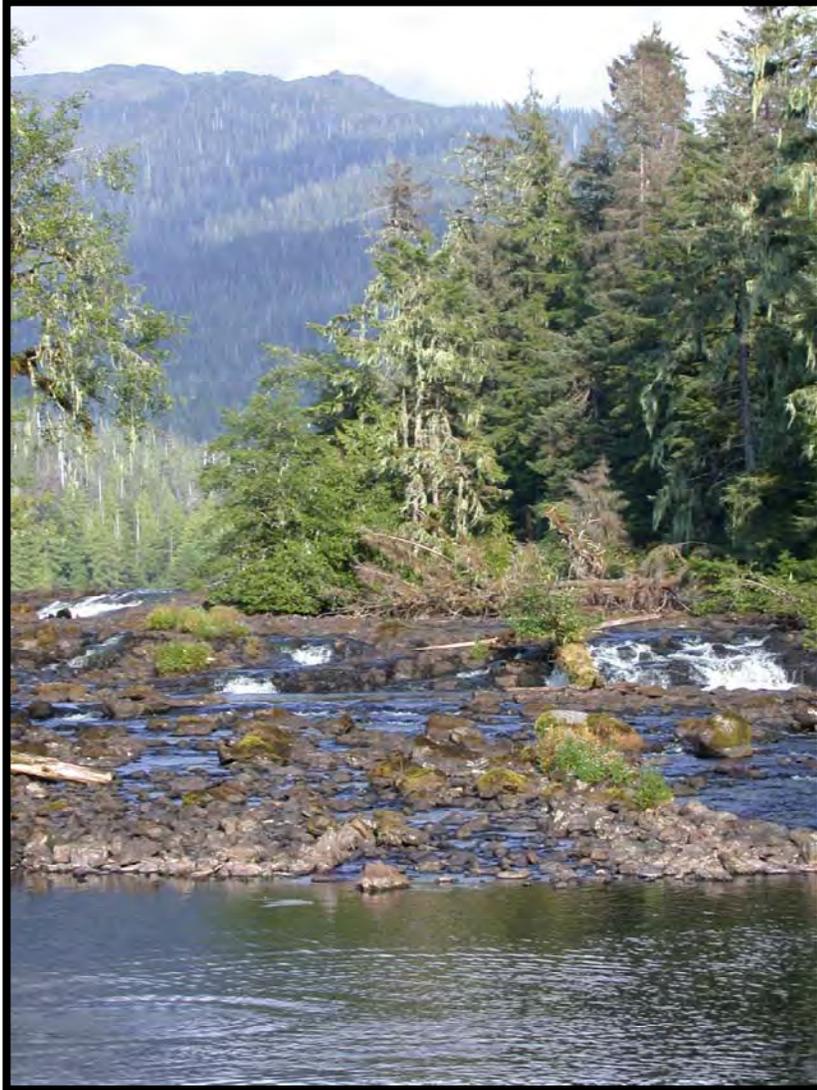


Klawock Watershed Restoration Master Plan



Prepared for

Klawock Watershed Council
Klawock, Alaska

October 2003

 Keta Engineering

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INTRODUCTION

This report presents the results of planning efforts of the Klawock Watershed Council (KWC) for the implementation of a restoration program for the Klawock River Basin. The Klawock system is located in southeast Alaska on the west side of Prince of Wales Island as shown in Figure 1. The basin occupies an area of approximately 45.5 square-miles (29,000 Acres) and consists of many smaller streams that feed 2800-acre Klawock Lake. The Klawock River conveys flow from the northwestern end of the lake and traverses a course of approximately one mile before discharging into tidewaters in the lagoon located above Klawock Harbor at the community of Klawock.

Landholdings in the Klawock watershed are predominately privately held. A small portion of the Tongass National Forest occupies the headwaters. Land ownership in the Klawock watershed is illustrated in Figure 2.

PURPOSE OF THIS PLAN

This plan is intended to serve as a guide for undertaking restoration efforts in the Klawock watershed. Proposed projects, procedures and needs reiterated or identified and summarized herein comprise a list of known needs to help reach the goals established by the KWC for the restoration of the Klawock system. This plan is intended as a guideline for the KWC to meet its goals as stated in its mission statement:

To balance the human uses of the Klawock Watershed with its natural capabilities, and

Restore Fisheries production and habitat, and

To plan for the actions within a comprehensive community watershed approach.

Specific goals of this plan are to:

Summarize Identified Restoration Needs

To provide a comprehensive listing of previously identified restoration needs from different sources within a single document

Identify specific projects to correct problems revealed through previous work To propose a mechanism with which to rectify problems identified in agency studies and accomplish the goals of the Klawock Watershed Council.

Recommend a system for project prioritization

To provide a systematic approach to identify which projects deserve the priority of the KWC's attention and resources. A systematic approach will help to ensure consistency in the KWC's project planning and implementation.

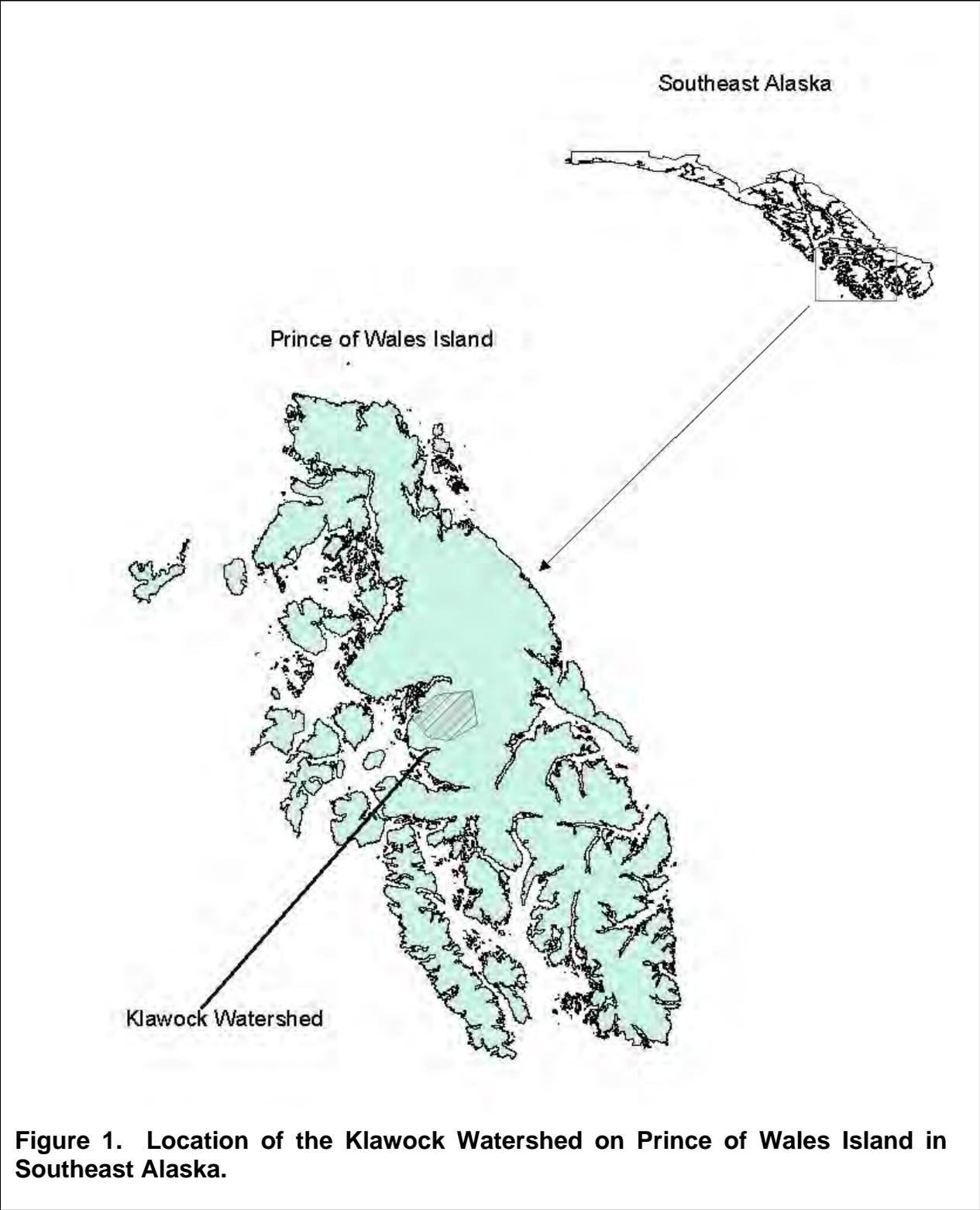
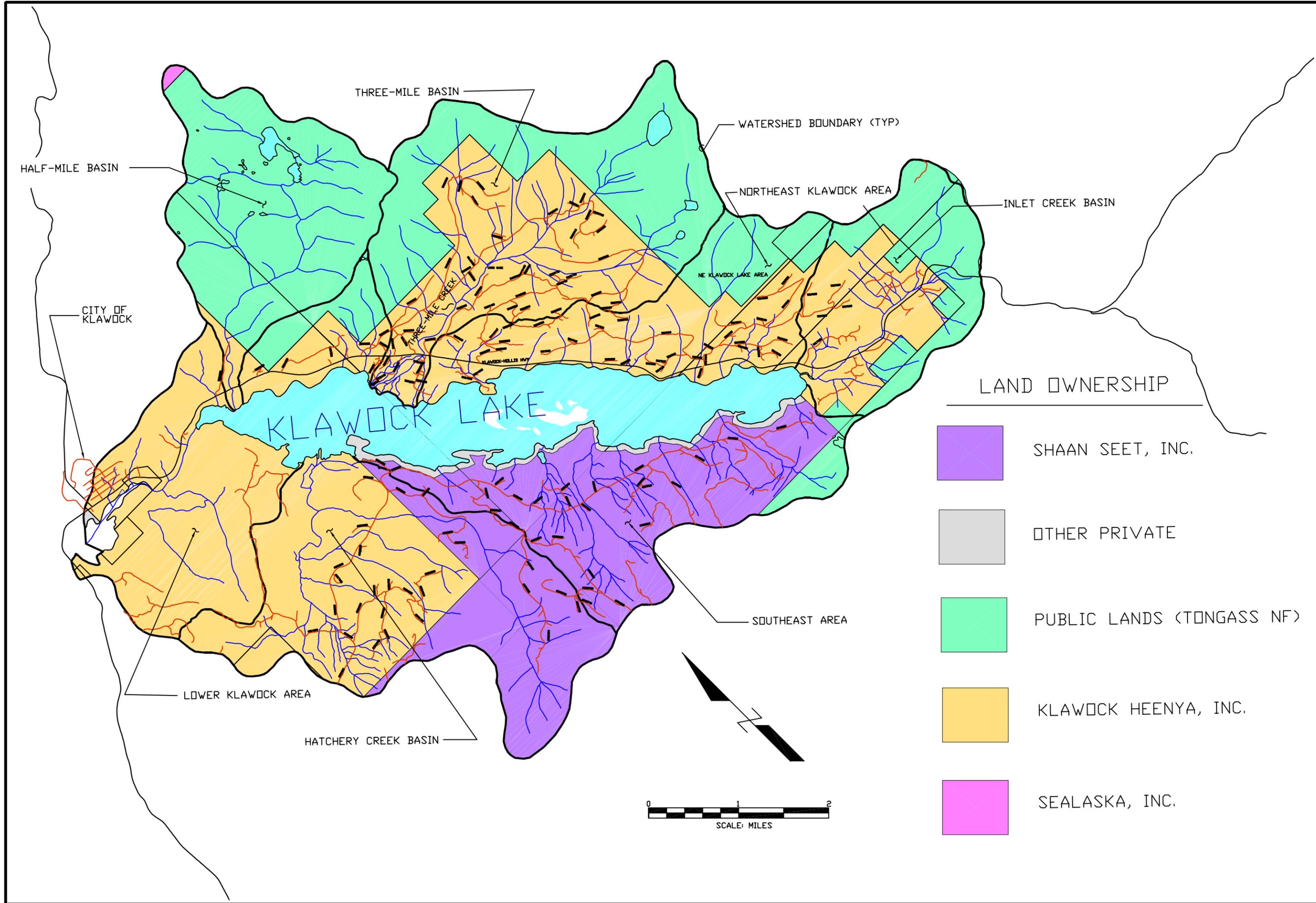


Figure 1. Location of the Klawock Watershed on Prince of Wales Island in Southeast Alaska.



LAND OWNERSHIP

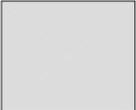
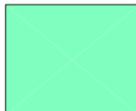
	SHAAN SEET, INC.
	OTHER PRIVATE
	PUBLIC LANDS (TONGASS NF)
	KLAWOCK HEENYA, INC.
	SEALASKA, INC.

FIGURE 2. Land Ownership & Project Areas

SCALE
HOR.: 1" = 1 Mile
VERT.: N/A

Such an approach can help to keep the KWC focused on broader long-term goals instead of being distracted by project minutia.

Recommend a system for project implementation

To provide a consistent yet flexible method for identifying, conceiving, planning, designing, funding, contracting and evaluating Klawock Watershed projects. Such a system will have to be flexible enough to allow for unforeseen developments yet adequately structured to allow for a consistent objective approach to achieve KWC goals and objectives

Identify contracting methods

To present the strengths and weaknesses of various contracting methods that may be used to achieve KWC projects. Because projects will be of a wide variety, no single contracting method will be ideal for all projects. This section is intended to match what type of contracting methods will be generally best suited to what type of project

Identify techniques for evaluation of project performance

To present a methodology for evaluating the KWC's expenditure of resources. Results of project performance evaluation provide information vital to the KWC to make sound management decisions. This is vital to provide clear direction for undertaking future efforts in a most efficient and effective manner.

Identify Administrative needs of the Watershed Council

To identify day-to-day, annual, and project tasks that will need attention. Identifying these duties will enable the KWC to implement solution(s) to satisfy its administrative and managerial needs.

IDENTIFIED RESTORATION NEEDS

Identified needs for restoration were primarily identified by two investigations. The first investigation was the Properly Functioning Condition Survey (PFC) conducted on the streams in the Klawock Basin by the USDA Forest Service (USFS). This investigation and report were completed over a three-year period and culminated in the final PFC report that was dated January 2003.

The Alaska Department of Fish & Game (ADF&G) completed a road condition survey (RCS) report that describes habitat effects related to the construction and operation of roadways in the Klawock Lake basin. This study was initiated in early 2002, with fieldwork completed in the summer and the final report released in December 2002.

These two assessment reports comprise the vast majority of restoration needs identified by this plan. Additional projects and needs presented herein are the results of the actions of the Klawock Watershed Council through formal meetings.

MANAGEMENT AND ADMINISTRATIVE NEEDS

In order to accomplish its goals and objectives, management and administrative capacity is a necessary resource for the KWC to possess. This capacity is necessary in both the general administration of the KWC and for specific duties directly associated with a particular project(s). The KWC is comprised of members of the community, most of which have full-time commitments and are thus unable to commit much of their own efforts to accomplish day-to-day tasks in an efficient and consistent manner. Therefore, a position is required to be staffed and supported in order to accomplish management and administrative tasks. Tasks that such a position would be responsible for would include:

General Council Administrative Needs

General administrative capacity is required to keep the KWC functioning and to accomplish tasks as directed by the KWC board. Examples of general administrative functions follow:

Marketing

Marketing involves the preparation of grants and proposals in order to seek the funds necessary to continue the operations of the KWC and to finance KWC projects. Marketing may be accomplished using in-house forces (KWC administration), using contract forces, or a combination of in-house and contract forces. The importance of successful marketing to the effectiveness of the KWC cannot be over-emphasized. Without successful marketing, the KWC would continue to be a volunteer organization and thus have little capacity to accomplish its goals and objectives.

Liaison

Liaison is necessary to the maintain communication between the KWC, agencies, contractors, consultants, the public and other parties. The KWC administration would be a point of contact for agencies, landowners, funding sources, and the public. This would involve answering inquiries about the KWC and its projects, applying for and providing information to permitting agencies, following up with funding requests and all other contact made directly to the KWC other than to the KWC board.

Bookkeeping

These are the routine day-to-day accounting tasks to keep track of assets and accounts to ensure that the KWC operates in a financially responsible manner. The administrative position would be able to make nominal expenditures for routine needs such as telephone, postage, office supplies, rent, utilities, etc.

Personnel Administration

The KWC may employ individuals to accomplish project tasks. These may be technical or labor positions or both, depending on the nature of the project(s) underway at that time. The administrative position would be responsible for overseeing and administering these positions for such needs such as hiring, giving directions, payroll and benefits, taxes, termination and record keeping.

Grant Management (general)

This involves preparing reports that may be required as a condition of grant monies. Other tasks include requesting grant payments and reporting on progress of projects to the grant manager from the granting agency or foundation. Specific duties will likely be required with each different grant and it will be the responsibility of the position to ensure that the KWC meets any and all such conditions.

Taxes

The KWC will be required to file taxes on a quarterly basis as a 501c(3) organization. The position will be responsible for working with an outside professional as required to prepare tax returns and any other reporting that is required by the Internal Revenue Service (IRS). KWC administration shall keep the board informed regarding tax matters. The administration shall accomplish this by providing close liaison between the board and the IRS.

Meetings

The position shall be responsible for representing the KWC administration at all KWC meetings. The position will record minutes from the meetings and be responsible for their safekeeping. A status report shall be presented at each meeting to update the KWC on all current projects and to bring attention to future problems needing resolution and future opportunities that may be exploited.

Project Management Needs

Project management deals with the managerial and administrative duties necessary to accomplish a specific project. Specific project duties include:

Project Planning

Planning involves identifying a project to provide a solution to an existing problem. This includes identifying the general scope of the project and basic elements of the project as well as what constraints may be involved. Cost estimates prepared in project planning are generally coarse and typically have an accuracy of -10 to +30%. Major permits required and the level of design effort necessary to prepare the project for implementation are also identified during project planning.

Design

Design involves refining the planning-level concepts to detailed instructions that a contractor can use to construct a project or implement a program. Design for constructed facilities includes the preparation of drawings, specifications and contract documents necessary to define the scope of work for the contractor. Many designs will require engineering expertise that may not be present in the KWC. Design of a program, e.g., water quality monitoring, involves preparation of detailed specifications for data collection, reduction, compilation and management. These types of projects not likely to include drawings as would be produced for a project including infrastructure, e.g., a culvert replacement.

Permitting

Permitting involves coordinating with agencies at different levels (local, state and federal) to get approval to construct a project or perform a process. Permitting can be a long process and can be difficult to estimate because agency requirements may be applied differently depending on the particular regulator. Permit conditions can markedly change the scope of a project. This is not only true for the capital investment but also for the O&M portion because permit conditions may require that monitoring activities be conducted long after the project has been constructed.

Procurement

Project procurement involves the acquisition of outside services to accomplish a project. This generally involves advertising for proposals or bids, evaluation of responses, negotiation, and award of a contract to complete the work. Procurement of services may have many conditions that are dictated by a funding source.

Contract Administration

There are many facets to the proper administration of a contract. The primary roles of the contract manager are presented below.

Oversight of Work

Oversight simply involves the inspection of the work to ascertain that satisfactory progress is being accomplished in the work. Regular and thorough inspection helps to ensure that unforeseen problems are minimized and will allow for contract amendments, when necessary, to be made in a proactive manner. Inspection of work should be documented and maintained in a separate project file. These records can be valuable to show intent and progress of the job should a claim situation arise.

Pay requests

Pay requests are evaluated based on the contract type. This may be a simple matter of approving an invoice from a vendor for materials supplied or services rendered or it may involve measurement of the work performed for a longer-term contract. Many construction contracts have clauses for retainage, generally 5% of the total contract, which is withheld from payments until the final project is complete. Unit-price contracts involve the measurement of actual work (pay items) completed to verify that the quantities invoiced are accurate. Lump sum contracts are similar in that they have a schedule of values that breaks down the total work into components, each having a dollar amount. These components are then paid for on a percentage basis corresponding to the amount of work completed and accepted. Good project inspection is necessary to be able to evaluate project pay requests.

Contract Amendments

Contract amendments are necessary when conditions change during the course of the project and a different approach in the contract is necessary. This may involve increasing or decreasing the amount of work or extending the contract period to complete the work. Proper contract management will reserve a contingency amount in the overall project budget to allow for unforeseen changes. This typically amounts to 15%-20% but may be higher for less detailed or design-build projects. Contract amendments may be sought by either party. Construction contract amendments are often referred to as change orders.

Funding Agency Requirements

Most monies passed down through grants or public funding agencies have performance requirements or conditions. Reporting on the project progress and on how the conditions of the funding are being satisfied will be required by the funding source. This may involve written reports, teleconferences, and quantitative measurement of various project parameters as well as financial reporting. Satisfying agency requirements can be a significant task in the overall management of a project but it is vital to ensure that cash flow is smooth. This smooth cash flow will, in turn, allow the KWC to make full and timely payments to its contractors.

Contract Closeout

Closeout involves verifying that all contract conditions have been satisfied. Project inspection should produce a "punch list" to be completed prior to contract close out. All items on the punch list should have their resolution individually verified by the administrator of the KWC prior to acceptance of the work. Upon acceptance of the work, the administrator shall verify that there are no outstanding pay requests remaining before processing the final request for payment. The final request for payment should account for any retainage and/or

advances for materials that may have been made. Final pay requests should receive approval by the KWC board before final payment is made.

Performance Evaluation and Long-term monitoring

After the project has been constructed, specific performance monitoring may be required beyond that which is occurring or will occur with a general long-term monitoring program. This project-specific monitoring may be paid for with dedicated project funds instead of general monitoring program funds. In such cases, the project should continue a separate accounting of funds expended on monitoring after the project has been constructed. Project-specific monitoring may also be integrated with other long-term monitoring that the KWC is conducting. This may be advantageous because it eliminates the separate accounting that is required for project accounts and allows the complete closeout of the project. However, funding restrictions may not allow for integration of the project monitoring with a long-term monitoring program(s). This should be investigated early in order to build sufficient funding into the project budget should monitoring not be able to be combined with a long-term program.

PROJECT PRIORITIZATION

The projects presented in this plan have been prioritized by the KWC for their implementation. These projects are presented in their order of priority. Highest priority projects are presented first and lower priority projects follow. Future projects not identified in this plan will need to be prioritized. This section proposed a methodology to prioritize future projects not identified in this plan.

In order to accomplish multiple projects with limited resources, the KWC needs to be able to prioritize which projects to undertake first. A systematic method is desirable so that the KWC has a standard procedure to evaluate and document projects. This will allow projects to be implemented in a manner that makes the most efficient use of available resources. This will help to ensure that the KWC receives the most “bang for the buck” for the projects implemented. A suggested technique is the project Evaluation and review technique. This technique has been previously presented to the KWC.

Suggested Considerations for Project Prioritization

Considerations for evaluating projects should include the following criteria. Other criteria can be easily added to the PERT matrix, as the KWC desires.

