



United States
Department of
Agriculture

Forest
Service

Wenatchee
National
Forest

215 Melody Lane
Wenatchee, WA 98801
TTY (509) 662-4396
Voice (509) 662-4335

File Code: 2560

Date: April 22, 2009


Mr. Bob Steele
Washington State Department of Fish & Wildlife
3860 Chelan Hwy
Wenatchee, WA 98801

Dear Mr. Steele:

Enclosed are two reports for the 2008-2009 erosion control work done on Lake Chelan under US Army Corps of Engineers (USACE) permit number NWS 2007 1652 CRC by the Forest Service. A certificate of compliance has been mailed to the USACE and copies of the report validating all required Large Woody Debris anchored and placed per WDFW agreement.

If you have any questions please contact Joe Kastenholtz (509- 682-4960) for additional information on the project.

Thank you for your help and cooperation in this matter.


ROBERT J. SHEEHAN
District Ranger

Enclosures:



Chelan Ranger District
Deer Point Campground
Erosion Control Treatment Site 58 Report
2009

Site 58 is the second erosion site treated under the Lake Chelan Hydroelectric Project No.637-022, under Article 401. The treatment followed the site specific plans for this site filed November 7, 2007 by Chelan PUD with the Federal Energy Regulatory Commission's (FERC) for approval of the Erosion Control Implementation and Erosion Monitoring and Maintenance Plan (Erosion Control treatment Plans) and the Site-Specific Erosion Control Plan (Site-Specific plan for site 58). On December 14, 2007, FERC issued the Order approving these plans.

Site permits and contracting actions were acquired and administered by the Forest Service, through a funding collection agreement with Public Utility District No. 1 of Chelan County (Chelan PUD). This site is addressed by under Nationwide Permit (NWP) 13 and permitted under reference # NWS 2007 1652 CRC Department of the Army, Seattle District, Corps of Engineers. Eight large pieces of large woody debris (LWD) were installed during the contract. The contract was awarded to LKE Corporation of Washougal Washington. The Deer Point site was awarded for \$81,802.80.

This report is intended to address permit requirement for LWD placement, monitoring of the LWD and treatments, and provide Chelan PUD an accomplishment report of how funds were administered. Eight large pieces of LWD approximately 400 square feet are part of our required mitigation.

Three hundred thirty eight tons of rock were used at this site, 238 tons on the uplake side and 100 tons on the dock side. What follows is a pictorial summary of the treatments, of special note is the anchoring of the Large Woody Debris (LWD) that was used in the treatments. A small amount of barged rock (10 cubic yards) was left on the down-lake side of the treatment site for future use in maintenance of the treatments or additional anchoring of LWD that is discovered during monitoring.

Monitoring of the site will follow the protocol and intent of the accepted Erosion Control Implementation and Erosion Monitoring and Maintenance Plan document. It outlines the requirements of implementation monitoring with informal surveys during years one and three after implementation, with a formal maintenance and safety monitoring survey done at five year intervals for the remainder of the license.



Start of treatment area A1a (50 feet) enhanced placed rock with LWD in foreground anchored with rock piles.



