Klawock Watershed Road Condition Survey

by

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December 2002

Alaska Department of Fish and Game **Division of Habitat and Restoration**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used in Divisional Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications without definition. All others must be defined in the text at first mention, as well as in the titles or footnotes of tables and in figures or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
metric ton	mt
milliliter	ml
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
ounce	oz
pound	lb
quart	qt
yard	yd

Spell out acre and ton.

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
hour (spell out for 24-hour clock)	h
minute	min
second	s

Spell out year, month, and week.

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.
All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.
and	&
at	@
Compass directions:	
east	E
north	N
south	S
west	W
Copyright	©
Corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
et alii (and other people)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.,
id est (that is)	i.e.,
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
number (before a number)	# (e.g., #10)
pounds (after a number)	# (e.g., 10#)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)

Mathematics, statistics, fisheries

alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	F, t, χ^2, etc.
confidence interval	C.I.
correlation coefficient	R (multiple)
correlation coefficient	r (simple)
covariance	cov
degree (angular or temperature)	°
degrees of freedom	df
divided by	÷ or / (in equations)
equals	=
expected value	E
fork length	FL
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
mideye-to-fork	MEF
minute (angular)	'
multiplied by	x
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
standard length	SL
total length	TL
Variance	Var

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ABSTRACT

A modified Road Condition Survey (RCS) was conducted by the Alaska Dept. of Fish and Game (ADF&G) Division of Habitat and Restoration (H&R), to assist the Klawock Watershed Council and primary landowners in developing a restoration and management plan for the Klawock Watershed. The Klawock Watershed is a 29,000-acre coastal watershed, which surrounds 2800-acre Klawock Lake and is managed by three Native corporations and the USDA Forest Service (USFS). The RCS was conducted May-July of 2002, and documented the condition of roads and stream crossing structures within the watershed. Over 1,000 features were identified and mapped into a Geographic Information System (GIS), along with a full complement of relevant attributes. H&R staff documented over 400 stream crossings associated with permanent and non-permanent roads within the watershed. All stream crossing structures were qualitatively evaluated based on conditional features; a subset of all culvert pipes was more thoroughly evaluated based on a Red-Grey-Green screening, which identified fish passage concerns. Twenty-nine culvert pipes were identified as RED, where present condition is not adequate for fish passage. In addition, over 250 erosional features were documented, with the majority of them associated with the temporary roads in the watershed.

Key Words: RCS, Klawock Watershed, GIS, culvert, erosion, fish passage, sedimentation, roads, stream crossings, coho salmon, *Oncorhynchus kisutch*, sockeye salmon, *Oncorhynchus nerka*, Klawock Watershed Council

INTRODUCTION

Project Area

The Klawock Watershed is located on Prince of Wales Island, in southern Southeast Alaska (Figure 1). The watershed is situated around 2800 acre Klawock Lake and encompasses an area of approximately 29,000 acres (Figure **2**). Draining from the northwestern end of the lake, the Klawock River flows approximately one mile before emptying into Klawock Harbor and the estuary around the community of Klawock.

Primary land use activities in the Klawock Watershed include timber harvest, road building, land development and recreation. The water supply for the city of Klawock is drawn from Half-mile Creek. Three-mile Creek is currently being evaluated as an additional water source (Klawock Watershed Condition Assessment, USFS, 2002).

Project Background

The Klawock Watershed Council and principal landowners (Klawock-Heenya, Inc., Shaan-Seet, Inc., and Sealaska, Inc) are currently developing a comprehensive watershed restoration and management plan for the Klawock Watershed. This plan was initiated due to concerns regarding the status of the watershed, specifically with regard to populations of sockeye salmon (*Oncorhynchus nerka*.) Additional concerns focus on maintenance of the quantity and quality of the municipal water supply and protection of Klawock Lake and associated values (e.g., recreation, development, access).

The impetus for the developing watershed plan grew from concurrent prioritization efforts by Central Council Tlingit and Haida Tribes of Alaska and the Tongass National Forest (TNF) during 2000, which identified the Klawock Watershed (at the 6^{th} and 5^{th} field Hydrologic Unit Code or HUC) as a critical watershed for assessment and restoration attempts. A Watershed Assessment Team (WAT), assembled by the USDA Forest Service (USFS) identified issues critical to the future management of the watershed. Existing information was limited for the Klawock Watershed, and during 1999, the USFS initiated work to address the issues identified by the WAT.

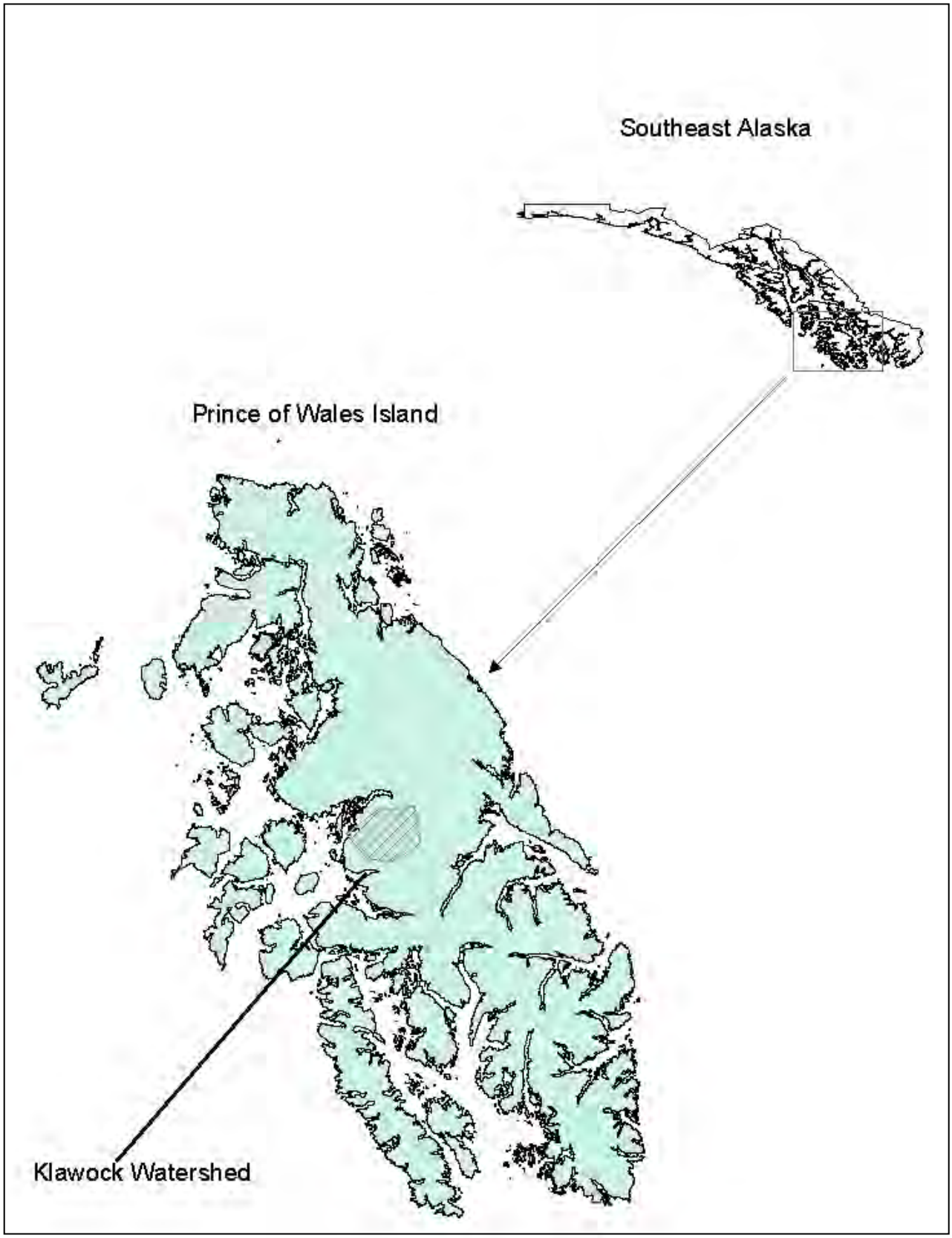

Figure 1. Location of the Klawock Watershed on Prince of Wales Island in Southeast Alaska.

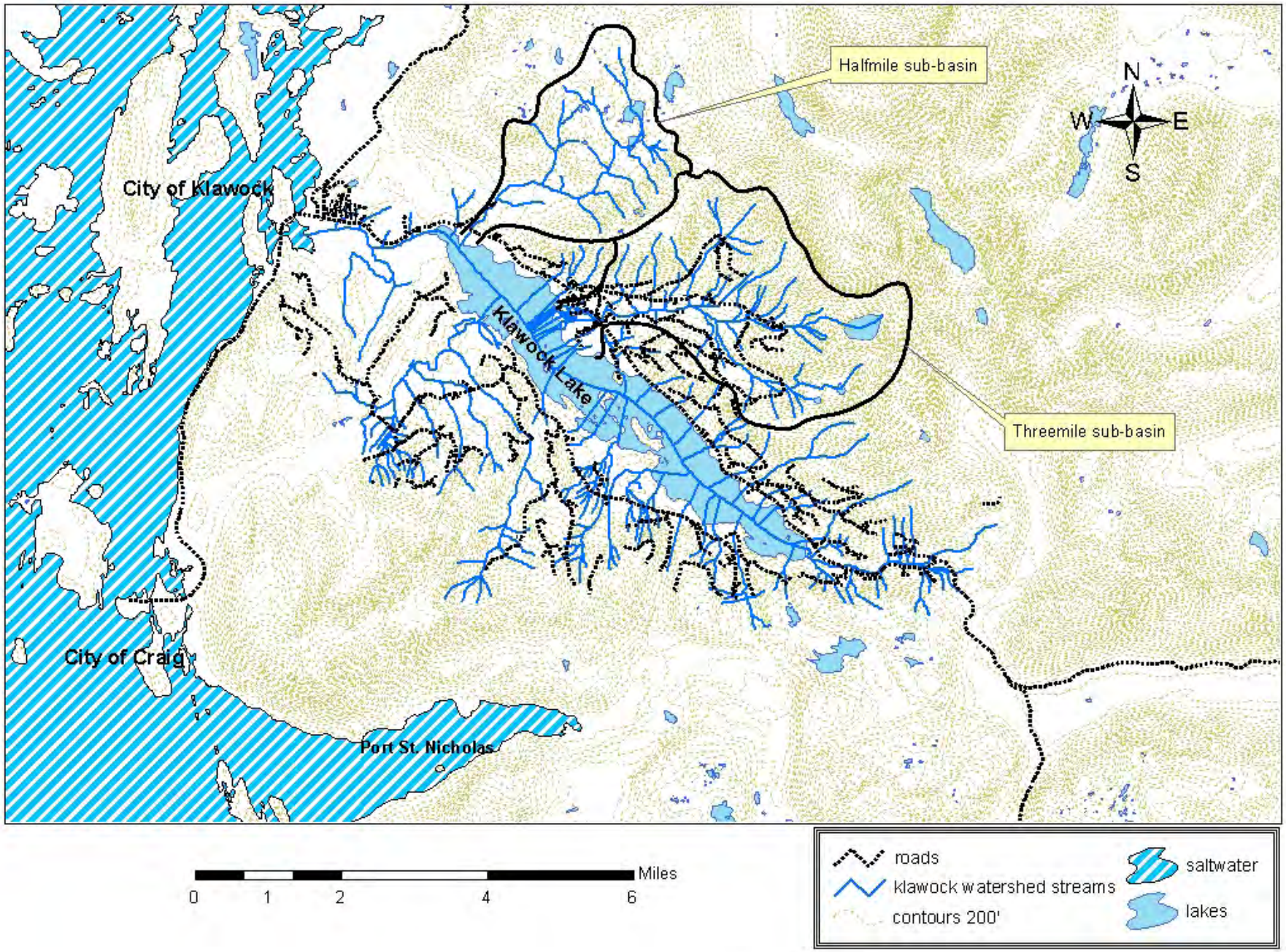

Figure 2. Location of the Klawock Watershed on Prince of Wales Island, Southeast Alaska, showing the sub basins Halfmile and Threemile.

This included a TNF Tier I stream survey, a Proper Functioning Condition (PFC)
Assessment of riparian and wetland areas, and a small-scale watershed analysis. Information derived from these inventories and assessments were mapped into a Geographic Information System (GIS) producing comprehensive stream, wetland, vegetation (harvest) and road layers.

The Klawock Watershed Council and ADF&G, H&R cooperated in addressing the remaining information gaps on the watershed. This included collaboration with the Klawock Watershed Council, Klawock-Heenya Corporation, Shaan-Seet Inc., Sealaska Corporation, the USFS and other cooperators.

Goals and Objectives
ADF&G, H&R had three primary objectives in cooperating with the watershed council, landowners and other collaborators: 1) conduct a RCS on the Klawock Watershed; 2) map the results of the RCS into a (GIS), and 3) provide a written narrative summarizing the results of Objectives 1 and 2.

H&R's goal in conducting the RCS of the Klawock watershed was to document and evaluate the condition of stream crossing structures and erosional features within the watershed. Ultimately, the survey would provide information for the following: 1) identification and distribution of fish passage problems, 2) identification and distribution of road maintenance issues, and 3) the basis for a prioritization of work scheduling/maintenance for future work on the watershed.

Both of the assessments conducted by the USFS (Klawock Watershed Condition Assessment) and ADF&G, H&R were intended to provide a comprehensive inventory of the watershed and its associated features, which could be mapped into a (GIS), and summarized through a report providing a basis for the development of the watershed restoration and management plan.

METHODS

The ADF&G, H&R worked closely with landowners and cooperators to ensure that access and logistical constraints were met before conducting field activities within the watershed. Fieldwork was conducted from vehicles and on foot throughout the watershed.

H&R staff conducted the RCS during May-July of 2002. Prior to conducting the RCS, H&R staff spent considerable time in the office and in the field developing and outlining field methods and techniques. Additional time was spent after the field season compiling the data, making maps and integrating the datasets into a GIS.

RCS Methodology
The USFS RCS protocol (USFS, 2000) was used as a template to design a methodical approach to address the current status of roads, stream-crossing structures, and fish passage concerns within the watershed. Road Condition Surveys have been used by the USFS as well as other private and state entities to address the condition of system roads (permanent or classified) and non-system roads (temporary or unclassified) with respect to these issues. These surveys are methods of determining the status and from that information deriving the maintenance needs for roads.

Road Condition Surveys provide information for: 1) identification of maintenance needs, 2) problem analyses, and 3) priority setting for work scheduling and funding (Transportation System Maintenance Handbook, March 2000). H&R employees familiar with the USFS RCS protocol evaluated and modified the existing protocol slightly, to better suit individual needs of the cooperators as well as ensuring that the format of the resulting data would be directly usable by the Watershed Council. In addition, it was imperative that the survey methods be simple and straightforward enough so that H&R employees with out formal RCS training are able to adopt and consistently and accurately collect relevant information. Deviations from the USFS RCS protocol were minimal in content, but allowed H&R staff to streamline the collection of relevant data without sacrificing the quality and sharing of necessary details.

The RCS consisted of systematically visiting all stretches of road and walking/driving the entire

length from beginning to end, with few exceptions. However, in some instances, it was not possible to conduct the surveys on small stretches of road because of logistical constraints (e.g., deep snow high in the watershed, lack of personnel, etc.). At all relevant features, unique waypoints were recorded on GPS units, so that they could be precisely located in the future. All data were recorded on standardized data sheets or on portable palm top computers.

Three unique datasheets were used to record all information collected during the RCS. General road condition features, waypoint information, and stream crossing features were all recorded on the modified Road Condition Survey ROADS datasheet (Appendix 1 and 1a). All fish trapping information was recorded in the FISH TRAPPING datasheet (Appendix 2 and 2a). Measurement data associated with culverts that required additional data for evaluation of fish passage were recorded on RCS CULVETS datasheets (Appendix 3 and 3a**).**

After recording all the header information on the top of the ROADS datasheet, a waypoint was marked to indicate the beginning of survey. Observers surveyed an entire length of road noting all pertinent features. At each new feature, a waypoint was entered on the GPS unit and the resulting waypoint recorded on the ROADS datasheet along with the appropriate feature code (Appendix 4). Specific measurements were recorded for those features that required additional data (e.g., culvert size, erosion size, slope). Information on a specific feature may have been recorded on multiple datasheets, depending on the structure; in all instances where data were recorded on multiple datasheets, a unique number was recorded in every instance so that information on one structure could be referenced back to the original code.

Stream Crossings

Documentation of streams that crossed watershed roads and their distribution was a key role during RCS. Stream crossings are defined as points on the temporary or permanent roads where a stream of any size crosses the road surface with or without a crossing structure in place. Each stream crossing was characterized by the type of structure (or lack thereof) that allowed water to move across or under road surfaces. Data recorded at stream crossings also included more specific information about the stream including, the Aquatic Habitat Management Unit (AHMU), if known, and channel bed width (m).

Stream Crossing Structures

Culverts

Data collected for all culvert pipes included: height, width, and length of pipe, percent culvert blockage, presence of inlet and/or outlet erosion, and upstream and downstream AHMU, if known. The structural integrity of the culvert pipes was recorded if these structures appeared to be damaged. All culvert pipes were further classified by a CONDITION category, based on the above measurements, which identified culverts as to their current operating status (e.g., perched, obstructed, damaged, etc). This allowed H&R staff to provide a systematic and standardized approach to evaluating the functional capability of culvert pipes across the watershed.

Additional information was collected on all culvert pipes that had more than 100 feet of anadromous or high-value resident habitat upstream of the culvert pipe. These data were recorded on the CULVERTS datasheet **(**Appendix 3). Anadromous habitat was identified by several approaches, but initially, the digital Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes (draft 2002) and the Anadromous Waters Catalog (AWC) 1998, were used for reference. If more than 100 feet of stream was considered to be anadromous above the pipe, then a full host of additional measures were obtained. If the stream in question was not currently in either the Atlas or AWC (or field staff questioned the accuracy of the AWC stream map with respect to upstream habitat), then an on-site decision was made regarding the extent of anadromous habitat upstream of the pipe, and ultimately, whether or not the culvert pipe warranted collection of the additional measures. On-site determinations of anadromous habitat included preliminary

trapping (with verification through capture of salmonids), or a brief inspection of the immediate upstream habitat and its quality.

For those pipes meeting the criteria of anadromous habitat, additional measurements were recorded that were necessary in determining several key factors in evaluating fish passage concerns. These measurements included: upstream and downstream gradient of stream (recorded with the use of clinometers or eye level and stadia rod); culvert pipe gradient; perch height; culvert pipe blockage; and the diameter of the pipe to bed width ratio. These measurements were used to perform a RED-GREY-GREEN analysis of culvert pipes, which is a process used to evaluate fish passage through existing structures (Flanders and Cariello, 2000). Appendix 3 outlines all data associated with anadromous or high-value resident habitat collected during culvert measurements.

Bridges, Log-stringer culverts, Log Bridges

All information collected on the remaining stream crossing structures on the watershed (excluding culvert pipes) are contained within the ROADS spreadsheet (Appendix 1). Data collected includes the same information recorded for all other features on the watershed as well as stream crossing structure specific measurements: percent blockage, length, width and height, presence of inlet and/or outlet erosion, downstream and upstream AHMU (if known), and the current operational condition of the structure.

