NORTH COAST RESOURCE PARTNERSHIP
2018/19 IRWM Project Application

The North Coast Resource Partnership (NCRP) 2018/19 Project Application Instructions and additional information can be found at the NCRP 2018/19 Project Solicitation webpage (https://northcoastresourcepartnership.org/proposition-1-irwm-round-1-implementation-funding-solicitation/). Please fill out grey text boxes and select all the check boxes that apply to the project. Application responses should be clear, brief and succinct.

Project Applications will be accepted until 5:00 pm, ~~March 8, 2019~~ **March 15, 2019.** It is important to save the application file with a distinct file name that references the project name. When the application is complete, please email to kgledhill@westcoastwatershed.com

If you have questions, need additional information or proposal development assistance please contact:

- Katherine Gledhill at kgledhill@westcoastwatershed.com or 707.795.1235
- Tribal Projects: Sherri Norris, NCRP Tribal Coordinator at sherri@cieaweb.org or 510.848.2043

Project Name: Kenny Creek Instream Habitat Enhancement Project

A. ORGANIZATION INFORMATION

1. **Organization Name: Eel River Watershed Improvement Group (ERWIG)**

2. **Contact Name/Title**
   Name: Isaac Mikus
   Title: Executive Director
   Email: isaac@erwig.org
   Phone Number (include area code): 707 845-8119

3. **Organization Address (City, County, State, Zip Code):**
   1500 Alamar Way
   Fortuna, CA 95540

4. **Organization Type**
   ☐ Public agency
   ☒ Non-profit organization
   ☐ Public utility
   ☐ Federally recognized Indian Tribe
   ☐ California State Indian Tribe listed on the Native American Heritage Commission's California Tribal Consultation List
   ☐ Mutual water company
   ☐ Other:

5. **Authorized Representative** (if different from the contact name)
   Name:
   Title:
   Email:
   Phone Number (include area code):

6. **Has the organization implemented similar projects in the past?** ☒ yes ☐ no
   Briefly describe these previous projects.
   Recently implemented similar projects include:
   1. Hollow Tree Trib Complex Habitat Enhancement Project: Installed 53 large woody debris (LWD) structures containing a total of 354 pieces of LWD. Planted 2,600 conifer seedlings.
   2.Hollow Tree Complex Habitat Enhancment Project - Phase 2: Installed 24 LWD structures containing 96 pieces of LWD. Planted 100 conifers.
   3. Fish Creek Instream Habitat Enhancement Project: Installed 22 LWD structures containing 63 pieces of LWD.

7. **List all projects the organization is submitting to the North Coast Resource Partnership for the 2018/19 Project Solicitation in order of priority.**
   Kenny Creek Instream Habitat Enhancement Project
   Cuneo Creek Riparian Restoration Project

8. **Organization Information Notes:**
   ERWIG has a long history of successful completion of stream restoration projects, going back over 20 years.

B. ELIGIBILITY

1. **North Coast Resource Partnership and North Coast IRWM Objectives**

   GOAL 1: INTRAREGIONAL COOPERATION & ADAPTIVE MANAGEMENT
   ☐ Objective 1 - Respect local autonomy and local knowledge in Plan and project development and implementation
   ☐ Objective 2 - Provide an ongoing framework for inclusive, efficient intraregional cooperation and effective, accountable NCIRWMP project implementation

☐ Objective 3 - Integrate Traditional Ecological Knowledge in collaboration with Tribes to incorporate these practices into North Coast Projects and Plans

GOAL 2: ECONOMIC VITALITY
☐ Objective 4 - Ensure that economically disadvantaged communities are supported and that project implementation enhances the economic vitality of disadvantaged communities by improving built and natural infrastructure systems and promoting adequate housing
☐ Objective 5 - Conserve and improve the economic benefits of North Coast Region working landscapes and natural areas

GOAL 3: ECOSYSTEM CONSERVATION AND ENHANCEMENT
☒ Objective 6 – Conserve, enhance, and restore watersheds and aquatic ecosystems, including functions, habitats, and elements that support biological diversity
☒ Objective 7 - Enhance salmonid populations by conserving, enhancing, and restoring required habitats and watershed processes

GOAL 4: BENEFICIAL USES OF WATER
☐ Objective 8 - Ensure water supply reliability and quality for municipal, domestic, agricultural, Tribal, and recreational uses while minimizing impacts to sensitive resources
☐ Objective 9 - Improve drinking water quality and water related infrastructure to protect public health, with a focus on economically disadvantaged communities
☐ Objective 10 - Protect groundwater resources from over-drafting and contamination

GOAL 5: CLIMATE ADAPTATION & ENERGY INDEPENDENCE
☒ Objective 11 - Address climate change effects, impacts, vulnerabilities, and strategies for local and regional sectors to improve air and water quality and promote public health
☐ Objective 12 - Promote local energy independence, water/ energy use efficiency, GHG emission reduction, and jobs creation

GOAL 6: PUBLIC SAFETY
☐ Objective 13 - Improve flood protection and reduce flood risk in support of public safety

2. Does the project have a minimum 15-year useful life?
☒ yes ☐ no
If no, explain how it is consistent with Government Code 16727.

3. Other Eligibility Requirements and Documentation

CALIFORNIA GROUNDWATER MANAGEMENT SUSTAINABILITY COMPLIANCE
a) Does the project that directly affect groundwater levels or quality?
☐ yes ☒ no
b) If Yes, will the organization be able to provide compliance documentation outlined in the instructions, to include in the NCRP Regional Project Application should the project be selected as a Priority Project?
☐ yes ☐ no

CASGEM COMPLIANCE

a) Does the project overlie a medium or high groundwater basin as prioritized by DWR?
☐ yes ☒ no
b) If Yes, list the groundwater basin and CASGEM priority:
c) If Yes, please specify the name of the organization that is the designated monitoring entity:
d) If there is no monitoring entity, please indicate whether the project is wholly located in an economically disadvantaged community.
☐ yes ☐ no

URBAN WATER MANAGEMENT PLAN

a) Is the organization required to file an Urban Water Management Plan (UWMP)?
☐ yes ☒ no
b) If Yes, list the date the UWMP was approved by DWR:
c) Is the UWMP in compliance with AB 1420 requirements?
☐ yes ☐ no
d) Does the urban water supplier meet the water meter requirements of CWC 525?
☐ yes ☐ no
c) If Yes, will the organization be able to provide compliance documentation outlined in the instructions, to include in the NCRP Regional Project Application should the project be selected as a Priority Project?
☐ yes ☐ no

AGRICULTURAL WATER MANAGEMENT PLAN

a) Is the organization – or any organization that will receive funding from the project – required to file an Agricultural Water Management Plan (AWMP)?
☐ yes ☒ no
b) If Yes, list date the AWMP was approved by DWR:
c) Does the agricultural water supplier(s) meet the requirements in CWC Part 2.55 Division 6?
☐ yes ☐ no

SURFACE WATER DIVERSION REPORTS

a) Is the organization required to file surface water diversion reports per the requirements in CWC Part 5.1 Division 2?
☐ yes ☒ no
d) If Yes, will the organization be able to provide SWRCB verification documentation outlined in the instructions, to include in the NCRP Regional Project Application should the project be selected as a Priority Project?
☐ yes ☐ no

STORM WATER MANAGEMENT PLAN

a) Is the project a stormwater and/or dry weather runoff capture project?
☐ yes ☒ no
b) If yes, does the project benefit a Disadvantaged Community with a population of 20,000 or less?
☐ yes ☐ no
e) If No, will the organization be able to provide documentation that the project is included in a Stormwater Resource Plan that has been incorporated into the North Coast IRWM Plan, should the project be selected as a Priority Project?

☐ yes ☐ no

C. GENERAL PROJECT INFORMATION

1. Project Name: Kenny Creek Instream Habitat Enhancement Project

2. Eligible Project Type under 2018/19 IRWM Grant Solicitation

- ☐ Water reuse and recycling for non-potable reuse and direct and indirect potable reuse
- ☐ Water-use efficiency and water conservation
- ☐ Local and regional surface and underground water storage, including groundwater aquifer cleanup or recharge projects
- ☐ Regional water conveyance facilities that improve integration of separate water systems
- ☒ Watershed protection, restoration, and management projects, including projects that reduce the risk of wildfire or improve water supply reliability
- ☐ Stormwater resource management projects to reduce, manage, treat, or capture rainwater or stormwater
- ☐ Stormwater resource management projects that provide multiple benefits such as water quality, water supply, flood control, or open space
- ☐ Decision support tools that evaluate the benefits and costs of multi-benefit stormwater projects
- ☐ Stormwater resource management projects to implement a stormwater resource plan
- ☐ Conjunctive use of surface and groundwater storage facilities
- ☐ Decision support tools to model regional water management strategies to account for climate change and other changes in regional demand and supply projections
- ☐ Improvement of water quality, including drinking water treatment and distribution, groundwater and aquifer remediation, matching water quality to water use, wastewater treatment, water pollution prevention, and management of urban and agricultural runoff
- ☐ Regional projects or programs as defined by the IRWM Planning Act (Water Code §10537)
- ☐ Other:

3. Project Abstract

This project will increase salmonid habitat in Kenny Creek through the placement, instream, of 28 LWD structures along a 1.1 mile long stream reach (worksite). The LWD structures will provide shelter, increase habitat complexity, deepen pools, provide velocity refugia, and enhance spawning gravels. Additionally, 400 coniferous trees will be planted along the riparian corridor. These trees will help decrease stream temperatures and will store carbon.

4. Project Description

The SF Eel watershed has been identified by NOAA, NMFS and CDFW as very important to the recovery of threatened and endangered salmonid species. Kenny Creek is an important salmonid-bearing tributary to the SF Eel River. It provides spawning and rearing habitat to juvenile and adult coho, Chinook and steelhead. A 2005 CDFW stream inventory report recommended adding woody debris to increase shelter complexity and to increase pool depth. A recent survey by ERWIG and CCC found that Kenny Creek is severely lacking LWD, with an average count of 18.2 pieces of LWD per mile. This project will add 90 pieces of LWD over 1.1 miles of stream length with the installation of 28 LWD structures. Adding these structures will increase the average count up to 100 pieces of LWD per mile, which rates as the highest target value of “very good”

according to the Southern Oregon Northern California Coast Coho Recovery Plan (NOAA, 2014). The project will be accomplished by purchasing logs and uprooting trees with rootwads from areas in which the stream canopy will not be affected. Logs and logs with rootwads will be placed by an excavator. After log placement, the California Conservation Corps (CCC) will anchor the logs to live trees and to each other. Upon construction completion, all exposed soil will be mulched and 400 conifer seedlings will be planted. All work will be supervised by the ERWIG project manager. This project will result in a dramatic increase in suitable habitat for salmonids. Habitat improvements include velocity refugia, increased shelter, deeper pools, and increased spawning habitat. This project will also result in a long-term increase in carbon sequestration with the planting of 400 conifers.

5. **Specific Project Goals/Objectives**

   Goal 1: Increase the amount and quality of habitat available to salmonids in Kenny Creek.
   Goal 1 Objective: Meet the NOAA SONCC guideline of "very good" for # of pieces of LWD in the project reach.
   Goal 1 Objective: Increase pool shelter and shelter complexity in the project reach.
   Goal 1 Objective: Deepen existing pools in the project reach.
   Goal 1 Objective: Create additional pool tailouts that are suitable for spawning.

   Goal 2: Restore the conifer component of the riparian corridor.
   Goal 2 Objective: Plant 400 native trees along the project reach.
   Goal 2 Objective: Sequestor 12,000 lbs of carbon per year by year 14 and 42,400 lbs per year by year 50, for a total of 928,280 lbs of carbon sequestered over 50 years.
   Goal 2 Objective:
   Goal 2 Objective:

   Goal 3:
   Goal 3 Objective:
   Goal 3 Objective:
   Goal 3 Objective:

   Additional Goals & Objectives (List)

6. **Describe how the project addresses the North Coast Resource Partnership and North Coast IRWM Plan Goals and Objectives selected**.

   Goal 3, Objective 6: This project will enhance watersheds and aquatic ecosystems by adding high quality woody habitat into Kenny Creek. The wood added will not only provide habitat for salmonids, but it will also improve geomorphic function in Kenny Creek and it will provide ecological benefit to a suite of native species.
   Goal 3, Objective 7: Kenny Creek is home to coho salmon, steelhead and Chinook salmon. This project will provide habitat to juvenile and adult salmonids. The LWD added to Kenny Creek will provide high water refugia, which is key to juvenile salmonid survivability. The LWD will also provide shelter from predators and will decrease density dependent competition.
   Goal 5, Objective 11: This project will make Kenny Creek more resilient to climate change by planting trees for carbon sequestration and by providing logs for velocity refugia for salmonids, a vital need during the higher flows resulting from climate change driven, more intense rainstorms.

7. **Describe the need for the project**.

Historic logging practices have led to existing conditions in which LWD is severely lacking in Kenny Creek. Trees that would have been available to recruit into Kenny Creek have been removed by logging and, currently, there are only smaller, third-growth coniferous trees in the riparian, most of which are healthy and unlikely to contribute to Kenny Creek anytime soon. Kenny Creek is a wide, flashy stream that easily transports smaller, unanchored logs out of the watershed. Currently there are only 20 pieces of LWD in the 1.1 mile project reach. Most of the limited LWD in Kenny Creek was placed and anchored through a 2008 ERWIG project. This project will result in the addition of 90 pieces of LWD over the 1.1 mile proejct reach.

8. **List the impaired water bodies (303d listing) that the project benefits:**
   South Fork Eel River

9. **Will this project mitigate an existing or potential Cease and Desist Order or other regulatory compliance enforcement action?** ☐ yes ☒ no
   If so, please describe?

10. **Describe the population served by this project.**
    This project is located west of Laytonville, CA in the town of Branscomb. Branscomb was a lumber town for many years and at one time the Harwood Mill employed 200 people. The housing crash of the late 2000's took a heavy toll on the mill and it had to close down. The mill was the main employer of the area; now that it is closed there are very few available jobs and economic drivers in the area.

11. **Does the project provide direct water-related benefits to a project area comprised of Disadvantaged Communities or Economically Distressed Communities?**
    - ☒ Entirely
    - ☐ Partially
    - ☐ No

    List the Disadvantaged Community(s) (DAC)
    The town of Branscomb and surrounding areas.

12. **Does the project provide direct water-related benefits to a project area comprised of Severely Disadvantaged Communities (SDAC)?**
    - ☒ Entirely
    - ☐ Partially
    - ☐ No

    List the Severely Disadvantaged Community(s)
    The town of Branscomb and surrounding areas.

13. **Does the project provide direct water-related benefits to a Tribe or Tribes**?
    - ☐ Entirely
    - ☐ Partially
    - ☒ No

    List the Tribal Community(s)

    If yes, please provide evidence of support from each Tribe listed as receiving these benefits.

14. **If the project provides benefits to a DAC, EDA or Tribe, explain the water-related need of the DAC, EDA or Tribe and how the project will address the described need.**
The community will benefit from the project through improved water quality and improved fisheries. The trees we plant will provide shade to the stream corridor, lowering air and water temperatures, which will improve downstream water quality. The habitat we create should result in a healthier salmonid population within Kenny Creek and the SF Eel River watershed.

15. **Does the project address and/or adapt to the effects of climate change? Does the project address the climate change vulnerabilities in the North Coast region?** ☒ yes ☐ no
If yes, please explain.
This project includes a tree planting component, which will decrease air and water temperatures within the watershed. The trees will also sequestor carbon. The instream portion of the project will result in habitat structures that will provide salmonids velocity refugia during climate change driven increases in the intensity of rainfall. Instream structures will also improve pool habitat and increase fish survivability during hotter and dryer summers.

16. **Describe how the project contributes to regional water self-reliance.**
This project will improve water quality by decreasing water temperatures. Many people who live in the watershed rely on water in the Kenny Creek watershed for their household needs.

17. **Describe how the project benefits salmonids, other endangered/threatened species and sensitive habitats.**
This project will greatly increase suitable salmonid habitat. Most of the stream is devoid of shelter and velocity refugia. This project will remedy the lack of habitat through the placement of LWD structures. The structures will provide shelter, velocity refugia, spawning substrate, and territory division for salmonids. Additionally the salmonid habitat will also benefit animals that use basking logs and cover logs, such as western pond turtles, yellow-legged frogs, and river otters.

18. **Describe local and/or political support for this project.**
The landowners and tenants in the watershed support the project.

19. **List all collaborating partners and agencies and nature of collaboration.**
This project has been developed with the support of CDFW.

20. **Is this project part or a phase of a larger project?** ☒ yes ☐ no
Are there similar efforts being made by other groups? ☐ yes ☒ no
If so, please describe?
In the summer of 2017 ERWIG used funding from the CDFW FRGP program and partnered with two engineering companies and a construction company to remove a fish passage barrier on Kenny Creek. That project was completed in the winter of 2018. Now that the barrier is removed we are following up with this fish habitat project in order to provide high quality habit in the now accessible stretch of stream above the former barrier.

21. **Describe the kind of notification, outreach and collaboration that has been done with the County(ies) and/or Tribes within the proposed project impact area, including the source and receiving watersheds, if applicable.**
N/A

22. **Describe how the project provides a benefit that meets at least one of the Statewide Priorities as defined in the 2018 IRWM Grant Program Guidelines and Tribal priorities as defined by the NCRP?**
This project meets the priority "Protect and Restore Important Ecosystems". Kenny Creek is an important coho, steelhead and Chinook stream. This project will restore the habitat in Kenny Creek, which will increase survivability and reproductive success of all salmonid species. The project will also improve water quality and restore natural ecosystem function.

23. **Project Information Notes:**

D. PROJECT LOCATION

1. **Describe the location of the project**
Geographical Information
Kenny Creek is a tributary to the SF Eel River. The mouth of Kenny Creek is at the town of Branscomb, CA, in Mendocino County. The project reach begins approximately 0.27 miles upstream of the confluence with the SF Eel River and extends 1.1 miles upstream. The middle of the project reach is located at Lat: 39.66669, Long: -123.63306

2. **Site Address (if relevant):**

3. **Does the applicant have legal access rights, easements, or other access capabilities to the property to implement the project?**
☒ Yes If yes, please describe
☐ No If No, please provide a clear and concise narrative with a schedule, to obtain necessary access.
☐ NA If NA, please describe why physical access to a property is not needed.
Currently ERWIG has an access agreement with the landowner allowing us to enter the property to plan this project. If funded, we will obtain an access agreement from the landowner under the terms of the grant agreement.

4. **Project Location Notes:**

E. PROJECT TASKS, BUDGET AND SCHEDULE

1. **Projected Project Start Date:** 3/1/20
Anticipated Project End Date: 3/31/22

2. **Will CEQA be completed within 6 months of Final Award?**
☐ Yes State Clearinghouse Number:
☐ NA, Project is exempt from CEQA
☐ NA, Not a Project under CEQA

☒ NA, Project benefits entirely to DAC, EDA or Tribe, or is a Tribal local sponsor. [Projects providing a water-related benefit entirely to DACs, EDAs, or Tribes, or projects implemented by Tribes are exempt from this requirement].
☐ No

3. **Please complete the CEQA Information Table below**
   Indicate which CEQA steps are currently complete and for those that are not complete, provide the estimated date for completion.

CEQA STEP	COMPLETE? (y/n)	ESTIMATED DATE TO COMPLETE
Initial Study	N	7/1/20
Notice & invitation to consult sent to Tribes per AB52	N	
Notice of Preparation	N	
Draft EIR/MND/ND	N	8/1/20
Public Review	N	9/1/20
Final EIR/MND/ND	N	10/1/20
Adoption of Final EIR/MND/ND	N	10/15/20
Notice of Determination	N	11/1/20
N/A - not a CEQA Project		

If additional explanation or justification of the timeline is needed or why the project does not require CEQA, please describe.

4. **Will all permits necessary to begin construction be acquired within 6 months of Final Award?**
   ☐ Yes
   ☒ NA, Project benefits entirely to DAC, EDA, Tribe, or is a Tribal local sponsor
   ☐ No

5. **PERMIT ACQUISITION PLAN**

Type of Permit	Permitting Agency	Date Acquired or Anticipated
LSAA	CDFW	3/1/21
401	CA Water Board	3/1/21
404	Army Corps	3/1/21

For permits not acquired: describe actions taken to date and issues that may delay acquisition of permit.

6. **Describe the financial need for the project**.
   This project is a fisheries restoration project that will not be undertaken without grant funding. The landowner does not have the financial means, nor frankly the desire, to pay for the project himself. The benefits to fish habitat in Kenny Creek are well worth the cost of the project.

7. **Is the project budget scalable?** ☒ yes ☐ no
   Describe how a scaled budget would impact the overall project.
   We have 28 structures designed as part of the project. We can reduce the cost of the project by 25% by building fewer structures. However, it is most cost effective to keep the project fully intact due to the flat rate of permitting costs, CEQA-related costs, and heavy equipment mobilization.

8. **Describe the basis for the costs used to derive the project budget according to each budget category.**
   The basis of all costs were developed through subcontractor estimates and by the costs incurred by similar projects over the last couple of years. Direct Project Admin costs were developed using costs incurred by past projects of similar scope. Planning/Design/Engineering Costs were developed through contractor estimates and costs incurred by past projects of similar scope. Construction and implementation costs were developed through contractor estimates and costs incurred by past projects.

9. **Provide a narrative on cost considerations including alternative project costs.**
   The budget was developed using the lowest estimates from qualified contractors and compared to the costs of similar projects. Other designs were considered to lower costs, with the result being the best designs for the goals of this project, at the lowest cost feasible.

10. **List the sources of non-state matching funds, amounts and indicate their status**.

    This project is the second phase, the first phase was the removal of a fish passage barrier. The barrier was removed in 2017 and the project closed in January 2019. The fish passage project was wholly funded through FRGP at a final cost of $671,393.22. Additionally, we will use 70 landowner donated logs for the project as cost share at the rate of $600 per log for a total of $42,000. ERWIG has anchoring materials in stock that we can donate to the project, it has a value of $4,830. All cost share is already secured.

11. **List the sources and amount of state matching funds.**

    The CCC will provide labor at a discount of $7.47 per hour per corpsmember for a total of $16,732.80. This cost share is secured.

12. **Cost Share Waiver Requested (DAC or EDA)?** ☒ yes ☐ no
    Cost Share Waiver Justification: Describe what percentage of the proposed project area encompasses a DAC/EDA, how the community meets the definition of a DAC/EDA, and the water-related need of the DAC/EDA that the project addresses. In order to receive a cost share waiver, the applicant must demonstrate that the project will provide benefits that address a water-related need of a DAC/EDA.
    The project is entirely in a severely disadvantaged community. The community is the town of Branscomb and the surrounding areas. The people in this area have few opportunities for employment and the area has experienced a severe economic decline since the mill closed. This goals of this project are to improve fish habitat and to improve water quality. A healthy watershed for fish and people will be a benefit to the DAC. The project is part of a watershed wide effort to recover salmon populations, which will result in increased economic opportunity.

13. **Major Tasks, Schedule and Budget for NCRP 2018 IRWM Project Solicitation**
Please complete MS Excel table available at https://northcoastresourcepartnership.org/proposition-1-irwm-round-1-implementation-funding-solicitation/; see instructions for submitting the required excel document with the application materials.

14. **Project Tasks, Budget and Schedule Notes:**

F. PROJECT BENEFITS & JUSTIFICATION

1. **Does the proposed project provide physical benefits to multiple IRWM regions or funding area(s)?**
☐ yes ☒ no
If Yes, provide a description of the impacts to the various regions.

2. **Provide a narrative for project justification. Include any other information that supports the justification for this project, including how the project can achieve the claimed level of benefits. List any studies, plans, designs or engineering reports completed for the project.** *Please see the instructions for more information about submitting these documents with the final application.*
As outlined in the Recovery Strategy for California Coho Salmon (CDFG, 2004), Kenny Creek is located within the Laytonville Hydrologic Sub-area in the Eel River Hydrologic Unit. The Recover Strategy for California Coho Salmon outlines several problems facing coho salmon in the Laytonville Sub-area. The problems outlined that pertain to Kenny Creek include quality and quantity of pools, limited escape cover and spawning gravels deficient in quantity. The South Fork Eel River is considered a priority watershed for restoration in the Coastal Multispecies Recovery Plan (NMFS, 2016). Additionally, coho in the South Fork Eel River watershed are considered a "core population" and "are likely to respond to recovery actions" (SONCC, 2014).
An LWD survey conducted by ERWIG and the CCC found only 20 pieces of LWD over 1.1 miles. The majority of the LWD counted was from a 2008 LWD project completed by ERWIG. Due to the lack of LWD, the Kenny Creek Stream Inventory Report (CDFG, 2005) recommends to "Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from bedrock ledges. Adding high quality complexity with woody cover in the pools is desirable."
A partial fish passage barrier was removed by ERWIG in the summer of 2017, providing coho, Chinook, and steelhead unimpeded access to two miles of upstream habitat. Most of the newly accessible habitat lacks shelter and velocity refugia. In 2018 and 2019, ERWIG and the CCC have developed design plans for 28 LWD structures, which will follow techniques and best practices found in the California Salmonid Stream Habitat Restoration Manual - Fourth Edition (CDFG, 2010). These structures are designed to achieve the claimed benefits. Stream restoration similar to this project has been shown to be effective (Bouwes, Bennett & Wheaton, 2016). Adding LWD to streams has been shown to increase growth rates in salmonids (Hafs, Harrison, Utz & Dunne, 2014) and increase survivability (Quinn & Peterson, 1996). The project will be monitored for three years following implementation and desired benefits will be measured (pool depths, shelter, spawning substrate).

3. **Does the project address a contaminant listed in AB 1249 (nitrate, arsenic, perchlorate, or hexavalent chromium)?** ☐ yes ☒ no
If yes, provide a description of how the project helps address the contamination.

4. **Does the project provide safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes consistent with AB 685?** ☐ yes ☒ no
   If Yes, please describe.

5. **Does the project employ new or innovative technologies or practices, including decision support tools that support the integration of multiple jurisdictions, including, but not limited to, water supply, flood control, land use, and sanitation?** ☐ yes ☒ no
   If Yes, please describe.