Project Capital Cost The amount of dollars necessary to plan, design, construct and administer a new project. These are the up front costs and do not include cost that will be experienced over the lifetime of the project for operations and maintenance.

Operations and Maintenance Cost The amount of money expended annually over the project life to keep the facility or program performing in its intended manner. Operations and maintenance costs can include things such as culvert cleaning, grading, sediment removal, monitoring costs, and administration.

Funding Conditions The amount of conditions or “strings” attached by funding source. In many instances funding sources, usually governmental agencies, have many requirements that greatly complicate a project. The KWC may wish to favor projects with funding sources that allow more freedom in the use of the funds.

Project Life The expected life of the facility. How long the project will provide its intended benefits before replacement, major reconstruction or abandonment is necessary.

Duration of project construction or implementation The amount of time necessary to construct a project or initiate a program.

Opportunity for local economic stimulation The perceived benefits to the local economy. Some projects may have more benefit to the local populace and therefore be deemed higher value.

Planned projects vs. “new ideas” New project ideas will undoubtedly arise throughout the life of the KWC. The KWC may wish to favor projects that have been on a planning list in order to maintain a long-term focus and adherence to a planned approach.

Permitting Complexity Projects that involve complex permitting issues that will require a great deal of effort may receive a lower or higher priority as the KWC sees fit.

Because some projects are of a drastically different nature, it is recommended that the different project categories be prioritized separately. In other words, education and outreach projects should be prioritized separately from engineering projects and knowledge acquisition projects. This means that the KWC will have three prioritization lists, with each list only containing projects of a particular category.

The KWC should decide which type of projects to put the most resources into but should not become focused only on one type of project to the exclusion of others. Engineering projects in particular can be attractive because of the desire to accomplish things and see things happen “on the ground”. Nevertheless, it is

important to make efforts in all areas if the KWC is to be successful in the long term.

PROPOSED PROJECTS

Proposed projects are grouped geographically within the Klawock Watershed by their respective sub-basin or location. There are six regions where projects will be performed on the ground in the Klawock watershed. These six areas comprise the entire Klawock basin and are illustrated in Figure 2. These areas are as follows:

- Lower Klawock Area
- Half-mile creek Sub-basin
- Three-mile Creek Sub-basin
- Northeast Klawock Lake Area
- Southeast Klawock Lake Area
- Hatchery Creek Sub-basin

Projects are further classified into three separate categories. This is done for administrative reasons. Projects may have components of the other categories included within the overall project, but should be grouped in the category by their dominant emphasis. The three categories of project are:

Engineering Projects

The primary characteristic to an engineering project is the performance of physical work on the ground to accomplish a desired goal. This may be the construction of a new facility such as a culvert or fishway, or the removal or correction of a deficiency such as a plugged culvert. Operation and maintenance work, e.g., cleaning plugged culverts, can be included as engineering work as well. These projects may range from simple efforts, such as the broadcasting of seed to promote re-vegetation, to the complex multi-faceted projects occurring over several phases having detailed designs and multiple contracts.

Engineering projects comprise the bulk of projects proposed in this plan. By their nature, these projects tend to be expensive and often lengthy. Some of these projects may require specialized analysis and designs, e.g., constructing special fish passage structures, while others can simply be constructed using available forces, e.g., road closure. Permitting constraints can change the nature and complexity of these projects. Because of the cost, permitting requirements and other technical constraints, strong project management skills are needed to successfully complete these types of projects.

Knowledge Acquisition Projects

Knowledge acquisition projects involve the study of a process or characteristic with the primary objective to be the discovery and documenting of information. Scientific investigations are the most common example of a knowledge acquisition project. These projects may be basic research projects or performance monitoring of completed engineering works. Knowledge acquisition projects are useful to measure parameters that may indicate whether other measures are necessary. Indeed, many engineering projects are the result of information gathered by scientific investigations. Potential subjects for knowledge acquisition for the Klawock Watershed Restoration Program include fisheries, hydrology, geology and geomorphology, hydrology, water quality, and forest resources to name a few. These projects may be well suited to use the expertise of agency personnel in concert with KWC forces if arrangements can be made to dedicate agency technical staff to KWC projects.

Public Outreach/Education Projects

These projects encompass activities that promote the KWC or its goals to the public or projects that educate the public on topics. Education outreach projects will most often involve cooperation with agencies and institutions. These projects often involve an event such as a presentation to students or providing information at a booth such as at the Prince of Wales Earth Day Celebration.

Proposed Engineering Projects

Engineering projects in this plan generally are comprised of certain types of work. Each sub-basin or area has projects of the following three types of work: roadway management, erosion stabilization and riparian thinning. Fish passage projects are a fourth type of project proposed although they are not proposed in all areas.

Roadway Management Projects

Roadway management consists of identifying which roads will be kept open for traffic and which roads will be closed to vehicular traffic. Closed roads can have water bars installed and drainage structures removed to stabilize the roadway and prevent excessive erosion and sedimentation. An effort has been made in this plan to work with the landowners to identify what roads will be maintained as open and which should be closed. The proposed roadway projects in this plan are based on this work.

Roadway management is an ongoing task that will require the expenditure of resources. Maintenance of driving surfaces, ditches, drainage structures, bridges, and roadway shoulders will require ongoing efforts. Many of the bridges and drainage structures in the Klawock Basin are in need of rehabilitation if the roads are to be kept open. Bridges and structures determined to be in failing condition by the road condition survey have been identified. Allowances to construct a temporary ford(s) or to reinforce these structures to allow for

equipment access have been made. This problem is particularly acute on road 6000000 along the south side of Klawock Lake where many log bridges and culverts of approximately 20 years of age exist. The contractor should use equipment that will be best suited to access the sites beyond failing and suspect bridges and construct a ford where necessary.

Erosion/Sedimentation

These projects are planned to stabilize sites where erosion has been identified and install measures to prevent or minimize sedimentation. Many of the types of works installed in erosion/sedimentation projects are similar to those used for closing roadways. Erosion is most commonly associated with flowing water on cut slopes roadway surfaces. This results in sediment transport to streams. Removal and stabilization of drainage structures will greatly reduce sediment input into water bodies in the Klawock basin.

Riparian Thinning

Riparian thinning projects are intended to thin excessive second growth trees. Thinning will promote more rapid growth of the remaining trees due to increased sunlight and decreased competition for nutrients. Thinning improves both terrestrial and aquatic habitat by opening forests to promote browse and habitat and aiding in the recruitment of large woody debris (LWD) in streams.

Thinning projects will involve mechanical thinning of dense coniferous reproduction, leaving the largest and best-formed trees. Thinning will be performed to USFS specifications and leave remaining trees at an average spacing of 16 feet by 16 feet along the streams identified for thinning treatment. Selection of leave trees will favor the most vigorous long-lived trees. Residual trees over 8 inches diameter breast height (dbh) will be left to provide LWD. Slash within five feet of the high water mark of streams will be pulled back into the thinned area and scattered. Alder less than 8-inches dbh within ten feet of stream banks will be left untreated.

Performance monitoring and measurement will be accomplished by making a series of random fixed-radius check plots taken throughout the thinned areas. The average number and relative quality of trees remaining after thinning will be quantified within these areas to estimate the stand density on the total project area. In addition, observations will be made of stream bank vegetation to document retention of high quality plant cover along stream banks. The total number of acres of riparian thinning within the Sub-basins will also be measured using coordinates measured along the perimeter of the work with a global positioning system (GPS).

Specific Fish Passage Issues

These projects are planned to correct specific deficiencies for fish passage. Projects can be to enhance resident fish passage as well as for anadromous species. A typical project will be to replace a culvert that has been identified as a temporary or partial barrier with a new structure that promotes fish passage.

Only roads that will be left open are slated for culvert replacement projects. Where roads are to be closed, the culverts will be removed and the roadway stabilized to minimize erosion and allow fish passage. Changes in road management plans, i.e., managing roads as open rather than closed, may necessitate installing fish passage structures where barriers to fish passage have been identified.

Other Specific projects as identified

These are projects that have been identified but do not match the above categories. These projects are typically specific to a particular area or sub-basin and are not proposed throughout the entire Klawock watershed.

Specific Projects

The following projects are listed in order of their priority. Their prioritization was made through a consensus of the KWC during one of the KWC meetings.

1. Three-mile Creek Basin Roadway Management

This project is to close roads and stabilize roads in the Three-mile watershed. The landowner has been consulted as to their road management concerns in the basin and these have been incorporated into this proposed project.

Road closure consists of removing drainage structures and constructing water bars on the road surface and ditch relief through the road prism. Culvert materials will be removed from the site but timber drainage structures will have their materials left in the basin after the structure is excavated and removed.

Roads will generally be closed, with the exception of main arterial access up the valley on both sides. Minor roads will be left open where the landowner has identified specific needs. The needs identified for the Three-mile basin are as follows in Table 1.

TABLE 1. Proposed Three-mile Roadway Management

<u>Road</u>	<u>Use</u>	<u>Action</u>
5032000	Primary Access	Maintain Open
5025700	Hunting/trapping Access	Maintain Open
5025910	Scenic View Access	Stormproof
5025000	Primary Access	Maintain Open

Road 5025000 is to be closed at the junction with road 5025910 to promote sediment reduction and erosion stabilization. Road 5032000 would be kept open to where its embankment materials have been excavated for re-use elsewhere in the basin.

The road management for this project is illustrated in Figure 3. The estimated cost for this project is \$141,100. A detailed cost break down is presented in Appendix A

2. Three-mile Creek Basin Erosion and Sediment Control

This project is proposed to stabilize identified erosion and reduce sedimentation associated with roadways within the Three-mile basin. The project will involve stabilizing roadway cut and fill slope erosion, roadway surface erosion, erosion associated with slides and structure removal. Various techniques will be employed to stabilize eroding areas to arrest the transport of sediment to waters that provide or flow into fish habitat. Much of this work involves placing erosion control netting and broadcasting seed and can be accomplished by hand. Crews can access sites on roads that are not accessible to equipment, such as road 5032520, to perform this type of work.

Several sites were identified in the RCS as experiencing erosion. Many of these sites are small and can be addressed by labor crews and require a minimum of equipment, e.g., broadcast seeders. Major erosion concerns are those that are more than 1000 square feet in area. Heavy equipment will be needed for larger areas and for installing water bars. These erosion and sediment projects should be performed while roadway closure projects are underway to take advantage of heavy equipment already on-site for road closure operations. Similarly, labor crews can compliment work done by heavy equipment by stabilizing excavated and graded materials where necessary with jute net, erosion control blankets, and/or seed mix.

The specific erosion sites identified by the RCS are illustrated on Figure 4. Major sites are differentiated on the figure by their larger symbols. The estimated cost for this project is \$150,000, which includes a 15% contingency (\$19,500). A detailed cost break down is presented in Appendix A.

ACCESS CONSTRAINTS

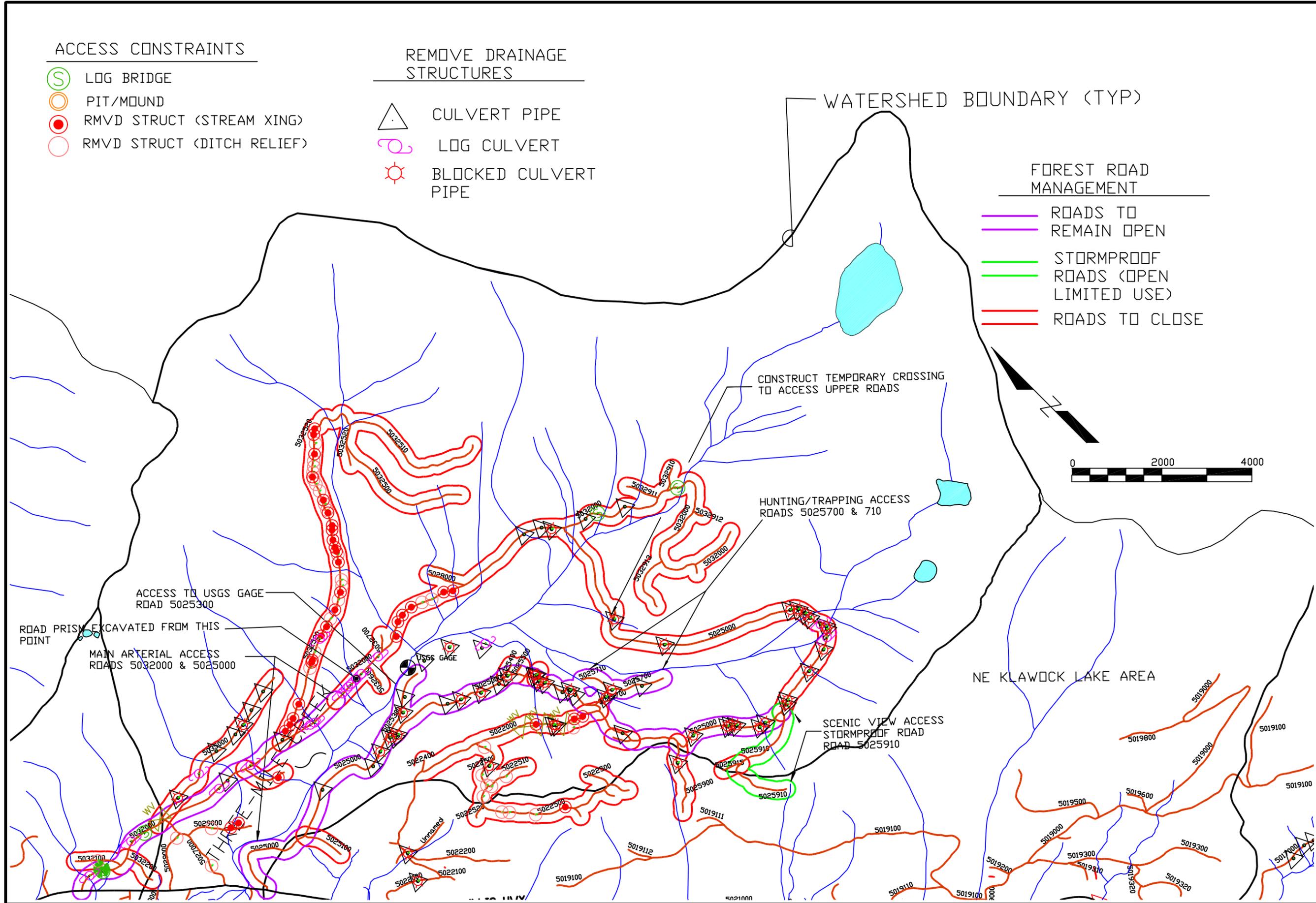
-  LOG BRIDGE
-  PIT/MOUND
-  RMVD STRUCT (STREAM XING)
-  RMVD STRUCT (DITCH RELIEF)

REMOVE DRAINAGE STRUCTURES

-  CULVERT PIPE
-  LOG CULVERT
-  BLOCKED CULVERT PIPE

FOREST ROAD MANAGEMENT

-  ROADS TO REMAIN OPEN
-  STORMPROOF ROADS (OPEN LIMITED USE)
-  ROADS TO CLOSE

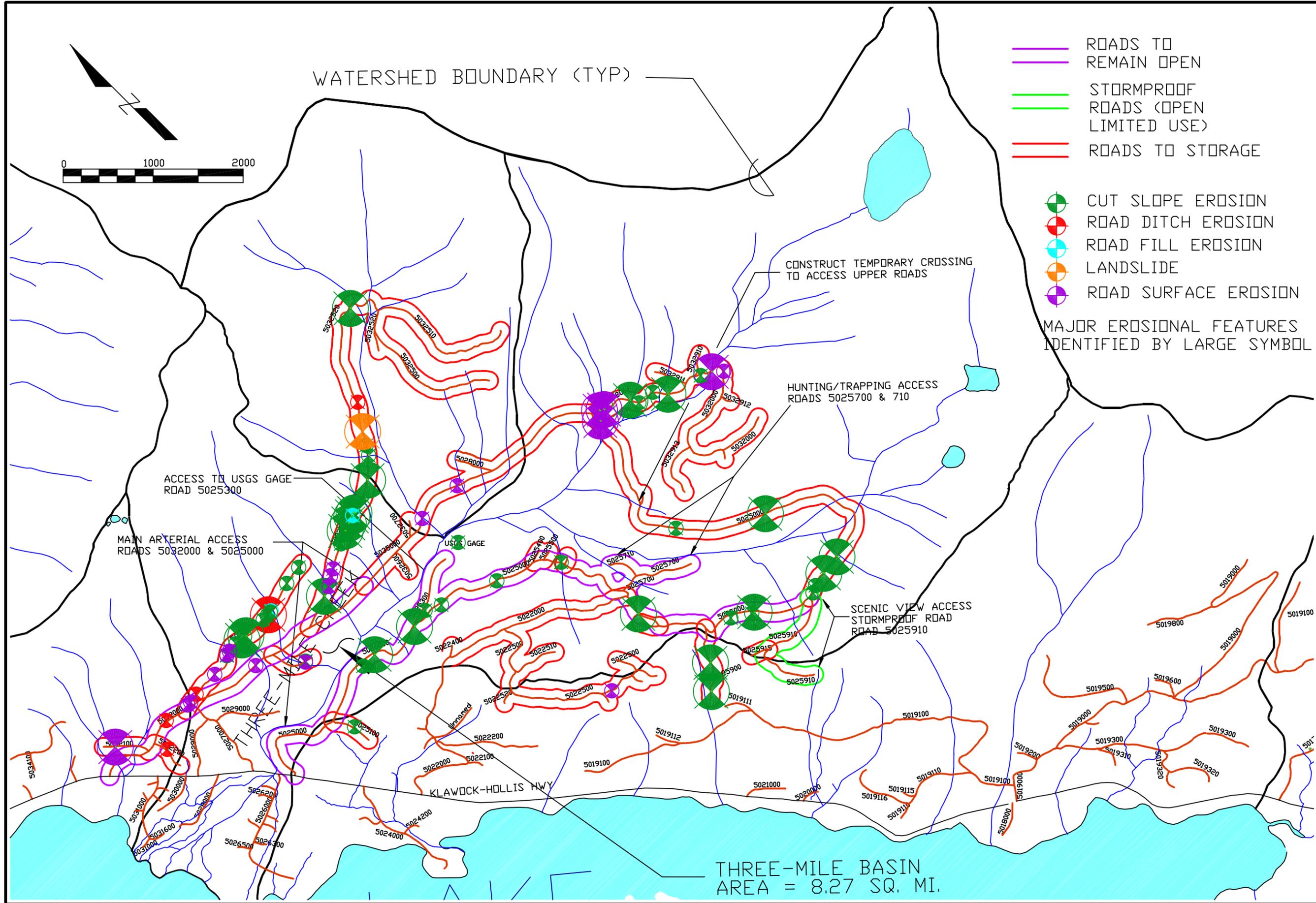


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**FIGURE 3. Three-Mile Basin
 Roadway Management**

SCALE
 HOR.: 1"=2000'
 VERT.: N/A



- ROADS TO REMAIN OPEN
 - STORMPROOF ROADS (OPEN LIMITED USE)
 - ROADS TO STORAGE
 - CUT SLOPE EROSION
 - ROAD DITCH EROSION
 - ROAD FILL EROSION
 - LANDSLIDE
 - ROAD SURFACE EROSION
- MAJOR EROSIONAL FEATURES IDENTIFIED BY LARGE SYMBOL

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**FIGURE 4. Three-mile Basin
 Roadway Erosion Stabilization**

SCALE
 HOR. 1" = 2000'
 VERT.: N/A

3. Three-mile Creek Delta Fish Passage Project (Road 5026000 crossing of Three-mile Creek distributary channel in Three-mile residential subdivision)

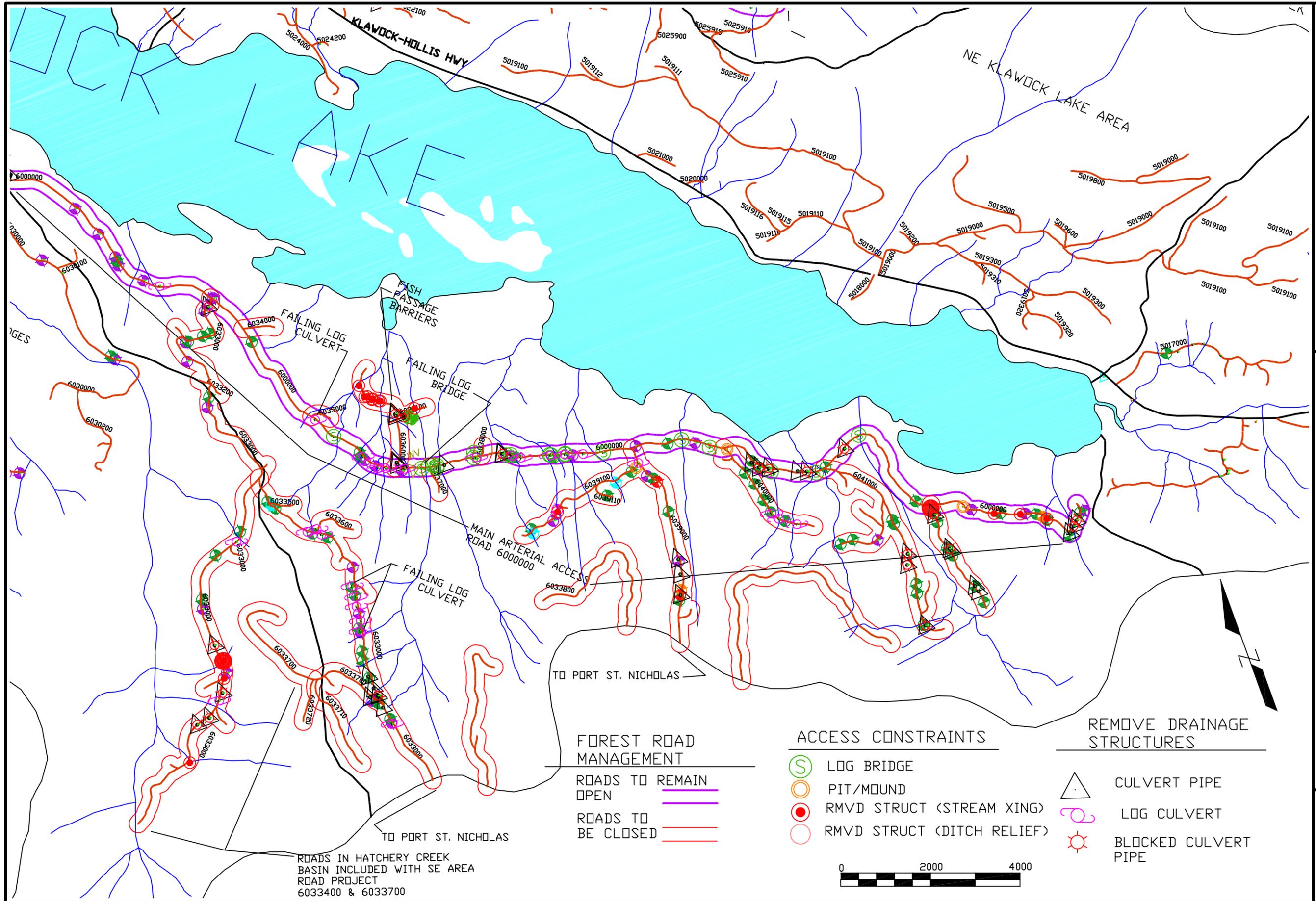
This site is located in the residential subdivision area on a distributary channel of Three-mile Creek on the stream's delta. The site was identified as a barrier to the migration of anadromous fish by the RCS (Site ID 1B044). This culvert is placed on a slope of 3.1% and has a perch height of 1.5 feet. This effectively blocks passage of anadromous and resident fish. Even though the stream is small it can provide habitat for the rearing of juveniles that will help to bolster the numbers of returning adults. New culverts shall be designed and installed in accordance with the procedures prescribed by ADF&G for anadromous fish passage. These design procedures require significantly more hydrological and hydraulic analysis than culverts that do not have fish passage conditions. Besides higher engineering costs, fish passage culverts are generally larger and thus more expensive than those culverts that were installed previously before fish passage was rigorously analyzed during culvert design. The location of this project is illustrated on Figure 11.

