

Klawock Lake Sockeye Salmon Action Plan Prince of Wales Island, Alaska



FEBRUARY 2020

Cathy Needham, Kai Environmental Consulting Services



Christine Woll, The Nature Conservancy, and



Rob Cadmus, Southeast Alaska Watershed Coalition



ACKNOWLEDGEMENTS

This document is an accumulation of many discussions with landowners, stakeholders and residents with an interest in pursuing ways to improve sockeye salmon numbers for Klawock Lake, Alaska. Without shared knowledge, ideas and commitment to moving forward this action plan would have no purpose.

The authors would like to thank Deborah Hart with the Southeast Alaska Fish Habitat Partnership for her coordination and efforts with the stakeholder sub-committee meetings.

We would also like to thank the following individuals for their contribution to this document:

Mary Edenshaw, Klawock Heenya Corporation
Ed Douville, Shaan Seet Corporation
Quinn Aboudarra, Klawock Cooperative Association
Lawrence Armour, Klawock Cooperative Association
Dennis Nickerson, Prince of Wales Tribal Conservation District
Jeff Lundberg, Klawock River Hatchery
Bill Gass, Southern Southeast Regional Aquaculture Association
Steve Heinl, Alaska Department of Fish and Game, Commercial Fisheries
Lauren Sill, Alaska Department of Fish and Game, Subsistence Division
L. Vercessi, Alaska Department of Fish and Game, Hatcheries Program
Jeff Reeves, USDA Forest Service, Craig Ranger District
Sheila Jacobson, USDA Forest Service, Craig Ranger District
Neil Stichert, U.S. Fish and Wildlife Service
Michael Kampnich, The Nature Conservancy
John Hudson, Southeast Alaska Watershed Coalition
Rebecca Bellmore, Southeast Alaska Watershed Coalition
Jennifer Nu, Southeast Alaska Watershed Coalition

Funding for this project has come from the National Fish and Wildlife Foundation. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government or the National Fish and Wildlife Foundation and its funding sources. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government, or the National Fish and Wildlife Foundation or its funding sources. This project was also funded in part by the Gordon and Betty Moore Foundation.

****Note from the Authors:** This document, dated February 2020, represents Version 1.0 of what the authors consider a living and dynamic Action Plan for sockeye salmon in Klawock Lake. Some funding requests and conversations for projects described within have been started. Progress on projects may be obtained by contacting the authors at the Southeast Alaska Watershed Coalition or The Nature Conservancy.

Table of Contents

1.0	Executive Summary	5
2.0	Purpose.....	7
3.0	Sockeye Salmon in Klawock Lake	7
3.1	Description of Klawock Lake Watershed	7
3.2	History of Sockeye Salmon in Klawock Lake	8
3.3	Current Sockeye Salmon Trends in Klawock Lake	9
4.0	Action Planning Process	10
4.1	Landowner Involvement	11
4.2	Stakeholder Involvement.....	12
5.0	Identified Projects for Improving Sockeye Salmon Populations.....	13
6.0	Priority Enhancement Projects.....	15
6.1	Develop a Local Advisory Committee.....	16
6.2	Secondary Priority Enhancement Projects	18
7.0	Priority Fish Abundance Projects	20
7.1	Continued Monitoring of Sockeye Salmon Escapement	22
7.2	Genetics Study.....	24
7.3	Project Improve Subsistence Harvest Reporting.....	25
7.4	Project Change Subsistence Fishing Regulations	26
7.5	Secondary Priority Fish Abundance Projects.....	27
8.0	Priority Habitat Projects.....	29
8.1	Conduct Spawning Surveys and Habitat Assessment Surveys	31
8.2	Develop a Land Owner Best Management Practices (BMP).....	34
8.3	Project Klawock Hollis Highway Fish Passage at Threemile.....	36
8.4	Secondary Priority Habitat Projects	37
9.0	Priority Education and Outreach Projects.....	38
9.1	Klawock Household Harvest Surveys and TEK Harvest Study	39
9.2	Klawock River Fishing Day.....	41
9.3	Secondary Priority Education and Outreach Projects	42
10.0	Conclusions.....	43
11.0	References.....	44
12.0	Embedded Website Links (in order of appearance).....	45

APPENDICES

- Appendix A: Extended Action Planning Process
- Appendix B: Original Project List
- Appendix C: Landowner Briefing Paper
- Appendix D: Evaluation Criteria for Project Prioritization
- Appendix E: Results of Community Survey (Survey Monkey)
- Appendix F: Summary of Threemile Creek Field Investigation

FIGURES

Figure 1. Landownership in Klawock Lake Watershed in Klawock, Alaska. The figure was provided by The Nature Conservancy. 8

TABLES

- Table 1. Primary and secondary enhancement project priorities identified for the Klawock Lake Sockeye Salmon Action Plan. The Community Perspective (CP) score indicates the community ranking of the project against all other projects identified in the planning process (scale 1 to 10, with 10 being the highest priority)..... 15
- Table 2. Primary and secondary fish abundance project priorities identified for the Klawock Lake Sockeye Salmon Action Plan. The Community Perspective (CP) score indicates the community ranking of the project against all other projects identified in the planning process (scale 1 to 10, with 10 being the highest priority). 20
- Table 3. Primary and secondary project priorities identified for the Klawock Lake Sockeye Salmon Action Plan. The Community Perspective (CP) score indicates the community ranking of the project against all other projects identified in the planning process (scale 1 to 10, with 10 being the highest priority). 29
- Table 4. Spawning Survey and Habitat Assessment projects proposed for Klawock Lake Watershed. 32
- Table 5. Outline of Best Management Practices for the Klawock Lake Watershed..... 35

1.0 Executive Summary

Sockeye salmon (*Onchorhynchus nerka*) are the most important salmon species for residents of Prince of Wales Island. The Prince of Wales communities of Klawock and Craig both share salmon resources from the Klawock Lake Watershed, and have continued to express a concern for the sockeye salmon populations in recent years. In 2016, Woll and Prussian (2016) finalized the *Klawock Lake Sockeye Salmon Retrospective Analysis*, which was the basis for forming a stakeholder group (including the community of Klawock) to identify the next best steps. A stakeholder meeting was held in November of 2017, with a recommendation for stakeholders to stay engaged. This led to the development of a Klawock Lake Sockeye Salmon Action Plan which includes developing a comprehensive project list, and prioritizing projects that can move forward in the near future with the following vision:

“To promote healthy and sustainable sockeye salmon populations in Klawock Lake for local communities”

The action planning process included the development of a project list that included input from the 2017 stakeholder meeting, the steering committee of the stakeholder group, and recent research work; all projects suggested were intended to help meet the abovementioned vision. The project list was then presented to land owners, along with a briefing, to assure their support for each of the projects. Projects were sorted into four topics that represented subcommittees at the stakeholder meeting and include: Enhancement, Fish Abundance, Habitat, and Education and Outreach. The stakeholder sub-committees reconvened and rated each of their group of projects using a standard set of criteria.

For projects that were determined to be a priority and feasible to move forward with, the project details were flushed out in this Klawock Lake Sockeye Salmon Action Plan. Secondary priority projects were then described to give context. It is recognized by all stakeholders that there are limiting factors that impact sockeye productivity at all life stages of the species. It has been acknowledged that there is no “silver bullet” solution that can help return sockeye salmon to the level of productivity they once had in Klawock Lake (Woll and Prussian, 2016). Thus, creating projects and momentum around a variety of potential limiting factors, at various points in the life cycle of sockeye salmon, can be helpful for alleviating stressors on their population.

The highest priority under the suggested Enhancement related projects was establishing a local committee to examine enhancement goals, benefits and risks. There were two secondary priority projects: minimizing impacts of hatchery released coho and continue to minimize coho escapement into Klawock Lake; conduct a sockeye salmon enhancement feasibility study to address the pros and cons of various enhancement options and methods.

There were four priority projects under Fish Abundance, with the highest priority being to continue to monitor escapement of sockeye salmon into Klawock Lake starting on July 1. Additionally, sampling sockeye salmon for genetics in the commercial fishery to estimate

commercial catch in the mixed stock fishery was a priority. The third priority project was to improve sockeye salmon subsistence harvest reporting for Klawock Lake. The final priority project was to explore options for changing subsistence regulations to address things like harvest dates and harvest limits. Secondary priority projects under Fish Abundance included determining the productivity of sockeye salmon in Klawock Lake, developing a Klawock Lake sockeye salmon management plan with escapement goals, and quantifying the condition and productivity of spawning habitat by quantifying the relationship between spawners entering each tributary and fry emerging.

There were three priority projects under Habitat. The first priority was conduct spawning and habitat surveys in tributaries not previously assessed in Needham, et al (2018). Some areas may be identified using local Traditional Ecological Knowledge (TEK). An additional priority project included developing a guidance document for all land owners that includes best management practices for protecting sockeye salmon habitat and populations for all future development. The final priority project was to evaluate and potentially replace the double culverts for fish passage improvement on the Threemile Creek tributary. Secondary priority projects included reviewing previous restoration work to determine if it is working, regularly monitor Inlet Creek to assure habitat is not being degraded, develop a Klawock Lake Watershed Beaver Management Plan and investigate the spatial distribution throughout time of sockeye and coho smolt in the Klawock estuary.

After integrating Education and Outreach projects into priority projects of other subjects, there were two priority projects to discuss. The first was to complete a Klawock Household Harvest Survey and/or a TEK Harvest Study to better understand the harvest and use patterns of sockeye salmon by the communities. The next priority was to continue a Klawock River Fishing Day hosted at the Klawock River Hatchery for communities to fish trout and learn more about the fish weir operations and the roll of the hatchery. There were two secondary priority Education and Outreach projects which included integrating Klawock Lake sockeye salmon education into the K-12 science curriculum and developing a fish consumption rate study.

All of the priority projects were determined to be a priority because they met the project vision of providing healthy and sustainable sockeye salmon populations in Klawock Lake for the community. They were also determined to be feasible in that there was a commitment to move the project forward, cost effective to implement and allowable under current rules and regulations. Priority projects were rated on their integrity, which determined whether the project was science based, would provide improvements and/or information for making improvements to sockeye salmon populations and/or habitat and would not impact or harm sockeye salmon populations in Klawock Lake. The final criteria for priority projects was that they were supported among the landowners and the community. This Klawock Lake Sockeye Salmon Action Plan includes additional details for each of the priority projects, including a project description that includes background information, identified lead entity and potential partners, cost considerations and funding options, and a timeline for next steps.