Removed and Missing Structures

Data associated with stream crossings that had no currently operating structure are contained within the ROADS spreadsheet (Appendix 1). This included data for streams that previously had an existing structure, that was removed, or locations where streams crossed over road surfaces without any indication of a stream crossing structure ever being in place.

Fish Trapping Data

Baited minnow traps and visual observations were used to document the presence of fish during the RCS. The main intent of fish trapping was to verify the presence of fish below and above stream-crossing structures, especially with regard to anadromous species. In some instances, H&R staff trapped portions of streams for the purpose of nominating new waterbodies to the Anadromous Waters Catalog. In all cases, data were collected and entered into our standardized datasheets or on palmtop computers. Information on updates to the AWC or Atlas will be supplied prior to the next round of nominations in 2004.

Generally, four traps were associated with each of the crossing structures: two upstream of the stream-crossing structure and two downstream. GPS information was not recorded for individual traps, unless they were located > 150 feet from the crossing structure; otherwise all fish trapping information could be located by finding the stream crossing structure, which was associated with a unique waypoint. All trapping related data was recorded on the fish trapping datasheets (Appendix 2).

Erosional Features

Erosion associated with watershed features (e.g., roads, streams) was identified and characterized by individual attributes. Characterization of erosional features was based primarily on the assumed cause of the erosion. This included cut-slope erosion (associated with slumping of fill material on the uphill sides of roads), surface erosion (disturbance of road surfaces), and other less common features such as fill slope erosion (slumping of downhill sides of roads), ditch erosion, fill falling through road surfaces, landslides across road surfaces, erosion as a result of removed structure, and stream abutment erosion.

Data recorded for all erosional features included: area impacted (length and width in feet); slope of transport for the erosional feature, if applicable; and distance to the nearest stream. All data recorded for erosional features are contained within the ROADS spreadsheet (Appendix 1).

Photo Documentation

Photo documentation using digital cameras played an important role in capturing and

conveying a variety of issues and concerns encountered across the watershed during the surveys. In some instances, it was impossible to document features with a photo, largely because of inclement weather, which made it impossible to use digital cameras and also made it difficult to clearly show the feature of interest.

All photograph files are linked (as with all other data) to respective GPS waypoints to aid in queries. Each of the photos taken was recorded in JPEG format, to allow a variety of users quick and easy access for viewing or printing purposes. Photo files are referenced in the **PIC_NUM** and **PHOTOFILE** fields in each of the ROADS spreadsheets (klawock_ watershed_ roads.xls and klawock_hollis _hway _roads.xls). A description of each of the photographs along with corresponding location is included in **Appendix 5**.

QUALITY CONTROL/DATA ANALYSES

Following collection of field data during May-July of 2002, data were checked for quality control by inspecting for consistency of column headings, correct coding of variables of interest, spatial accuracy with respect to the location of waypoints, and correct units of measure. Obvious errors were corrected and subsequent data queries using MS Access, MS Excel and ESRI ArcMap 8.1 found others. In addition, a subset of the entire dataset (approximately 6 percent) was thoroughly checked record by record for all mistakes. This exercise allowed H&R staff to determine the accuracy of data entry, and, through extrapolation, to ascertain if the entire database was sufficiently accurate to begin more complex summary and analyses. H&R staff found few mistakes in the smaller subset of data, and thus proceeded in summarization of the data, after mistakes were corrected.

Analysis of RCS data was done primarily with MS Excel and ArcMap through the use of filtering, queries, and visual inspection. RCS data for the watershed were broadly grouped into two major classes: 1) Klawock watershed data on temporary or unclassified roads and 2) data associated with the Klawock-Hollis Highway. Further, data collected on the watershed for each of the above classes were grouped into a series of three worksheets representing specific and/or unique data parameters. A list of the worksheets along with a brief description of their contents is included in Appendix 6.

RESULTS

H&R staff surveyed approximately 85 miles of road during the RCS on the Klawock Watershed to assess condition with respect fish passage concerns, maintenance issues, and erosional impacts. During this survey, over 1,000 features were documented and spatially located using GPS instruments leading to full integration with a Geographic Information System (GIS).

Stream crossings

Over 400 stream crossings were documented on the watershed (Figure 3). These included streams associated with a variety of structures, specifically addressed in the following sections.

Stream Crossing Structures

Streams that bisected watershed roads were classified by the type of structure that allowed the water to move across or under the road. Six distinct features (types of structure) were observed associated with stream crossings on the watershed and included 1) corrugated metal pipes; 2) corrugated plastic pipes; 3) log stringer culverts/log bridges; 4) permanent bridges; 5) removed structures (of varying design); and 6) missing structures.

Culvert Pipes

Two types of culvert pipes were used to allow stream passage on the watershed roads: Corrugated Plastic Pipes (CPPs) and Corrugated Metal Pipes (CMPs). The latter represented the majority of stream crossing structures, accounting for over 59% of all structures on the watershed **(**Figure 4**).**

Culvert pipes that were blocked by greater than 10% were considered obstructed and to be potential problem pipes, based on fish passage

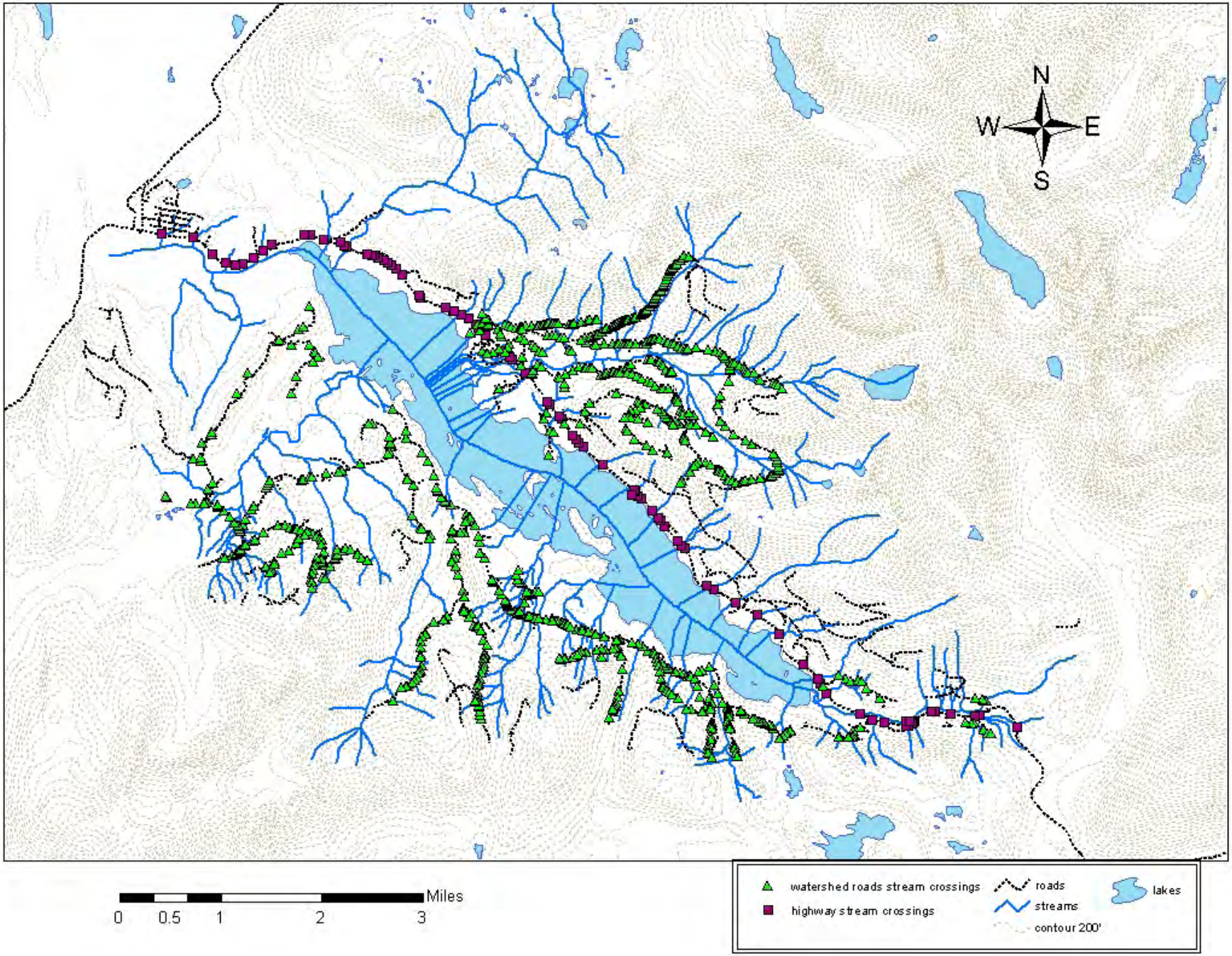

Figure 3. Location of all stream crossings associated with permanent and temporary roads in the Klawock Watershed, Southeast Alaska.

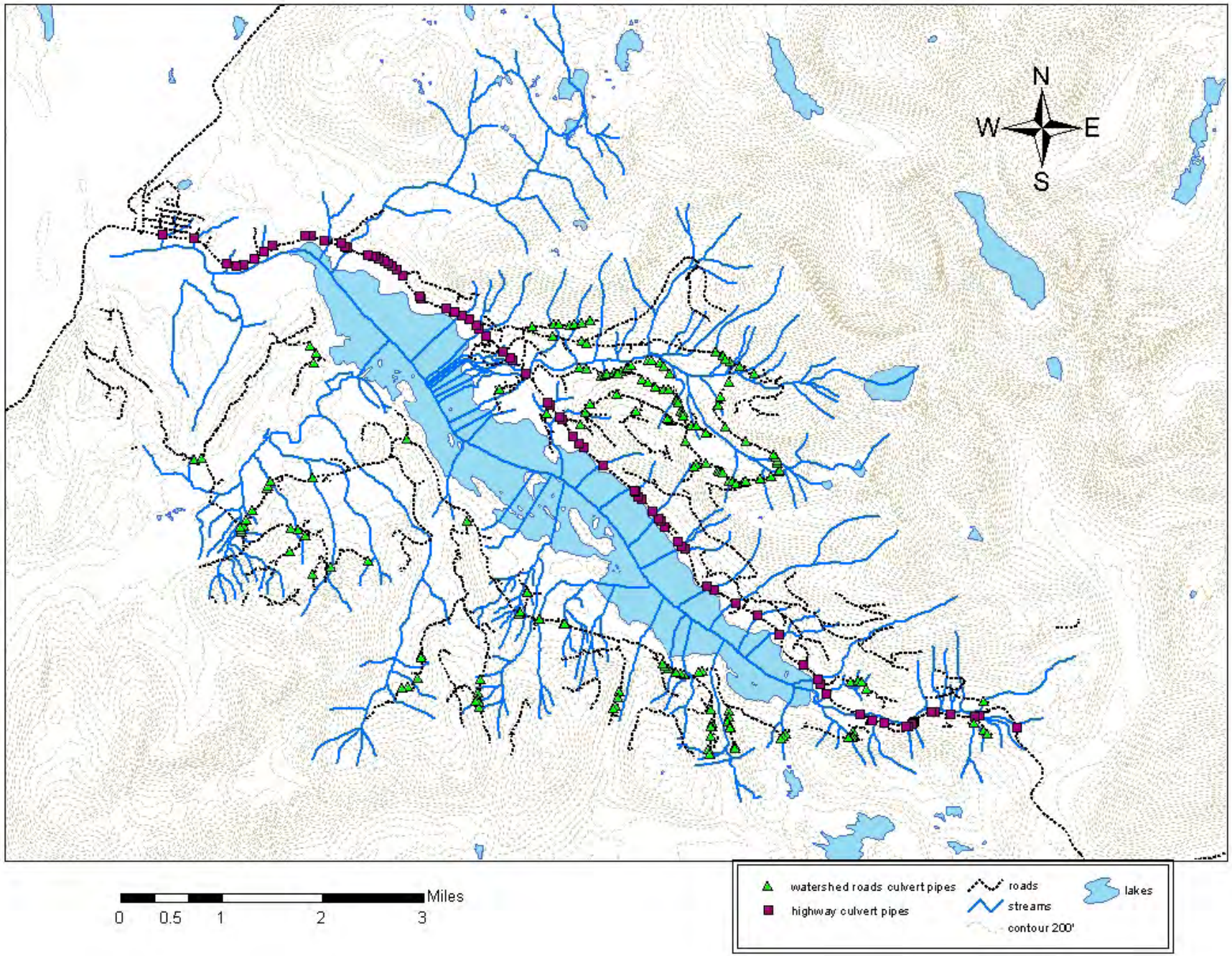

Figure 4. Location of all culvert pipes associated with permanent (Klawock-Hollis Highway) and temporary (watershed) roads in the Klawock Watershed, Southeast Alaska.

evaluation criteria established by a working group composed of ADF&G, DOT, and USFS fish passage experts (Flanders and Cariello, 2000). Based on this criterion, **109** culvert pipes (both metal and plastic) were below this threshold, with a mean percent blockage of approximately 60%. Seventeen culvert pipes were classified as perched to some degree, which may inhibit fish passage, depending on severity of the perch and water depth in the pool below a culvert. Eighteen culvert pipes had multiple problems (e.g., damaged and obstructed) associated with their condition. The condition of all culvert pipes is depicted in Figures 5 and 6. Culvert pipes associated with the temporary roads of Klawock Watershed are portrayed in Figure 5. Culvert pipes associated with the Klawock-Hollis Highway are depicted in Figure 6. Damaged pipes were much less common and occurred at 16 locations in the watershed. All data associated with culvert pipes across the watershed are summarized in Appendix 7**.**

Additional measurements were collected at culvert pipes that occurred within (or potentially within) anadromous habitat, which allowed H&R staff to perform a RED-GREY-GREEN analyses. Thirty-one culvert pipes had enough information to allow this analysis, 29 of these were considered to be RED, indicating that conditions were assumed to be inadequate for fish passage **(**Figure 7**).** The full results of this evaluation are summarized in Appendix 8**.**

Log Culverts and Bridges

Log stringer culverts, log bridges and permanent bridges were used at 90 locations throughout the watershed. Common problems or conditions associated with stream crossing features of this design included obstructed and failing structures, generally caused by timbers or material falling through the surface. Of the 90 structures of these types, 28 (31%) were classified as obstructed or failing. Data on log stringer culverts, log bridges and permanent bridges are summarized by condition in Appendix 9.

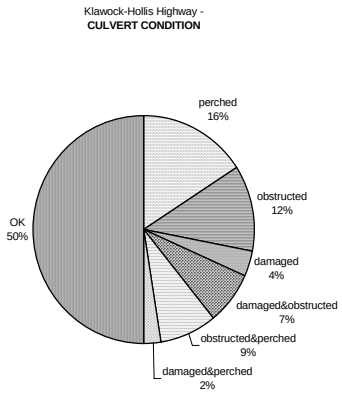

Figure 5. Condition of all culvert pipes associated with the Klawock-Hollis Highway (n=82).

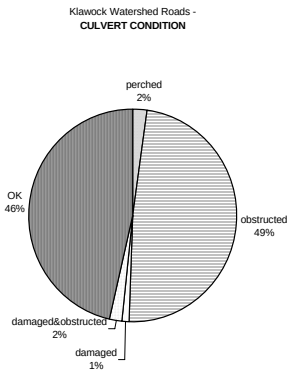

Figure 6. Condition of all culvert pipes associated with Klawock Watershed temporary roads (n=172).

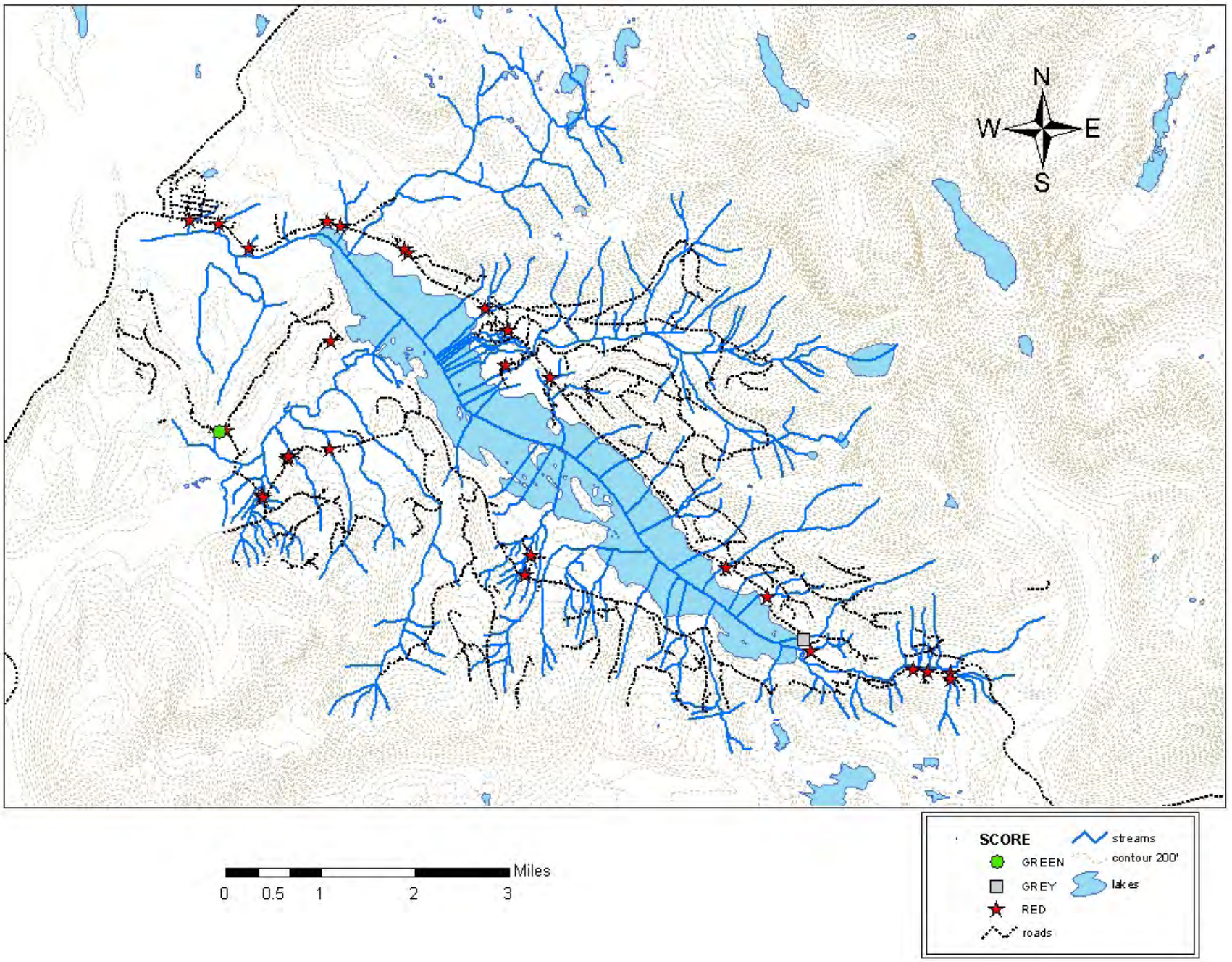

Figure 7. Location and SCORE (Red-Grey-Green analyses) of 31 selected culvert pipes occurring within anadromous habitat in the Klawock Watershed, Southeast Alaska.

Removed or Missing Structures

The remaining stream crossings were not associated with currently operating structures of any kind. These included locations where a structure had been removed (n=115) or where a stream crossing structure appeared to be missing (n=86).