6. **For each of the Potential Benefits that the project claims complete the following table to describe an estimate of the benefits expected to result from the proposed project.** [*See the NCRP Project Application Instructions, Potential Project Benefits Worksheet and background information to help complete the table. The NCRP Project Application, Attachment B includes additional guidance, source materials and examples from North Coast projects*.]

PROJECT BENEFITS TABLE

Potential Benefits Description	Physical Amt of Benefit	Physical Units	Est. Economic Value per year	Economic Units
Water Supply				
Water Quality				
Other Ecosystem Service Benefits				
Habitat Restoration	3.28	acres	13120	dollars
Other Benefits				
Carbon Sequestration	9.3	tons	140	dollars

Potential Benefits Description	Physical Amt of Benefit	Physical Units	Est. Economic Value per year	Economic Units

7. Project Justification & Technical Basis Notes:

Major Tasks, Schedule and Budget for North Coast Resource Partnership 2018/19 IRWM Project Solicitation

Project Name: Kenny Creek Instream Enhancement Project
Organization Name: Eel River Watershed Improvement Group

Task #	Major Tasks	Task Description	Major Deliverables	Current Stage of Completion	IRWM Task Budget	Non-State Match	Total Task Budget	Start Date	Completion Date
A	**Category (a): Direct Project Administration**								
1	Administration	In cooperation with the County of Humboldt sign a sub-grantee agreement for work to be completed on this project. Develop invoices with support documentation. Provide audited financial statements and other deliverables as required	Invoices, audited financial statements and other deliverables as required	0%	$1,600.00	$0.00	$1,600.00	3/1/20	3/1/22
2	Monitoring Plan	Develop Monitoring Plan to include goals and measurable objectives	Final Monitoring Plan	50%	$400.00	$0.00	$400.00	4/1/20	6/1/20
3	Labor Compliance Program	Execute service agreement with Labor Compliance Program company	Submission of Labor Compliance Program	0%	$300.00	$0.00	$300.00	5/1/21	11/1/21
4	Reporting	Develop monthly reports describing work completed, challenges, and strategies for reaching remaining project objectives. Develop Final Report	Quarterly and Final Reports	0%	$6,500.00	$0.00	$6,500.00	4/1/20	3/1/22
B	**Category (b): Land Purchase/Easement**								
1				0%	$0.00	$0.00	$0.00		
C	**Category (c): Planning/Design/Engineering/Environmental Documentation**								
1	Final Design /Plans	Create final design plans based on existing conditions in year of construction.	Finalized Design Plans	90%	$300.00	$0.00	$300.00	5/1/21	7/1/21
2	Environmental Documentation: CEQA *	Prepare DWR Environmental Information Form; Select qualified consultant to complete the CEQA process through a qualification based selection process; Notify Native American Heritage Commission to determine if tribal traditional lands are in the project area; Conduct preliminary project review; Prepare Initial Study and all relevant CEQA documents as per CEQA Guidelines. File Notice of Determination	Environmental Information Form; Notice of Determination; Letter from lead agency stating there were no legal challenges during public review; Approved and adopted CEQA documentation	0%	$28,000.00	$0.00	$28,000.00	4/1/20	10/1/20
3	Permit Development *: LSAA	Submit an LSAA application to CDFW, pay required fee.	LSAA permit	0%	$4,550.00	$0.00	$4,550.00	6/1/20	8/1/20
4	Permit Development *: 401/404	Work with the regional water quality board and army corps to obtain 401 clearance and 404 permit	401 certification	0%	$5,500.00	$0.00	$5,500.00	6/1/20	9/1/20
D	**Category (d): Construction/Implementation**								
1	Construction/Implementation Contracting	Get contractor estimates, develop contracts.	Signed contracts with contractors	0%	$240.00	$0.00	$240.00	5/1/21	6/1/21
2	Labor Compliance Program	Labor compliance subcontracor monitors compliance	Compliance certification.	0%	$1,440.00	$0.00	$1,440.00	5/1/21	10/1/21
3	Mobilization and Site Preparation	Prepare Site and mobilize project:1. Initiate project site preparation; 2. Assure project permits are in place; 3. Remove fish from excavator crossing. 4. Conduct pre-project site photo-monitoring	Summary of site preparation activities in monthly reports; fish removal report, pre-project site photos	0%	$3,257.00	$0.00	$3,257.00	6/1/21	8/1/21
4	Tool and Material Purchasing	Purchase materials for project, including, but not limited to: anchoring tools, anchoring hardware, logs and field supplies. Landowner will donate 70 logs to the project. ERWIG will donate rebar, nuts and plates.	Summary of purchasing in monthly reports	0%	$14,798.00	$46,830.00	$64,828.00	6/1/21	9/1/21
5	Project Construction/Implementation: Heavy Equipment Operation	Site construction of 28 LWD structures will begin with wood placement by excavator. When appropriate, a tree faller will be selectively cutting down trees from the riparian area to fall into the creek. Photo monitoring of construction.	Summary of construction activities in monthly progress report; Photo documentation; Construction completed	0%	$39,000.00	$0.00	$39,000.00	8/1/21	10/1/21
6	Project Construction/Implementation: Final log placement and anchoring	CCC corpsmember will move LWD into position using a grip hoist come along. Corpsmembers will use one-inch threaded rebar to anchor logs to mature riparian trees, and each other.	Summary of construction activities in monthly progress report; photo documentation; anchoring completed	0%	$59,368.00	$0.00	$59,368.00	8/1/21	10/1/21
6	Milestone: Construction Project Close Out, Inspection & Demobilization	Inspect project components and establish that work is complete. Verify that all project components have been installed and are functioning as specified. De-mob construction equipment. Conduct project completion photo monitoring. Prepare record drawings.	As-Built and Record Drawings; Project completion site photos	0%	$1,940.00	$0.00	$1,940.00	10/1/21	10/31/21

Project Name: Kenny Creek Instream Enhancement Project
Organization Name: Eel River Watershed Improvement Group

Task #	Major Tasks	Task Description	Major Deliverables	Current Stage of Completion	IRWM Task Budget	Non-State Match	Total Task Budget	Start Date	Completion Date
7	Riparian Restoration	Purchase and plant 400 conifers	Summary of planting activities in monthly progress report, photo documentation, tree planting completed.	0%	$2,840.00	$0.00	$1,420.00	12/1/21	2/1/22
8	Project Signage	Design and purchase signage	Appropriately designed signed posted at project site	0%	$600.00	$0.00	$600.00	11/1/21	12/31/21
9	Project Performance Monitoring	Residual pool depths will be measured at scour structures, shelter values will be calculated at cover structures and tree survival will be documented. Suitable pool tailouts for spawning will be counted.	Monitoring report including pre-project baseline data and 3 years of post construction data.	0%	$1,256.00	$0.00	$1,256.00	6/1/21	7/1/23
10	Construction Administration	Complete tasks necessary to administer construction contract. Keep daily records of construction activities, inspection, and progress. Conduct project construction photo-monitoring.	Construction Management Logs; Completed construction administration tasks documented in monthly progress reports	0%	$4,188.00	$0.00	$4,188.00	3/1/20	3/1/22
	Total North Coast Resource Partnership 2018/19 IRWM Grant Request				**$176,077.00**	**$46,830.00**	**$224,687.00**		
	Is Requested Budget scalable by 25%? If yes, indicate scaled totals; if no delete budget amount provided.				**$132,057.75**	**$35,122.50**	**$168,515.25**		
	Is Requested Budget scalable by 50%? If yes, indicate scaled totals; if no delete budget amount provided.								

Detail Budget for North Coast Resource Partnership 2018/19 IRWM Project Solicitation

Project Name: Kenny Creek Instream Enhancement Project
Organization Name: Eel River Watershed Improvement Group

Budget Detail

Row (a) Direct Project Administration Costs					
Project Management Type	**Personnel by Discipline**	**Number of Hours**	**Hourly Wage**	**% of Cost (if applicable) ***	**Total Admin Cost**
Administration/Monitoring Plan/Compliance	Executive Director	80	$50		$4,000
Reporting	Project Manager	160	$30		$4,800
Total					**$8,800**
*** What is the percentage based on (including total amounts)?**					
*** How was the percentage of cost determined?**					

Row (b) Land Purchase/Easement

Row (c) Planning/Design/Engineering & Environmental Documentation					
Personnel (Discipline)	**Major Task Name**	**Number of Hours**	**Hourly Wage**	**Total Cost**	
ERWIG Project Manager	Final Design Plans	10	30	$300	
CEQA Compliance Staff	Environmental Documentation: CEQA			$28,000	Flat Rate
ERWIG Project Manager	Submit an LSAA application to CDFW, pay required fee.	5	30	$4,550	Includes permit fee of approximately $4,400
ERWIG Project Manager	Work with the regional water quality board and army corps to obtain 401 clearance and 404 permit	30	30	$5,500	Includes estimated fees of $4,600
Total				**$38,350**	

Row (d) Construction/Implementation					
Personnel (Discipline)	**Work Task and Sub-Task (from Work Task Table)**	**Number of Hours**	**Hourly Wage**	**Total Cost**	
ERWIG Project Manager	Construction/Implementation Contracting	8	30	$240	
Labor Compliance Company	Labor Compliance Program	16	$90	$1,440	
Truck Driver	Mobilization and Site Prep	8	$130	$1,040	
Biologist	Mobilization and Site Prep			$1,317	Flat Rate
ERWIG Project Manager	Mobilization and Site Prep	30	30	$900	
Equipment Operator	Project Construction/Implementation: Heavy Equipment Operation	400	70	$28,000	
Laborer	Project Construction/Implementation: Heavy Equipment Operation	200	55	$11,000	
CCC Corpsmembers	Project Construction/Implementation: Final log placement and anchoring	2240	24	$53,760	
CCC C1 Overtime	Project Construction/Implementation: Final log placement and anchoring	84	37	$3,108	
Truck Driver	Milestone: Construction Project Close Out, Inspection & Demobilization	8	130	$1,040	
ERWIG Project Manager	Milestone: Construction Project Close Out, Inspection & Demobilization	30	30	$900	
Tree Planting Subcontractor	Riparian Restoration	40	35	$1,640	Includes $240 for mileage
ERWIG Project Manager	Project Signage	8	30	$240	
ERWIG Project Manager	Project Performance Monitoring	30	30	$900	
ERWIG Project Manager	Construction Administration	100	30	$3,000	
Materials and Equipment	**Work Task and Sub-Task (from Work Task Table)**	**Number of Units**	**Unit Cost**	**Total Cost**	
Tools and Materials: See Supplemental Budget	Tools and Materials Purchasing			$14,798	See Supplemental Budget
SPIKE supplies for CCC (food, household supplies)	Project Construction/Implementation: Final log placement and anchoring	2	1250	$2,500	
Conifer Trees	Riparian Restoration	400	3	$1,200	
Project Sign	Project Signage	1	360	$360	
ERWIG Mileage	Project Performance Monitoring	660	0.54	356.4	
ERWIG Mileage	Construction Administration	2200	0.54	1188	
Total				**$128,927**	

Grand Total **$176,077**

Kenny Creek Instream Habitat Enhancement Project - Supplemental Budget

	Units Requested	Applicant Cost Share	Partner Cost Share	Unit Price	Amount Requested
Tools and Materials					
Portaband saw blades (units)	20			$8.00	$160.00
Erosion Control Materials (rice straw, etc)	1			$180.00	$180.00
Timber Bit Extensions (units)	10			$22.00	$220.00
GFCI (units)	4			$30.00	$120.00
Pig Mats (box of one hundred)	1			$100.00	$100.00
Misc Construction Materials (chuck keys, allen wrenches, sheer pins, etc)	1			$250.00	$250.00
Misc Field Materials (waders, markers, flagging, etc.)	1			$500.00	$500.00
Chainsaw	1			$400.00	$400.00
LWD (Logs, Rootwads)	20			$600.00	$12,000.00
Hilti Epoxy Glue Packs	14			$62.00	$868.00
Total					**$14,798.00**

Kenny Creek Instream Habitat Enhancement Project Design

Features 1421-6921

Feature: 1421

Existing Condition: Run, 0% cover, 1.0 foot max residual depth **Bankfull:** 28 feet

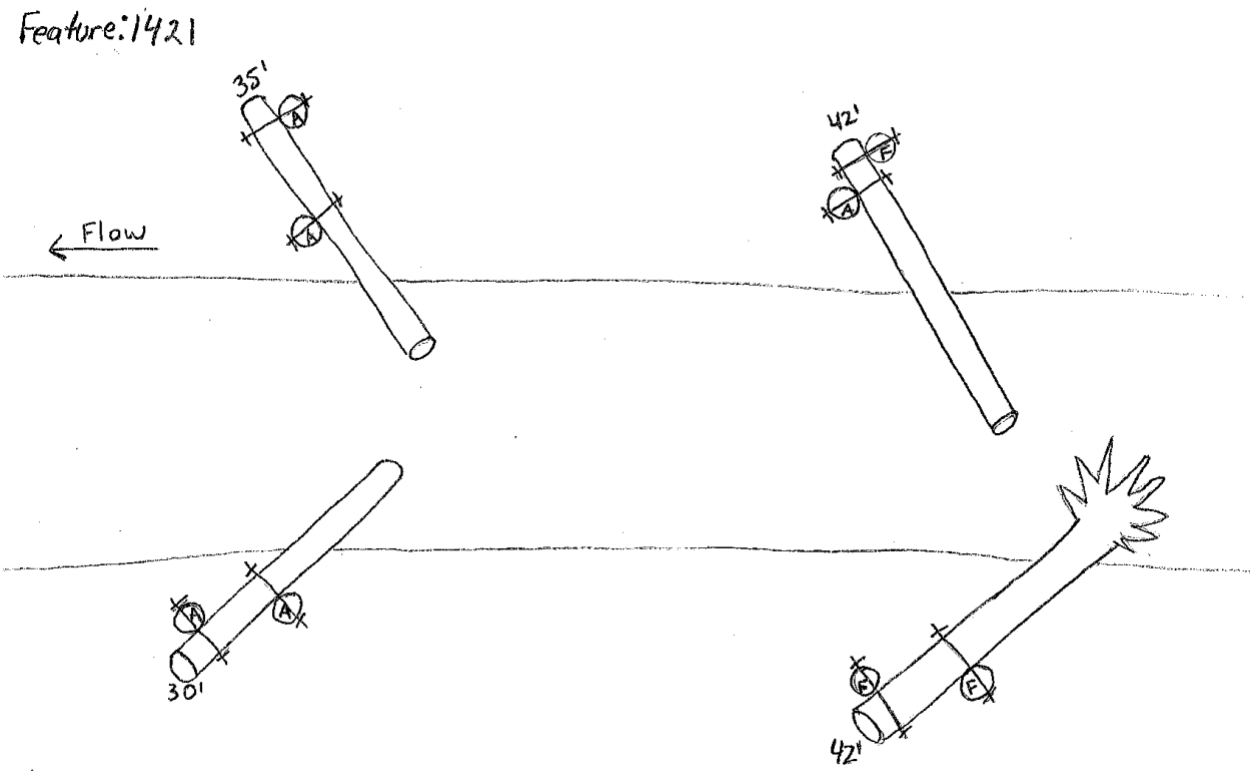
Project: Uproot 1 fir and fall 1 redwood from left bank. Cut each into 2 pieces. The rootwad is angled upstream and anchored to left bank. The log is aimed upstream and anchored to right bank. Fifty feet downstream there will be 2 logs on opposite banks, both aimed upstream, anchored to the banks.

Length Treated: 30' **Square Footage:** 75 ft^2

Objective: Increase cover and scour

Labor: **CCC:** 40 hours **Equipment operator:** 4 hours **Timber Faller:** 1 hour

Supplies: 40 feet of rebar, 16 plates, 16 nuts



Feature: 1493

Existing Condition: Pool, 10% cover, 2.4 food max residual depth

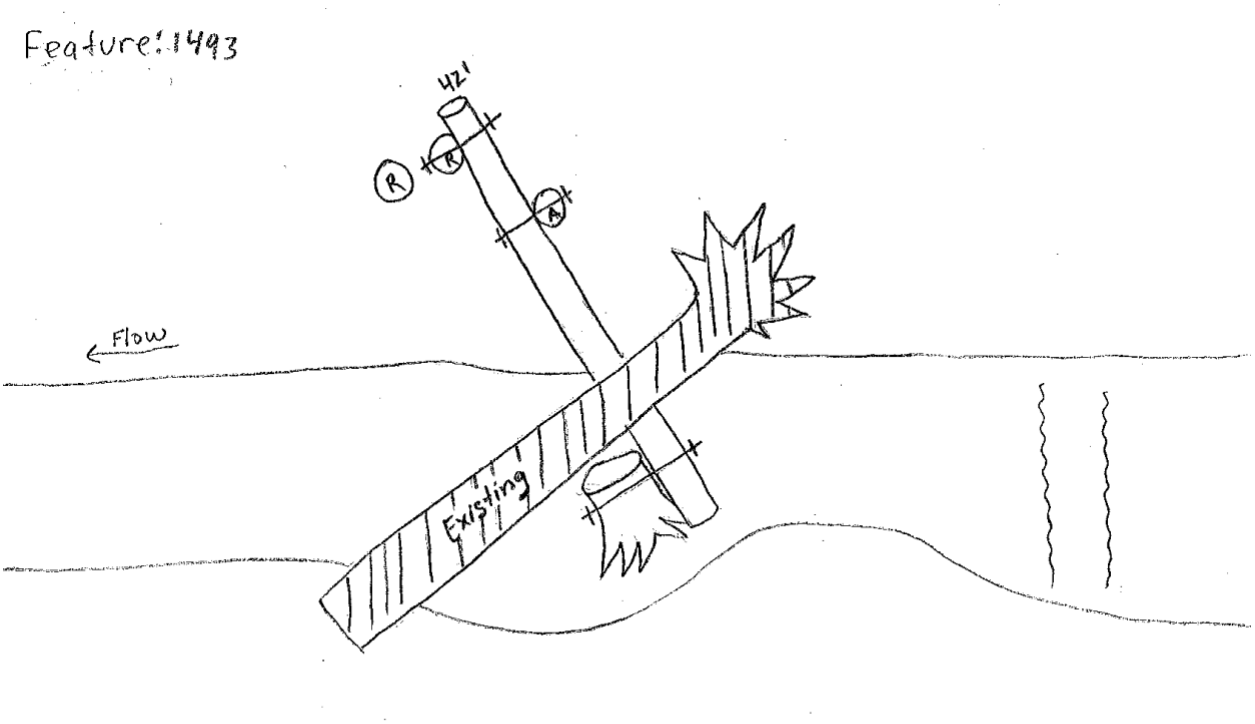
Project: Purchase 1 rootwad with no stem and place adjacent to upstream end of existing log, anchored. Fall 1 redwood from left bank. Redwood log is anchored to right bank, is under the existing log, and is anchored to rootwad.

Length Treated: 8’ **Square Footage:** 30 ft^2

Objective: Increase cover and scour

Labor: **CCC:** 24 hours **Equipment operator:** 3 hours **Timber Faller:** 0.5 hours

Supplies: 1 rootwad with no stem, 15 feet rebar, 6 plates, 6 nuts



Feature: 1717

Existing Condition: Plunge pools, 15% cover, 2.8 foot max residual depth **Bankfull:** 26 feet

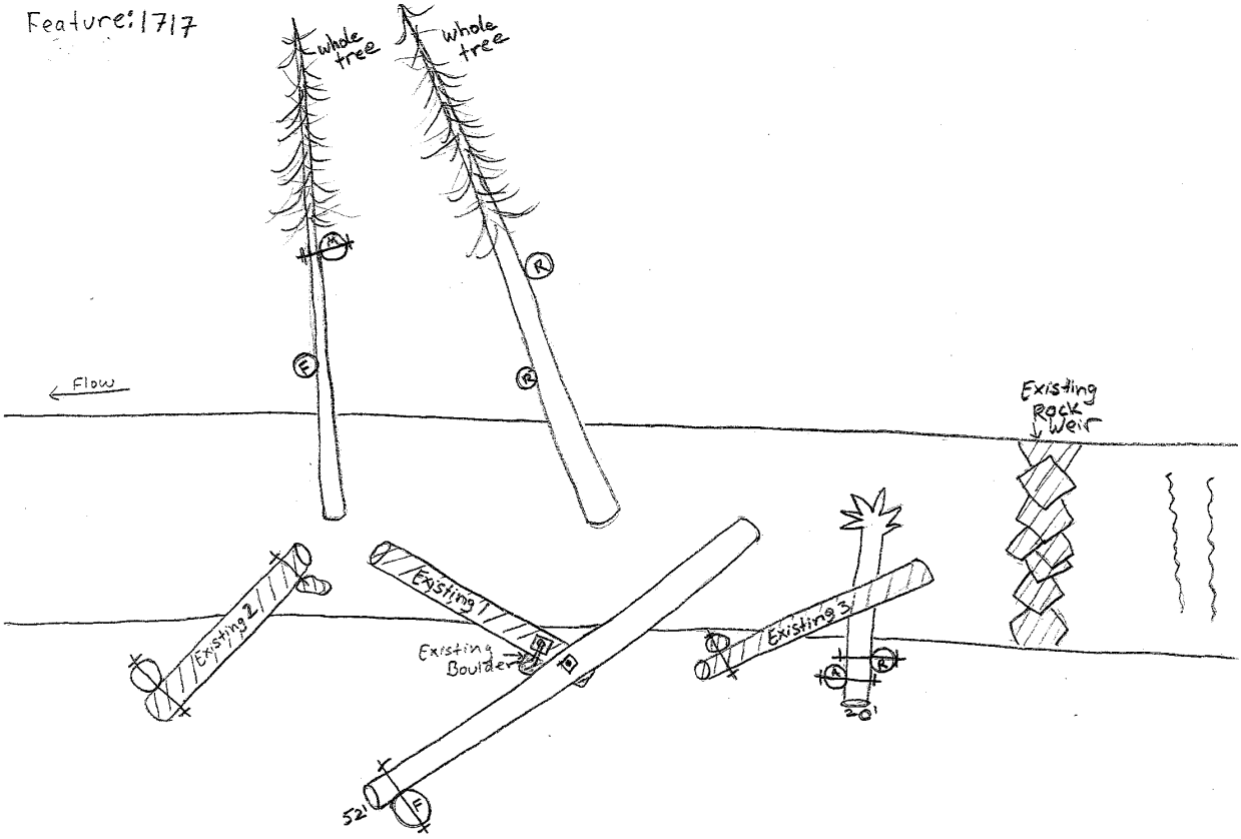
Project: Uproot 1 fir from left bank. Place rootwad in the middle of the pool anchored to left bank and existing log. Fall 1 fir on right bank. Anchor this 52 foot log to left bank existing log and fir, pointing upstream into pool. Fall 2 trees, 1 redwood, 1 fir. One is pointed upstream and wedged and will be at least 39 feet long. The other is perpendicular, pointed at old structure, and anchored.

Length Treated: 30' **Square Footage:** 80 ft^2

Objective: Increase cover and scour

Labor: CCC: 80 hours **Equipment operator:** 6 hours **Timber Faller:** 1 hour

Supplies: 30 feet rebar, 10 nuts, 10 plates



Feature: 1851

Existing Condition: Pools and run, 10% cover, 2.2 foot max residual depth

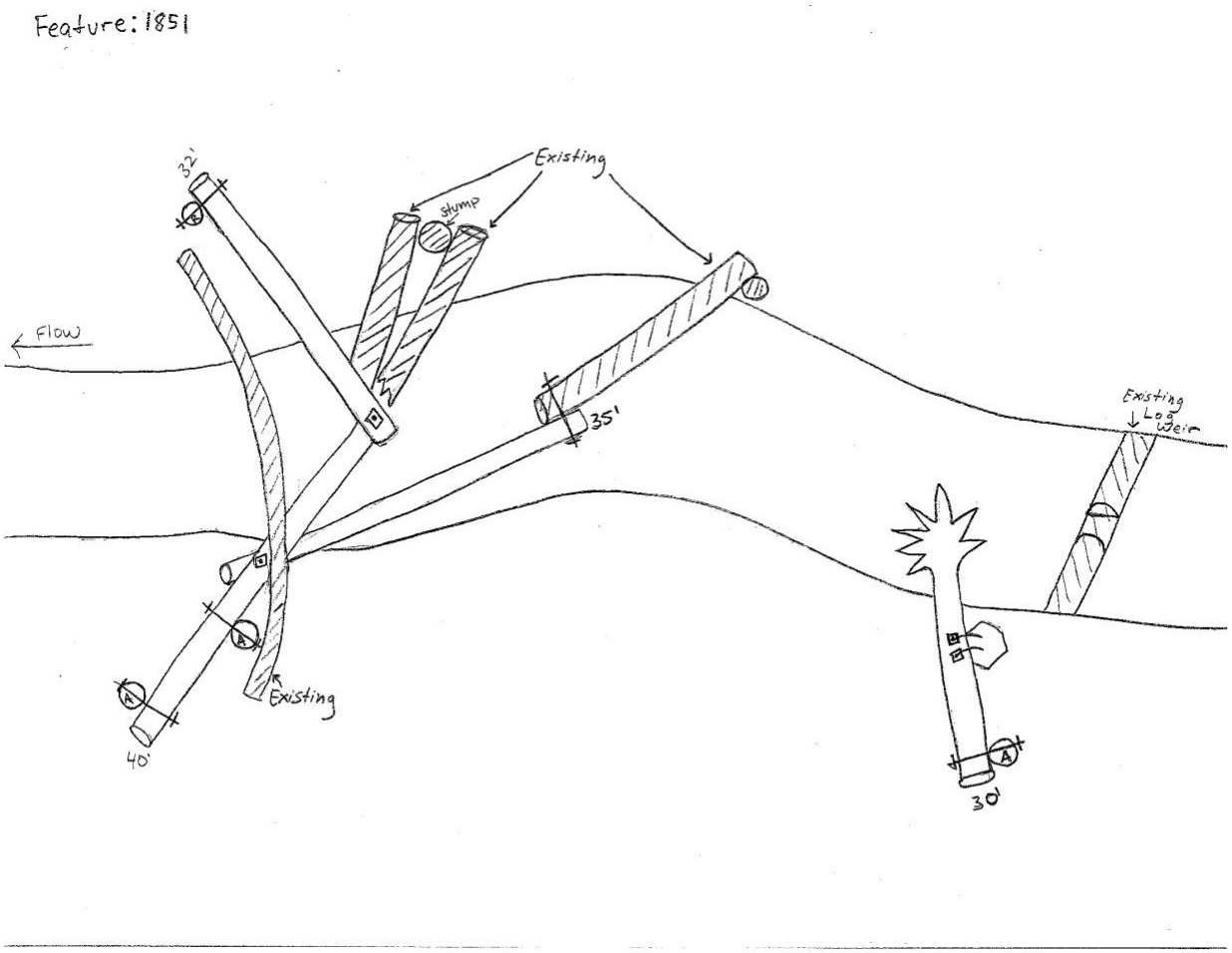
Project: Dig up 1 redwood and fall 1 fir from left bank. Cut each into 2 pieces. Anchor 1 log to left bank, 1 log to right bank, and anchor them to each other. Anchor a cover log to first log and to existing right bank log in scour pool. Anchor 1 rootwad to left bank and boulder.

