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Seattle City Light

September 21, 2018

SECRETARY
FEDERAL ENERGY REGULATORY COMMISSION
888 FIRST STREET, N.E., SUITE 1A
WASHINGTON, D.C. 20426

RE: Skagit Hydroelectric Project No. 553 – 2010-2011 Erosion Control (Article 409 Report)

Dear Secretary:

Seattle City light (City Light) is pleased to submit the 2016-2017 Erosion Control Report for the Skagit River Hydroelectric Project (FERC Project No. 553), as required by License Article 409 and FERC's May 15, 1996 Order Approving the *Soil Erosion Control Plan*. FERC's July 6, 1998 Order Amending the Approved Soil Erosion Plan changed the variable yearly funding amounts to uniform annual funding amounts and allowed use of a portion of the $500,000 "New Sites & Maintenance" contingency fund for maintenance of erosion control measures installed at identified sites. City Light's total financial obligation for erosion control remained the same. This is the sixth biennial report per the Erosion Control Settlement Agreement, which required annual reports for the first ten years of the license and then reports covering two years until the end of the license.

The National Park Service has performed erosion control work at the Skagit River Project pursuant to the Erosion Control Settlement Agreement (Section 6.1) and continued this work in 2016 and 2017. The 2016 and 2017 *Annual Expenditures Statements* for the Skagit Hydroelectric Project, submitted in March 2016 and 2017, respectively, provide more detail on expenditures for erosion control activities.

If you have any questions about this report, please contact Shelly Adams by phone at (206) 684-3117 or by email at shelly.adams@seattle.gov.

Sincerely,

Colleen McShane, Director
Natural Resources and Hydro Licensing Division

SA:sw

Enclosure

Cc: w/enclosure
Dave Snyder, FERC
Patrick Regan, FERC (PRO)
Karen Taylor-Goodrich, NPS
Tammra Sterling, NPS
Jon Riedel, NPS
Stacy McDonough, NPS

Erosion Control and Revegetation Completion Report 2016-2017
Skagit River Hydroelectric Project (#553)

J. Riedel, Geologist, North Cascades National Park
Stacy McDonough, Plant Ecologist, North Cascades National Park

INTRODUCTION

As stipulated in the 1991 Erosion Control Settlement Agreement (SA) between the National Park Service (NPS) and Seattle City Light (City Light), erosion control activities in Ross Lake National Recreation Area (NRA) continued during the two-year period of 2016 to 2017. The purpose of this report is to update the Federal Energy Regulatory Commission (FERC) on progress under the terms of the operating license for the Skagit River Hydroelectric Project. Detailed accounting of expenditures is not provided in this report because this information is provided in other reports.

A total of 25 recreation sites, including docks, campgrounds and trails have been treated in the past 27 years (Figure 1). The combined area of stabilized shoreline is nearly 1/3 mile in a difficult setting with steep slopes, where the average erosion rate in unconsolidated glacial deposits is 1 feet/year and can exceed 5 feet/year (Riedel 1990).

NPS crews, funded by City Light, did not complete any site maintenance during 2016 or 2017. However, a site maintenance inventory, along with plans for 2018 maintenance and revegetation work was completed at several sites. Routine maintenance of erosion control equipment was also performed.

SITE MAINTENANCE INVENTORY

An NPS crew, along with a representative from City Light, visited several recreation sites on October 12, 2017 to assess conditions. All sites previously treated were in fair to excellent condition except for Site E-40 at McMillian dock (Figure 1, Table 1).

As determined from the site visit, maintenance of the rock walls at recreation sites will mainly entail rebuilding the toe scour protection, where most wave energy is focused when the lake is at or near full pool. Additional maintenance needs identified include tree removal from some rock walls and removal of old cribbing. Priorities for 2018 will include addressing cribbing along the east side of Ross Lake at all E-70 sites and rock wall repair at site E-47. Details regarding recreation site conditions are included in Table 1 below.

Figure 1. Skagit River Hydroelectric Project erosion sites.

