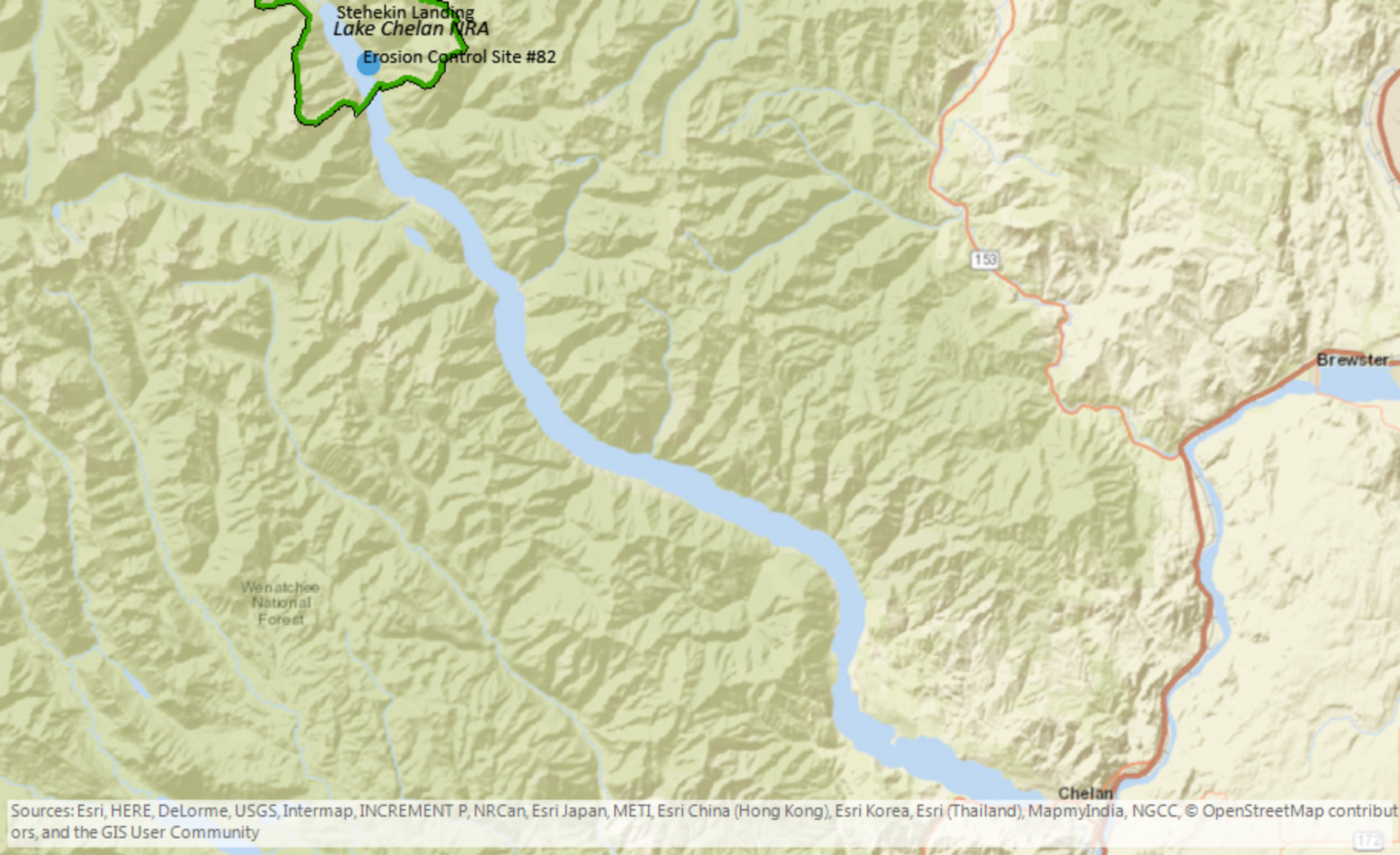




Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



Stehekin Landing
Lake Chelan NRA

Erosion Control Site #82

Wenatchee
National
Forest

153

Brewster

Chelan

ATTACHMENTS