The cost estimate for replacing this culvert is approximately \$21,000. This cost is itemized in Appendix A.

4. Southeast Klawock Lake Area Road Management

The southeast Klawock Lake area will be accessed via road 6000000 along the lake to reach the eastern limits of road coverage. All other local roads are planned to be closed. The road management actions proposed for the southeast Klawock Lake area is illustrated by Figure 5. Figure 5 shows roads to remain open, roads to be closed and drainage structures to be removed. Access constraints are also shown to aid in selecting equipment and operations.

Numerous log culverts and log bridges were used in the construction of this road. These structures are now on the order of 20 years of age and some are failing. These weakened structures pose access problems for heavy equipment. The southeast Klawock Lake area can be accessed via roads 6039000, 6033000 and 6000000. Road closure work using heavy equipment should be conducted using access as required to avoid failing bridges. In particular, the bridges on road 6000000 in the vicinity of the roads 6035000 and 6037000 have been identified as failing. Access to the east part of this area can occur over road 6039000 to close the eastern roads in this area. Equipment would need to be mobilized out of the basin to then reach areas to the west in order to avoid crossing the bridge at road 6000000's junction with road 6037000.



**FIGURE 5. SE Klawock Lake Area
 Roadway Management**

SCALE: 1" = 2000'
 HOR.: N/A
 VERT.: N/A

In order to reach drainage structures in roads 6040000, 6039100 and 6033000 pit/mounds may need to be removed first to allow equipment access. Log structures removed (except cables) can be disposed of in the basin. All metal and plastic structures, e.g., culverts, cables, must be removed.

Closed roadways should be scarified and seeded in accordance with standard best management practices. The estimated cost to implement these road management goals is \$210,000. This estimate includes a large contingency (30%) because of the access problems posed by the log bridges.

5. Southeast Region Culvert Barriers to Fish Passage Project

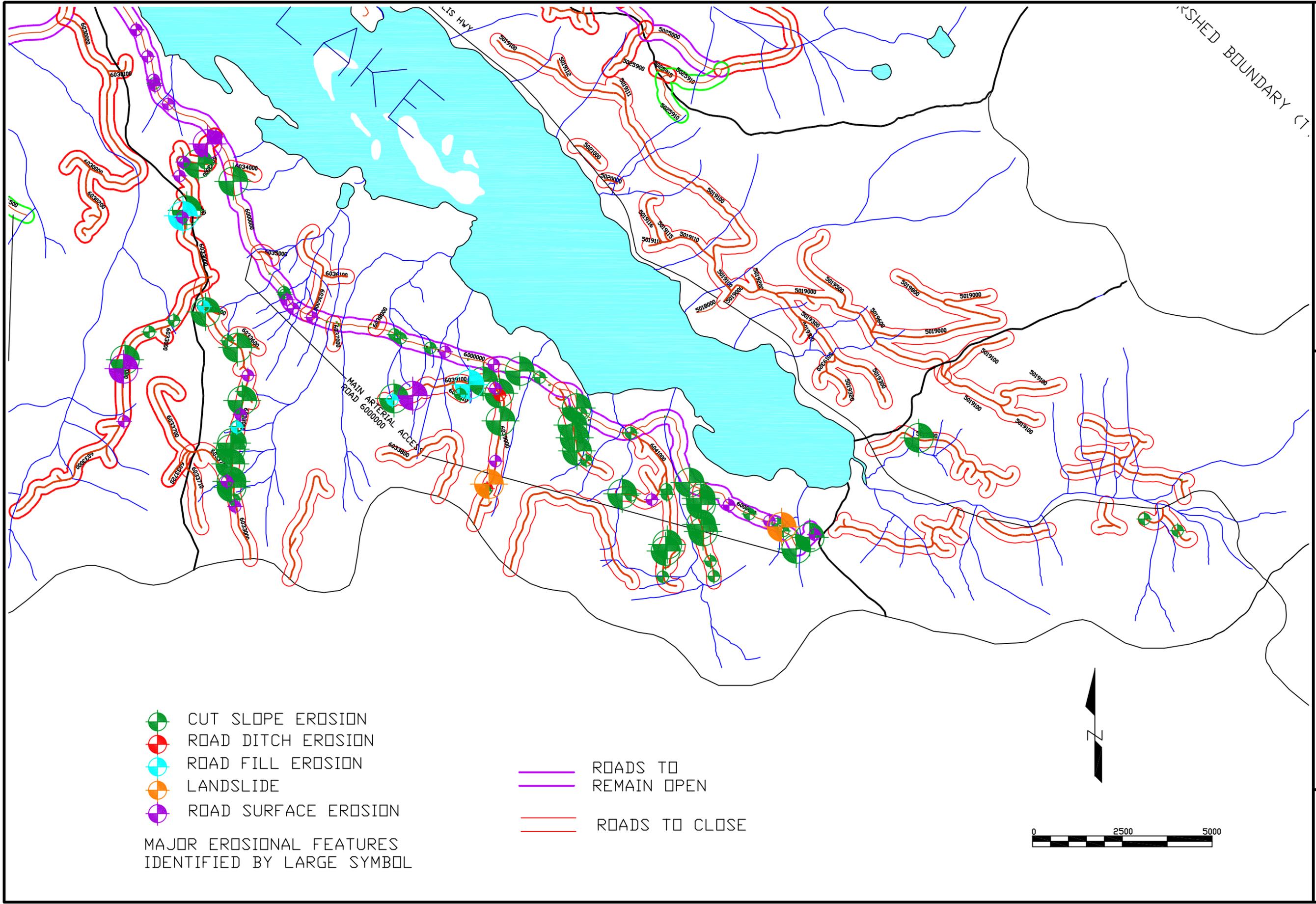
Two existing culverts (ADF&G Ids 2A002 & 2A005) have been identified in the southeast Klawock Lake area as barriers to anadromous fish passage. These two culverts are located on road 6036000 just off of the main road 6000000. Road 60360000 has been identified as a road that will be closed by the landowner and these two culverts will be removed as part of the road closure process. The excavations created from removing the two culverts should receive special attention to stabilize the soils and allow fish passage through the prism of the closed road.

This project will be completed as part of the Southeast Klawock Lake Area Roadway Management work. It is presented separately to emphasize its importance should roadway management goals change for road 6036000. The project is illustrated on Figure 5. Costs for the project are included as part of the Southeast Region Roadway Management project.

6. Southeast Region Erosion and Sediment Control

The proposed project will involve stabilizing roadway cut and fill slope erosion, roadway surface erosion, erosion associated with slides and structure removal. This work will be accomplished by crews working in concert with the road closure operations that will be performed by heavy equipment. Various techniques will be employed to stabilize eroding areas to arrest the transport of sediment to waters that provide or flow into fish habitat. Techniques to stabilize erosion include breaking up long sustained roadway grades with water bars and stabilizing bare cut and fill slopes using native seeds, jute netting, straw bales, and similar erosion control measures. Check dams, straw bales and other sediment control measures will also be installed to collect and trap sediment, thereby reducing the amount of fine roadway sediments as a pollutant to streams in the basin.

Sites where erosion was identified by the RCS are illustrated on Figure 6. Major erosion areas (>1,000 square feet) are identified by a larger symbol.



-  CUT SLOPE EROSION
 -  ROAD DITCH EROSION
 -  ROAD FILL EROSION
 -  LANDSLIDE
 -  ROAD SURFACE EROSION
- MAJOR EROSIONAL FEATURES IDENTIFIED BY LARGE SYMBOL

-  ROADS TO REMAIN OPEN
-  ROADS TO CLOSE

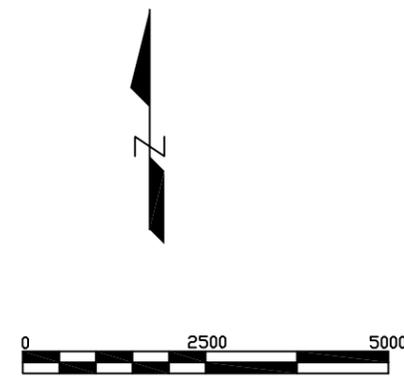


FIGURE 6. Inlet Creek Sub-basin, NE & SE Areas Erosion Stabilization

SCALE
 HOR.: 1" = 2500'
 VERT.: N/A

The majority of the major erosion sites are on roads that will be closed by the road management project, e.g., 6033000, 6039000 and 6041000.

The estimated cost for this project is \$134,000. A breakdown of this estimate is presented in Appendix A.

7. Hatchery Creek Basin Road Management

With the planned closure of roads 6033000 and 603900 in the southeast Klawock Lake Area, the Hatchery Creek basin will provide the sole roadway access to the south side of Klawock Lake via road 6000000. All road access to the property owned by Shaan Seet, Inc. will require access through the Klawock Heenya, Inc. property in the Hatchery Creek basin. The landowners have been involved in the development of this management plan and are committed to working with each other and the KWC for roadway management.

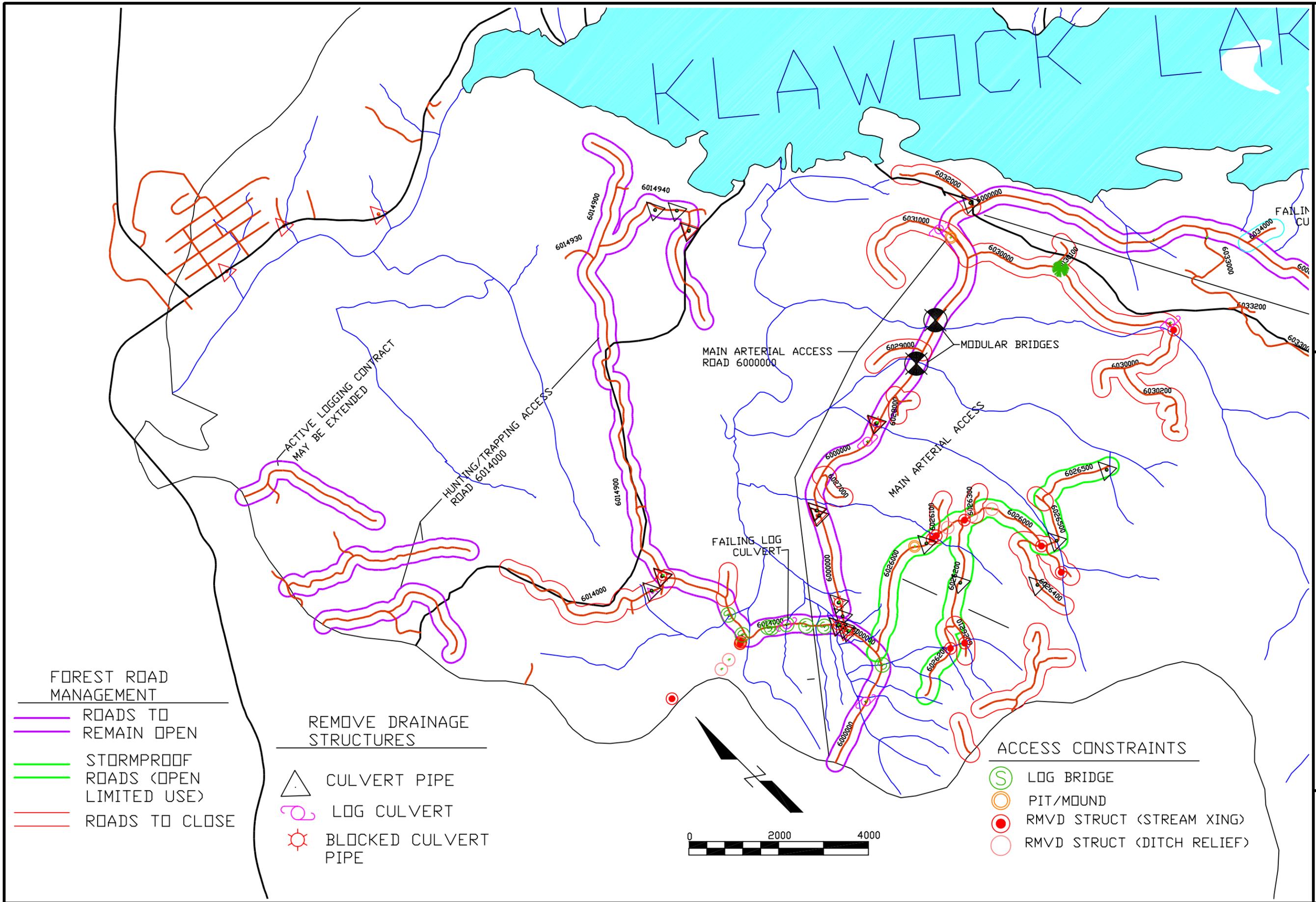
The landowner has elected to keep several roads open in the Hatchery Creek basin besides the main arterial road 600000. These roads were selected to maintain as open because of specific identified needs. The roads identified to remain as open or in limited use in the Hatchery Creek watershed are as presented in Table 2. The road management proposed for this project is illustrated in Figure 7.

TABLE 2. Proposed Hatchery Creek Basin Roadway Management

Road	Use	Action
6000000	Primary Access	Maintain Open
6014000	Hunting/trapping Access	Maintain Open
6014900	Hunting/trapping Access	Maintain Open
6014940	Hunting/trapping Access	Maintain Open
6026000	Hunting/trapping Access	Stormproof
6026500	Hunting/trapping Access	Stormproof
6026200	Hunting/trapping Access	Stormproof
Unnamed (above mill)	Active Logging	Maintain Open

The unnamed road located east of the Viking Lumber Sawmill is currently being used for access to an open logging contract on Klawock Heenya Property. This contract is scheduled through May 2004, but may be extended at the discretion of Klawock Heenya, Inc. The landowner has indicated that they may elect to close this road in the future after future logging plans are better defined.

Seven log stringer bridges and one log culvert on road 6014000 and two log culverts on road 6000000 are located where the roads traverse the upper Hatchery Creek valley. These structures will require maintenance and ultimately replacement if the landowner elects to keep these roads open permanently.



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**FIGURE 7. Hatcher Creek Basin
Roadway Management**

SCALE
HOR.: 1" = 2000'
VERT.: N/A

This will necessitate the incurrence of capital costs to replace the structures as well as the commitment to maintain these structures and the remainder of the open roadways.

Two road systems within the upper Hatchery Creek basin (Roads 6033400 and 6033700) have been excluded from this project because they are accessed from the southeast Klawock Lake area via Road 6033000. These roads will be included with the southeast Klawock Lake area road management project because of simpler logistics. In addition, these two roads are located on Shaan Seet property like all those within the southeast Klawock Lake area. The vast majority of the Hatchery Creek basin roadways are located on Klawock Heenya lands.

8. Hatchery Creek Erosion and Sediment Control

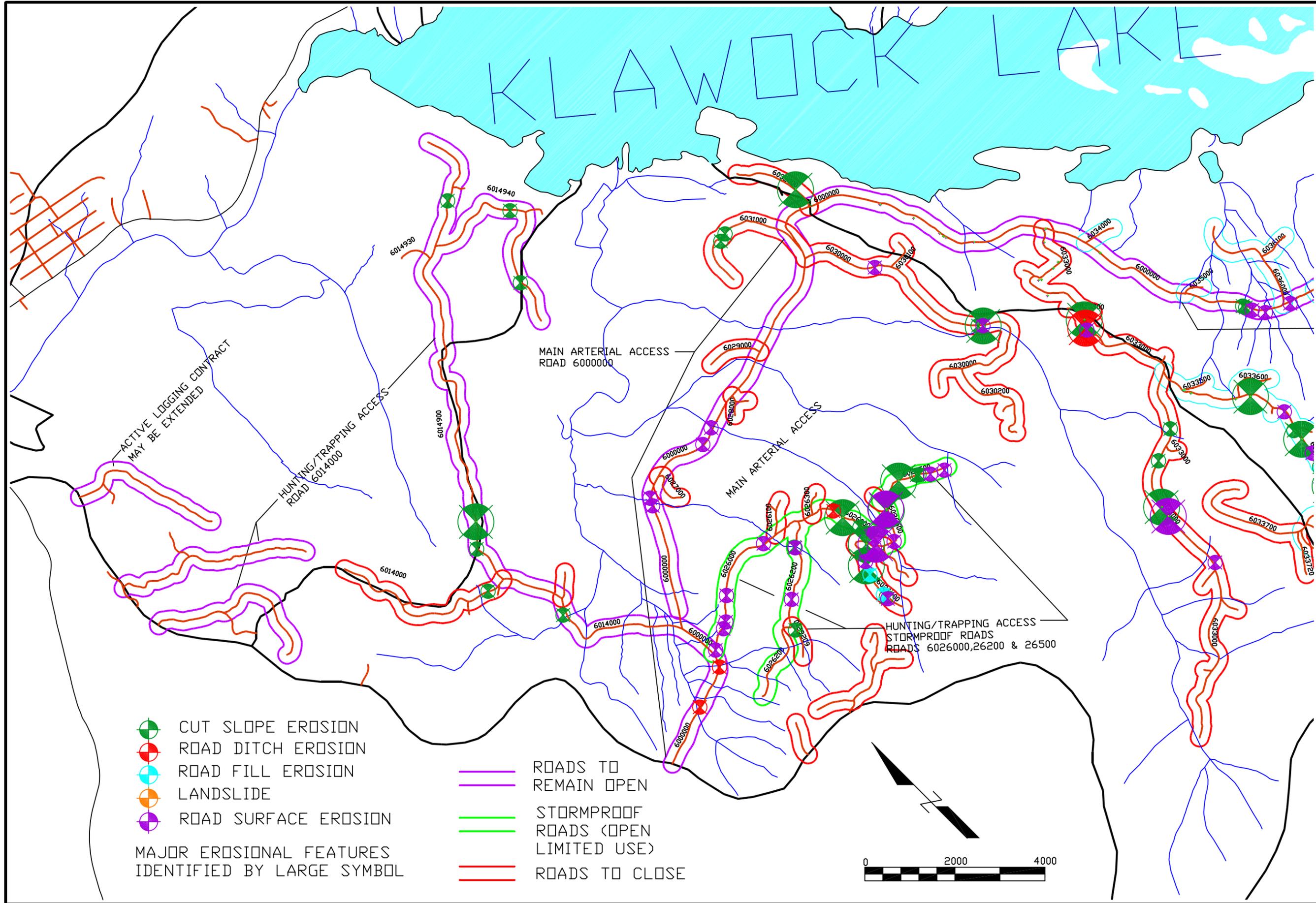
This project will stabilize erosion and reduce sediment from the Hatchery Creek basin using the same techniques, material and level of labor as in the similar projects in other basins. Sites identified as cut slope, fill slope, road surface, ditch, and landslide erosion are illustrated on Figure 8. Of particular concern is the 6026 road system; specifically, roads 6026000, 6026200 and 6026500. The landowner has elected to keep these roads open for limited use. Drivable water bars should be constructed on these roads to reduce surface erosion. Cut slopes should be stabilized with seed and erosion control matt.

The estimated cost for this project is \$126,000. A detailed breakdown is presented in Appendix A.

9. Hatchery Creek Fish Passage Upgrades

This project is to remove culverts identified as barriers to fish passage by the ADF&G RCS report and replace them with structures that promote fish passage. A total of seven CMP culverts exist in the Hatchery Creek Basin that the RCS identified as problems (red category) for fish passage. Four of these culverts are exist on road 6000000 (1B011, 1B018, 1B1019, AND 1B030), two are located on road 6014000 (3A016 & 3A33) and one exists on road 6014900 (3A053). If the landowner decides later to close these roads, these culverts could simply be removed and the stream crossings graded and stabilized to promote fish passage.

The locations of these culverts are shown on Figure 9. The estimated construction cost for this project is approximately \$49,000 (average \$7,000 per site). The total project cost when management, engineering, permitting, and 5 years of post-construction monitoring are included is estimated to be approximately \$75,000. The overall estimated cost for the project with contingencies of 20% is \$90,000. A break down of the estimated costs is presented in Appendix A.