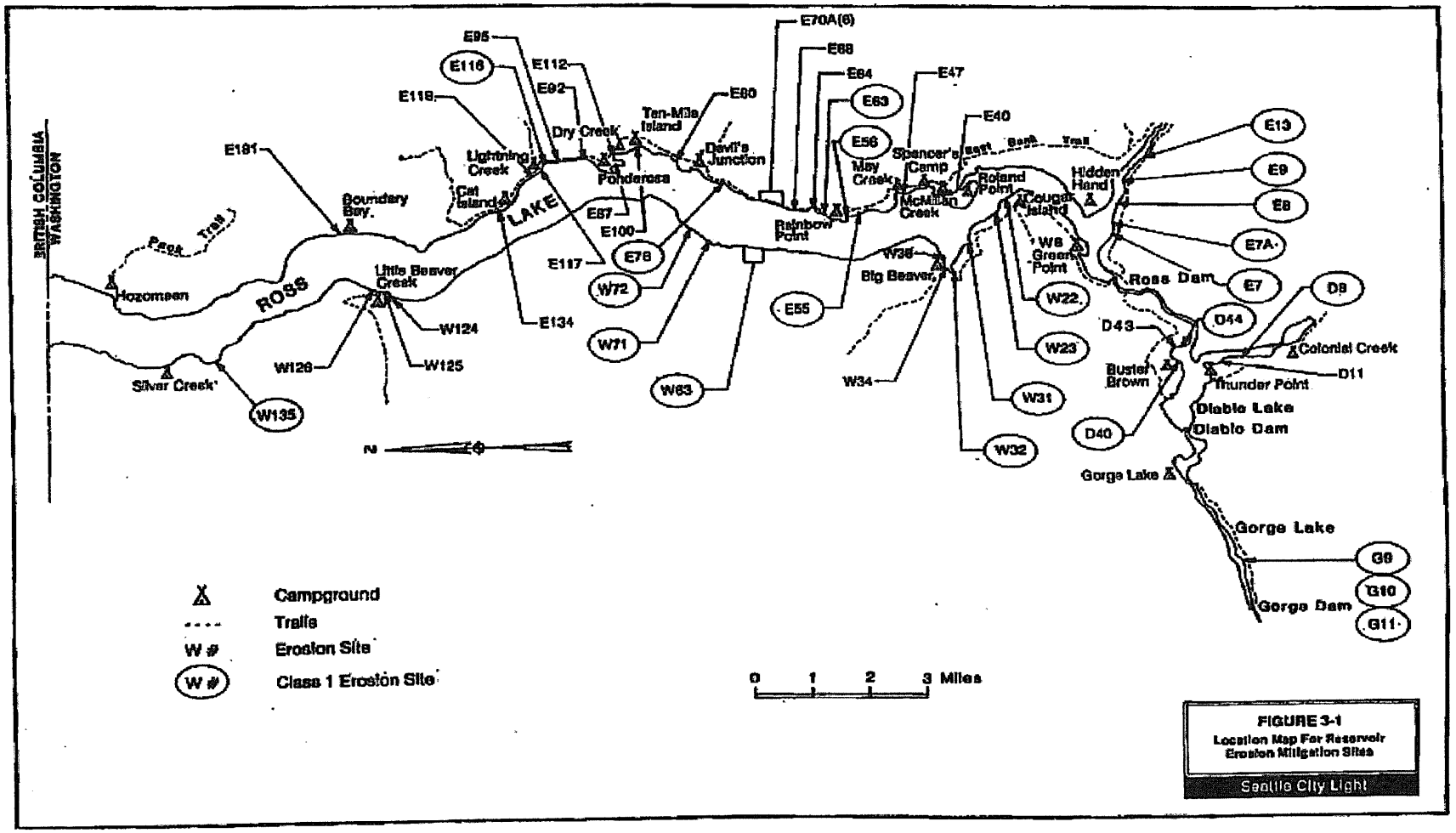


Table 1. Summary of Erosion Control Sites with Condition Assessment.