Proposed Project: Lake Chelan FERC Erosion Control site #82

Project Location: Stehekin, Chelan County, WA

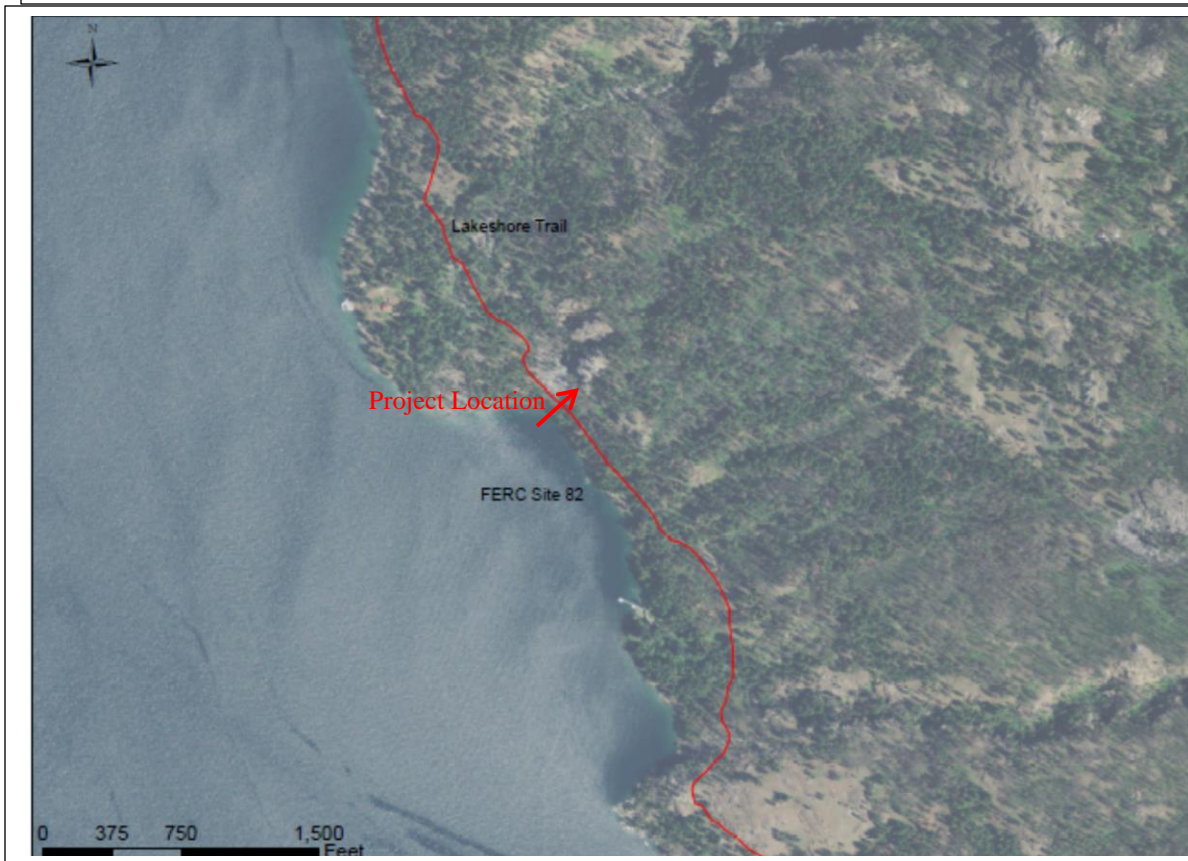
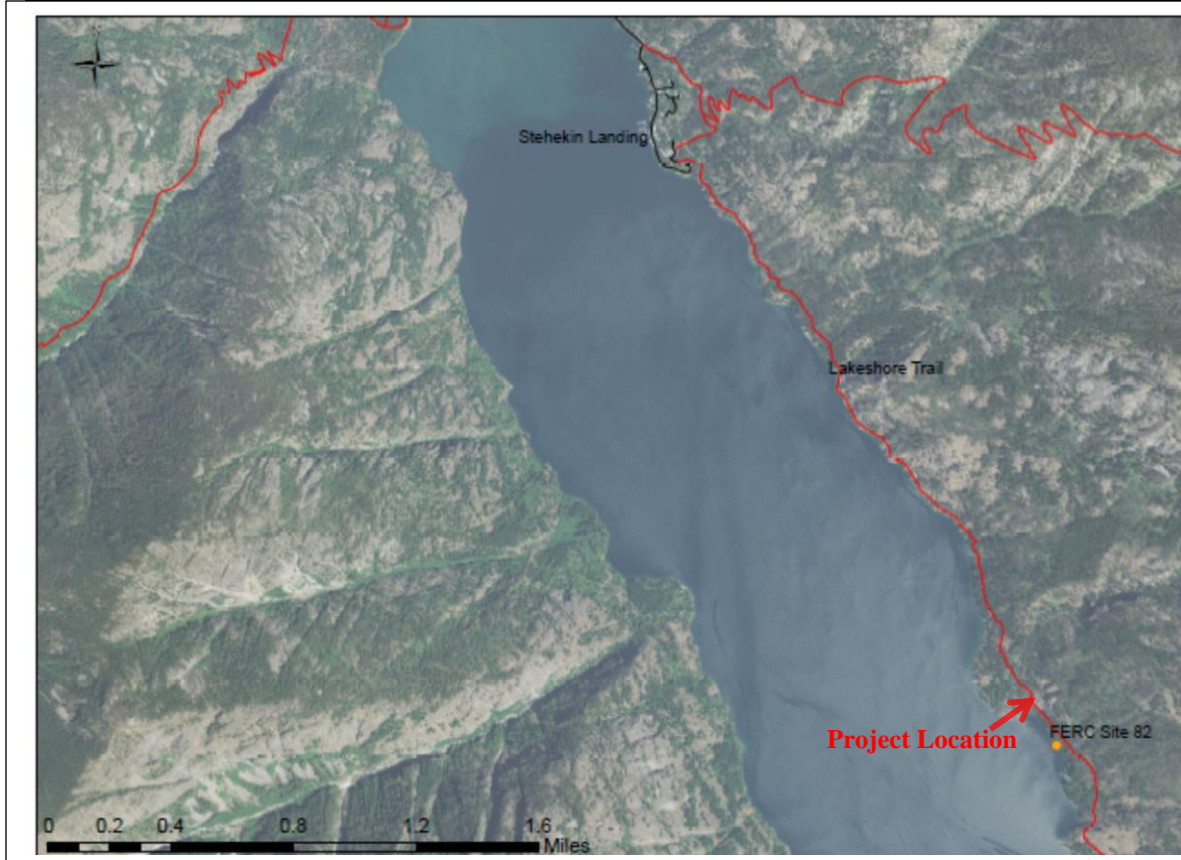
Adjacent Property Owners: None