2.0 Purpose

The purpose of this Klawock Lake Sockeye Salmon Action Plan (Action Plan) is to help guide landowners, stakeholders and the Klawock community in promoting healthy and sustainable sockeye salmon populations in Klawock Lake for local communities. Recent energy to address sockeye salmon in Klawock Lake stems from the recently released *Klawock Lake Sockeye Salmon Retrospective Analysis* (Woll and Prussian, 2016) document, which synthesized the past work that had been undertaken in the Klawock Lake Watershed.

From there, a stakeholder group was assembled and discussions began to identify the next best steps. First, a steering committee was formed, to plan a stakeholder meeting in Klawock in November of 2017. The steering committee was broken up into sub-topics, including: Enhancement, Fish Abundance, Habitat, and Community Engagement. The two-day stakeholder meeting included attendance from approximately 45 people including landowners, residents from Klawock and Craig, and representatives from the Klawock River Hatchery, local, state and federal agencies, and conservation non-profits. Summary documents from the meeting may be found at the [Southeast Alaska Fish Habitat Partnership](#) website:

A post-meeting feedback survey identified the need to stay engaged in the process and continue to move forward with collaborative community involvement. In October of 2018, Kai Environmental Consulting Services, LLC (Kai Environmental) was contracted by the Southeast Alaska Watershed Coalition (SAWC) to expand the shared ideas and next steps, by developing a Klawock Lake Sockeye Salmon Action Plan. This process includes developing a comprehensive project list, and prioritizing projects that can move forward in the near future.

3.0 Sockeye Salmon in Klawock Lake

3.1 Description of Klawock Lake Watershed

Klawock Lake is located on the central west coast of Prince of Wales Island. The watershed encompasses approximately 12,000 hectares, contains approximately 215 kilometers of mapped streams and has approximately 5,555 hectares of wetlands. The lake itself has a surface area of approximately 1190 hectares. Past studies have broken the watershed up into seven major sub-basins: Klawock River, Halfmile Creek, Threemile Creek, Inlet Creek, Hatchery Creek, Inlet Creek, Southeast and Northeast (Woll and Prussian, 2016; CCTHITA and USFS, 2002). The lake is described as having two main basins. The smaller and deeper basin has a maximum depth of 49 meters and drains an area of approximately 3,760 hectares on the east side of the watershed (Conitz, 2010). The second basin drains approximately 7,610 hectares and has a maximum depth of 30 meters (Conitz, 2010).

Klawock Lake drains into the Klawock River, and then into an estuary at the head of Klawock Inlet. The Klawock River Hatchery is located on the Klawock River approximately 300 meters below the outlet of Klawock Lake. The Klawock River system is an anadromous fish system that is cataloged in the Alaska Anadromous Fish Catalog as number 103-60-10470. Klawock

Lake contains sockeye salmon (*Onchorhynchus nerka*), coho salmon (*O. kisutch*), pink salmon (*O. gorbuscha*), chum salmon (*O. keta*), steelhead (*O. mykiss*), cutthroat trout (*O. clarkii*), and Dolly Varden char (*Salvelinus malma*).

The largest landowner in the Klawock Lake Watershed is Klawock Heenya Corporation, with approximately 5,868 hectares (Figure 1). Klawock Heenya is a village corporation formed under the Alaska Native Settlement Claims Act (ANSCA). The USDA Forest Service owns approximately 3,116 hectares in the Klawock Lake watershed. The ANSCA village corporation from Craig, Shaan Seet Corporation, owns almost 2,428 hectares. The City of Klawock owns approximately 15 hectares and Sealaska Corporation, the regional ANSCA Corporation, owns some sub-surface rights (Figure 1). The remaining 573 hectares are comprised of individual subdivided properties, with private landowners.

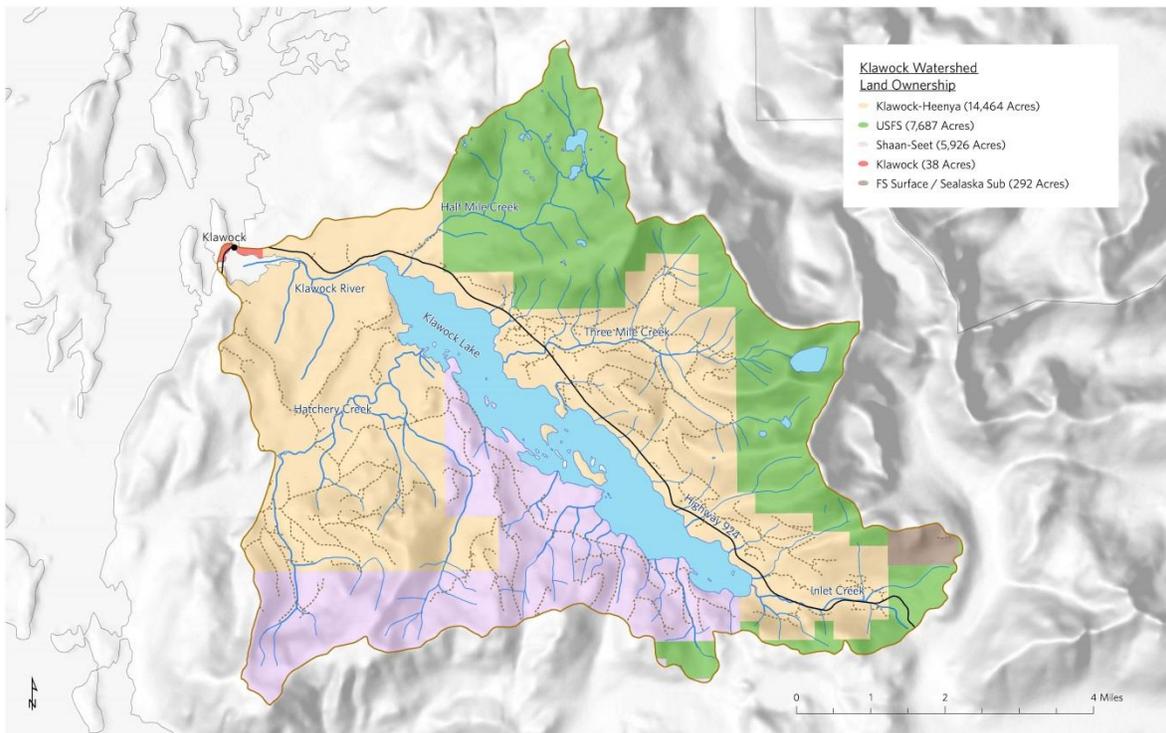


Figure 1. Landownership in Klawock Lake Watershed in Klawock, Alaska. The figure was provided by The Nature Conservancy.

3.2 History of Sockeye Salmon in Klawock Lake

Klawock's first settlers were Tlingit who originated from the northern winter village of Tuxekan. They used the area as a fishing camp for the summer period, and called it by several different names: Klawerak, Tlevak, Clevak, and Klawak. Darrow (1934) reported that the Klawock Lake

Watershed had a long history of human occupation, with Tlingit settlers crossing the Harris River bridge down to the east side of the lake, by following an old animal trail. An old village site and shell middens that radiocarbon date back to 750 years ago have been found along Klawock River (Ratner et al., 2006). When the Klawock Hatchery was constructed, a newly discovered shell midden that contained charcoal and burned bone fragments was found, which radiocarbon dated to approximately 6,500 years ago (Ratner, et al., 2006).

Sockeye salmon (*O. nerka*) have been one of the most important salmon species to indigenous peoples of Southeast Alaska for as long as the region has been occupied. Salmon and halibut were some of the first trade items mentioned, in recorded history of contact with Spaniards (Ratner, et al., 2006). In Thornton (2012), sockeye salmon in the Klawock Lake Watershed are named as the resource that drew Tlawa'k and his family to settle in what is present day Klawock. Post European contact, sockeye salmon became commercially targeted, and in 1872 a saltery was established in Klawock (which later became a cannery) (Ratner et al., 2006). Sockeye salmon remained the primary target species until the early 1900's, when pink salmon took over in commercial importance.

Around the same time that pink salmon became the primary target salmon species commercially harvested, the U.S. government promoted hatcheries in Alaska as a response to the overharvesting of sockeye salmon (Ratner et al., 2006). The Klawock River Hatchery's original location was at the base of Klawock River falls in 1897, but was moved to the mouth of Threemile Creek in 1898 where it operated until 1916. During that period an average of 3.2 million sockeye salmon sac fry were released each year (Ratner et al., 2006); however, it is unlikely these fish made a significant contribution to the commercial fishery (Ratner et al, 2006, Roppel, 1982).

3.3 Current Sockeye Salmon Trends in Klawock Lake

In 1978, the State of Alaska Department of Fish and Game (ADFG) constructed the Klawock River Hatchery in its present location and from 1987 to 2004 approximately 14 million juvenile sockeye salmon were released into Klawock Lake (Woll and Prussian, 2016). Sockeye salmon are no longer a part of Klawock River Hatchery operations, as the focus is enhancement of coho salmon.

Annual estimates of sockeye salmon harvest and escapement in Klawock Lake has often been nonexistent or minimal, but there has been a general decline in the last century (Woll and Prussian, 2016). Commercial harvest estimates during the late 1880s showed cumulative harvests and escapements as large as 80,000 sockeye salmon; whereas no cumulative harvest or escapement numbers have been above 30,000 fish since the 1940s. Since 2000, escapement numbers have been more reliably collected and demonstrate a period of historical low productivity within the last decade. Traditional ecological knowledge also points to noticeable declines (Langdon 2006; Ratner et al. 2006).

A majority of the Klawock Lake Watershed is owned by two Alaska Native Village Corporations and beginning in the 1970s and into the 1980s their land was extensively harvested for timber. Most of the harvest was prior to the 1991 update to the Alaska Forest Resources and Practices Act that instituted riparian buffer zones, and therefore a majority of the timber harvest occurred up to the stream banks (Woll and Prussian, 2016; Needham et al, 2018). In the mid-2000s the Klawock Lake Watershed Council completed restoration work identified in the *Klawock Lake Restoration Master Plan* (Keta Engineering, 2003). The work included pulling culverts, riparian thinning, and bank stabilization projects.