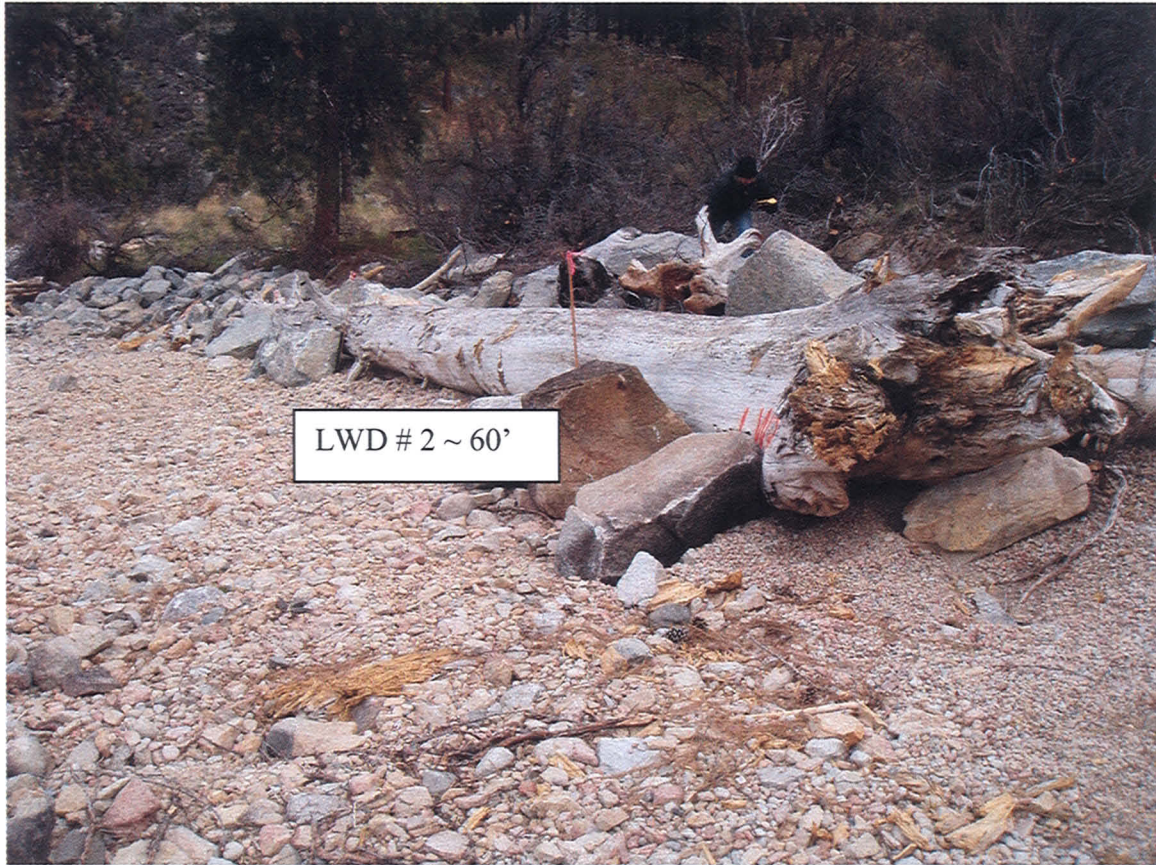
LWD #1 side view showing large rock piles used to anchor LWD. Natural smaller woody debris randomly piled left of treatment.



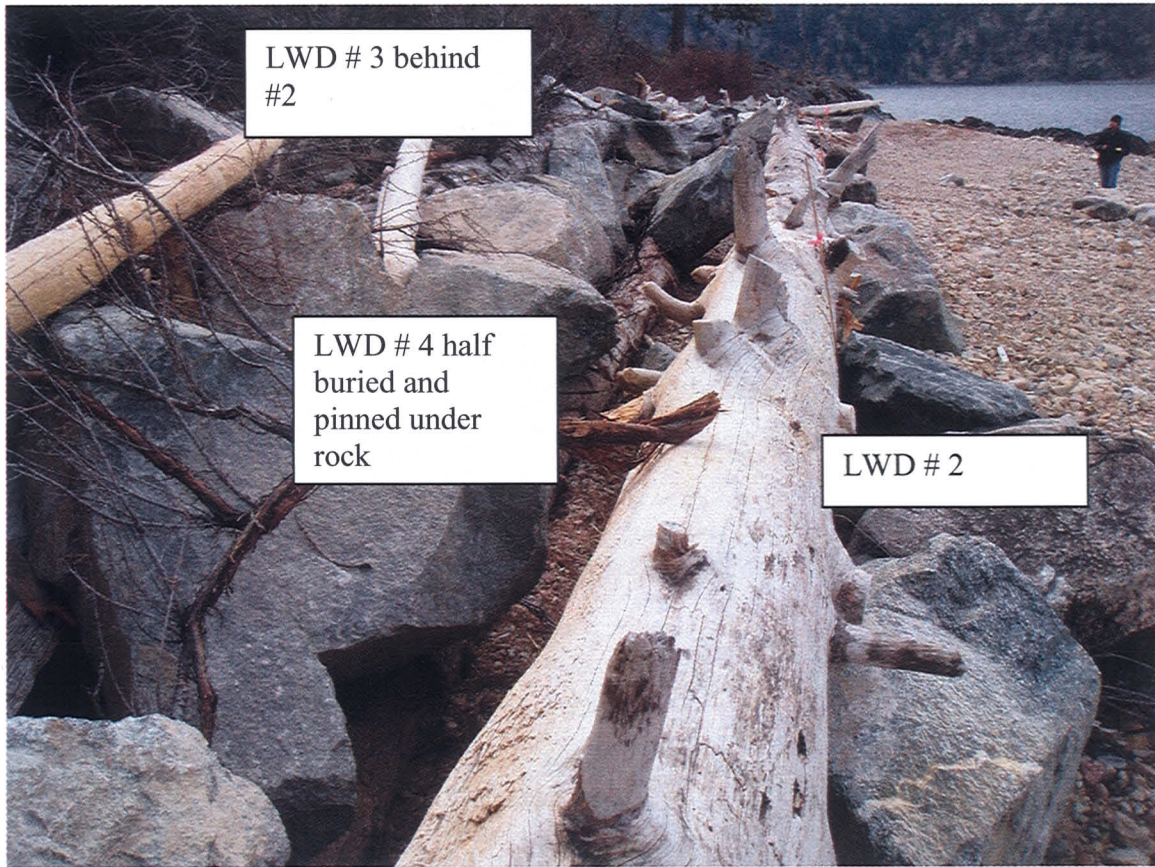
Minor area between treatments A1a and A1b approximately 12 feet of existing larger rock filled with minor woody debris from shoreline. Existing large rock shows approximate level of 1100 feet lake elevation.