Length Treated: 30’ **Square Footage:** 108 ft^2

Objective: Increase cover and scour

Labor: CCC: 48 hours **Equipment operator:** 5 hours **Timber Faller:** 0.5 hours

Supplies: 45 feet rebar, 20 nuts, 18 plates, 2 mollies, 1 pack of Hilti glue



Feature: 2019

Existing Condition: Pool, 15% cover, 2.5 foot max residual depth **Bankfull:** 25 feet

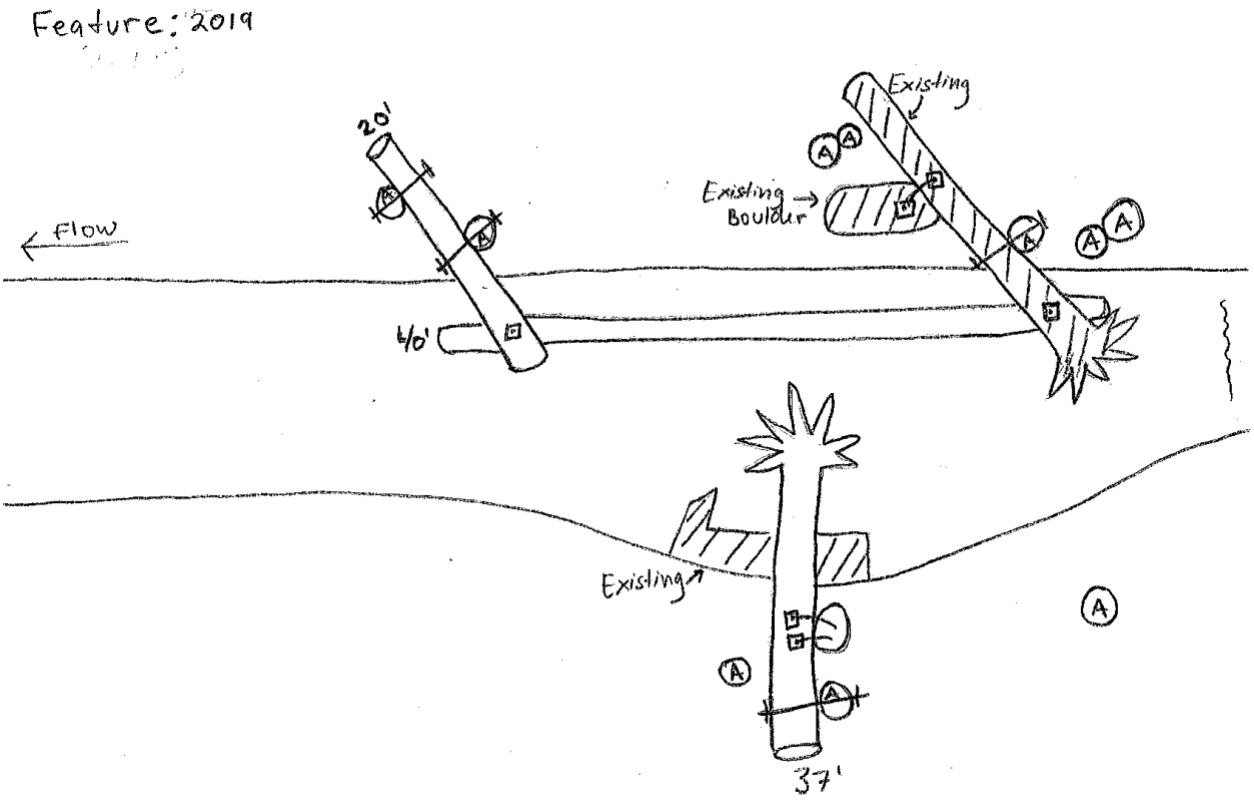
Project: Dig up 1 fir from left bank, cut into 3 pieces. Rootwad on left bank anchored to left bank boulder, buried log, and left bank tree. Downstream scour log is anchored to right bank. Cover log anchored between scour log and existing structure.

Length Treated: 9' **Square Footage:** 85 ft^2

Objective: Increase scour and cover

Labor: CCC: 48 hours **Equipment operator:** 5 hours **Timber Faller:** 0

Supplies: 40 feet rebar, 16 plates, 19 nuts, 2 mollies, 1 pack of Hilti glue



Feature: 2204

Existing Condition: Pool and riffle, 20% cover, 1.9 foot max residual depth **Bankfull:** 35 feet

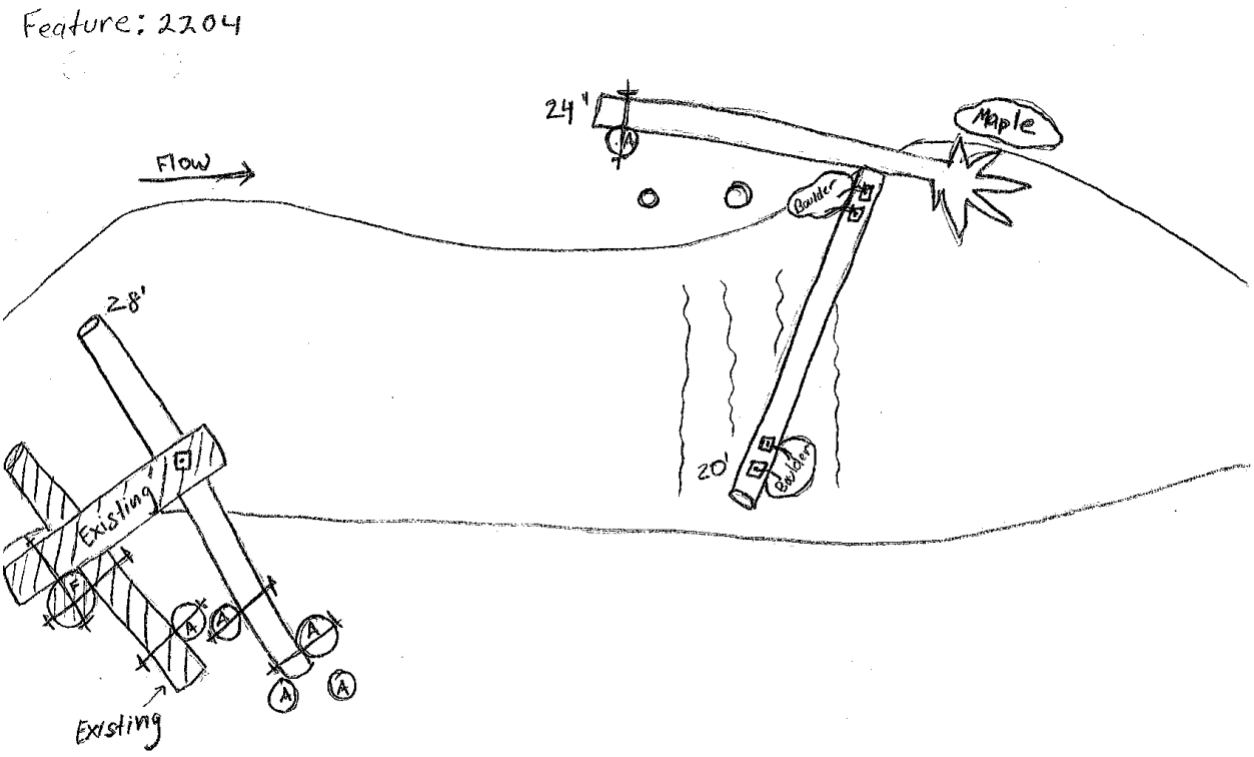
Project: Dig up 1 fir from left bank and cut into 3 pieces. Place one log on existing structure and anchor to right bank. Place log with rootwad in lower pool pointed downstream and anchored to left bank. Place a short log in riffle, aimed upstream and wedged into the left bank, anchored to boulders placed at either end.

Length Treated: 10' **Square Footage:** 60 ft^2

Objective: Increase cover, scour, and gravel recruitment

Labor: CCC: 48 hours **Equipment operator:** 6 hours **Timber Faller:** 0

Supplies: 2 boulders, 45 feet rebar, 23 nuts, 18 plates, 4 mollies, 2 packs of Hilti glue



Feature: 2401

Existing Condition: Pool, 5% cover, 2.3 foot max residual depth

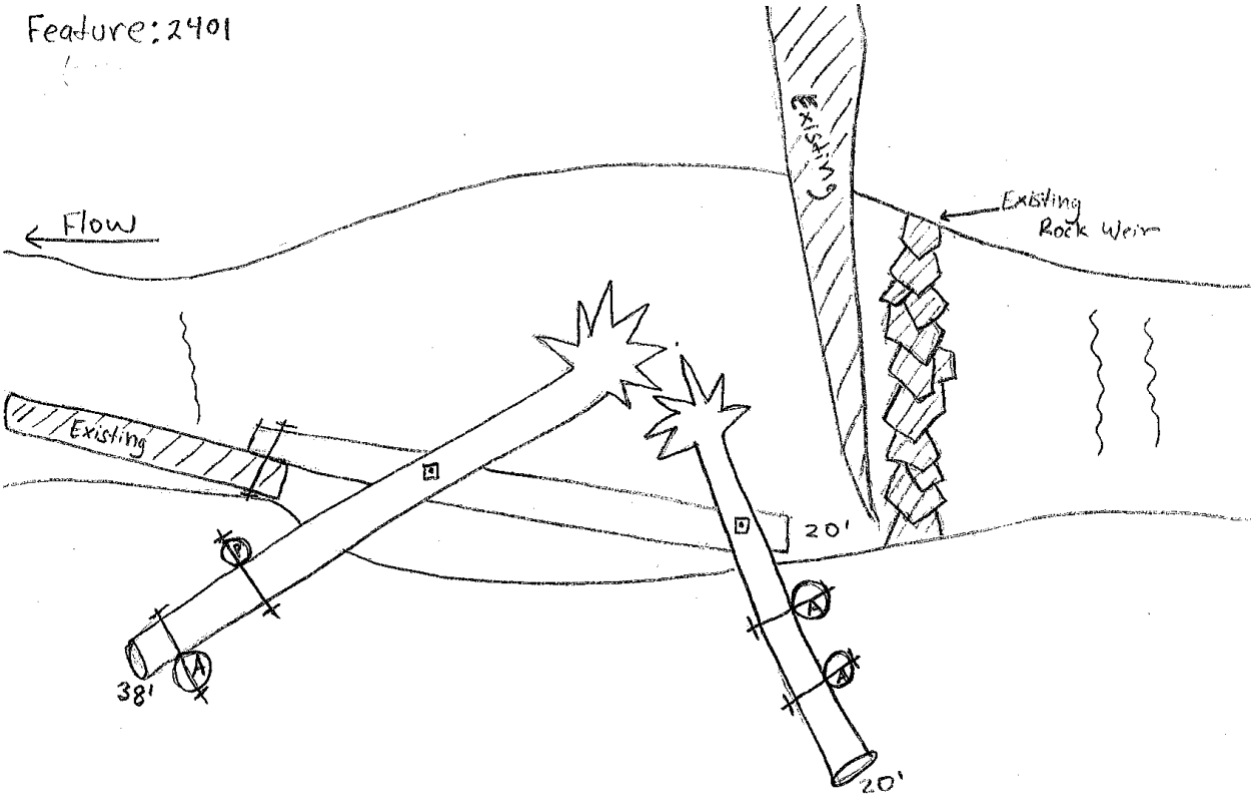
Project: Purchase 2 trees and cut one into 2 pieces. Place 1 log with root wad into pool anchored to a left bank tree. Place a cover log between old structure and the first log, anchored to both. Place a second log with root wad in the middle of the channel, pointed upstream, anchored to left bank.

Length Treated: 20’ **Square Footage:** 80 ft^2

Objective: Increase cover and scour

Labor: CCC: 32 hours **Equipment operator:** 5 hours **Timber Faller:** 0

Supplies: 2 trees, 35 feet rebar, 14 plates, 17 nuts



Feature: 2612

Existing Condition: Pool, 20% cover, 2.6 foot max residual depth **Bankfull:** 30 feet

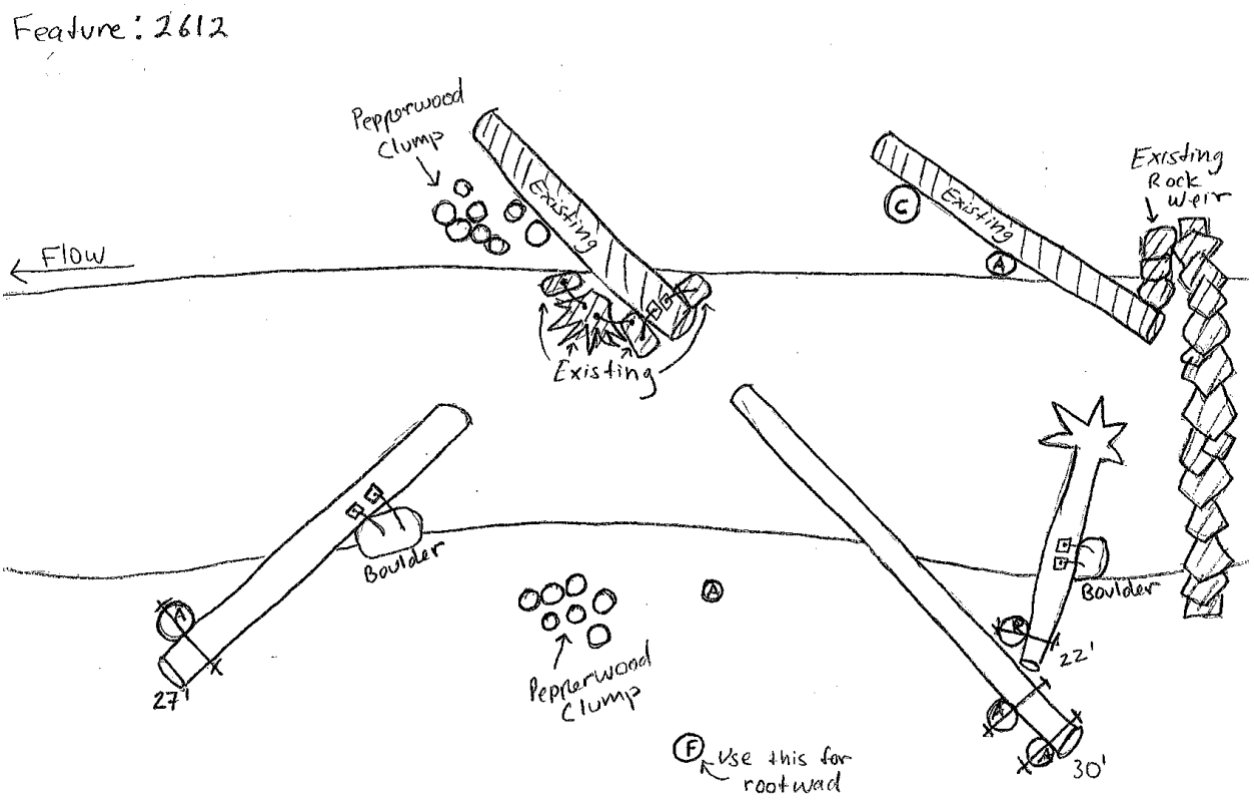
Project: Uproot a topped fir from the left bank and purchase 2 logs. Place the tree in the upper pool, anchored to the left bank. Place one log upstream of existing structure as a flow diversion, anchored to the left bank. Place the other log downstream of structure, pointing upstream, anchored to the left bank and a placed boulder.

Length Treated: 15' **Square Footage:** 70 ft^2

Objective: Increase scour and cover.

Labor: CCC: 32 hours **Equipment operator:** 4 hours **Timber Faller:** 0

Supplies: 2 logs, 1 boulder, 4 mollies, 2 packs of Hilti glue, 20 nuts, 16 plates, 40 feet rebar



Feature: 3190

Existing Condition: Pool, 5% cover, 2.5 foot max residual depth **Bankfull:** 32 feet

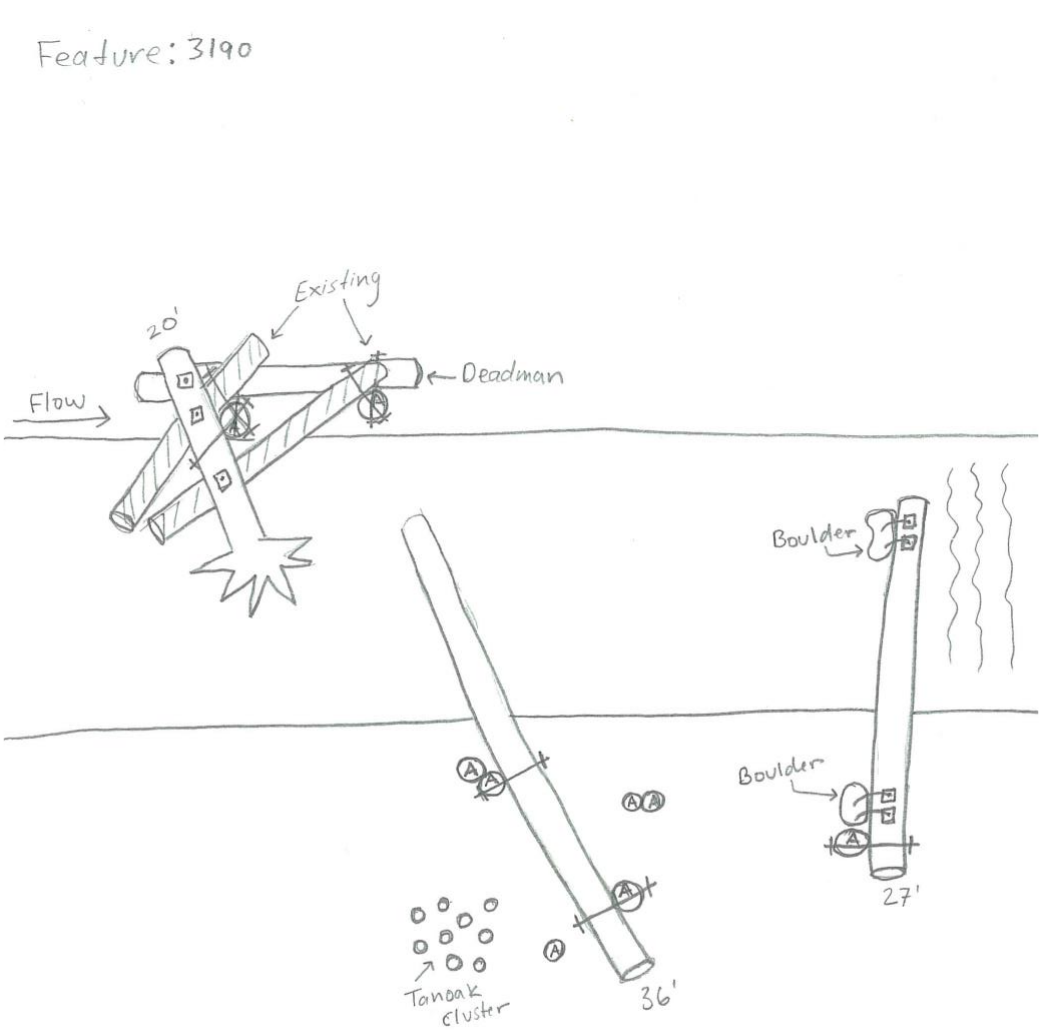
Project: Uproot 1 tree from right bank and cut it into 2 pieces. Place the root wad in upper pool anchored to left bank, deadman, and live tree. Purchase 2 logs, place 1 in upper pool for scour, anchored to the right bank. Place the second log in the riffle for gravel capture, anchored to right bank and placed boulders.

Length Treated: 45' **Square Footage:** 100 ft^2

Objective: Increase cover, scour, and gravel capture.

Labor: CCC: 48 hours **Equipment operator:** 8 hours **Timber Faller:** 0

Supplies: 2 logs, 2 boulders, 4 mollies, 1 pack of Hilti glue, 30 plates, 37 nuts, 75 feet rebar



Feature: 3419

Existing Condition: Run with edge pool, 5% cover, 1.8 foot max residual depth **Bankfull:** 35 feet

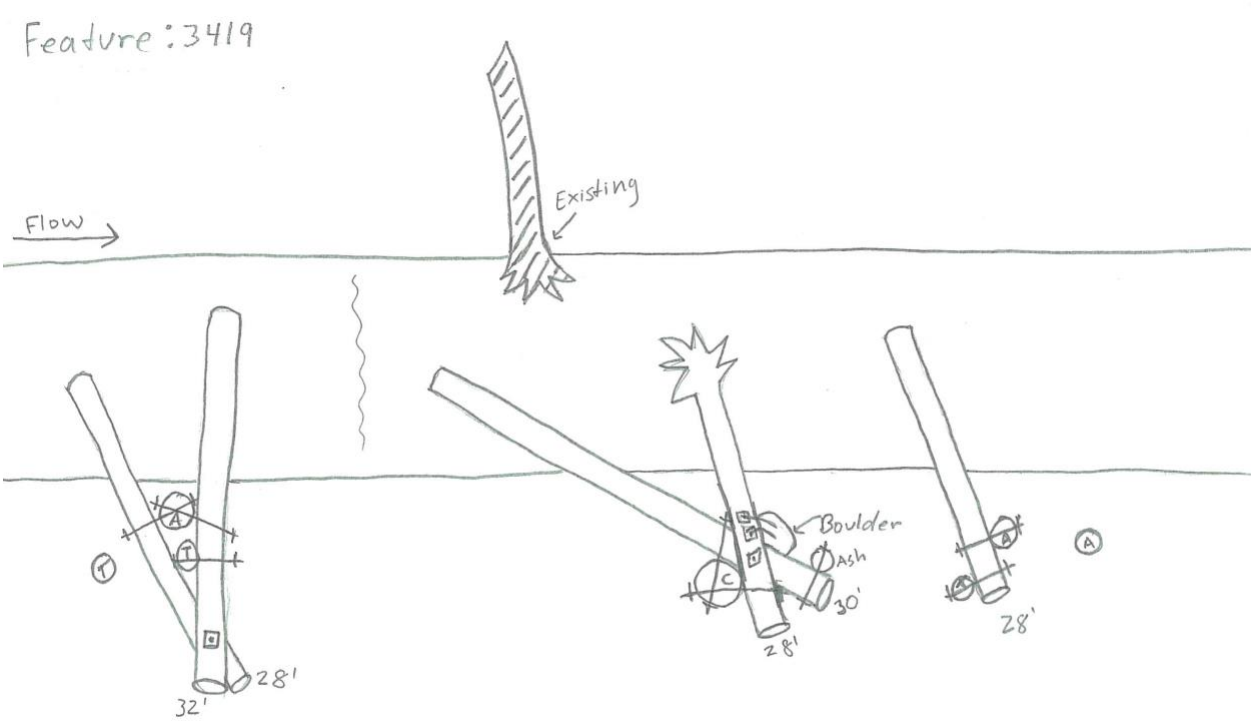
Project: Uproot a left bank tree and cut into 3 pieces. Place a log pointed upstream along the right bank, anchored to right bank trees and boulder. Place the root wad on top of the first log, anchored to the log and to the right bank tree. Place second log downstream of the others, anchored to the right bank. Purchase 2 logs. Place the shorter log upstream of the larger log, both anchored to the right bank and to each other.

Length Treated: 30' **Square Footage:** 125 ft^2

Objective: Increase cover and scour.

Labor: CCC: 48 hours **Equipment operator:** 8 hours **Timber Faller:** 0.5 hours

Supplies: 2 logs, 2 mollies, 1 pack of Hilti glue, 24 plates, 27 nuts, 60 feet rebar



Feature: 3616

Existing Condition: Pool and run, 0% cover, 1.6 foot max residual depth **Bankfull:** 24 feet

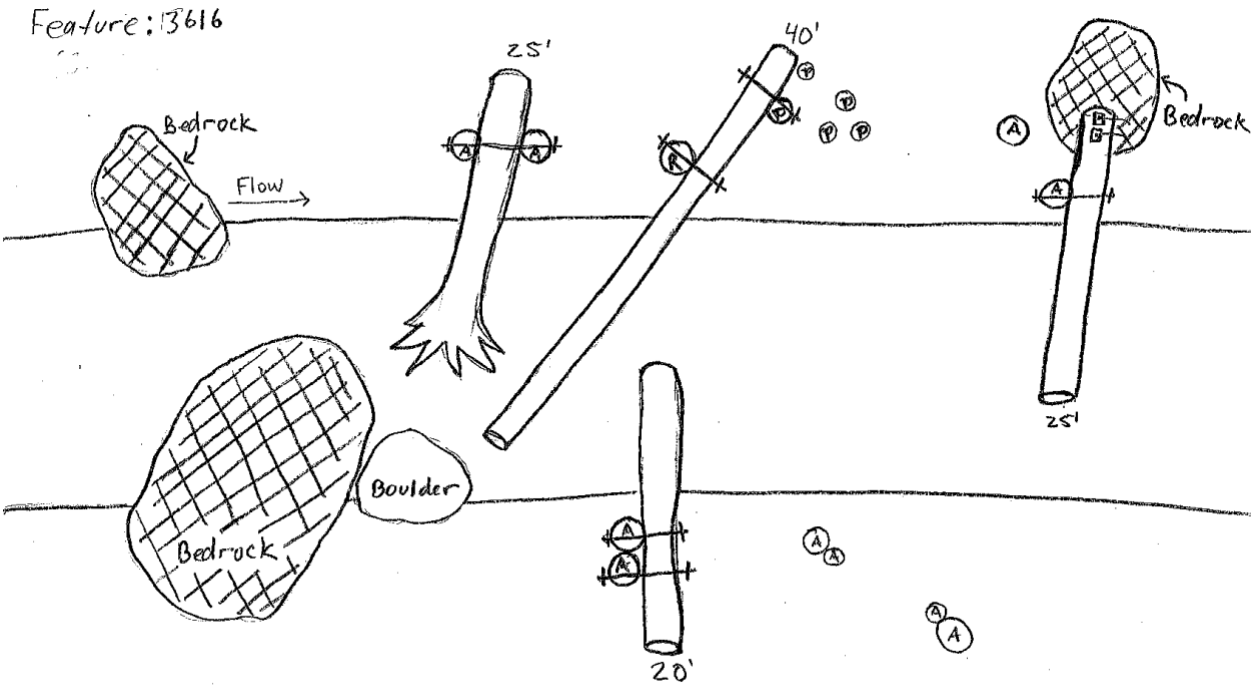
Project: Uproot 1 fir and cut into 3 pieces. Purchase 1 log. Place root wad by right bank boulder and anchored to left bank alders. Place a log almost to right bank boulder anchored to left bank trees. Place a log in pool anchored to right bank alders. Place a log in right bank pool anchored to left bank tree and bedrock.