Fish Trapping

H&R staff baited and set 206 minnow traps to determine fish presence and distribution patterns at 73 locations across the watershed. Full results are summarized in Appendix 6. Coho salmon, *Oncorhynchus kisutch*, were the only anadromous species captured in H&R trapping efforts on the watershed and were captured at 27 locations; at 12 of these locations, coho were captured downstream of the stream crossing feature only (Figure 8).

Dolly Varden, *Salvelinus malma*, were captured at 47 locations throughout the watershed; at 11 of these locations, dolly varden were captured only downstream of the crossing feature (Figure 9). Cutthroat trout, *Oncorhynchus clarki* were captured at a total of 39 locations throughout the watershed, 12 of which included locations where cutthroat were only captured downstream of the crossing structures (Figure 10).

H&R trapping efforts during the course of the RCS work have led to the addition (or extension) of at least eight stream arcs in the Anadromous Waters Catalog. These will be nominated for update in the next cycle of nominations in 2004. The current distribution of known anadromous streams is depicted in Figure 11 and includes the draft updates mentioned.

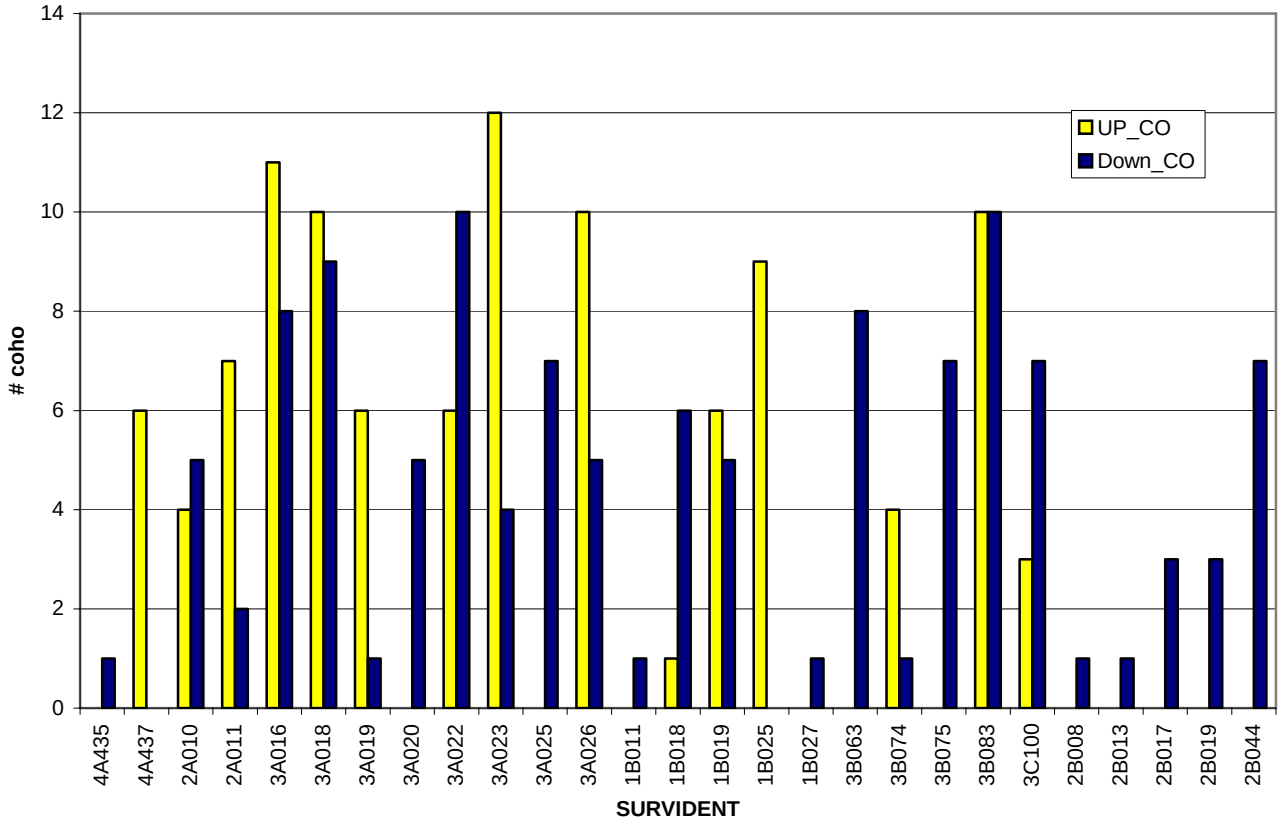

Figure 8. Coho trapping results upstream (UP_CO) and downstream (Down_CO) of stream crossing structures on Klawock Watershed.

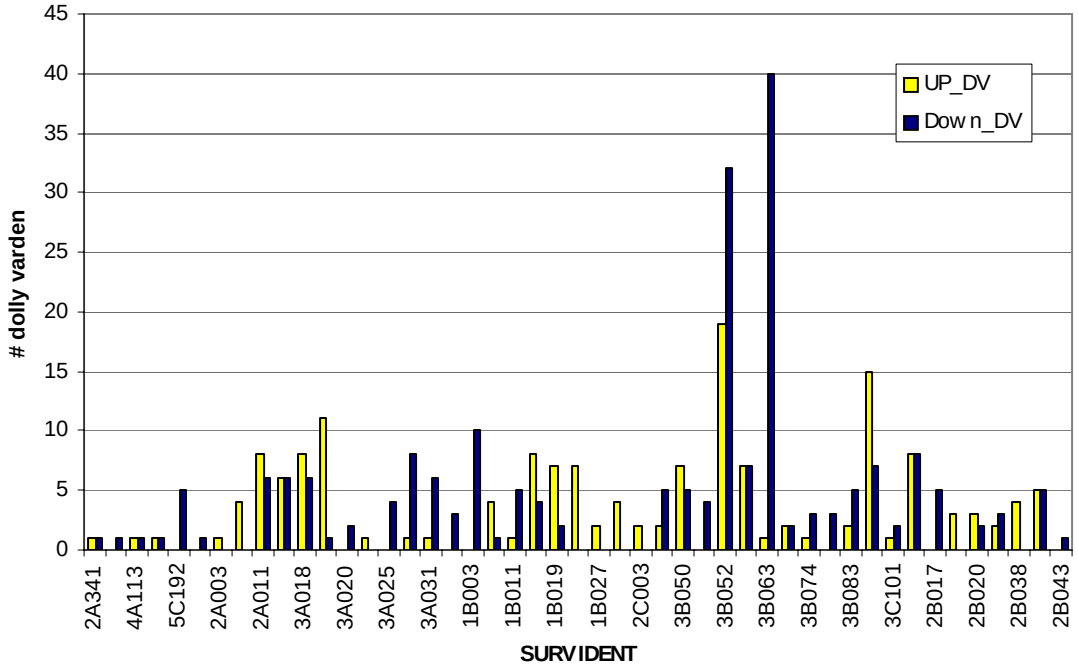

Figure 9. Dolly Varden trapping results upstream (UP_DV) and downstream (Down_DV) of stream crossing structures on the Klawock Watershed.

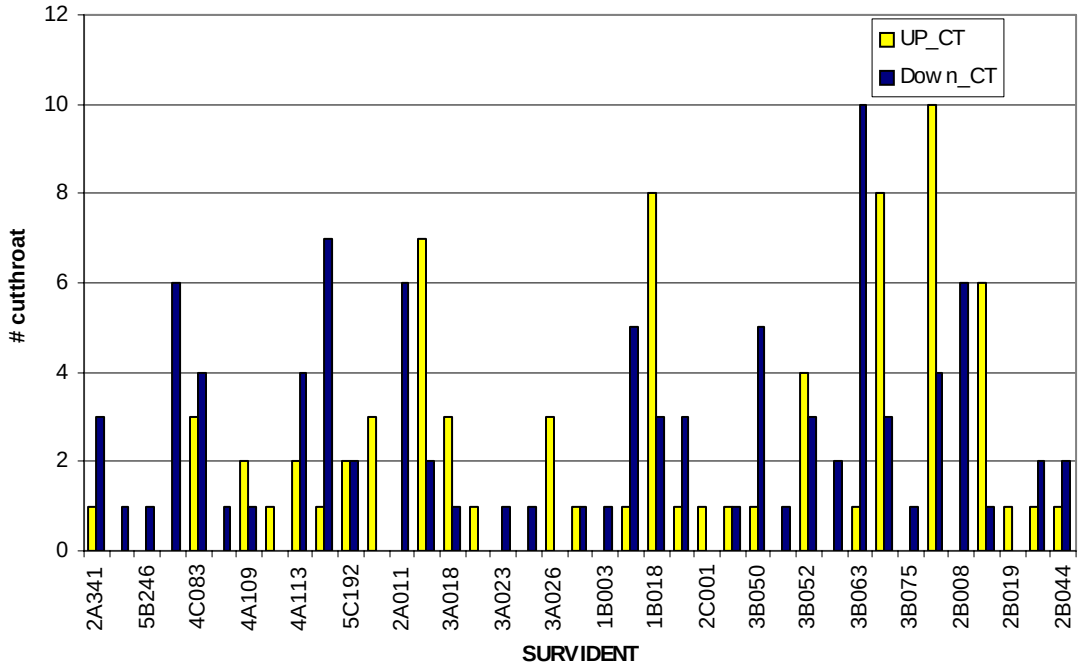

Figure 10. Cutthroat trapping results upstream (UP_CT) and downstream (Down_CT) of stream crossing structures on the Klawock Watershed.

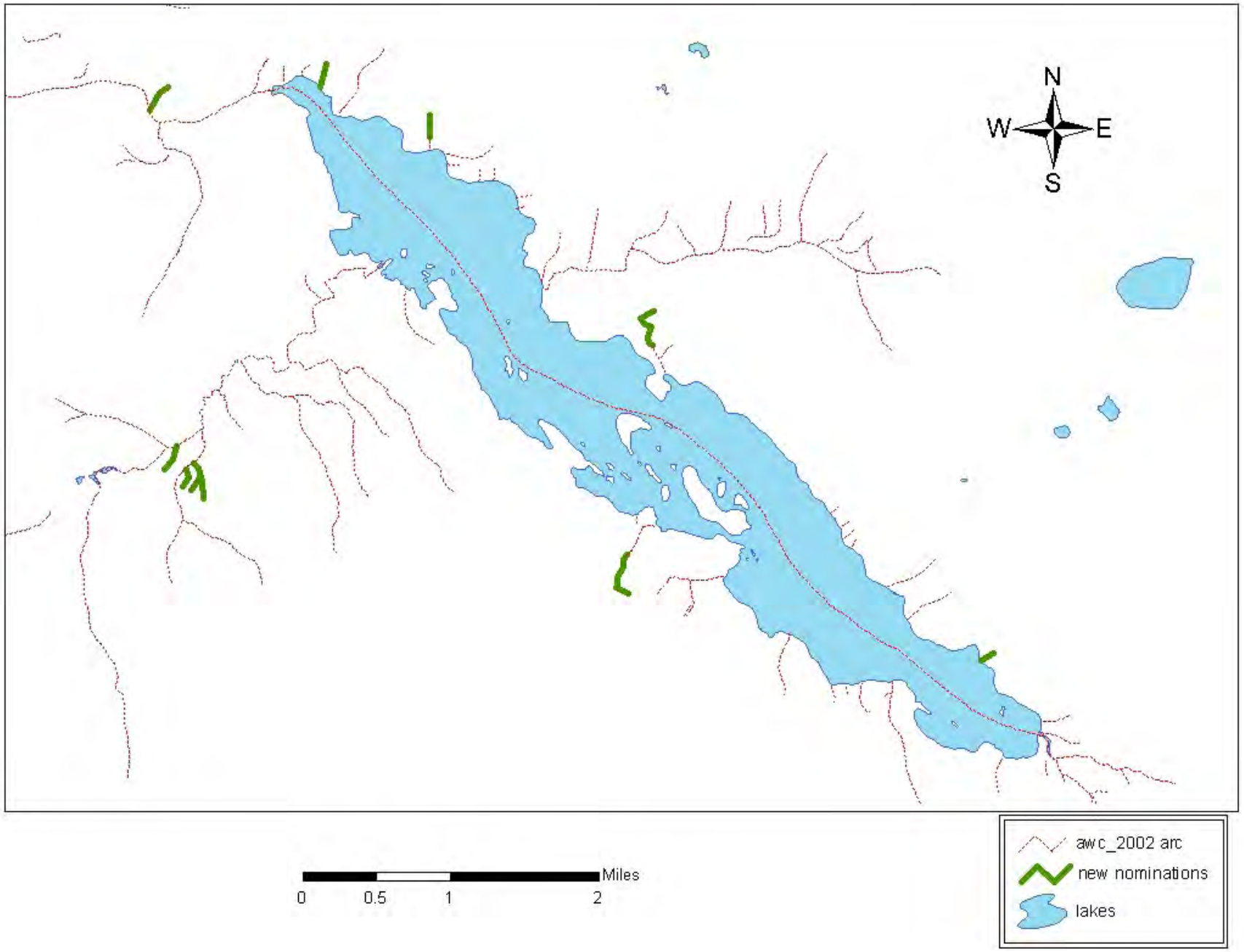

Figure 11. Current known hydrography of anadromous waters within the Klawock Watershed, Prince of Wales Island, based on digital AWC (draft 2002) and fish trapping efforts during Road Condition Surveys, 2002.

Erosional Features

Erosion on the watershed was primarily associated with the temporary roads constructed to provide access for timber activities. Erosional features were categorized into 11 distinct feature classes, based on individual attributes associated with each.

Cut-slope Erosion

Cut-slope erosion occurred throughout the watershed and was observed at 137 locations **(**Figure 12**).** Erosion of this kind paralleled the temporary roads on the watershed and had a mean length of approximately 117 feet (S.D.= 139 ft). The width of cut-slope erosion averaged approximately 18 feet (S.D. = 20 ft). The largest single incidence of cut-slope erosion on the watershed covered an area of approximately 16,500 sq feet (length = 1,100 feet).

Surface Erosion

Surface erosion occurred on the temporary roads and was observed at 98 locations throughout the watershed **(**Figure 12). Surface erosion was generally the result of inadequate ditch relief, undersized or obstructed stream crossing structures, or lack of water bars. Erosion on the surface of roads averaged 73 feet long (S.D. = 59 ft) by 14 feet wide (S.D. = 12 ft). The largest single incidence of surface erosion on the watershed covered an area of approximately 1,500 sq. feet.

Other Erosional Features

Several other types of erosion were observed less commonly within the Klawock Watershed and included fill-slope erosion (Figure 12), which was observed at 10 locations; ditch erosion (n = 9); fill falling through road surface (n=6); landslides across road (n=3); removed structure erosion (n =1); and stream abutment erosion (n=1).

Anadromous Fish Habitat and Watershed Features

Approximately 130 miles of stream have been documented and mapped in the Klawock Watershed (Klawock Watershed Condition Assessment, USFS, 2002), based on current stream coverages developed by the USFS and ADF&G. This represents a minimum estimate of the actual amount of stream habitat in the watershed, because not all stream channels have been identified especially those higher in the watershed. The Anadromous Waters Catalog compiled by ADF&G currently identifies approximately 16 miles of anadromous stream habitat within the watershed, which also represents a minimum estimate. H&R staff estimate that a minimum of 35 miles of anadromous stream habitat exists in the watershed based on the compilation of three datasets: 1) the USFS stream coverage and all streams identified as AHMU class I; 2) the current AWC coverage from ADF&G; and 3) RCS conducted during 2002.

Of the 413 stream crossings identified on the watershed, approximately 118 (29%) occur within anadromous habitat, as defined above. This includes a variety of structures currently in place (e.g., culvert pipes, bridges, log culverts/bridges), as well as locations where streams pass over/through roads with no structure currently operating (e.g., missing structures, removed structures). Corrugated metal culvert pipes (n = 45) were the most common stream passage structure used in anadromous habitat and comprised over 38% of the total.

Our analyses of culvert pipes with respect to anadromous fish passage (RED-GREY-GREEN), included evaluation of 20 of the 45 corrugated metal pipes located within anadromous habitat. Culvert pipes currently not meeting standards of appropriate fish passage (i.e., RED pipes) were noted at 95% (n = 19) of these observations, where data were available. The one remaining culvert pipe was scored as grey, meaning that additional information is needed to accurately assess fish passage. Table 1 summarizes the scoring of these 20 structures with respect to the RED-GREY-GREEN evaluation.

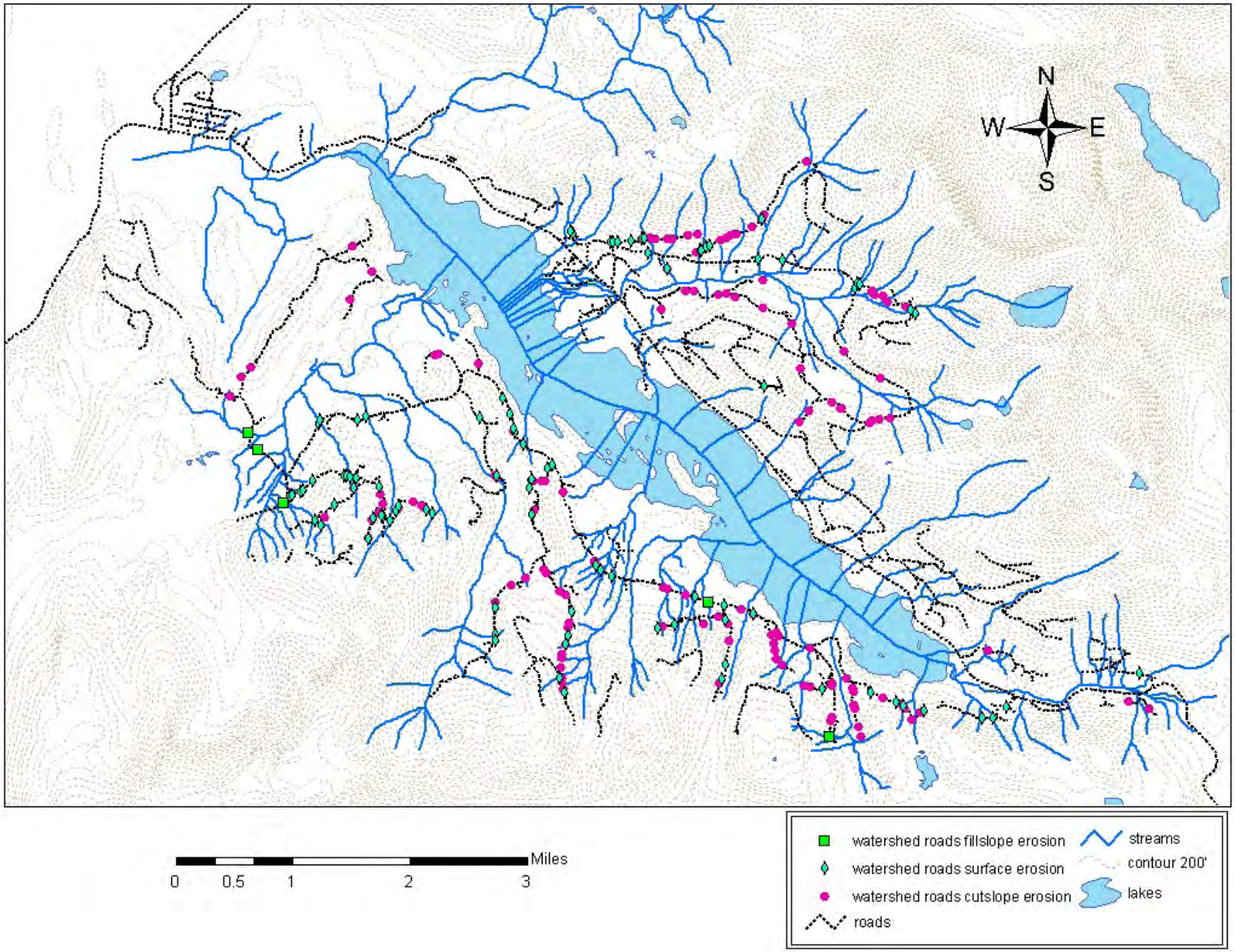

Figure 12. Location of major erosional features within the Klawock Watershed, Southeast Alaska.

