PROSPECTUS
for
TRILLIUM MITIGATION BANK

El Capitan Passage, North Prince of Wales Island, SE Alaska

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INTRODUCTION

MITIGATION BANK PROJECT LOCATION & DESCRIPTION

Columbia River Carbonates (CRC) is proposing to develop a mitigation bank, the Trillium Mitigation Bank (Bank), on a 1,227 acre property, owned in fee simple and identified as U.S. Mineral Survey 1010. The Bank site is located on North Prince of Wales Island, the largest island in the Alexander Archipelago, immediately north of El Capitan Passage in the vicinity of Dry Pass within portions of Sections 3, 4, 9, and 10, Township 66 South, Range 78 East of the Copper River Meridian (Sheet 1). The Bank is being proposed in accordance with the U.S. Army Corps of Engineers (USACE/Corps) and the U.S. Environmental Protection Agency's (EPA) *Compensatory Mitigation for Losses of Aquatic Resources* rule (2008) for certification through the Interagency Bank Review Team (IRT), comprised of the EPA, the USACE, and other appropriate regulatory agencies. Upon certification by the IRT, the proposed Bank will provide mitigation for projects located within the proposed service area with unavoidable impacts to jurisdictional waters of the U.S. authorized under Section 404 of the Clean Water Act.

PROPOSED BANK SITE

The proposed Bank site provides an opportunity for preservation and functional lift at the watershed scale, through restoration of aquatic resources within a site that will be self-sustaining. Development of the Bank site will preserve the lower reaches of the El Capitan Creek watershed comprised of valuable aquatic resources such as wetlands, anadromous fish streams, and riparian habitats. In addition to the preservation of the lower reaches of the El Capitan Creek watershed, the Bank project proposes the restoration of aquatic resources impacted by historic logging road development. If not preserved the Bank site could potentially be utilized for second-growth logging, mining, and/or recreational lot subdivision as the site is privately held property.

Landscape Position

The Bank site is situated along the western slopes of El Capitan Peak, and encompasses the majority of a coastal valley with a southern aspect containing the lower El Capitan Creek watershed occurring within the twelve digit Hydrologic Unit Code (HUC) 109101031102 (Appendix A Figure 2). The headwaters of El Capitan Creek, El Capitan Lake, is located west of the Bank site, with El Capitan Cave, Alaska's largest known cave with the deepest known vertical-drop pit in the world, located east of the site. According to *Ecoregions of Alaska* (Nowacki *et al.* 2001), the Bank site largely occurs on karst, within an area identified as the *North Prince of Wales-Kuiu Carbonates* (*NPOWKC*), with a small area within the northeast corner of the site

Map of *North Prince of Wales-Kuiu Carbonates* (Carstensen 2013)

occurring within *Kuiu-POW Granitics* (*KPOWG*).
Topographical elevations within the Bank site range from approximately 1,000 to 1,200 feet within upper elevations to sea-level within the estuarine wetlands located at the confluence of El Capitan Creek and El Capitan Passage/Dry Pass. Freshwater forested wetlands fringe the estuarine wetlands, particularly along the eastern portion of the El Capitan Passage/Dry Pass shoreline where an onsite terrace bench occurs. Shortly inland the elevation of El Capitan Creek increases at a series of falls. North of the falls, the valley containing the El Capitan Creek watershed opens up/widens, particularly as it meanders to the west. Several tributaries of El Capitan Creek originating from slopes surrounding the valley join the mainstem located at the valley floor. Forested/scrub-shrub riverine wetlands and palustrine wetlands, comprised of aquatic bed, emergent, emergent/scrub-shrub and forested wetland Cowardin classes, also occur within the valley floor at elevations below 150 feet. Forested wetlands occur throughout the slopes surrounding the valley. An emergent/scrub-shrub bog wetland occurs within the southwestern portion of the site along eastern aspect slopes ranging in elevations from approximately 150 to 300 feet. A mosaic of fen and bog wetlands, comprised of emergent and scrub-shrub Cowardin classes, occurs within the western portion of the site at elevations ranging from 800 to 1,000 feet.

Bank Site Land Use
The majority of the Bank site, and most of the areas of Tongass National Forest adjacent to the site, was logged during the 1970s (Carstensen 2013), with a network of roads developed throughout to facilitate logging. Today a section of Forest Service (FS) Road 15 is located within the central portion of the proposed Bank site. Currently, CRC primarily uses the Bank site for access, via FS Road 15, to the greater Prince of Wales (POW) road system and population centers and it is the only overland access route for CRC's Calder Mine located 5- miles west of the Bank site. A short spur road off FS Road 15 also provides access to the eight small privately owned recreational lots located immediately north of El Capitan Passage. In order to provide continued overland access for the Calder Mine and the recreational lots, FS Road 15 will need to remain open.

Adjacent Land Use
The outer property boundary of the proposed Bank site, to the north, east, and west, abuts the Tongass National Forest administered by the U.S. Forest Service (USFS). The southern property boundary of the site abuts a strip of shoreline immediately north of El Capitan Passage near the entrance of Dry Pass, consisting of eight privately owned recreational lots, some with cabins. The central portion of the southern property boundary abuts tidelands within El Capitan Passage owned by the State of Alaska. The Bear Valley Fishing Lodge consisting of private property used for commercial recreation abuts the Bank site to the east.