Deer Point recreational steps (B1 contract reference) with treatments A1b left of steps and treatment A1c right. Natural smaller woody debris left on site behind large existing rock (far left of picture).



This is a north looking view of LWD #2 in the foreground from the down-lake butt end of the log. The person in the picture is collecting GPS point # 3 on top of LWD # 3.



This view looking south shows the uplake end of LWD #2 pinned with multiple rocks. Treatment is double row of placed rock with LWD for approximately 80 feet.



LWD 2

LWD 4

LWD 3

Person standing on LWD #3 while taking GPS point, photograph shows half buried LWD # 4 behind LWD # 2. This treatment blended barged in rock and existing LWD to treat a (1- 1.5 foot) under cut raw bank. Hanging bitter brush and vegetation was trimmed to allow tighter rock placement.



This shows LWD # 5 foreground with rock piles by end stakes, minor natural woody debris placed behind rock anchored pieces. Treatment B3 recreational steps are shown at the top of the stake.



B3 recreational steps frontal view with LWD # 5, treatment right of steps changes to single rock placement with minor woody debris.



End of uplake treatment section single rock with natural woody debris. Lower end of LWD #5 has rock on top of it. Double root-wad cedar is placed at approximately 1099.7 to 1100 feet elevation. This was a borderline natural piece that did not truly meet our standard for LWD to be anchored, its placement is done so that it will naturally stay embedded in washed up gravels. This piece was not counted in our calculations.



The southern section of the existing log crib had some undercutting of gravels. This was single and smaller rock placed at the toe of the existing logs. This is treatment zone F (contract) approximately 25 lineal feet.



This shows the right side of the existing log cribbing at the Deer Point Dock. A large tree died and blew over causing spaces to develop in the cribbing. Cribbing was pushed back in place, with a new fabric cloth liner and re-leveled. The top of the photograph shows the first section of A2 treatment behind the recreational steps. The top layer of soil was slightly disturbed to do a trial planting of native blue bunch wheatgrass and yarrow (*Agropyron spicatum* and *Achillea millefolium*, respectively).



This is a frontal view of the recreational step access at the end of the existing wood cribbing.



This photograph shows a person sitting on LWD # 6 while taking a GPS point. These are pinned with rock on the high end. This is a T2 treatment with a fabric cloth pocket behind the upper layer of rock. This A2 area was also seed with a native grass mixture of Blue bunch wheatgrass and yarrow. A small amount of additional rock approximately 10 cubic yards was left in front of the natural rock outcrop for maintenance or additional anchoring of new LWD pieces.



This is LWD # 7 in the foreground it is anchored with large rock and cabled wrapped. The left one-third of the picture shows the end of treatment zone A2. GPS point #7 is being collect by the person in the photograph.