Table 1. RED-GREY-GREEN analyses of corrugated metal culvert pipes occurring within anadromous habitat in the Klawock Watershed.

PROJCODE	SURVIDENT	CULVERT DIA. (in)	SCORE	# RED CAT'S	PERCH HT (ft)	% BLOCK	GRADIENT %	BEDWIDTH RATIO
KLW32	3B075	48	RED	2	2.00	0	5.06	0.94
KLW32	3B063	24	RED	3	1.71	15	1.84	0.61
KLW32	3B074	48	RED	2	1.71	10	2.89	1.22
KLW32	3C100	48	RED	2	1.50	0	1.64	1.52
KLW32	2B044	36	RED	2	1.33	0	NA	0.46
KLW22	1B030	18	RED	3	0.95	80	2.51	1.52
KLW32	2B019	42	RED	3	0.50	0	3.87	0.36
KLW22	1B019	24	RED	2	0.46	0	2.90	0.87
KLW32	2B015	60	RED	2	0.46	0	NA	0.44
KLW22	3A016	36	RED	3	0.00	25	3.28	0.30
KLW32	2B020	108	RED	3	3.00	20	2.12	0.61
KLW32	3B053	48	RED	2	2.85	0	8.60	1.02
KLW32	1B003	24	RED	2	1.50	99	NA	0.87
KLW32	3B052	42	RED	2	0.52	0	6.05	0.59
KLW32	3C101	36	RED	2	0.49	0	1.17	NA
KLW22	2A005	48	RED	3	NA	90	3.49	0.35
KLW32	2B013	60	RED	2	NA	5	0.80	0.44
KLW22	1B011	24	RED	1	NA	0	4.64	0.61
KLW22	2A002	36	RED	1	0.20	0	2.84	NA
KLW32	2B017	108	GREY	0	NA	0	NA	0.69

DISCUSSION

The Klawock Watershed is a relatively small coastal watershed with a complex array of streams, and it hosts a significant amount of land use activities. The watershed has provided subsistence users with a variety of resources, most notably an abundant supply of salmon, for at least 125 years. Within the last 40 years, it has also contributed revenue (primarily from timber sales), recreational benefits and a water supply to the outlying communities and native corporations. The effect has been an ever-increasing demand on the resources of the watershed.

Only recently, has concern arisen regarding balancing the demand for resources and land development with the overall quality and health of the watershed. This concern has spurred collaboration between landowners, citizen groups, communities and state and federal agencies to address the current state of affairs affecting the watershed. Of utmost importance to this collaboration was the identification of the necessary data that would allow an evaluation of the watershed with respect to water quality and fish habitat.

The formation of the Klawock Watershed Council played a key role in elevating concern for the watershed and its values, as well as initiating and assisting in coordinating the efforts of outside groups and agencies. The assistance of the USFS and ADFG, H&R was necessary to provide the watershed council with baseline data on the status of the watershed. The Klawock Watershed Council could direct work efforts and restoration on the watershed based on a prioritization of needs.

The USFS, in coordination with the watershed council, landowners and other participants recently completed work on the Klawock Watershed Condition Assessment (USFS, 2002), providing the council with updated information

on key aspects of watershed health. This included a Proper Functioning Condition (PFC) assessment, which addressed the functionality of the riparian and wetland areas within the watershed. Tongass National Forest Tier I stream surveys were also conducted to provide preliminary information on the distribution of fish and fish habitat. In addition, a small-scale watershed analysis was conducted to provide a reference that characterized key ecosystem processes, interactions and functions.

The ADFG, H&R was commissioned to address the current condition of roads and related stream crossing features within the watershed. A standardized protocol based on the USFS Road Condition Survey was conducted on the watershed to address these issues. Documentation and evaluation of stream crossing features, erosional impacts from road building, and presence of anadromous fish and habitat were key issues identified through H&R surveys on the watershed.

Integration of USFS and H&R data into a Geographic Information System (GIS) was paramount in spatially relating features and conditions across the watershed. This provides the Klawock Watershed Council with the most comprehensive information to date on the condition of the watershed, with spatially explicit data and a full host of attributes viewable across the watershed available through a GIS environment.

A sound prioritization of restoration opportunities based on available data is the ultimate goal of the Klawock Watershed Council. Information contained within this report should not be considered a 'stand alone' prioritization of future work; rather, this data in conjunction with USFS data should be considered to provide the framework for prioritization efforts including restoration opportunities, road closures, and repair/replacement of stream crossing structures.

RECOMMENDATIONS

The Road Condition Surveys conducted by the ADF&G, Division of Habitat and Restoration, provide information on the current condition of roads, stream crossing structures, and fish passage. Information on the hydrology and geomorphology of the watershed, as well as key ecosystem processes and ultimately how these all interact, is not contained within this report. Therefore, it is beyond the scope of ADF&G and this report to make strict recommendations on maintenance. However, we do provide a synopsis and general overview of actions and their intended results, which should be recognized during the prioritization process.

The Klawock Watershed has an abundant and complex array of streams, which bisect the numerous temporary and permanent roads. Every existing stream crossing structure on the watershed roads, including the roads themselves, has current and future maintenance needs associated with it. Identification of roads to be permanently closed could be the first step in the prioritization process. This would entail a cost/benefit analysis outlining structures to be removed, providing the necessary water bars for downstream transport of water and providing the appropriate Access Travel Management (ATM) device to ensure closure to motorized vehicles.

To provide the necessary long-term health and stability of the watershed, it must be recognized that additional funds and maintenance WILL BE REQUIRED for roads that remain open, taking into consideration that there are few, if any, permanent structures that require no periodic maintenance needs. Therefore, it is crucial that funds be available for future maintenance of stream crossing structures on all roads that remain open. This should be reflected or taken into consideration in the prioritization process.

The Road Condition Surveys conducted by ADF&G provided information on each of these structures with respect to current operating status and condition. Additionally, information has been provided on anadromous fish habitat associated with each of the structures. Providing adequate fish passage for stream crossing structures across the watershed would be a high priority from a 'strict' fishery point of view. Replacement and/or repair of those structures occurring within anadromous habitat could be

the first step in restoration efforts on the watershed, which address the needs of restoring populations of salmonids.

However, water quality has also been identified as a key concern for the Klawock Watershed. Replacement and/or repair of structures only within anadromous habitat (generally lower in the watershed) may not be balanced with maintenance of high water quality standards throughout the watershed. The cumulative impacts (on both water quality and anadromous habitat) of improperly functioning stream crossing structures and erosion higher in the watershed can lead to degradation of downstream reaches. Balancing the needs for high water quality standards, adequate fish passage and fish habitat, and maintenance of roads that remain open must involve a thorough review of information provided by the Road Condition Surveys as well as the Proper Functioning Condition Assessment (USFS), which together can provide the framework for a prioritization of work and ultimately, the Klawock Watershed restoration and management plan.

ACKNOWLEDGEMENTS

We thank the village corporations of Klawock Heenya, Shaan Seet, and Sealaska for their cooperation in obtaining access to the Klawock Watershed. Bill Peratovich was especially helpful in this respect. The Klawock Watershed Council, and specifically Sam Thomas played a large role in communication and logistical manners, as well as volunteering time in the field. We appreciate help from Sally Merfeld of the Craig Ranger District, USFS in obtaining GIS coverages of the Klawock Watershed, which were useful in field planning activities. The Prince of Wales Hatchery offered the use of a boat, which was never used, but appreciated. Mark Minnillo of ADF&G, Div. of Habitat and Restoration provided critical information of past work on the watershed, future expectations and logistical support. Moira Ingle and Brian Frenette in the Regional Office of H&R reviewed earlier drafts of this manuscript and provided much needed comments. Habitat and Restoration staff responsible for all data collection, entry, and analyses included David Gregovich, Christine Schmale, Sanjay Pyare, Kim Obermeyer and Jeff Nichols.

LITERATURE CITED

ADF&G, Div. of Habitat. 1998. Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes. Six volumes. Alaska Dept. of Fish and Game. Anchorage, AK. Revised periodically.

ADF&G, Div. of Habitat. 1998. An Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes. Six volumes. Alaska Dept. of Fish and Game. Anchorage, AK. Revised periodically.

ADF&G, Div. of Habitat. 2002. Draft GIS data for An Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes. Alaska Dept. of Fish and Game.

Flanders, L.S., and Jim Cariello. 2000. Tongass Road Condition Survey Report. ADF&G Technical Report No. 00-7.

USFS (United States Forest Service). 2002. Klawock Watershed Condition Assessment. Mark J. Lehner, Project Director.

USFS. 2000. Forest Service Handbook; Transportation System Maintenance Handbook FSH7709.58. Region 10 Supplement No. 7709.58-2000-1. 67 pp.

Appendix 1. ADF&G Road Condition Survey ROADS datasheet.

Date_____ Crew_____ Rd. system_____ GPS unit#_____ Camera_____

ID#	Tag?	Waypoint#	Road#	Feature1	Feature2	Length (ft)	Width (ft)	Height (in)	CBW (m)	%_cp blk	cp_ ero	AHMU	erosion slope	Slope Dist_str	Pic#	comments

Appendix 1a. Spreadsheet column header descriptions for the ROADS datasheets (KLW_ROADS.XLS AND KLAWOCK_HOLLIS_HWAY_ROADS.XLS).

PROJCODE: Project code which consists of three letters indicating location followed by one digit indicating the number of the trip to that location (i.e. first trip, second trip) followed by one digit indicating the year (i.e. 2 for 2002, 3 for 2003) Example: klw22 would be the second trip to Klawock in 2002.

SURVIDENT: Unique station id that is made up of trip day followed by team letter followed by the waypoint number. Example: 2A010 is waypoint number 10 and it was taken on day 2 of the trip by team A. All SURVIDENT's are unique within each PROJCODE.

LAT: Latitude coordinates of waypoint in decimal degrees, NAD27, Alaska Zone1

LONG: Longitude coordinates of waypoint in decimal degrees, NAD27, Alaska Zone1

TRIP_DAY: describes what day of the trip it is. 1, 2, 3…

TEAM: Consists of a letter that corresponds with which GPS unit is being used. Example: a team using GPS number 1 would be team "A".

WAYPT: a point taken with a GPS unit.

WAYPT_ERR: waypoint error

SURVDATE: the date on which the data was taken.

ID_NUM: unique identification number given to all features on the watershed. Any items which were noted as "tagged" structures (see next code), will have aluminum tags at that structure in the field, and will also be flagged so they can be found easily.

TAG: indicates a problem feature (i.e., these items were regarded as potential to severe problems which needed to be addressed for a variety of reasons. In some instances, items were tagged, which need further review/visitation from personnel with expertise relating to the type of structure; in most cases this would include road engineers). Some items were tagged which may just need review from the Klawock watershed coordinator, as they may not need any remedy, but should be brought to their attention.

SYSTEM: watershed or road system

CREW: first and last initials of people making up each crew (CS, JN, DG…)

GPS_NUM: GPS unit number (1, 2, 3…)

ROAD_NUM: indicates road number (logging road number, hwy number…)

FEATURE_1, FEATURE_2, FEATURE_3, FEATURE_4: these columns contain codes that indicate features associated with a particular waypoint. See the feature and locator code explanation.xls for full explanation of all variables used.

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LOCATOR: indicate direction for roads and stream confluences. (i.e. RS=right spur, LB=left bank)

CONDITION: Describes the condition of culvert pipes and bridges

LENGTH_CP: length of culvert pipe in feet– **(we added this length to be specific for culvert pipes, bridges, log culverts so that we could differentiate the length of stream crossing features and those of erosional features)**

WIDTH_CP: width of culvert pipe in feet– (same as for length_cp)

HEIGHT_CP: height of culvert pipe in inches– (same as for length_cp)

LENGTH_DPL: length of ditch plugging in feet– (similar to length_cp, and height_cp)

WIDTH_DPL: width of ditch plugging in feet- (similar to length_cp, and height_cp)

LEN_EROS: length of erosion in feet – (similar to length_cp, and height_cp)

WIDTH_EROS: width of erosion in feet – (similar to length_cp, and height_cp)

CBW: stream channel bed width measured in meters

CHANTYPE: stream channel type

USGRADIENT: gradient of a stream on the upstream end of a culvert pipe

DSGRADIENT: gradient of a stream on the downstream end of a culvert pipe

CP_PCT_BLK: % of culvert pipe blockage

CP_EROSION: indicates inlet and/or outlet erosion of the sediment surrounding openings of a culvert pipe. I = inlet erosion only; O = outlet erosion only; I/O = inlet and outlet erosion; N = no erosion present

CE_SL2STRM: slope of the cut-slope erosion towards a stream

DIST2STRM: distance to stream…indicates the distance from cut-slope erosion to a stream in meters

US_AHMU: upstream aquatic habitat management unit. When AHMU was entered it was not verified through trapping, electro-shocking, etc – it was field staff's best guess based on the habitat.

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DS_AHMU: downstream aquatic habitat management unit. When AHMU was entered it was not verified through trapping, electro-shocking, etc – it was field staff's best guess based on the habitat.

CAMERADESC: name of the camera being used

PIC_NUM: picture number as indicated by the camera

PHOTOFILE: file name given to each photo

OFFCMTS: office comments; comments made about the data post field work

FLDCMTS: field comments; comments made about the data while in the field

Appendix 2. ADF&G Road Condition Survey FISH TRAPPING datasheet.

DATE_____ CREW_____

ID#	Waypoint#	Duration (hrs)	Temp (C)	Up_ Trap#	Dn_ Trap#	U_ Coho	U_ DV	U_ CT	U_ SH	D_ Coho	D_ DV	D_ CT	D_ SH	comments

Appendix 2a. Spreadsheet column header descriptions for the FISH TRAPPING datasheets (KLW_FISH_TRAPPING.XLS AND KLAWOCK_HOLLIS_HWAY_FISH_TRAPPING.XLS).

Fish Variable	Variable Explanation
PROJCODE	individual codes for projects (e.g., KLW12 and KLW22 is Klawock watershed proper, KLW32 is the highway)
SURVIDENT	this is identical to SURVIDENT in the ROADS and FISH TRAPPING spreadsheet and is the link between the data in the 3 spreadsheets.
WAYPOINT	waypoint number from GPS Unit.
LAT	latitude in decimal degrees, NAD27 Alaska Zone 1
LONG	longitude in decimal degrees, NAD27 Alaska Zone 1
ID_NUMBER	unique identification number given to all features on the watershed. Any items which were noted as "tagged" structures (see next code), will have aluminum tags at that structure in the field, and will also be flagged so they can be found easily.
CAP_METH	fish capture technique – MTR = Minnow Trap.
DUR	duration – length (hrs) minnow traps were soaked for before checking.
TEMP	water temperature (Celsius)
U_TRP_NUMBER	number of traps placed upstream of stream crossing structure.
D_TRP_NUMBER	number of traps placed downstream of stream crossing structure.
U_CO	number of coho captured in upstream traps
U_DV	number of dolly varden captured in upstream traps
U_CT	number of cutthroat trout captured in upstream traps
U_SH	number of steelhead captured in upstream traps
D_CO	number of coho captured in downstream traps
D_DV	number of dolly varden captured in downstream traps
D_CT	number of cutthroat trout captured in downstream traps
D_SH	number of steelhead captured in downstream traps
OFFICE COMMENTS	ADF&G comments about data collection questions/comments made in the office after data entry
COMMENTS	comments made in the field specific for each road of data entry, if recorded

Appendix 3. ADF&G Road Condition Survey CULVERTS spreadsheet.

Crew_____ Date_____ GPS Unit#_____

ID#	Waypoint#	U_ Grad	D_ Grad	HI	TC_I	CO_I	BLD_C	BLD_T	US_ SBTC_O	TC_O	CO_O	PD	TC	B_TC	OHW_O	OHW_W	comments

U_grad = upstream gradient
D_grad = downstream gradient
HI = height of instrument
TC_I = top of culvert at inlet
CO_I = culvert opening at inlet
BLD_C = bedload coverage %
BLD_T = bedload coverage type
US_SBTC_O = upstream substrate type at opening

TC_O = top of culvert at opening
CO_O = culvert opening at outlet
PD = pool depth
TC = tailcrest
B_TC = bankful at tailcrest
OHW_O = ordinary high water mark downstream
OHW_W = ordinary high water width downstream

Appendix 3a. Spreadsheet column header descriptions for the CULVERTS datasheets (KLW_CULVERTS.XLS AND KLAWOCK_HOLLIS_HWAY_CULVERTS.XLS).

PROJCODE	individual codes for projects (e.g., KLW12 and KLW22 is Klawock watershed proper, KLW32 is the highway)
SURVIDENT	this is identical to SURVIDENT in the ROADS and FISH TRAPPING spreadsheet and is the link between the data in the 3 spreadsheets.
WAYPOINT	waypoint number from GPS Unit.
LAT	latitude in decimal degrees, NAD27 Alaska Zone 1
LONG	longitude in decimal degrees, NAD27 Alaska Zone 1
ID_NUMBER	unique identification number given to all features on the watershed. Any items which were noted as "tagged" structures (see next code), will have aluminum tags at that structure in the field, and will also be flagged so they can be found easily.
U_GRAD	stream gradient measured upstream of culvert pipe
D_GRAD	stream gradient measured downstream of culvert pipe
HI	Height of Instrument - vertical distance b/t the level line of sight and the roadway established by a hand level on a staff at the centerline of the road.
TC_I	top of culvert at inlet - measured as the vertical distance b/t the HI line of sight and the highest point on the top of the culvert. This measurement is used in determining the gradient of the culvert (critical factor in computing flow velocity).
CO_I	culvert opening at inlet - measured as the vertical distance measured from the top of the culvert to the streambed.
BLD_C	culvert bedload coverage - % of culvert's length that is covered with bedload.
BLD_T	culvert bedload type - dominant class of substrate particle size within the culvert.
US_SBTC_O	dominant substrate type upstream of the culvert.
TC_O	top of culvert at outlet - vertical distance between the HI line of sight and the highest point on the top of the culvert at outlet.
CO_O	culvert opening at outlet - measured as the distance from the top of the culvert at the average depth of the bedload in the culvert or the bottom of the culvert (which ever is less).
PD	pool depth - measured as the vertical distance from the top of the culvert outlet and the stream bottom.
TC	tailcrest - measured as the vertical distance b/t the HI line of sight and the lowest point of the streambed at the tailcrest cross section.
B_TC	bedwidth at tailcrest - measured as the horizontal distance from the bottom of bank to the bottom of bank at the tailcrest cross section.
OHW_O	ordinary high water mark downstream - is the vertical distance b/t the HI line of sight and the vegetation line on one side of the channel at the tailcrest cross section.
OHW_W	ordinary high water width downstream - is the horizontal distance b/t the ordinary high water mark on one side of the stream and the ordinary high water mark on the other side of the stream measured at the tailcrest cross section.
OFFICE_COMMENTS	ADFG comments about data collection questions made in the office after data has been collected.
COMMENTS	comments made in the field specific for each row of data entry, if present.