The Tongass National Forest that borders the proposed Bank site to the north, east, and west, contains the upper El Capitan Creek watershed (Appendix A Figure 1). Current and future land use within the upper watershed is directed by *Tongass National Forest Land and Resource Management Plan* (USFS 2008) Land Use Designations (LUDs) at the watershed level, or Value Comparison Unit (VCU). The areas of the Tongass National Forest adjacent to the Bank site are comprised of the following LUDs (Carstensen 2013):

- A geologic Special Area (SA) encompasses El Capitan Peak
- An original Old Growth Reserve (OG) frames the northeast site boundary
- LUDs that allow varying degrees of logging include Timber Production (TM), Managed Landscape (ML), and Scenic Viewshed (SV)

  The original Managed Landscape (ML) unit along the north side of El Capitan Passage/Dry Pass, and units within the upper El Capitan Creek watershed, have been overlaid (shown by white hatching on Appendix A Figure 1) with two recent additions to Old Growth Reserve (OG) that preempt the underlying LUDs. Old Growth Reserve (OG) Unit 5360 now encompasses El Capitan Lake, as well as protecting most of the shoreline of El Capitan Passage/Dry Pass west of the Bank site from further logging. The ML area southwest of the site and the TM area northwest of the site (shown by red asterisks) could in theory see additional logging

As a side note, the north-central portion of Kosciusko Island south of El Capitan Passage/Dry Pass and the Bank site is designated as LUD 2 lands managed in a roadless state to retain the wilderness character of the area (Carstensen 2013).

PROPOSED MITIGATION BANK OBJECTIVES

The majority of the Bank site, and most of the areas of Tongass National Forest adjacent to the site was logged during the 1970s (Carstensen 2013). The Bank site has experienced historic aquatic resource loss due to logging road fill placement in wetlands and stream crossings. However, FS Road 15 is the only overland route that connects CRC's Calder Mine, located approximately 5- miles west of the proposed Bank site, to the greater POW road system. Thus, FS Road 15 and a short spur road off of FS Road 15 that provides access to the eight recreational lots along the El Capitan Passage shoreline will need to remain open.

Excluding FS Road 15, approximately 29,623 linear feet of ancillary logging roads occur within the Bank site with several roads bisecting (built through) wetlands and small streams (Appendix A Figure 3). Approximately 10,760 cubic yards of ancillary road (e.g. logging roads other than FS Road 15) fill occurs within wetlands and streams within the Bank site. Ancillary road fill within wetlands and streams and other types of fill such as logging debris, degraded log cribbing culverts, and bridges in stream channels are impacting Bank site aquatic resources. Observed logging road crossings over El Capitan Creek and the streams largest tributaries are comprised of anchored logs. The anchored log bridges are in various states of decay with logs large enough that stream flow could be blocked or re-routed in the event of bridge failure. A number of logs from previously failed bridges were observed within tributaries of El Capitan Creek. Additionally, numerous wooden crib log culvert crossings within smaller tributary streams were also observed to be in various states of decay. Details on ancillary logging road wetland and stream impacts are presented within Appendix A on Figure 3. Road fill in wetlands to be removed are shown in red, with numbering (Numbers 1-19) that corresponds to the table within Figure 3 detailing the individual areas of fill removal. Details on other types of fill such as logging debris and degraded log cribbing culverts and bridges will be provided within the draft MBI.

CONCEPTUAL MITIGATION BANK SITE DESIGN

The overall conceptual Bank site design involves the restoration of aquatic resources through re-establishment and rehabilitation, and the preservation of the entire site[1]. Conceptual aquatic resource restoration through re-establishment is the removal of ancillary road (e.g. logging roads other than FS Road 15) fill within wetlands and re-establishment of stream channel connectivity through removal of road fill, logging debris, and degraded log cribbing culverts and bridges. Ancillary road fill, and other types of fill such as logging debris, degraded log cribbing culverts and bridges in wetlands and stream channels within the Bank site will be removed and disposed of in appropriate pre-determined upland Bank site areas.

Conceptual aquatic resource restoration through rehabilitation has two components. Re-establishment of wetlands through fill removal will effectively rehabilitate hydrological regimes and connections of wetlands immediately downslope from wetland fill removal areas. To rehabilitate the hydrological regimes and connections of wetlands bisected by FS Road 15, a series of culverts will be installed within the roadbed in the areas of the road that were built through wetlands. Additionally, the hydrological connectivity of streams bisected by FS Road 15 will also be rehabilitated through installation of appropriately sized culverts where degraded log cribbing culverts need to be replaced, and stream crossing areas where no conduits, such as log cribbing, currently exist.

Mitigation Bank Goals

The primary ecological goals of the proposed Bank are to restore aquatic resources through re-establish and re-habilitation, and preserve the entire site. To develop the Bank site according to the conceptual site restoration design (Appendix A Figures 3-5) and achieve the stated ecological goals, the specific Bank goals are as follows:

- Goal 1: Restore, through *re-establishment*, Fen/Bog mosaic wetlands, Forested wetlands, and streams, impacted by historic logging road development (approximately 5 acres).

[1]*Definitions according to 33CFR 332.2 Definitions, are as follows;*

Restoration *means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area,* ***restoration is divided into two categories: re-establishment and rehabilitation****.*

Re-establishment *means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.*

Rehabilitation *means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.*

Preservation *means the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms.*

- Goal 2: Restore, through *rehabilitation*, Bog wetlands and Forested wetlands impacted by historic logging road development, and streams impacted by historic logging and road development (approximately 100 acres).