Length Treated: 13' **Square Footage:** 105 ft^2

Objective: Increase cover and scour.

Labor: CCC: 32 hours **Equipment operator:** 6 hours **Timber Faller:** 0

Supplies: 1 log, 2 mollies, 1 pack of Hilti glue, 16 plates, 18 nuts, 40 feet rebar



Feature: 3827

Existing Condition: Pool, 5% cover, 1.7 foot max residual depth **Bankfull:** 28 feet

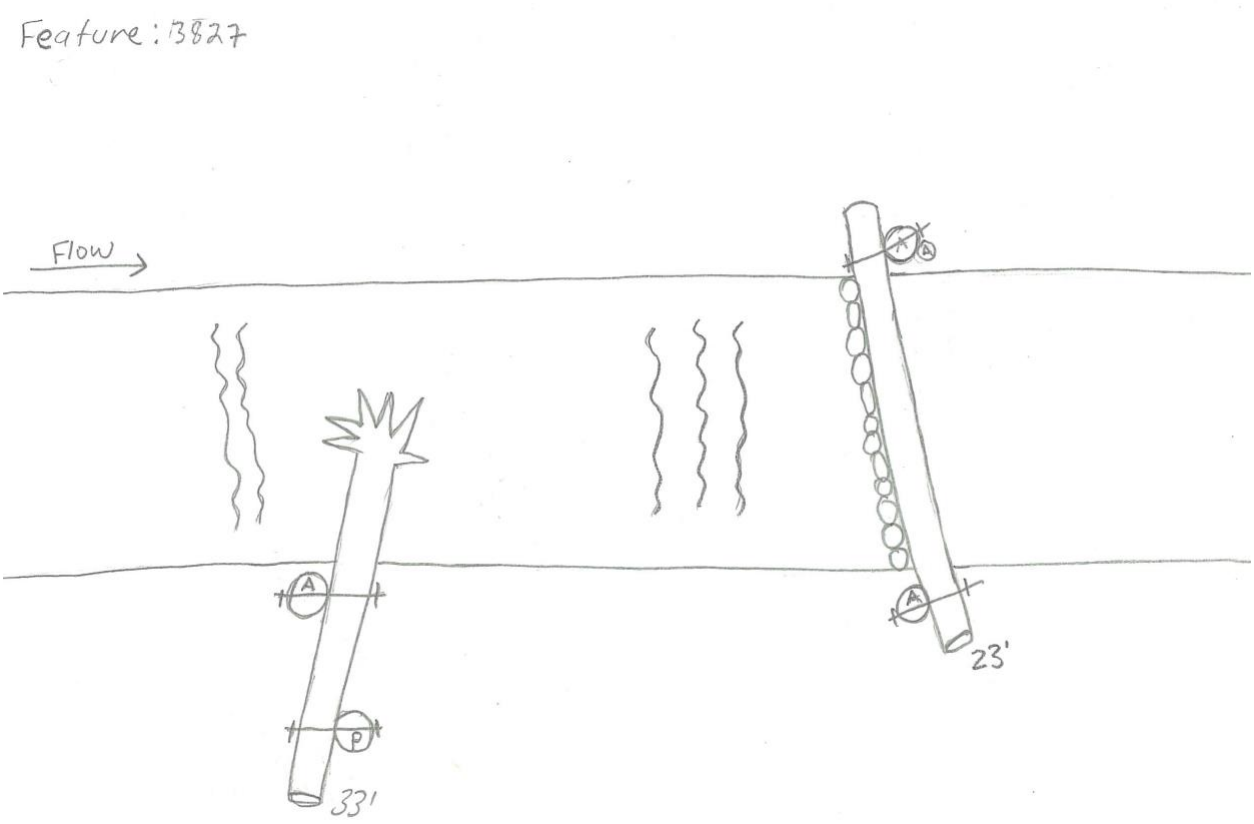
Project: Uproot 1 fir from right bank and cut into 2 pieces. Place rootwad in pool, anchored to right bank trees. Place second log downstream, anchored to trees on both banks, as a gravel capture log.

Length Treated: 8' **Square Footage:** 60 ft^2

Objective: Gravel retention, increase cover

Labor: CCC: 12 hours **Equipment operator:** 3 hours **Timber Faller:** 0 hours

Supplies: 2 boulders, 8 plates, 8 nuts, 20 feet rebar



Feature: 3988

Existing Condition: Pool, 0% cover, 0.9 foot max residual depth **Bankfull:** 25 feet

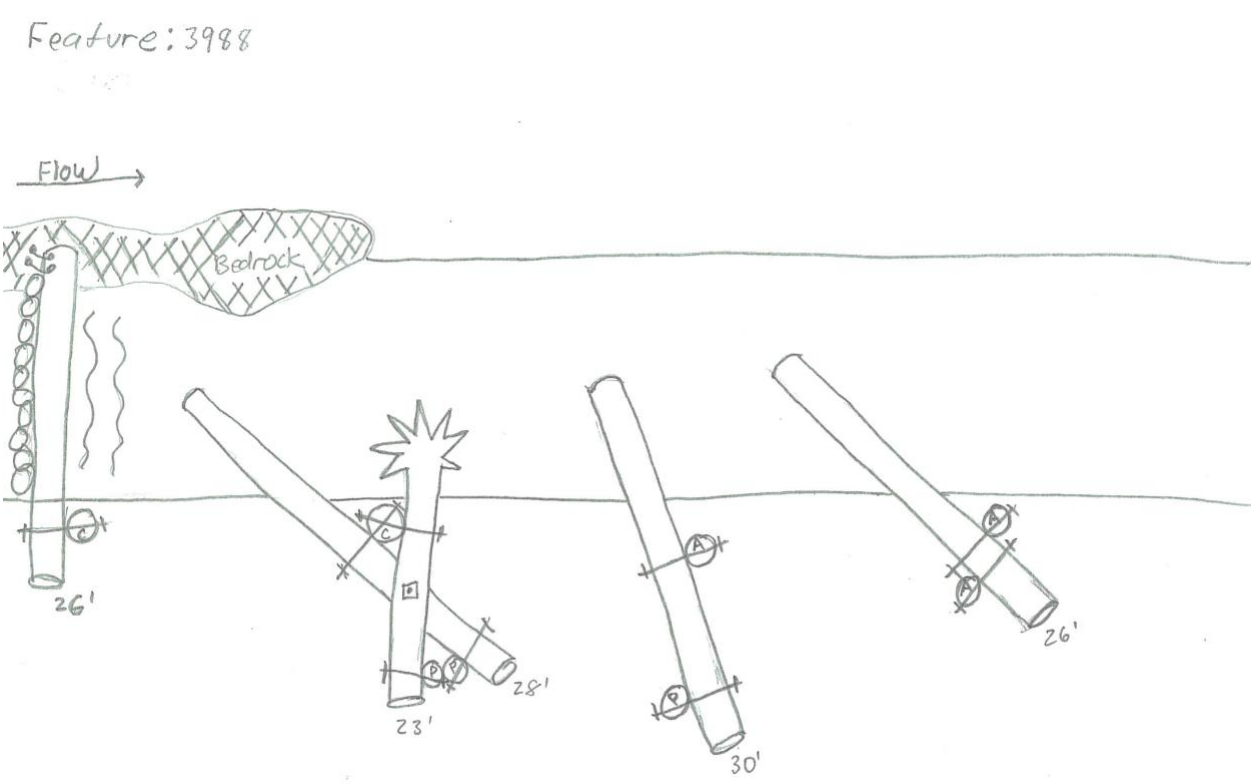
Project: Uproot left bank fir and cut into 3 pieces and purchase 1 log. Place three logs aimed upstream, each anchored and wedged to right bank trees. Place rootwad anchored to right bank tree and upstream log. Place last log upstream for gravel capture, anchored to right bank tree and left bank bedrock.

Length Treated: 18' **Square Footage:** 98 ft^2

Objective: Gravel retention, increase cover

Labor: CCC: 32 hours **Equipment operator:** 5 hours **Timber Faller:** 0 hours

Supplies: 1 logs, 2 mollies, 1 pack of Hilti glue, 24 plates, 24 nuts, 60 feet rebar



Feature: 4272

Existing Condition: Pool with 0% cover, 1.8 foot max residual depth **Bankfull:** 19 feet

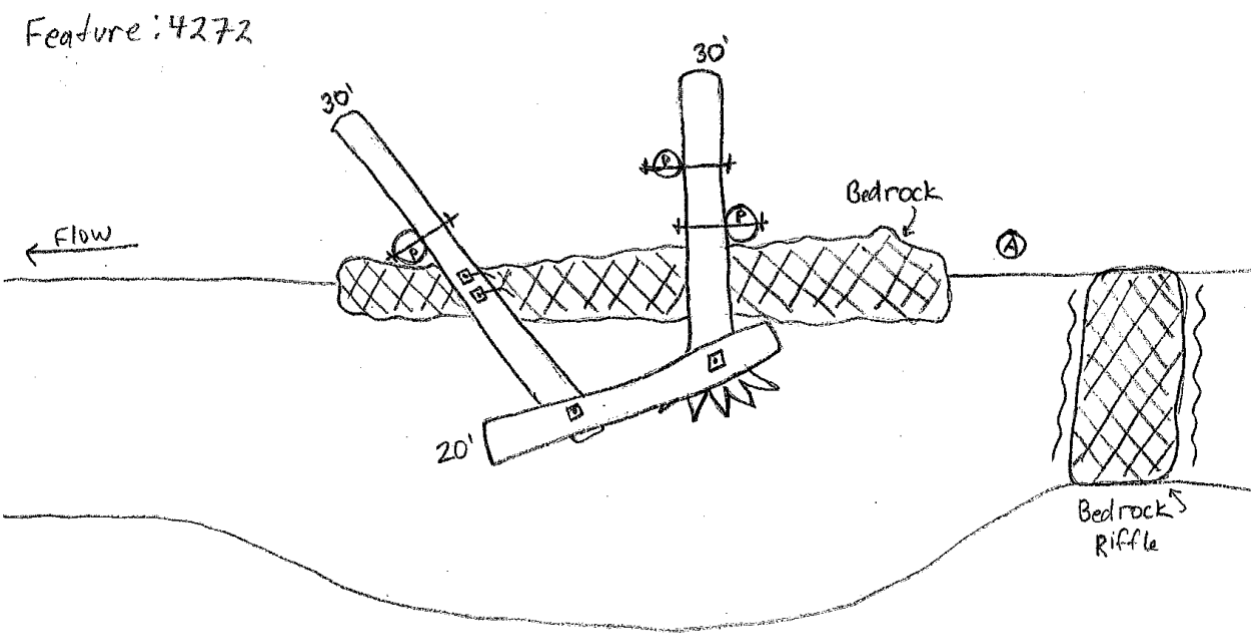
Project: Purchase 1 redwood rootwad and 2 logs. Place rootwad perpendicular to flow anchored to right bank trees. Place a log downstream of the rootwad anchored to bedrock and right bank tree. Place a cover log between the two, anchored to each.

Length Treated: 20 feet **Square Footage:** 60 ft^2

Objective: Increase cover

Labor: CCC: 32 hours **Equipment operator:** 5 hours **Timber Faller:** 0

Supplies: 2 logs, 1 redwood rootwad, 35 feet rebar, 14 plates, 16 nuts, 2 mollies, 1 pack of Hilti glue



Feature: 4530

Existing Condition: Pool with 0% cover, 1.9 foot max residual depth **Bankfull:** 22 feet

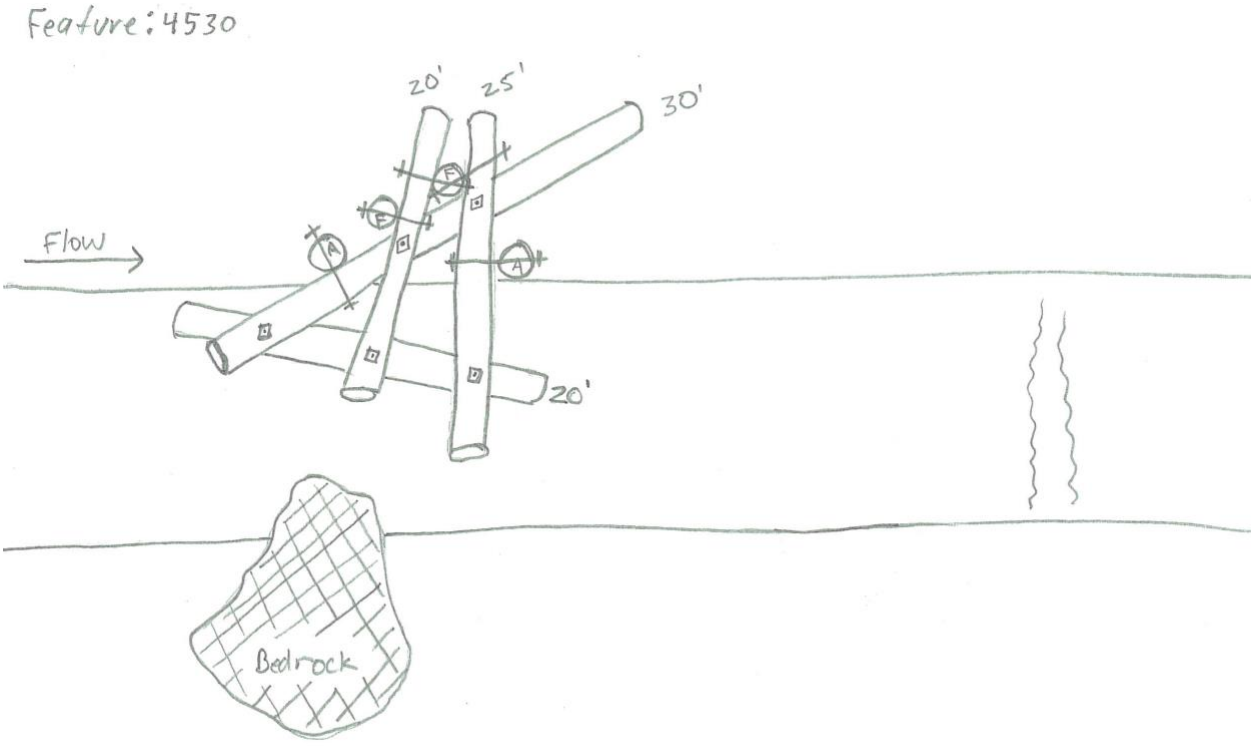
Project: Purchase 4 logs. Place one log anchored to left bank trees. Place a second log on top of the first, anchored to left bank trees and first log. Place the third log on top of the first, anchored to left bank trees and the first log. Place a cover log anchored to all three logs.

Length Treated: 60' **Square Footage:** 120 ft^2

Objective: Increase cover and scour

Labor: CCC: 72 hours **Equipment operator:** 2 hours **Timber Faller:** 2 hours

Supplies: 4 logs, 20 plates, 25 nuts, 50 feet rebar



Feature: 4769

Existing Condition: Pool with 10% cover **Bankfull:** 26 feet

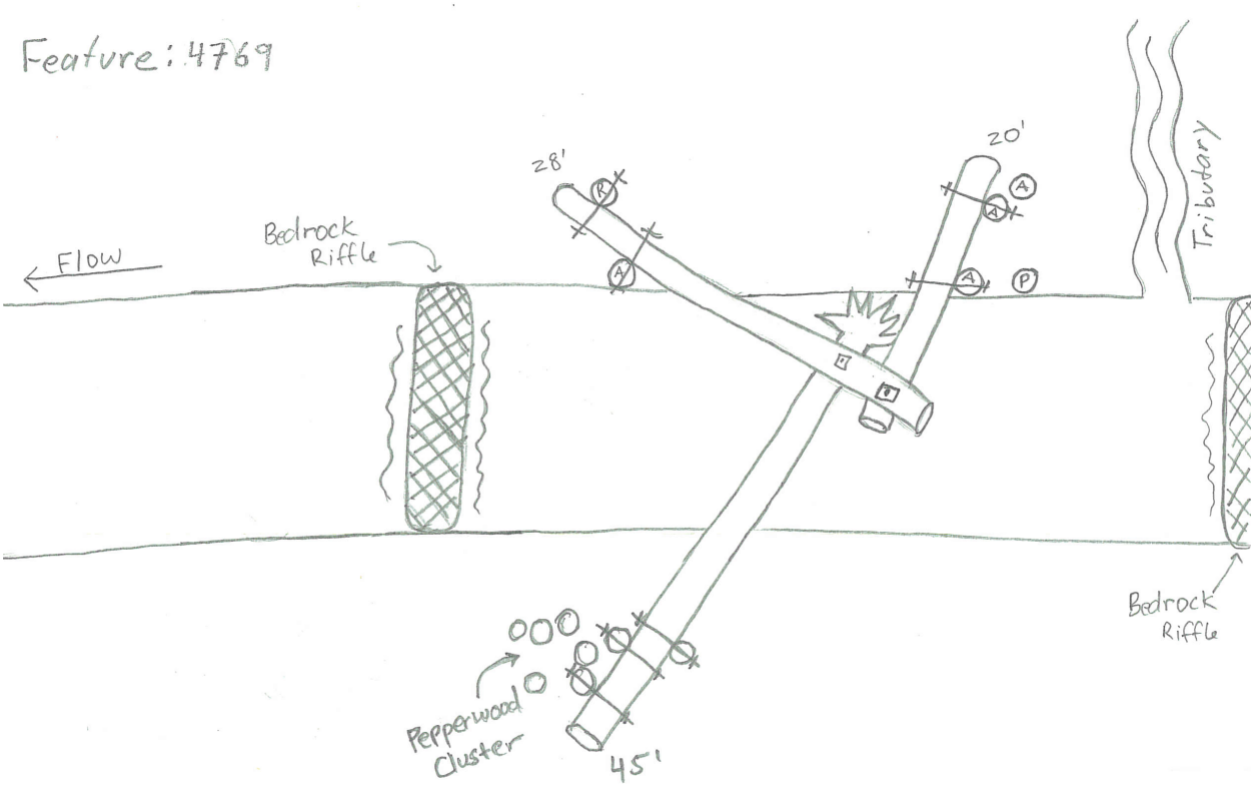
Project: Uproot 1 left bank fir, cut into 3 pieces. Place the rootwad anchored to left bank trees. Place 2 logs crossing in the pool, anchored to right bank trees, the first log, and to each other.

Length Treated: 25' **Square Footage:** 70 ft^2

Objective: Increase cover

Labor: CCC: 24 hours **Equipment operator:** 6 hours **Timber Faller:** 0

Supplies: 45 feet rebar, 20 nuts, 18 plates



Feature: 5519

Existing Condition: Pool with 15% cover, 4.3 foot max residual depth **Bankfull:** 26 feet

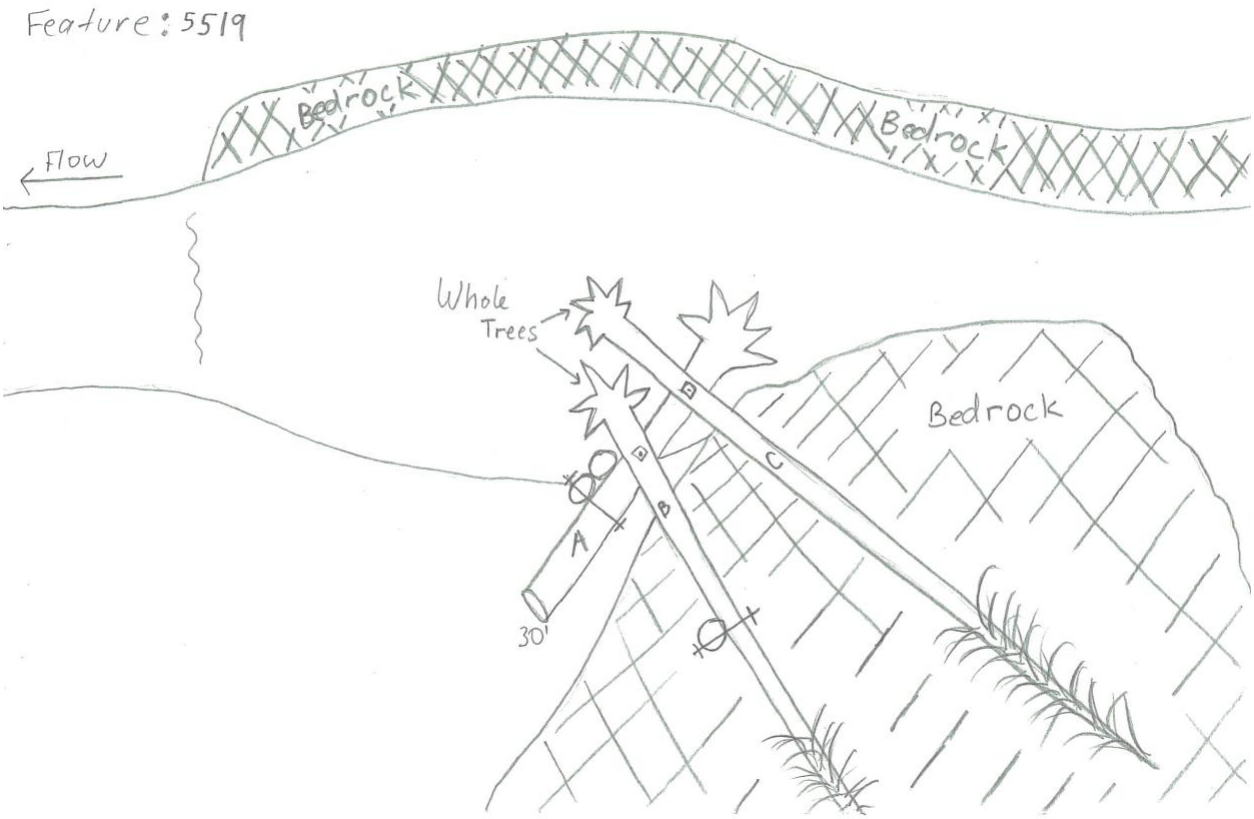
Project: Uproot 3 left bank firs. Place 2 whole trees and 1 rootwad from the left bank into pool. Log A is anchored to a left bank tree, log B and C are on top of log A, anchored to log A.

Length Treated: 15 feet **Square Footage:** 60 ft^2

Objective: Increase cover and scour

Labor: CCC: 12 hours **Equipment operator:** 5 hours **Timber Faller:** 0

Supplies: 20 feet rebar, 10 nuts, 8 plates



Feature: 5690

Existing Condition: Pool with 0% cover, 1.5 foot max residual depth **Bankfull:** 25 feet

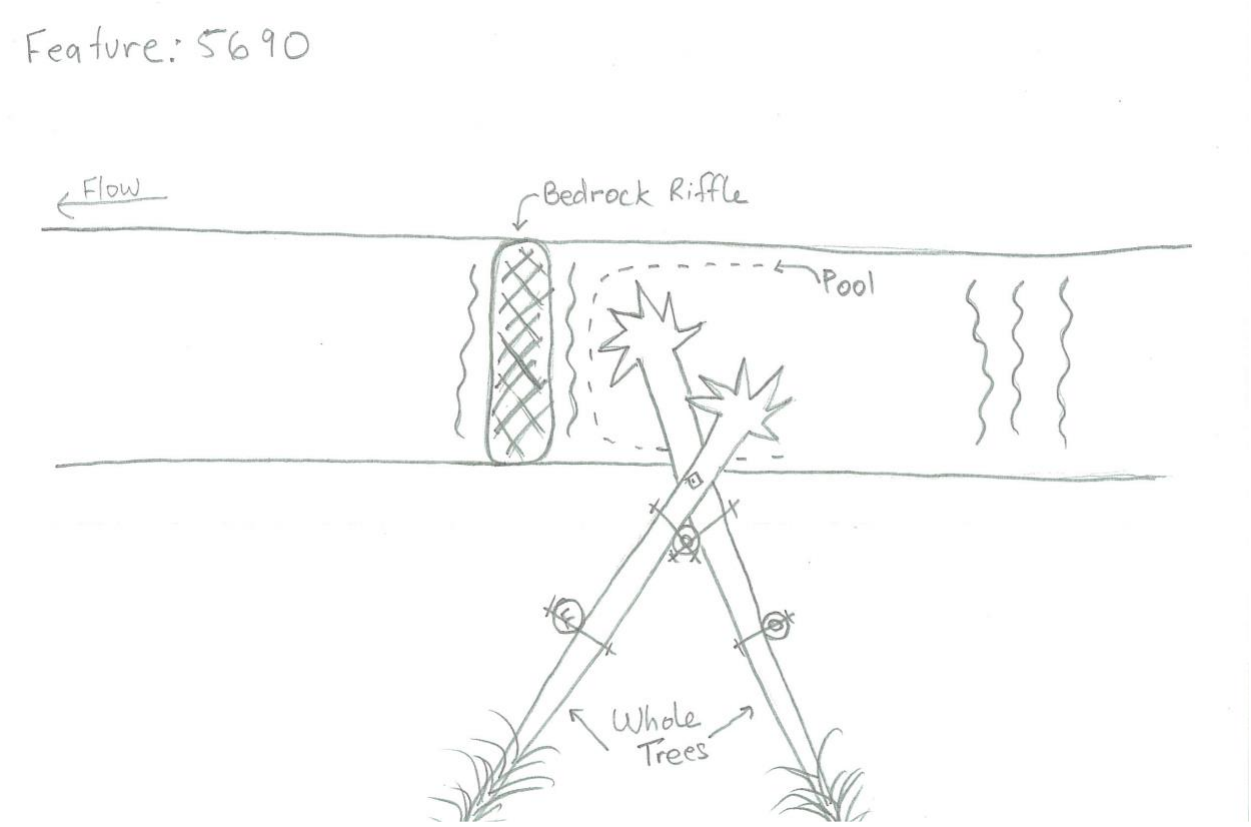
Project: Uproot 2 right bank firs. Place both trees in pool, anchored to each other and right bank trees.