Appendix 4. List of major features encountered during Road Condition Surveys on the Klawock Watershed, Prince of Wales Island, Alaska, 2002. ***These variables were used for FEATURE1, FEATURE2, FEATURE3, FEATURE4.***

feature code	feature description
ANB	Abutment w/ no Bridge
BGF	Barrier, Geologically Fixed
BGR	Start of Road
BRG	Bridge, Undefined
BRR	Barrier
BRS	Begin Road Survey
BVP	Beaver Pond
CMB	Corregated Metal Pipe w/ Baffles
CMP	Corregated Metal Pipe
CON	Confluence
CPP	Corregated Plastic Pipe
CTV	Channel type verification
DPL	Ditch Plugging
DTR	Ditch Crossing/Relief
EDR	End of Road
ERS	End Road Survey
FLS	Fill slumping
FFE	fill falling through road surface
GTC	Gated and Closed
GTO	Gated and Open
HOL	Hole in road surface
LGC	Log Culvert
LSB	Log Stringer Bridge
MOU	Stream mouth
MPB	Mound/Pit blocking car/truck traffic, Traffic Term
ORV	Use by Off-road Vehicles
PIP	Pipe, Undefined
PMB	Permanent (long-term) Bridge
QRY	Quarry
RIS	Road intersection (left – right identified through the locator field)
RCE	Cut slope erosion
RCO	Roadway impassable-Obliterated(FS)-closed road system (FRPA)
RDE	Ditch erosion
RDS	Road Disturbance
REF	general reference point
RFE	Fill slope erosion
RIS	Road system intersection
RQE	Quarry erosion
RRE	Removed Structure Erosion
RRM	Removed Structure
RSA	Stream abutment erosion
RSE	Surface erosion

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RSL	Landslide across road from above
RSN	Missing structure
RSP	Spur Road
RWB	Water Bar or similar device to divert water off ro
RWO	Road Wash Out
RWR	Water running/ponding on road surface
RXG	Road Crossing
RXS	Road Cross-section site
SSL	Landslide in Stream from above
SXG	Stream Crossing
SID	Stream in ditch
TTN	mound/pit blocking, but driveable by off road vehicle
TRB	Tributary
UEF	Upper Extent of Fish Habitat
VEG	Organic Closure
WDC	Wooden Culvert

Appendix 5. List and description of all photographs recorded during Road Condition Surveys on the Klawock Watershed, May-July 2002.

PHOTOFILE	PROJCODE	SURVIDENT	WAYPT	PHOTO(s) DESCRIPTION
IMG_0001.JPG; IMG_0002.JPG	KLW22	1B002	2	stream bank and roadbank erosion
IMG_0004.JPG	KLW22	1B003	3	log culvert and clay transport
IMG_0005.JPG	KLW22	1B004	4	plugging creating small pond
IMG_0007.JPG	KLW22	1B009	9	log culvert
IMG_0008.JPG	KLW22	1B015	15	"CPP is damaged, perched and blocked"
IMG_0009.JPG; IMG_0010.JPG	KLW22	1B018	18	pipe is squashed and water is flowing underneath pipe
IMG_0012.JPG	KLW22	1B019	19	CMP slightly perched
IMG_0013.JPG	KLW22	1B021	21	surface erosion
IMG_0014.JPG	KLW22	1B025	25	plugging creating small pond
IMG_0015.JPG	KLW22	1B027	27	log culvert
IMG_0016.JPG	KLW22	1B030	3	beaver pond
MVC-390F.JPG; MVC-391F.JPG	KLW22	2A005	5	obstructed CMP from beavers
MVC-392F.JPG; MVC-393F.JPG; MVC-394.JPG	KLW22	2A010	10	sediment deposit in area
MVC-395F.jpg;MVC-396F.jpg	KLW22	2A011	11	beaver dam
MVC-397F.jpg	KLW22	2A012	12	removed bridge
IMG_0018.jpg;IMG_0020.jpg	KLW22	2C001	1	structural damage to log bridge
IMG_0021.jpg	KLW22	2C003	3	slightly obstructed stream crossing structure
IMG_0022.jpg	KLW22	2C004	4	surface and slight fillslope erosion
IMG_0023.jpg;IMG_0024.jpg	KLW22	2C009	9	ponding evident due to blockage from sedimentation
IMG_0026.jpg	KLW22	2C012	12	surface erosion
IMG_0027.jpg	KLW22	2C014	14	cutslope erosion slopes onto road and into currently dry streambed
IMG_0028.jpg	KLW22	2C016	16	water ponding in ditch
IMG_0032.jpg;IMG_0033.jpg	KLW22	2C018	18	?
IMG_0029.jpg;IMG_0030.jpg	KLW22	2C019	19	apparently collapsed log culvert; ponding above and below road
IMG_0031.jpg	KLW22	2C021	21	dry stream/ditch channel
IMG_0034.jpg;IMG_0035.jpg	KLW22	3A016	16	obstructed and partially damaged CMP
IMG_0040.jpg	KLW22	3A018	18	log stringer bridge
IMG_0047.jpg;IMG_0048.jpg;IMG_0049.jpg	KLW22	3A019	19	downstream side of log stringer bridge plugged with organic matter
IMG_0050.jpg;IMG_0051.jpg	KLW22	3A020	20	structural damage to log culvert
IMG_0052.jpg	KLW22	3A021	21	chuck holes on log culvert
IMG_0053.jpg	KLW22	3A023	23	partially obstructed log culvert
IMG_0054.jpg	KLW22	3A024	24	fill falling through log culvert road surface
IMG_0055.jpg;IMG_0056.jpg	KLW22	3A025	25	upstream/downstream image of log stringer bridge
IMG_0057.jpg	KLW22	3A026	26	log stringer bridge
IMG_0059.jpg;IMG_0061.jpg	KLW22	3A031	31	structural damage to inlet of pipe leading to obstruction and erosion
IMG_0060.jpg	KLW22	3A032	32	cutslope erosion
IMG_0062.jpg	KLW22	3A033	33	culvert angled incorrectly leading to some inlet erosion
IMG_0065.jpg	KLW22	3A034	34	cutslope erosion
IMG_0066.jpg	KLW22	3A035	35	cutslope erosion

--continued--

Appendix 5 (Page 2 of 6).

PHOTOFILE	PROJCODE	SURVIDENT	WAYPT	PHOTO(s) DESCRIPTION
IMG_0067.jpg	KLW22	3A042	42	cutslope erosion
IMG_0068.jpg	KLW22	3A046	46	veg growing in stream channel above CMP
IMG_0069.jpg	KLW22	3A048	48	cutslope erosion
IMG_0071.jpg	KLW22	3A049	49	CMP
IMG_0074.jpg;IMG_0075.jpg	KLW22	3A051	51	cutslope erosion
IMG_0072.jpg;IMG_0073.jpg	KLW22	3A053	53	perched CMP
IMG_0079.jpg	KLW22	3A057	57	?
IMG_0080.jpg	KLW22	3A058	58	ponding evident due to blockage from sedimentation
IMG_0081.jpg;IMG_0082.jpg	KLW22	4A070	70	cutslope erosion
IMG_0083.jpg;IMG_0084.jpg;IMG_0085.jpg	KLW22	4A073	73	removed structure with lower half still in fill material
IMG_0086.jpg	KLW22	4A075	75	cutslope erosion
IMG_0087.jpg	KLW22	4A076	76	cutslope erosion and small landslide
IMG_0087.jpg	KLW22	4A077	77	cutslope erosion and small landslide
IMG_0089.jpg	KLW22	4A078	78	fill slope erosion and damaged CMP
IMG_0090.jpg	KLW22	4A079	79	cutslope erosion
IMG_0088.jpg	KLW22	4A080	80	improper removal of CMP leads to surface erosion
IMG_0089.jpg	KLW22	4A085	85	?
IMG_0090.jpg	KLW22	4A097	97	?
IMG_0091.jpg;IMG_0092.jpg;IMG_0093.jpg	KLW22	4A110	110	CMP obstructed from road fill
IMG_0094.jpg	KLW22	4A111	111	dry stream/ditch channel
IMG_0099.jpg	KLW22	4A113	113	underside of log culvert
IMG_0100.jpg;IMG_0101.jpg	KLW22	4A114	114	damaged and obstructed CMP
IMG_0102.jpg	KLW22	4A121	121	cutslope erosion
IMG_0103.jpg	KLW22	4A140	140	cutslope erosion
IMG_0104.jpg	KLW22	4A142	142	cutslope erosion
IMG_0105.jpg	KLW22	4A147	147	landslide from above road
MVC-398F.jpg	KLW22	4C056	56	cutslope erosion
MVC-399F.jpg	KLW22	4C058	58	fillslope erosion
MVC-401F.jpg	KLW22	4C064	64	ATM - veg growing on road surface
MVC-403F.jpg	KLW22	4C065	65	cutslope erosion
MVC-404F.jpg	KLW22	4C066	66	surface erosion and possible fill slumping
MVC-405F.jpg	KLW22	4C067	67	missing structure
MVC-402F.jpg	KLW22	4C069	69	missing structure leading to surface erosion
MVC-400F.jpg	KLW22	4C071	71	stream channel with LWD lodged in banks
MVC-406F.jpg	KLW22	4C077	77	fill falling through log culvert road surface
MVC-407F.jpg	KLW22	4C079	79	fill falling through log culvert road surface
MVC-408F.jpg	KLW22	4C082	82	surface erosion
MVC-409F.jpg	KLW22	4C083	83	log culvert
MVC-410F.jpg	KLW22	4C090	90	log culvert

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Appendix 5 (Page 3 of 6).

PHOTOFILE	PROJCODE	SURVIDENT	WAYPT	PHOTO(s) DESCRIPTION
MVC-411F.jpg	KLW22	4C091	91	cutslope erosion
MVC-412F.jpg	KLW22	4C096	96	log culvert
MVC-413F.jpg	KLW22	4C099	99	obstructed log culvert
MVC-416F.jpg	KLW22	5A157	157	surface erosion
MVC-417F.jpg;MVC-418F.jpg	KLW22	5A166	166	cutslope erosion with bedrock falling on road surface
MVC-419F.jpg	KLW22	5A167	167	fill slope erosion
MVC-420F.jpg	KLW22	5A168	168	chuck holes present leading to road failure
MVC-421F.jpg;MVC-422F.jpg	KLW22	5A191	191	cutslope erosion and log culvert failure
MVC-423F.jpg	KLW22	5A194	194	cutslope erosion
MVC-424F.jpg	KLW22	5A198	198	cutslope erosion
MVC-425F.jpg	KLW22	5A200	200	fillslope erosion w/ sediment into stream
img_0050_wp44.jpg; img_0051_wp44.jpg	KLW12	1B044	44	obstructed CMP
MVC-118F.jpg	KLW12	2A311	311	CMP
MVC-119F.jpg	KLW12	2A316	316	ditch plugging
MVC-120F.jpg	KLW12	2A319	319	stream in ditch
MVC-121F.jpg	KLW12	2A327	327	stream in ditch
MVC-122F.jpg	KLW12	2A330	330	channel backcutting above CMP
MVC-124F.jpg;MVC-125F.jpg	KLW12	2A341	341	log stringer bridge
MVC-126F.jpg;MVC-127F.jpg;MVC-128F.jpg;MVC-129F.jpg	KLW12	2A361	361	"blocked CMP, water ponding, road eroding, may fail"
IMG_0006.jpg;IMG_0007.jpg	KLW12	2B056	56	beaver pond
IMG_0008.jpg	KLW12	2B060	60	log culvert
IMG_0009.jpg;IMG_0010.jpg	KLW12	2B061	61	log culvert
IMG_0011.jpg	KLW12	2B063	63	ponding evident due to blockage from sedimentation
IMG_0012.jpg;IMG_0013.jpg;IMG_0014.jpg	KLW12	2B068	68	log culvert
IMG_0015.jpg	KLW12	2B070	70	log culvert
IMG_0016.jpg;IMG_0017.jpg;IMG_0018.jpg;IMG_0019.jpg	KLW12	2B071	71	perched CMP
IMG_0020.jpg;IMG_0021.jpg	KLW12	2B077	77	massive erosion on and in stream bank
IMG_0022.jpg;IMG_0023.jpg	KLW12	2B079	79	log cuvlert
IMG_0024.jpg	KLW12	2B080	80	obstructed culvert
IMG_0025.jpg;IMG_0026.jpg	KLW12	2B082	82	log culvert
IMG_0027.jpg;IMG_0028.jpg	KLW12	2B083	83	log culvert
MVC-132F.jpg	KLW12	3A378	378	overflow channel on road
MVC-133F.jpg	KLW12	3A379	379	CMP with overflow channel on top and 1/2 on the CMP at inlet?
MVC-134F.jpg;MVC-135F.jpg;MVC-136F.jpg	KLW12	3A386	386	past debri flow/slide has scoured channel creating erosion
MVC-137F.jpg;MVC-138F.jpg	KLW12	3A411	411	past landslide scoured channel; deposited on valley floor
MVC-139F.jpg	KLW12	3A415	415	?
MVC-142F.jpg;MVC-143F.jpg	KLW12	3A428	428	landslide scouring stream bed; CMP debri left
IMG_0029.jpg;IMG_0030.jpg	KLW12	3B085	85	plugging creating small pond
IMG_0031.jpg	KLW12	3B086	86	cutslope erosion into ditch

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PHOTOFILE	PROJCODE	SURVIDENT	WAYPT	PHOTO(s) DESCRIPTION
IMG_0032.jpg	KLW12	3B087	87	log culvert
IMG_0033.jpg	KLW12	3B089	89	obstructed structure?
IMG_0034.jpg	KLW12	3B090	90	obstructed log culvert
IMG_0035.jpg	KLW12	3B092	92	log culvert
IMG_0037.jpg	KLW12	3B093	93	obstructed structure?
IMG_0038.jpg	KLW12	3B094	94	ponding evident due to blockage from sedimentation
IMG_0039.jpg	KLW12	3B095	95	surface erosion
IMG_0040.jpg	KLW12	3B096	96	log culvert
IMG_0043.jpg;IMG_0044.jpg;IMG_0045.jpg;IMG_0046.jpg	KLW12	3B097	97	LWD creating cascades
IMG_0041.jpg;IMG_0042.jpg	KLW12	3B098	98	removed structure
IMG_0047.jpg	KLW12	3B099	99	spur road and landing site
IMG_0048.jpg	KLW12	3B100	100	removed structure
IMG_0049.jpg	KLW12	3B101	101	removed CMP near stream
IMG_0050.jpg	KLW12	3B102	102	stream bank erosion
IMG_0051.jpg;IMG_0052.jpg	KLW12	3B108	108	quarry erosion into small stream
IMG_0053.jpg	KLW12	3B110	110	LWD creating cascades
IMG_0054.jpg	KLW12	3B111	111	removed CMP near stream
IMG_0055.jpg	KLW12	3B113	113	stream cascade
IMG_0057.jpg	KLW12	3B114	114	cutslope erosion
IMG_0058.jpg	KLW12	3B115	115	possible landslide deposition area
IMG_0059.jpg	KLW12	3B117	117	stream through landslide deposition area
IMG_0060.jpg;IMG_0061.jpg	KLW12	3B118	118	edge of landslide deposition area
IMG_0063.jpg;IMG_0064.jpg	KLW12	3B119	119	2 side by side 12 inch CMP's
IMG_0065.jpg	KLW12	3B120	120	?
IMG_0066.jpg	KLW12	3B121	121	ditch plugging leading to ponding
IMG_0044.jpg;IMG_0045.jpg	KLW12	4A435	435	?
IMG_0046.jpg	KLW12	4A437	437	?
IMG_0067.jpg	KLW12	4B125	125	surface erosion
IMG_0068.jpg	KLW12	4B126	126	surface erosion
IMG_0069.jpg	KLW12	4B127	127	obstructed outlet CMP for ditch
IMG_0070.jpg	KLW12	4B128	128	surface erosion
IMG_0071.jpg	KLW12	4B129	129	fill slope erosion and road failure
IMG_0072.jpg	KLW12	4B130	130	fill slope erosion and road failure
IMG_0074.jpg	KLW12	4B132	132	partially obstructed log culvert
IMG_0075.jpg	KLW12	4B133	133	cutslope erosion
IMG_0076.jpg	KLW12	4B135	135	surface erosion
IMG_0077.jpg	KLW12	4B137	137	partially obstructed log culvert
IMG_0078.jpg	KLW12	4B138	138	cutslope erosion falling into ditch
IMG_0079.jpg	KLW12	4B139	139	obstructed CMP at inlet
IMG_0080.jpg;IMG_0081.jpg;IMG_0082.jpg	KLW12	4B140	140	cutslope erosion near stream

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Appendix 5 (Page 5 of 6).