Page 1 of 8

Lat/Long: 48.27914N / 120.62991W (WGS84)

Applicant: Vicki Gempko – NPS

Vicinity Map



Site Photo



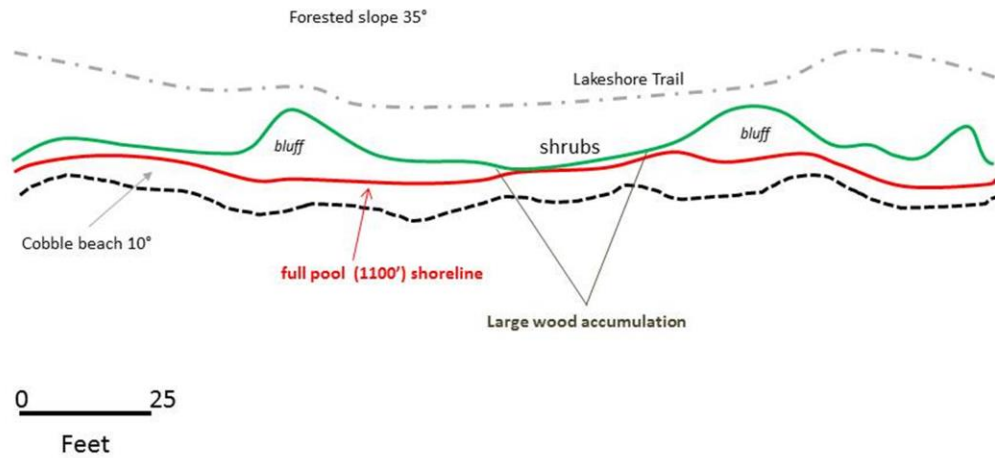
Photo 1. Site 82 during March 2016. Lake Chelan is drawn down about 12 ft, exposing the cobble beach. Note proximity of trail to eroding bank. Proposed solution to protect trail shown.

Photo 1. Site 82 during March 2016. Lake Chelan is drawn down about 12 ft exposing the cobble beach. Note proximity of trail to eroding bank. Proposed solution to protect trail shown.