- Goal 3: Abandon all ancillary logging roads connected to FS Road 15 that occur within the Bank site (approximate total 35,000 linear feet).

- Goal 4: Control invasive plant species along FS Road 15 and throughout the Bank site.

- Goal 5: Permanently protect (preserve) and manage the Bank site in perpetuity. (Preserve approximately 350 acres of wetlands comprised of Fen/Bog Mosaic, Bogs, High Salt Marsh and Forested wetlands, 50 acres of streams, 250 acres of upland buffer to wetlands/streams, 550 acres forested timberland upland habitat, and 25 acres of road abandonment)

MITIGATION BANK OBJECTIVES

The stated goals will be accomplished as follows:

Goal 1: Re-establishment of Fen/Bog Mosaic Wetlands, Forested Wetlands, and Streams

Objective 1a. Re-establish Fen/Bog mosaic wetlands and Forested wetlands through removal of approximately 10,760 cubic yards of (logging) road fill.

Objective 1b. Re-establish stream channel connectivity through removal of (logging) road fill, logging debris, and degraded log cribbing culverts and bridges.

Objective 1c. Re-establish native vegetation by planting or seeding, and/or applying borrowed native topsoil to facilitate natural colonization.

Goal 2: Rehabilitation of Bog Wetlands, Forested Wetlands, and Streams

Objective 2a. Rehabilitate downslope Forested wetlands through removal of (logging) road fill within upslope Fen/Bog mosaic wetlands (see Objective 1a.).

Objective 2b. Rehabilitate downslope Forested wetlands through installation of culverts within portions of FS Road 15 that bisects upslope wetlands and interrupt downslope wetland hydrology.

Objective 2c. Rehabilitate streams bisected by FS Road 15 through installation of appropriately sized culverts, or replacement of degraded log cribbing with an appropriately sized culvert.

Goal 3: Abandonment of Ancillary Logging Roads

Objective 3a. Abandon approximately 29,623 linear feet of ancillary logging roads connected to FS Road 15 that are generally located in uplands, through blocking off road

access and discontinuation of road maintenance to allow for natural native plant colonization.

Goal 4: Control Invasive Plant Species

Objective 4a. Control invasive plant species, such as reed canarygrass (*Phalaris arundinacea*) along FS Road 15. Control invasive plant species throughout the Bank site upon detection (the Bank site is relatively free of invasive plant species, except along FS Road 15).

Goal 5: Protection and Management of Bank Site

Objective 5a. To permanently protect the Bank site in perpetuity, place an IRT approved conservation easement or other appropriate legal instrument over the Bank site property, identified as U.S. Mineral Survey 1010.

Objective 5b. Establish an endowment to fund the in-perpetuity long-term maintenance and monitoring activities (to be specified in the mitigation banking instrument (MBI) management plan).

Objective 5c. Manage the Bank according to the management plan (to be specified in MBI management plan) prepared for the Bank site.

MITIGATION BANK ESTABLISHMENT & OPERATION

Upon IRT approval, CRC will establish the Bank through completion of proposed restoration activities and recording of a conservation easement or other appropriate permanent legal protection instrument as approved by the IRT. Conveyance of any interest in the property shall then be subject to the conservation easement or legal protection instrument. Use prohibitions reflected in the protection instrument will preclude the site from being used for activities incompatible with the intent of the instrument. Any area not encumbered by the protection instrument, such as FS Road 15, will not be credited for Bank use. Additionally, a to-be-determined buffer off each side of the road will be proposed.

Total credits generated by the Bank and a credit release/award schedule will be determined in consultation with the IRT. The precise number of credits actually generated by the Bank cannot be determined until the project is finally approved and implemented, and the success of preservation and restoration activities is assessed by the IRT. Credits will be established and awarded to the Bank upon the Sponsor's demonstration that Performance Standards, included within the IRT approved final Mitigation Banking Instrument (MBI) have been met. Once credits are awarded the Bank may sell, use, or otherwise transfer that credit at any time, subject to the provisions of the final IRT approved Mitigation Banking Instrument (MBI). A credit is defined as a unit of measure representing the increase in the ecological value of the Bank site. A credit for this Bank represents the increase in functions and values of the Bank site aquatic resources through preservation and restoration.

PROPOSED MITIGATION BANK SERVICE AREA

Due to the geographical distance of potential projects from the proposed Bank site, and the need to include areas where future projects would benefit from the use of the Bank, the proposed service area encompasses the following eight digit HUC sub-basins; HUC 19010101, HUC 19010102, HUC 19010103, and HUC 19010202 (Sheet 3). The proposed service area has not been revised according to the Alaska District Corps Special Public Notice SPN-2013-599. Once further regulatory agency clarification regarding SPN-2013-599 is issued, the Bank sponsor will revise the proposed service area as needed.

Upon certification by the IRT, the proposed Bank will provide projects located within the proposed service area with mitigation for unavoidable impacts to aquatic resources authorized under Section 404 of the Clean Water Act. The Bank should also be considered mitigation on a case-by-case basis for projects located out of the proposed service area with in-kind impacts.