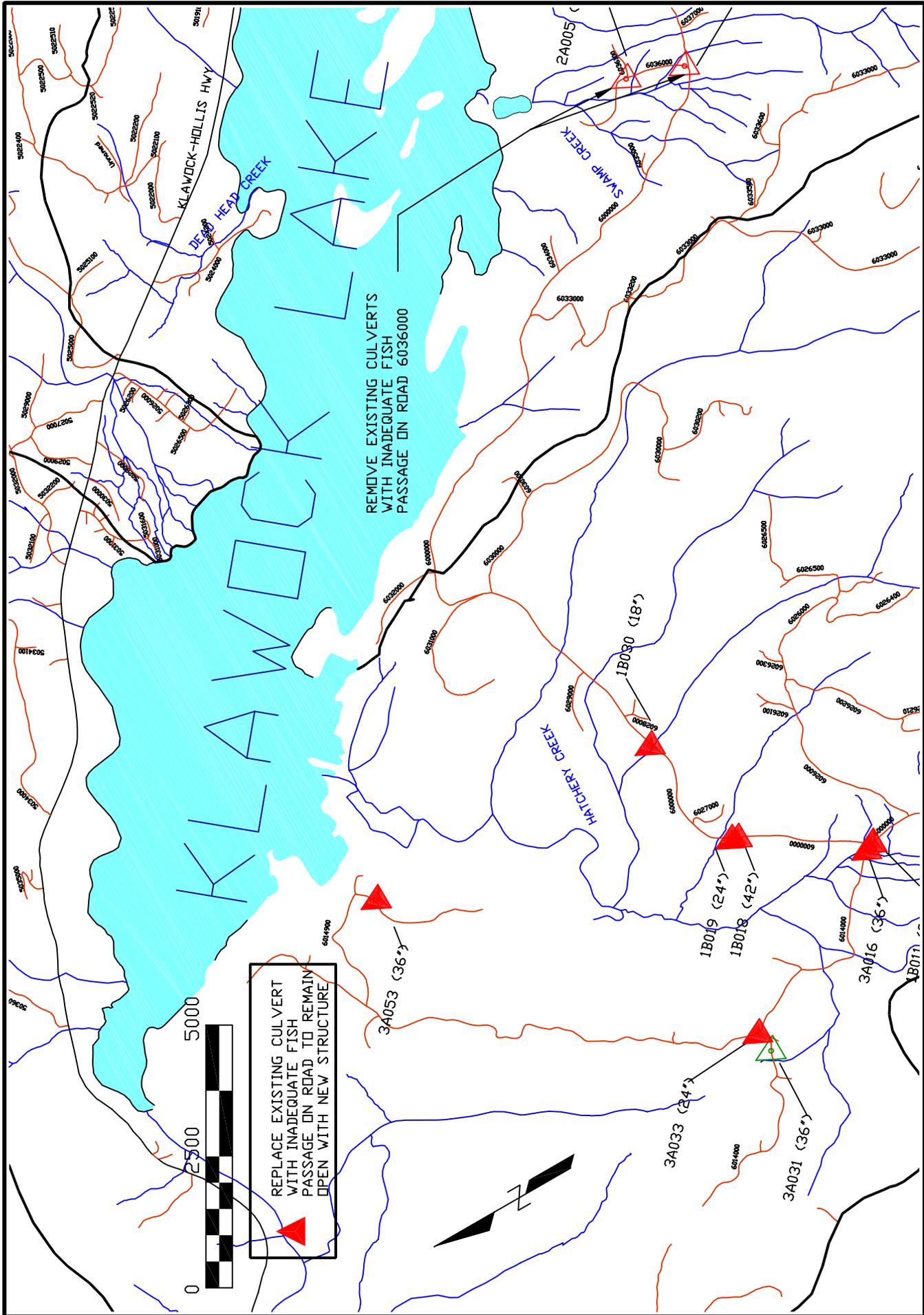


 CUT SLOPE EROSION
 ROAD DITCH EROSION
 ROAD FILL EROSION
 LANDSLIDE
 ROAD SURFACE EROSION
 MAJOR EROSIONAL FEATURES IDENTIFIED BY LARGE SYMBOL

 ROADS TO REMAIN OPEN
 STORMPROOF ROADS (OPEN LIMITED USE)
 ROADS TO CLOSE

FIGURE 8. Hatchery Creek Basin
Erosion Stabilization

SCALE
 HOR.: 1" = 2000'
 VERT.: N/A



REPLACE EXISTING CULVERT WITH INADEQUATE FISH PASSAGE ON ROAD TO REMAIN OPEN WITH NEW STRUCTURE

REMOVE EXISTING CULVERTS WITH INADEQUATE FISH PASSAGE ON ROAD 6036000

Figure 9. Hatchery Creek Basin Culverts with Inadequate Anadromous Fish Passage Conditions

SCALE
 HOR.: 1"=2500'
 VERT.: N/A

10. Northeast Klawock Lake Area/Inlet Creek Road Management

The Inlet Creek basin has the fewest miles (5.9) of any of the project areas with the exception of Half-mile creek. Consultation with the landowners has revealed that they desire to close all the roads in the Inlet Creek basin. Several culvert pipes and one log culvert were identified to be existing in the roads of the Inlet Creek basin.

This project will remove all drainage structures and stabilize roadways by constructing water bars and ditch relief through the road prism.

Of particular interest is the culvert on road 5025000 where it crosses Inlet Creek tributary 11A. This culvert has been identified as a fish passage barrier by the RCS. Special attention should be given to its removal to ensure that the stream crossing of the roadway is passable to fish. If the landowner ever decides to leave 5025000 in service or return it to service after closure, a structure that promotes fish passage should be installed.

The proposed Inlet Creek/NE Klawock Lake Area road management is illustrated in Figure 10.

The total estimated cost for the Inlet Creek and NE Area road closures is estimated at \$70,700. A cost breakdown is presented in Appendix A.

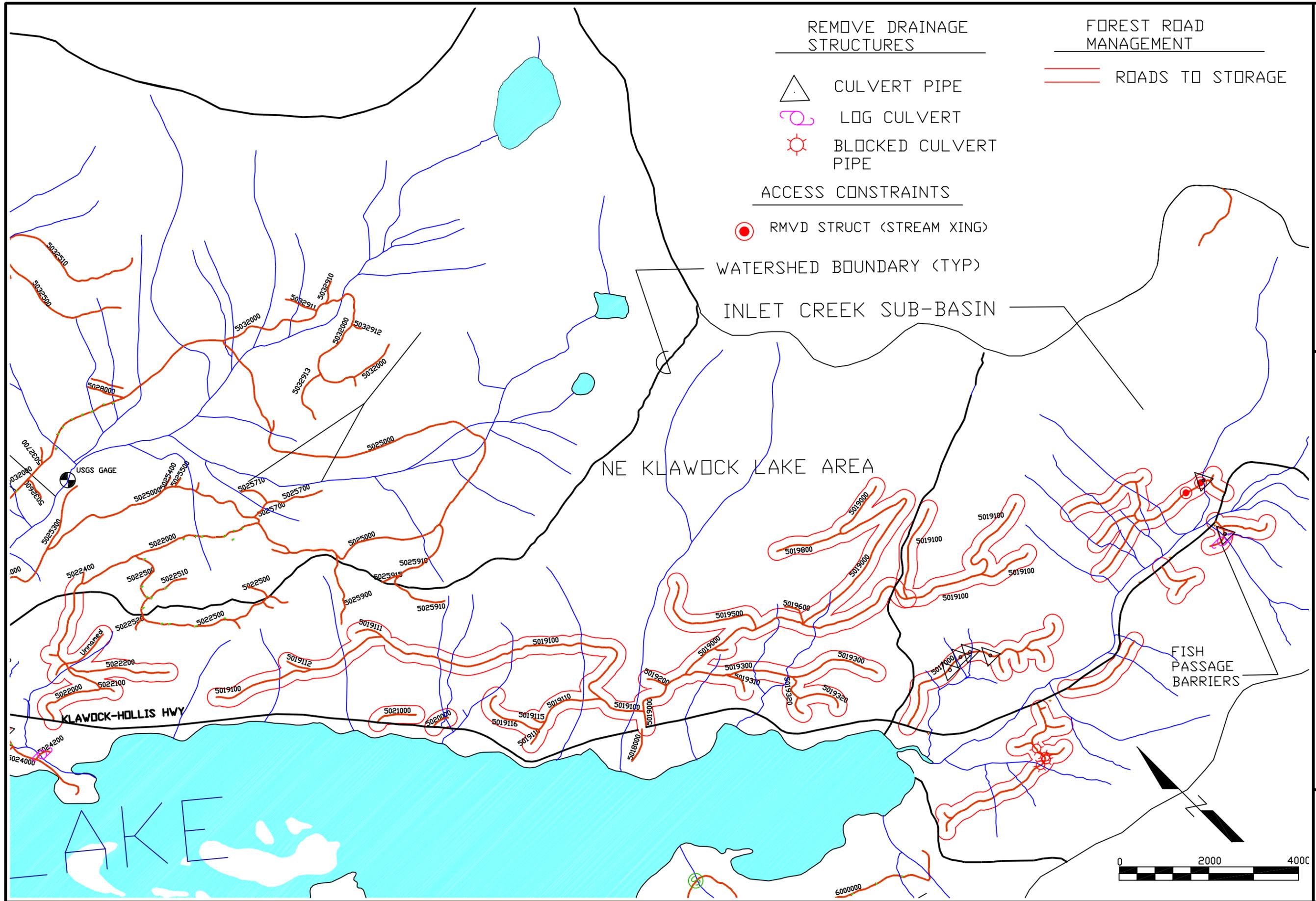
11. Northeast Klawock Lake Area/Inlet Creek Erosion and Sediment Control

Few areas were identified in the NE Klawock Lake Area and the Inlet Creek basin as the 501900 road is already closed and much of the area was not surveyed. Road 5017000 had one site with major cut slope erosion and there were two areas of cut slope erosion identified in the upper reaches of the watershed.

Estimated costs for these areas are estimated at \$81,700 due to the lack of identified sites. A large contingency is built into this estimate to allow for additional sites in need of attention in areas not surveyed. The sites identified in the Inlet Creek Basin/NE Klawock Lake area are illustrated in Figure 6

12. Inlet Creek Fish Passage Project

This project would remove an existing culvert on road 5025000 where it crosses a tributary to Inlet Creek (Tributary 11A) to allow resident fish passage. The culvert (RCS ID 6C074) was identified as a barrier to fish passage by the RCS.



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**FIGURE 10. NE Klawock & Inlet
 Creek Roadway Management**

The excavation created from removing the culvert would be stabilized and graded to allow fish passage through the road prism. Additional grade control structures may be needed to promote fish passage.

The existing 24-inch culvert is undersized and placed at too steep a slope which creates a velocity barrier for fish passage. Preliminary planning-level calculations indicate that a culvert on the order of 66 inches in diameter would be necessary to meet current fish passage criteria. This project would be complete as part of the Inlet Creek Roadway Management work. It is presented separately to emphasize its importance should roadway management goals change for road 5025000. Note that 5025000 was also used as a road number for a road in the Three-mile basin. The project is illustrated on Figure 10. Costs for the project are included as part of the Inlet Creek Roadway Management project.

13. Klawock-Hollis Highway Fish Passage Improvements

This project is necessary to remove perched culverts on the Klawock-Hollis Highway along Klawock Lake that block anadromous fish from reaching spawning and rearing habitat above the highway. The USFS PFC report identified several culverts as being impassable to anadromous species and the ADF&G RCS report confirmed these culverts were barriers. The RCS also identified additional culverts as impassable to bring the total to 18 highway culverts in need of upgrades to allow fish passage. The locations of these culverts along the Klawock Hollis Highway are shown in Figures 11 and 12.

Discussions with planning engineers at the Alaska Department of Transportation and Public Facilities (ADOT/PF) indicate that highway bridges are desirable for the Half-mile and Three-mile Creek crossings. Construction of these bridges would require realigning the highway in order to maintain traffic over the existing culverts during construction. This adds significant costs for earthwork and roadway construction. Bridges and associated road construction costs for each of these two stream crossings are estimated to be \$2.2M and \$2.8M for the Half-mile Creek crossing and Three-mile Creek crossing respectively. A breakdown of this estimate is presented in Appendix A

Culvert structures are envisioned for the remaining 16 sites. These may be simple corrugated metal pipes (CMPs) to replace existing smaller structures, e.g. 24-inch CMPS or bottomless structural-plate arch bridge structures for larger crossings. Total costs are estimated at \$3.1M for this project. Planning-level cost estimates are presented in Appendix A.

This project involves work in an ADOT/PF highway right of way on a state-owned facility and therefore will be much more complicated than typical projects on private land elsewhere in the basin.

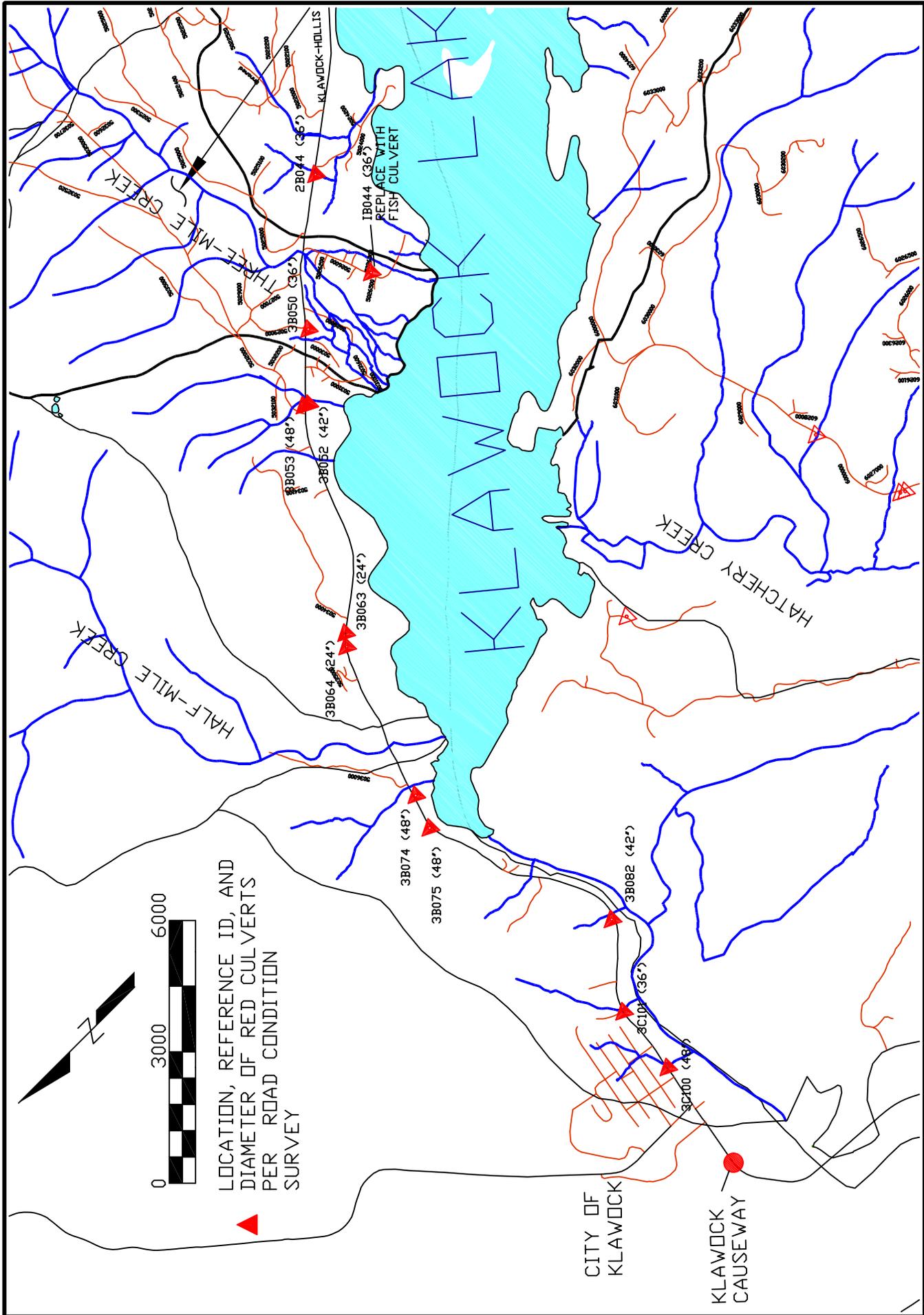


Figure 1 I. Klawock-Hollis Highway Project Locations (West)

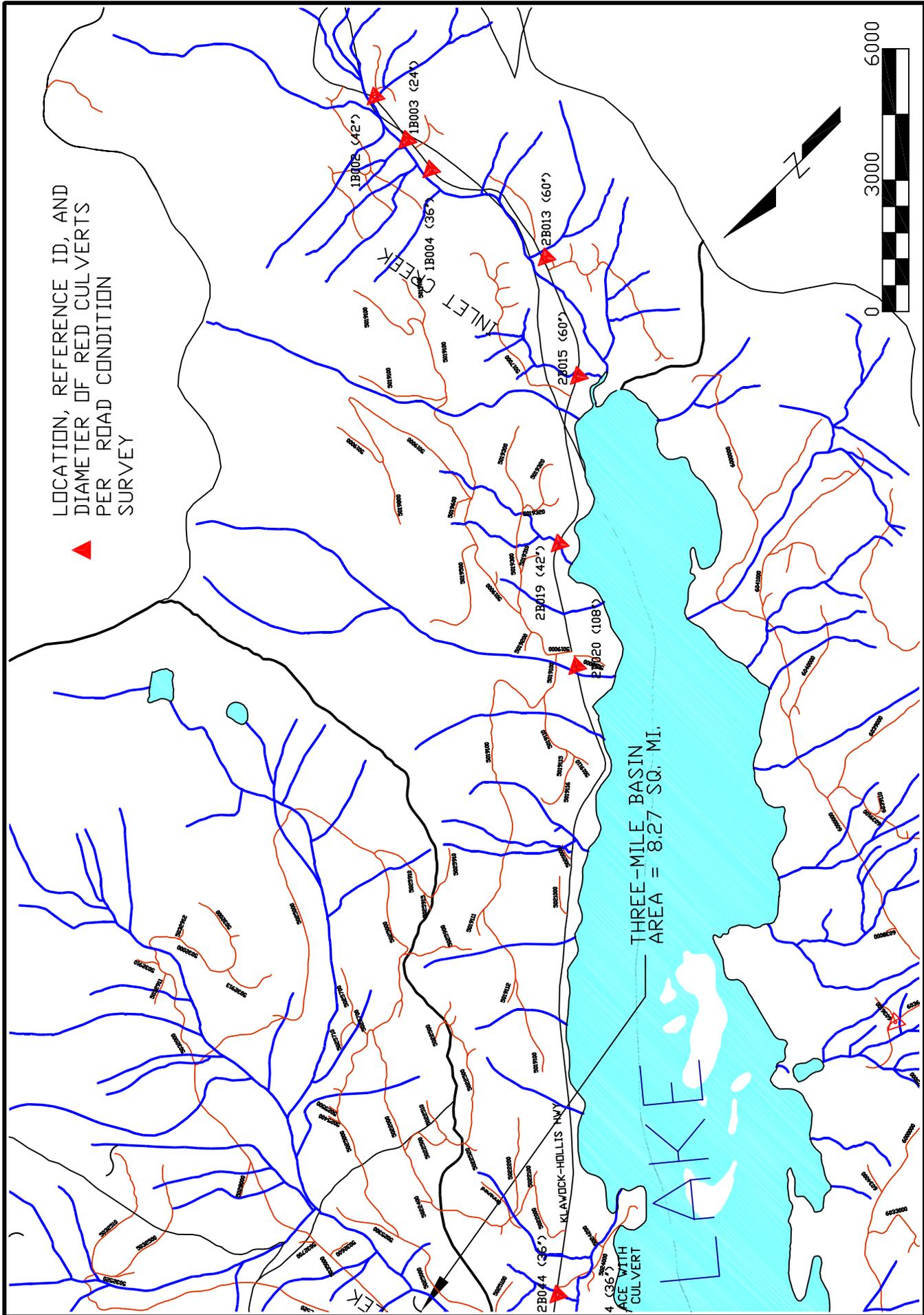


Figure I2. Klawock-Hollis Highway Project Locations (East)

14. Klawock Causeway Fish Passage Improvements

This project is currently underway in the design phase. The preferred design to breach the highway causeway has yet to be determined but it has been narrowed down to a type of culvert(s) or an arch-bridge. The opportunity still exists for the KWC to promote this project. The KWC could assist in seeking funds. The KWC could possibly be a recipient of construction monies and act as a “pass through” to fund the construction of the project. The estimated construction cost for this project is \$228,000. A breakdown of this estimate is presented in Appendix A. The location of the Klawock causeway project is shown on Figure 11.

The causeway project also will provide an opportunity for the KWC to monitor its effectiveness after it has been constructed. Because this project is already underway in the engineering phase, a monitoring proposal should be presented separately because of the likelihood that the parties other than the KWC will be responsible for its construction. Separating the monitoring from the engineering/construction phase will help to define the project as a stand alone project for the KWC should other parties be responsible for its construction. Because of its location, this project also would be ideal to use as a demonstration project for public education and outreach.

15. Half-mile Creek Sediment Reintroduction

This project's purpose is to reintroduce streambed sediments to the half-mile creek channel. Currently, sediments are deposited in the City of Klawock's municipal reservoir where quiescent conditions promote deposition. These streambed sediments would normally be transported downstream under natural conditions. These sediments are of the larger sand and gravel size gradations and provide materials that make good spawning habitat downstream of the reservoir.

The Alaska Department of Fish And Game has required the City of Klawock to prepare a sediment re-introduction plan and to develop instream flow measures as a permit condition for modifications made to their existing reservoir. This plan has not been prepared to date and given the current financial condition of small municipalities and cutbacks in state revenue sharing its status is unknown.

This project would be to work with the City of Klawock and permitting agencies to prepare a sediment re-introduction plan for Half-mile below the reservoir. Actual dredging of the reservoir and re-introduction of sediment below the reservoir is envisioned to be performed by City forces. However, the KWC could seek funds, and possibly serve as a funding conduit, to assist the City in the planning and operation(s).

This project should only be undertaken with the cooperation of and in close coordination with the City of Klawock.

The total estimated cost for this project is \$46,000. A breakdown is presented in Appendix A.

16. Half-mile Creek Basin Roadway Management

There is only one road within the Half-mile creek basin. This road is owned by Klawock Heenya, Inc. and accesses the existing municipal water supply source for the City of Klawock. Klawock-Heenya reports that title to this property is in the process of being transferred to the City of Klawock. The current and future operations by the City of Klawock prohibit the closure of this road. The KWC may offer the City technical assistance to the City to reduce sediment generated and transported from the road to Half-mile Creek. No work is envisioned being performed by the KWC on this road system and therefore, no costs are proposed.