This is LWD # 8 it is anchored by cable and a large rock pile.



This is a close up photograph of LWD # 8 cabled with 1/2 inch stainless steel cable and glued with Hilti HY150 epoxy adhesive into drilled holes 8-9 inches deep.

Deer Point Site 58 LWD GPS Locations

Point # 1 = LWD #1 ~ center of log

Lat. 48° 01' 35.91551" N

Long. 120° 18' 47.61504" W

Point # 2 = LWD #2 ~ center of log

Lat. 48° 01' 34.93085" N

Long. 120° 18' 46.73844" W

Point # 3 = LWD #3 ~ high point of log

Lat. 48° 01' 34.81293" N

Long. 120° 18' 46.36639" W

Point # 4 = LWD #4 ~ SE 1/4 of log

Lat. 48° 01' 34.68978" N

Long. 120° 18' 46.50662" W

Point # 5 = LWD #5 ~ center of log

Lat. 48° 01' 34.20168" N

Long. 120° 18' 46.69791" W

Point # 6 = LWD #6 ~ center of medium and small logs

Lat. 48° 01' 34.69759" N

Long. 120° 18' 43.45133" W

Point # 7 = LWD #7 and #8 between 2 logs

Lat. 48° 01' 35.16736" N

Long. 120° 18' 42.40052" W

Deer Point Site 58 LWD GPS Locations

x 1

2 x

x 3

4 x

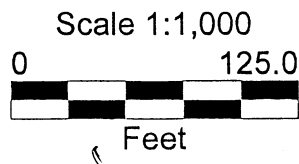
x 5

Dock

x 6

x 7

Lat/Long
WGS 1984



R040917A.ssf
4/21/2009

GPS Pathfinder® Office





US Army Corps
of Engineers ®
Seattle District



CERTIFICATE OF COMPLIANCE WITH DEPARTMENT OF THE ARMY PERMIT

Permit Number: NWS 2007 1652 CRC

Name of Permittee: USDA Forest Service- Chelan Ranger District


Date of Issuance: April 28, 2008

Upon completion of the activity authorized by this permit, please check the applicable boxes below, sign this certification, and return it to the following address:

Department of the Army
U.S. Army Corps of Engineers
Seattle District, Regulatory Branch
Post Office Box 3755
Seattle, Washington 98125-3755

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of your authorization, your project is subject to suspension, modification, or revocation.

- ☒ The work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of this permit.
- ☒ The mitigation required (not including monitoring) by the above-referenced permit has been completed in accordance with the terms and conditions of this permit. *All require LWD anchored and placed per WDFW agreement.*



Signature of Permittee
Robert J. Sheehan
District Ranger

Chelan Ranger District
Mitchell Creek Campground
Erosion Control Treatment Site 59 Report
2009

Site 59 is the first erosion site treated under the Lake Chelan Hydroelectric Project No.637-022, under Article 401. The treatment followed the site specific plans for this site filed November 7, 2007 by Chelan PUD with the Federal Energy Regulatory Commission's (FERC) for approval of the Erosion Control Implementation and Erosion Monitoring and Maintenance Plan (Erosion Control treatment Plans) and the Site-Specific Erosion Control Plan (Site-Specific plan for site 59). On December 14, 2007, FERC issued the Order approving these plans.

Site permits and contracting actions were acquired and administered by the Forest Service, through a funding collection agreement with Public Utility District No. 1 of Chelan County (Chelan PUD). This site is addressed by under Nationwide Permit (NWP) 13 and permitted under reference # NWS 2007 1652 CRC Department of the Army, Seattle District, Corps of Engineers. The contract was awarded to LKE Corporation of Washougal Washington. The Mitchell Creek site was awarded for \$93,534.50.

This report is intended to address permit requirement for large woody debris (LWD) placement, monitoring of the LWD and treatments, and provide Chelan PUD an accomplishment report of how funds were administered. Sixteen large pieces of LWD approximately 655 square feet are part of our required mitigation.

Eight hundred fifty eight tons of rock were used at this site what follows is a pictorial summary of the treatments, of special note is the anchoring of the Large Woody Debris that was used in the treatments.