MITIGATION BANK NEED & FEASIBILITY

ANALYSIS OF MITIGATION BANK MARKET NEED

Historical Demand/Permitted Mitigation

The proposed Service Area (Sheet 3) for the Trillium Mitigation Bank includes the communities of Prince of Wales–Outer Ketchikan, Ketchikan Gateway and Wrangell-Petersburg, as defined by the USACE Section 404 Permit summary (Appendix B). Permit activity in the period between 2008 and 2012[2] in this area for off-site permittee responsible mitigation resulted in 14 permits requiring 32.65 acres of wetland mitigation and 9405 linear feet of stream mitigation. In addition, 21 permits were issued for this area providing for In-Lieu Fee (ILF) mitigation, which required 149.8 ILF mitigation credits (Appendix B). Twenty-three (23) permits were also issued for on-site mitigation, for a total of 58 permits issued in this period for ILF on-site and off-site mitigation. Only eleven of these permits included rehabilitation/enhancement activities, none provided re-establishment/restoration mitigation.

Current/Future Mitigation Demand

The Alaska Department of Transportation (AKDOT) *Southeast Region Preconstruction Active Projects Status Report* (2013) identifies multiple projects in the preliminary or design phase that are funded and in need of mitigation for impacts to aquatic resources. These projects include road construction/improvements and airport expansion/improvements in Ketchikan, such as Shelter Cove, Petersburg, Wrangell, and Prince of Wales Island. Conversations with AKDOT environmental project managers suggest that AKDOT is supportive of a mitigation option that includes a permitted mitigation bank that would serve this region. Specific requests have been made by AKDOT for mitigation needs over the next two years to support planned and funded projects.

[2]*The permit summary data provided by the USACE identified mitigation activity from 2008 through 2012. However, no mitigation activity was identified for the 26 Section 10/404 permits issued for this area in 2013. Upon further investigation, apparently nine permits were issued that exceeded the 0.1 acre threshold and thus likely required mitigation that may have not been accurately recorded in the FOIA documents reviewed for this assessment. The total area of impact/fill for these nine permits was 5.22 acres.*

In addition to the likely demand for mitigation credit for AKDOT and other municipal/public infrastructure projects, a number of private projects which would require wetland mitigation for final approval are presently in the planning or active stage of development, such as the Bokan Mountain mine project. The Bokan Mountain Permitting/General Operations Manager advised that they intend to submit a permit application and mitigation plan for proposed aquatic resource impacts in late-2014 or early-2015. Additional mining (Niblack) and other private development projects will add to the demand for aquatic resource mitigation in the proposed Service Area, as evidenced by the mitigation demand history noted above.

FEASIBILITY OF PROPOSED BANK

The proposed Trillium Mitigation Bank site is wholly owned by CRC, the Bank sponsor. CRC will provide the full scope of regulatory requirements to permit, construct, and manage the proposed Bank, including the executing of an in-perpetuity easement. As an established business in operation since 1985, CRC possesses sufficient means to complete all of the permitting, design, and construction activities necessary to establish the Bank and is capable of providing any financial assurances that may be required by the final Mitigation Bank Instrument (MBI).

The Trillium Mitigation Bank will be the only established mitigation bank within the proposed Service Area that provides mitigation credits derived from the restoration of aquatic resources. The Federal Mitigation Rule (USACE 33 CFR Parts 325 and 332) adopted in April 2008 directs that mitigation banks be utilized for permitted off-site mitigation for in-kind resources, if the permitted impact occurs within the service area of an approved and operational mitigation bank. Thus, the proposed Bank will restore and preserve in-kind aquatic resources that have been and likely will be impacted by previous and future projects within the Service Area.

This mitigation bank market need analysis indicates that the market for mitigation credits will provide more than adequate revenues to support all aspects and obligations beyond the initial permitting and construction costs of establishing and operating the Bank. Additionally, as the proposed Bank mitigation strategy provides for the restoration and preservation of 1227 acres of land containing high quality, at-risk aquatic resources, the mitigation strategy is consistent with the existing natural features of the site, diminishing the risk of long term failure.

OWNERSHIP & LONG-TERM MANAGEMENT STRATEGY

Ownership

CRC has fee simple ownership of the proposed 1,227-acre Bank site identified as U.S. Mineral Survey 1010 (Sheet 2).

Long-Term Management Strategy

Upon IRT approval of the proposed Bank site, a long-term management plan will be included within a draft Mitigation Bank Instrument (MBI). The overall long-term management strategy will be the protection and viability of the Bank site through continued site maintenance, monitoring, and reporting after the establishment period performance standards are determined to be achieved. The long-term management plan will identify the long-term management and monitoring activities intended to assure protection in perpetuity and viability of the Bank site, in addition to the establishment period management and monitoring activities. The draft MBI will identify the Bank manager responsible for the managing of the Bank pursuant to the terms of the

long-term management plan and will outline the cost of the management activities identified in the plan to determine an appropriate endowment amount to fund the activities. The endowment account will likely be established and funded incrementally with the sale of credits and will be managed by a qualified third party organization.

SPONSOR QUALIFICATIONS & CONTACT INFORMATION

Bank Sponsor Qualifications

CRC, based in Woodland, Washington, is the Sponsor of the proposed Trillium Mitigation Bank. CRC was established in 1985 and has supplied industries with ground calcium carbonate pigments, high-grade ultra-fine ground calcium carbonate products, and technical service for more than 25 years. In January 2012, CRC acquired the proposed Bank site after purchasing the Calder Mine, located approximately 5 miles west the Bank site, in December of 2010.