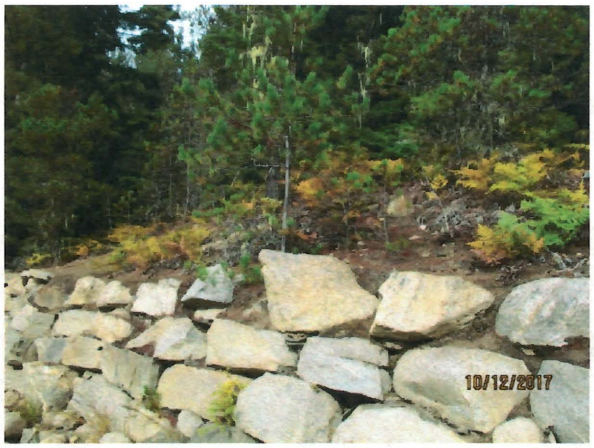
Priority	Site #	Site Name and Erosion Control Method	Year Construction Completed	Year Planted - # of Plots	Square Feet	Condition Assessment 2017 1 (low)-10 (high)
Low	E-40	McMillian-rock wall 33' x 3'	2004		30	2
Medium	E-47	May Creek –rock wall 39' x 4.5' (north of dock) 4' x 4.5, (south of dock)	2002		150	5
High	E-56	Rainbow Point-rock wall 170' x 4'	NA		680	Not visited
High	E-64	East Bank Trail-reroute 120' x 3' (height estimated)	2003		~360	Not visited
High	E-68	East Ban k Trail-rock wall 80' x 4'	2003		320	Not visited
High	E-70A-1	East Bank Trail-cribbing 30' x 60'	1995		213	6/7
High	E-70A-1A	East Bank Trail-cribbing	1997-98	1998-193	675	6/7
High	E-70A-2	East Bank trail-cribbing Upper tier: 35' x 6' Lower tier: 30' x 6'	1996-97	1998-675	390	6/7
High	E-70A-3	East Bank trail-cribbing 100' x 15'	1998	1999-357	1500	6/7
High	E-70A-4	East Bank trail-cribbing 45' x 25'	2001		1125	6/7
High	E-70A-5	East Bank trail-cribbing 30' x 3' and 50' x 10' Also 40' x 5' mid-section	1995	1998-207	500	6/7
High	E-70A-5A	East Bank trail-cribbing	1997	2000-147	384	6/7
Medium	E-70A-6	East Bank trail-cribbing No rebuild, only reveg. 2000 ft^2	2000-01	2001-240		6/7
High	E-80A	Devils Junction-rock wall 103' x 4.5'	1992	1999-101	500	7
Medium	E-80B	Devils Junction-rock wall 44' x 2 to 3'	2004	2000-97	132	Not visited
Medium	E-100	10 Mile-rock wall and logs 54' x 3.5' (E of NE point) 60' x 4' (W of N point)	2001	2001-360	190	8
Medium	E-112	Dry Cr.-rock wall & logs 23' x 3' (SE corner of campground) 45' x 4.5' (S shore of campground)	1999	1999-166	~260	6/7
Low	E-87	Ponderosa -rock wall 141' x 5'	2003		750	8
Medium	E-92	Lodgepole-rock walls Two 10' x 3- 4'	2004		80	Not visited

Table 1. Summary of Erosion Control Sites with Condition Assessment.

Priority	Site #	Site Name and Erosion Control Method	Year Construction Completed	Year Planted - # of Plots	Square Feet	Condition Assessment 2017 1 (low)-10 (high)
Medium	E-95	Lightning Horse-rock wall 287' x 4-4.' Faced with 2 to 3' diameter rocks	1998-99	1999-625 2001-239 2017-65	~1140	8
High	E-116	Lightning Trail- reroute By GIS and maps about 350' long			~700	Not visited
Low	E-117	Lightning Trail- rock wall 60' x 2 to 3'	2000		~240	10
Medium	E-118A	Lightning Camp-log or wall Two 20' x 1' walls	2000		40	Not visited
Medium	E-118B	Light Camp-rock wall 45' x 1'	2000	2000-190	45	Not visited
High	E-134A	Cat Island- rock wall 18' x < 2'	2000	2001-150	1000	7
Medium	E-134B	Cat Island-rock wall 50' x 6' (W of dock) 68' x 3.5' (Further W of bedrock)	2001		130	7
High	E-181	Boundary bay-rock wall 155'x 4 to 5'	1993	2000-633	~1000	5/6
High	W-34	Big Beaver trail- rock wall 200' x 3'	1996	2001-463 2016-548	600	8/9
Medium	W-36	Big Beaver- rock wall 50' x 2'	2002		100	8
Medium	W-124	Little Beaver- rock wall, steps Stairs are 25' section	1998	2000-463		5
High	W-125	Little Beaver-rock wall 70' x 5 to 6'	NA	Trail and dock moved	~420	Not removed yet
High	W-126	Little B. Trail – cribbing and dock removal	NA	Trail and dock moved		Not removed yet
High	D-11	Thunder Pt.-rock wall 290' x 2 to 3'	2005		870	Not visited
Medium	D-40	Power Line-rock & log boom 93' x 2-3'	2005		279	Not visited
High	D-43	Buster Brown-rock wall 100' x 3.5'	2005		350	Not visited