Plan View (Existing and Proposed)

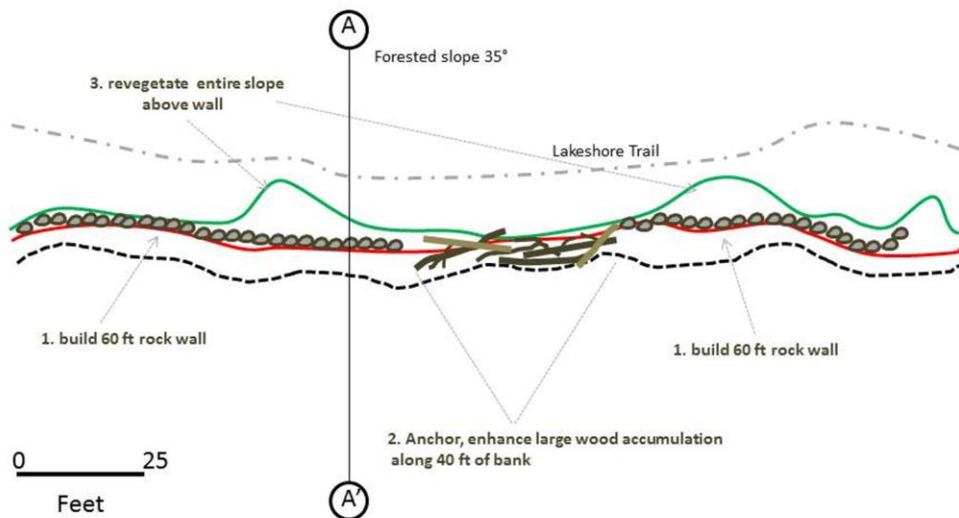
Existing

Lake Chelan Erosion Control Site 