ELS, based in Longview, Washington, and Waterman Mitigation Partners, based in Juneau, Alaska, are CRC's primary consultants for the proposed Bank project. ELS has been in business in the Pacific Northwest since 1996, and has worked with CRC for 15 years. ELS owners and senior biologists have years of experience implementing and managing projects in Washington and Oregon involving jurisdictional waters of the U.S., mitigation, and mitigation banking. Waterman Mitigation Partners, managed by Steve Sego, is coordinating the current Section 404 permit for Hecla Greens Creek Mining Company, and the establishment of the proposed mitigation site, the Nevada Creek Mitigation Site in Juneau, Alaska. ELS is also the primary environmental consultant for the project. While with Washington State based Habitat Bank, Steve Sego worked to establish the first private mitigation bank certified under the State's Wetland Mitigation Banking Pilot Program, the Snohomish Basin Mitigation Bank located in Snohomish County. Please see the link below for more information on this approved mitigation bank:

http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/sites/snohomishbasin.html.

ELS's mitigation banking experience includes establishing and operating the approved Long Beach Mitigation Bank located on the Long Beach Peninsula in Washington State. ELS is also working on two proposed mitigation banks currently in the IRT review process; the Coweeman River Mitigation Bank in Cowlitz County, Washington, for Habitat Bank and the Ocean Shores Mitigation Bank in Ocean Shores, Washington, for the City of Ocean Shores. Please see the links below for more information on the approved Long Beach Mitigation Bank and the proposed banks currently in the IRT review process:

Long Beach Mitigation Bank	http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/sites/long-beach.html
Coweeman River Mitigation Bank	http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/sites/coweeman.html
Ocean Shores Mitigation Bank	http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/sites/oceanshores.html

ELS and Steve Sego have also worked with the Washington State based Habitat Bank on the following approved banks; the Columbia River Wetland Mitigation Bank located near Vancouver, Washington, the East Fork Lewis Wetland Mitigation Bank in Amboy, Washington,

and the Remy Farm Consolidated Wetland Mitigation site in Battle Ground, Washington. Please see the links below for more information on the approved aforementioned banks:

Columbia River Wetland Mitigation Bank	http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/sites/clark_county.html
East Fork Lewis Wetland Mitigation Bank	http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/sites/east-fork-lewis.html
Remy Farm Consolidated Wetland Mitigation	http://www.mitigationbankingservices.com/about-mbs/battle-ground-project/

ELS has also worked with other various public and private entities in evaluating and developing unique mitigation approaches such as consolidated mitigation and advanced mitigation, and in leading projects in an ecologically responsible way through the permitting and development process. Waterman Mitigation Partners has also supported additional mitigation projects in the State of Washington, and provides consultation and guidance to private and regulatory interests involved in wetlands permitting and mitigation banking. Together with other stakeholders, ELS and Waterman Mitigation Partners provide CRC with the experience, technical expertise, and knowledge to propose, establish, and successfully operate a mitigation bank in the State of Alaska.

Contact Information

Contact information for the Bank Sponsor, and the Sponsor's primary consultants is as follows:

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ECOLOGICAL SUITABILITY OF SITE TO ACHIEVE BANK OBJECTIVES

The proposed Bank site located within the lower watershed of El Capitan Creek provides important physical, chemical, and biological functions. Wildlife, such as brown bear, eagles, wolves, and several species of salmon, and array of aquatic resources, such as wetlands, streams and associated riparian areas, occur within the site. These resources proposed for preservation and restoration contribute significantly to the ecological sustainability of the watershed situated within a karst landscape.

BANK SITE SOILS

Table 1 below lists the mapped U.S.D.A. Natural Resource Conservation Service (NRCS) soils occurring within the Bank site (Appendix A Figure 7; NRCS 2013):

Table 1. Summary of NRCS mapped Bank site soils.

Map Unit	Soil Series	Identified as Hydric[1]
10	Tonowek and Tuxekan soils, 0 to 15 percent slopes	No
30CFX	Karta silt loam, 5 to 100 percent slopes	Yes
34DFX	St.Nicholas-Shakan association, 35 to 100 percent slopes	Yes
40DEX	Sarkar-McGilvery complex, 35 to 100 percent slopes	Yes
85	Kina peat, 0 to 35 percent slopes	Yes
220C	Kina-Maybeso association, 5 to 35 percent slopes	Yes
351DE	Karta-Tolstoi complex, 35 to 75 percent slopes	Yes
442CE	Ulloa-Sarkar complex, 5 to 75 percent slopes	Yes

[1] Soil identified as hydric by the National List; all states *Hydric Soils of the U.S.* (NRCS April 2012).

BANK SITE NATIONAL WETLAND INVENTORY MAPPING

The following Table 2 summarizes the National Wetland Inventory (NWI) mapping of the Bank site (Appendix A Figure 7; USFWS 2013):

Table 2. Summary of Bank site NWI mapping.

Map Unit	Wetland Classification
E2AB1/USN	Estuarine, intertidal, aquatic bed, algal/estuarine, intertidal, unconsolidated shore, regularly flooded
E2EM1P	Estuarine, intertidal, emergent, persistent, irregularly flooded
PEM1/SS1B	Palustrine, emergent, persistent/scrub-shrub, needle-leaved evergreen, saturated
PEM1B	Palustrine, emergent, persistent, saturated.
PFO4/EM1B	Palustrine, forested, needle-leaved evergreen/emergent, persistent, saturated
PFO4B	Palustrine, forested, needle-leaved evergreen, saturated

Preliminary delineation of the site derived through reconnaissance level site investigations generally agree with NWI mapping except in that forested wetland occurrence was observed to be more extensive than NWI mapping indicates.