Length Treated: 10 feet **Square Footage:** 80 ft^2

Objective: Increase cover and scour

Labor: CCC: 12 hours **Equipment operator:** 3 hours **Timber Faller:** 0

Supplies: 10 plates, 11 nuts, 25 feet rebar



Feature: 5896

Existing Condition: Run with 0% cover, 1.1 foot max residual depth **Bankfull:** 18 feet

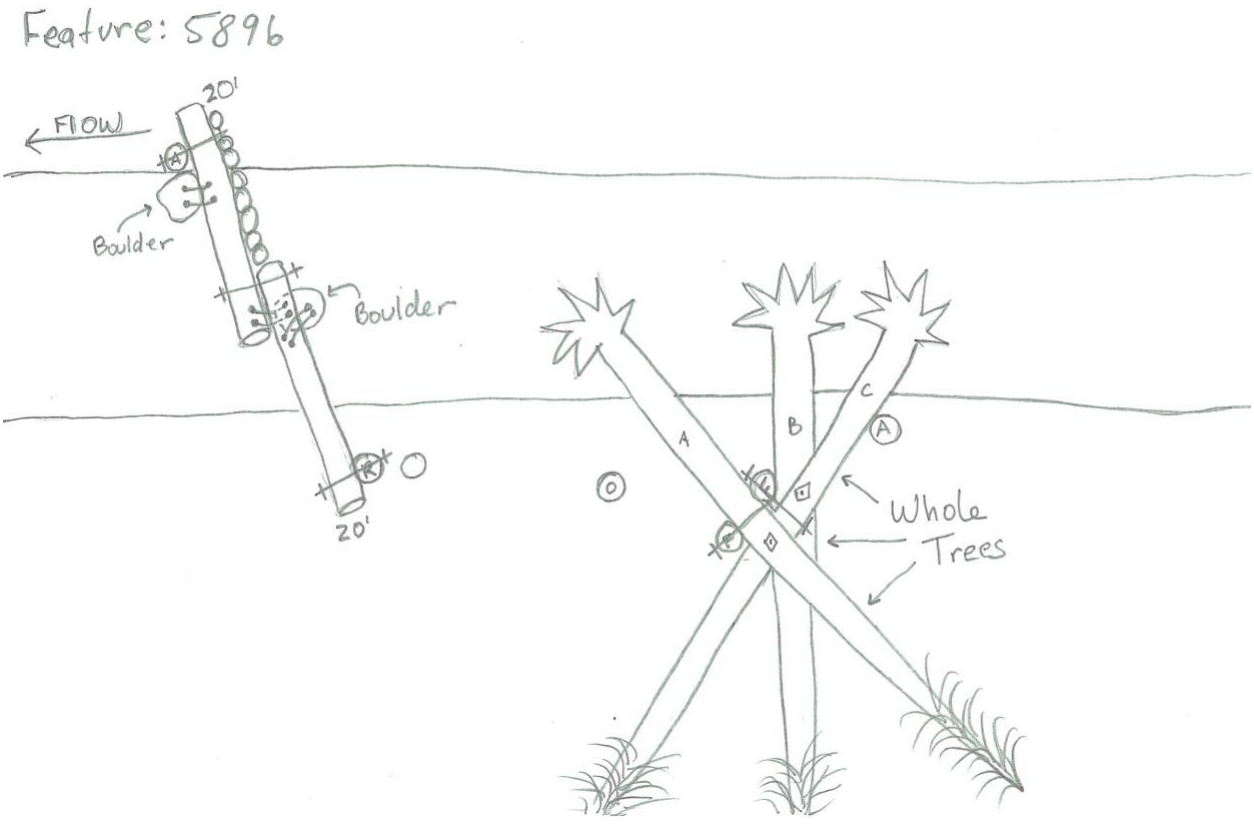
Project: Uproot 3 left bank firs. Place all 3 whole trees in the run, anchored to left bank trees and to each other. Log A is anchored to log C, log C is anchored to logs A and B. Log A is on log C, which is on log B. Purchase 2 logs, place one log along the substrate for gravel capture, anchored to right bank tree and 2 boulders. Place a log anchored to left bank tree and boulder. Left bank log is on top of boulder and right bank log is attached to boulder underneath left bank log.

Length Treated: 24 feet **Square Footage:** 135 ft^2

Objective: Gravel recruitment, increase cover, scour, and velocity refugia.

Labor: CCC: 20 hours **Equipment operator:** 5 hours **Timber Faller:** 0

Supplies: 2 boulders, 2 logs, 6 mollies, 2 packs of Hilti glue, 23 plates, 29 nuts, 65 feet rebar



Feature: 5969

Existing Condition: Pool with 5% cover, 1.1 foot max residual depth **Bankfull:** 16 feet

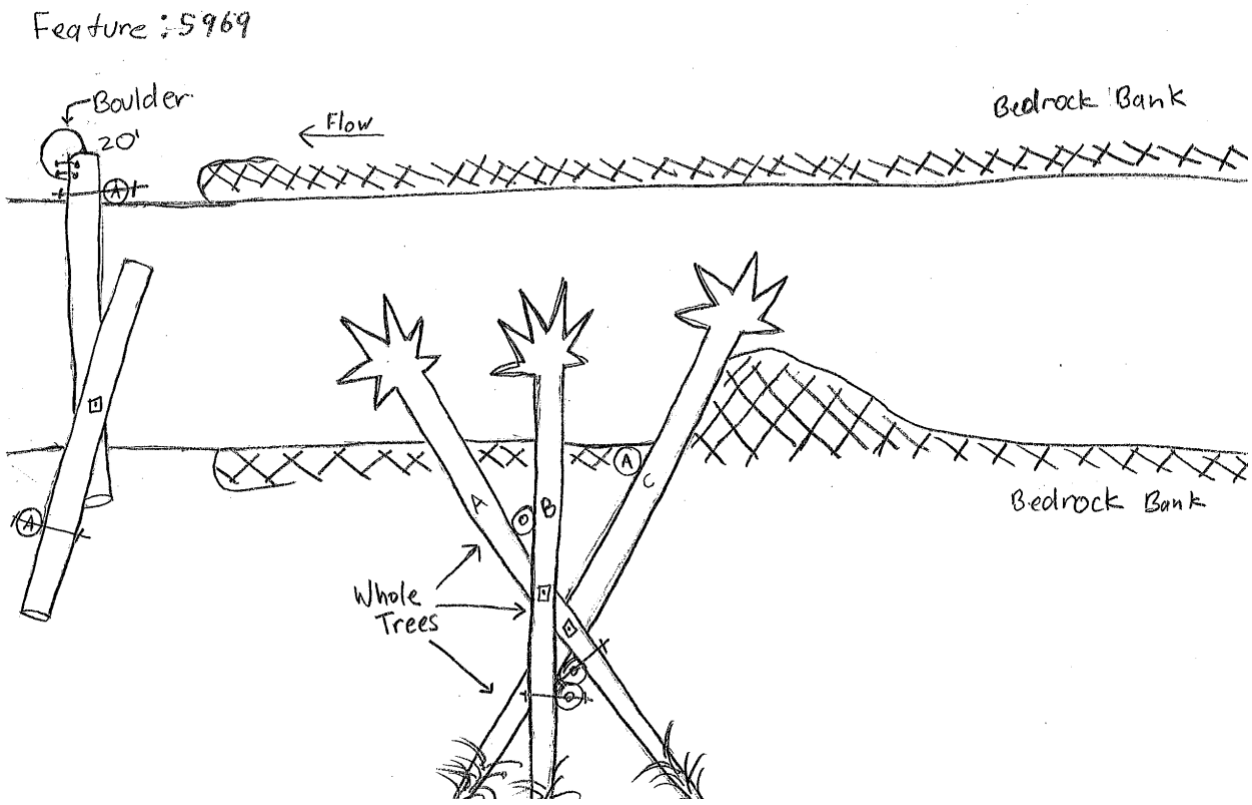
Project: Uproot 3 left bank firs. Place 2 whole trees in pool, wedged on left bank. Place third tree in the pool anchored to one of the other logs. Log B is on log A, anchored together. Log A is on log C. Purchase 2 logs, place one log along streambed for gravel capture anchored to right bank alder and boulder, place second log on the first to act as a brace, anchored to left bank alder.

Length Treated: 22 feet **Square Footage:** 140 ft^2

Objective: Gravel retention, increase cover and scour.

Labor: CCC: 8 hours **Equipment operator:** 5 hours **Timber Faller:** 0

Supplies: 1 boulder, 2 logs, 2 mollies, 1 pack of Hilti glue, 18 plates, 19 nuts, 45 feet rebar



Feature: 6072

Existing Condition: Pool with 5% cover, 2.1 foot max residual depth **Bankfull:** 21 feet

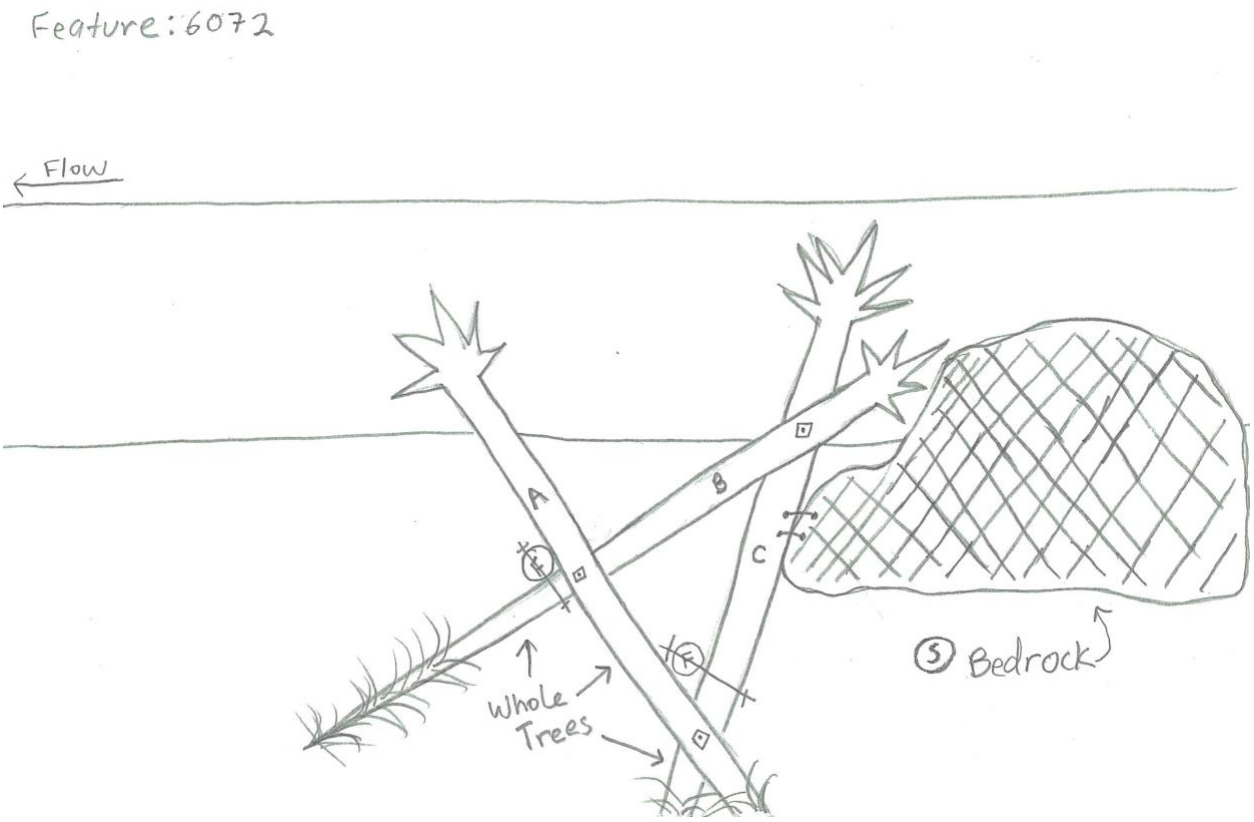
Project: Uproot 3 left bank firs. Place all 3 whole trees in pool from left bank. Log A is on log B and C, anchored to both. Log B is on log C, anchored together. Log C is anchored to bedrock and live fir.

Length Treated: 15 feet **Square Footage:** 130 ft^2

Objective: Increase cover and scour.

Labor: CCC: 16 hours **Equipment operator:** 6 hours **Timber Faller:** 0

Supplies: 2 mollies, 1 pack Hilti glue, 12 plates, 16 nuts, 35 feet rebar



Feature: 6145

Existing Condition: Pool with 10% cover, 4.5 foot max residual depth **Bankfull:** 27 feet

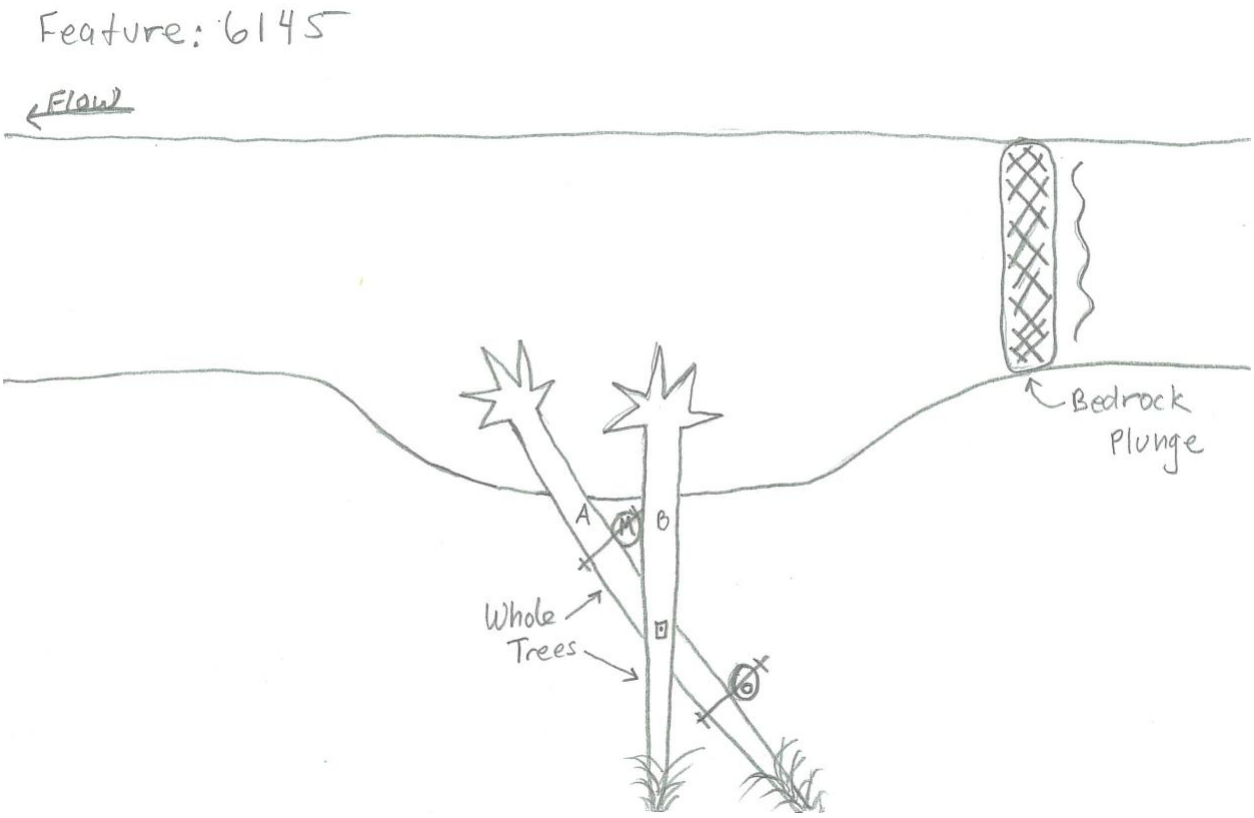
Project: Uproot 2 left bank firs. Log A is under B, anchored to two trees on right bank. Log B is on top of Log A, anchored together.

Length Treated: 20 feet **Square Footage:** 100 ft^2

Objective: Increase cover and scour.

Labor: **CCC:** 4 hours **Equipment operator:** 3 hours **Timber Faller:** 0

Supplies: 6 plates, 6 nuts, 15 feet rebar



Feature: 6245

Existing Condition: Run with 0% cover, 0.8 foot max residual depth **Bankfull:** 25 feet

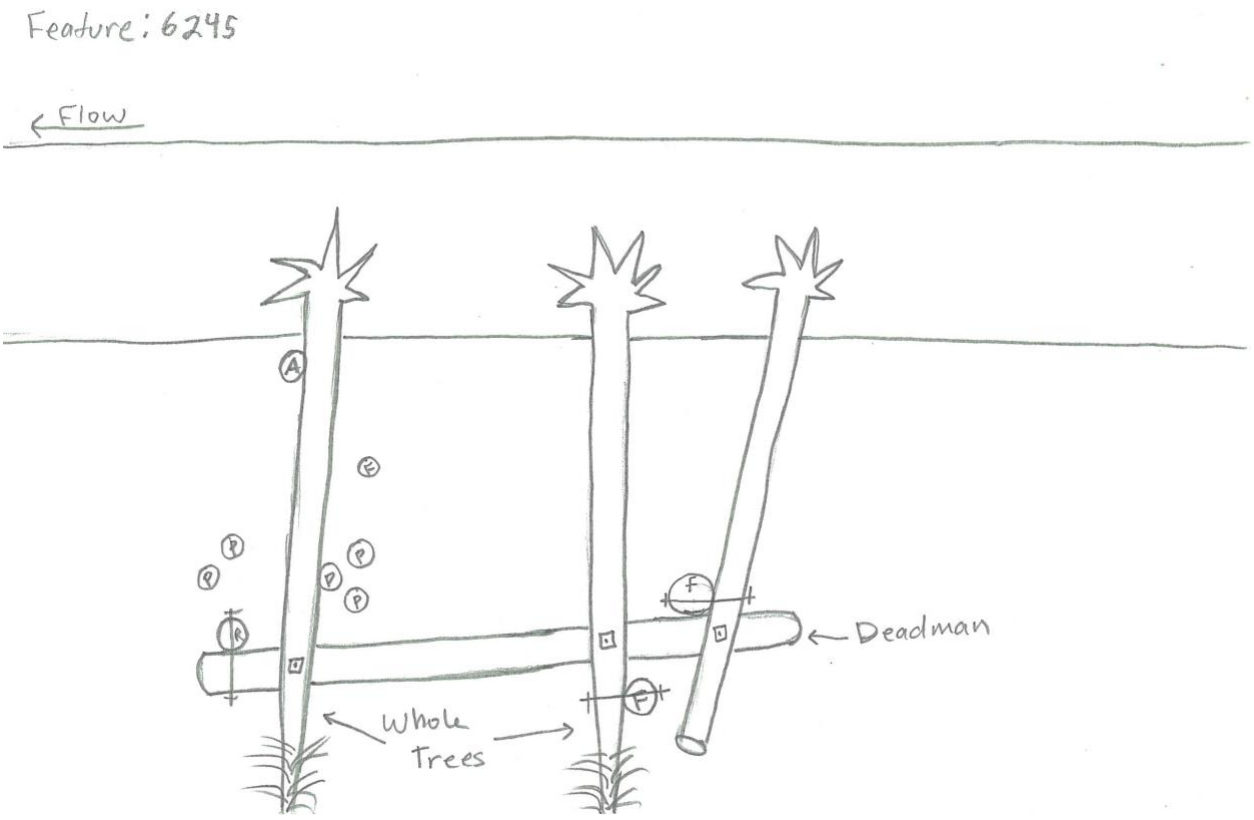
Project: Uproot 3 left bank firs, cut one into 2 pieces. Place first whole tree wedged on the left bank, anchored to deadman. Place second tree and LRW in pool, anchored to deadman. Also anchor root wad to left bank tree. Deadman also anchored to left bank tree.

Length Treated: 15 feet **Square Footage:** 80 ft^2

Objective: Increase cover and scour.

Labor: CCC: 12 hours **Equipment operator:** 4 hours **Timber Faller:** 0

Supplies: 12 plates, 15 nuts, 30 feet rebar



Feature: 6304

Existing Condition: Run with 0% cover, 1 foot max residual depth **Bankfull:** 26 feet

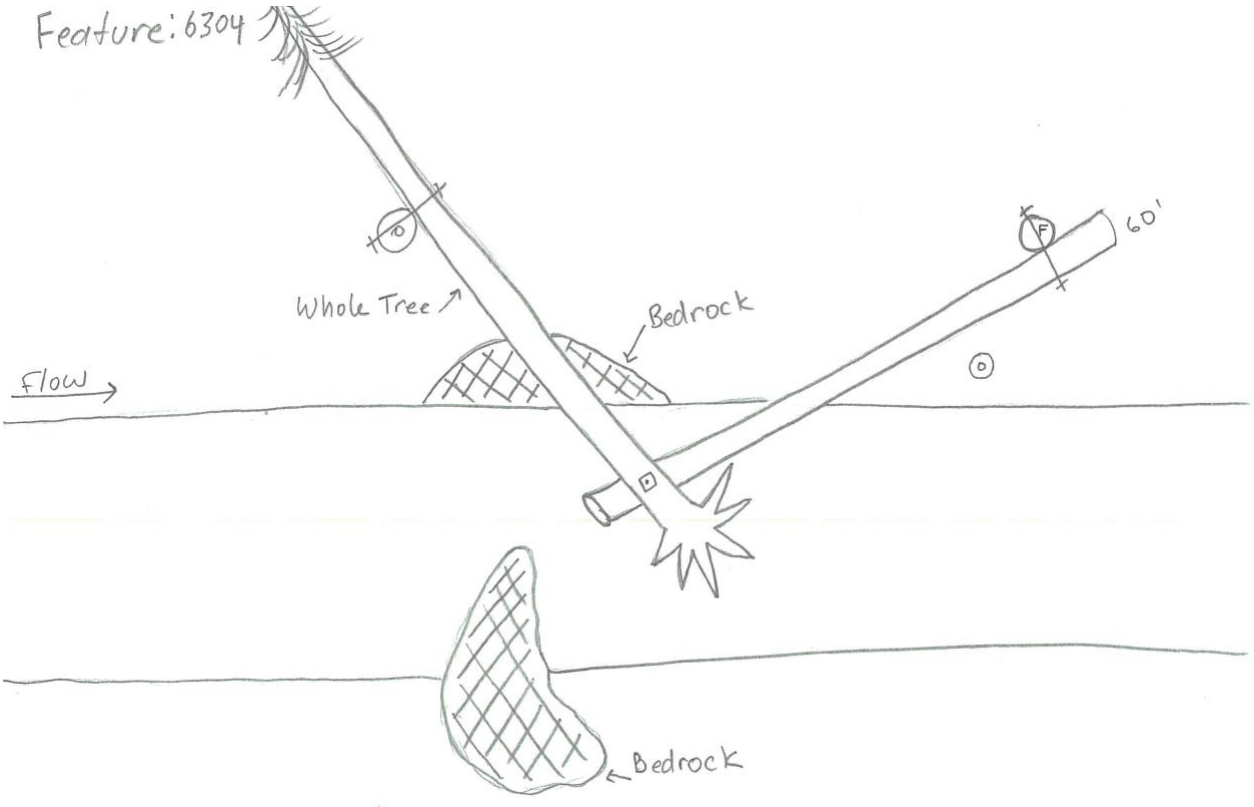
Project: Uproot 1 left bank fir, fall 1 left bank fir. Place the whole tree pointed downstream on left bank bedrock, anchored to left bank tree and log. Place second log pointed upstream, anchored to left bank tree and tree in structure.

Length Treated: 15 feet **Square Footage:** 70 ft^2

Objective: Increase cover and scour.

Labor: **CCC:** 8 hours **Equipment operator:** 3 hours **Timber Faller:** 0.5 hours

Supplies: 6 plates, 7 nuts, 15 feet rebar



Feature: 6595

Existing Condition: Pool with 0% cover, 1.8 foot max residual depth **Bankfull:** 19 feet

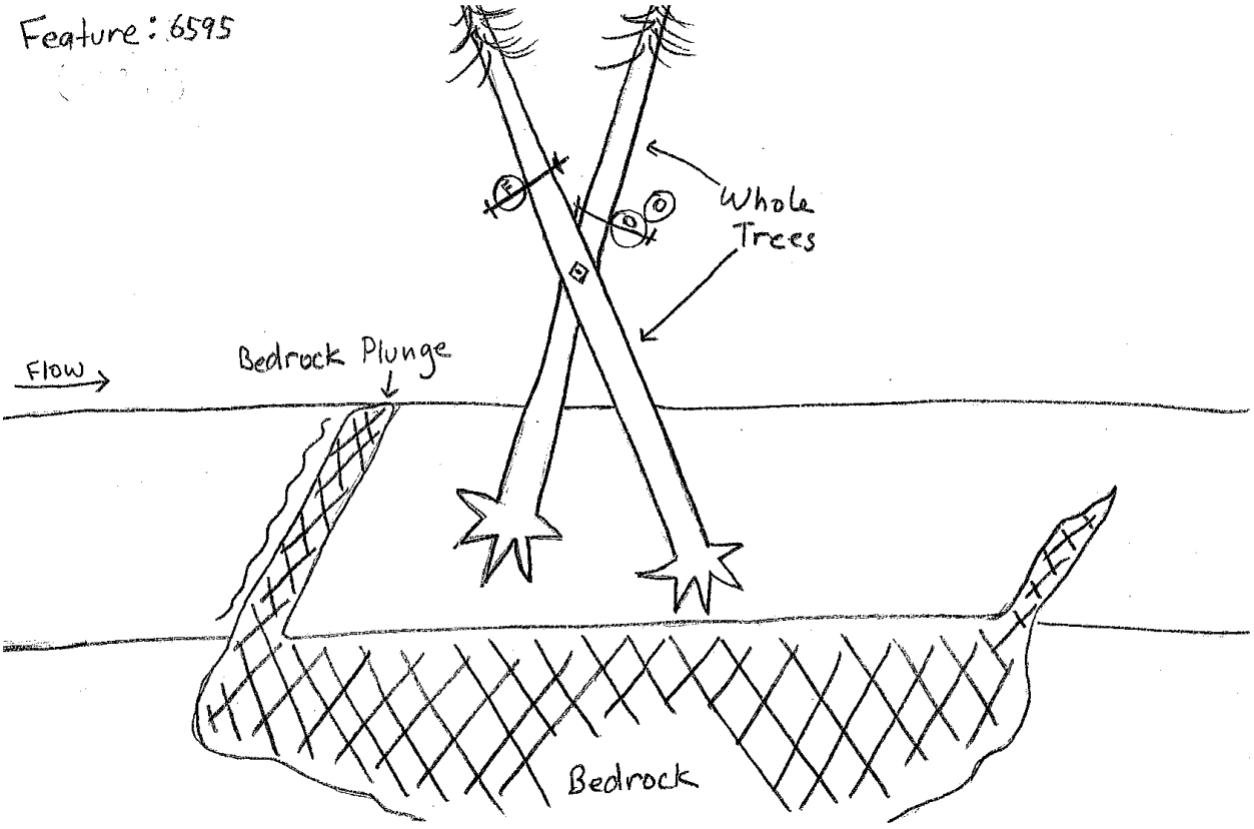
Project: Uproot 2 left bank firs. Place both whole trees into pool, anchored to left bank trees and to each other.