PHOTOFILE	PROJCODE	SURVIDENT	WAYPT	PHOTO(s) DESCRIPTION
IMG_0083.jpg	KLW12	4B141	141	sediment/substrate leading to obstructed CMP and erosion
IMG_0084.jpg	KLW12	4B142	142	cutslope erosion
IMG_0085.jpg	KLW12	4B143	143	cutslope erosion
IMG_0087.jpg	KLW12	4B144	144	CMP
IMG_0086.jpg	KLW12	4B145	145	cutslope erosion
IMG_0088.jpg	KLW12	4B146	146	cutslope erosion
IMG_0089.jpg	KLW12	4B147	147	fill slope erosion
IMG_0090.jpg	KLW12	4B148	148	cutslope erosion
IMG_0092.jpg	KLW12	4B149	149	undescribed erosion
IMG_0091.jpg	KLW12	4B150	150	fill slope erosion into stream
IMG_0093.jpg	KLW12	4B151	151	perched CMP for ditch
IMG_0096.jpg	KLW12	4B152	152	cutslope erosion
IMG_0097.jpg	KLW12	4B154	154	cutslope erosion
IMG_0099.jpg	KLW12	4B158	158	removed structure
IMG_0100.jpg	KLW12	4B161	161	cutslope erosion
IMG_0101.jpg	KLW12	4B162	162	removed structure
IMG_0102.jpg	KLW12	4B163	163	surface erosion
IMG_0104.jpg	KLW12	4B168	168	removed structure
IMG_0105.jpg	KLW12	4B170	170	cutslope erosion
IMG_0106.jpg;IMG_0107.jpg	KLW12	4B172	172	cutslope erosion measurements
IMG_0108.jpg	KLW12	4B173	173	cutslope erosion and LWD
IMG_0110.jpg;IMG_0111.jpg	KLW12	4B174	174	cutslope erosion
IMG_0109.jpg	KLW12	4B175	175	removed and discarded CMP
IMG_0112.jpg	KLW12	4B177	177	cutslope erosion
IMG_0113.jpg	KLW12	4B182	182	cutslope and surface erosion
IMG_0114.jpg	KLW12	4B184	184	cutslope erosion
IMG_0119.jpg	KLW12	4B189	189	removed structure/tank trap/water bar
IMG_0118.jpg	KLW12	4B189	189	cutslope erosion and waterbar/removed structure
IMG_0126.jpg	KLW12	4B195	195	landslide from above road
IMG_0122.jpg	KLW12	5B228	228	skid/cat road w/ no fill
IMG_0123.jpg	KLW12	5B233	233	removed structure
IMG_0124.jpg;IMG_0125.jpg;IMG_0126.jpg	KLW12	5B245	245	landslide through stream crossing and CMP
IMG_0127.jpg	KLW12	5B250	250	cutslope erosion
IMG_0128.jpg	KLW12	5B250	250	surface erosion and possible fill slumping
IMG_0129.jpg	KLW12	5B252	252	fill slope erosion
IMG_0131.jpg	KLW12	5B264	264	CMP with some outlet erosion
MVC-378F.jpg	KLW12	6C074	74	CMP
MVC-379F.jpg	KLW12	6C075	75	log stringer bridge
MVC-380F.jpg;MVC-381F.jpg	KLW12	6C084	84	beaver activity obstructing CMP

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PHOTOFILE	PROJCODE	SURVIDENT	WAYPT	PHOTO(s) DESCRIPTION
MVC-382F.jpg;MVC-383F.jpg	KLW12	6C085	85	beaver activity obstructing CMP
MVC-385F.jpg	KLW12	7C111	111	water through roadbed
MVC-388F.jpg	KLW12	7C114	114	skid/cat road with no fill near stream
IMG_0008.JPG;IMG_0009.JPG;IMG_0010.JPG	KLW32	3C100	100	perched CMP
IMG_0001.JPG;IMG_0002.JPG;IMG_0003.JPG;IMG_0004.JPG	KLW32	1B001	1	beaver gate on CMP and damage to CMP
IMG_0005.JPG;IMG_0006.JPG	KLW32	1B002	2	perched CMP
IMG_0007.JPG;IMG_0008.JPG	KLW32	1B003	3	CMP - outlet perched; inlet obstructed
IMG_0011.JPG;IMG_0012.JPG	KLW32	1B004	4	CMP - inlet obstructed; outlet crushed/damaged
IMG_0013.JPG;IMG_0014.JPG;IMG_0015.JPG	KLW32	2B005	5	CMP - inlet obstructed; outlet perched slightly
IMG_0016.JPG;IMG_0017.JPG;IMG_0018.JPG	KLW32	2B006	6	CMP - inlet obstructed
IMG_0019.JPG	KLW32	2B007	7	CMP with dry ditch
IMG_0020.JPG	KLW32	2B008	8	CMP
IMG_0021.JPG	KLW32	2B009	9	CMP - inlet crushed
IMG_0022.JPG;IMG_0023.JPG	KLW32	2B010	10	CMP - inlet crushed; outlet obstructed
IMG_0029.JPG;IMG_0030.JPGIMG_0031.JPG	KLW32	2B011	11	geologic barrier
IMG_0032.JPG;IMG_0033.JPG	KLW32	2B012	12	CMP - damaged
IMG_0034.JPG;IMG_0035.JPG	KLW32	2B013	13	CMP
IMG_0036.JPG;IMG_0037.JPG	KLW32	2B014	14	CMP on inlet creek
IMG_0038.JPG;IMG_0039.JPG	KLW32	2B016	16	CMP - inlet obstructed
IMG_0040.JPG;IMG_0041.JPG	KLW32	2B017	17	CMP
IMG_0042.JPG	KLW32	2B018	18	CMP with dry ditch
IMG_0043.JPG;IMG_0044.JPG;IMG_0045.JPG	KLW32	2B020	20	CMP perched
IMG_0046.JPG	KLW32	2B021	21	CMP with dry ditch
IMG_0047.JPG;IMG_0048.JPG;IMG_0049.JPG;IMG_0050.JPG	KLW32	2B022	22	CMP with outlet perched
IMG_0051.JPG	KLW32	2B023	23	CMP with outlet perched
IMG_0052.JPG;IMG_0053.JPG	KLW32	2B024	24	CMP - obstructed
IMG_0054.JPG;IMG_0055.JPG	KLW32	2B026	26	CMP - obstructed partially
IMG_0056.JPG	KLW32	2B027	27	CMP
IMG_0057.JPG	KLW32	2B029	29	CMP
IMG_0058.JPG;IMG_0059.JPG;IMG_0060.JPG	KLW32	2B035	35	CMP - ditch plugging leading to pavement failure?
IMG_0061.JPG	KLW32	2B042	42	CMP - slightly damaged
IMG_0062.JPG;IMG_0063.JPG;IMG_0064.JPG	KLW32	2B044	44	CMP - perched
IMG_0065.JPG;IMG_0066.JPG;IMG_0067.JPG	KLW32	3B046	46	multiple CMP on 3 mile
IMG_0065.JPG;IMG_0066.JPG;IMG_0067.JPG	KLW32	3B047	47	multiple CMP on 3 mile
MVC-455F.JPG;MVC-456F.JPG;MVC-457F.JPG	KLW32	3B059	59	damaged CMP
MVC-461F.JPG	KLW32	3B071	71	CMP in veg
MVC-462F.JPG;MVC-463F.JPG	KLW32	3B074	74	CMP perched
MVC-464F.JPG	KLW32	3B076	76	CMP inlet crushed causing ponding upstream
MVC-465F.JPG;MVC-466F.JPG	KLW32	3B082	82	CMP and stream choked with veg
MVC-467F.JPG	KLW32	3B083	83	stream choked - cant find structure
IMG_0069.JPG	KLW32	4B084	84	CMP

Appendix 6. Summary of all fish trapping efforts on the Klawock Watershed during Road Condition Surveys, May-July, 2002 on Prince of Wales Island, SE Alaska.

						Coho		Dolly Varden		Cutthroat Trout	
PROJCODE	SURVIDENT	Waypoint#	# up_str traps	# down_str traps	Type of crossing structure[A]	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
KLW12	2A341	341	2	2	LGC	0	0	1	1	1	3
KLW12	2A335	335	0	2	CMP	NA	0	NA	0	NA	0
KLW12	3A417	417	2	2	CMP	0	0	0	0	0	0
KLW12	3A418	418	0	2	LGC	NA	0	NA	0	NA	0
KLW12	3A419	419	2	2	CMP	0	0	0	0	0	0
KLW12	4A435	435	0	3	CMP	NA	**1**	NA	0	NA	0
KLW12	4A437	437	2	0	LGC	**6**	NA	0	NA	0	NA
KLW12	1B044	044	1	1	CMP	0	0	0	0	0	0
KLW12	2B061	061	1	1	LSB	0	0	0	0	0	0
KLW12	2B068	068	1	1	LSB	0	0	0	0	0	0
KLW12	2B076	076	0	1	RRM	NA	0	NA	0	NA	0
KLW12	3B089	089	1	1	LGC	0	0	0	0	0	1
KLW12	3B092	092	1	1	LGC	0	0	0	0	0	0
KLW12	5B246	246	1	1	LSB	0	0	0	0	0	1
KLW12	5B247	247	0	1	NONE	NA	0	NA	0	NA	0
KLW12	5B248	248	0	1	NONE	NA	0	NA	0	NA	0
KLW12	6C074	074	0	2	CMP	NA	0	NA	1	NA	6
KLW22	4C083	083	2	2	LSB	0	0	0	0	3	4
KLW22	4C090	090	0	2	LSB	NA	0	NA	0	NA	1
KLW22	5A225	225	0	1	LGC	NA	0	NA	0	NA	0
KLW22	4A109	109	1	2	LSB	0	0	0	0	2	1
KLW22	4A114	114	1	1	CMP	0	0	0	0	1	0
KLW22	4A113	113	2	2	LSB	0	0	1	1	2	4
KLW22	4A118	118	2	2	LSB	0	0	0	0	0	0
KLW22	4A130	130	2	2	LSB	0	0	1	1	1	7
KLW22	5C192	192	2	2	LGC	0	0	0	5	2	2
KLW22	2A002	002	1	1	CMP	0	0	0	1	0	0
KLW22	2A003	003	2	2	NONE	0	0	1	0	0	0
KLW22	2A010	010	1	1	RRM	**4**	**5**	4	0	3	0
KLW22	2A011	011	1	1	RRM	**7**	**2**	8	6	0	6
KLW22	3A016	016	2	2	CMP	**11**	**8**	6	6	7	2

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						Coho		Dolly Varden		Cutthroat Trout	
PROJCODE	SURVIDENT	Waypoint#	# up_str traps	# down_str traps	Type of crossing structure[A]	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
KLW22	3A018	018	1	1	LSB	**10**	**9**	8	6	3	1
KLW22	3A019	019	1	1	LSB	**6**	**1**	11	1	1	0
KLW22	3A020	020	1	2	LSB	0	**5**	0	2	0	0
KLW22	3A022	022	1	1	LSB	**6**	**10**	0	0	0	0
KLW22	3A023	023	1	1	LSB	**12**	**4**	1	0	0	1
KLW22	3A025	025	0	1	LSB	NA	**7**	NA	4	NA	1
KLW22	3A026	026	1	1	LSB	**10**	**5**	1	8	3	0
KLW22	3A031	031	1	1	CMP	0	0	1	6	1	1
KLW22	3A033	033	1	0	CMP	0	NA	0	NA	0	NA
KLW22	3A053	053	1	1	CMP	0	0	0	3	0	0
KLW22	1B003	003	0	2	LGC	NA	0	NA	10	NA	1
KLW22	1B007	007	2	2	LSB	0	0	4	1	0	0
KLW22	1B011	011	2	2	CPP	0	**1**	1	5	1	5
KLW22	1B018	018	2	2	CMP	**1**	**6**	8	4	8	3
KLW22	1B019	019	2	2	CMP	**6**	**5**	7	2	1	3
KLW22	1B025	025	1	0	RSN	**9**	NA	7	NA	0	NA
KLW22	1B030	030	1	0	CMP	0	NA	0	NA	0	NA
KLW22	1B027	027	1	1	LGC	0	**1**	2	0	0	0
KLW22	2C001	001	1	1	LSB	0	0	4	0	1	0
KLW22	2C003	003	1	1	LSB	0	0	2	0	0	0
KLW22	2C009	009	1	0	LGC	0	NA	0	NA	0	NA
KLW22	2C018	018	2	2	LSB	0	0	2	5	1	1
KLW32	3B050	050	2	2	CMP	0	0	7	5	1	5
KLW32	3B051	051	0	2	CMP	NA	0	NA	4	NA	1
KLW32	3B052	052	2	2	CMP	0	0	19	32	4	3
KLW32	3B053	053	2	2	CMP	0	0	7	7	0	2
KLW32	3B063	063	2	2	CMP	0	**8**	1	40	1	10
KLW32	3B064	064	2	2	CMP	0	0	2	2	0	0
KLW32	3B074	074	2	2	CMP	**4**	**1**	1	3	8	3
KLW32	3B075	075	2	2	CMP	0	**7**	0	3	0	1
KLW32	3B083	083	2	2	CMP	**10**	**10**	2	5	0	0
KLW32	3C100	100	2	2	CMP	**3**	**7**	15	7	10	4
KLW32	3C101	101	2	2	CMP	0	0	1	2	0	0
KLW32	2B008	008	0	2	CMP	NA	**1**	NA	0	NA	6

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						Coho		Dolly Varden		Cutthroat Trout	
PROJCODE	SURVIDENT	Waypoint#	# up_str traps	# down_str traps	Type of crossing structure[A]	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
KLW32	2B013	013	2	2	CMP	0	**1**	8	8	6	1
KLW32	2B017	017	0	1	CMP	NA	**3**	NA	5	NA	0
KLW32	2B019	019	2	2	CMP	0	**3**	3	0	1	0
KLW32	2B020	020	1	2	CMP	0	0	3	2	0	0
KLW32	2B022	022	2	2	CMP	0	0	2	3	1	2
KLW32	2B038	038	1	0	CMP	0	NA	4	NA	0	NA
KLW32	2B044	044	2	2	CMP	0	**7**	5	5	1	2
KLW32	2B043	043	0	1	CMP	NA	0	NA	1	NA	0

A Type of Crossing Structure – this is the stream crossing structure allowing the stream to pass over or under the road surface. Codes are as follows:

CMP – corrugated metal culvert pipe
CPP – corrugated plastic culvert pipe
LGC – log culvert
LSB – log stringer bridge
NONE - no structure is currently in place
RRM - removed structure (i.e., a structure was in place in the past, but had been removed prior to RCS)
RSN - missing structure (i.e., no structure has been placed at these locations to allow streams under or over the road surface)

Appendix 7. Type, feature, condition and associated measurements of all culvert pipes in the Klawock Watershed recorded during Road Condition Surveys, May-July, 2002. *(All column headers are explained in the various variable explanation documents on the CD's)*

PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW22	1B018	18	6000000	CMP	SXG	CRU	39	NA	NA	I/O	1	1	IMG_0009.JPG; IMG_0010.JPG
KLW22	1B019	19	6000000	CMP	SXG	PER	24	0.7	0%	N	1	1	IMG_0012.JPG
KLW22	1B023	23	6000000	CMP	DTR	OBS	NA	NA	100%	NA	NA	NA	
KLW22	1B030	30	6000000	CMP	SXG	OBS	18	0.3	80%	N	2	2	IMG_0016.JPG
KLW22	2A002	2	6036000	CMP	SXG		36	NA	0%	NA	2		
KLW22	2A005	5	6036000	CMP	SXG	OBS	48	3.5	90%	NA	NA	NA	MVC-390F.JPG; MVC-391F.JPG
KLW22	2C005	5	6000000	CMP	DTR		18	NA	0%	N	NA	NA	
KLW22	3A016	16	6014000	CMP	SXG	OBS	36	3.0	25%	N	1	1	IMG_0034.jpg;IMG_0035.jpg
KLW22	3A031	31	6014000	CMP	SXG		36	1.0	5%	I/O	2	2	IMG_0059.jpg;IMG_0061.jpg
KLW22	3A033	33	6014900	CMP	SXG	OBS	24	0.3	20%	I/O	NA	NA	IMG_0062.jpg
KLW22	3A046	46	6014900	CMP	SXG		24	NA	NA	I/O	5	5	IMG_0068.jpg
KLW22	3A049	49	6014900	CMP	SXG		24	NA	NA	NA	5	5	IMG_0071.jpg
KLW22	3A053	53	6014900	CMP	SXG		36	1.0	0%	I/O	2	2	IMG_0072.jpg;IMG_0073.jpg
KLW22	4A071	71	6000000	CMP	SXG	OBS	18	0.1	50%	N	5	5	
KLW22	4A072	72	6000000	CMP	SXG	OBS	12	0.3	70%	I/O	5	5	
KLW22	4A073	73	6000000	CMP	SXG	CRB	36	1.5	NA	I/O	4	4	IMG_0083.jpg;IMG_0084.jpg;IMG_0085.jpg
KLW22	4A092	92	6042000	CMP	SXG		12	0.3	10%	I/O	5	5	
KLW22	4A095	95	6042000	CMP	DTR	OBS	12	NA	90%	N	NA	NA	
KLW22	4A096	96	6042000	CMP	DTR	OBS	12	NA	70%	N	NA	NA	
KLW22	4A098	98	6042000	CMP	SXG	CRU	12	0.2	100%	I/O	5	5	
KLW22	4A099	99	6042000	CMP	SXG		24	0.4	0%	I/O	4	4	
KLW22	4A102	102	6042000	CMP	SXG		24	1.0	0%	I/O	4	4	
KLW22	4A103	103	6042000	CMP	SXG		24	0.3	0%	I/O	5	5	
KLW22	4A110	110	6000000	CMP	SXG	OBS	18	0.5	100%	I/O	NA	NA	IMG_0091.jpg;IMG_0092.jpg;IMG_0093.jpg
KLW22	4A111	111	6000000	CMP	DTR	OBS	18	NA	50%	I/O	NA	NA	IMG_0094.jpg
KLW22	4A114	114	6000000	CMP	SXG	OBS	36	1.0	100%	I/O	2	2	IMG_0100.jpg;IMG_0101.jpg
KLW22	4A115	115	6000000	CMP	SXG		18	0.3	0%	I	4	4	
KLW22	4A117	117	6000000	CMP	DTR	OBS	18	NA	30%	N	NA	NA	
KLW22	4A119	119	6000000	CMP	SXG	OBS	18	0.2	100%	N	5	5	

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PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW22	4A120	120	6000000	CMP	SXG	OBS	24	0.4	20%	N	4		4
KLW22	4A122	122	6000000	CMP	SXG		24	NA	5%	NA	5		5
KLW22	4A145	145	6039000	CMP	DTR		18	NA	0%	I/O	NA	NA	
KLW22	4A146	146	6039000	CMP	SXG		24	NA	NA	NA	5		5
KLW22	4A148	148	6039000	CMP	SXG		18	NA	NA	NA	4		4
KLW22	4A151	151	6039000	CMP	DTR		24	NA	0%	NA	NA	NA	
KLW22	4B062	62	6041000	CMP	DTR	OBS	18	NA	90%	I/O	NA	NA	
KLW22	4B064	64	6041000	CMP	SXG	OBS	18	1.0	50%	I	NA	NA	
KLW22	4B066	66	6041000	CMP	DTR	OBS	18	NA	70%	N	NA	NA	
KLW22	4B067	67	6041000	CMP	SXG	OBS	24	1.0	50%	N	4		4
KLW22	4B070	70	6041000	CMP	DTR	PER	18	NA	0%	I	NA	NA	
KLW22	4B073	73	6041000	CMP	DTR	OBS	18	NA	30%	I	NA	NA	
KLW22	4B074	74	6041000	CMP	SXG	OBS	36	1.0	100%	NA	4		4
KLW22	4C092	92	6000000	CMP	SXG		NA	NA	NA	NA	NA	NA	
KLW22	5A156	156	6033000	CMP	SXG	OBS	24	0.5	50%	I/O	4		4
KLW22	5A202	202	6033000	CMP	DTR	OBS	24	NA	40%	N	NA	NA	
KLW22	5A206	206	6033000	CMP	SXG		24	0.5	0%	N	4		4
KLW22	5A209	209	6033000	CMP	SXG		18	0.5	0%	N	5		5
KLW22	5A210	210	6033000	CMP	SXG	OBS	18	0.5	50%	I	5		5
KLW22	5A217	217	6033000	CMP	SXG		18	1.0	5%	I/O	4		4
KLW22	5A222	222	6033700	CMP	SXG		24	0.5	5%	I	4		4
KLW22	5A233	233	6033400	CMP	DTR	OBS	18	NA	100%	I	NA	NA	
KLW22	5A234	234	6033400	CMP	SXG	OBS	18	0.3	70%	I	5		5
KLW22	5A241	241	6033400	CMP	SXG	OBS	12	0.5	30%	I	4		4
KLW22	5A245	245	6033400	CMP	SXG	OBS	18	2.0	100%	I	3		3
KLW22	5A247	247	6033400	CMP	SXG	OBS	18	0.5	50%	I	4		4
KLW22	5A262	262	6032000	CMP	SXG	PER	24	0.3	0%	I/O	3		3
KLW22	5C111	111	6026000	CMP	SXG		NA	NA	NA	NA	3		3
KLW22	5C118	118	6026000	CMP	DTR		18	NA	NA	NA	NA	NA	
KLW22	5C139	139	6026500	CMP	SXG		48	NA	NA	NA	NA	NA	
KLW22	5C154	154	6026500	CMP	SXG		24	NA	NA	NA	3		3
KLW22	5C166	166	6026400	CMP	SXG		24	0.2	0%	N	4		4
KLW22	5C172	172	6026200	CMP	DTR		12	NA	NA	NA	NA	NA	
KLW22	5C177	177	6026200	CMP	SXG	PER	24	0.4	NA	NA	NA	NA	