BANK SITE RESOURCES & EXISTING CONDITIONS

Preliminary delineation of the site derived through reconnaissance level site investigations was conducted by ELS on May 13 and 14, 2013, and July 29 through August 2, 2013. During the ELS site investigations, an array of natural resources such as wetlands, streams and associated riparian areas, and karst features were observed to occur within the lower El Capitan Creek watershed encompassed by the Bank site. Further documentation on the natural resources that the Bank site offers will be documented within the draft MBI.

Fen/Bog Mosaic Wetlands

Fen/Bog Mosaic wetlands occur within the upper elevations of the western portion of the Bank site (Appendix A Figure 2). Soils within the fens occurring within the Fen/Bog Mosaic are saturated organic peat soils primarily vegetated with emergent herbaceous obligate wetland (OBL) and facultative wetland (FACW) species such as skunk cabbage (*Lysichiton americanus*, OBL), water sedge (*Carex aquatilis*, OBL), several-flowered sedge/many-flowered sedge (*Carex pluriflora*, OBL), and Grass of Parnassus (*Parnassia fimbriata*, FACW) growing amongst various species of grasses and sphagnum mosses.

Photograph of Fen/Bog Mosaic Wetland (July/early August 2013)

Soils within the bogs occurring within the Fen/Bog Mosaic are saturated organic peat soils primarily vegetated with stunted trees that comprise one Cowardin vegetation class, scrub-shrub. The scrub-shrub bogs occurring within the Fen/Bog Mosaic are vegetated with facultative (FAC) tree species such as western hemlock (*Tsuga heterophylla*, FAC), Alaska cedar (*Callitropsis nootkatensis*, FAC), shore pine (*Pinus contorta*, FAC), and facultative upland (FACU) shrub species such as rusty menziesia (*Menziesia ferruginea*, FACU). Green false hellebore (*Veratrum viride*, FAC) and obligate wetland species such skunk cabbage and deer cabbage (*Nephrophyllidium crista-galli*, OBL) occur within the herbaceous stratum along with various species of sphagnum moss.

<u>Existing Condition</u>

An ancillary logging road runs through a transition zone between the Fen/Bog Mosaic, on the upslope, and Forested Wetlands downslope of the Fen/Bog Mosaic. The road also crosses a perennial stream that originates within the Fen/Bog Mosaic wetlands, as the stream continues downslope it flows through the Forested Wetlands. Road fill cuts off hydrological connections between the wetlands, and has disturbed hydrological regimes within the downslope Forested Wetlands. In order to restore the historic wetland area the road is built through and rehabilitate the stream and downslope Forested Wetlands, 3,775-cubic yards of road fill is proposed to be removed from approximately 0.66-acres of former wetland (Appendix A Figures 3 and 5). Road fill removal in this area will also effectively remove an old wood crib culvert and fill constricting the channel of the perennial stream.

Fen/Forested Wetland Mosaic Wetlands

Relatively undisturbed emergent fens also occur within areas of Fen/Forested Wetland Mosaic located in the valley bottomlands containing El Capitan Creek (Appendix A Figure 2). Further information on the composition and extent of the Fen/Forested Wetland Mosaic will be documented in the draft MBI.

Photograph of Bog Wetland (July/early August 2013)

Bog Wetlands

Low elevation Bog Wetlands comprised of emergent/scrub-shrub Cowardin vegetation classes occur within the southwestern portion of the site Bank site (Appendix A Figure 2). The Bog Wetlands transition from a stunted tree scrub-shrub woodland comprised of facultative tree species such as western hemlock, Alaska cedar, and shore pine, to an open emergent bog. In the emergent Bog Wetland, herbaceous obligate wetland species such as roundleaf sundew (*Drosera rotundifolia*, OBL) and white marsh marigold (*Caltha leptosepala*, OBL), and facultative species such as fernleaf goldthread (*Coptis aspleniifolia*, FAC) grow amongst sphagnum mosses and ground hugging shrubs such as small cranberry (*Vaccinium oxycoccos*, OBL) and black crowberry (*Empetrum nigrum*, FAC). Stair-stepped acidic pools with obligate wetland species such as skunk cabbage growing within them are also scattered throughout the emergent areas of the Bog Wetlands. Soils within the bogs occurring within the Fen/Bog Mosaic are primarily saturated organic peat soils.

<u>Existing Condition</u>

FS Road 15 runs through a transition zone between the Bog Wetlands upslope to the west and Forested Wetlands downslope to the east. Fill from the road fill cuts off hydrological connections between the wetlands and has disturbed hydrological regimes within the downslope Forested Wetlands. A series of culverts within FS Road 15 is proposed to hydraulically reconnect the Bog and Forested Wetlands and rehabilitate hydrological regimes within the downslope Forested Wetlands (Appendix A Figure 3).

Photograph of low elevation Forested Wetland with red alder dominant in overstory (July/early August 2013)

Forested Wetlands

Forested Wetlands occur throughout the Bank site (Appendix A Figure 2). Onsite Forested Wetlands with the facultative tree species red alder (*Alnus rubra*, FAC) typically dominant within the overstory primarily occur within the valley floor and lower elevation slopes. Forested Wetlands also occur on the

higher elevation hillslopes to the west and east. However, the higher elevation hillslope Forested Wetlands have different species compositions as dominant overstory species are typically facultative western redcedar (*Thuja plicata*, FAC) and western hemlock.