82 – Existing Plan (map) View

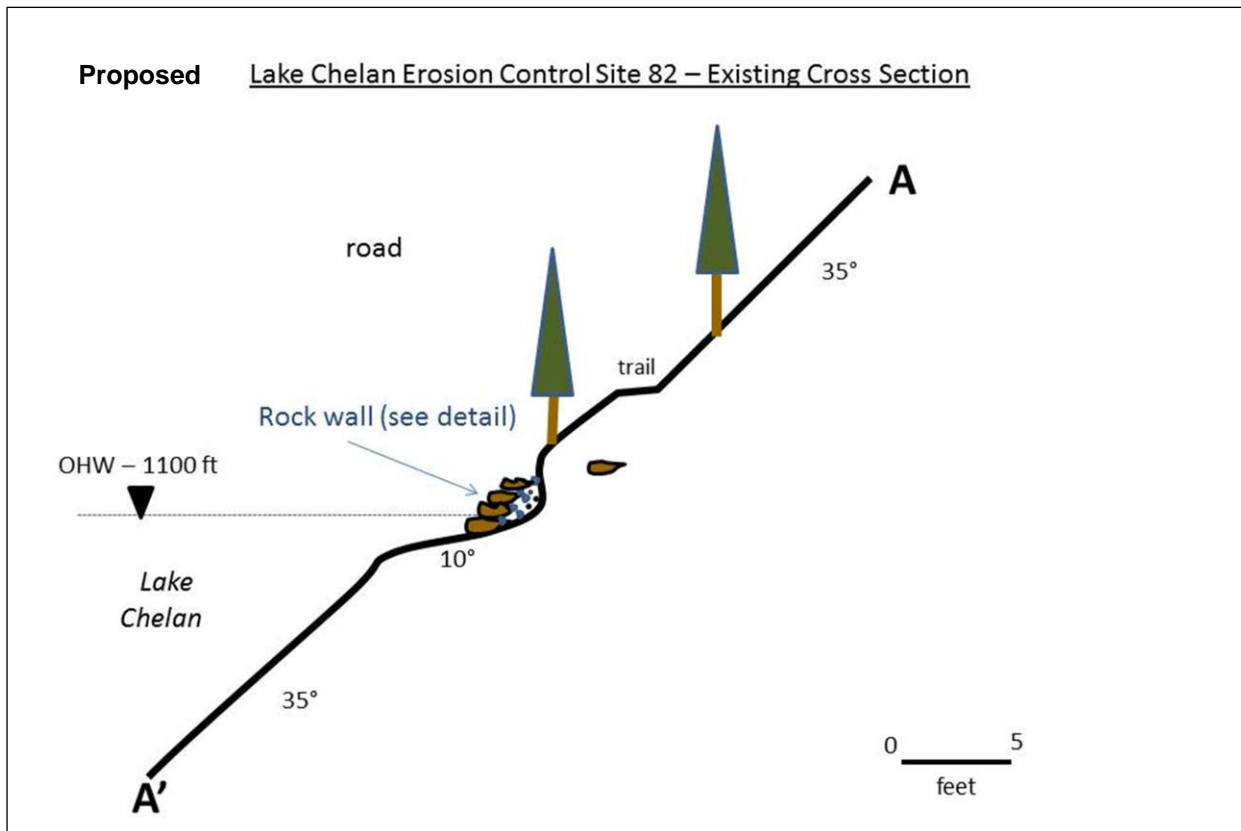
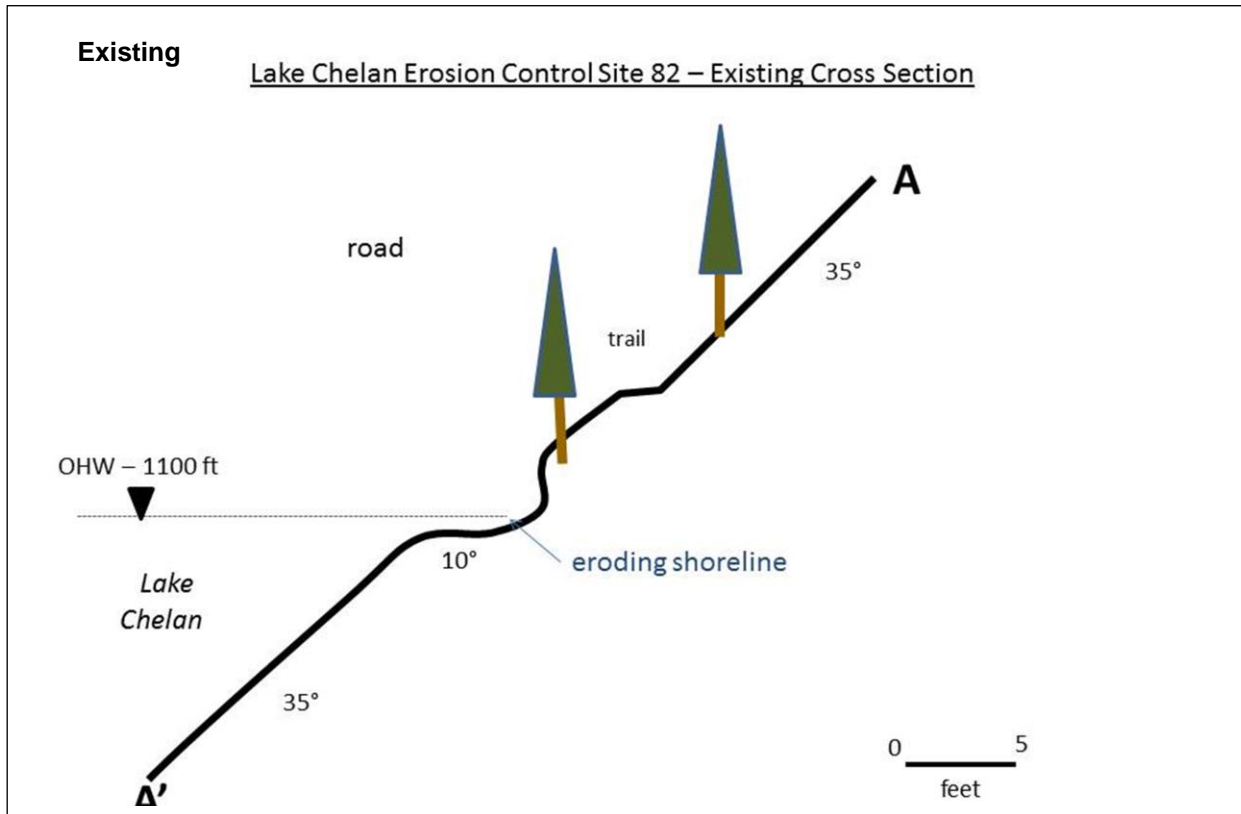