4.0 Action Planning Process

Kai Environmental was engaged to develop a planning process for this Klawock Lake Sockeye Salmon Action Plan. An extended accounting of the process may be found in Appendix A. In general, the following steps were taken:

- Kai Environmental developed a project list from recent technical papers, as well as projects identified during a Klawock Lake Stakeholder Meeting in November 2017 (see Appendix B).
- Kai Environmental presented the project list to the Klawock Lake stakeholder steering committee for review. The steering committee categorized the projects, and added additional projects.
- Kai Environmental developed a briefing paper to accompany the project list, and met with landowners in the Klawock Lake Watershed (see Appendix C).
- Kai Environmental convened the Klawock Lake Stakeholder group in a series of meetings in order to evaluate the projects on the project list under standard criteria (see Appendix D).
- Klawock Cooperative Association developed a Survey Monkey tool that included the project list, and asked Klawock Lake users to rate their support for each project (see Appendix E).
- Kai Environmental, TNC, KCA, and SAWC hosted a community meeting to get feedback on the draft proposal.

After projects in the project list were evaluated and prioritized, summaries were developed to provide more detail on the logical next steps and feasibility of the project (see Section 5.0). The community's perspective was incorporated into the prioritization process using the results of the Survey Monkey. The Survey Monkey tool allowed for community members to rank projects using two methods. The first method included having respondents go through the entire list of projects and for each individual project rate their support for that project on a scale of 0 (no support) to 10 (strongly support). An average was taken across all respondents and the three top supported projects were:

- Maintaining local representation on the Southern Southeast Regional Aquaculture Association Board of Directors

- Continue to monitor sockeye escapement
- Conduct a sockeye salmon productivity study

The second method of rating, asked respondents to list the top five projects they would support the most. Two projects tied as the top project: Conduct a sockeye salmon productivity study and Evaluate past restoration activities.

4.1 Landowner Involvement

It was recognized early in the process that having landowner involvement in the action planning process would be key for the development of a plan that could move forward. Many projects identified would involve having landowners support if they work on the ground and/or access to areas within the watershed. Kai Environmental met with each major landowner, except the U.S. Forest Service who did not respond to any requests for meetings. Individual property owners in the Klawock Lake Subdivision and/or along the Klawock Hollis Highway were not involved in this portion of the planning process. However, it is expected they would be involved on a project by project level, if a project may impact or is adjacent to their property. The following is a summary by each major landowner:

- **Klawock Heenya Corporation:** the Board of Directors was supportive of the project, appreciated the one-on-one meeting, chose not to remove any projects from the project list, and said their Chief Executive Officer Mary Edenshaw would remain involved in the process through her involvement with the steering committee
- **Shaan Seet Corporation:** the General Manager was supportive of the action planning process, chose not to remove any projects from the project list, indicated they would like to see priority given to projects where local shareholders could be employed and chose to remain involved and update the Board of Directors throughout the process
- **Sealaska Corporation:** the staff from the Natural Resources Department and Corporate Council requested to defer to the local village ANSCA Corporation, unless a specific project would require access to subsurface rights that Sealaska Corporation owns in the watershed

As private landowners, Klawock Heenya Corporation and Shaan Seet Corporation have previously accessed funding from the USDA Natural Resource Conservation Service (NRCS), for projects such as upland pre-commercial thinning. There have been initial discussions about utilizing this Klawock Lake Sockeye Salmon Action Plan as a framework for landowners to develop a partnership that may be eligible for Regional Conservation Partnership Program (RCPP) funding. This funding source provides opportunities for the “NRCS, conservation partners and landowners to work together to harness innovation, expand the conservation mission and demonstrate the value and efficacy of voluntary, private lands conservation”.

4.2 Stakeholder Involvement

Numerous stakeholders, aside from landowners, have been interested in addressing the community of Klawock's concern for declining sockeye salmon populations. The following groups have engaged in the action planning process:

- Klawock Residents – A traditional Tlingit village, the Heenya Kwan Tlingit have a long historical tie to sockeye salmon in Klawock Lake. Further, all Klawock residents are rural residents, with a history of subsistence fishing in both State and Federal waters within the Klawock Lake Watershed.
- Klawock Cooperative Association – a federally recognized tribe governing and providing services to Klawock Tribal residents, including projects to address sockeye salmon populations in Klawock Lake.
- State of Alaska Department of Fish and Game (ADFG) – one of two management agencies, managing State waters for sockeye salmon in Alaska. ADFG has several roles for the Klawock Lake Watershed, including: commercial fisheries, subsistence fisheries and habitat management. Further the State of Alaska permits hatchery operations.
- USDA Forest Service – one of two management agencies, managing subsistence in federal waters for sockeye salmon in Alaska.
- U.S. Fish and Wildlife Service – a federal agency which provides resources for fish habitat and fish passage on all lands.
- Southern Southeast Regional Aquaculture Association – the operating organization for the Klawock River Hatchery.
- The Nature Conservancy (TNC) – as a conservation non-profit organization, TNC has brought forward funding to address the community's desire to work towards a sustainable sockeye salmon population in Klawock Lake. TNC has also been involved in data collection and research within the watershed.
- Southeast Alaska Watershed Coalition (SAWC) – as a non-profit organization, SAWC fosters partnerships and inspire Southeast Alaskans to steward watersheds and support communities through participatory projects, research, and learning.
- Southeast Alaska Fish Habitat Partnership – a non-profit organization that works to foster cooperative fish habitat conservation in freshwater and coastal ecosystems.
- Prince of Wales Tribal Conservation District (POW TCD) – a non-profit organization of Prince of Wales Tribes and village ANSCA corporations that blend traditional knowledge with technical resources to actively manage natural resources in their service area.
- Southeast Alaska Land Trust – a non-profit organization that works to permanently conserve wetlands, recreation lands, wildlife habitat, open space, and subsistence lands throughout Southeast Alaska.

Subsistence users encompass all rural residents, which includes all communities on Prince of Wales Island. The community of Craig is also a consistent user of the Klawock Lake Watershed.

5.0 Identified Projects for Improving Sockeye Salmon Populations

It is recognized by all stakeholders that there are limiting factors that impact sockeye productivity at all life stages of the species. It has been acknowledged that there is no “silver bullet” solution that can help return sockeye salmon to the level of productivity they once had in Klawock Lake (Woll and Prussian 2016). Thus, creating projects and momentum around a variety of potential limiting factors, at various points in the life cycle of sockeye salmon, can be helpful for alleviating stressors on their population.

As a result of the planning process outlined above, four overarching categories for potential projects were identified as being important for addressing next actions in the Klawock Lake Watershed, with respect to sockeye salmon populations and their limiting factors and stressors. These include: Enhancement, Fish Abundance, Habitat, and Education and Outreach. All four topics were considered important and potential projects were only prioritized within each subject area, and not between the four topic areas.

Addressing enhancement topics is two-fold, in that the current hatchery on Klawock River primarily produces coho salmon populations which are perceived by the community as being a factor in declining sockeye salmon populations from predation and competition of resources. However, there is also interest in potentially enhancing sockeye salmon populations from local brood stock.

The fish abundance topic primarily looks at projects that identify the number of sockeye salmon in or available to the Klawock Lake Watershed. This includes escapement, productivity, and harvest related sub-topics, as well as the mechanisms of how to obtain and understand the number of fish.

Habitat is the topic most commonly thought of when addressing watershed scale planning and management. Assuring sockeye salmon have access to quality habitat addresses the juvenile life stage of population success as well as providing suitable places for returning adults to spawn. Large scale land changes and subsequent restoration efforts have occurred in the Klawock Lake Watershed and understanding how these changes have impacted habitat would assist land and resource managers in understanding what improvements (if any) would assure sockeye salmon at different life stages a higher level of survival.

In order for continuing to address healthy Klawock Lake sockeye salmon populations, a number of education and outreach projects were identified. Community support and buy-in for healthy sockeye salmon populations in Klawock Lake is essential for the long-term stewardship of this resource.

The next sections of this document are organized by each category, with no preference given to any category. A table that represents the primary and secondary prioritized projects are presented with a brief description, entities involved and the scoring from the community perspectives survey. The primary prioritized projects then have detail in them to expand upon

the project description, identify the logical lead entities (i.e. who “owns” the project), identify potential partners, discuss any funding considerations and potential options knowns at the time of the report, and to talk about timelines for the project. Secondary priority projects are also described briefly to supply context for the project and why it may not have been prioritized higher.

6.0 Priority Enhancement Projects

Enhancement projects were two-fold. First the current hatchery on Klawock River primarily produces coho salmon populations which are perceived by the community as being a factor in declining sockeye salmon populations from predation and competition of resources. Secondly, there is also interest in potentially enhancing sockeye salmon populations from local brood stock. Stakeholders identified five enhancement projects in the original project list developed for the Action Planning process (Appendix B). Table 1 shows the primary and secondary priorities. The remaining projects were not evaluated by the Enhancement Subcommittee, but information on them may be found in Appendix B.

Table 1. Primary and secondary enhancement project priorities identified for the Klawock Lake Sockeye Salmon Action Plan. The Community Perspective (CP) score indicates the community ranking of the project against all other projects identified in the planning process (scale 1 to 10, with 10 being the highest priority).

Title	Description	Lead Entity	Potential Partners	CP Score
Primary Priority Projects				
Develop Local Committee	Establish local committee to examine enhancement goals, benefits and risks	Klawock Cooperative Association and Klawock River Hatchery	Craig Tribal Association, Klawock Heenya Corporation, Shaan-Seet Corporation	7.68
Secondary Priority Projects				
Minimize potential impacts of hatchery coho	Hatchery continues to prioritize release of coho at off-site locations and minimization coho escapement into Klawock Lake.	SSRAA / Alaska Department of Fish and Game	Local Committee	N/A
Conduct a sockeye salmon enhancement feasibility study	A study to look at the feasibility, pros and cons of various enhancement options and methods	Not determined	Prince of Wales Tribal Conservation District	6.45

6.1 Develop a Local Advisory Committee

6.1.1 Project Description

The Enhancement subcommittee of the Klawock Lake Stakeholders group identified the need for a Local Advisory Committee, with the primary intent of providing feedback and recommendations on Klawock River Hatchery operations and any potential future projects aimed at expanding hatchery operations to include sockeye salmon enhancement. Members on the Enhancement subcommittee felt that no other sockeye salmon enhancement project could or should move forward until after a local advisory committee was formed, recognizing that the hatchery and enhancement has been contentious in the community for many years.