Site W-36: Big Beaver dock rock wall extends on both sides of the dock. Toe protection could use some rebuilding, approximately 10 linear feet on the north side and approximately 8 linear feet on the south side. Site ranks an 8.

Site W-34: Site is a rock wall on an outwash terrace just south of the Big Beaver horse camp, in which approximately 5 linear feet of the east side of the wall requires toe protection maintenance. West side of the wall looks excellent; it was built originally with slightly larger toe protection. Some tree removal is necessary at this site; most are small right now and could be done with handsaws. One or two trees will require a chainsaw. Site ranks an 8/9.



Site W-124: Site is located just above the current Little Beaver dock. Wall is in good condition but requires approximately 30 linear feet of toe protection built. Site ranks a 5.

Site W-125 and W-126: This is the location of the old dock for Little Beaver. Two stacks of cribbing that are approximately 6 feet long require removal, as well as some concrete from an old bulkhead. There is no maintenance required here, just removal.

Site E-181: The Boundary Bay dock site requires ~ 60 linear feet of toe protection to be built on the north side, wall itself looks good. Toe protection is needed under the stairs as well, the large boulders by the stairs are not ideal. Excess large rock should be removed. Site ranks a 5/6.

Site E-134B: Some toe protection is needed on the dock site for Cat Island. Revegetation staff could plant to prevent erosion. Site ranks a 7.

Site E-134A: Rebuild pocket beach wall on the west side of Cat Island. Site ranks a 7.

Site E-117: Site is a rock wall north of the Lightning Bridge, hiker camp. Nicely buried, no maintenance needed. There is reed canary grass along wall. Site ranks at 10.

Site E-95: Site is a rock wall south of the Lightning Bridge, horse camp. Wall lacks toe protection for ~ 50 linear feet. Exposed fabric needs to be cut off and the toe protection also needs improvement at the corner. Site ranks an 8.

Site E-87: The Ponderosa dock site needs some toe protection at gaps, but otherwise is in good shape. Discussed the possibility of extending the wall 150 feet to the south, or as far as the stockpiled material that is on-site could take it, which might be slightly less. Site ranks an 8.

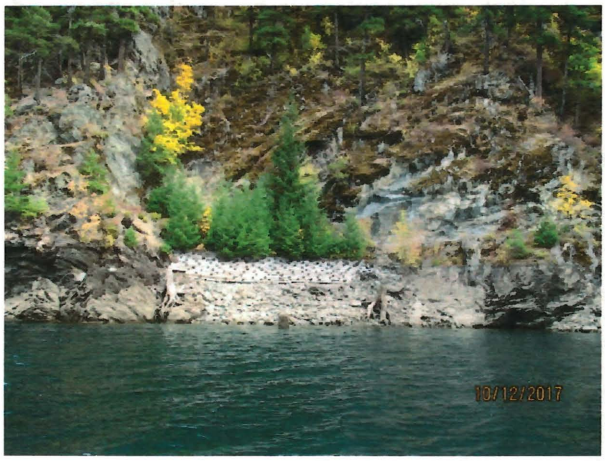
E-112: Toe protection looks good at Dry Creek dock, but work is needed on the west end. There is also a pocket beach by the large log that needs a toe protection rebuild and some maintenance of the top of the wall for ~ 10 linear feet. Site ranks a 6/7.

Site E-100: On north side of 10 Mile Island. Wall near sign needs ~ 20 linear feet of toe protection at the point and also for ~ 30 linear feet of the wall. Site ranks an 8.

Site E-80A: The wall by the Devil's Junction dock extends to the west. Built in 1992, the wall needs ~ 75 linear feet of toe protection rebuilt. On the west side of a dock, some protection has eroded and would benefit from a log being pinned to the shore. Also, a cable has slipped off one of the trees and needs to be reattached. The large steel beam on the beach should be hauled out. Site ranks a 7.