17. Three-mile Creek Basin Riparian Thinning

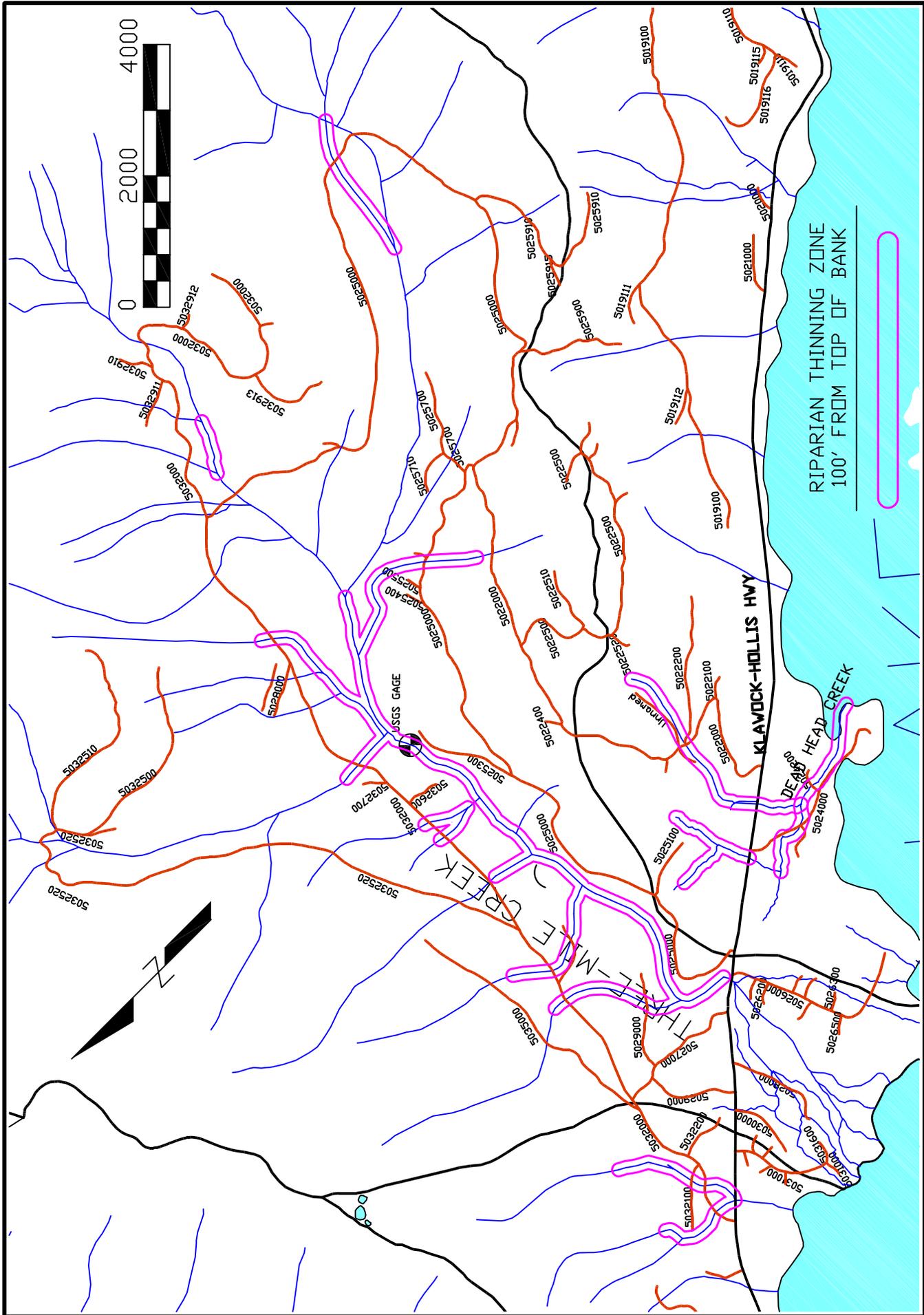
Riparian Thinning was recommended in the USFS PFC as a means help promote confer regeneration and regrowth and provide a source of LWD to streams in the Three-mile watershed. Access to complete this work is envisioned to take place with ATV vehicles for areas to be thinned that are adjacent to closed roads. Access to other areas would be via pickup.

Riparian thinning would be performed on areas from the stream bank to a distance of 100 feet upland. This thinning would be performed on both sides of the stream. This project encompasses a total of approximately 25 acres along 5,500 feet in multiple locations of Three-mile Creek and its tributaries. The project is estimated to require approximately 50 man-days with a 2 - 3 man crew using chain saws to complete. The areas proposed for Riparian Thinning in the Three-mile basin are illustrated in Figure 13. The cost for this project is estimate at \$31,200. An itemized cost estimate for this project is presented in Appendix A

18. Northeast Klawock Lake Area Riparian Thinning

This project is similar to other riparian thinning projects and encompasses a total of approximately 20 acres along 4,400 feet in multiple locations. The expected time to complete the work in this project is approximately 40 man-days with a 2 - 3 man crew using chain saws. Riparian thinning would be performed on an area from the stream bank to a distance of 100 feet on both sides of the stream.

The areas proposed for Riparian Thinning in the Inlet Creek and Northeast Klawock Lake area are illustrated in Figure 14. The cost for this project is estimate at \$26,400. An itemized cost estimate for this project is presented in Appendix A.



SCALE
 HOR.: 1"=2000'
 VERT.: N/A

Figure I3. Three-mile Creek Basin Riparian Thinning



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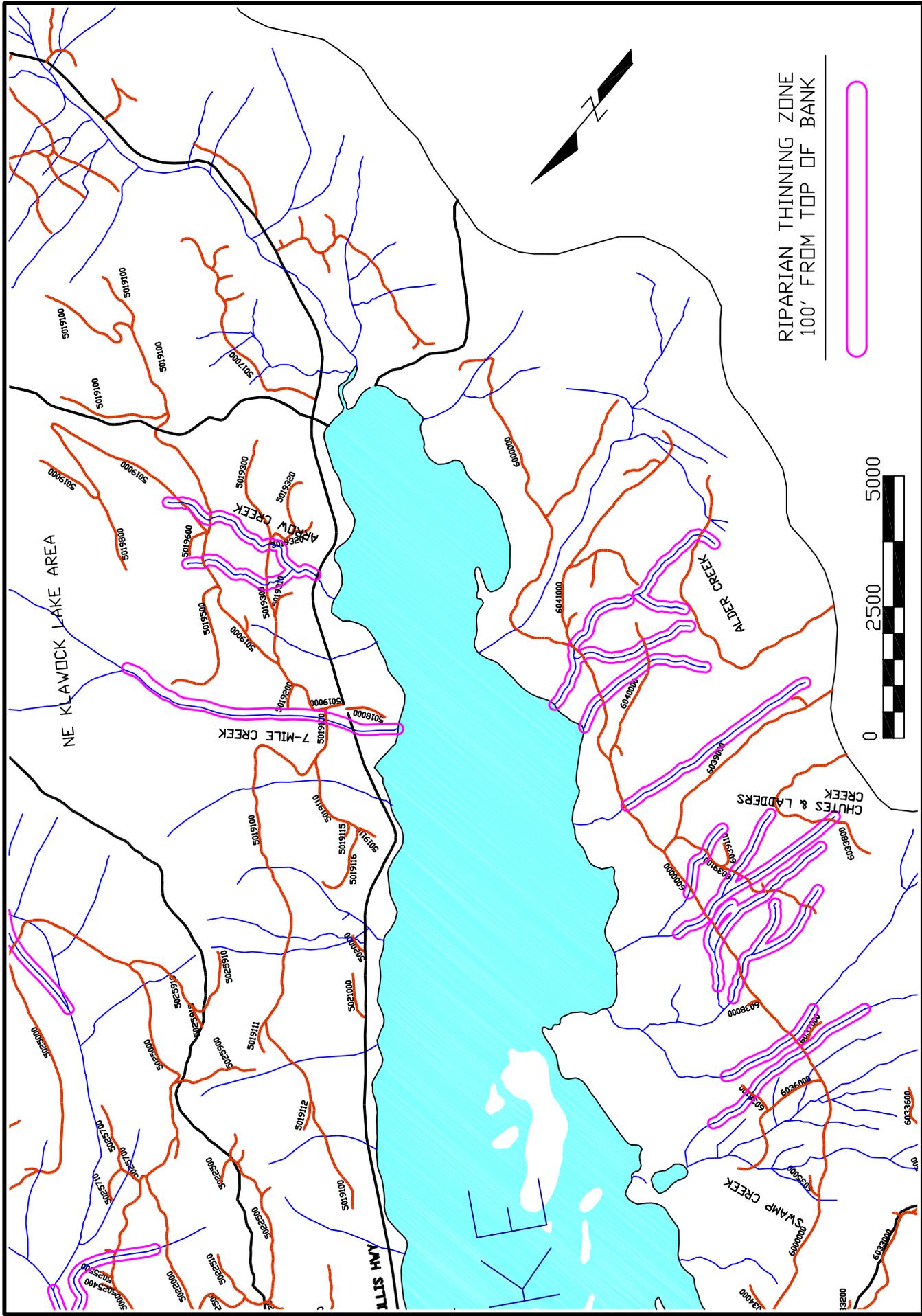


Figure I4. NE and SE Klawock Lake Riparian Thinning

SCALE
 HOR.: 1"=2500'
 VERT.: N/A

19. Southeast Region Riparian Thinning

Riparian Thinning was also recommended in the USFS PFC as a means help promote confer regeneration and regrowth and provide a source for LWD to streams in the streams in the southeast Klawock Lake Area. Access to complete this work is envisioned to take place with ATV vehicles for areas that are adjacent to closed roads. Access to other areas would be via pickup. This project encompasses a total of approximately 30 acres along multiple locations of the named streams and their tributaries. The project is estimated to require approximately 60 man-days of labor with a 2 - 3 man crew using chain saws.

Riparian thinning proposed in the southeast Klawock Lake area is illustrated by Figure 14. The total estimated cost for this work is \$35,000, which includes a 20% contingency (\$5,800).

20. Hatchery Creek Basin Riparian Thinning

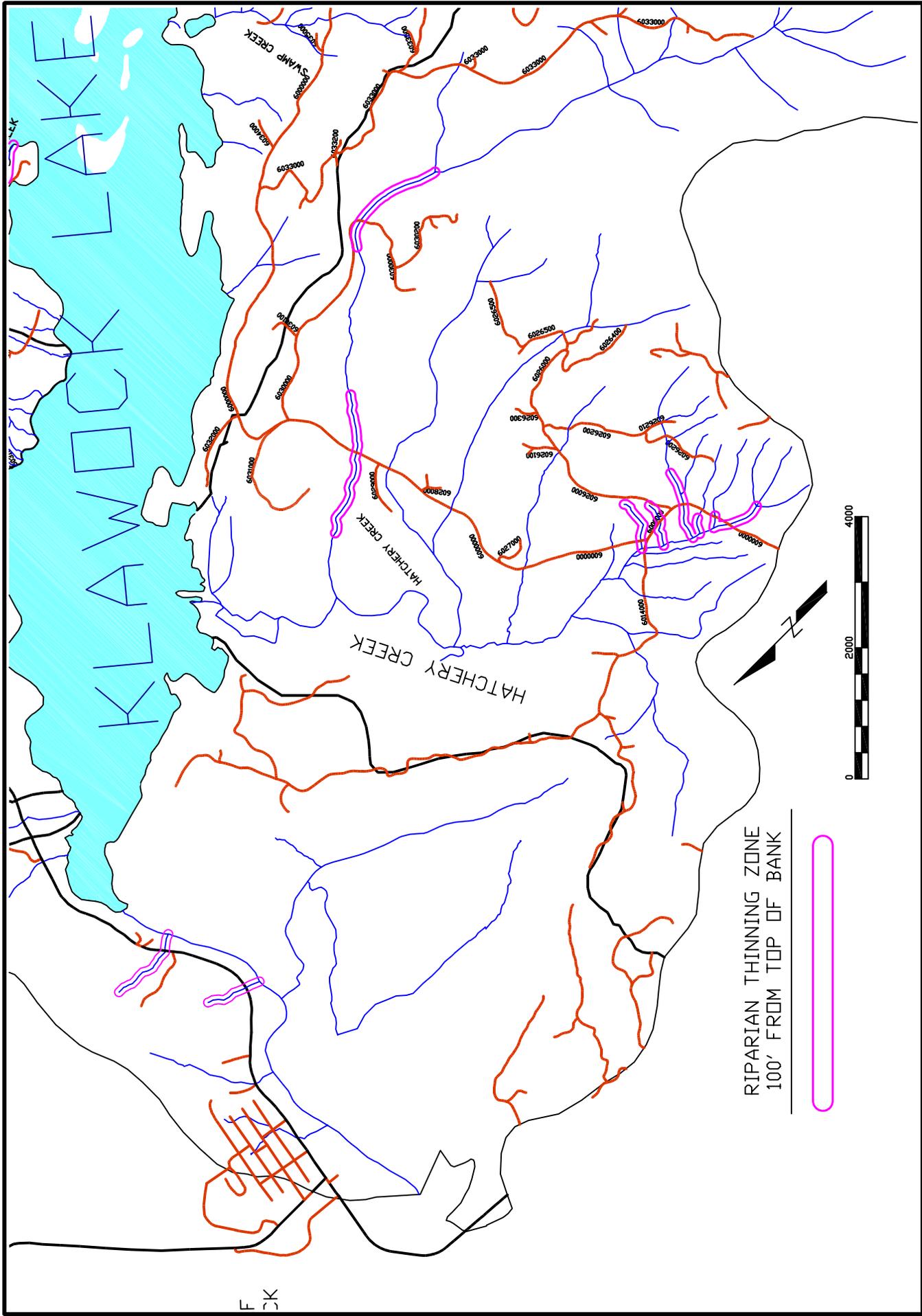
The areas where riparian thinning is proposed in the Hatchery Creek basin are illustrated in Figure 15. These areas correspond to those recommended by the USFS PFC report. Approximately 15 acres are proposed for riparian thinning in the Hatchery Creek basin.

The Hatchery Creek riparian thinning project is estimated to be able to be completed in approximately 50 man-days with a 2 - 3 man crew using chain saws. Crews will access areas for thinning via pickup or ATV depending on the road conditions. The estimated cost for this project is \$23,400. This amount includes a contingency of 20% (\$3,900).

21. Lower Klawock Streams Riparian thinning

Riparian thinning is minor in the lower Klawock compared to the other areas proposed for thinning in the watershed. A total of 13 acres of riparian thinning were identified in the PFC assessment as being desired to benefit to the Klawock basin. The PFC report identified 5 acres on A&K creek as a candidate for riparian thinning. This stream was dropped from consideration because of the extensive private property along its alignment. The streams where riparian thinning was identified is proposed are Waterline Creek (5 acres) and Trailhead Creek (3 acres). Because of the close proximity to the Three-mile system and the small amount of thinning proposed in the lower Klawock area, this work will be combined with the Three-mile Creek riparian Thinning project.

The Lower Klawock Thinning projects are shown on Figure 15. The estimated cost for the lower Klawock area project is \$4,000.



RIPARIAN THINNING ZONE
100' FROM TOP OF BANK



SCALE
HOR.: 1"=2000'
VERT.: N/A

Figure I5. Lower Klawock & Hatchery Creek Basin Riparian Thinning

Knowledge Acquisition Projects

The projects undertaken will provide opportunities to learn more about the Klawock system and to determine the effectiveness of the proposed projects in achieving their goals. There may also be opportunities for basic research in the Klawock as well to study the resources and natural systems in the Klawock. The KWC will assist and partner with agency studies as opportunities present themselves. However, it is envisioned that the main thrust of knowledge acquisition will be the monitoring of the results of the KWC projects.

Monitoring results should be kept on a central system so that data from one project in one area of the watershed may be compared and correlated with other data from the Klawock. A database program is ideal for this task. The KWC should make an effort to ensure that all data collected and archived is compatible with agency GIS systems.

Specific physical parameters that may be monitored are hydrological, water quality, channel geometry and erosion and sedimentation. The KWC should undertake a project to design a database and compile data collected. Existing databases may be available from agency personnel and it is recommended that the KWC investigate this to avoid duplicating work.

Budgets have been built into the costs estimates of the engineering projects proposed in this plan for performance monitoring. These budgets are sufficient to initiate a database for KWC collected data and begin a data collection program for the particular project that they are associated with.

Education/Public Outreach Projects

Public Outreach and education help to educate the public, promote stewardship of natural resources, and foster support for the KWC among the community. Possible public outreach projects that can be initiated by the KWC include the creation of a website to expose the KWC to the public. This could be accomplished by local expertise and help to show the KWC to those elsewhere in the state and abroad.

The KWC can make presentations at the local schools and assist students interested in natural resources. Students may be able to volunteer to collect data to assist the KWC in monitoring projects. The KWC can participate in the annual Earth day fair held on Prince of Wales Island to educate people to the activities of the KWC and gain more public exposure.

The KWC has conducted a river cleanup on the Klawock River. This should be continued using volunteer efforts. This helps to generate support for the KWC and also helps the river environment.

Countless opportunities exist for the KWC to educate and reach out to the public. It is important to keep this in mind that these ideas have a way of coming forth and their expression should be encouraged at the KWC.

Lobbying/Marketing efforts

The KWC can lobby for funding to complete both internal projects and projects to be performed by others in the Klawock area. A prime example is to lobby for funds to complete fish passage upgrades on the Klawock Hollis Highway along Klawock Lake and the Klawock causeway project.

The KWC may be able to act as a funding conduit to undertake projects. These projects do not need be direct projects that the KWC has resources to accomplish on their own. This could be an excellent source of revenue and exposure for the KWC.

CONTRACTING METHODS

The KWC is a small organization without the forces to construct and/or operate projects and without forces to perform specialized professional tasks. Therefore, contracting will be necessary for services not available in-house. Contracts can generally be divided into two classes: Professional services contracts and construction contracts.

Professional services are those services that are based on professional opinion and judgment. These types of services are sought to generally provide a solution to a problem and not to actually construct or implement the solution. Types of professional services that may be sought by the KWC include technical disciplines such as accounting, engineering, law, cadastral surveying, forestry and various natural scientific disciplines such as biology, geology, and chemistry and social sciences such as archeology and economics.

Non-professional services are services that are used to accomplish a defined task. Construction contracting is an example where the task is defined (plans and specifications) and it is the contractor's job to complete the task. Other non-professional services that may be required are for printing, catering, custodial services, and general and maintenance labor.

Contract Structure

Professional Services Contracts

Professional services are typically contracted for on a Lump sum or time-and-materials basis. Time and materials contracts offer the most flexibility. Lump

sum contracts should have a detailed scope of work specified in order to avoid or minimize disputes.

Negotiated contracts

Most professional services contracts for the KWC can be procured through negotiation. Only where the scope of services is anticipated to be large or where additional parties are desired to promote increased competition should competitive proposals be warranted. However the KWC may wish to solicit proposals from local professionals to avoid the appearance of favoritism.

Competitive proposals

Larger professional services contracts may can be solicited or via a Requests for Proposals (RFPs). In such cases the KWC administration would draft an RFP and publish the solicitation in newspapers and perhaps trade journals. Three papers is a normal quantity to seek respondents but a larger number may be used to promote competition by advertising over a broader geographic area. Respondents would be ranked based upon an established system that takes into account the proposed probable costs, experience on similar projects, qualifications of the project manager, and qualifications of proposed staff.

Construction Contracts

Force Account Contracts

Force account work is done on a time and materials basis with the owner acting as the contractor. In other words, the owner's forces procure the materials and equipment and perform the labor to accomplish the work. Depending on the complexity of the work, this could require the KWC to have a large staff employed (and therefore payroll) and either own or lease equipment. Force account work often uses construction documents that are more schematic or conceptual in nature. Because of the above characteristics, force account work requires strong management capability.

Time and Materials Contracts

Time and materials contracts are paid for at billing rates prescribed and agreed to in the contract. These contracts are based upon an estimate of probable costs provided by the contractor. Allowances are defined for overhead and profit for materials, subcontractors or special equipment rented for the project. A provision is often included in the contract that no fees in excess of the estimate or a certain percentage beyond the estimate will be paid without advance approval. Because these types of contracts are paid on a time and materials basis, they are very flexible to amend for more or less work.

Lump-sum Contracts

Lump sum contracts stipulate that a certain fee will be paid for the work completed. There is no payment made based on amount of time and materials needed by the contractor to accomplish the work –only on the actual work performed. However, change orders to these types of contracts are often paid on a time and materials basis. Because the fee is set, the contractor's incentive is to accomplish the work with a minimum amount of time (cost) and therefore maximize their profit. Lump sum contracts must be defined very well in advance to minimize the chance of disputes.

Unit price Contracts

Unit price contracts specify a certain amount of compensation will be made for a certain amount of work that can be measured in physical units. Examples would be paying for seed and fertilized slopes by the acre, culvert pipe by the foot, or excavation by the cubic yard. Unit price contracts require a Measurement and Payment Section to describe the units of measurement, the method(s) for measuring the work and the limits of payment. Measurement methods must be clearly defined or else disputes can easily occur as different measurement methods can yield different quantities of work. Because of the need for physical measurement of the work to verify contractor quantities, these types of contracts require experienced inspection personnel who are familiar not only with construction methods but also with construction contracts.

PERFORMANCE MEASUREMENT

Performance measurement is desirable to ascertain whether or not a particular project was effective or not in accomplishing its goal. Performance of a project may vary depending on the season or on the length of time that has passed since the project was implemented.

Quantitative versus Qualitative Evaluation

Depending on the goal, measurement of a project's performance may be extremely difficult to quantify. With these types of objectives a qualitative measurement is more appropriate. For example if the goal of a project is to reduce sediment input into streams, it will likely be very difficult to measure sediment transport in the stream let alone determine the effects of the project on sediment transport. In instances like these, it is better to measure an index or several indices that are known to correlate with the process that is of interest. In the case of sediment transported to a stream, one might measure the effectiveness of seeding by comparing the size of bare exposed areas that were present prior to the seeding to after. Other indices that could be measured include the presence or absence of sediment in catch basins excavated at culverts or if road surface erosion has reappeared after stabilization work was completed.

Quantitative measurements are those that can be expressed in numerical terms. Examples of parameters that can be directly measured include miles of roads taken out of service, dollars spent, feet of culvert removed or installed, and pounds of seed broadcast on a site. Quantitative parameters are preferable when they can be easily measured but in many instances there are too many variables and thus qualitative indices may better gauge of a project's success.

Indirect benefits may also be evaluated in a project to gauge its effectiveness. Examples are dollars infused into the local economy by a project or repairs made to roadways in order to access project sites.

IDENTIFIED FUNDING SOURCES

Potential sources of funding for KWC restoration projects have been investigated concurrent with the preparation of this plan. Prince of Wales Tribal Enterprise Consortium, LLC, has primarily performed this work for KWC. (POWTEC). Keta Engineering has coordinated with POWTEC in identifying potential funding sources and assisted with the preparation of grant applications to fund projects presented in this plan. POWTEC has identified several sources of potential funds for KWC operations and projects. These funding sources are presented in tabular format in Appendix B.

The vast majority of grants to fund the type of restoration work planned by the KWC require the recipient to have a non-profit organization status in accordance with Section 501c(3) of the U.S. Tax Code. As of the writing of this plan, the KWC has yet to achieve this status and is therefore severely handicapped in its ability to seek grant funds directly. Obtaining a 501c(3) status is vital for the KWC to be eligible to seek most grants for restoration work. This task must be a priority in order to maximize potential sources to fund the projects presented in this plan.

ADF&G has dedicated monies available for restoration efforts in the Klawock Lake Basin. These funds are available through the Southeast Sustainable Salmon Fund (SSSF). ADF&G has dedicated some of these funds to current KWC projects in the Three-mile basin. The projects proposed in this plan are presented in the format used to apply for SSSF funds in Appendix C. The KWC may use these applications to apply for future SSSF funds as well as a template to apply for other funds.

FUTURE PLANNING EFFORTS

This master plan represents an initial planning effort by the KWC. Planning is an ongoing process and as new information becomes available, new areas will become apparent that may be in need of attention by the KWC. This plan should be amended as necessary to reflect any change in the goals and objectives that may occur in the KWC and to reflect the KWC's accomplishments. Future

planning efforts can be generally categorized into two classes: Plan maintenance and plan updates.

Plan Maintenance

Plan maintenance involves modifying and amending the existing master plan that is currently in place with the KWC. This may include changing project lists to reflect completion of projects, adding new project ideas as they may arise, and appending new data and studies to be used to guide the implementation of proposed projects. Project priority lists can be updated as new information or funding becomes available that may change the priority in which projects are implemented. Maintenance is an ongoing activity and the administration should be tasked with keeping track of planning as directed by the KWC. Documents should be appended to the plan on an annual basis. Documents might typically be a project proposal or technical memoranda to provide supplemental information and data to a planned project.