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PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW12	1B044	44	5025000	CMP	SXG		36	0.7	0%	I/O	2	2	img_0050_wp44.jpg; img_0051_wp44.jpg
KLW12	2A311	311	5025000	CMP	SXG		24	1.0	NA	O	3	3	MVC-118F.jpg
KLW12	2A313	313	5025000	CMP	DTR		18	NA	0%	O	NA	NA	
KLW12	2A316	316	5025000	CMP	SXG		24	0.5	0%	N	4	4	MVC-119F.jpg
KLW12	2A317	317	5025000	CMP	DTR		24	NA	0%	O	NA	NA	
KLW12	2A318	318	5025000	CMP	SXG	OBS	18	NA	40%	I/O	4	4	
KLW12	2A321	321	5025300	CMP	SXG		18	1.0	10%	I/O	3	3	
KLW12	2A324	324	5025300	CMP	DTR	OBS	18	NA	50%	NA	NA	NA	
KLW12	2A325	325	5025300	CMP	SXG	OBS	18	0.5	50%	I/O	3	3	
KLW12	2A326	326	5025300	CMP	DTR		18	NA	NA	NA	4	4	
KLW12	2A329	329	5025300	CMP	SXG		NA	0.5	0%	I/O	4	4	
KLW12	2A330	330	5025300	CMP	SXG		18	0.7	0%	I/O	NA	NA	MVC-122F.jpg
KLW12	2A332	332	5025300	CMP	DTR		NA	NA	0%	NA	NA	NA	
KLW12	2A335	335	5025300	CMP	SXG	OBS	24	0.7	30%	I/O	NA	NA	
KLW12	2A337	337	5025300	CMP	DTR		18	NA	NA	NA	NA	NA	
KLW12	2A339	339	5025300	CMP	SXG		18	0.5	0%	N	4	4	
KLW12	2A346	346	5025000	CMP	SXG		18	0.4	0%	O	4	4	
KLW12	2A347	347	5025000	CMP	SXG	OBS	24	0.7	20%	I/O	4	4	
KLW12	2A352	352	5025000	CMP	SXG		24	0.5	NA	I/O	NA	NA	
KLW12	2A353	353	5025000	CMP	SXG	OBS	36	0.7	20%	I/O	4	4	
KLW12	2A355	355	5025000	CMP	SXG	OBS	18	0.4	100%	I/O	4	4	
KLW12	2A357	357	5025000	CMP	SXG		18	1.0	NA	I/O	3	3	
KLW12	2A358	358	5025000	CMP	SXG	OBS	18	NA	50%	I/O	3	3	
KLW12	2A359	359	5025000	CMP	SXG	OBS	36	1.3	90%	I/O	NA	NA	
KLW12	2A361	361	5025600	CMP	SXG	OBS	24	1.0	100%	I/O	NA	NA	MVC-126F.jpg;MVC-127F.jpg;MVC-128F.jpg;MVC-129F.jpg
KLW12	2A362	362	5025600	CMP	SXG	OBS	24	1.0	20%	I/O	NA	NA	
KLW12	2A363	363	5025600	CMP	SXG	OBS	18	0.5	30%	I/O	NA	NA	
KLW12	2A364	364	5025600	CMP	SXG		18	0.3	0%	NA	NA	NA	
KLW12	2A365	365	5025600	CMP	SXG	OBS	24	0.7	50%	I/O	NA	NA	
KLW12	2A366	366	5025600	CMP	SXG		24	0.5	0%	I/O	NA	NA	
KLW12	2A368	368	5025700	CMP	SXG	OBS	18	0.5	60%	I/O	NA	NA	
KLW12	2A369	369	5025700	CMP	SXG	OBS	18	0.5	30%	I/O	NA	NA	
KLW12	2A370	370	5025700	CMP	SXG		18	0.3	0%	I/O	NA	NA	
KLW12	2B071	71	5032000	CMP	SXG		18	0.6	NA	NA	4	4	IMG_0016.jpg;IMG_0017.jpg;IMG_0018.jpg;IMG_0019.jpg

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PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW12	2B080	80	5032000	CMP	SXG		18	0.1	NA	I/O	NA	NA	IMG_0024.jpg
KLW12	2B081	81	5032000	CMP			NA	NA	NA	NA	5	5	
KLW12	3A377	377	5022000	CMP	DTR	OBS	18	0.4	30%	O	NA	NA	
KLW12	3A378	378	5022000	CMP	SXG		24	1.0	10%	I/O	NA	NA	MVC-132F.jpg
KLW12	3A379	379	5022000	CMP	SXG	OBS	24	0.5	99%	I/O	NA	NA	MVC-133F.jpg
KLW12	3A384	384	5022000	CMP	DTR		NA	NA	NA	NA	NA	NA	
KLW12	3A385	385	5022000	CMP	DTR	OBS	18	NA	90%	NA	NA	NA	
KLW12	3A386	386	5022000	CMP	SXG		36	2.0	10%	I/O	NA	NA	MVC-134F.jpg;MVC-135F.jpg;MVC-136F.jpg
KLW12	3A387	387	5022000	CMP	SXG	OBS	NA	NA	40%	NA	4	4	
KLW12	3A392	392	5025000	CMP	SXG		18	0.1	NA	NA	NA	NA	
KLW12	3A393	393	5025000	CMP	SXG	OBS	18	0.5	20%	I/O	4	4	
KLW12	3A396	396	5025000	CMP	DTR	OBS	18	NA	50%	I/O	NA	NA	
KLW12	3A398	398	5025000	CMP	SXG		18	0.5	10%	I/O	NA	NA	
KLW12	3A399	399	5025000	CMP	SXG	OBS	18	0.7	15%	I	NA	NA	
KLW12	3A400	400	5025000	CMP	SXG		18	0.5	10%	I/O	NA	NA	
KLW12	3A403	403	5025000	CMP	SXG	OBS	36	1.0	50%	I/O	4	4	
KLW12	3A404	404	5025000	CMP	SXG	OBS	18	0.5	40%	I	4	4	
KLW12	3A406	406	5025000	CMP	DTR		18	NA	NA	NA	NA	NA	
KLW12	3A408	408	5025000	CMP	SXG	OBS	24	0.5	50%	I/O	4	4	
KLW12	3A409	409	5025000	CMP	SXG	OBS	24	0.5	50%	I/O	NA	NA	
KLW12	3A411	411	5025000	CMP	SXG	OBS	36	2.5	80%	I/O	3	3	MVC-137F.jpg;MVC-138F.jpg
KLW12	3A413	413	5025000	CMP	SXG	OBS	18	0.5	100%	I/O	NA	NA	
KLW12	3A416	416	5025000	CMP	SXG	OBS	18	0.8	90%	I/O	4	4	
KLW12	3A417	417	5025000	CMP	SXG	OBS	48	2.5	30%	I/O	2	2	
KLW12	3A419	419	5025000	CMP	SXG	OBS	24	NA	100%	NA	1	2	
KLW12	3A420	420	5025000	CMP	SXG	OBS	18	0.6	99%	NA	3	3	
KLW12	3A421	421	5025000	CMP	SXG	OBS	24	0.5	50%	NA	4	4	
KLW12	3A422	422	5025000	CMP	SXG	OBS	18	0.5	100%	NA	4	4	
KLW12	3A423	423	5025000	CMP	SXG	OBS	18	0.5	100%	NA	4	4	
KLW12	3A424	424	5025000	CMP	DTR	OBS	18	NA	100%	NA	4	4	
KLW12	3A426	426	5025000	CMP	DTR		18	NA	NA	NA	4	4	
KLW12	3A428	428	5025000	CMP	SXG	OBS	24	2.0	100%	I/O	NA	NA	MVC-142F.jpg;MVC-143F.jpg
KLW12	3A430	430	5025000	CMP	SXG	OBS	36	NA	20%	I/O	NA	NA	
KLW12	3A431	431	5025000	CMP	DTR		18	NA	NA	NA	NA	NA	

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PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW12	3A432	432	5025000	CMP	DTR	OBS	18	NA	50%	I/O	NA	NA	
KLW12	3B119	119	5032000	CMP	SXG		12	0.5	NA	NA	NA	NA	IMG_0063.jpg;IMG_0064.jpg
KLW12	3B121	121	5032000	CMP	SXG		12	NA	NA	NA	NA	NA	IMG_0066.jpg
KLW12	4A435	435	5024000	CMP	SXG	OBS	24	1.0	30%	I/O	NA	NA	IMG_0044.jpg;IMG_0045.jpg
KLW12	4B127	127	5032300	CMP	SXG	OBS	18	NA	100%	NA	4	4	IMG_0069.jpg
KLW12	4B139	139	5032300	CMP	DTR		NA	NA	NA	NA	NA	NA	IMG_0079.jpg
KLW12	4B141	141	5032300	CMP	SXG		24	NA	NA	I/O	4	4	IMG_0083.jpg
KLW12	4B144	144	5032300	CMP	SXG		24	NA	NA	NA	NA	NA	IMG_0087.jpg
KLW12	4B149	149	5032300	CMP	SXG	OBS	36	1.5	85%	NA	3	3	IMG_0092.jpg
KLW12	4B151	151	5032300	CMP	SXG		18	NA	NA	NA	5	5	IMG_0093.jpg
KLW12	4B153	153	5032300	CMP	SXG		18	NA	NA	NA	5	5	
KLW12	5B239	239	5025000	CMP	DTR		18	NA	NA	NA	NA	NA	
KLW12	5B241	241	5025000	CMP	SXG	OBS	18	NA	100%	NA	4	4	
KLW12	5B245	245	5025000	CMP	SXG		NA	NA	NA	NA	3	3	IMG_0124.jpg;IMG_0125.jpg;IMG_0126.jpg
KLW12	5B250	250	5025000	CMP	SXG		36	NA	NA	NA	3	3	
KLW12	5B262	262	5017000	CMP	SXG		36	NA	NA	NA	4	4	
KLW12	5B263	263	5017000	CMP	SXG		36	NA	NA	NA	5	5	
KLW12	5B264	264	5017000	CMP	SXG		36	NA	NA	I/O	4	4	IMG_0131.jpg
KLW12	5B265	265	5017000	CMP	SXG		36	NA	NA	NA	4	4	
KLW12	5C049	49	5025900	CMP	DTR	OBS	18	NA	15%	NA	NA	NA	
KLW12	5C050	50	5025900	CMP	SXG	OBS	18	NA	20%	NA	5	5	
KLW12	5C060	60	5022500	CMP	SXG	OBS	24	0.4	40%	I/O	4	4	
KLW12	6C074	74	5025000	CMP	SXG		24	1.3	0%	I/O	2	2	MVC-378F.jpg
KLW12	6C078	78	5025000	CMP	DTR		18	NA	NA	NA	NA	NA	
KLW12	6C079	79	5025000	CMP	DTR		18	NA	NA	NA	NA	NA	
KLW12	6C082	82	6036000	CMP	SXG		36	1.0	0%	NA	2	2	
KLW12	6C084	84	6036000	CMP	SXG	OBS	48	5.0	NA	NA	1	2	MVC-380F.jpg;MVC-381F.jpg
KLW12	6C092	92	6000000	CMP	SXG		18	NA	NA	NA	5	5	
KLW12	6C094	94	6000000	CMP	SXG	OBS	NA	NA	15%	NA	5	5	
KLW12	7C105	105	5016000	CMP	SXG	OBS	24	NA	100%	NA	4	5	
KLW12	7C106	106	5016000	CMP	SXG	OBS	24	NA	20%	NA	4	4	
KLW12	7C107	107	5016000	CMP	SXG	OBS	18	NA	100%	NA	5	5	
KLW12	7C109	109	5016000	CMP	SXG	OBS	24	NA	30%	NA	NA	NA	
KLW12	7C110	110	5016000	CMP	DTR	OBS	18	NA	50%	NA	NA	NA	

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PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW12	7C114	114	5012000	CMP	SXG		18	2.0	NA	NA	1	2	MVC-388F.jpg
KLW22	1B010	10	6000000	CPP	SXG	CRB	NA	NA	30%	NA	4	4	
KLW22	1B011	11	6000000	CPP	SXG		24	1.0	0%	N	2	1	
KLW22	1B014	14	6000000	CPP	SXG		24	0.5	0%	N	4	4	
KLW22	1B015	15	6000000	CPP	SXG	ALL	24	0.2	85%	I/O	5	5	IMG_0008.JPG
KLW22	1B016	16	6000000	CPP	DTR	OBS	24	NA	95%	I/O	NA	NA	
KLW22	4A143	143	6039000	CPP	SXG		18	0.6	0%	I/O	4	4	
KLW32	3C100	100	924 (hwy)	CMP	SXG	PER	48	0.80	0%	N	2	2	IMG_0008.JPG;IMG_0009.JPG;IMG_0010.JPG
KLW32	3C101	101	924 (hwy)	CMP	SXG		36	NA	0%	N	NA	NA	
KLW32	1B001	1	924 (hwy)	CMP	SXG		48	1.80	0%	I	1	1	IMG_0001.JPG;IMG_0002.JPG;IMG_0003.JPG;IMG_0004.JPG
KLW32	1B002	2	924 (hwy)	CMP	SXG	PER	42	1.10	0%	I	1	1	IMG_0005.JPG;IMG_0006.JPG
KLW32	1B003	3	924 (hwy)	CMP	SXG	OBP	24	0.70	99%	I	1	1	IMG_0007.JPG;IMG_0008.JPG
KLW32	1B004	4	924 (hwy)	CMP	SXG	CRB	36	0.90	99%	I	1	1	IMG_0011.JPG;IMG_0012.JPG
KLW32	2B005	5	924 (hwy)	CMP	SXG	OBP	24	0.50	99%	I	4	1	IMG_0013.JPG;IMG_0014.JPG;IMG_0015.JPG
KLW32	2B006	6	924 (hwy)	CMP	SXG	CRB	24	0.40	55%	I	4	1	IMG_0016.JPG;IMG_0017.JPG;IMG_0018.JPG
KLW32	2B007	7	924 (hwy)	CMP	DTR		24	NA	30%	N	NA	NA	IMG_0019.JPG
KLW32	2B008	8	924 (hwy)	CMP	SXG		24	0.60	0%	N	4	1	IMG_0020.JPG
KLW32	2B009	9	924 (hwy)	CMP	DTR	CRB	24	NA	99%	N	NA	NA	IMG_0021.JPG
KLW32	2B010	10	924 (hwy)	CMP	SXG	CRB	24	0.40	70%	N	4	1	IMG_0022.JPG;IMG_0023.JPG
KLW32	2B012	12	924 (hwy)	CMP	DTR	CRU	24	NA	0%	I	NA	3	IMG_0032.JPG;IMG_0033.JPG
KLW32	2B013	13	924 (hwy)	CMP	SXG		60	3.50	5%	N	1	1	IMG_0034.JPG;IMG_0035.JPG
KLW32	2B014	14	924 (hwy)	CMP	SXG		120	8.00	0%	N	1	1	IMG_0036.JPG;IMG_0037.JPG
KLW32	2B015	15	924 (hwy)	CMP	SXG		60	3.50	0%	N	1	1	
KLW32	2B016	16	924 (hwy)	CMP	SXG	OBS	24	1.00	99%	I	4	NA	IMG_0038.JPG;IMG_0039.JPG
KLW32	2B017	17	924 (hwy)	CMP	SXG		108	4.00	0%	I	1	1	IMG_0040.JPG;IMG_0041.JPG
KLW32	2B018	18	924 (hwy)	CMP	DTR	OBS	24	NA	20%	N	NA	NA	IMG_0042.JPG
KLW32	2B019	19	924 (hwy)	CMP	SXG		42	3.00	0%	N	NA	NA	
KLW32	2B020	20	924 (hwy)	CMP	SXG	OBP	108	4.50	20%	N	NA	NA	IMG_0043.JPG;IMG_0044.JPG;IMG_0045.JPG
KLW32	2B021	21	924 (hwy)	CMP	DTR		24	NA	10%	N	NA	NA	IMG_0046.JPG
KLW32	2B022	22	924 (hwy)	CMP	SXG	OBP	72	3.00	30%	N	NA	NA	IMG_0047.JPG;IMG_0048.JPG;IMG_0049.JPG;IMG_0050.JPG
KLW32	2B023	23	924 (hwy)	CMP	SXG	PER	48	2.50	0%	N	4	3	IMG_0051.JPG
KLW32	2B024	24	924 (hwy)	CMP	SXG	OBS	24	1.80	90%	I	4	3	IMG_0052.JPG;IMG_0053.JPG
KLW32	2B025	25	924 (hwy)	CMP	SXG	OBP	36	1.50	30%	N	3	3	
KLW32	2B026	26	924 (hwy)	CMP	SXG	OBS	24	1.50	80%	N	4	4	IMG_0054.JPG;IMG_0055.JPG

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PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW32	2B027	27	924 (hwy)	CMP	SXG		50	2.00	5%	I	4	NA	IMG_0056.JPG
KLW32	2B028	28	924 (hwy)	CMP	DTR	CRB	24	NA	50%	N	NA	NA	
KLW32	2B029	29	924 (hwy)	CMP	SXG	OBS	40	2.00	15%	N	4	3	IMG_0057.JPG
KLW32	2B030	30	924 (hwy)	CMP	SXG		24	0.50	10%	N	5	4	
KLW32	2B031	31	924 (hwy)	CMP	DTR	OBS	24	NA	20%	N	NA	NA	
KLW32	2B032	32	924 (hwy)	CMP	SXG	OBS	24	0.50	20%	N	4	4	
KLW32	2B033	33	924 (hwy)	CMP	DTR		24	NA	40%	N	NA	NA	
KLW32	2B034	34	924 (hwy)	CMP	SXG		24	1.00	10%	N	NA	NA	
KLW32	2B036	36	924 (hwy)	CMP	SXG	PER	36	1.50	0%	N	4	3	
KLW32	2B037	37	924 (hwy)	CMP	SXG	OBS	24	0.50	20%	N	4	4	
KLW32	2B038	38	924 (hwy)	CMP	SXG		24	0.50	10%	N	NA	NA	
KLW32	2B040	40	924 (hwy)	CMP	SXG		24	0.50	5%	N	4	NA	
KLW32	2B041	41	924 (hwy)	CMP	DTR		24	NA	10%	N	NA	NA	
KLW32	2B042	42	924 (hwy)	CMP	SXG	CRU	36	1.00	10%	I	4	2	IMG_0061.JPG
KLW32	2B043	43	924 (hwy)	CMP	SXG		24	0.80	10%	N	NA	NA	
KLW32	2B044	44	924 (hwy)	CMP	SXG	PER	36	2.00	0%	N	NA	NA	IMG_0062.JPG;IMG_0063.JPG;IMG_0064.JPG
KLW32	2B045	45	924 (hwy)	CMP	SXG	PER	36	1.50	0%	N	4	NA	
KLW32	3B046	46	924 (hwy)	CMP	SXG		113	7.50	0%	N	1	1	IMG_0065.JPG;IMG_0066.JPG;IMG_0067.JPG
KLW32	3B047	47	924 (hwy)	CMP	SXG		104	7.50	0%	N	1	1	IMG_0065.JPG;IMG_0066.JPG;IMG_0067.JPG
KLW32	3B048	48	924 (hwy)	CMP	DTR	CRB	24	NA	95%	NA	NA	NA	
KLW32	3B049	49	924 (hwy)	CMP	DTR	OBS	24	NA	100%	NA	NA	NA	
KLW32	3B050	50	924 (hwy)	CMP	SXG		36	1.20	0%	N	1	1	
KLW32	3B051	51	924 (hwy)	CMP	SXG		18	0.50	0%	N	3	1	
KLW32	3B052	52	924 (hwy)	CMP	SXG		42	1.80	0%	I/O	1	1	
KLW32	3B053	53	924 (hwy)	CMP	SXG	CRP	48	1.20	0%	I	1	1	
KLW32	3B054	54	924 (hwy)	CMP	SXG		36	0.50	0%	N	NA	NA	
KLW32	3B055	55	924 (hwy)	CMP	SXG		36	0.50	0%	N	4	3	
KLW32	3B056	56	924 (hwy)	CMP	SXG		24	NA	NA	NA	NA	NA	
KLW32	3B057	57	924 (hwy)	CMP	SXG		36	0.70	10%	N	4	4	
KLW32	3B058	58	924 (hwy)	CMP	SXG		18	0.80	0%	N	3	3	
KLW32	3B059	59	924 (hwy)	CMP	SXG		24	0.60	0%	I	4	4	MVC-455F.JPG;MVC-456F.JPG;MVC-457F.JPG
KLW32	3B060	60	924 (hwy)	CMP	SXG		24	0.40	0%	N	4	4	
KLW32	3B061	61	924 (hwy)	CMP	SXG		24	0.50	0%	N	4	3	
KLW32	3B062	62	924 (hwy)	CMP	SXG		36	0.50	5%	N	1	1	

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Appendix 7 (Page 8 of 8).