E-70 Sites: There are 9 cribbing walls here along the trail below Devil's Junction dock and have been identified as a priority for 2018. All require some amount of toe protection and all should be inspected from the trail for details, for now photographs document the conditions. Some sections have failed and needs to be repaired or rebuilt. Overall, sites rank a 6/7. Photographs are from north to south along lakeshore.

E-70 Sites: Continued photograph from north to south.



Site of log storage: This site is south of the E-70 cribbing sites. The joint is too low were the pen is connected and this should be tightened.

Site E-47: The rock wall at the May Creek dock needs repair and is a priority for 2018. About 15 linear feet of the rock wall built in 2002 failed because no soil filter or filter fabric was placed behind the wall, resulting in the waves removing soil from behind the wall leading to its collapse. The remaining 25 linear feet of wall is in excellent shape. Work for 2018 should be done when the lake level is about 1595 to 1600 feet so that all equipment will be in the water. Removal of the failed section will occur, along with excavating a bench below that area for the new rock wall base. Geotextile filter fabric will be placed prior to laying course rock for the base. The wall will be backfilled and toe scour protection will be rebuilt. When appropriate, revegetation will occur along the shoreline.

Site E-40: The dock at McMillian camp is a low priority site but needs work. The rock wall on the west side of the dock needs attention; large rocks or a 50-foot log could be installed. The log currently here is too short. Ideally, a larger log could be laid so the root wad faces the dock, with the other end on the shoreline pinned by an existing stump. It would be necessary to put rocks along the shoreline to make a bed for the log. Site ranks a 2.

REVEGETATION

Accomplishments in 2016

- Completed plantings at Big Beaver (548 plants) and Chert Quarry (57 plants) for a total of 605 plants installed at erosion sites on Ross Lake.
- Collected a total of 0.62 oz of seed from Hozomeen
- Transplanted 576 seedlings for Cat Island and 660 seedlings for the Ten Mile erosion control site.
- Maintained plants in the native plant nursey including trimming, fertilizing, irrigating, and inventory.
- Utilized funds for to purchase:
  - Soil sterilizer in order to allow sterilization of composted soil and to prevent soil pathogens and weeds in nursery-grown plants.
  - New weed cloth for the entire nursery facility.

Accomplishments in 2017

- Successfully used soil sterilizer (purchased in 2016) throughout the 2017 season.
- Completed construction of new capillary bed for wetland herbaceous plants.
- Completed capital improvements: replaced sand in greenhouse beds; replaced gravel throughout nursery facility; and replaced heat coils in greenhouse.
- Completed supplemental plantings at Chert Quarry (23 plants) and Lightning Stock Camp (65 plants) for a total of 88 plants installed at erosion control sites on Ross Lake.

- Reviewed erosion control sites with wooden cribbing and made recommendations to botanist for removal of trees which could potentially to damage erosion control structures.
- Scouted planting site at Big Beaver and observed need to reduce cover of invasive reed canarygrass (*Phalaris arundinacea)* before planting native species.
- Collected 1.23 oz of seed from 8 species at Lightning Stock Camp and 2.62 oz of seed at Hozomeen. Current seed inventory of other erosion control sites remains robust (28 lbs of seed from 27 species).
- Completed nursery report writing and creation of GPS and photo documentation logs.
- Maintained plants in the native plant nursey including trimming, fertilizing, irrigating, and inventory.

Wetland planting at Big Beaver

Replacing weed cloth in native plant nursery

***Mahonia nervosa* planted at Chert Mine Erosion Control Site**

EQUIPMENT MAINTENANCE

Maintenance of the erosion control workboat known as 'Sahale' was also conducted in 2016-2017. The Sahale has been the erosion control program boat for more than 19 years and is used to transport crews and materials to and from job sites, and to push the barge and crane to project sites and material collection sites. One fuel injector was replaced, a set of props for the outdrive was purchased, and one oil change was completed. The erosion control barge 'Forrest' had a hydraulic hose replaced and a new motor installed.

COMPLIANCE

Copies of all permits are kept at the NPS office in Sedro-Woolley and are available on request.

EROSION MONITORING

No erosion monitoring occurred in 2016 to 2017. Plans call for revisiting the five bank erosion monitoring sites in 2018.