Plan Updates

This plan should be updated periodically. The frequency at which it is updated depends on the rate at which projects are implemented and competed and the amount of new project proposals that are generated. A changing board makeup may also bring a different vision to the KWC. A different vision may manifest itself in a different direction of focus and, thus, different priorities. It is estimated that this plan will need to be updated approximately every 5 to 7 years. Plan updates involve a complete re-working of the plan as opposed to maintenance where the plan is supplemented with new appendices.

ACKNOWLEDGEMENTS

This plan is the result of a cooperative effort of the members of the Klawock Watershed Council. The assistance of the many members of the Council is appreciated. In particular, Sam Thomas and John Morris, Jr. who served as Chairman and Secretary/Treasurer of the Klawock Watershed Council were of great help in the preparation of this plan. Bill Peratrovich of Klawock Heenya, Inc. and Leona Charles Casey of Shaan Seet, Inc. were instrumental in providing critical direction that helped in the formulation of this plan. Other members of the Klawock Watershed Council assisted in this plan's preparation and their help is appreciated. John Bruns assisted in the initiation of projects in the Three-mile sub-basin and Paul Coffey provided valuable assistance in editing the draft report. Agency personnel from the USDA Forest Service and National Resources Conservation Service, US Fish and Wildlife Service and the State of Alaska Department of Fish and Game and Department of Natural Resources also assisted and their help is appreciated.

Appendix A. Cost Estimates

3-mile Basin Roadway Erosion Stabilization

Project Management and contract administration:	\$	10,000.00
Construction	\$	103,675.91
Construction Inspection/Layout:	\$	9,600.00
Project Documentation and write up:	\$	2,500.00
Post-construction performance monitoring:	\$	3,000.00
Final Report:	\$	1,500.00
Subtotal	\$	130,275.91
Contingency	15% \$	19,541.39
Total	\$	149,817.30

SE Area Roadway Erosion Stabilization

Project Management and contract administration:	\$	10,000.00
Construction	\$	91,456.52
Construction Inspection/Layout:	\$	8,400.00
Project Documentation and write up:	\$	2,500.00
Post-construction performance monitoring:	\$	3,000.00
Final Report:	\$	1,500.00
Subtotal	\$	116,856.52
Contingency	15% \$	17,528.48
Total	\$	134,384.99

Hatchery Creek Basin Roadway Erosion Stabilization

Project Management and contract administration:	\$	10,000.00
Construction	\$	96,451.52
Construction Inspection/Layout:	\$	8,400.00
Project Documentation and write up:	\$	2,500.00
Post-construction performance monitoring:	\$	3,000.00
Final Report:	\$	1,500.00
Subtotal	\$	121,851.52
Contingency	20% \$	24,370.30
Total	\$	146,221.82

NE Area/Inlet Creek Roadway Erosion Stabilization Project

Project Management		\$	5,000.00
Construction		\$	48,276.36
Construction Inspection/Layout:		\$	3,600.00
Project Documentation and write up:		\$	2,500.00
Post-construction performance monitoring:		\$	2,000.00
Final Report:		\$	1,500.00
Subtotal		\$	62,876.36
contingency	30%	\$	18,862.91
Total		\$	81,739.27

3-mile Basin Roadway Management

	UNIT	Qty	Unit Cost		Extended Cost
Equipment					
Grader	Month	1	\$ 9,200.00	\$	9,200.00
Excavator	Month	1.5	\$ 7,590.00	\$	11,385.00
Dump truck	Month	1.5	\$ 4,218.18	\$	6,327.27
Pickup	Month	2	\$ 1,725.00	\$	3,450.00
chop saw	Month	1	\$ 434.70	\$	434.70
ATV	veh*Month	4	\$ 1,000.00	\$	4,000.00
				\$	34,796.97
Materials					
jute mesh	SY	3000	\$ 3.00	\$	9,000.00
seed	lb	2000	\$ 4.00	\$	8,000.00
Misc	LS			\$	3,000.00
				\$	20,000.00
	No.	Hrs/week	weeks	\$/hr	
Operator	2	40	4	\$ 40.00	\$ 12,800.00
Laborer	2	40	4	\$ 25.00	\$ 8,000.00
Foreman	1	40	10	\$ 50.00	\$ 20,000.00
Inspector	1	40	10	\$ 30.00	\$ 12,000.00
				\$	52,800.00
			subtotal	\$	107,596.97
Project Documentation and write up:					\$2,500
Post-construction performance monitoring:					\$5,000
Final Report:					\$2,500
subtotal				\$	117,596.97
contingency			20%		\$23,519.39
Total					\$141,116.37

SE Klawock Lake Area Roadway Management

	UNIT	Qty	Unit Cost		Extended Cost
Equipment					
Grader	Month	2.5	\$ 9,200.00	\$	23,000.00
Excavator	Month	2.5	\$ 7,590.00	\$	18,975.00
Dump truck	Month	2.5	\$ 4,218.18	\$	10,545.45
Pickup	Month	3	\$ 1,725.00	\$	5,175.00
chop saw	Month	3	\$ 434.70	\$	1,304.10
ATV	veh*Month	5	\$ 1,000.00	\$	5,000.00
				\$	63,999.55
Materials					
jute mesh	SY	3000	\$ 3.00	\$	9,000.00
seed	lb	2000	\$ 4.00	\$	8,000.00
Misc	LS			Bridge shoring	\$ 25,000.00
				\$	42,000.00
	No.	Hrs/week	weeks	\$/hr	
Operator	2	40	4	\$ 40.00	\$ 12,800.00
Laborer	2	40	4	\$ 25.00	\$ 8,000.00
Foreman	1	40	10	\$ 50.00	\$ 20,000.00
Inspector	1	40	10	\$ 30.00	\$ 12,000.00
					\$ 52,800.00
			subtotal	\$	158,799.55
Project Documentation and write up:					\$2,500
Post-construction performance monitoring:					\$5,000
Final Report:					\$2,500
subtotal				\$	168,799.55
contingency				25%	\$42,199.89
Total					\$210,999.44

Hatchery Creek Basin Roadway Management

	UNIT	Qty	Unit Cost		Extended Cost
Equipment					
Grader	Month	1	\$ 9,200.00	\$	9,200.00
Excavator	Month	1	\$ 7,590.00	\$	7,590.00
Dump truck	Month	1.5	\$ 4,218.18	\$	6,327.27
Pickup	Month	2	\$ 1,725.00	\$	3,450.00
chop saw	Month	2	\$ 434.70	\$	869.40
ATV	veh*Month	4	\$ 1,000.00	\$	4,000.00
				\$	31,436.67
Materials					
jute mesh	SY	1200	\$ 3.00	\$	3,600.00
seed	lb	1000	\$ 4.00	\$	4,000.00
Misc	LS			\$	3,000.00
				\$	10,600.00
	No.	Hrs/week	weeks	\$/hr	
Operator	2	40	4	\$40.00	\$ 12,800.00
Laborer	2	40	4	\$25.00	\$ 8,000.00
Foreman	1	40	10	\$50.00	\$ 20,000.00
Inspector	1	40	10	\$30.00	\$ 12,000.00
				\$	52,800.00
				subtotal	\$ 94,836.67
Project Documentation and write up:					\$2,500
Post-construction performance monitoring:					\$5,000
Final Report:					\$2,500
subtotal				\$	104,836.67
contingency				20%	\$20,967.33
Total					\$125,804.01

NE Klawock Lake Area/Inlet Creek Basin Roadway Management

	UNIT	Qty	Unit Cost		Extended Cost
Equipment					
Grader	week	2	\$ 3,066.67	\$	6,133.33
Excavator	Week	2	\$ 2,530.00	\$	5,060.00
Dump truck	week	1.5	\$ 1,440.00	\$	2,160.00
Pickup	Month	1	\$ 1,725.00	\$	1,725.00
chop saw	week	2	\$ 144.90	\$	289.80
ATV	veh*Month	1	\$ 1,000.00	\$	1,000.00
				\$	16,368.13
Materials					
jute mesh	SY	500	\$ 3.00	\$	1,500.00
seed	lb	500	\$ 4.00	\$	2,000.00
Misc	LS			\$	500.00
				\$	4,000.00
	No.	Hrs/week	weeks	\$/hr	
Operator	2	40	2	\$ 40.00	\$ 6,400.00
Laborer	2	40	3	\$ 25.00	\$ 6,000.00
Foreman	1	40	3	\$ 50.00	\$ 6,000.00
Inspector	1	40	3	\$ 30.00	\$ 3,600.00
					\$ 22,000.00
			subtotal	\$	42,368.13
Project Documentation and write up:					\$2,500
Post-construction performance monitoring:					\$5,000
Final Report:					\$2,500
subtotal				\$	52,368.13
contingency			35%		\$18,328.85
Total					\$70,696.98

Klawock Hollis Highway Fish Passage Improvements Half-mile & Three-mile Creek Crossings

Half-mile Creek Bridge

Item	Unit	Quantity	Unit Cost	Extended Cost
Roadway Embankment	CY	60,000	\$ 10.00	\$ 600,000
Base Course	Ton	265	\$ 35.00	\$ 9,275
AC Pavement - 4" Thick	SY	915	\$ 35.00	\$ 32,025
Excavate Existing Roadway	CY	6000	\$ 7.00	\$ 42,000
Bridge and Foundation	SF	3200	\$ 250.00	\$ 800,000
Traffic & Environmental Controls	LS	1	\$ 75,000.00	<u>\$ 75,000</u>
			Construction Subtotal	\$ 1,558,300
			Engineering, Administration and Construction Management @ 20%	<u>\$ 311,660</u>
			Project Subtotal	\$ 1,869,960
			Contingency @ 20%	<u>\$ 373,992</u>

Estimated Project Cost \$ 2,243,952

Three-mile Creek Bridge

Item	Unit	Quantity	Unit Cost	Extended Cost
Roadway Embankment	CY	70,000	\$ 10.00	\$ 700,000
Base Course	Ton	310	\$ 35.00	\$ 10,850
AC Pavement - 4" Thick	SY	1068	\$ 35.00	\$ 37,380
Excavate Existing Roadway	CY	7000	\$ 7.00	\$ 49,000
Bridge and Foundation	SF	3840	\$ 250.00	\$ 960,000
Traffic & Environmental Controls	LS	1	\$ 75,000.00	<u>\$ 75,000</u>
			Construction Subtotal	\$ 1,832,230
			Engineering, Administration and Construction Management @ 20%	<u>\$ 366,446</u>
			Project Subtotal	\$ 2,198,676
			Contingency @ 20%	<u>\$ 439,735</u>

Estimated Project Cost \$ 2,638,411

Klawock Hollis Highway Fish Passage Improvements Klawock Hollis Highway Culvert Replacement

Estimated Average Site Condition

Item	Unit	Quantity	Unit Cost	Extended Cost
Mobilization	LS	1	\$ 2,500	\$ 2,500
Excation	CY	1500	\$ 10	\$ 15,000
Pipe Bedding	Ton	155	\$ 35	\$ 5,425
Culvert Structure, site average	LF	140	\$ 300	\$ 42,000
Backfill & compaction	CY	700	\$ 13	\$ 9,100
Base Course	Ton	130	\$ 250	\$ 32,500
AC Pavement - 4" Thick	SY	250	\$ 35	\$ 8,750
D/S Grade Control Structures	Ea	3	\$ 1,200	\$ 3,600
R & R Guardrail	LF	70	\$ 60	\$ 4,200
Construction Staking	LS	1	\$ 4,000	\$ 4,000
Traffic and Environmental Controls	LS	1	\$ 12,000	\$ 12,000
			Construction Subtotal	\$ 139,075
		Engineering, Adminstration and Construction Mangement @ 15%		\$ 20,861
			Project Subtotal	\$ 159,936
		Contingency @ 20%		\$ 31,987
			Estimated Average Project Cost	\$ 191,924

Extended to 16 Sites \$ 3,070,776

Inlet Creek Fish Passage Improvements

Estimated Average Site Condition

Item	Unit	Quantity	Unit Cost	Extended Cost
Mobilization	LS	1	\$ 250	\$ 250
Excavate and dipose of existing CMPS	Ea	1	\$ 500	\$ 500
Slope and stabilize excavation	Ea	1	\$ 500	\$ 500
D/S Grade Control Structures	Ea	1	\$ 1,200	\$ 1,200
Project Management, Layout, Permitting	LS	1	\$ 2,500	\$ 2,500
			Construction Subtotal	\$ 4,950
Post Construction Monitoring	Year	5	\$ 2,000	\$ 10,000
			Project Subtotal	\$ 14,950
			Contingency @ 20%	\$ 2,990

Estimated Project Cost \$ 17,940

Hatchery Creek Fish Passage Improvements

Estimated Average Site Condition Item	Unit	Quantity	Unit Cost	Extended Cost
Excavation & disposal of existing culverts	CY	107	\$ 8.50	\$ 910
Bedding	Ton	16	\$ 35	\$ 560
New Culvert, in place 36" Avg	LF	30	\$ 90	\$ 2,700
Backfill and compaction	CY	86	\$ 7.00	\$ 602
Temporary bypass & Environmental Controls	LS	1	\$ 1,000	\$ 1,000
D/S Grade control structures	Ea	1	\$ 1,200	\$ 1,200
			Average Construction Subtotal (per site)	\$ 6,972
			Construction Subtotal (6 sites)	\$ 48,801
Contractor Mobilization	LS	1	\$ 1,000	\$ 1,000
			Subtotal	\$ 1,000
Site mapping	LS	1	\$4,500	\$ 4,500
Engineering	LS	1	\$4,000	\$ 4,000
Permitting	LS	1	\$2,000	\$ 2,000
			Subtotal design (6 sites)	\$ 10,500
			Construction Total	\$ 60,301
Project Management	LS	1	\$ 5,000	\$ 5,000
Post Construction Monitoring	Year	5	\$ 2,000	\$ 10,000
			Project Subtotal	\$ 75,301
			Contingency @ 20%	\$ 15,060
			Estimated Project Cost	\$ 90,361

Half-mile Creek Sediment & Instream Flow Management

Item	Unit	Quantity	Unit Cost	Extended Cost
KWC Project Administration	LS	1	\$5,000	\$5,000
Sediment Reintroduction Plan Preparation & engineering of instream flow maintenance system	LS	1	\$18,000	\$18,000
City/Agency Coordination Plan modifications	LS	1	\$5,000	\$5,000
Sediment Reintroduction Plan Subtotal	LS	1	\$28,000	\$28,000
Performance Monitoring	Year	5	\$2,000	\$10,000
			Subtotal	\$38,000
			Planning contingency @ 20%	\$7,600
			Project Subtotal	\$45,600
Total Project Estimate				\$ 46,000

Klawock Causeway Breach

Earthwork & Paving

Excavation	3000	CY	\$10	\$30,000
Pipe bedding	130	Ton	\$35	\$4,550
Backfill & Compaction	1500	CY	\$13	\$19,500
Rip rap	100	Ton	\$50	\$5,000
Slope stabilization/seeding	1	LS	\$1,200	\$1,200
Base course	130	Ton	\$35	\$4,550
ACP Patch 4" thick	250	SY	\$35	\$8,750

Subtotal \$73,550

Structures

Bottomless pre-cast box culvert	140	LF	\$ 525	\$73,500
Relocate City of Klawock Utilities	1	LS	\$ 10,000	\$10,000
R & R Guard rail (site average)	100	LF	\$ 60	\$6,000

Subtotal \$89,500

General, Site environmental protection and safety

Mobilization	1	LS	\$ 5,000	\$5,000
Construction Staking	1	LS	\$ 2,000	\$2,000
Traffic Control	1	LS	\$ 15,000	\$15,000
Erosion and sediment control	1	LS	\$ 5,000	\$5,000

Subtotal \$27,000

Total Estimated Construction Cost \$190,050

Planning contingency 20% \$38,010

Total Estimate \$228,060

Three-mile Delta Fish Passage Project

Item	Unit	Quantity	Unit Cost	Extended Cost
Site survey and mapping	LS	1	\$1,000	\$1,000
Engineering	LS	1	\$2,500	<u>\$2,500</u>
Subtotal design				\$3,500
Excavation of existing culvert	LS	1	\$500	\$500
Bedding	LS	1	\$1,000	\$1,000
New Culvert In place	LS	1	\$2,700	\$2,700
Backfill and compaction	LS	1	\$500	\$500
Surfacing Material	LS	1	\$400	\$400
Temporary bypass & Environmental Controls	LS	1	\$500	\$500
D/s Grade control structures	LS	1	\$1,200	<u>\$1,200</u>
Construction Total				\$6,800
Project management/permitting	LS	1	\$3,000	\$3,000
Post Construction performance monitoring	Year	2	\$2,000	<u>\$4,000</u>
				\$7,000
Subtotal				\$17,300
			Contingency @ 20%	\$3,460
			Total Estimate	\$20,760

Three-mile Basin Riparian Thinning

	Unit	Quantity	Unit Cost	Extended Cost
Project Management and contract administration & Preparation of contact documents	LS	1	\$3,500	\$3,500
Thinning Inspection layout	LS	1	\$3,000	\$3,000
Thinning	Acre	25	\$500	\$12,500
Project Documentation and write up	LS	1	\$1,500	\$1,500
Post-thinning performance monitoring	LS	1	\$3,000	\$3,000
Final Report	LS	1	<u>\$2,500</u>	<u>\$2,500</u>
Subtotal				\$26,000
			Contingency @ 20%	<u>\$5,200</u>
			Total Estimate	\$31,200

NE Klawock Lake Area Riparian Thinning

	Unit	Quantity	Unit Cost	Extended Cost
Project Management and contract administration & Preparation of contact documents	LS	1	\$3,500	\$3,500
Thinning Inspection layout	LS	1	\$2,000	\$2,000
Thinning	Acre	20	\$500	\$10,000
Project Documentation and write up	LS	1	\$1,500	\$1,500
Post-thinning performance monitoring	LS	1	\$2,500	\$2,500
Final Report	LS	1	<u>\$2,500</u>	<u>\$2,500</u>
Subtotal				\$22,000
			Contingency @ 20%	<u>\$4,400</u>
			Total Estimate	\$26,400

SE Klawock Lake Area Riparian Thinning

	Unit	Quantity	Unit Cost	Extended Cost
Project Management and contract administration & Preparation of contact documents	LS	1	\$3,500	\$3,500
Thinning Inspection layout	LS	1	\$3,500	\$3,500
Thinning	Acre	30	\$500	\$15,000
Project Documentation and write up	LS	1	\$1,500	\$1,500
Post-thinning performance monitoring	LS	1	\$3,000	\$3,000
Final Report	LS	1	<u>\$2,500</u>	<u>\$2,500</u>
Subtotal				\$29,000
			Contingency @ 20%	<u>\$5,800</u>
			Total Estimate	\$34,800

Hatchery Creek Basin Riparian Thinning

	Unit	Quantity	Unit Cost	Extended Cost
Project Management and contract administration & Preparation of contact documents	LS	1	\$3,500	\$3,500
Thinning Inspection layout	LS	1	\$2,000	\$2,000
Thinning	Acre	15	\$500	\$7,500
Project Documentation and write up	LS	1	\$1,500	\$1,500
Post-thinning performance monitoring	LS	1	\$2,500	\$2,500
Final Report	LS	1	<u>\$2,500</u>	<u>\$2,500</u>
Subtotal				\$19,500
			Contingency @ 20%	<u>\$3,900</u>
			Total Estimate	\$23,400

Appendix B. Potential Funding Sources

**Klawock Watershed Restoration Master Plan
Appendix B. Potential Funding Sources**

<u>Agency/Organization</u>	<u>Types of Projects Funded</u>	<u>Typical Grant Amount</u>	<u>Contact</u>	<u>Deadline</u>
Alaska Conservation Foundation	can be used to cover administrative and/or program costs including: fundraising, and specific program activities	\$0.00-\$25,000	http://www.akcf.org/grants/grant_os.htm	8-Dec-03
America Sportfishing Association's FishAmerica Foundation (partner with NOAA)	demonstrate significant benefits to marine, estuarine or anadromous fisheries resources. Projects must involve community participation activities.	\$5,000-\$30,000 (match required)	http://www.nmfs.noaa.gov/habitat/restoration/projects_programs/crp/partners/fishamerica.html	11-Aug-03
EPA 319 Program (run through ADEC as ACWA grant program)	Projects which lead to the recover of impaired waterbodies, protect waters at-risk of degradation, stewardship, data collection and monitoring and/or clean water education.	\$1,000-\$100,000 (match required)	http://www.state.ak.us/dec/dawq/dec_dawq.htm	mid-April
EPA Water Quality Cooperative Agreement	Cooperative agreements are made in accordance with the Clean Water monitoring techniques, NPDES strategies, development of best develop and manage water quality programs	\$10,000-\$500,000	http://www.epa.gov/oww/FY2003WQCA/	initial proposals due 12/31/2002
EPA Watershed Assistance Grants	River Network (on behalf of EPA) makes grants available to local long-term effectiveness	\$1,500-\$30,000	http://www.rivernetwork.org/howwecanhelp/index.cfm?doc_id=94#wag	waiting for 2003 appropriations
EPA Wetland Program Development Grants	Wetland monitoring and assessment, wetland protection and management, wetland regulations, wetland restoration, water-quality monitoring and improvement	\$1,500-\$500,000	http://www.epa.gov/oww/wetlands/grantguidelines/	October/November
Five-Star Restoration Challenge Grants (multi-agency)	Projects must include a strong on-the-ground wetland, riparian, or coastal habitat restoration component and should also include education, outreach, and community stewardship components. Projects involving only research, monitoring or planning are not eligible for funding	\$5,000-\$20,000	http://www.nfwf.org/programs/5star-rfp.htm	March

**Klawock Watershed Restoration Master Plan
Appendix B. Potential Funding Sources**

National Fish and Wildlife Foundation Challenge Grants	project outcomes.	\$10,000-\$150,000 (includes a 1:1 match)	http://www.nfwf.org/programs/grant_apply.htm	June 1 and October 15 each year
NOAA Community-based Restoration Grants	benefit living marine resources, including anadromous fish. Projects will that provide educational and social benefits for people and the NOAA trust resources.	\$50,000-\$200,000 (includes a 1:1 match)	http://www.nmfs.noaa.gov/habitat/restoration/funding_opportunities/funding.html	12-Sep-03
NOAA/The Nature Conservancy	or endorsed by a local chapter.	\$25,000-\$75,000	http://www.nmfs.noaa.gov/habitat/restoration/projects_programs/crp/partners/tnc.html	May
Trout Unlimited and NOAA embrace-a-stream	Need to be associated with a Trout Unlimited Chapter.	\$1,000-\$10,000 (includes a 1:1 match)	http://www.nmfs.noaa.gov/habitat/restoration/projects_programs/crp/partners/troutunlimited.html	December
U.S. Fish and Wildlife Service - Coastal Program	coastal watershed management, conservation of endangered species, benefits fish and/or migratory birds	\$5,000-\$50,000 (match required)	www.fws.gov/cep/coastweb.html	none
U.S. Fish and Wildlife Service - Partners Program	Preserve, protect and enhance fish and wildlife habitat. Mainly removing exotic species	\$300-\$25,000	http://partners.fws.gov/	none

**Klawock Watershed Restoration Master Plan
Appendix B. Potential Funding Sources**

<p>U.S. Fish and Wildlife Service - Tribal Wildlife Grants</p>	<p>traditional importance and species that are not hunted or fished. habitat conservation, ongoing and/new fish and wildlife management history studies, habitat mapping, field surveys and population monitoring, habitat preservation, land acquisition, conservation easements, and outreach efforts.</p>	<p>up to \$250,000</p>	<p>http://grants.fws.gov/tribal.html</p>	<p>11-Sep-03</p>
<p>U.S. Fish and Wildlife Service - Tribal Landowner Incentive Program</p>	<p>the types of projects the Service might fund include prescribed burning to degraded habitat.</p>	<p>up to \$200,000</p>	<p>http://grants.fws.gov/tribal.html</p>	<p>11-Sep-03</p>

APPENDIX C. Proposed Project Descriptions in Southeast Sustainable Salmon Fund Format

Statement of Proposed Work

I. Project Title

Three-mile Basin Roadway Management Project

II. Project Manager

Klawock Watershed Council
Project Manager

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to close roadways in the Three-mile sub-basin of the Klawock watershed on Prince of Wales Island, Alaska. Closing roadways and the removal of drainage structures will stabilize the existing roads and make them less susceptible to reduce washing out. This will reduce erosion and sediment transported to streams in the Three-mile basin.