The local advisory committee does not necessarily need to be formalized as a non-profit organization. It could simply be hosted by one of the partners mentioned in Section 6.1.2. Once formed, an initial organizational meeting could quickly set the structure of the ad hoc group. Appointing a chairman to run and facilitate the meetings and a note taker would be sufficient for operations. The overall goal of the group would be to examine enhancement goals, benefits and risks for the Klawock Lake Watershed. One of the first questions to address may include whether or not the community as a whole is supportive of sockeye salmon enhancement efforts. Another important task of the group would be to assure that a Klawock representative continues to be appointed to the Board of Directors for the Southern Southeast Regional Aquaculture Association (SSRAA). The current member is Dennis Nickerson, and the seat he represents is Native Corporations (not specifically Klawock Heenya, all Native Corporations in Southeast Alaska). Board of Directors terms expire every two years, and members need to be re-appointed. The process requires a nomination and support from the group that the member represents. There is not a dedicated seat for the community of Klawock, Klawock Heenya Corporation, nor for the Klawock Hatchery.

A local advisory committee does not need to be restricted by only engaging in making recommendations for enhancement type activities and/or projects. There were other projects identified through the process of developing this Action Plan that would benefit from localized discussions. These include (but are not limited to):

- Establish a local Klawock Lake Watershed Committee (which would be responsible for submitting proposals to the Board of Fish and Federal Subsistence Board programs to change harvest regulations);
- Improve stakeholder communications (includes government agencies, harvesters, and other stakeholders engaged in the Action Plan process);
- Improve communications between stakeholders and SSRAA (Identify ways communications between local stakeholders and SSRAA can happen regarding hatchery operations);

- Continue to host stakeholder meetings on the Klawock Watershed beyond the Action Planning process (with Southeast Alaska Fish Habitat Partnership volunteering to take the lead role); and
- Develop outreach materials about the function and importance of the fish weir.

During the Action Planning process, it was recommended that the Local Advisory Committee may consider forming as an ADFG Advisory Committee. These committees are authorized by Alaska Statute 16.05.260 for the purpose of providing a local forum for the collection and expression of opinions and recommendations on matters related to the management of fish and wildlife resources. There are four formal ADFG Advisory Committees on Prince of Wales Island, including: Craig, East Prince of Wales Island, Hydaburg, and Klawock. Instead of creating a new [local advisory committee](#), it may make more sense to utilize the existing committees for this purpose.

6.1.2 Lead Entity and Potential Partners

The most appropriate lead entities would be the Klawock Cooperative Association (on behalf of Klawock community members) and SSRAA. A co-lead is highly recommended, to bring balance to the process of decision making. Other appropriate entities to be involved could include:

- Craig Tribal Association (on behalf of Craig community members)
- Klawock Heenya and Shaan Seet representation (Shaan Seet expressed interest)
- State of Alaska (Hatchery owner and responsible for permitting operations)
- Prince of Wales Tribal Conservation District
- A Fish and Game Advisory Committee Member
- Fisheries biologist with expertise in hatchery costs and benefits
- 1-2 community representative seats

6.1.3 Cost Considerations and Funding Options

The overall cost of organizing a local advisory committee and convening would be minimal. Meeting space and a teleconference line would be needed, which could potentially come in the form a contribution by any of the partnering organizations. Additional cost consideration may arise, once the committee has convened and determined how they would like to go about business. For instance, a need for outside facilitation may arise. A potential funding source for this might be [Resource Advisory Committee \(RAC\) funds](#) from the USDA Forest Service. Advisory Committee members' time may be used as a matching contribution if one is required.

6.1.4 Project Timeline

A local advisory committee could be set up at any time, and should be set up prior to engaging in other enhancement projects highlighted in this Action Plan. If the local advisory committee would want to formally interact with the hatchery permitting process, they could request being included on the distribution list for the ADFG's [Salmon Enhancement Regional Planning](#) team.

6.2 Secondary Priority Enhancement Projects

There were two secondary priority projects that were identified in the process. It is suggested that after the local advisory committee is established, a review of enhancement be conducted. One such potential project included minimizing potential impacts of coho salmon enhancement. This was ranked as a priority given how frequently it was mentioned at the community meeting. Coho salmon enhancement can have potential impacts on sockeye, including coho smolt predating on sockeye salmon fry; coho and sockeye competing in both the watershed and estuary; and impacts on sockeye having to pass through the weir designed for coho enhancement and collection of brood stock. Furthermore, it is highly irregular to operate hatcheries on wild systems, given the overall impacts on wild salmon stocks. The management of the hatchery has significantly improved operations and efforts to mitigate impacts on wild stocks over time, and minimization of impacts is overseen by the ADFG as part of their role in managing private non-profit hatchery operations. The hatchery and ADFG have been slowly moving much of its releases to the Klawock estuary and to Port Assumption, recognizing that the hatchery should not over-escape hatchery-raised coho salmon into Klawock Lake, and should only need to produce enough coho returning to Klawock Lake to capture the brood stock they require. The ADFG regularly monitors over-escapement and has the authority to change permitting requirements of the hatchery if it feels that coho management impacts the health of the watershed.

Another secondary priority project is to conduct a feasibility study of sockeye salmon enhancement projects. Although sockeye salmon enhancement at the current hatchery was a high priority of the community, it ranked lower in this action plan because there are concerns about feasibility and because of an acknowledgement that a local advisory committee and robust feasibility assessment must happen first. The feasibility of rearing and releasing sockeye salmon at the Klawock River hatchery has been questioned because of permitting concerns related to potential negative impacts to the wild stock. Klawock River Hatchery is currently approved to retain 1 million green eggs; however, they are not currently permitted for any sockeye salmon release sites or to rear sockeye salmon. ADFG has not permitted releasing or rearing of sockeye salmon at the Klawock River Hatchery due to the absence of an appropriate biosecurity plan which would overcome fish pathology concerns and require a disease-free water source, which is not currently available at the Klawock River Hatchery. The feasibility of mist incubating eggs in Klawock Lake tributaries has been questioned because it is not a legal activity under Alaska's salmon enhancement laws, which requires utilizing a private non-profit hatchery and associated private non-hatchery permit. Utilizing mist incubators as research, instead of for long-term rehabilitation, has been permitted before, but never for more than a few years and never for sockeye. It is unlikely that a research permit would be permitted for Klawock Lake given specific concerns about sockeye salmon health, and even if it was, it would not be for long enough to rehabilitate sockeye salmon populations. Finally, the feasibility of flying fish from another hatchery with a clean water source into the Klawock system has been questioned because of permitting concerns related to potential negative impacts on the wild stock. For this to occur, the closest available sockeye salmon hatchery (Snettisham) would need to be permitted to hatch

and rear Klawock Lake sockeye, and then transport them to Klawock for release. It may be likely that concerns about fish health would prevent such a long-term transport time (3-4 hours) from being permitted (L. Vercessi, ADFG Private non-profit hatchery coordinator, personal communications). Finally, it is widely known that survival levels for enhanced sockeye salmon can be quite variable across different ecosystems, and more would need to be known about lake productivity in order to understand how successful enhancement might be at rehabilitating stocks. Sockeye productivity is further discussed in Section 10.4

Through the course of this community action plan, more information about the ultimate feasibility of sockeye salmon enhancement was researched and organized. This does not negate the need for a more formal feasibility study, but does raise questions about whether sockeye enhancement is at all feasible given the information outlined above. The advisory committee could consider the implications of what the action plan suggests about feasibility before deciding to embark on a more robust feasibility assessment.

7.0 Priority Fish Abundance Projects

Fish abundance projects were geared towards identifying the number of sockeye salmon in or available to the Klawock Lake Watershed. This includes escapement, productivity, and harvest related sub-topics, as well as the mechanisms of how to obtain and understand the number of fish. There were ten fish abundance projects identified in the original project list developed for the Action Planning process (Appendix B). Table 2 identifies the primary and secondary priorities. Projects being conducted by others and/or projects identified but not determined to be a priority may be found in Appendix B.

Table 2. Primary and secondary fish abundance project priorities identified for the Klawock Lake Sockeye Salmon Action Plan. The Community Perspective (CP) score indicates the community ranking of the project against all other projects identified in the planning process (scale 1 to 10, with 10 being the highest priority).

Title	Description	Lead Entity	Potential Partners	CP Score
Primary Priority Projects				
Continue to monitor escapement	Continue to monitor sockeye escapement starting July 1 and assure SSRAA has funding to continue this	USDA Forest Service; Southern Southeast Regional Aquaculture Association	Alaska Department of Fish and Game Division of Commercial Fisheries; Klawock Cooperative Association	9.19
Sockeye salmon genetic sampling	Sample sockeye salmon for genetics in the commercial fisheries for 3 years to estimate commercial catch in the mixed stock fishery	Alaska Department of Fish and Game		8.7
Improve subsistence harvest reporting	Hire an in-season subsistence surveyor to collect harvest data on the fishing grounds, have a permit drop box location in Klawock, design a smart phone application for reporting	Alaska Department of Fish and Game - Division of Subsistence	Klawock Cooperative Association	8.77
Change Subsistence Fishing Regulations	Explore options for changing subsistence harvest dates and limits, including staggering subsistence and commercial openings	Klawock Cooperative Association	Alaska Department of Fish and Game - Craig Advisory Committee	6

Title	Description	Lead Entity	Potential Partners	CP Score
Secondary Priority Projects				
Sockeye salmon productivity study	Determine the productivity of sockeye salmon from Klawock Lake	Not determined	-	9.06
Develop Klawock sockeye salmon management plan	Develop a Klawock sockeye salmon management plan and develop escapement goals, using a collaborative plan between stakeholders and agencies	Alaska Department of Fish and Game Division of Commercial Fisheries	Klawock Cooperative Association, Craig Tribal Association	9
Quantify spawners entering and fry existing each tributary	The best way to quantify the condition and productivity of current spawning habitat for sockeye abundance is to quantify the relationship between spawners entering each tributary, and fry emerging from each tributary	Not determined	-	7.24

7.1 Continued Monitoring of Sockeye Salmon Escapement

7.1.1 Project Description

Counting adult sockeye salmon that return to Klawock Lake is a critical data need, and continuing to assure there is funding to do so was identified as one of the highest priorities by both stakeholders and the community. Klawock River Hatchery typically identifies and counts all fish that pass the Klawock River weir from the first week of July through the end of the coho run at the end of October or early November. They do not usually put the weir in earlier because of out-migrating steelhead. In recent years, supplemental funds from the Office of Subsistence Management's Fisheries Resource Monitoring Program (FRMP) have allowed for the weir to be installed and staffed starting July 1, prior to when the Klawock River Hatchery would ordinarily install the weir. Maintaining funding for being able to count sockeye salmon through the entirety of their run was the intent of this project when it was identified. Knowing the escapement in-season can assist fishery managers in making decisions regarding fishery opening as soon as a problem is recognized. On average, approximately 11% of the sockeye salmon escapement can be missed if the weir is not installed at the earlier date (S. Heidl, personal communication). However, this is largely dependent upon water levels and if early migrating salmon can make it over the falls before the weir.