Proposed

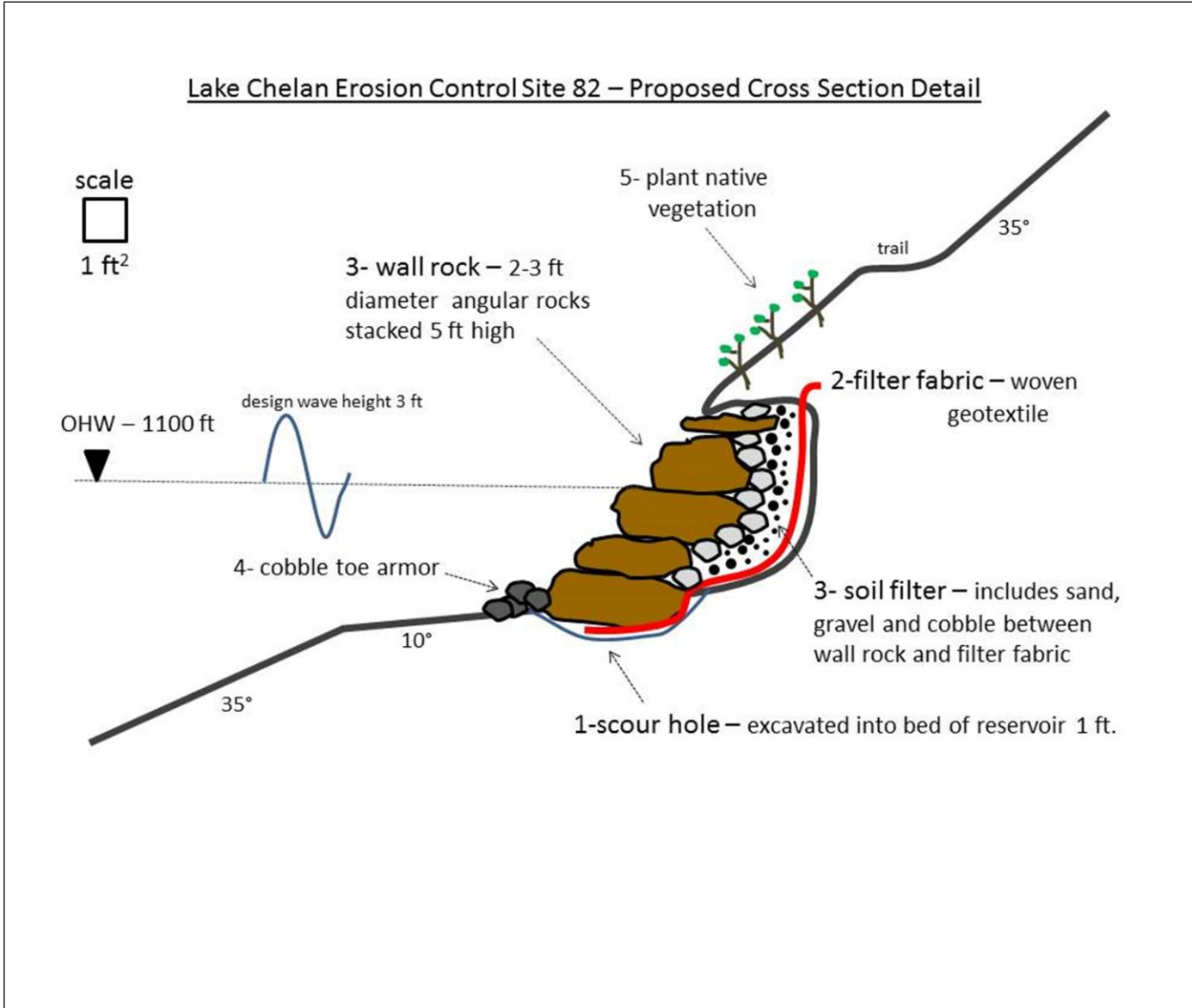
Lake Chelan Erosion Control Site 82 – Proposed Plan (map) View



Cross Section (Existing and Proposed)



Cross Section (Proposed Cross Section Detail)