Existing Condition

Within the eastern portion of the Bank site an ancillary logging road identified as the "high road" bisects numerous Forested Wetlands, some associated small with ephemeral/seasonal streams. Road fill interrupts stream channel connectivity, cuts off hydrological connections between wetlands, and has disturbed hydrological regimes within the downslope Forested Wetlands. In order to restore the historic wetland areas the road is built through and rehabilitate stream channel connectivity and hydrological regimes within downslope Forested Wetlands, approximately 1.25 acres, or 5,651-cubic yards of road fill is proposed to be removed (Appendix A Figures 3 and 4). Road fill removal in these areas will also effectively remove an old wood crib culverts and fill further constricting stream channels.

Freshwater Marsh Wetlands (Ponds)

Photograph of Freshwater Marsh Wetland (Pond) "fed" by a karst spring (July/early August 2013)

Two significant Freshwater Marsh[3] Wetlands (Ponds) occur on the Bank site, one immediately north of the Bog Wetland and the other within the north central portion of the site (Appendix A Figure 2). The Freshwater Marsh Wetland north of the Bog Wetlands within the southwestern portion of the site is peculiar as the southern end of the pond is perched above a karst feature containing a sinkhole with a cave opening. The pond is sparsely vegetated with aquatic obligate wetland species such as yellow pond-lily (*Nuphar lutea*, OBL) and appears to have no inlet or outlet.

The Freshwater Marsh Wetland (Pond) within the north central portion of the site is "fed" by a karst spring that surfaces/resurges near the western edge of the pond (Appendix A Figure 2). The area is comprised of one large pond formed through a conglomeration of beaver dammed pools hydrologically connected by overflows that cascade over relic beaver dams. The karst spring is likely the primary hydrologic source of the pond, and the pond appears to drain from the north to the south towards the confluence of El Capitan Creek and one of the streams tributaries. Other than the relic beaver dams and sheared beaver chewed willow saplings that did not look like they had been recently browsed, no recent beaver activity was observed. The pond is sparsely vegetated with aquatic obligate wetland species such as nodding water nymph (*Najas*

[3]*The use of the term "Marsh" is meant to indicate a small freshwater lake or pond.*

flexilis, OBL), skunk cabbage, and *Sparganium* spp. Areas immediately surrounding the pond have been logged as evident by large stumps that surround the edges, however, a diverse array of plant species occur in the logged areas.

Shoreline oblique photograph taken near confluence of El Capitan Creek and El Capitan Passage (Carstensen 2013)

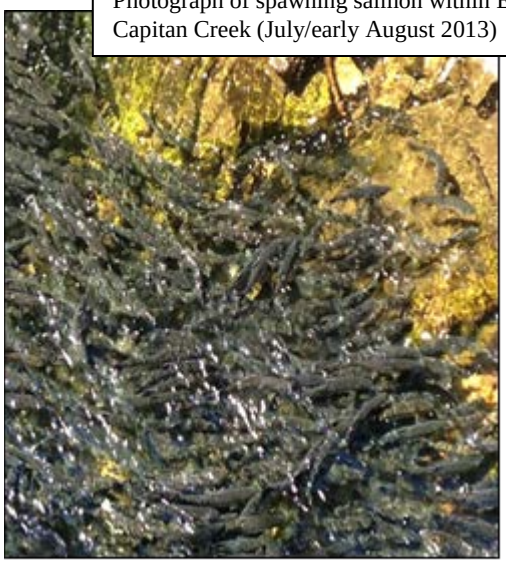
High Salt Marsh Wetlands

The High Salt Marsh Wetlands that occur along the Bank site's eastern shoreline at the confluence of El Capitan Creek and El Capitan Passage are mapped as estuarine, intertidal, emergent, persistent, irregularly flooded (E2EM1P) wetlands by the NWI (Appendix A Figures 3and 6). Soils within the High Salt Marsh Wetlands are permanently saturated anaerobic soils with low chroma soil colors. Salt tolerant obligate wetland and facultative wetland species such as Lyngbye's sedge (*Carex lyngbyei*, OBL) and tufted hairgrass (*Deschampsia caespitosa*, FACW) are dominant. Other salt tolerant species such as seaside arrowgrass (*Triglochin maritime*, OBL) occur sporadically. CRC is in the process of determining whether the Bank site property includes a large portion of the estuarine High Salt Marsh Wetlands through an Alaska State Tideland Survey of the mean high water line. According to Richard Carstensen (2013), productive estuaries, like the one located at the confluence of El Capitan Creek and El Capitan Passage/Dry Pass, are few and far between in the area as neither carbonates nor granitics are optimum for deltaic deposition. Other nearby estuarine wetlands occur further west in Calder Bay.

FUNCTIONAL ASSESSMENT OF WETLANDS EXISTING CONDITION

Field data for assessing the Bank site wetland units using the Wetland Ecosystem Services Protocol for Southeast Alaska (WESPAK-SE) has been collected, and ELS is currently in the process of completing preliminary WESPAK-SE assessments that use the most up-to-date assessment guidance and calculators available. ELS is planning on completing further field verification of the preliminary assessments, and assessing any missing units during the final delineation scheduled for May and/or June of 2014. Final WESPAK-SE assessments will be included in the draft MBI.