Starting in 2018, the FRMP funding was not available. The Klawock River Hatchery did install the weir early in 2018, and the USDA Forest Service supplied a staff person to assist in continuing to take scales for Age, Sex, and Length (ASL) analysis (J. Reeves, personal communication). FRMP dollars are on a four year cycle, with the next opportunity to access these funds being in 2020. In the interim, ADFG staff have requested that the hatchery operation plan stipulate that the weir be installed on July 1. The Klawock River Hatchery Manager, Jeff Lundberg, agreed that if this stipulation were to be implemented, that the hatchery would be able to cover the extra month of manning the weir to pass to sockeye salmon (S. Heidl, personal communication). Unfortunately, the stipulation for early installation did not make it into the 2019 operational permit and the weir was not installed until late July. It will be up to ADFG and Klawock River Hatchery to continue to request and agree to this arrangement and include in the annual operational permit; if not, the local advisory group or SSRAA board seat could continue to advocate for this approach to the hatchery.

This project has the potential to incorporate some education and outreach with the community of Klawock. There have been concerns regarding the weir structure and operation, which include the potential the weir has to impact spawning salmon. There were two projects on the potential project list associated with the weir (Appendix A). The first was to look at alternative weir structures; the Fish Abundance group categorized that project as "not important or not supported". Some concerns that have been expressed about the weir have been addressed by making modifications to the tailrace and breaching the weir during extreme high flows (J. Reeves, personal communication). Further, alternative weir structures previously tried have not

produced accurate fish counts (i.e. trap in weir and video camera in weir) (J. Reeves, personal communication). Numerous community members and a former ADFG fisheries biologist still have concerns about the weir operations, and it is recommended that the Local Advisory Committee (described in Section 6.1.1) could look at developing a pilot study to reassess options like the video camera in the weir to count sockeye salmon for the July portion of the run.

The second project was “community outreach/education on the fish weir”, which was described as educating the community on the importance and function of the fish weir on the Klawock River. The Klawock weir supports the Fish Abundance subcommittee’s primary goal of continuing to monitor sockeye salmon escapement, and therefore the benefit might outweigh the potential impacts of the weir. This outreach and education component could be tasked to the Local Advisory Committee (Section 6.1.1) to provide education back to the community regarding the function and importance of the Klawock fish weir, which could help ease tensions between the community and the hatchery.

7.1.2 Lead Entity and Potential Partners

The primary partners include ADFG Commercial Fisheries and Southern Southeast Regional Aquaculture Association (SSRAA) which oversees operations at the Klawock River Hatchery. Further, ADFG Hatchery Program, who permits hatchery operations and owns the Klawock River Hatchery is a main partner. The USDA Forest Service has also accessed FRMP funds and provides staff to assist with scale sampling sockeye salmon. The Local Advisory Committee could be a potential partner for education and outreach regarding the weir.

7.1.3 Cost Considerations and Funding Options

The cost of installing the weir earlier than the start of standard operations for the Klawock River Hatchery are primarily staff time to manage the weir operations for the month of July. In addition to counting and passing fish, a trained fisheries biologist has also spent additional days at the hatchery in order to scale sample any sockeye salmon that move into the tailrace at the weir. The USDA Forest Service and/or Klawock Cooperative Association could apply for [Fisheries Resource Monitoring Program Funds](#) in 2021. In 2018, the Klawock River Hatchery provided one month of staff in-kind support to pass sockeye salmon and the USDA Forest Service provided a biologist to scale sample sockeye salmon when the hatchery called.

7.1.4 Project Timeline

The hatchery operation plan stipulation for early installation of the weir did not make it into the plan for the 2019 season. Early coordination between ADFG and the Klawock River Hatchery for the 2020 season should start early in the new year to assure that weir can be installed and manned July 1, 2020.

7.2 Genetics Study

7.2.1 Project Description

One common data gap in most Southeast Alaska sockeye salmon systems is knowing how many salmon are captured in the commercial harvest. This is due to the fishery being a mixed stock at the time and location that the commercial fisheries occur. Sockeye salmon are harvested incidentally in the purse seine fishery. One research strategy is to estimate the commercial harvest through genetic mixed stock analysis. Klawock Lake sockeye salmon migrate and are caught in commercial fishing Districts 3 and 4. A genetic background of the Klawock Lake sockeye salmon stock already exists, therefore genetic sampling and analysis of the commercially caught sockeye salmon should give an indication of the proportion of sockeye salmon intercepted in the fishery.

The ADFG was successful in securing three years of funding with the objective of “estimating the weekly and annual harvest of Klawock Lake sockeye salmon in commercial purse seine fisheries in management districts 3 and 4 in 2018, 2019, and 2020, such that the estimates are within 7% of the true value 90% of the time” (S. Heinl, personal communication). Results will be summarized for all three years of the project by April 2021, with a final ADFG Fishery Data Series Report completed by November 2021. The final project results will be presented to the public at a stakeholders’ meeting in Klawock. After the final report is complete would be the time to assess whether or not further genetics work would need to be continued, and how this information could be used to inform management-related decisions.

7.2.2 Lead Entity and Potential Partners

ADFG is the lead entity for the current study that is collecting data through the 2020 season.

7.2.3 Cost Considerations and Funding Options

The project is currently funded at approximately \$133,718.00 with a matching fund obligation of \$29,421.00. Stakeholder engagement at the end of the project is not included, with the exception of ADFG being funded to travel to Klawock.

7.2.4 Project Timeline

The project is in progress at the time of this report. The following timeline is expected:

- Continue genetic sampling through Summer 2020
- Data analysis complete by November 2020
- Summary results and draft report by April 2021
- Final report by November 2021
- Report out to stakeholders in late Fall 2021
- Determine if future sampling analysis is needed at stakeholder meeting in Fall 2021

7.3 Project Improve Subsistence Harvest Reporting

7.3.1 Project Description

It has long been acknowledged across the region, that there is a discrepancy between reported harvest of sockeye salmon and actual harvest of sockeye salmon in subsistence fisheries. Research conducted by ADFG showed that reported harvest is approximately 60-85% lower than estimated actual harvest depending on the community (Woll and Prussian, 2016). Improved harvest reporting can provide information about the amount of effort subsistence fishermen put forth in order to meet their needs, as well as provide data to ADFG for determining the Amounts Necessary for Subsistence (ANS) for all communities that harvest at Klawock River.

The Hydaburg Cooperative Association's on-site confidential harvest creel survey has shown a fair amount of success in more accurately reflecting the actual subsistence sockeye salmon harvest. Because most of their systems are accessed by boat from Hydaburg, a creel surveyor can interview all users of the sockeye salmon systems. The surveys are conducted either on the fishing grounds, at the Hydaburg dock, or in a follow-up interview at the fisherman's home. For the Klawock Lake sockeye salmon subsistence fishery, funding for hiring a technician to observe the fishery Monday – Friday every day from June 1 through July 31 would be the first step. The observer would note everyone who fished each day, so that if an interview on the grounds could not occur then the technician could follow up with the fisherman at a separate time. The surveyor should be a Tribal member or rural resident that has a fair amount of trust and/or support in Klawock and Craig. All fishermen would be asked for the species and number of fish caught, as well as questions about the amount of effort (recorded as hours fished and number of sets made). The harvest surveyor would not record names or residence of fishermen, in order to keep the surveys confidential. The harvest surveyor would not report harvest to law enforcement officials. It should be acknowledged that the project would need to gain trust over time, as did the Hydaburg project, and that data may not be very accurate for the first couple of years while the program builds trust within the communities.

For such a project to be successful, a fair amount of education and outreach to fisherman and the communities should be planned up front. Ideas for this include:

- Develop a flier that can be given to those who obtain a harvest permit, that gives the basics of why accurate reporting is important and what the information is used for
- Hold community meetings that discuss how the data is used to manage sockeye salmon
- Provide “collection boxes” for permits at the end of season

7.3.2 Lead Entity and Potential Partners

Klawock Cooperative Association, in partnership with the Craig Tribal Association, would make a logical lead as they are the best entities to hire a subsistence harvest surveyor. The ADFG Division of Subsistence could also be a partner and possibly offer training support, as well as data synthesis assistance.

7.3.3 Cost Considerations and Funding Options

Costs would include a data collection technician to be present during all harvest to observe the fishery and collect confidential data. The technician position would be for approximately 2 months. The USDA Forest Service has a [Citizens Science grant](#) that may fit this project well, although it is a national competition. These funds would be limited, and may only cover the cost of technician time and administration, leaving the education and outreach portion of the objectives to be funded separately. The [Alaska Southeast Sustainable Salmon Funds](#) may also be an option for funding both components of the project.