Mitigation Plan

Lake Chelan FERC Erosion Control Site # 82: Lakeshore Trail Mitigation Plan

The mitigation plan will incorporate native vegetation in the areas that currently can't support vegetative habitat due to the steep slope and unstable soils while retaining the existing vegetation to the extent possible and when it's not possible then salvaging and replanting them. Incorporating vegetation provides several benefits. First, it will enhance stability of erosion control structures through root-reinforcement of soil. Second, it will establish native vegetation in barren areas of the shoreline. Third, the mitigation plan will improve habitat conditions along the slope by providing cover and shade through the planting of shrub species to include nootka rose, snowberry and birchleaf spirea. These species have expansive root systems that will contribute to bank stabilization over time. Native seed will be broadcast through the site (seed species include: bluebunch wheatgrass, yarrow, fireweed and aster). Since maintaining genetic integrity is a priority on NPS lands, both the shrubs and the seed planted on site have originated from plant material collected in the surrounding area. Small woody debris will be included to aid in moisture retention and provide shade for new plantings. Wave action from wind and a large commercial ferry prevents wood from being incorporated in the structure due to potential to weaken it

The site to be planted is approximately 630 sq ft. On-site vegetation includes serviceberry, nootka rose, ceanothus, douglas fir, ponderosa pine, pacific dogwood, kinickinick, birch leaf spirea and bluebunch wheatgrass and a variety of forbs. To the extent possible, existing vegetation will be retained; however, some plants close to the toe of the slope (where the rocks will be placed, primarily kinickinick) will be salvaged and replanted. The planting plan will be installed in Fall 2017.

Planting Plan:

Area:

approximately 630 sq ft

Materials:

Plants

18 snowberry (*Symphoricarpos albus*)

13 nootka rose (*Rosa nutkana*)

15 birch leaf spirea (*Spirea betulifolia*)

Mitigation Plan (continued)

Yarrow (*Achillea millefolia*)
Fireweed (*Epilobium angustifolium*)

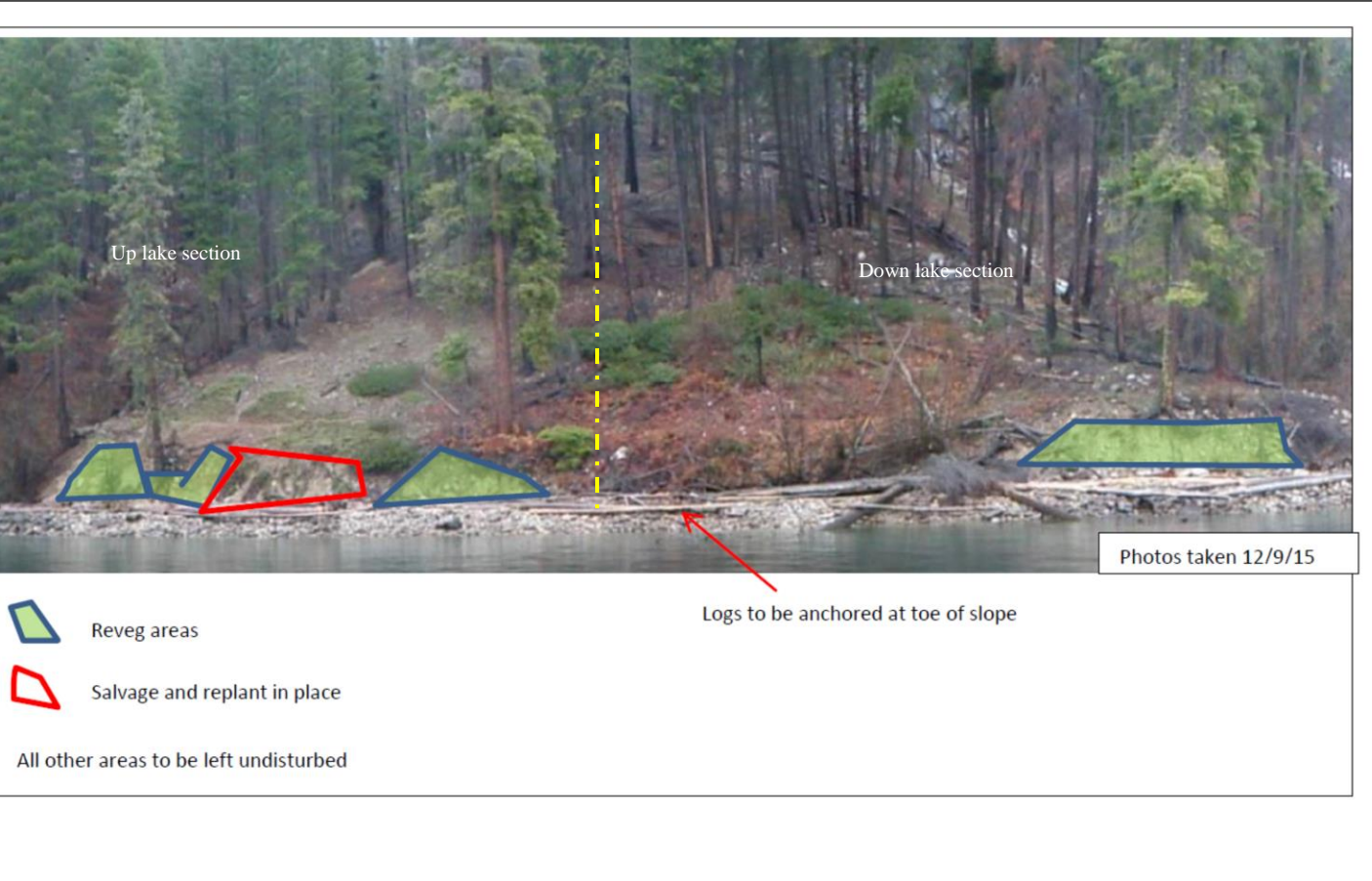
Planting:

All plant material will be planted in fall (Oct 2017). The spacing of the shrub plantings will be approximately 2-3 foot intervals.

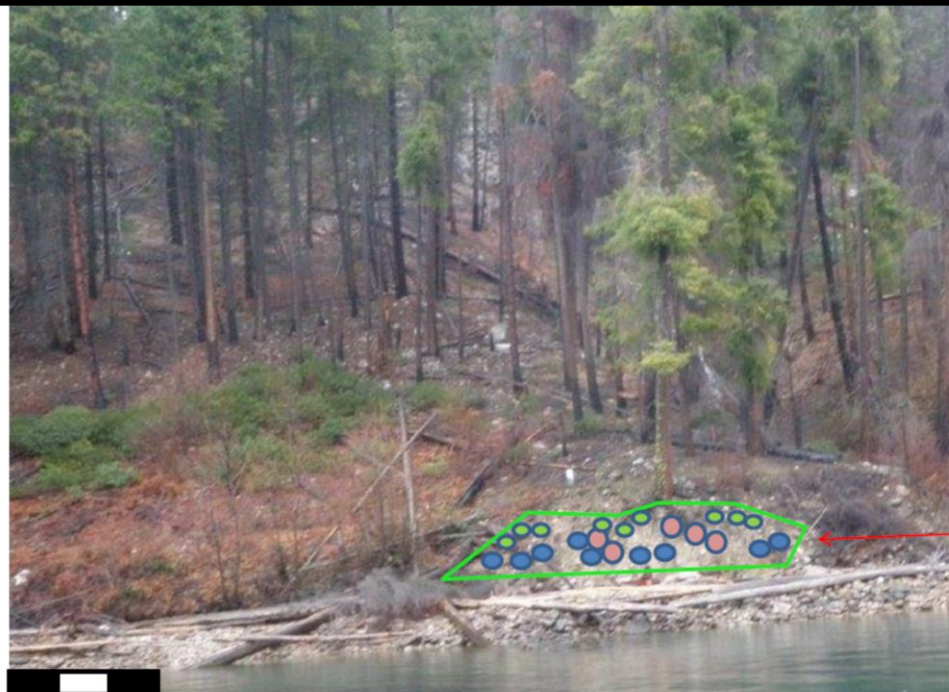
Maintenance:

In the 5 years following planting, the site will be checked in fall of each year. Plantings not successful will be replaced.

Reveg site photo



Reveg Plan (down lake section)



0 5 10 15 feet

Photo taken 12/9/2015

Reveg area (~ 280 sq ft)

- Snowberry (9 plants)
- Nootka Rose (5 plants)
- Birchleaf Spirea (9 plants)

Reveg Plan (up lake section)



0 5 10 15 feet

Photo taken 12/9/15

Reveg area (~350 sq ft)

- Snowberry (9 plants total)
- Nootka Rose (8 plants total)
- Birchleaf Spirea (6 plants total)