2. Summary Description

The proposed project will involve stabilizing existing roadways within the Three-mile basin. All roads will be closed with the exception of roads needed to access an existing USGS gage and to roads that are especially important for local subsistence use. A third road would be left open but have vehicle access discouraged by storm-proofing the road. The proposed road management for the Three-mile basin is illustrated by Figure 3 from the Klawock Watershed Restoration Master Plan

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Close and stabilize roads to eliminate sediment associated with vehicle use.
- ii. Improve water quality and fish habitat in the Three-mile basin.

- iii. Stabilize and arrest roadway erosion identified by the ADF&G road condition survey.
- iv. Reduce sources of fine sediment to streams.
- v. Provide employment opportunities in an economically depressed area.

2. Justification

Fine sediments are known to be detrimental to fish habitat, particularly spawning habitat. Roads are a major source of such sediments and the areas that are proposed for stabilization have already been identified as problem areas.

Removal of drainage structures and closure of roads will greatly reduce the chances of road washout and associated sedimentation that impairs water quality in streams that provide fish habitat or that affect the water quality of these streams.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of the miles of roadway taken out of service.
- ii. Measurement of the quantities of drainage structure removed, e.g. , number of culverts.
- iii. Measurement of the quantity of water bars installed on roadways.
- iv. Measurement of area of eroded sites stabilized
- v. Measurement of individual erosion/sediment control structures installed
- vi. Observation of structure performance, e.g. the presence or absence of fine sediments trapped.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

1. Project summary of work completed listing
 - i. Roads closed to vehicular travel
 - ii. Drainage structures removed
 - iii. Eroded areas stabilized and method(s) employed
 - iv. List of structures and Best Management Practice techniques employed, i.e. check dams, jute mesh, etc.
2. Photo documentation of before and after conditions.
3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of eroded areas for rejuvenation and regrowth of vegetation
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will reduce the amount of sediments that are transported to the streams of the Three-mile basin from roads that are open to vehicle traffic. ADF&G has determined Three-mile system is the most productive sockeye stream in the Klawock River Basin. The Three-mile system is also used as habitat by Pink and Coho Salmon as well as steelhead, rainbow trout, cutthroat trout and Dolly Varden Char. Reducing fine sediments will improve spawning and rearing habitat conditions for all these species.

Several fisheries would benefit from improved habitat in the Three-mile System. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

VIII. Stakeholder Support

This project is located entirely in the Three-mile basin owned by Klawock Heenya Corporation. Klawock Heenya, Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

X. Budget

Construction and project management	\$107,597
Project Documentation and write up:	\$ 2,500
Post-construction performance monitoring:	\$ 5,000
Final Report:	\$ 2,500
Subtotal	\$ 117,597
Contingency @ 20%	\$ 23,519
Total	\$ 141,116

Statement of Proposed Work

I. Project Title

Three-mile Creek Delta Fish Passage Project

II. Project Manager

Klawock Watershed Council
Project Manager

III. Project Description

1. Need for and Purpose of Proposed Project

An existing culvert was identified by the Alaska Department of Fish and Game as a barrier to the migration of anadromous fish. This culvert was identified (Site Id 1B044) by ADF&G during a their road condition survey of the Klawock watershed. This culvert effectively blocks fish from reaching habitat upstream and thus reduces the productivity of the Klawock watershed.

2. Summary Description

This project is proposed to remove a culvert that was identified as a barrier to anadromous fish migration by the road condition survey conducted by ADF&G. A new structure will be designed and constructed that will promote fish passage and thereby make more habitat available for producing fish in the Klawock watershed. The location of the proposed project is shown on Figure 11 from the Klawock Watershed Restoration Master Plan.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Increase available habitat in the Klawock watershed by removing a barrier to fish migration and installing a new structure that promotes fish passage.
- ii. Stabilize and arrest erosion at the existing structure.
- iii. Reduce sources of fine sediment to the stream.

- iv. Provide employment opportunities in an economically depressed area.

2. Justification

The existing culvert is within an anadromous stream and does not meet current ADF&G standards for fish passage. A new structure that does meet ADF&G standards will improve the fisheries productivity of the watershed.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of the parameters of the new structure, e.g. slope, embedment, length, and flow velocity.
- ii. Observation of the presence of fish utilizing restored upstream habitat through biological survey(s).

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

1. Project summary of work completed listing
 - i. Design considerations for new structure
 - ii. As-built drawings of completed structure
 - iii. Photo documentation of before and after conditions.
 - iv. Results of biological monitoring.

VI. Benefits to Salmon/Salmon Fisheries.

This project will increase the amount of habitat available to fish in the Three-mile system of Klawock watershed. ADF&G has determined Three-mile system is the

most productive sockeye stream in the Klawock River Basin. The Three-mile system is also used as habitat by Pink and Coho Salmon as well as steelhead, rainbow trout, cutthroat trout and Dolly Varden Char.

Several fisheries would benefit from improved habitat in the Three-mile System. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

VIII. Stakeholder Support

This project is located entirely in the Three-mile basin on lands owned by Klawock Heenya Corporation. Klawock Heenya, Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

X. Budget

Surveying and Engineering	\$ 3,500
Construction	\$ 6,800
Project Management and permitting	\$ 3,000
Post-construction performance monitoring (2 years):	\$ 4,000
Subtotal	\$ 17,300
Contingency @ 20%	\$ 3,460
 Total	 \$ 20,760

Statement of Proposed Work

I. Project Title

Southeast Klawock Lake Area Roadway Management Project

II. Project Manager

Klawock Watershed Council
Project Manager

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to close roadways in the southeast area of the Klawock Lake basin on Prince of Wales Island, Alaska. Closing roadways and the removal of drainage structures will stabilize the existing roads and make them less susceptible to reduce washing out. This will reduce erosion and sediment transported to streams in this area of the Klawock Lake basin.

2. Summary Description

The proposed project will involve stabilizing existing roadways within the Three-mile basin. All roads are proposed to be closed with the exception of road 6000000 that is proposed to be maintained open to provide the only access to the southeast Klawock Lake area. The proposed road management for the southeast Klawock Lake area is illustrated in Figure 5 from the Klawock Watershed Restoration Master Plan

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Close and stabilize roads to eliminate sediment associated with vehicle use.
- ii. Improve water quality and fish habitat in the Three-mile basin.

- iii. Stabilize and arrest roadway erosion identified by the ADF&G road condition survey.
- iv. Reduce sources of fine sediment to streams.
- v. Provide employment opportunities in an economically depressed area.

2. Justification

Fine sediments are known to be detrimental to fish habitat, particularly spawning habitat. Roads are a major source of such sediments and the areas that are proposed for stabilization have already been identified as problem areas.

Removal of drainage structures and closure of roads will greatly reduce the chances of road washout and associated sedimentation that impairs water quality in streams that provide fish habitat or that affect the water quality of these streams.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of the miles of roadway taken out of service.
- ii. Measurement of the quantities of drainage structure removed, e.g. , number of culverts.
- iii. Measurement of the quantity of water bars installed on roadways.
- iv. Measurement of area of eroded sites stabilized.
- v. Measurement of individual erosion/sediment control structures installed.
- vi. Observation of structure performance, e.g. the presence or absence of fine sediments trapped.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

1. Project summary of work completed listing
 - i. Roads closed to vehicular travel
 - ii. Drainage structures removed
 - iii. Eroded areas stabilized and method(s) employed
 - iv. List of structures and Best Management Practice techniques employed, i.e. check dams, jute mesh, etc.
2. Photo documentation of before and after conditions.
3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of eroded areas for rejuvenation and regrowth of vegetation
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will reduce the amount of sediments that are transported to the streams of the southeast Klawock Lake area from roads that are open to vehicle traffic. The stream systems in this area are used as habitat by Pink and Coho Salmon as well as steelhead, rainbow trout, cutthroat trout and Dolly Varden Char. Reducing fine sediments will improve spawning and rearing habitat conditions for all these species.

Several fisheries would benefit from improved habitat in the stream systems of the southeast Klawock Lake area. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

VIII. Stakeholder Support

This project is located entirely on lands owned by Shaan Seet, Inc. Shaan Seet, Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Shaan Seet, Inc., Klawock Heenya, Inc., Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

X. Budget

Construction and project management	\$158,799
Project Documentation and write up:	\$ 2,500
Post-construction performance monitoring:	\$ 5,000
Final Report:	\$ 2,500
Subtotal	\$ 168,799
Contingency @ 25%	\$ 42,200
Total	\$ 210,999

Statement of Proposed Work

I. Project Title

Hatchery Creek Basin Roadway Management Project

II. Project Manager

Klawock Watershed Council
Project Manager

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to close roadways in the Hatchery Creek sub-basin of the Klawock watershed on Prince of Wales Island, Alaska. Closing roadways and the removal of drainage structures will stabilize the existing roads and make them less susceptible to reduce washing out. This will reduce erosion and sediment transported to streams in this area of the Klawock Lake basin.

2. Summary Description

The proposed project will involve stabilizing existing roadways within the Hatchery Creek basin. Most roads will be closed in this sub-basin. Exceptions include road 6000000 will be kept open to provide the only access to the southeast Klawock Lake area. The 6014 road system will be kept open to access important hunting and trapping areas near the mouth of Hatchery Creek and the 6026 road system will be storm-proofed in accordance with USFS practices to discourage traffic and make the road more resistant to erosion and sedimentation of streams. The proposed road management for the Hatchery Creek basin is illustrated in Figure 7 from the Klawock Watershed Restoration Master Plan

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Close and stabilize roads to eliminate sediment associated with vehicle use.

- ii. Improve water quality and fish habitat in the Hatchery Creek basin.
- iii. Stabilize and arrest roadway erosion identified by the ADF&G road condition survey.
- iv. Reduce sources of fine sediment to streams.
- v. Provide employment opportunities in an economically depressed area.

2. Justification

Fine sediments are known to be detrimental to fish habitat, particularly spawning habitat. Roads are a major source of such sediments and the areas that are proposed for stabilization have already been identified as problem areas.

Removal of drainage structures and closure of roads will greatly reduce the chances of road washout and associated sedimentation that impairs water quality in streams that provide fish habitat or that affect the water quality of these streams.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of the miles of roadway taken out of service.
- ii. Measurement of the quantities of drainage structure removed, e.g., number of culverts.
- iii. Measurement of the quantity of water bars installed on roadways.
- iv. Measurement of area of eroded sites stabilized.
- v. Measurement of individual erosion/sediment control structures installed.
- vi. Observation of structure performance, e.g. the presence or absence of fine sediments trapped.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

1. Project summary of work completed listing
 - i. Roads closed to vehicular travel
 - ii. Drainage structures removed
 - iii. Eroded areas stabilized and method(s) employed
 - iv. List of structures and Best Management Practice techniques employed, i.e. check dams, jute mesh, etc.
2. Photo documentation of before and after conditions.
3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of eroded areas for rejuvenation and regrowth of vegetation
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will reduce the amount of sediments that are transported to the streams in the Hatchery Creek sub-basin from roads that are open to vehicle traffic. The stream systems in this area are used as habitat by Pink and Coho Salmon as well as steelhead, rainbow trout, cutthroat trout and Dolly Varden Char. Reducing fine sediments will improve spawning and rearing habitat conditions for all these species.

Several fisheries would benefit from improved habitat in the Hatchery Creek system. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

VIII. Stakeholder Support

This project is located entirely on lands owned by Shaan Seet, Inc and Klawock Heenya, Inc. Klawock Heenya and Shaan Seet are both members of the Klawock Watershed Council and have both participated in the development of this project concept. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Shaan Seet, Inc., Klawock Heenya, Inc., Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

X. Budget

Construction and project management	\$ 94,837
Project Documentation and write up:	\$ 2,500
Post-construction performance monitoring:	\$ 5,000
Final Report:	\$ 2,500
Subtotal	\$ 104,837
Contingency @ 20%	\$ 20,967
Total	\$ 125,804

Statement of Proposed Work

I. Project Title

Hatchery Creek Basin Roadway Erosion Stabilization Project

II. Project Manager

Klawock Watershed Council Project Administrator
TBA

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to stabilize identified erosion and reduce sedimentation associated with roadways within the Hatchery Creek sub-basin of the Klawock River Basin on Prince of Wales Island, Alaska. Roadway erosion in the Klawock basin was identified, located, and compiled by ADF&G Habitat Division in their road condition survey dated December 2002. The location of the proposed work illustrated on Figures 8 from the Klawock watershed restoration plan.

2. Summary Description

The proposed project will involve stabilizing roadway cut and fill slope erosion, roadway surface erosion, erosion associated with slides and structure removal. Various techniques will be employed to stabilize eroding areas to arrest the transport of sediment to waters that provide or flow into fish habitat. The following types of erosion sites are identified in the Hatchery Creek basin:

- Roadway Ditch Erosion – 2 sites
- Roadway Surface Erosion – 23 sites
- Roadway Fill Slope Erosion – 2 sites
- Roadway Cut Slope Erosion – 25 sites

Techniques to stabilize erosion include- Breaking up long sustained roadway grades that collect and concentrate runoff.

Stabilizing bare cut and fill slopes using native seeding, jute netting, straw bales, check dams and similar erosion control measures.

Installing check dams, straw bales and other sediment control measures to collect and trap sediment thereby reducing the amount of fine roadway sediments as a pollutant to streams in the Three-mile basin.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Improve water quality and fish habitat in the Hatchery Creek sub-basins draining into Klawock Lake.
- ii. Stabilize roadway erosion identified by the ADF&G road condition survey.
- iii. Reduce sources of fine sediment to streams.
- iv. Provide employment opportunities in an economically depressed area.
- v. Close and stabilize lesser roads to minimize erosion and sedimentation associated with vehicle use.

2. Justification

Fine sediments are known to be detrimental to fish habitat, particularly spawning habitat. Roads are a major source of such sediments and the areas that are proposed for stabilization have already been identified as problem areas.

The proposed project will undertake corrective action to areas identified in the road condition assessment as problem sites.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of area of eroded sites stabilized
- ii. Measurement of individual structures installed

- iii. Observation of structure performance, e.g. the presence or absence of fine sediments trapped.
- iv. Measurement of the miles of roadway taken out of service.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

1. Project summary of work completed listing
 - i. Roads closed to vehicular travel
 - ii. Eroded areas stabilized and method(s) employed
 - iii. List of structures and Best Management Practice techniques employed, i.e. check dams, jute mesh, etc.
2. Photo documentation of before and after conditions.
3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of eroded areas for rejuvenation and regrowth of vegetation
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will stabilize bare eroded slopes in the Hatchery Creek Basin draining into Klawock Lake. This will thereby reduce fine sediments transported to the streams in this part of the Klawock Watershed. The streams in this area provide productive Sockeye Salmon habitat. Besides Sockeye, these streams provide habitat for Pink and Coho Salmon as well as Steelhead, Rainbow and Cutthroat Trout and Dolly Varden Char. Reducing fine sediments will improve spawning and rearing habitat conditions for all these species.

Several fisheries would benefit from improved habitat conditions in the Hatchery Creek system. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local

sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

Stakeholder Support

This project is located entirely in the lands owned by both Klawock Heenya and Shaan Seet, Inc. Klawock Heenya and Shaan Seet, Inc are both members of the Klawock Watershed Council and have participated in the development of this project concept. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

VIII. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

IX. Budget

Project Management and contract administration & Preparation of contact documents:	\$ 10,000
Construction	\$ 96,451
Construction Inspection/Layout:	\$ 8,400
Project Documentation and write up:	\$ 2,500
Post-construction performance monitoring:	\$ 3,000
Final Report:	\$ 1,500
Subtotal	\$ 121,851
Contingency @ 20%	\$ 24,37
Total	\$ 146,222

Statement of Proposed Work

I. Project Title

Hatchery Creek Basin Fish Passage Project

II. Project Manager

Klawock Watershed Council
Project Manager

III. Project Description

1. Need for and Purpose of Proposed Project

Six existing culverts were identified by the Alaska Department of Fish and Game as barriers to the migration of anadromous fish. These culverts were identified (Site Ids 1B011, 1B018, 1B1019, 1B030, 3A016, 3A33 and 3A053) by ADF&G during a their road condition survey of the Klawock watershed. These existing culverts effectively block fish from reaching habitat upstream and thus reduce the productivity of the Klawock watershed.

2. Summary Description

This project is proposed to remove six culverts that were identified as a barriers to anadromous fish migration by the road condition survey conducted by ADF&G. New structures will be designed and constructed that will promote fish passage and thereby make more habitat available to produce fish in the Klawock watershed. The location of the proposed project is shown on Figure 9 from the Klawock Watershed Restoration Master Plan.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Increase available habitat in the Klawock watershed by removing barriers to fish migration and installing a new structures that promotes fish passage.
- ii. Stabilize and arrest erosion at the sites of the existing structures.

- iii. Reduce sources of fine sediment to the streams.
- iv. Provide employment opportunities in an economically depressed area.

2. Justification

The existing culverts are within anadromous streams and do not meet current ADF&G standards for fish passage. New structures that do meet ADF&G standards will improve the fisheries productivity of the watershed.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of the parameters of the new structures, e.g. slope, embedment, length, and flow velocity.
- ii. Observation of the presence of fish utilizing restored upstream habitat through biological survey(s).

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

- 1. Project summary of work completed listing
 - i. Design considerations for new structures
 - ii. As-built drawings of completed structures
 - iii. Photo documentation of before and after conditions.
 - iv. Results of biological monitoring.

VI. Benefits to Salmon/Salmon Fisheries.

This project will increase the amount of habitat available to fish in the Hatchery Creek system of Klawock watershed. This system is used as habitat by Sockeye, Pink and Coho Salmon as well as steelhead, rainbow trout, cutthroat trout and Dolly Varden Char.

Several fisheries would benefit from improved habitat in the Hatchery Creek System. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

VIII. Stakeholder Support

This project is located entirely in the Three-mile basin on lands owned by Klawock Heenya Corporation. Klawock Heenya, Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

X. Budget

Surveying and Engineering	\$ 8,500
Construction	\$ 48,801
Project Management and permitting	\$ 7,000
Post-construction performance monitoring (5 years):	\$ 10,000
Subtotal	\$ 75,301
Contingency @ 20%	\$ 15,060
Total	\$ 90,361

Statement of Proposed Work

I. Project Title

Northeast Klawock Lake Area and Inlet Creek Basin Roadway Management Project

II. Project Manager

Klawock Watershed Council
Project Manager

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to close roadways in the Northeast Klawock Lake area and the Inlet Creek sub-basin of the Klawock watershed on Prince of Wales Island, Alaska. Closing roadways and the removal of drainage structures will stabilize the existing roads and make them less susceptible to reduce washing out. This will reduce erosion and sediment transported to streams in these areas of the Klawock Lake basin.

2. Summary Description

The proposed project will involve stabilizing existing roadways within the Northeast Klawock Lake area and Inlet Creek basin. All roads will be closed in these areas. The proposed road management for these two regions is illustrated by Figure 10 from the Klawock Watershed Restoration Master Plan

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Close and stabilize roads to eliminate sediment associated with vehicle use.
- ii. Improve water quality and fish habitat in the Hatchery Creek basin.
- iii. Stabilize and arrest roadway erosion identified by the ADF&G road condition survey.

- iv. Reduce sources of fine sediment to streams.
- v. Provide employment opportunities in an economically depressed area.

2. Justification

Fine sediments are known to be detrimental to fish habitat, particularly spawning habitat. Roads are a major source of such sediments and the areas that are proposed for stabilization have already been identified as problem areas.

Removal of drainage structures and closure of roads will greatly reduce the chances of road washout and associated sedimentation that impairs water quality in streams that provide fish habitat or that affect the water quality of these streams.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of the miles of roadway taken out of service.
- ii. Measurement of the quantities of drainage structure removed, e.g., number of culverts.
- iii. Measurement of the quantity of water bars installed on roadways.
- iv. Measurement of area of eroded sites stabilized.
- v. Measurement of individual erosion/sediment control structures installed.
- vi. Observation of structure performance, e.g. the presence or absence of fine sediments trapped.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

1. Project summary of work completed listing
 - i. Roads closed to vehicular travel
 - ii. Drainage structures removed
 - iii. Eroded areas stabilized and method(s) employed
 - iv. List of structures and Best Management Practice techniques employed, i.e. check dams, jute mesh, etc.
2. Photo documentation of before and after conditions.
3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of eroded areas for rejuvenation and regrowth of vegetation
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will reduce the amount of sediments that are transported to the streams in the Northeast Klawock Lake area and the Inlet Creek sub-basin from roads that are open to vehicle traffic. These stream systems are used as habitat by Sockeye, Pink and Coho Salmon as well as steelhead, rainbow trout, cutthroat trout and Dolly Varden Char. Reducing fine sediments will improve spawning and rearing habitat conditions for all these species.