7.3.4 Project Timeline

The following steps have been identified for a timeline to move forward:

- Secure funding
- Develop a confidential sockeye salmon harvest survey protocol
- Hire and train a harvest survey technician
- Educate subsistence fishermen
- Collect data

7.4 Project Change Subsistence Fishing Regulations

7.4.1 Project Description

Currently, the subsistence fishing regulations for Klawock are some of the most restrictive in the region and include the following:

- Allowed fishing below the bridge under state regulations from July 7 to August 7, from 8 a.m. Monday through 5 p.m. Friday
- 20 fish per household per day
- Waters closed upstream of bridge to mouth of river for both state and federal
- May only fish from boat with outboard less than 50 horsepower

The allowable timeframe for subsistence harvest has been based on numerous planning efforts to reduce competition from communities farther away than Klawock and Craig, while still allowing for meaningful harvest opportunity for nearby communities. However, recent observations and anecdotal information have suggested a shift in run-timing of sockeye salmon into August which may have made reduced the overall opportunity for harvest. An evaluation of recent run-timing would be sufficient information for submitting a proposal to the Board of Fisheries for a change. The next opportunity would be a call for proposals in April of 2020 with a Board of Fisheries meeting on those proposals in January of 2021. Along these lines, there are other potential changes to regulations that rural residents may consider, especially as more data is available on commercial and subsistence harvest information. Therefore, the Klawock Cooperative Association may want to put together a local committee to discuss options. Having a biologist to

assist, such as a USDA Forest Service Subsistence Biologist, would help in the preparations of proposals.

7.4.2 Lead Entity and Potential Partners

Klawock Cooperative Association and Craig Tribal Association could form a partnership to address this with both environmental staff and Tribal Council members. Partners may include the POW Tribal Conservation District, the Craig Fish and Game Advisory Committee and local Southeast Subsistence Regional Advisory Council members. Technical assistance may come from ADFG staff as well as USDA Forest Service Subsistence Biologists.

7.4.3 Cost Considerations and Funding Options

This project may be a relatively low cost if Tribal staff would prioritize it. Engaging with Southeast Subsistence Regional Advisory Council and/or local Fish and Game Advisory Committees would assist, so time to attend those meetings should be covered. For both federal and state proposals to be successful, it is best if the proponent attends the respective board meeting, so travel costs should be considered. Pairing this with an Education and Outreach project may assist with prioritizing funding.

7.4.4 Project Timeline

A call for proposals for changing the State of Alaska Board of Fisheries Regulations for finfish in Southeast Alaska will occur in early 2020, with a deadline for proposals on/about April 10, 2020. The cycle is every 3 years, and this next call will change regulations starting in 2021. The call for proposals and information needed to submit a proposal may be found [here](#).

A call for proposals for changing Federal Subsistence Program Regulations for all fish in Southeast Alaska will also occur in early 2020, and the cycle for proposals is every two years. Changes to the Federal Subsistence Program Regulations will also be in 2021. The all for proposals and additional information on the regulatory process and how to submit a proposal may be found [here](#).

7.5 Secondary Priority Fish Abundance Projects

There were three secondary priority projects rated by the Fish Abundance subcommittee. These projects include a sockeye salmon productivity study, developing a Klawock Lake sockeye salmon management plan and quantifying sockeye salmon spawners entering spawning habitat and distribution of fry when they emerge.

The conditions that impact the historic, current, and potential productivity of Klawock Lake and how many sockeye salmon it can produce is one of the largest data gaps for Klawock Lake. Understanding how many sockeye salmon rear in the lake, their condition, and the underlying physical and biological properties that contribute to this productivity would assist managers in understanding where the limitations of sockeye salmon populations lie; within the lake and habitat environment or during ocean phases. Assessing sockeye salmon productivity was also identified in the enhancement and habitat subcommittees. It was the most common chosen

project by survey respondents and ranked third overall as important projects. Unfortunately, understanding of the factors associated with sockeye salmon productivity is complex, and requires commitment and resources for long-term monitoring using a consistent approach. Looking at smolt numbers and/or condition was recommended as perhaps the easiest way to get a glimpse into how many fish successfully are rearing in the lake (M. McPhee, personal communication), but still would require long-term funding and commitment. The Fish Abundance subcommittee recognized that assessing outmigration of sockeye salmon juveniles could potentially be harmful to the sockeye salmon population overall, because of how fragile juveniles are when being handled.

During the November 2017 Stakeholder meeting, the Fish Abundance group identified “Develop a Klawock Lake sockeye salmon management plan” as a potential project. The idea was put forth as a mechanism for developing escapement goals for sockeye salmon into Klawock Lake. Fishery Management Plans are typically developed by the State of Alaska, and are a formal plan that is approved by the Alaska Board of Fish and put into regulation (S. Heintz, personal communication, 2019). The Alaska Board of Fish is responsible for allocation of the species, and the management plan would include commercial and subsistence allocations in addition to escapement goals. Allocations are based on many factors, some of which are unknown at this time. These include an understanding of the commercial take in Districts 103 and 104 and whether or not the “Amounts Necessary for Subsistence (ANS)” is current or reflective of the communities that utilize Klawock Lake sockeye salmon. It would also include better data information on escapement, commercial, and subsistence harvest; therefore, pending the outcome of that data, a sockeye salmon management plan would be premature.

Woll and Prussian (2016) pointed out that the best way to evaluate the condition of sockeye salmon spawning habitat for abundance would be to quantify sockeye salmon spawners entering spawning tributaries and the fry emerging from the same tributaries. It was acknowledged such a project would be expensive. Focusing on major spawning tributaries first, might be a more cost effective way to approach such a project. However, Woll and Prussian (2016) also noted focusing on spawning habitat assessments (Section 11.1) and restoration efforts in these areas is a secondary way to support sockeye salmon productivity.

8.0 Priority Habitat Projects

Habitat is the topic most commonly thought of when addressing watershed scale planning and management. Assuring sockeye salmon have access to quality habitat addresses the juvenile life stage of population success as well as providing suitable places for returning adults to spawn. There were 29 habitat projects identified in the original project list developed for the Action Planning process (Appendix B). Many carry a common theme, but are located in different areas within the Klawock Lake watershed. Table 3 identifies the primary and secondary priorities, where common projects are lumped together. The original individual projects that were lumped and projects that were identified as not feasible, not supported and/or not important during the Action Planning process may be found in Appendix B.

Table 3. Primary and secondary project priorities identified for the Klawock Lake Sockeye Salmon Action Plan. The Community Perspective (CP) score indicates the community ranking of the project against all other projects identified in the planning process (scale 1 to 10, with 10 being the highest priority).

Title	Description	Lead Entity	Potential Partners	CP Score
Primary Priority Projects				
Conduct spawning surveys and habitat assessment surveys including TEK	Conduct spawning surveys for Halfmile Creek, Hatchery Creek, and Klawock Lake Shore. Conduct Tier I or Tier II habitat surveys to compliment spawning surveys. Use TEK to inform trends in spawning extent and abundance.	Southeast Alaska Watershed Coalition; The Nature Conservancy	Klawock Cooperative Association	6.79-9.05
Develop landowner best management practices	Develop a guidance document for all land owners which includes best management practices for protecting sockeye salmon habitat and populations for all future development within the watershed.	Kai Environmental Consulting Services	Southeast Alaska Watershed Coalition; The Nature Conservancy	8.16
Klawock Hollis Highway Fish Passage at Threemile	Evaluate and replace the double culverts with a bridge on Threemile Creek at the Klawock Hollis Highway Crossing.	Klawock Cooperative Association Tribal Transportation; U.S. Fish and Wildlife Service	USDA Forest Service; Alaska Department of Transportation	8.18

Title	Description	Lead Entity	Potential Partners	CP Score
Secondary Priority Projects				
Review previous road decommissioning, land stabilization, habitat thinning projects, and restoration work	Review previous road decommissioning plans, determine if roads were decommissioned appropriately, identify areas where landslide stabilization occurred and evaluate, identify previous restoration projects and evaluate. Identify areas where habitat thinning occurred and evaluate/measure changes, define next steps Decide on next steps.	Southeast Alaska Watershed Coalition, The Nature Conservancy	Tribal Conservation District, Klawock Heenay, Shaan Seet	8-8.42
Inlet Creek Monitoring	Regularly monitor habitat (through stream surveys, i.e. every 5 years) to assure good habitat is not becoming degraded.	Klawock Cooperative Association	The Nature Conservancy	8.89
Develop Klawock Lake Watershed Beaver Management Plan	A plan of when it is appropriate to remove beaver dams that are blocking access to spawning and rearing habitat, and when they should be left in place.	Southeast Alaska Watershed Coalition; The Nature Conservancy	Klawock Cooperative Association	8.89
Spatial distribution of sockeye smolt in the Klawock estuary	Preliminary investigation into the spatial distribution throughout time of sockeye and coho smolt in Klawock estuary.	The Nature Conservancy	N/A	6.13

8.1 Conduct Spawning Surveys and Habitat Assessment Surveys

8.1.1 Project Description

This project description combines five separate projects outlined in the Action Planning process that relate to assessment of sockeye salmon spawning habitat to help prioritize and inform future interventions and management decisions (H8, H9, R1 R3 & H4 in the Action Planning Spreadsheet).

The Klawock Watershed Condition Assessment (CCTHITA and USFS, 2002) is the most comprehensive analysis of stream habitat condition to date, and it was conducted to assess watershed health in response to local concerns about sockeye salmon numbers. This assessment suggested that timber harvest practices and road building during the 1970s-1990s, before the implementation of riparian buffer setbacks along stream corridors, severely impaired the natural functions of many streams within the Klawock Lake watershed. As a result, The Klawock Watershed Council commissioned a Klawock Watershed Restoration Master Plan (Keta Engineering, 2003), which was subsequently updated (Williams, 2008). Significant investments in restoration activities in the Klawock Lake watershed followed, including considerable amount of work to reduce sediment contributions to streams, improve fish passage through roads, close logging roads, and improve riparian conditions along lake tributaries. While it is likely that most of these activities have improved stream function, the direct impacts on increasing the number of returning sockeye are unknown and some restoration actions, such as forest thinning in riparian areas, may take many years to result in improved function or population impacts.

With the most obvious and straight forward habitat interventions having been completed in this watershed, stakeholders involved in the Action Planning stressed the need for additional data to ensure that future interventions would be impactful. Table 4 details the data gaps identified by restoration practitioners and stakeholders. Spawning surveys have been prioritized to better understand which stream reaches are most important for sockeye spawning and show trends in spawning use/extent. Habitat condition assessments for spawning areas and other anadromous waters will allow practitioners to understand if stream reaches are functioning properly.