Length Treated: 15 feet **Square Footage:** 80 ft^2

Objective: Increase cover and scour.

Labor: CCC: 16 hours **Equipment operator:** 3 hours **Timber Faller:** 0

Supplies: 15 feet rebar, 6 plates, 6 nuts



Feature: 6708

Existing Condition: Pool with 0% cover, 1.4 foot max residual depth **Bankfull:** 22 feet

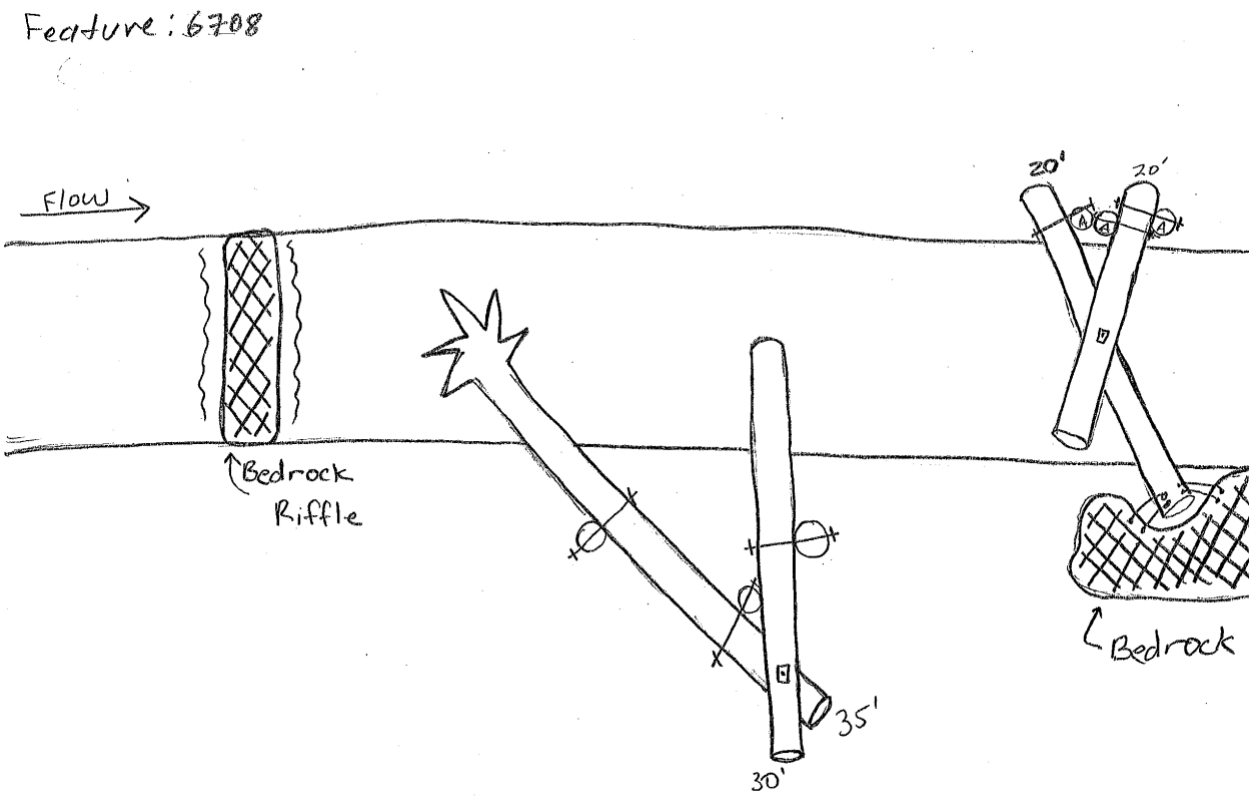
Project: Uproot 1 left bank fir, cut into 2 pieces. Place rootwad pointed upstream into pool, anchored to right bank trees. Place log downstream of rootwad, anchored to rootwad and right bank tree. Purchase 2 logs, place one on streambed for gravel capture anchored to left bank tree and bedrock, place second log crossing first, anchored to the first log and left bank trees.

Length Treated: 10 feet **Square Footage:** 50 ft^2

Objective: Gravel retention, increase cover and velocity refugia.

Labor: CCC: 24 hours **Equipment operator:** 4 hours **Timber Faller:** 0

Supplies: 2 logs, 4 mollies, 1 pack Hilti glue, 24 plates, 31 nuts, 60 feet rebar



Feature: 6870

Existing Condition: Pool with 5% cover, 2.8 foot max residual depth **Bankfull:** 23 feet

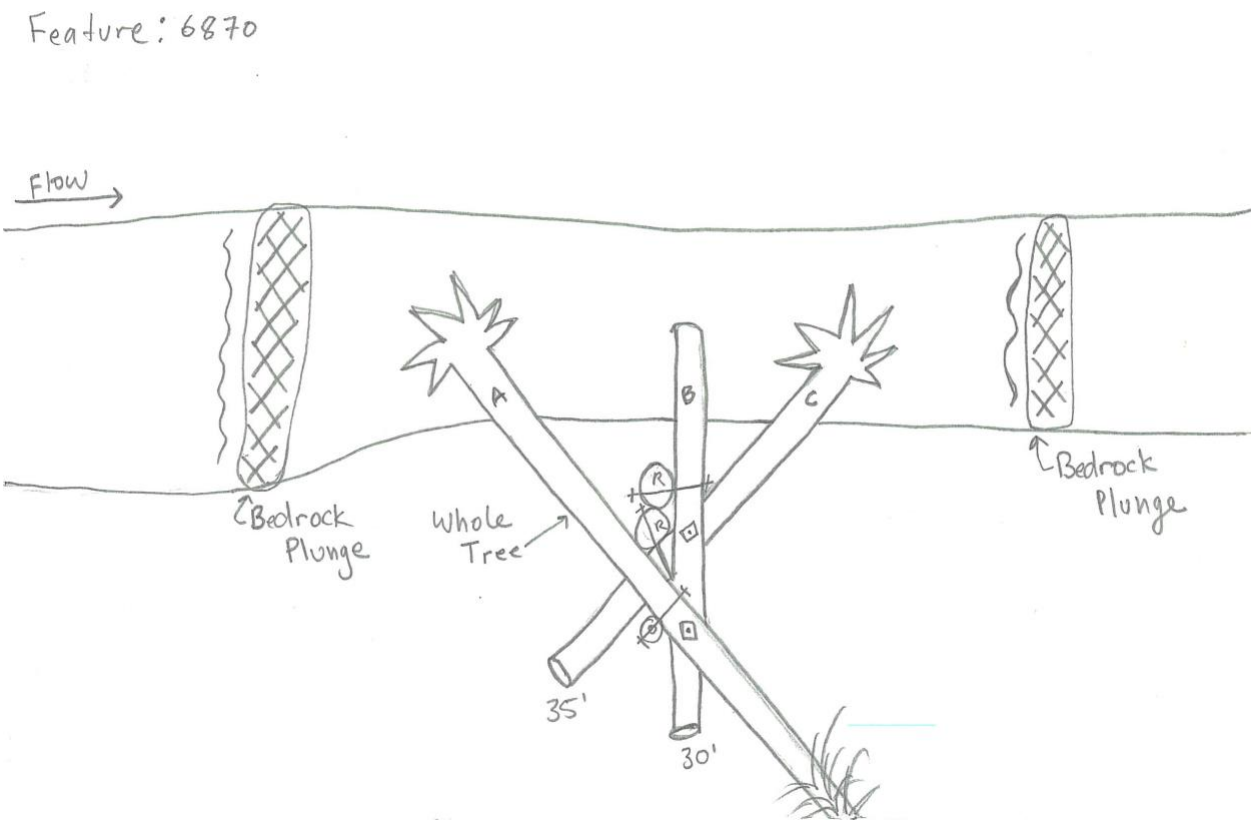
Project: Uproot 2 right bank firs, cut 1 into 2 pieces. Place the whole tree in the upstream part of pool. Place the log in the center of the pool. Place the rootwad in the lower part of the pool. Log A is on log B, which is on log C. Log A and B are anchored together, log B and C are anchored together. Logs A, B, and C are also anchored to right bank trees.

Length Treated: 20 feet **Square Footage:** 75 ft^2

Objective: Increase cover and scour.

Labor: **CCC:** 24 hours **Equipment operator:** 4 hours **Timber Faller:** 0

Supplies: 25 feet rebar, 10 plates, 12 nuts



Feature: 6921

Existing Condition: Pool with 5% cover, 3.6 foot max residual depth **Bankfull:** 20 feet

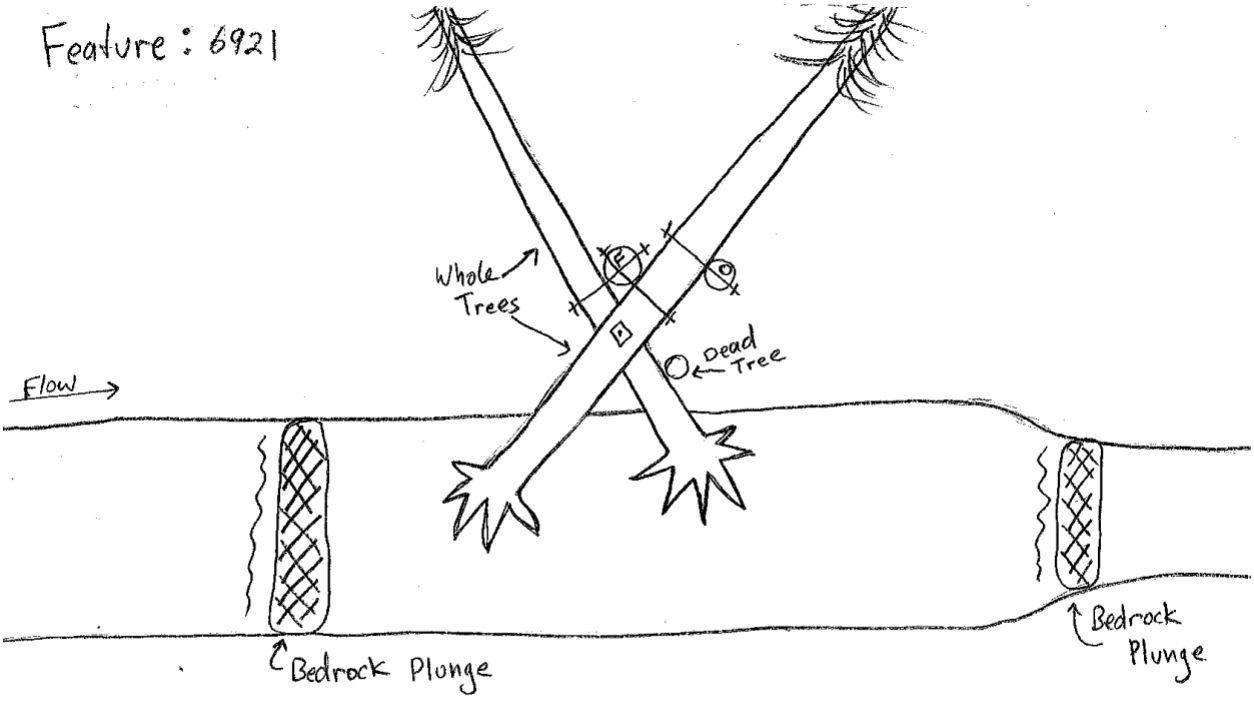
Project: Uproot 2 left bank firs. Place whole trees in pool, anchored to left bank trees and to each other.

Length Treated: 15 feet **Square Footage:** 60 ft^2

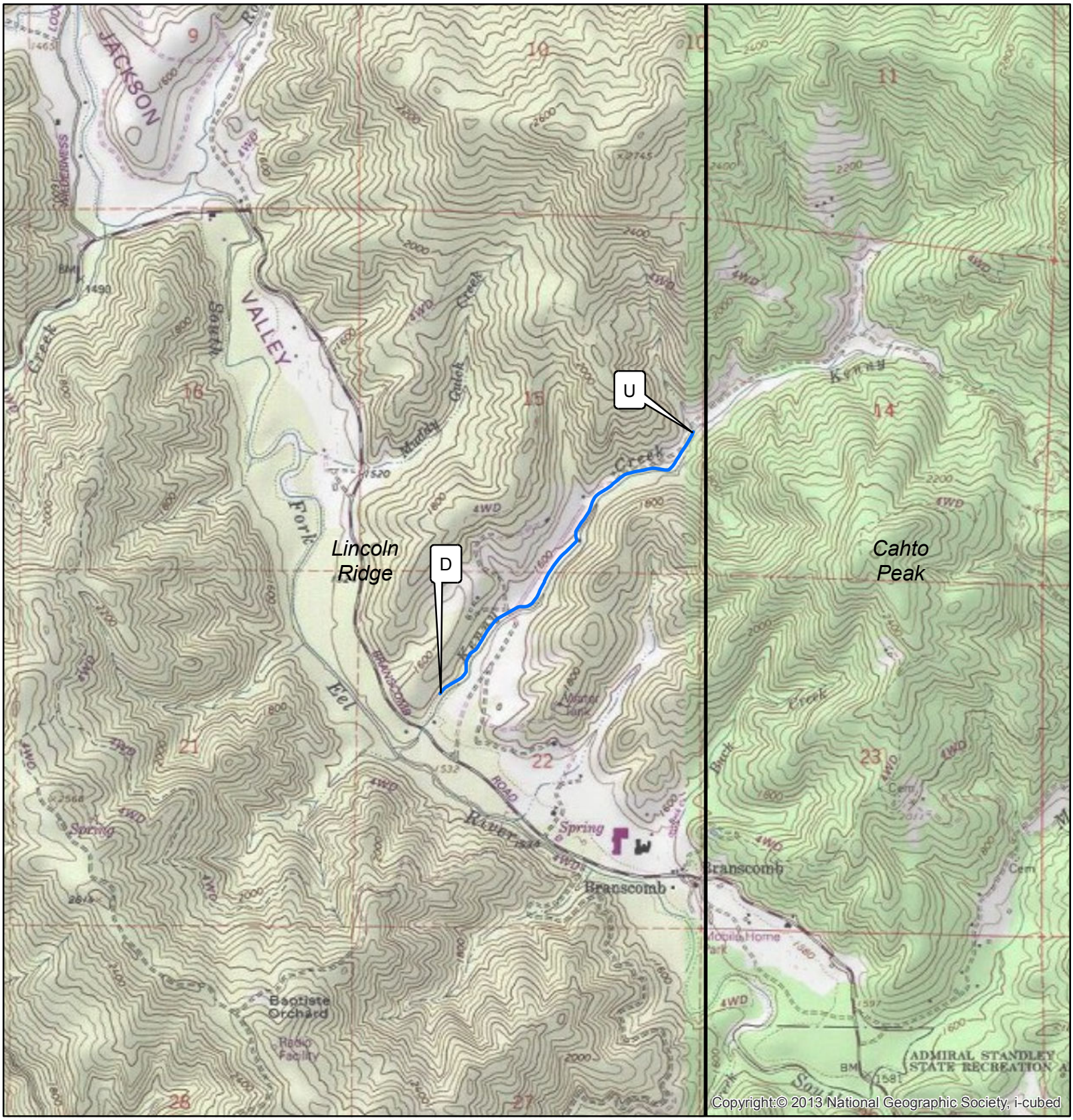
Objective: Increase cover.

Labor: CCC: 16 hours **Equipment operator:** 4 hours **Timber Faller:** 0

Supplies: 20 feet rebar, 8 plates, 9 nuts



Project Location Topographic Map
Kenny Creek Instream Habitat Enhancement Project
Lincoln Ridge Quad, Mendocino County



Kenny Creek Project Reach

Eel River Watershed Improvement Group
March 2018

0 0.3 0.6 1.2 Miles

N

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STREAM INVENTORY REPORT

Kenny Creek
October 2005

INTRODUCTION

A stream inventory was conducted on 10/24/2005 and 10/25/2005 on Kenny Creek. The survey began at the confluence with South Fork Eel River and extended upstream 2.6 miles.

The Kenny Creek inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Kenny Creek. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for Chinook salmon, coho salmon, and steelhead trout. Recommendations for habitat improvement activities are based upon target habitat values suitable for salmonids in California's north coast streams.

WATERSHED OVERVIEW

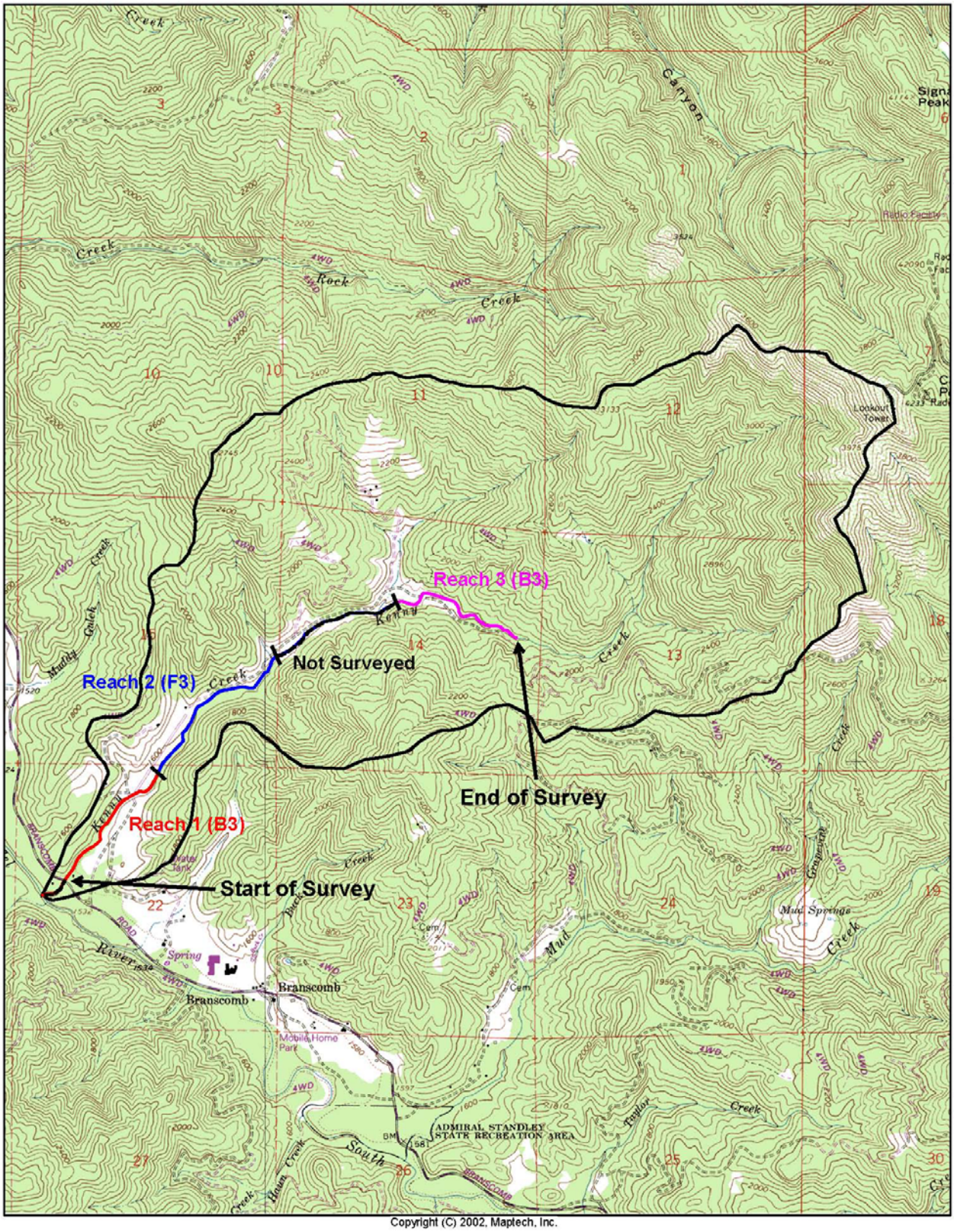
Kenny Creek is a tributary to South Fork Eel River, a tributary to the Eel River, located in Mendocino County, California (Map 1). Kenny Creek's legal description at the confluence with South Fork Eel River is T21N R16W S22. Its location is 39°39'33" north latitude and 123°38'27" west longitude, LLID number 1236407396592. Kenny Creek is a 1st order stream and has approximately 3.6 miles of blue line stream according to the USGS Lincoln Ridge 7.5 minute quadrangle. Kenny Creek drains a watershed of approximately 3.4 square miles. Elevations range from about 1,500 feet at the mouth of the creek to 3,500 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is partially managed for timber production. Vehicle access exists via exit Branscomb Road in Laytonville from Highway 101. Travel approximately 10.5 miles to Kenny Creek Road, this parallels the creek.

METHODS

The habitat inventory conducted in Kenny Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Conservation Corps (CCC) Technical Advisors and Watershed Stewards Project/AmeriCorps (WSP) Members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). This inventory was conducted by a two-person team.

Kenny Creek

Map 1



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Kenny Creek

SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest (measured in the thalweg), dominant substrate composing the pool tail crest, and embeddedness. Habitat unit types encountered for the first time are measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement. All pools except step-pools are fully sampled.

HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the *California Salmonid Stream Habitat Restoration Manual*. This form was used in Kenny Creek to record measurements and observations. There are eleven components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) near the bottom of the stream survey reach using a Marsh-McBirney Model 2000 flow meter.

2. Channel Type:

Channel typing is conducted according to the classification system developed and revised by David Rosgen (1994). This methodology is described in the *California Salmonid Stream Habitat Restoration Manual*. Channel typing is conducted simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a clinometer, hand level, hip chain, tape measure, and a stadia rod.

3. Temperatures:

Both water and air temperatures are measured and recorded at every tenth habitat unit. The time of the measurement is also recorded. Both temperatures are taken in degrees Fahrenheit at the middle of the habitat unit and within one foot of the water surface.

4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1990). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. Dewatered units are labeled "dry". Kenny Creek habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean

wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Kenny Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. In Kenny Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all fully-described habitat units, dominant and sub-dominant substrate elements were ocularly estimated using a list of seven size classes and recorded as a one and two, respectively. In addition, the dominant substrate composing the pool tail-outs is recorded for each pool.

8. Canopy:

Stream canopy density was estimated using modified handheld spherical densiometers as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Kenny Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the center of approximately every third unit in addition to every fully-described unit, giving an approximate 30% sub-sample. In addition, the area of canopy was estimated ocularly into percentages of coniferous or hardwood trees.

9. Bank Composition and Vegetation:

Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to withstand winter flows. In Kenny Creek, the dominant composition type and the dominant

vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

10. Large Woody Debris Count:

Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each habitat unit all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in Kenny Creek. In addition, underwater observations were made at 8 sites using techniques discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.19, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

- Riffle, Flatwater, and Pool Habitat Types
- Habitat Types and Measured Parameters
- Pool Types
- Maximum Residual Pool Depths by Habitat Types
- Mean Percent Cover by Habitat Type
- Dominant Substrates by Habitat Type
- Mean Percent Vegetative Cover for Entire Stream
- Fish Habitat Inventory Data Summary by Stream Reach (Table 8)

- Mean Percent Dominant Substrate / Dominant Vegetation Type for Entire Stream
- Mean Percent Shelter Cover Types for Entire Stream

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Kenny Creek include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence
- Riffle, Flatwater, Pool Habitat Types by Total Length
- Total Habitat Types by Percent Occurrence
- Pool Types by Percent Occurrence
- Maximum Residual Depth in Pools
- Percent Embeddedness
- Mean Percent Cover Types in Pools
- Substrate Composition in Pool Tail-outs
- Mean Percent Canopy
- Dominant Bank Composition by Composition Type
- Dominant Bank Vegetation by Vegetation Type

HABITAT INVENTORY RESULTS

* ALL TABLES AND GRAPHS ARE LOCATED AT THE END OF THE REPORT *

The habitat inventory of 10/24/2005 and 10/25/2005 was conducted by Isaac Mikus and Sean McSmith (WSP). The total length of the stream surveyed was 13,571 feet.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 0.3 cfs on 10/21/05.

Kenny Creek is a B3 channel type for 3,893 feet of the stream surveyed (Reach 1), a F3 channel type for 6,601 feet of the stream surveyed (Reach 2), a B3 channel type for 3,077 feet of the stream surveyed (Reach 3).

B3 channel types are moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools; very stable plan and profile; stable banks; cobble channel. F3 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratio; cobble channel.