Several fisheries would benefit from improved habitat in these stream systems. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

VIII. Stakeholder Support

This project is located entirely on lands owned by Klawock Heenya, Inc. Klawock Heenya is a member of the Klawock Watershed Council and has participated in the development of this project concept. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Shaan Seet, Inc., Klawock Heenya, Inc., Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

X. Budget

Construction and project management	\$ 42,368
Project Documentation and write up:	\$ 2,500
Post-construction performance monitoring:	\$ 5,000
Final Report:	\$ 2,500
Subtotal	\$ 52,368
Contingency @ 20%	\$ 18,329
Total	\$ 70,697

Statement of Proposed Work

I. Project Title

Northeast Klawock Lake area and Inlet Creek Basin Roadway Erosion Stabilization Project

II. Project Manager

Klawock Watershed Council Project Administrator
TBA

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to stabilize identified erosion and reduce sedimentation associated with roadways within the Northeast Klawock Lake Area and the Inlet Creek sub-basin of the Klawock River Basin on Prince of Wales Island, Alaska. Roadway erosion in the Klawock basin was identified, located, and compiled by ADF&G Habitat Division in their road condition survey dated December 2002. The location of the proposed work illustrated on Figures 6 from the Klawock watershed restoration plan.

2. Summary Description

The proposed project will involve stabilizing roadway cut and fill slope erosion, roadway surface erosion, erosion associated with slides and structure removal. Various techniques will be employed to stabilize eroding areas to arrest the transport of sediment to waters that provide or flow into fish habitat.

Techniques to stabilize erosion include- Breaking up long sustained roadway grades that collect and concentrate runoff.

Stabilizing bare cut and fill slopes using native seeding, jute netting, straw bales, check dams and similar erosion control measures.

Installing check dams, straw bales and other sediment control measures to collect and trap sediment thereby reducing the amount of fine roadway sediments as a pollutant to streams in the Three-mile basin.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Improve water quality and fish habitat in the stream systems draining into Klawock Lake.
- ii. Stabilize roadway erosion identified by the ADF&G road condition survey.
- iii. Reduce sources of fine sediment to streams.
- iv. Provide employment opportunities in an economically depressed area.
- v. Close and stabilize lesser roads to minimize erosion and sedimentation associated with vehicle use.

2. Justification

Fine sediments are known to be detrimental to fish habitat, particularly spawning habitat. Roads are a major source of such sediments and the areas that are proposed for stabilization have already been identified as problem areas.

The proposed project will undertake corrective action to areas identified in the road condition assessment as problem sites.

3. Performance Measurement

Project performance will be described and quantified through the following measurements and observations.

- i. Measurement of area of eroded sites stabilized
- ii. Measurement of individual structures installed
- iii. Observation of structure performance, e.g. the presence or absence of fine sediments trapped.
- iv. Measurement of the miles of roadway taken out of service.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is an engineering project and is intended to rectify deficiencies that have been previously identified by scientific investigations.

V. Deliverables

Deliverables for this project will include the following:

1. Project summary of work completed listing
 - i. Roads closed to vehicular travel
 - ii. Eroded areas stabilized and method(s) employed
 - iii. List of structures and Best Management Practice techniques employed, i.e. check dams, jute mesh, etc.
2. Photo documentation of before and after conditions.
3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of eroded areas for rejuvenation and regrowth of vegetation
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will stabilize bare eroded slopes in the northeast Klawock Lake area and Inlet Creek sub-basin draining into Klawock Lake. This will thereby reduce fine sediments transported to the streams in this part of the Klawock Watershed. The streams in this area provide productive Sockeye Salmon habitat. Besides Sockeye, these streams provide habitat for Pink and Coho Salmon as well as Steelhead, Rainbow and Cutthroat Trout and Dolly Varden Char. Reducing fine sediments will improve spawning and rearing habitat conditions for all these species.

Several fisheries would benefit from improved habitat conditions in the Hatchery Creek system. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

VII. Schedule

To be announced.

Stakeholder Support

This project is located entirely in the lands owned by both Klawock Heenya, Inc. Klawock Heenya is a member of the Klawock Watershed Council and has participated in the development of this project concept. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

VIII. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

IX. Budget

Project Management and contract administration & Preparation of contact documents:	\$ 5,000
Construction	\$ 48,276
Construction Inspection/Layout:	\$ 3,600
Project Documentation and write up:	\$ 2,500
Post-construction performance monitoring:	\$ 2,000
Final Report:	\$ 1,500
Subtotal	\$ 62,877
Contingency @ 20%	\$ 18,863
Total	\$ 81,739

Statement of Proposed Work

X. Project Title

Half-mile Creek sediment reintroduction and instream flow management Project

XI. Project Manager

Klawock Watershed Council
Project Manager

XII. Project Description

1. Need for and Purpose of Proposed Project

The existing municipal water supply reservoir traps stream bedload that would normally provide spawning materials in Half-mile Creek below them reservoir. The USFS PFC study recommended reintroducing sediments below the dam to try to recreate a more natural system.

2. Summary Description

This project is proposed to assist the City of Klawock prepare a sediment reintroduction plan to meet the USFS goals. No actual work is proposed in this project but could be later if funds are available. This project will only be undertaken with close cooperation with the city of Klawock.

XIII. Objectives

5. Statement of Objectives

The project objectives are:

- i. Increase available spawning habitat in the Half-mile Creek basin by allowing coarse sediment to be transported to the low reaches of Half-mile Creek.
- ii. Help to develop an instream flow mechanism for the City of Klawock's dam to maintain streamflow in low water periods.

6. Justification

The existing reservoir traps coarse sediments that would normally make it to the lower reaches and provide spawning habitat for salmonids. A plan is the first step to reintroducing the sediment back into the stream system.

7. Performance Measurement

8. Project performance measurement will be determined during in the plan to be prepared.

9. Modeling/Statistical Analysis

Any modeling or statistics will be determined in the plan.

XIV. Deliverables

Deliverables for this project will include the following:

- i. Sediment reintroduction and instream flow management plan for the Half-mile Creek system.

XV. Benefits to Salmon/Salmon Fisheries.

This project will increase the amount of habitat available to fish in the Hatchery Creek system of Klawock watershed. This system is used as habitat by Sockeye, Pink and Coho Salmon as well as steelhead, rainbow trout, cutthroat trout and Dolly Varden Char.

Several fisheries would benefit from improved habitat in the Hatchery Creek System. The sockeye salmon support an important subsistence fishery at the mouth of the Klawock River and also are targeted by the commercial seine fishery in the waters of Prince of Wales Island. The Coho resource sustains local sport and subsistence fisheries and is an important part of the commercial troll fleet's harvest throughout the panhandle. Steelhead and resident trout provide sport fishing opportunities in the Klawock system. A reduction of fine roadway sediments would benefit all the aforementioned fisheries.

XVI. Schedule

To be announced.

XVII. Stakeholder Support

This project is located entirely in the Three-mile basin on lands owned by Klawock Heenya Corporation. Klawock Heenya, Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperative, Prince of Wales Hatchery Association, Craig Community Association and private members of the community.

XVIII. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association.

XIX. Budget

Project Administration	\$ 5,000
Plan preparation	\$ 18,000
City/Agency Coordination	\$ 5,000
Plan Subtotal	\$ 28,000
Post-construction performance monitoring	\$ 10,000
Subtotal	\$ 38,000
Contingency @ 20%	\$ 7,600
Total	\$ 45,600

Statement of Proposed Work

I. Project Title

Three-mile Basin Riparian Thinning

II. Project Manager

Klawock Water Council Project Administrator

To be announced

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to promote growth of large riparian trees while stabilizing stream banks and reducing sedimentation.

2. Summary Description

The proposed project will involve mechanical thinning of dense coniferous reproduction, leaving the largest and best-formed trees on an average spacing of 16 feet by 16 feet along Three-mile Creek and several associated tributaries. Selection of leave trees will favor the most vigorous long-lived trees. Thinning will promote more rapid growth of the remaining trees due to increased sunlight and decreased competition for nutrients. Residual trees over 8 inches d.b.h. will be left to provide LWD. Slash within five feet of the high water mark of streams will be pulled back into the thinned area and scattered. Alder less than 8 inches d.b.h. within ten feet of stream banks will be left untreated. This project encompasses a total of approximately 25 acres along 5,500 feet in multiple locations of Three-mile Creek and its tributaries. The project is expected to be completed in approximately 50 man-days with a 2 - 3 man crew using chain saws.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Improve re-growth of conifers along riparian areas to promote channel stability and shade.

- ii. Provide sources of LWD along streams.
- iii. Reduce sources of fine sediment to streams.
- iv. Provide employment opportunities in an economically depressed area

2. Justification

Thinning of extremely dense coniferous reproduction is known to increase diameter growth of conifers and to promote growth of herbaceous plants and low shrubs which help to stabilize soil.

The proposed project will undertake corrective action to improve water quality in streams within the watershed and improve quantity of stream flows during critical fish spawning periods.

3. Performance Measurement

Project performance will be evaluated through measurements and observations.

- i. A series of random fixed radius check plots will be taken throughout the thinned areas to quantify the average number and relative quality of trees remaining after thinning.
- ii. Observations will be made of stream bank vegetation to assure retention of high quality plant cover along stream banks.
- iii. The total number of acres of riparian thinning within the Three-mile Creek Sub-basin will be measured.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is a forest and fisheries habitat project and is intended to improve the quality and timing of stream flows in the Three-mile Creek Sub-basin of the Klawock Watershed by improving the growth rate and health of second growth coniferous reproduction along streams in the basin.

V. Deliverables

Deliverables for this project will include the following:

- 1. Project summary of work completed listing
 - i. Number of acres of riparian thinning

- ii. ii. Maps delineating thinned areas
- 2. Photo documentation of before and after conditions.
- 3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of riparian areas for rejuvenation and regrowth of herbaceous plants and low shrubs
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will improve the health and promote the growth of larger trees along riparian areas in the Three-mile Creek Sub-basin increasing infiltration and late summer stream flows. The Three-mile system is one of the most critical stream systems in the Klawock Watershed. It is a productive Sockeye salmon stream and is also used as habitat for Pink and Coho Salmon as well as Steelhead, Rainbow trout, Cutthroat trout and Dolly Varden Char. The stream may become an important drinking water source for the City of Klawock.

Fisheries dependent on the Three-mile stream system would benefit from improved health of second growth coniferous reproduction along riparian areas in the Three-mile basin.

VII. Schedule

Prepare Contract Documents: 3 weeks

Start Onsite Work

90 days to complete work

Post-thinning inspection and report: 60 days after completion of work.

VIII. Stakeholder support

This project is located entirely in the Three-mile Creek Sub-basin owned by Klawock Heenya Corporation. Klawock Heenya Corporation is a member of the Klawock Watershed Council and has participated in the development of this project concept and is in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association and the Klawock Cooperative Association.

X. Budget

Project Management and contract administration & Preparation of contact documents:	\$3500
Thinning Inspection layout:	\$ 3,000
Thinning	\$12,500
Project Documentation and write up:	\$1,500
Post-thinning performance monitoring:	\$3,000
Final Report:	\$2500
Subtotal:	\$26,000
Contingency @ 15%:	\$ 3,900
Subtotal \$	\$29,000
Total Planning Estimate	\$30,000

Statement of Proposed Work

II. Project Title

Northeast Streams Riparian Thinning

II. Project Manager

Klawock Water Council Project Administrator

To be announced

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to promote growth of large riparian trees while stabilizing stream banks and reducing sedimentation.

2. Summary Description

The proposed project will involve mechanical thinning of dense coniferous reproduction, leaving the largest and best-formed trees on an average spacing of 16 feet by 16 feet along 7-mile, Arrow, and 2.5-mile Creeks and associated tributaries. Selection of leave trees will favor the most vigorous long-lived trees. Thinning will promote more rapid growth of the remaining trees due to increased sunlight and decreased competition for nutrients. Residual trees over 8 inches d.b.h. will be left to provide LWD. Slash within five feet of the high water mark of streams will be pulled back into the thinned area and scattered. Alder less than 8 inches d.b.h. within ten feet of stream banks will be left untreated. This project encompasses a total of approximately 20 acres along 4,400 feet in multiple locations of the named streams and their tributaries. The project is expected to be completed in approximately 40 man-days with a 2 - 3 man crew using chain saws.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Improve re-growth of conifers along riparian areas to promote channel stability and shade.

- ii. Provide sources of LWD along streams.
- iii. Reduce sources of fine sediment to streams.
- iv. Provide employment opportunities in an economically depressed area

2. Justification

Thinning of extremely dense coniferous reproduction is known to increase diameter growth of conifers and to promote growth of herbaceous plants and low shrubs which help to stabilize soil.

The proposed project will undertake corrective action to improve water quality in streams within the watershed and improve quantity of stream flows during critical fish spawning periods.

3. Performance Measurement

Project performance will be evaluated through measurements and observations.

- i. A series of random fixed radius check plots will be taken throughout the thinned areas to quantify the average number and relative quality of trees remaining after thinning.
- ii. Observations will be made of stream bank vegetation to assure retention of high quality plant cover along stream banks.
- iii. The total number of acres of riparian thinning within the Sub-basins will be measured.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is a forest and fisheries habitat project and is intended to improve the quality and timing of stream flows in the northeast streams of the Klawock Watershed by improving the growth rate and health of second growth coniferous reproduction along streams in the basin.

V. Deliverables

Deliverables for this project will include the following:

- 1. Project summary of work completed listing
 - iii. Number of acres of riparian thinning

- iv. ii. Maps delineating thinned areas
- 2. Photo documentation of before and after conditions.
- 3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of riparian areas for rejuvenation and regrowth of herbaceous plants and low shrubs
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will improve the health and promote the growth of larger trees along riparian areas in the northeast streams feeding Klawock Lake increasing infiltration and late summer stream flows. These systems are important in the Klawock Watershed. Coho, Sockeye and Pink Salmon use these streams as well as Steelhead, Rainbow trout, Cutthroat trout and Dolly Varden Char.

Fisheries dependent on these systems would benefit from improved health of second growth coniferous reproduction along riparian areas in the Arrow, 7-mile and 2.5 mile creeks.

VII. Schedule

Prepare Contract Documents: 3 weeks

Start Onsite Work

90 days to complete work

Post-thinning inspection and report: 60 days after completion of work.

VIII. Stakeholder support

This project is located entirely in the Northeast area of Klawock Lake on land owned by Klawock Heenya, Inc. Klawock Heenya, Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept and is in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Shaan Seet, Inc., Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association and the Klawock Cooperative Association.

X. Budget

Project Management and contract administration & Preparation of contact documents:	\$3,500
Thinning Inspection layout:	\$ 2,000
Thinning	\$10,000
Project Documentation and write up:	\$1,500
Post-thinning performance monitoring:	\$2,500
Final Report:	\$2,500
Subtotal:	\$22,000
Contingency @ 15%:	\$ 3,325
Subtotal \$	\$25,300
Total Planning Estimate	\$26,000

Statement of Proposed Work

III. Project Title

Southeast Klawock Lake Area Riparian Thinning

II. Project Manager

Klawock Water Council Project Administrator

To be announced

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to promote growth of large riparian trees while stabilizing stream banks and reducing sedimentation.

2. Summary Description

The proposed project will involve mechanical thinning of dense coniferous reproduction, leaving the largest and best-formed trees on an average spacing of 16 feet by 16 feet along Alder, Swamp, Chutes & Ladders and Salmon Salad Creeks and associated tributaries. Selection of leave trees will favor the most vigorous long-lived trees. Thinning will promote more rapid growth of the remaining trees due to increased sunlight and decreased competition for nutrients. Residual trees over 8 inches d.b.h. will be left to provide LWD. Slash within five feet of the high water mark of streams will be pulled back into the thinned area and scattered. Alder less than 8 inches d.b.h. within ten feet of stream banks will be left untreated. This project encompasses a total of approximately 30 acres along multiple locations of the named streams and their tributaries. The project is estimated to require approximately 60 man-days of labor with a 2 - 3 man crew using chain saws.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Improve re-growth of conifers along riparian areas to promote channel stability and shade.

- ii. Provide sources of LWD along streams.
- iii. Reduce sources of fine sediment to streams.
- iv. Provide employment opportunities in an economically depressed area

2. Justification

Thinning of extremely dense coniferous reproduction is known to increase diameter growth of conifers and to promote growth of herbaceous plants and low shrubs which help to stabilize soil.

The proposed project will undertake corrective action to improve water quality in streams within the watershed and improve quantity of stream flows during critical fish spawning periods.

3. Performance Measurement

Project performance will be evaluated through measurements and observations.

- i. A series of random fixed radius check plots will be taken throughout the thinned areas to quantify the average number and relative quality of trees remaining after thinning.
- ii. Observations will be made of stream bank vegetation to assure retention of high quality plant cover along stream banks.
- iii. The total number of acres of riparian thinning within the Sub-basins will be measured.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is a forest and fisheries habitat project and is intended to improve the quality and timing of stream flows in the southeast area streams of the Klawock Watershed by improving the growth rate and health of second growth coniferous reproduction along streams in the basin.

V. Deliverables

Deliverables for this project will include the following:

- 1. Project summary of work completed listing
 - v. Number of acres of riparian thinning

- vi. ii. Maps delineating thinned areas
- 2. Photo documentation of before and after conditions.
- 3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of riparian areas for rejuvenation and regrowth of herbaceous plants and low shrubs
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will improve the health and promote the growth of larger trees along riparian areas in the southeast streams feeding Klawock Lake increasing infiltration and late summer stream flows. These systems are important in the Klawock Watershed. Coho, Sockeye, and Pink salmon species inhabit these streams as well as Steelhead, Rainbow trout, Cutthroat trout and Dolly Varden Char.

Fisheries dependent on these systems would benefit from improved health of second growth coniferous reproduction along riparian areas in the Alder, Salmon Salad, Chutes and Ladders and Swamp Creeks.

VII. Schedule

Prepare Contract Documents: 3 weeks

Start Onsite Work

90 days to complete work

Post-thinning inspection and report: 60 days after completion of work.

VIII. Stakeholder support

This project is located entirely in the southeast area of Klawock Lake on land owned by Shaan Seet, Inc. Shaan Seet, Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept and is in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Shaan Seet, Inc., Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association and the Klawock Cooperative Association.

X. Budget

Project Management and contract administration & Preparation of contact documents:	\$3,500
Thinning Inspection layout:	\$ 3,500
Thinning	\$15,000
Project Documentation and write up:	\$1,500
Post-thinning performance monitoring:	\$3,000
Final Report:	\$2,500
Subtotal:	\$29,000
Contingency @ 15%:	\$ 4,350
Subtotal \$	\$33,350
Total Planning Estimate	\$35,000

Statement of Proposed Work

IV. Project Title

Hatchery Creek Basin Riparian Thinning

II. Project Manager

Klawock Water Council Project Administrator

To be announced

III. Project Description

1. Need for and Purpose of Proposed Project

This project is proposed to promote growth of large riparian trees while stabilizing stream banks and reducing sedimentation.

2. Summary Description

The proposed project will involve mechanical thinning of dense coniferous reproduction, leaving the largest and best-formed trees on an average spacing of 16 feet by 16 feet along Hatchery Creek and several associated tributaries. Selection of leave trees will favor the most vigorous long-lived trees. Thinning will promote more rapid growth of the remaining trees due to increased sunlight and decreased competition for nutrients. Residual trees over 8 inches d.b.h. will be left to provide LWD. Slash within five feet of the high water mark of streams will be pulled back into the thinned area and scattered. Alder less than 8 inches d.b.h. within ten feet of stream banks will be left untreated. This project encompasses a total of approximately 25 acres along 5,500 feet in multiple locations of Hatchery Creek and its tributaries. The project is expected to be completed in approximately 50 man-days with a 2 - 3 man crew using chain saws.

IV. Objectives

1. Statement of Objectives

The project objectives are:

- i. Improve re-growth of conifers along riparian areas to promote channel stability and shade.

- ii. Provide sources of LWD along streams.
- iii. Reduce sources of fine sediment to streams.
- iv. Provide employment opportunities in an economically depressed area

2. Justification

Thinning of extremely dense coniferous reproduction is known to increase diameter growth of conifers and to promote growth of herbaceous plants and low shrubs which help to stabilize soil.

The proposed project will undertake corrective action to improve water quality in streams within the watershed and improve quantity of stream flows during critical fish spawning periods.

3. Performance Measurement

Project performance will be evaluated through measurements and observations.

- i. A series of random fixed radius check plots will be taken throughout the thinned areas to quantify the average number and relative quality of trees remaining after thinning.
- ii. Observations will be made of stream bank vegetation to assure retention of high quality plant cover along stream banks.
- iii. The total number of acres of riparian thinning within the Hatchery Creek Sub-basin will be measured.

4. Modeling/Statistical Analysis

No theoretical modeling or statistical analysis is proposed for this project. This is a forest and fisheries habitat project and is intended to improve the quality and timing of stream flows in the Hatchery Creek Sub-basin of the Klawock Watershed by improving the growth rate and health of second growth coniferous reproduction along streams in the basin.

V. Deliverables

Deliverables for this project will include the following:

- 1. Project summary of work completed listing
 - vii. Number of acres of riparian thinning

- viii. ii. Maps delineating thinned areas
- 2. Photo documentation of before and after conditions.
- 3. Results of monitoring sediment traps installed.
 - i. Visual monitoring with photo documentation for presence/absence of trapped sediment
 - ii. Visual monitoring of riparian areas for rejuvenation and regrowth of herbaceous plants and low shrubs
 - iii. Field results of water quality monitoring, turbidity

VI. Benefits to Salmon/Salmon Fisheries.

This project will improve the health and promote the growth of larger trees along riparian areas in the Hatchery Creek Sub-basin increasing infiltration and late summer stream flows. The system is one of the most critical stream systems in the Klawock Watershed. It is a productive Sockeye salmon stream and is also used as habitat for Pink and Coho Salmon as well as Steelhead, Rainbow trout, Cutthroat trout and Dolly Varden Char

Fisheries dependent on the Hatchery Creek stream system would benefit from improved health of second growth coniferous reproduction along riparian areas in the Hatchery Creek basin.

VII. Schedule

Prepare Contract Documents: 3 weeks

Start Onsite Work

90 days to complete work

Post-thinning inspection and report: 60 days after completion of work.

VIII. Stakeholder support

This project is located entirely in the Hatchery Creek Sub-basin owned by Shaan Seet Inc. Shaan Seet Inc. is a member of the Klawock Watershed Council and has participated in the development of this project concept and is in support of this project. Other stakeholders include the Klawock Watershed Council, Klawock Cooperation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association, and the Klawock Cooperative Association and private members of the community.

IX. Partners

Partners committed to donating resources to this project include the Klawock Watershed Council, Klawock Heenya Corporation, Alaska Department of Fish and Game, USDA Forest Service, USDA Natural Resources Conservation Service, Craig Community Association and the Klawock Cooperative Association.

X. Budget

Project Management and contract administration & Preparation of contact documents:	\$3,500
Thinning Inspection layout:	\$ 2,000
Thinning	\$7,500
Project Documentation and write up:	\$1,500
Post-thinning performance monitoring:	\$2,500
Final Report:	\$2,500
Subtotal:	\$19,500
Contingency @ 25%:	\$ 2,925
Subtotal \$	\$22,425
Total Planning Estimate	\$23,000