Monitoring of the site will follow the protocol and intent of the accepted Erosion Control Implementation and Erosion Monitoring and Maintenance Plan document. It outlines the requirements of implementation monitoring with informal surveys during years one and three after implementation, with a formal maintenance and safety monitoring survey done at five year intervals for the remainder of the license.

The Mitchell Creek site (59) does not have any planting components, however some trial applications of planting some low elevation shrubs or cuttings maybe attempted on the last treatment zones G and F1.



LWD was pre-stage at the uplake portion of the treatment site 568 tons of rock were pre-stage at this site during early December 2008. Approximately 356 linear feet of shoreline were treated on the up lake side of site 59 with 241 linear feet treated on the down lake portion of the site.



Placement of rock started and was completed in March of 2009. A Komat'su 220 excavator was the primary rock moving machine. All full treatment areas use a Geotex 801 fabric cloth 12 feet wide that is placed over coir wattles which are placed at 1100 and 1104 elevations, fabric was placed near the top of the treatment and into the toe trench. A small toe trench was excavated below 1100 feet with approximately $\frac{1}{2}$ of the excavated material going upslope to create a softer slope and some be pulled in front of the toe of the trench.



LWD # 1

The photograph shows (LWD# 1) our first rock anchored piece of LWD it has 3 large rock on top of the log and is side pinned by rock. This is treatment area "A" which called for single large rock. We had additional rock and beefed up the treatment.



(LWD #2)

This shows a shoreline view of LWD # 2 (ends are at orange stakes) the piece is down at 1099 feet of elevation and pinned under large rocks. Smaller woody debris that was not of suitable size but naturally washed up in this bay is re-distributed behind and in front of treatment with no attempt to anchor it.



(Top view of LWD #2 pinned with rock)



(LWD # 3 half buried at 1099 feet elevation between pink flagged lathe), 2 large and 2 med rocks pin the log, medium piece “trapped” with one pin point behind anchored LWD. This top log is not a counted mitigation piece of LWD, but still pinned. This is the beginning of treatment C a full T1 type of treatment with fabric cloth and waddles.



(LWD # 4) LWD #4 is between flagged stakes and pinned with 2 large rock with minor LWD placed behind anchored log. The intent here is that # 4 is anchored at 1099 feet elevation and will be under water, anchoring rock should keep minor LWD behind it but allow some movement.



(LWD # 5) LWD #5 is one of the larger pieces of LWD it is double cabled to large rock with ½ inch stainless steel cable and epoxy cemented into rock with Hilti HY 150 adhesive. Shoreline texture of this area was deliberately left rough to mimic original conditions recorded in the 1999 survey photographs CD31 FR 13 and CD 31 FR14.



(LWD # 6) LWD # 6 (between flagged stakes) is a large 30 foot x 18 inch diameter tree bole that is double rocked and double cabled to rocks it is at the very toe of the treatment approximately 1098.5 -1099. Feet of elevation. Smaller woody debris has been placed on top of treated area to help naturalize the site with scattered pieces of "beached" wood. Recreational rock steps (B1) from the upland campsite are right of the old historic steel piling in the photograph.



(Treatment B1) Rock steps for recreational access from shoreline camp site to water, treatment zone C1 ends at root wad right of the lathe and flagging. Large 4-5 foot relatively flat rock was used to create recreational access path.



(LWD # 8 front with pink flagged lathe, and LWD # 7 behind, beach view)
Both LWD pieces are cabled with LWD # 7 partially buried below 1100 Feet elevation. LWD # 8 is at 1099 approximately top of log. This is treatment zone D1 planned as a single large rock with LWD treatment, however due to having additional rock available we choose to improve and beef up this treatment area. Note large blackish rock behind LWD # 8.