Water temperatures taken during the survey period ranged from 48 to 51 degrees Fahrenheit. Air temperatures ranged from 41 to 61 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 38% pool units, 31% riffle units, 29% flatwater units, 1% was not surveyed, and 1% culvert units (Graph 1). Based on total length of Level II habitat types there

were 29.1% flatwater units, 25.3% pool units, 17.4% riffle units and 0.3% culvert units (Graph 2). Due to lack of landowner access 27.8% of the total stream length was not surveyed.

Twelve Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 34% mid-channel pool units, 23% low gradient riffle units and 18% step run units (Graph 3). Based on percent total length, 28% was not surveyed, 23% step run units and 22% mid-channel pool units.

A total of 72 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 93%, and comprised 92% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Thirty four of the 72 pools (47%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 72 pool tail-outs measured, 2 had a value of 1 (2.8%); 28 had a value of 2 (38.9%); 17 had a value of 3 (23.6%); 7 had a value of 4 (9.7%); 18 had a value of 5 (25%); (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate such as bedrock, log sills, boulders, or other considerations.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 12, flatwater habitat types had a mean shelter rating of 9, and pool habitats had a mean shelter rating of 17 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 17, scour pools had a mean shelter rating of 12 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders the dominant cover types in Kenny Creek. Graph 7 describes the pool cover in Kenny Creek. Bedrock ledge is the dominant pool cover type followed by boulders.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Large cobble observed in 51% of pool tail-outs and small cobble observed in 18% of pool tail-outs.

The mean percent canopy density for the surveyed length of Kenny Creek was 95%. The mean percentages of hardwood and coniferous trees were 82.5% and 13.0%, respectively and 4.5% of the canopy was open. Graph 9 describes the mean percent canopy in Kenny Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 97%. The mean percent left bank vegetated was 99%. The dominant elements composing the structure of the stream banks consisted of 53% sand/silt/clay and 38% bedrock (Graph 10). Hardwood trees were the dominant vegetation type observed in 75% of the units surveyed. Additionally, 23.9% of the units surveyed had coniferous tress as the dominant vegetation type, and 1.1% had brush as the dominant vegetation (Graph 11).

Kenny Creek

BIOLOGICAL INVENTORY RESULTS

Eight sites were dived for species composition and distribution in Kenny Creek in November, 2005. Water temperatures taken during the sampling period 12:00 to 13:20 ranged from 46° to 48° Fahrenheit. Air temperature was 54° Fahrenheit. The sites were sampled by Trevor Toffelfson (DFG) and Isaac Mikus (WSP).

In reach 1, which comprised the first 3,893 feet of stream, 2 sites were sampled. The reach sites yielded 20 young-of-the-year steelhead/rainbow trout (SH/RT) and 43 coho.

In reach 2, four sites were sampled starting approximately 3,894 feet from the confluence with South Fork Eel River and continuing upstream 6,601 feet. The reach sites yielded 11 young-of-the-year SH/RT and 19 coho.

In reach 3, two sites were sampled starting approximately 10,495 feet from the confluence with South Fork Eel River and continuing upstream 3,077 feet. The reach sites yielded 8 young-of-the-year SH/RT, 1 age 1+ SH/RT and 27 coho.

The following chart displays the information yielded from these sites:

2005 Kenny Creek dive observations

Date	Site #	Hab. Unit #	Hab. Type	Approx. Dist. from mouth (ft.)	Coho		SH/RT		
					YOY	1+	YOY	1+	2+
Reach 1 B3 Channel Type									
11/01/05	1	002	Pool	579	24	0	9	0	0
11/01/05	2	005	Pool	799	19	0	11	0	0
Reach 2 F3 Channel Type									
11/01/05	3	050	Pool	3,301	12	0	4	0	0
11/01/05	4	058	Pool	3,813	0	0	1	0	0
11/01/05	5	061	Run	3,893	0	0	0	0	0
11/01/05	6	127	Pool	7,180	7	0	6	0	0
Reach 3 B3 Channel Type									
11/01/05	7	183	Pool	13,303	4	0	4	0	0
11/01/05	8	188	Pool	13,464	23	0	4	1	0

Kenny Creek

DISCUSSION

Kenny Creek is a B3 channel type for 3,893 feet of the stream surveyed (Reach 1), a F3 channel type for 6,601 feet of the stream surveyed (Reach 2), a B3 channel type for 3,077 feet of the stream surveyed (Reach 3). The suitability of B3 channel types for fish habitat improvement structures is as follows: excellent for plunge weirs, boulder clusters and bank placed boulders, single and opposing wing deflectors, and log cover. The suitability F3 channel types for fish habitat improvements structures is as follows: good for bank-placed boulders, singe and opposing wing deflectors; and fair for plunge weirs, boulder clusters, channel constrictors, and log cover.

The water temperatures recorded on the survey days 10/24/2005 and 10/25/2005, ranged from 48 to 51 degrees Fahrenheit. Air temperatures ranged from 41 to 61 degrees Fahrenheit. To make any conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Flatwater habitat types comprised 29% of the total length of this survey, riffles 17%, and pools 25%. The pools are relatively deep, with only 34 of the 72 (47%) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat is recommended.

Thirty of the 72 pool tail-outs measured had embeddedness ratings of 1 or 2. Twenty four of the pool tail-outs had embeddedness ratings of 3 or 4. Eighteen of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Sediment sources in Kenny Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Forty seven of the 72 pool tail-outs had silt, sand, large cobble, boulders or bedrock as the dominant substrate. This is generally considered unsuitable for spawning salmonids.

The mean shelter rating for pools was 17. The shelter rating in the flatwater habitats was 9. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in Kenny Creek. Bedrock ledges are the dominant cover type in pools followed by boulders. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The mean percent canopy density for the stream was 95%. Reach 1 had a canopy density of 94%; reach 2 had a canopy density of 95.7%; reach 3 had a canopy density of 97%. In general, revegetation projects are considered when canopy density is less than 80%.

Kenny Creek

The percentage of right and left bank covered with vegetation was 97% and 99%, respectively. In areas of stream bank erosion or where bank vegetation is sparse, planting endemic species of coniferous and hardwood trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

1) Kenny Creek should be managed as an anadromous, natural production stream.

2) The limited water temperature data available suggest that maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.

3) Where feasible, design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

4) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from bedrock ledges. Adding high quality complexity with woody cover in the pools is desirable.

5) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream.

6) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.

7) Suitable size spawning substrate on Kenny Creek is limited to relatively few reaches. Projects should be designed at suitable sites to trap and sort spawning gravel.

COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey reach.

Position (ft.)	Habitat Unit #	Comments:
0	001	Start of survey at the Branscomb Road Bridge. Landowner access permission was not granted below the bridge. The 1996 stream survey was used to get the stream length from the South Fork Eel River to the bridge. Channel type is a B3.

Kenny Creek

Position (ft.)	Habitat Unit #	Comments:
579	002	Branscomb Road Bridge. First fish sample site.
799	005	Second fish sample site.
2,511	036	Right bank erosion, 50' long x 25' high.
2,820	041	Creek dark with tannins for the entire survey length.
2,865	042	Habitat Unit #30 1996 survey.
3,112	046	Culvert.
3,301	050	Third fish sample site.
3,813	058	Fourth fish sample site.
3,893	061	Channel type changes to a F3. Fifth fish sample site.
4,379	067	Bedrock sheet with a 3.1’ plunge.
5,582	091	Access at the airstrip.
5,794	096	Bedrock sheet with a 3.8' plunge.
6,125	103	Right bank erosion from the road.
6,298	107	Plunge of 1.8'.
6,468	111	Plunge of 1.3'.
6,885	120	Plunge of 2.6'.
6,912	121	Bedrock plunge of 2.2'.
7,180	127	Sixth fish sample site.
7,216	128	Right bank tributary, accessible to fish with a slope of ~6%. No fish were observed. N39.67202 degrees, W123.62628 degrees.

Kenny Creek

Position (ft.)	Habitat Unit #	Comments:
7,204	130	Landowner access permission not granted for this section of creek. The road length was measured with a hip chain in order to get an approximation of the stream length. In this un-surveyed portion is a right bank tributary. N39.67606, W123.61736.
10,494	131	Channel type changes to a B3.
10,944	137	Left bank erosion, 6' high x 15' long.
10,984	138	Wood vehicle bridge, 12' wide x 10' high x 40' long.
11,740	155	Slight right bank erosion.
11,957	158	All left bank trees have been cut down through HU 158 and parts of 157 and 159.
12,262	165	Right bank erosion contributing fine sediment, 15' high x 25' long.
12,475	169	Temporary bridge.
13,158	178	Left bank erosion.
13,303	183	Seventh fish sample site.
13,464	188	Eighth fish sample site.
13,571	190	End of survey due to lack of landowner access. Stream gradient increasing, with boulders more dominant.

REFERENCES

Flosi, G., Downie, S., Hopelain, J., Bird, M., Coey, R., and Collins, B. 1998. *California Salmonid Stream Habitat Restoration Manual*, 3rd edition. California Department of Fish and Game, Sacramento, California.

McCain, M., D. Fuller, L. Decker and K. Overton. 1990. Stream habitat classification and inventory procedures for northern California. FHC Currents. No.1. U.S. Department of Agriculture. Forest Service, Pacific Southwest Region.

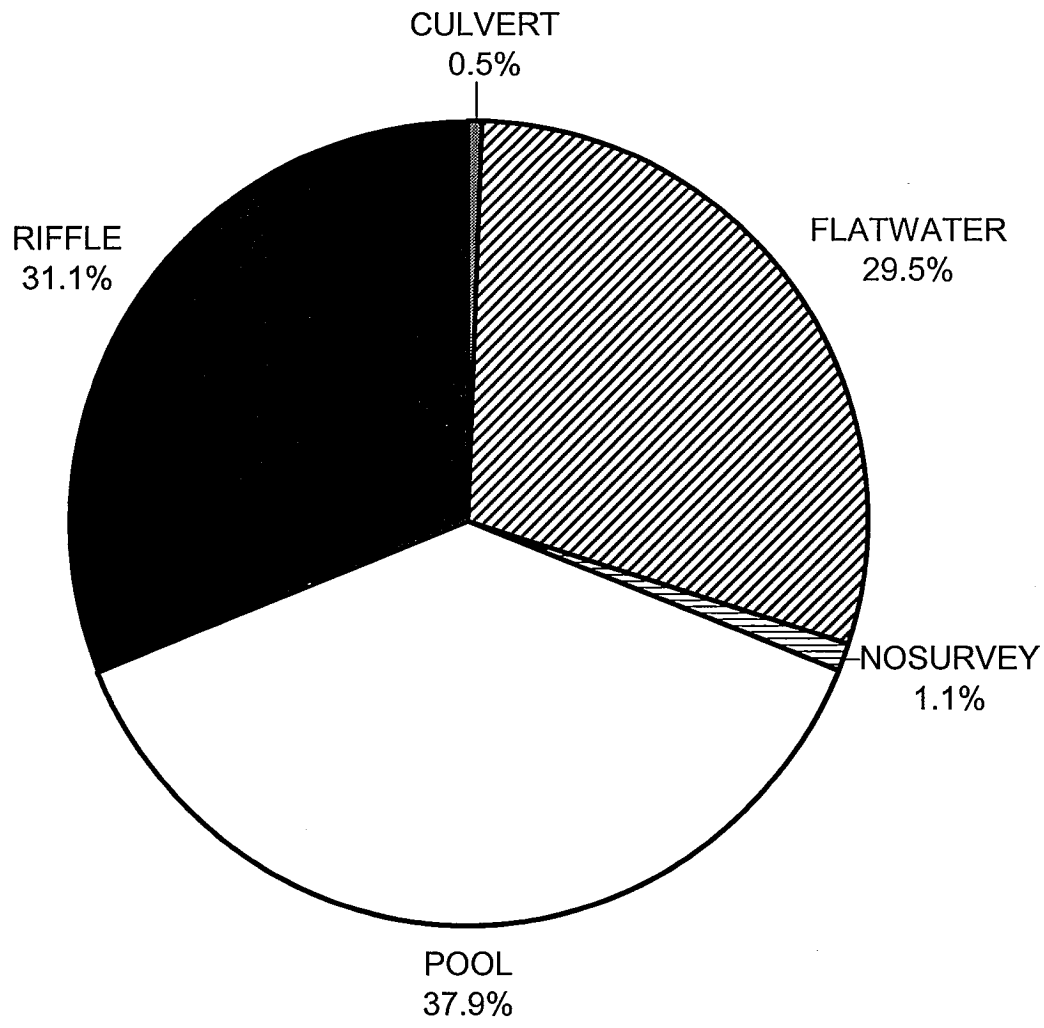
Rosgen, D.L., 1994. A Classification of Natural Rivers. Catena, Vol 22: 169-199, Elsevier Science, B. V. Amsterdam.

Kenny Creek

LEVEL III and LEVEL IV HABITAT TYPES

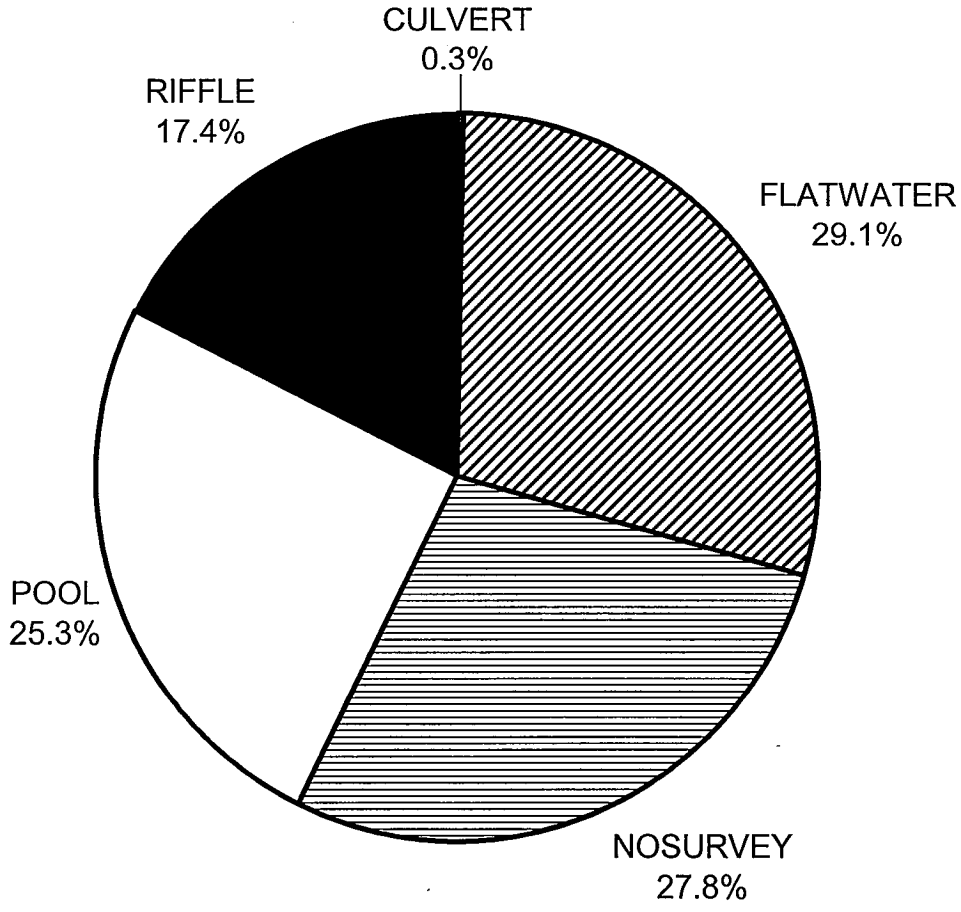
RIFFLE			
Low Gradient Riffle	(LGR)	[1.1]	{ 1}
High Gradient Riffle	(HGR)	[1.2]	{ 2}
CASCADE			
Cascade	(CAS)	[2.1]	{ 3}
Bedrock Sheet	(BRS)	[2.2]	{24}
FLATWATER			
Pocket Water	(POW)	[3.1]	{21}
Glide	(GLD)	[3.2]	{14}
Run	(RUN)	[3.3]	{15}
Step Run	(SRN)	[3.4]	{16}
Edgewater	(EDW)	[3.5]	{18}
MAIN CHANNEL POOLS			
Trench Pool	(TRP)	[4.1]	{ 8 }
Mid-Channel Pool	(MCP)	[4.2]	{17}
Channel Confluence Pool	(CCP)	[4.3]	{19}
Step Pool	(STP)	[4.4]	{23}
SCOUR POOLS			
Corner Pool	(CRP)	[5.1]	{22}
Lateral Scour Pool - Log Enhanced	(LSL)	[5.2]	{10}
Lateral Scour Pool - Root Wad Enhanced	(LSR)	[5.3]	{11}
Lateral Scour Pool - Bedrock Formed	(LSBk)	[5.4]	{12}
Lateral Scour Pool - Boulder Formed	(LSBo)	[5.5]	{20}
Plunge Pool	(PLP)	[5.6]	{ 9 }
BACKWATER POOLS			
Secondary Channel Pool	(SCP)	[6.1]	{ 4 }
Backwater Pool - Boulder Formed	(BPB)	[6.2]	{ 5 }
Backwater Pool - Root Wad Formed	(BPR)	[6.3]	{ 6 }
Backwater Pool - Log Formed	(BPL)	[6.4]	{ 7 }
Dammed Pool	(DPL)	[6.5]	{13}
ADDITIONAL UNIT DESIGNATIONS			
Dry	(DRY)	[7.0]	
Culvert	(CUL)	[8.0]	
Not Surveyed	(NS)	[9.0]	
Not Surveyed due to a marsh	(MAR)	[9.1]	