PROJCODE	SURVIDENT	WAYPT	ROAD_NUM	TYPE[a]	FEATURE[b]	CONDITION[c]	HEIGHT CMP_in	CBW meters	CMP_ % BLK	CMP_ EROSION[d]	UPSTR AHMU	DOWNSTR AHMU	PHOTOFILE
KLW32	3B063	63	924 (hwy)	CMP	SXG	OBP	24	1.00	15%	N	1	1	
KLW32	3B064	64	924 (hwy)	CMP	SXG	PER	24	0.80	0%	N	1	1	
KLW32	3B065	65	924 (hwy)	CMP	SXG	PER	24	0.60	0%	N	4	4	
KLW32	3B066	66	924 (hwy)	CMP	SXG	CRU	24	0.50	0%	N	4	2	
KLW32	3B067	67	924 (hwy)	CMP	SXG		24	0.40	0%	N	4	3	
KLW32	3B068	68	924 (hwy)	CMP	SXG		24	0.50	0%	N	4	3	
KLW32	3B069	69	924 (hwy)	CMP	SXG		24	0.40	0%	N	4	2	
KLW32	3B070	70	924 (hwy)	CMP	SXG		24	0.60	0%	N	4	2	
KLW32	3B071	71	924 (hwy)	CMP	SXG		24	dry	0%	N	4	4	MVC-461F.JPG
KLW32	3B072	72	924 (hwy)	CMP	SXG		78	8.00	0%	N	1	1	
KLW32	3B073	73	924 (hwy)	CMP	SXG		24	dry	0%	N	NA	1	
KLW32	3B074	74	924 (hwy)	CMP	SXG	PER	48	1.00	10%	I	1	NA	MVC-462F.JPG;MVC-463F.JPG
KLW32	3B075	75	924 (hwy)	CMP	SXG	PER	48	1.30	0%	N	1	2	
KLW32	3B076	76	924 (hwy)	CMP	SXG	CRB	24	1.00	90%	I	3	NA	MVC-464F.JPG
KLW32	3B077	77	924 (hwy)	CMP	SXG	PER	48	NA	0%	N	4	NA	
KLW32	3B078	78	924 (hwy)	CMP	SXG		36	1.50	0%	N	1	1	
KLW32	3B079	79	924 (hwy)	CMP	SXG	PER	18	0.70	0%	N	NA	NA	
KLW32	3B080	80	924 (hwy)	CMP	SXG	OBS	24	0.60	99%	N	NA	NA	
KLW32	3B081	81	924 (hwy)	CMP	SXG		24	0.50	30%	N	4	3	
KLW32	3B082	82	924 (hwy)	CMP	SXG	PER	42	1.20	0%	N	1	1	MVC-465F.JPG;MVC-466F.JPG
KLW32	4B084	84	924 (hwy)	CMP	SXG	OBP	48	1.75	30%	I	3	NA	IMG_0069.JPG

TYPE[a] - Represents type of culvert pipe (CMP - corrugated metal pipe; CPP - corrugated plastic pipe) used.

FEATURE[b] - Represents whether the culvert pipe was used for a stream crossing (SXG) or ditch relief (DTR)

CONDITION[c] - Represents the current condition of the culvert pipe (see below)

ALL	structure is crushed or damaged, obstructed, and perched
CRB	structure is crushed or damaged, and obstructed
CRP	structure is crushed or damaged, and perched
CRU	structure is crushed or damaged
OBF	structure is obstructed and failing
OBP	structure is obstructed and perched
OBS	structure is obstructed
PER	structure is perched

CMP_EROSION[d] - Represent the presence of inlet (I), outlet (O), both inlet and outlet erosion (I/O) or no erosion present (NONE)

Appendix 8. RED-GREY-GREEN Analysis of culvert pipes on the Klawock Watershed evaluated during Road Condition Surveys, May-July, 2002 on Prince of Wales Island, Southeast Alaska.

PROJCODE	SURVIDENT	CULVERT DIAMETER	SCORE	#_RED categories	Anadromous Fish Presence?	Resident Fish Presence?	Perch Height (ft)	% Blockage	Culvert Gradient	Diameter Bedwidth ratio
KLW12	1B044	36	RED	2	NO	NO	1.54	0	3.14	1.31
KLW12	6C074	24	RED	2	NO	YES	NA	0	3.01	0.45
KLW22	1B030	18	RED	3	YES	YES	0.95	80	2.51	1.52
KLW22	1B018	39	RED	2	YES	YES	0.59	0	2.05	NA
KLW22	1B019	24	RED	2	YES	YES	0.46	0	2.90	0.87
KLW22	3A033	24	RED	2	YES	YES	0.1	20	3.77	2.03
KLW22	3A016	36	RED	3	YES	YES	0	25	3.28	0.30
KLW22	3A053	36	RED	2	NO	YES	0.52	0	3.98	0.91
KLW22	2A005	48	RED	3	NO	YES	NA	90	3.49	0.35
KLW22	1B011	24	RED	1	NO	YES	NA	0	4.64	0.61
KLW22	2A002	36	RED	1	NO	NO	0.2	0	2.84	NA
KLW22	3A031	36	GREEN	0	NO	YES	0	5	NA	0.91
KLW32	3B075	48	RED	2	YES	YES	2.00	0	5.06	0.94
KLW32	3B063	24	RED	3	YES	YES	1.71	15	1.84	0.61
KLW32	3B074	48	RED	2	YES	YES	1.71	10	2.89	1.22
KLW32	3C100	48	RED	2	YES	YES	1.5	0	1.64	1.52
KLW32	2B044	36	RED	2	YES	YES	1.33	0	NA	0.46
KLW32	2B019	42	RED	3	YES	YES	0.5	0	3.87	0.36
KLW32	2B015	60	RED	2	YES	YES	0.46	0	NA	0.44
KLW32	3B082	42	RED	2	YES	YES	0.33	0	1.38	0.89
KLW32	2B020	108	RED	3	NO	YES	3.00	20	2.12	0.61
KLW32	3B053	48	RED	2	NO	YES	2.85	0	8.60	1.02
KLW32	1B002	42	RED	2	NO	YES	2.36	0	1.72	0.97
KLW32	1B003	24	RED	2	NO	YES	1.50	99	NA	0.87
KLW32	3B064	24	RED	2	NO	YES	0.72	0	1.97	0.76
KLW32	3B052	42	RED	2	NO	YES	0.52	0	6.05	0.59
KLW32	3C101	36	RED	2	NO	YES	0.49	0	1.17	NA
KLW32	1B004	36	RED	1	NO	YES	0.00	99	NA	1.02
KLW32	3B050	36	RED	1	NO	YES	0.00	0	6.76	0.76
KLW32	2B013	60	RED	2	NO	YES	NA	5	0.80	0.44
KLW32	2B017	108	GREY	0	YES	YES	NA	0	NA	0.69

Appendix 9. Type, feature, condition and associated measurements of all stream crossing structures, excluding culvert pipes, in the Klawock Watershed observed during Road Condition Surveys, May-July, 2002.

PROJCODE	SURVIDENT	ROAD#	Type[a]	Feature[b]	Condition[c]	Length (ft)	Width (ft)	Height (in)	CBW (m)	% block	Feature Erosion[d]	Upstr AHMU	Down AHMU	photofile
KLW22	3C050	6000000	BRG	SXG										
KLW22	3C051	6000000	BRG	SXG										
KLW22	1B003	6000000	LGC	SXG			11.0	30	1.5	10		3	3	Img_004.jpg
KLW22	1B027	6000000	LGC	SXG			21.0	36	4.5	0		1	1	Img_0015.jpg
KLW22	2C003	6000000	LGC	SXG		30.0	3.0	20	0.3	10		4	4	Img_0021.jpg
KLW22	2C008	6000000	LGC	SXG		28.0	2.0	24	0.3	0		4	4	
KLW22	2C009	6000000	LGC	SXG	OBS	28.0	2.0	20	0.4	98	I/O	4	3	Img_0023.jpg Img_0024.jpg
KLW22	2C013	6000000	LGC	SXG	OBS	25.0	1.5	18	0.1	95	N	5	5	
KLW22	2C019	6000000	LGC	SXG	FAI	28.0	2.0	18	0.5	100	I/O	4	4	Img_0029.jpg Img_0030.jpg
KLW22	3A021	6014000	LGC	SXG	FAI	25.0	7.0	30	1.0	100		1	1	Img_0052.jpg
KLW22	3C031	6000000	LGC	SXG		30.0	5.0	12		0		4	4	
KLW22	4A137	6039000	LGC	SXG	OBS	30.0	6.0	24	0.2	80		4	4	
KLW22	4B040	6040000	LGC	SXG		20.0	8.0	6	1.0	0	N	4	4	
KLW22	4B042	6040000	LGC	SXG	OBS	35.0	15.0	16	2.0	20	I/O	4	4	
KLW22	4B045	6040000	LGC	SXG		25.0	8.0	10	1.5	0	N	4	4	
KLW22	4C076	6000000	LGC	DTR										
KLW22	4C078	6000000	LGC	DTR										
KLW22	5A169	6033000	LGC	DTR	OBS			24		70	N			
KLW22	5A180	6033000	LGC	SXG	OBS	25.0	5.0	24	0.5	90	I	4	4	
KLW22	5A183	6033600	LGC	SXG		30.0	4.0	24	2.0	0	N	4	4	
KLW22	5A184	6033600	LGC	SXG		30.0	5.0	24	1.0	0	I	4	4	
KLW22	5A190	6033000	LGC	SXG	FAI	30.0	5.0	18	1.0	60	N	4	4	
KLW22	5A193	6033000	LGC	SXG		30.0	2.0	12	0.1	10	N	5	5	
KLW22	5A195	6033000	LGC	SXG	OBS	35.0	4.0	24	2.0	80	I/O	4	4	
KLW22	5A197	6033000	LGC	SXG	OBS	30.0	2.5	24	0.5	90	I	4	4	
KLW22	5A199	6033000	LGC	SXG	FAI				1.0	90	I/O	3	4	
KLW22	5A214	6033000	LGC	SXG	OBS	25.0	2.0	24	0.5	90	N	5	5	
KLW22	5A225	6033400	LGC	SXG		15.0	25.0	18	1.3		N	3	3	
KLW22	5A228	6033400	LGC	DTR		30.0	1.0	12		0				
KLW22	5A229	6033400	LGC	DTR	OBS	30.0	6.0	0		100				

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PROJCODE	SURVIDENT	ROAD#	Type[a]	Feature[b]	Condition[c]	Length (ft)	Width (ft)	Height (in)	CBW (m)	% block	Feature Erosion[d]	Upstr AHMU	Down AHMU	photofile
KLW22	5A243	6033400	LGC	SXG	OBS	25.0	4.0	24	1.0	50	N	3	3	
KLW22	5A257	6030000	LGC	SXG	OBS	25.0	2.0	24	0.3	60	N	5	5	
KLW22	5C192	6031000	LGC	SXG		25.0	6.0	24	0.6	0	N	1 OR 2	1 OR 2	
KLW12	2A341	5025300	LGC	SXG		23.0	11.0	29	2.0	0	N	2	2	Mvc-124f.jpg Mvc-125f.jpg
KLW12	2B060	5032000	LGC	SXG	OBS	30.0	4.0	6	1.0	70	I/O	3	3	Img_0008.jpg
KLW12	2B066	5032000	LGC	SXG			10.0	3	0.8	0		3	2	
KLW12	2B070	5032000	LGC	SXG		30.0	13.0	3	1.1			3	3	Img_0015.jpg
KLW12	2B082	5032000	LGC	SXG		8.0	4.0		2.0					Img_0025.jpg Img_0027.jpg
KLW12	2B083	5032000	LGC	SXG	OBS	25.0			1.0	100	I/O	3	3	Mvc-139f.jpg
KLW12	3A415	5025000	LGC	SXG										
KLW12	3A418	5025000	LGC	SXG										Img_0032.jpg
KLW12	3B087	5032000	LGC	SXG										
KLW12	3B088	5032000	LGC	SXG			3.3							Img_0033.jpg
KLW12	3B089	5032000	LGC	SXG										Img_0034.jpg
KLW12	3B090	5032000	LGC	SXG	OBS					60				Img_0035.jpg
KLW12	3B092	5032000	LGC	SXG								3	2	Img_0040.jpg
KLW12	3B096	5032000	LGC	SXG								1 or 2	1 or 2	Img_0046.jpg
KLW12	4A437	5024200	LGC	SXG	OBS	20.0	33.0	24	2.0	90		1	1	Img_0074.jpg
KLW12	4B132	5032300	LGC	SXG	OBS	25.0	8.0	24	2.0	70		3	3	Img_0108.jpg
KLW12	4B173	3032520	LGC	SXG	OBS	30.0	2.0	8	0.7	100	I/O	4	4	Mvc-379f.jpg
KLW12	6C075	5025000	LGC	SXG		21.0	15.0	24	2.0			2	2	
KLW12	6C093	6000000	LGC	SXG										
KLW12	6C096	6000000	LGC	SXG										
KLW12	6C097	6000000	LGC	SXG										
KLW12	6C098	6000000	LGC	DTR										
KLW12	6C099	6000000	LGC	SXG								3	3	
KLW12	6C100	6000000	LGC	SXG										
KLW12	6C101	6000000	LGC	SXG										
KLW22	1B007	6000000	LSB	SXG			25.0	60	2.5	0		2	2	
KLW22	2C001	6000000	LSB	SXG	FAI	30.0	40.0	60	6.0	0		1 or 2	1 or 2	Img_0018.jpg Img_0020.jpg
KLW22	2C018	6000000	LSB	SXG		30.0	28.0	72	3.0	0				Img_0032.jpg Img_0033.jpg

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PROJCODE	SURVIDENT	ROAD#	Type[a]	Feature[b]	Condition[c]	Length (ft)	Width (ft)	Height (in)	CBW (m)	% block	Feature Erosion[d]	Upstr AHMU	Down AHMU	photofile
KLW22	3A018	6014000	LSB	SXG		42.0	25.0	48	3.0	0	N	1	1	Img_0040.jpg
KLW22	3A019	6014000	LSB	SXG	OBS	20.0	20.0	12	3.0	90	O	1	1	Img_0047.jpg Img_0048.jpg Img_0049.jpg
KLW22	3A020	6014000	LSB	SXG										Img_0050.jpg Img_0051.jpg
KLW22	3A022	6014000	LSB	SXG		30.0	10.0	24	0.8	10		1	1	
KLW22	3A023	6014000	LSB	SXG	OBS	20.0	15.0	36	1.5	20				Img_0053.jpg
KLW22	3A025	6014000	LSB	SXG	OBS	22.0	22.0	48	3.5	85		1	1	Img_0055.jpg Img_0056.jpg
KLW22	3A026	6014000	LSB	SXG		20.0	23.0	72	2.5	0		1	1	Img_0057.jpg
KLW22	4A063	6000000	LSB	SXG										
KLW22	4A064	6000000	LSB	SXG										
KLW22	4A065	6000000	LSB	SXG										
KLW22	4A066	6000000	LSB	SXG										
KLW22	4A067	6000000	LSB	SXG										
KLW22	4A109	6000000	LSB	SXG		30.0	40.0	48	2.5	0	N	2	2	
KLW22	4A113	6000000	LSB	SXG		28.0	12.0	42	2.5	5	N	2	2	Img_0099.jpg
KLW22	4A118	6000000	LSB	SXG		30.0	20.0	48	1.3		N	3	3	
KLW22	4A126	6000000	LSB	SXG	OBS	30.0	4.0	24	0.3	20		5	5	
KLW22	4A130	6000000	LSB	SXG		30.0	40.0	72	3.5	0	N	2	2	
KLW22	4C083	6000000	LSB	SXG		20.0	14.0	48	4.7			2	2	Mvc-409f.jpg
KLW22	4C086	6000000	LSB	SXG		20.0	15.0	60	1.5					
KLW22	4C090	6000000	LSB	SXG		20.0	15.0	60	1.1			2	2	Mvc-410f.jpg
KLW22	4C096	6000000	LSB	SXG		22.0	6.0	28						Mvc-412f.jpg
KLW22	4C099	6000000	LSB	SXG		22.0	15.0	60	2.3					Mvc-413f.jpg
KLW12	2B061	5032000	LSB	SXG										Img_0009.jpg Img_0010.jpg
KLW12	2B068	5032000	LSB	SXG		25.0	11.0	3	1.1	0				Img_0012.jpg Img_0013.jpg Img_0014.jpg
KLW12	5B246	5025000	LSB	SXG								3	3	
KLW12	5B254	5025000	LSB	SXG								3	3	
KLW12	6C091	6000000	LSB	SXG								2	1	
KLW12	6C102	6000000	LSB	SXG										

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PROJCODE	SURVIDENT	ROAD#	Type[a]	Feature[b]	Condition[c]	Length (ft)	Width (ft)	Height (in)	CBW (m)	% block	Feature Erosion[d]	Upstr AHMU	Down AHMU	photofile
KLW12	7C113	5012000	LSB	SXG		21.0	18.0	42	4.0			2	1	
KLW22	1B031	6000000	PMB	SXG		30.0	40.0	108	10.0	0		1	1	

Type[a] - type of stream crossing structure used at this location:

- **LGC = log culvert**
- **LSB = log stringer bridge**
- **PMB = permanent long term bridge**

Feature[b] - feature which stream crossing structure is used for:

- **DTR = ditch relief**
- **SXG = stream crossing**

Condition[c] - condition of stream crossing structure:

- **FAI = structure is failing or failing is imminent**
- **OBS = structure is obstructed > 10%**