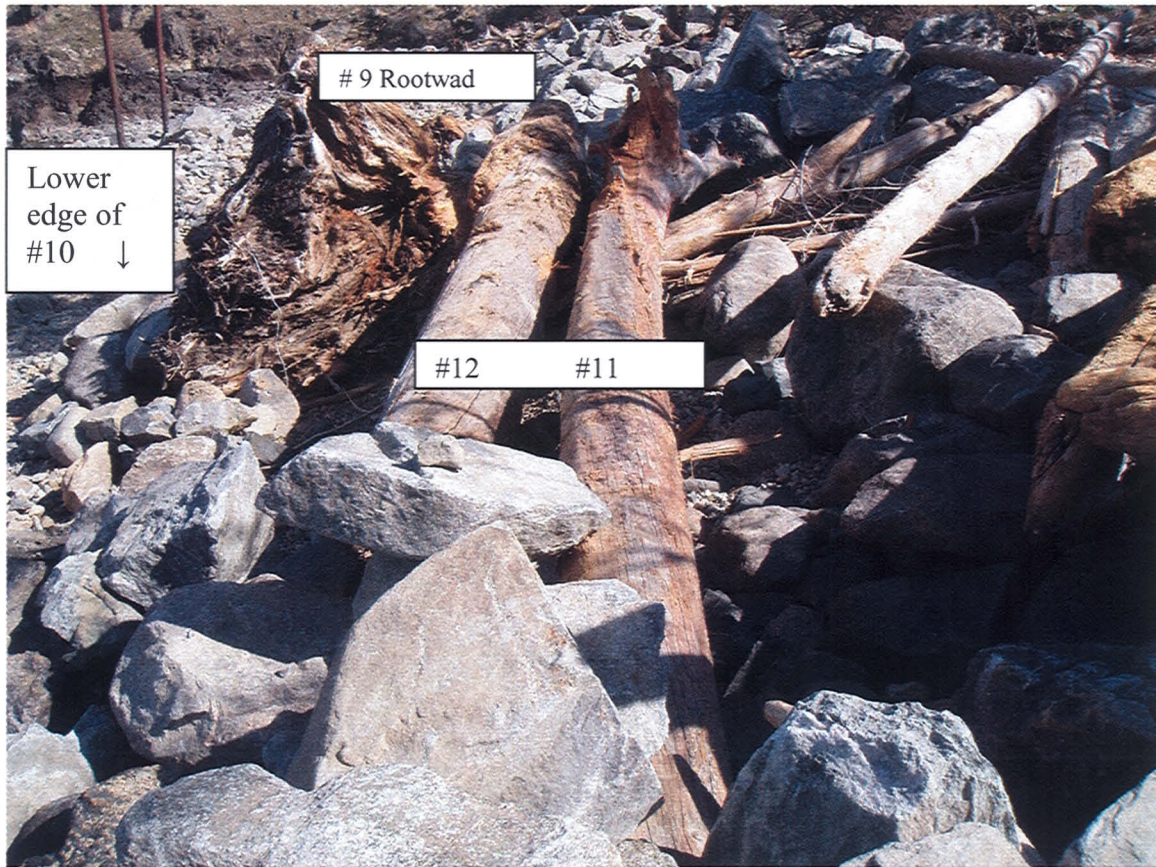
(LWD #7 and #8 side view)

This picture shows double cables on piece #7 (behind large black rock) and rock pinning downlake end. LWD piece # 8 is partially buried with rock on the buried end, with cable on the downlake end.



(LWD #10 foreground and LWD # 9 with large root wad)

Both left ends of these logs are partially buried LWD #10 is buried under the root wad of # 8. Rocks on top of and cables are used on both pieces of LWD. This is still treatment zone D1. LWD pieces # 11 and 12 are located behind # 9's large root wad.



(LWD # 11 and 12)

These pieces of LWD have rock placed on top of the down lake end and are trapped behind the large root wad of LWD # 9.





(B2 Recreational Rock Steps)

This photograph shows treatment zones C2 and B2, C2 is the full treatment left of the steps. At the base of the large point rock is approximately 40 yards of surplus rock for additional repairs should they be needed.



Side view of surplus rock uplake side of Mitchell Creek site.



Site C3 full treatment continued on the other side of the rock for 17 feet. End of uplake treatment of site 59.



Approximately 190 tons of pre-placed rock for treatments D2 – E2, for treating 148 feet of erosion control repair. Note old crib wall and failed stream side section that has washed out.

Photo is approximately 20 feet of spot rock treatment in area D2.



Lighter white rock is newly placed beefing up failed section of previous 1980 treatment.



B3 recreational steps are right of the large black rock followed by treatment area E1 a fully treated area with fabric cloth and waddles.