Photograph of spawning salmon within El Capitan Creek (July/early August 2013)



ESSENTIAL FISH HABITAT

The entire mainstem of El Capitan Creek (approximately 10,969-linear feet) and approximately 13,264-linear feet of associated upper reaches/tributaries occur within the Bank site. The Tongass National Forest Revised Alaska Region Channel Type Classification system identifies El Capitan Creek as a high quality fish habitat Floodplain Medium (FPM) channel type (Southeast Alaska GIS Library 2014). The Tongass National Forest Stream Classification, used to categorize streams according to

fish production values, classifies El Capitan Creek as an anadromous fish-bearing Class 1 Stream (Southeast Alaska GIS Library 2014). According to the Alaska Department of Fish and Game (ADF&G) Anadromous Waters Catalog mapping of El Capitan Creek, Coho salmon, chum salmon, pink salmon, steelhead, and Dolly Varden occur within El Capitan Creek (Appendix A Figure 8). However, at the confluence of the mainstem with upper arm reaches/tributaries, one arm meanders to the west and the other to the east. Coho salmon, steelhead, and Dolly Varden occurrence is mapped as continuing only within the western arm, and chum and pink salmon occurrence is mapped as continuing only within the eastern arm.

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 defines "anadromous species" as meaning species of fish which spawn in fresh or estuarine waters of the United States and which migrate to ocean waters, with the term "essential fish habitat" (EFH) meaning those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. El Capitan Creek therefore falls under the definition of as EFH according to the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006. Additionally, according to the *Prince of Wales Island Area Plan* (Alaska Department Natural of Resources 1998), El Capitan Creek is classified as an anadromous fish stream closed to mineral entry with the estuarine wetlands, comprised of emergent vascular salt marsh and algal bed communities at the mouth of the stream, designated as Crucial Habitat (Ha) for salmon rearing and schooling to a depth of 40 feet at mean lower low water (Appendix C).

Photograph of black bear foraging for salmon within El Capitan Creek (July/early August 2013)

WILDLIFE & UPLAND HABITAT

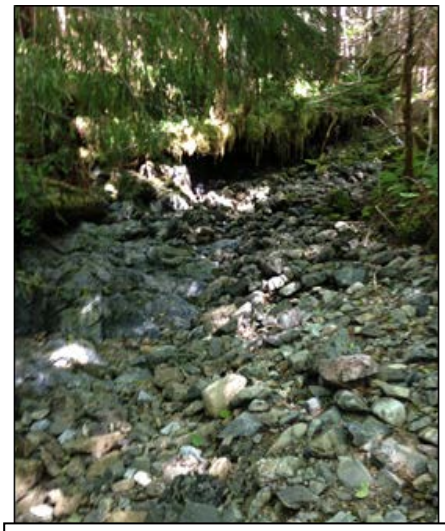
During the week of July 29 through August 2, 2013, ELS biologists observed black bears foraging for fish within El Capitan Creek, as well as numerous bald eagles foraging and perching along the stream and the El Capitan Passage/Dry Pass shoreline. Sitka black-tailed deer scat, and wolf scat was also observed throughout the site. The *Prince of Wales Island Area Plan* also identifies Crucial Habitat in the area of the confluence of El Capitan Creek and El Capitan Passage due to seasonal black bear concentrations (Appendix C).

Upland Habitat

The majority of the upland occurring within the Bank site is thick re-growth, predominately consisting of approximately 35 year old Sitka spruce (*Picea sitchensis*), western red cedar, and Alaska yellow cedar. Vegetation within the understory of the thick re-growth is generally sparse. Logging debris such as large stumps and left over logs and slash, is scattered throughout the upland forest floors of the site. Targeted upland areas of the Bank site may be good candidates for gap cutting, plantings, and/or other treatment methods described by the *Forest Restoration in the Tongass: Why, How and Where* (Christensen 2012). It is also worth noting that remnant stands of mature forest, typically located on steep slopes, remain within the Bank site (Appendix A Figure 2).

KARST FEATURES

The entire Bank site occurs on karst (Carstensen 2013). Various karst features have been observed within the Bank site, and undoubtedly there are many other features that are yet to be located. According to *The Coastal Forests and Mountains Ecoregion of Southeastern Alaska and the Tongass National Forest* (Audubon Society-Alaska and The Nature Conservancy 2007), the karst resources that occur within the Tongass National Forest in general, and North Prince of Wales in particular, are of international significance for their intensity, diversity and recreational values, as well as biological, cultural and paleontological values.



Photograph of channel of sinking/losing stream located within northern portion of Bank site (July/early August 2013)

Observed karst features include cave entrances (lower image to right), insurgent and resurgent areas, sink holes, a karst spring, and sinking/losing streams (lower image to left) (Appendix A Figure 2). Due to strong surface and subsurface interactions in karst landscapes, groundwater and surface water are typically hydraulically connected through numerous karst features that facilitate surface and subsurface hydrologic exchanges. Thus, groundwater and surface water often constitute a single dynamic system in karst terrains.

Photograph of cave entrance located east of karst spring (July/early August 2013)

CULTURAL RESOURCES

The *Prince of Wales Island Area Plan* (ADNR 1998), identifies no occurances of cultural resource sites within the area plan management subunit, Subunit 4a – El Cap North (Appendix C). However, a cultural resource survey of the site by a qualified archaeological firm will be completed, and a Section 106 consultation will be initiated through the USACE upon submitting of the draft MBI and archaeological report to the IRT.

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