KENNY CREEK 2005
HABITAT TYPES BY PERCENT OCCURRENCE



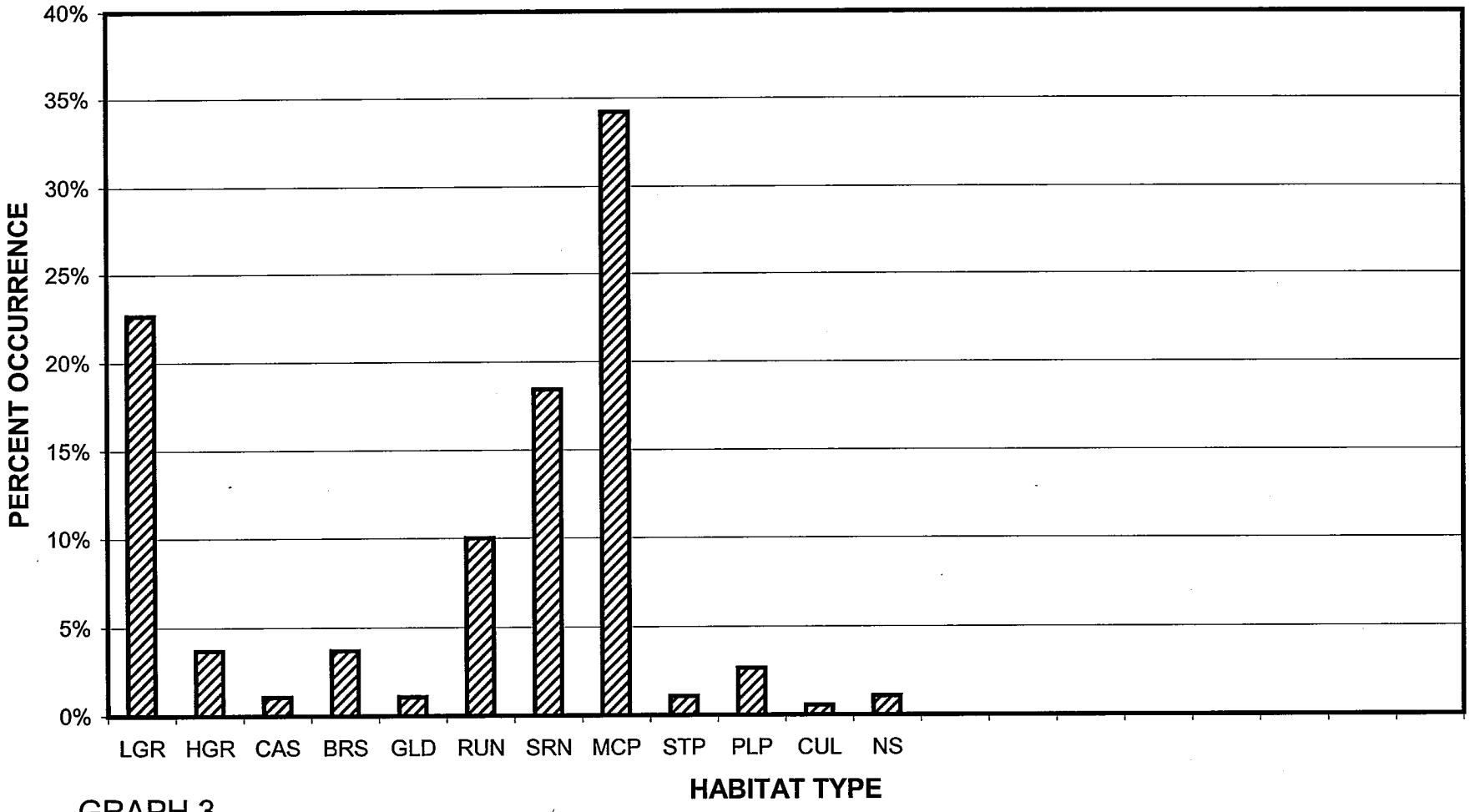
GRAPH 1

KENNY CREEK 2005
HABITAT TYPES BY PERCENT TOTAL LENGTH



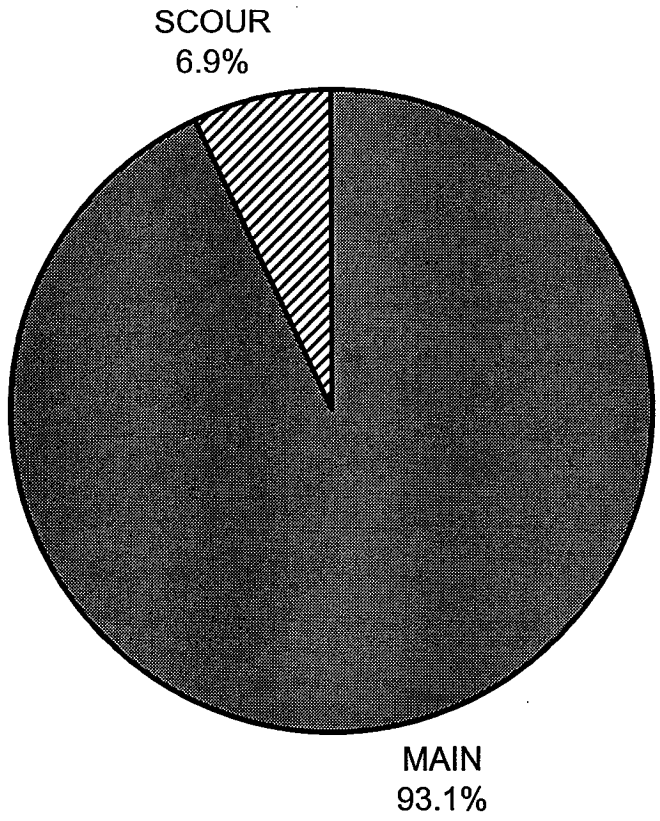
GRAPH 2

KENNY CREEK 2005
HABITAT TYPES BY PERCENT OCCURRENCE



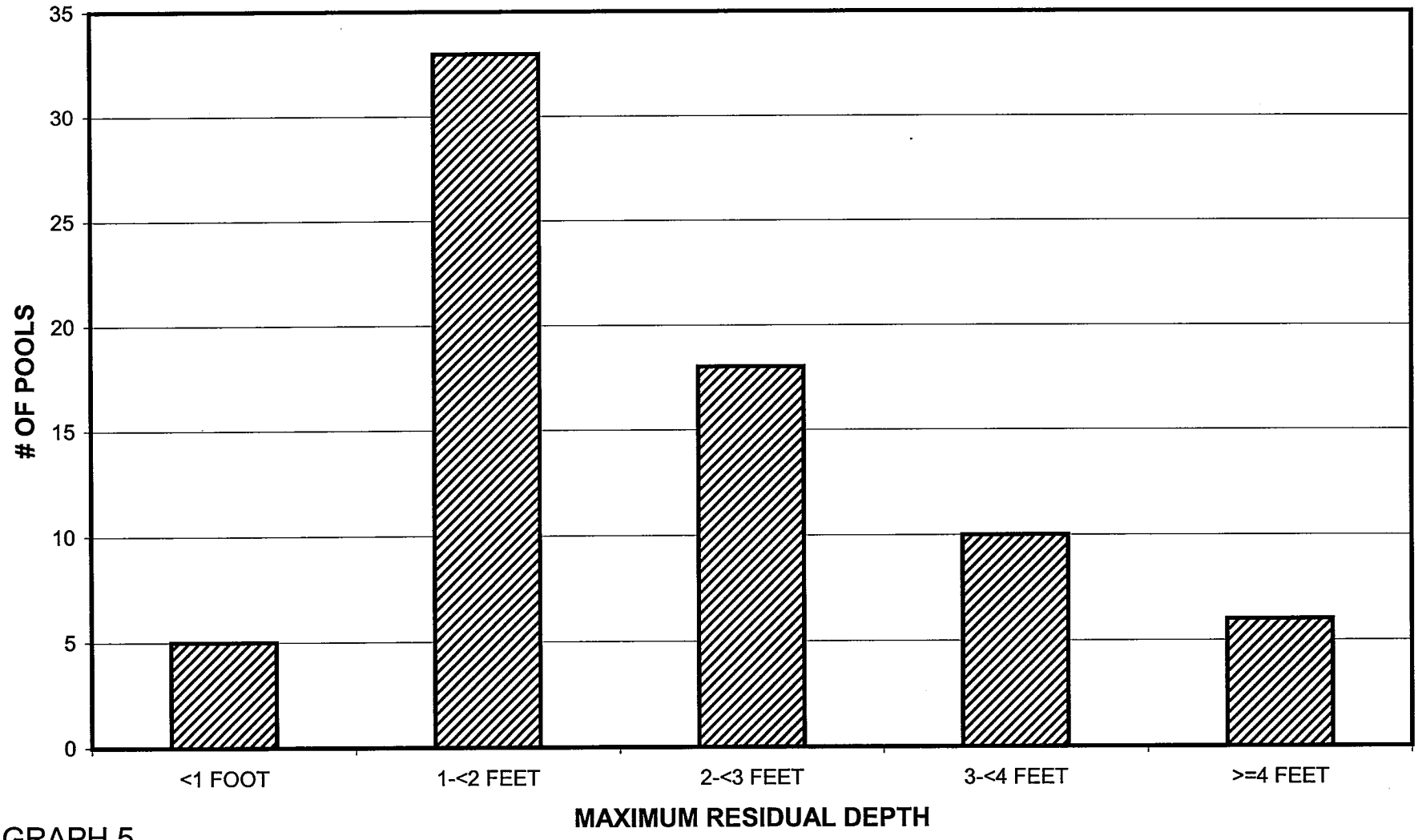
GRAPH 3

KENNY CREEK 2005
POOL TYPES BY PERCENT OCCURRENCE



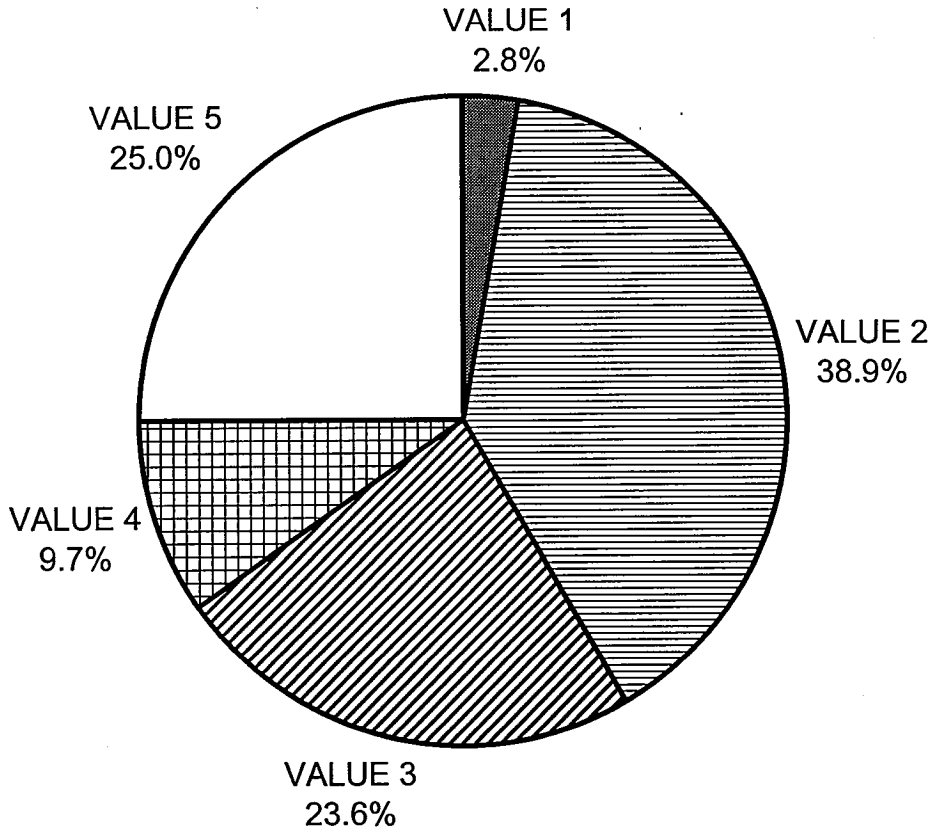
GRAPH 4

KENNY CREEK 2005
MAXIMUM DEPTH IN POOLS



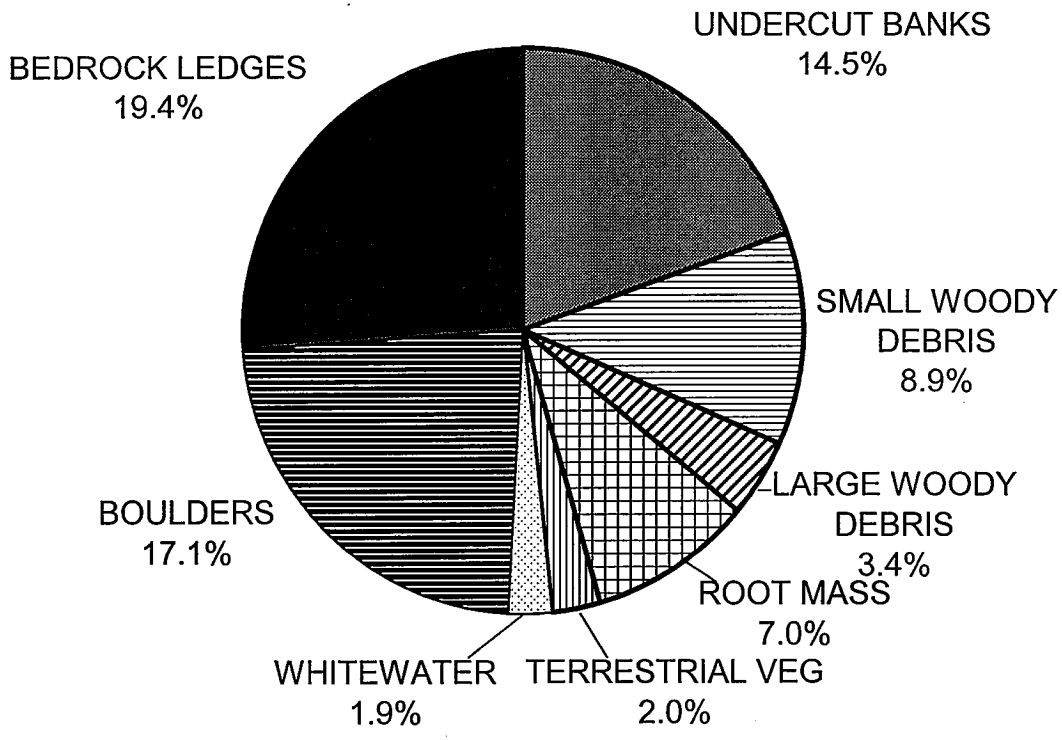
GRAPH 5

KENNY CREEK 2005
PERCENT EMBEDDEDNESS



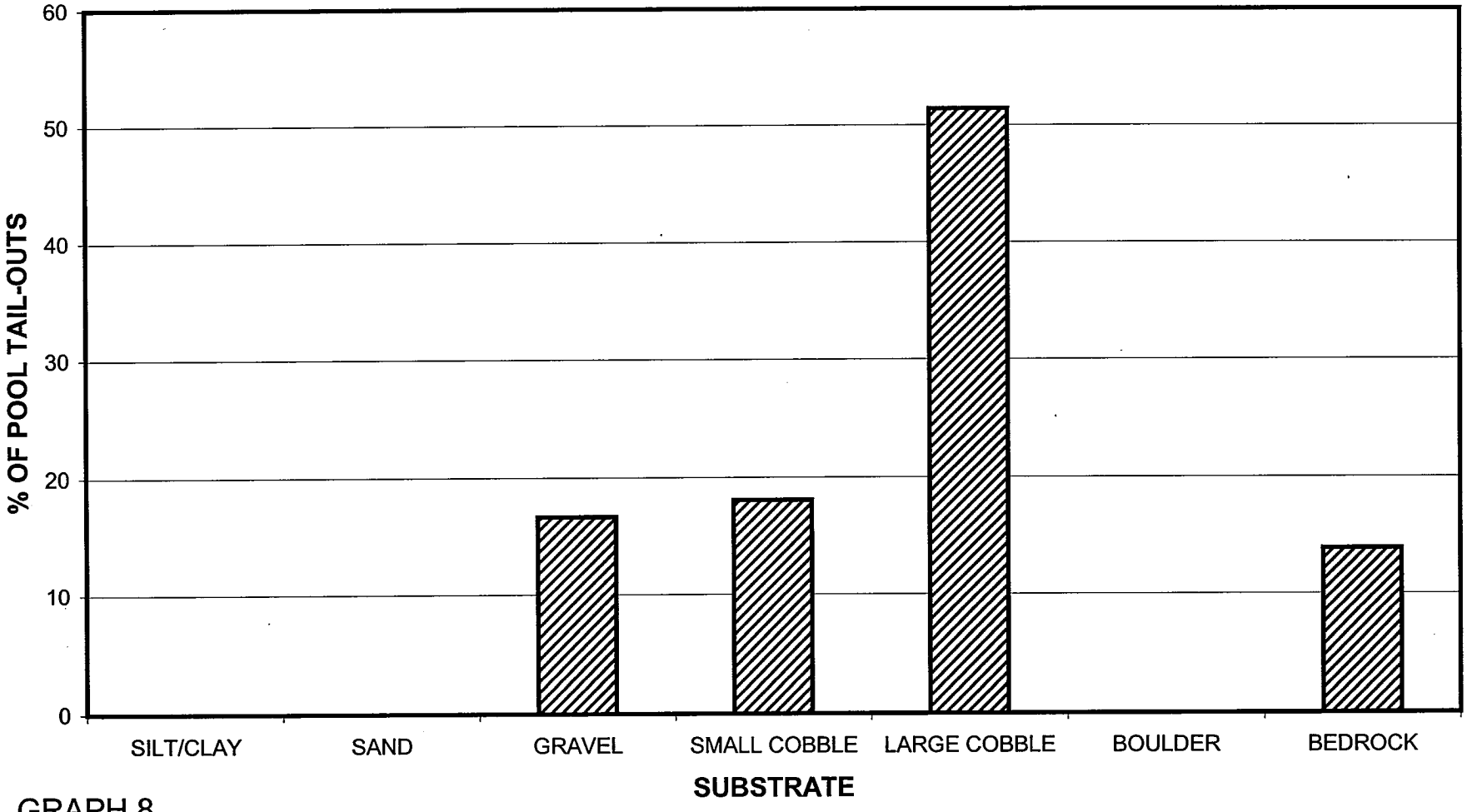
GRAPH 6

KENNY CREEK 2005
MEAN PERCENT COVER TYPES IN POOLS



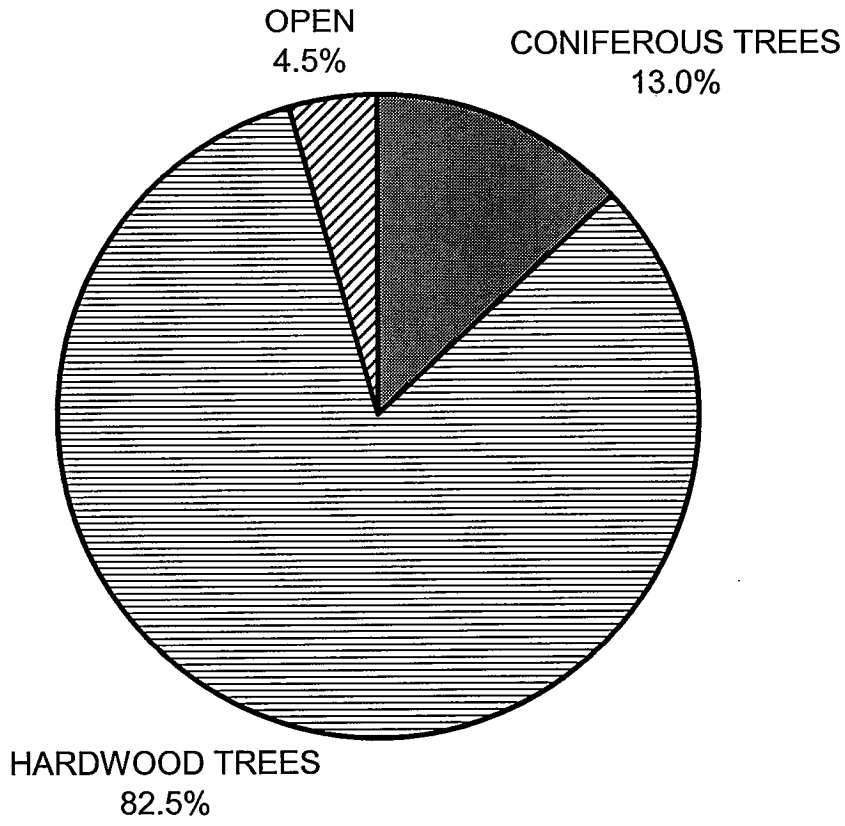
GRAPH 7

KENNY CREEK 2005
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



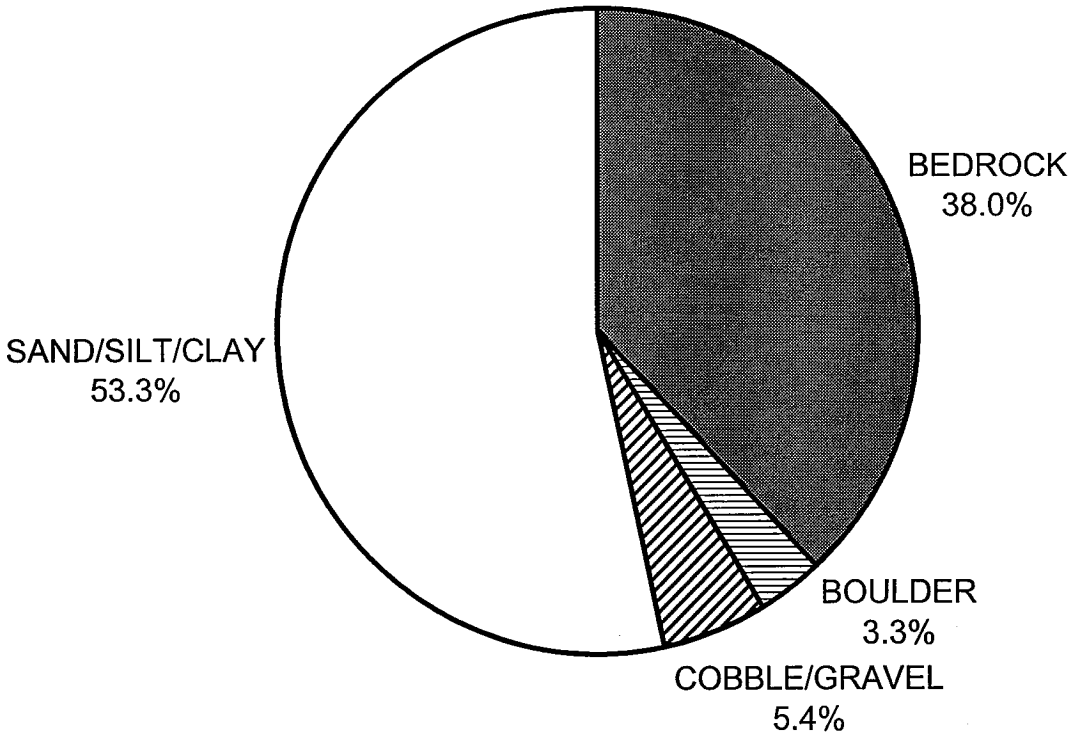
GRAPH 8

KENNY CREEK 2005
MEAN PERCENT CANOPY



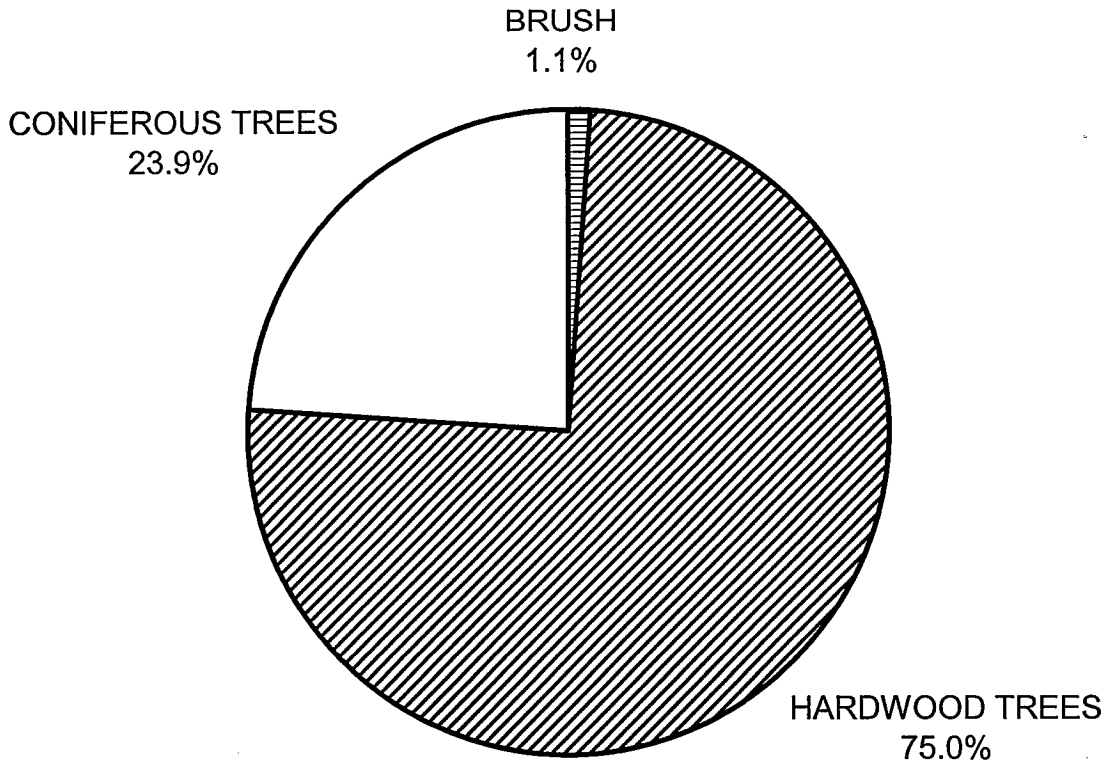
GRAPH 9

KENNY CREEK 2005
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

KENNY CREEK 2005
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
1	0	CULVERT	0.5	46	46	0.3									
56	8	FLATWATER	29.5	71	3950	29.1	11.6	0.7	1.2	493	27624	326	18263		9
2	0	NOSURVEY	1.1	1890	3779	27.8									
72	72	POOL	37.9	48	3431	25.3	13.8	1.3	2.4	687	49482	1255	90381	1028	17
59	12	RIFFLE	31.1	40	2365	17.4	11.3	0.4	0.8	236	13927	101	5930		12

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
190	92	13571	91033	114574

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
43	7	LGR	22.6	44	1872	13.8	11	0.4	1	284	12223	112	4796		6	95
7	2	HGR	3.7	39	270	2.0	15	0.5	0.8	109	764	50	349		30	98
2	2	CAS	1.1	34	69	0.5	11	0.6	1.5	274	549	144	288		20	93
7	1	BRS	3.7	22	154	1.1	4	0.5	0.9	76	529	38	265		0	100
2	1	GLD	1.1	58	115	0.8	12	1.1	1.5	612	1224	673	1346		0	99
19	4	RUN	10.0	38	726	5.3	11	0.6	1.4	367	6975	199	3781		0	99
35	3	SRN	18.4	89	3109	22.9	12	0.6	1.6	622	21767	380	13297		20	95
65	65	MCP	34.2	47	3053	22.5	13	1.1	10.8	650	42250	1070	69526	863	17	96
2	2	STP	1.1	58	115	0.8	14	1.3	1.9	707	1414	1036	2071	846	10	97
5	5	PLP	2.6	53	263	1.9	22	2.7	8.5	1164	5818	3757	18784	3259	12	84
1	0	CUL	0.5	46	46	0.3										
2	0	NS	1.1	1890	3779	27.8										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
190	92	13571	93514	114503

Table 3 - Summary of Pool Types

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid.Vol. (cu.ft.)	Mean Shelter Rating
67	67	MAIN	93	47	3168	92	13.2	1.1	652	43664	862	57758	17
5	5	SCOUR	7	53	263	8	22.2	2.7	1164	5818	3259	16293	12

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
72	72	3431	49482	74051

Table 4 - Summary of Maximum Residual Pool Depths By Pool Habitat Types

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
65	MCP	90	5	8	31	48	17	26	9	14	3	5
2	STP	3	0	0	2	100	0	0	0	0	0	0
5	PLP	7	0	0	0	0	1	20	1	20	3	60

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1< 2 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
72	5	7	33	46	18	25	10	14	6	8

Mean Maximum Residual Pool Depth (ft.): 2.4

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005 Dry Units: 0

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
43	7	LGR	13	0	0	1	0	0	0	14	0
7	2	HGR	0	0	0	0	0	0	0	100	0
2	2	CAS	0	0	0	0	0	0	5	45	0
7	1	BRS	0	0	0	0	0	0	0	0	0
59	12	TOTAL RIFFLE	8	0	0	1	0	0	1	33	0
2	1	GLD	0	0	0	0	0	0	0	0	0
19	3	RUN	0	0	0	0	0	0	0	0	0
35	3	SRN	0	0	0	0	33	0	0	0	0
56	7	TOTAL FLAT	0	0	0	0	14	0	0	0	0
65	63	MCP	16	9	4	8	2	0	1	18	18
2	2	STP	5	0	0	0	0	0	3	23	20
5	5	PLP	2	16	0	2	2	0	13	4	41
72	70	TOTAL POOL	15	9	3	7	2	0	2	17	19
1	0	CUL									
2	0	NS									
190	89	TOTAL	12	7	3	6	3	0	2	18	15

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005 Dry Units: 0

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
43	7	LGR	0	0	0	14	86	0	0
7	2	HGR	0	0	0	0	50	50	0
2	2	CAS	0	0	0	0	50	0	50
7	1	BRS	0	0	0	0	0	0	100
2	1	GLD	0	0	0	0	100	0	0
19	4	RUN	0	0	25	0	75	0	0
35	3	SRN	0	0	0	0	100	0	0
65	65	MCP	2	0	29	11	42	2	15
2	2	STP	0	0	50	0	50	0	0
5	5	PLP	0	0	0	0	20	0	80

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
95	14	86	0	97	99

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Kenny Creek | LLID: 1236407396592 | Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005 | Survey Length (ft.): 13571 | Main Channel (ft.): 13571 | Side Channel (ft.): 0

Confluence Location: Quad: LINCOLN RIDGE | Legal Description: T21NR16WS22 | Latitude: 39:39:33.0N | Longitude: 123:38:27.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: B3
Reach Length (ft.): 3893
Riffle/Flatwater Mean Width (ft.): 13.9
BFW:
Range (ft.): 23 to 29
Mean (ft.): 25
Std. Dev.: 2
Base Flow (cfs.): 0.3
Water (F): 49 - 50 Air (F): 53 - 61
Dry Channel (ft): 0

Canopy Density (%): 94.0
Coniferous Component (%): 20.3
Hardwood Component (%): 79.7
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 96.3
Dominant Shelter: Undercut Banks
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 8
LWD per 100 ft.:
Riffles: 1
Pools: 1
Flat: 1

Pools by Stream Length (%): 34.9
Pool Frequency (%): 38.3
Residual Pool Depth (%):
< 2 Feet Deep: 35
2 to 2.9 Feet Deep: 39
3 to 3.9 Feet Deep: 17
>= 4 Feet Deep: 9
Mean Max Residual Pool Depth (ft.): 2.4
Mean Pool Shelter Rating: 32

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 4 Sm Cobble: 39 Lg Cobble: 57 Boulder: 0 Bedrock: 0
Embeddedness Values (%): 1. 8.7 2. 60.9 3. 26.1 4. 4.3 5. 0.0

STREAM REACH: 2

Channel Type: F3
Reach Length (ft.): 6601
Riffle/Flatwater Mean Width (ft.): 12.3
BFW:
Range (ft.): 18 to 31
Mean (ft.): 25
Std. Dev.: 5
Base Flow (cfs.): 0.3
Water (F): 48 - 50 Air (F): 41 - 61
Dry Channel (ft): 0

Canopy Density (%): 95.7
Coniferous Component (%): 12.5
Hardwood Component (%): 87.5
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 99.5
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 26.0
Pool Frequency (%): 47.1
Residual Pool Depth (%):
< 2 Feet Deep: 45
2 to 2.9 Feet Deep: 24
3 to 3.9 Feet Deep: 18
>= 4 Feet Deep: 12
Mean Max Residual Pool Depth (ft.): 2.9
Mean Pool Shelter Rating: 9

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 15 Sm Cobble: 6 Lg Cobble: 48 Boulder: 0 Bedrock: 30
Embeddedness Values (%): 1. 0.0 2. 30.3 3. 18.2 4. 6.1 5. 45.5

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: B3
Reach Length (ft.): 3077
Riffle/Flatwater Mean Width (ft.): 7.7
BFW:
Range (ft.): 21 to 24
Mean (ft.): 23
Std. Dev.: 1
Base Flow (cfs.): 0.3
Water (F): 48 - 51 Air (F): 52 - 58
Dry Channel (ft): 0

Canopy Density (%): 96.9
Coniferous Component (%): 7.4
Hardwood Component (%): 92.6
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 96.9
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 0
LWD per 100 ft.:
Riffles: 1
Pools: 1
Flat: 0

Pools by Stream Length (%): 11.6
Pool Frequency (%): 26.7
Residual Pool Depth (%):
< 2 Feet Deep: 94
2 to 2.9 Feet Deep: 6
3 to 3.9 Feet Deep: 0
>= 4 Feet Deep: 0
Mean Max Residual Pool Depth (ft.): 1.3
Mean Pool Shelter Rating: 11

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 38 Sm Cobble: 13 Lg Cobble: 50 Boulder: 0 Bedrock: 0

Embeddedness Values (%): 1. 0.0 2. 25.0 3. 31.3 4. 25.0 5. 18.8

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	27	43	38.0
Boulder	5	1	3.3
Cobble / Gravel	4	6	5.4
Sand / Silt / Clay	56	42	53.3

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	0	0	0.0
Brush	0	2	1.1
Hardwood Trees	66	72	75.0
Coniferous Trees	26	18	23.9
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values: 3

Table 10 - Mean Percent of Shelter Cover Types For Entire Stream

StreamName: Kenny Creek LLID: 1236407396592 Drainage: Eel River - South Fork

Survey Dates: 10/24/2005 to 10/25/2005

Confluence Location: Quad: LINCOLN RIDGE Legal Description: T21NR16WS22 Latitude: 39:39:33.0N Longitude: 123:38:27.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	8	0	15
SMALL WOODY DEBRIS (%)	0	0	9
LARGE WOODY DEBRIS (%)	0	0	3
ROOT MASS (%)	1	0	7
TERRESTRIAL VEGETATION (%)	0	14	2
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	1	0	2
BOULDERS (%)	33	0	17
BEDROCK LEDGES (%)	0	0	19