Table 4. Spawning Survey and Habitat Assessment projects proposed for Klawock Lake Watershed.

Project Title	Description	Explanation
Conduct spawning surveys in Halfmile Creek	Conduct spawning surveys and use some existing data to provide more focus on surveys	Halfmile Creek has previously been identified as historically one of the most important sockeye salmon spawning systems in Klawock Lake. Some limited sockeye salmon spawning data was collected from 2014-2016, however because the system is so flashy, during high water events no data could be collected, making the dataset unreliable.
Conduct spawning surveys on Klawock Lake shoreline	Conduct spawning surveys on Klawock Lake shoreline in areas identified as spawning habitat	No recent surveys of lakeshore spawning have occurred, and it is unknown if significant lakeshore spawning occurs.
Conduct spawning surveys in Hatchery Creek	Conduct spawning on reaches that were not included in the 2018 report	From 2014-2016 spawning and habitat surveys were conducted on one tributary within the Hatchery Creek sub-basin where sockeye salmon were known to spawn but had limited access to spawning habitat due to a beaver dam complex. Additional data is needed for the remainder of the sub-watershed.
Use Traditional Ecological Knowledge to inform sockeye spawning trends	Collect TEK from traditional use of sockeye on historical extent and abundance of sockeye spawning to compare to current spawning abundance and extent	Comparison could suggest trends in spawning abundance.
Complete habitat surveys on spawning creeks	Conduct Tier I or Tier II habitat surveys to compliment previous spawning surveys	Habitat surveys have not been completed for Halfmile Creek, Hatchery Creek, or any of the smaller streams on the SE-NE side of Klawock Lake.

Depending on funding, these projects can either be combined into one larger comprehensive project, or they can be broken down into smaller projects. If smaller projects are more readily fundable, then it might make the best sense to pair the Hatchery Creek and Halfmile Creek surveys together, since there is some limited data on both systems. These systems are also best suited for conducting habitat surveys. In conjunction with spawning surveys, stream habitat surveys to obtain expanded information on the quality of habitat available for sockeye salmon in the same drainages should be taken. To be consistent with past surveys in Needham et al (2018), the USDA Forest Service Tier 2 survey protocol could be used. This, along with spawning habitat surveys in Halfmile Creek and along the Klawock Lake shoreline all rated a 9.05 in the community perspectives survey (Table 3).

Assessing spawning habitat in Halfmile Creek is challenging. Attempts to count spawning sockeye in the past have not been successful because at high water it is difficult to see fish as well as wade through the creek. One option may be the use of a drone that takes video inflight. While it is expensive technology, given the cost of the drone and the training to fly one for a survey, the project might appeal to a funder interested in piloting the project.

The gathering of traditional knowledge on historical spawning areas should be combined with the monitoring of spawning areas and lakeshore locations during the sockeye salmon spawning season. Further, this effort should be coordinated with community engagement/outreach projects. While gathering lakeshore habitat data could be incorporated, there is no standard protocol, so methods would need to be developed as part of the project. During follow up meetings with the steering committee, it was brought up that traditional knowledge of sockeye salmon spawning areas around the lake could be compared back to where sockeye salmon are spawning now along the lakeshore, to determine if there may be longer standing impacts. Further, this may have implications or be a sign of how the sockeye salmon populations have changed over time.

8.1.2 Lead Entity and Potential Partners

The Nature Conservancy has successfully completed surveys in the major spawning tributaries, and would make a logical lead. Using a local workforce as in previous studies may allow for access to broader funding opportunities. The project might be able to use “academy” style training to tap workforce development funds, which may reduce costs of implementing surveys. Other potential partners would be Klawock Cooperative Association, Klawock Heenya, and Shaan Seet, from which local crews may be hired.

8.1.3 Cost Considerations and Funding Options

In order to provide the same effort as past sockeye salmon spawning studies, funding should be for a minimum of three seasons for a two person crew and a biologist to lead the crew, synthesize the data and develop a report. With the exception of Halfmile Creek, all areas are often most easily accessed using a boat, so partnering with an organization such as Klawock Cooperative Association who does predation studies and temperature monitoring in the lake, may assist in reducing startup costs.

A portion of the project may be fundable under the Alaska Sustainable Salmon Fund. Crew training might be paired with Natural Resource Academy trainings. Innovative portions of the project, such as a pilot drone study or using TEK to better understand climate impact may also be an option for funding.

8.1.4 Project Timeline

The first step in moving this project forward would include securing funding. The POW TCD has secured funds to host a training to ensure a trained local workforce is available for spawning surveys, habitat surveys, and hand tool sized restoration projects. The Southeast Alaska

Watershed Coalition has submitted an application to National Fish and Wildlife Foundation, in partnership with the Klawock Cooperative Association, POW TCD, and The Nature Conservancy, to move forward with a subset of the habitat and spawning surveys. Work could begin as early as the summer of 2020 if funding is secured. If funding is not secured, then further grant writing efforts would be needed.

8.2 Develop a Land Owner Best Management Practices (BMP)

8.2.1 Project Description

During the Action Plan planning process, the idea of developing Best Management Practices (BMPs) tailored towards landowners within the Klawock Lake Watershed was identified. The primary purpose of the document would be to assist in minimizing potential impacts to sockeye salmon populations and/or habitat as new development occurs within the watershed. A BMP guidance document would be written for all landowners, from individual lot owners to the larger land owners: Klawock Heenya and Shaan Seet. The planning process for this Action Plan document did not include reaching out to individual lot owners within the Klawock Lake watershed. BMPs should be in place for individual landowners too, so some effort to go back and capture at a minimum the Klawock Lake Subdivision would be necessary.

A first step could be to have a facilitated meeting with landowners to provide background on sensitive areas in the watershed, as well as general things that can be done to preserve all salmon habitat in these areas. Having landowners work together to brainstorm actions they are willing to take in order to protect salmon habitat and sockeye salmon populations would assist in giving them ownership in any BMP document that may be developed. Recognizing that it may be hard to get individual landowners along the Klawock Hollis Highway and the Klawock Lake Subdivision engaged, especially in a “meeting” format, developing a briefing paper and questionnaire might be an education and outreach step that could be taken. For example, Southeast Alaska Watershed Coalition’s [“living next to a salmon stream”](#) brochure will be modified to communicate best management practices to individual landowners in the Klawock Lake Subdivision. Table 5 outlines a BMP plan for landowners in the Klawock Lake Watershed.

Table 5. Outline of Best Management Practices for the Klawock Lake Watershed

<i>Watershed Condition and Background</i>
Ownership, property boundaries, watershed boundaries, topography and landscape features.
Location of streams and known fish presence and use.
Location and type of wetlands.
Roads, road condition, borrow pits, access plans, access needs, and access options.
Maps detailing past logging, thinning, and other developments.
<i>Future Land Uses</i>
Access, forestry management, subdivision/sale, non-forest timber products, recreation, etc.
<i>BMPS</i>
Conservation, recreation, non-timber forest products, and/or set asides.
Access and Roads.
Suggestions on site selection and design if subdivision is to occur.
Subdivision/development standards: density, size of lots, % of fill for building pads allowed, sanitation, etc.
Suggested buffers for lakeshore and streams.
Suggestions for forestry management, including pre-commercial thinning, possible carbon sequestration options, cut locations, rotations, etc.

8.2.2 Lead Entity and Potential Partners

Kai Environmental has been engaging with major landowners during this Action Planning process, and may be able to facilitate a joint landowner meeting. The process should start with outreach and education, and then work to get commitment from landowners on BMPs.

8.2.3 Cost Considerations and Funding Options

Funding for facilitated meeting would need to include funds to bring in any experts to present. Possible sources of funding options include the following:

- USDA Forest Service RAC funds
- NRCS Rural Conservation Partnerships Program
- USDA Joint Chiefs Landscape Restoration Partnership
- National Fish and Wildlife Foundation
- US Fish and Wildlife Service Partnership Funds.

8.2.4 Project Timeline

This project is timely as landowners are engaged in the current Action Planning process. This project could take place as soon as funding is secured for facilitation, coordination, and research time. The Southeast Alaska Watershed Coalition has submitted an application to National Fish and Wildlife Foundation, in partnership with the Klawock Cooperative Association, POW TCD, and The Nature Conservancy, that would partially fund this project. Work could begin as early

as the summer of 2020 if funding is secured. If funding is not secured, then further grant writing efforts would be needed.

8.3 Project Klawock Hollis Highway Fish Passage at Threemile

8.3.1 Project Description

The Threemile Creek tributary crossing with the Klawock Hollis Highway has been identified as a location where the double culverts inhibit the passage of juvenile fish. When assessed, the culverts are both identified as “red” culverts (where red indicates the culverts are inadequate for fish passage). The issue likely stems from the creeks’ constriction at the Klawock-Hollis Highway and is compounded by additional factors such as rapid aggrading from high alluvial transport (CCTHITA and USFS, 2002). The culverts have also change the course of a floodplain channel, and then a subdivision was constructed in the floodplain on the river left side of Threemile tributary. In order to protect landowners from the naturally meander of the creek through the floodplain, portions of the creek have been dyked (CCTHITA and USFS, 2002). Further, a landowner has removed large woody debris from the stream reach immediately downstream of the crossing, causing channel incision and decreased habitat complexity (Needham et al, 2018).

Numerous entities over the years have looked at how to best address the crossing. The area receives a lot of attention, not just because Threemile Creek was historically the largest spawning system in the Klawock Lake Watershed, but because the hydrology of the system at the crossing produces subsequent challenges not necessarily related to fish (i.e. subdivision landowners). Each time the location is looked at by various experts, the conclusion is that restoration and upgrades to the crossing are needed, but the cost of funding this work is high and the logistics of secure permission and design are complex. In 2018 and 2019, the Klawock Cooperative Association took the initial steps to access bridge monies from the Tribal Transportation Program for this project, but currently this crossing is not applicable to the Tribal Transportation Program. The US Fish and Wildlife Service’s Fish Passage Program is another option for moving this project forward, as this program could conduct a geomorphic assessment of the crossing. Determining the feasibility of restoring fish passage in a way that would not increase flooding risk for the landowners is a first and necessary step. It would be prudent to begin identifying funding sources for replacing the crossing, as this could take several years to secure.