Since Mitchell Creek Shelter is the hub all shoreline water activities 3 different sets of rock steps were planned to facilitate user access to the Lake via the constructed steps; two in front and one along side of Mitchell Creek.



B5 are the recreational steps leading from Mitchell Shelter area to Lake and Mitchell Creek. Rock next to creek to pink flagged lathe is rock over the old exposed wire basket gabion from 1980's or 1970's repair when Mitchell Creek over flowed it channel.



This is an overhead view of the treated area around Mitchell Creek Shelter.



LWD # 13 and # 14

These pieces of LWD are down lake of Mitchell Creek. They are anchored by rock piles over the LWD.



Upper end of LWD # 13 anchored with large single rock on top of LWD.



(LWD # 15)

LWD # 15 is anchored by two large piles of rock. Treatment areas F and G approximately 66 feet are treated with a double row of rock and this one large anchored piece of LWD. Despite having extra rock the decision was made to stay with the two forms of proposed treatments.



(LWD # 16)

LWD # 16 is anchored by a large single rock centered on top of the log between two other large rocks.



Mitchell Creek site 59 end of treatment, F1 single rock treatment.



Mitchell Creek storage location of rock to beef up future treatments for LWD, or stream work; approximately 45 yards of material.

Mitchell Creek Site 59 LWD GPS Locations

Up Lake side of site

Point # 1 = LWD #1 ~ center of log

Lat. 47° 58' 16.39399" N

Long. 120° 11' 32.76848" W

Point # 2 = LWD #2 ~ center of log

Lat. 47° 58' 15.98454" N

Long. 120° 11' 32.75528" W

Point # 3 = LWD #3 ~ center of log

Lat. 47° 58' 15.54444" N

Long. 120° 11' 33.04750" W

Point # 4 = LWD #4 ~ center of log

Lat. 47° 58' 15.46290" N

Long. 120° 11' 33.19608" W

Point # 5 = LWD #5 ~ center of log

Lat. 47° 58' 15.27849" N

Long. 120° 11' 33.47072" W

Point # 6 = LWD #6 ~ center of log

Lat. 47° 58' 14.91869" N

Long. 120° 11' 33.72109" W

Point # 7 = LWD #7 ~ center of log

Lat. 47° 58' 14.46166" N

Long. 120° 11' 34.21037" W

Point # 8 = LWD #8 ~ center of log

Lat. 47° 58' 14.40970" N

Long. 120° 11' 34.41930" W

Point # 9 = LWD #9 and LWD #10 ~ center between 2 logs

Lat. 47° 58' 14.08568" N

Long. 120° 11' 34.58109" W

Point # 10 = LWD #11 and LWD #12 ~ center between 2 logs

Lat. 47° 58' 13.93490" N

Long. 120° 11' 34.64828" W

Mitchell Creek Site 59 LWD GPS Locations

Down Lake below Mitchell Creek

Point # 11 = LWD #13 ~ center of log

Lat. 47° 58' 09.52649" N

Long. 120° 11' 32.26134" W

Point # 12 = LWD #14 ~ center of log

Lat. 47° 58' 09.31156" N

Long. 120° 11' 32.37623" W

Point # 13 = LWD #15 ~ center of log

Lat. 47° 58' 08.61932" N

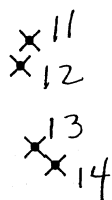
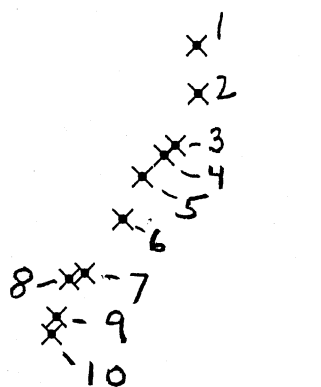
Long. 120° 11' 32.18870" W

Point # 14 = LWD #16 ~ center of log

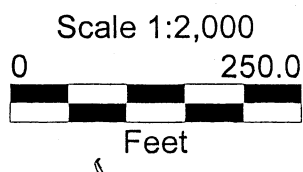
Lat. 47° 58' 08.46792" N

Long. 120° 11' 31.93212" W

Mitchell Creek Site 59 LWD GPS Locations



Lat/Long
WGS 1984



R040919A.ssf
4/21/2009

GPS Pathfinder® Office