8.3.2 Lead Entity and Potential Partners

This project is a candidate for having a co-lead. The Tribal Transportation Program within the Klawock Cooperative Association is likely the best entity to secure funds for this project, if it were to go to construction as a bridge project. The U.S. Fish and Wildlife Service’s Fish Passage Program would also be a source of funds and could provide the technical assistance for assuring the project comes to fruition. Having these organizations work together to overcome the obstacles the project presents, has the highest potential for success.

Other partners may include:

- Klawock Heenya Corporation who owns land around the project and may be able to provide access and easements
- The USDA Forest Service who have spent time assessing the Threemile drainage
- The State of Alaska Department of Transportation and Public Facilities who may be able to provide funds to assist with matching contributions
- The Nature Conservancy and Southeast Alaska Watershed Coalition to help coordinate activities and keep the project moving
- The Prince of Wales Tribal Conservation District who may be able to engage in education and outreach

8.3.3 Cost Considerations and Funding Options

An initial geomorphic assessment to determine project feasibility would likely cost between \$25,000 - \$35,000. Costs for design and construction would vary depending on the type of crossing or action pursued. The Southeast Alaska Watershed Coalition has solicited support from U. S. Fish and Wildlife Services' Fish passage program for a geomorphic assessment. An education and outreach component for subdivision landowners should also be considered.

8.3.4 Project Timeline

The following steps have been identified for a timeline to move forward

- Secure funding for a Geomorphic Assessment
- Complete a Geomorphic Assessment via USFWS's Fish Passage Program
- Engage landowners and the Alaska Department of Transportation and Public Facilities
- Secure landowner permission and obtain permits as necessary
- Secure funding for engineering and design for replacing the crossing or other actions, if options exist after the geomorphic assessment.

At any time, it would be prudent to begin identifying funding sources for replacing the crossing, as the cost is likely to be high and secure funds could take several years.

8.4 Secondary Priority Habitat Projects

There were several habitat projects that were categorized as a secondary priority, some projects were not chosen as high priority because work had been started or completed at the time of the drafting of this plan. A review of past road decommissioning, review past landslide work, and review habitat thinning projects is meant to inform restoration practitioners on the success of past actions and prioritize future interventions. These projects were not chosen as a high priority, as some of this review work was started and conducted by SAWC and TNC for the Threemile Creek drainage. A summary report from that effort may be found in Appendix F. While additional review would be beneficial in the Hatchery and Halfmile sub-watersheds, recommendations were made for additional thinning, road decommissioning, and fish habitat

restoration for the Threemile Creek drainage. SAWC, TNC, Klawock Cooperative Association, and the POW-TCD are beginning the process of raising funds to implement the projects suggested in Appendix F. It is recommended that SAWC and TNC integrated the review of past interventions at the Hatchery and Halfmile Creek sub-watersheds into future restoration projects and habitat assessments.

Other secondary priority projects include monitoring Inlet Creek, developing a beaver management plan, and determining the spatial distribution of sockeye and coho smolt in the Klawock estuary. Inlet Creek provides relatively undisturbed spawning habitat for sockeye salmon, including wide riparian buffers where timber harvest previously occurred. Continuing to monitor that instream large woody debris remains available was a recommendation from the Klawock Lake Sockeye Spawning Habitat Assessment (Needham, et al., 2018). In some respects, this project may be incorporated into the development of landowner BMPs (Project highlighted in Section 9.2).

During the winter of 2018/2019, SAWC and TNC met with local interested parties to discuss site specific beaver activity that is likely to the detriment of sockeye salmon. It was determined that a beaver management plan for the watershed was not warranted, as beaver management is generally considered a low priority for restoration of sockeye salmon. Appendix F provides additional information on this review. Before any targeted beaver population control measures or dam removals are attempted in the watershed to restore or maintain historical sockeye spawning habitat, it is recommended that the following steps are taken:

1. Document the location and size of beaver dams and ponds in the watershed
2. Determine the amount of known or potential salmon spawning habitat impacted by beaver ponds
3. Document fish species and life stages living in beaver ponds
4. Measure the influence of beaver ponds on water temperature and sediment transport/storage
5. Assess the potential for beaver dams to block or impede fish passage

Woll and Prussian (2016) recommended that investigating the spatial distribution throughout time of sockeye salmon and coho salmon smolt in the Klawock estuary would be beneficial. While Klawock Cooperative Association is investigating predation on sockeye salmon in the Klawock Lake, this work does not include the Klawock estuary. The extent of sockeye salmon use of the Klawock estuary is unknown, if sockeye salmon juveniles are spending time in the estuary it is feasible that large coho smolt may predate on small Age-1 sockeye salmon smolt if their spatial distribute overlapped for any length of time (Woll and Prussian, 2016).

9.0 Priority Education and Outreach Projects

During the 2017 Stakeholder Meeting there were 13 potential projects identified that could be more generally defined as education and/or outreach type projects. Some projects fit with projects identified in other subgroups, while some were stand-alone projects. All of the originally identified projects may be found in Appendix B. There was not an “Education and

Outreach” subcommittee assigned to review and rank the projects during the Action Planning Process; therefore, the document authors prioritized the list.

Eight of the projects were incorporated into other projects in Enhancement, Fish Abundance and/or Habitat and include:

- Local representation on SSRAA Board was incorporated into Section 6.1.1.
- Establish a local Klawock Watershed committee was incorporated into Section 6.1.1.
- Educate subsistence users on the value of accurate harvest reporting was incorporated into Section 7.3.1.
- Community outreach/education of the fish were was incorporated into Section 7.1.1
- Three projects were combined (improve stakeholder communications, communications between stakeholders and SSRAA, and continue stakeholder meetings) and were considered inherent to the action planning process. They also were incorporated into Section 6.1.1.
- Quantify/Qualify coho concerns in the Klawock Watershed were incorporated into the discussion of “minimize impacts of hatchery coho” and “coho enhancement concerns” in Section 6.3, as well as “spatial distribution of sockeye salmon in the estuary” in Section 8.4.

The remaining five projects on the list were prioritized based on the community perspectives scoring process and whether or not the project fit the vision of the action plan. The Household Harvest Surveys and Klawock TEK Harvest study were combined into one priority project. The Klawock River Fishing Day was considered a priority project. And finally, two projects were discussed as secondary priority projects: engaging in K-12 education and developing a fish consumption rate.

9.1 Klawock Household Harvest Surveys and TEK Harvest Study

9.1.1 Project Description

In 2016, the Klawock Cooperative Association received Bureau of Indian Affairs funding to conduct household harvest surveys in the community of Klawock. The project was modeled after other household survey projects intended to gather data on the harvest and use patterns for sockeye salmon in the community of Klawock. The surveys were completed for the summer of 2016 fishing year. Typically, the end result of the data analysis can be used for determining the Amounts Necessary for Subsistence (ANS) for a community. It also helps to gather traditional ecological knowledge (TEK) about past and current harvesting patterns, to better understand how the community uses the subsistence fishery. A final outcome may also include identifying regulations that could be changed to better suit the harvest patterns for the community. The 2016 effort did not generate enough data to be formally analyzed. A total of 15 surveys were conducted, when the sample goal was 20% of all households in Klawock. A second effort to try to capture information across users of Klawock Lake sockeye salmon specifically was initiated

through an online survey in Survey Monkey during the summer fishing season of 2017. Summary information is available through the Klawock Cooperative Association, however no formal reports have been written (Q. Aboudara, personal communication). An obstacle of the project might have been survey fatigue from residents of Klawock.

The protocol Klawock Cooperative Association set out to implement, allowed for the standardized survey to collect responses that could be run through a statistical analysis that would support harvest patterns and use. The project should be repeated, if the information is deemed useful, however this would require local stakeholders to sit down and discuss the value in having this type of data.

A second type of study, which incorporates TEK about historical harvest and use patterns could be done by conducting directed interviews. At stakeholder meetings, local residents have already provided locations where sockeye salmon previously spawned in the lake and discussed the changes in the timing of the year when sockeye salmon return. This project could be formalized by developing a standard set of discussion questions, identifying local knowledgeable elders, conducting interviews with discussion questions as talking points, using historical and current maps as visuals during the interviews, recording the interviews, and writing a summary report that incorporates what is learned.

9.1.2 Lead Entity and Potential Partners

The Klawock Cooperative Association would be a lead entity, with the Prince of Wales Tribal Conservation District as a potential partner. Other partners could include Craig Tribal Association, since the community of Craig is an established subsistence user group of Klawock Lake sockeye salmon.

9.1.3 Cost Considerations and Funding Options

The cost of conducting the Household Harvest Surveys are generally around \$50-60,000. The [Fisheries Resource Monitoring Program](#) has funded such studies in the past, and in some cases provided an anthropologist to assist in the study design and/or data analysis. The funding source requires a partnership with local Tribal entities. The [Bureau of Indian Affairs](#) used discretionary funds for the first Household Harvest Survey project awarded to Klawock Cooperative Association, so budget considerations could be taken into account from that effort.

The costs of conducting directed interviews for gathering TEK would include staff time, stipends for interviewees, and recording equipment. In recent years, for Southeast Alaska, it has been getting more difficult to get harvest survey and TEK type projects funded (L. Sill, personal communications). One strategy would be to pair the data collection with other academic type funding, such as climate change. No specific grants and/or partnerships were identified at the time of this report.

9.1.4 Project Timeline

For the Household Harvest Survey project, the first step would be for Klawock Cooperative Association to determine if they would take the lead on effort. If so, the next step would be to secure funding. If not, then another organization identified in Section 9.1.2 could take the lead in securing funding to pursue the project. Once a lead entity has been identified, they could reach out to Lauren Sill at ADFG of Subsistence for funding ideas, or they could reach out to the University of Alaska Fairbanks Fisheries and determine if there is other research this project could be paired.

The TEK project could be paired up with other project grant proposals, such as “Improving Subsistence Harvest Reporting” in Section 7.3, or “Spawning Surveys and Habitat Surveys” in Section 8.1. The lead entities for each of those projects could decide how directed interviews could be incorporated into the project planning. Therefore, the first step would be to identify a lead entity to incorporate the project into another study, or to lead the project. The next step would be to secure funding

9.2 Klawock River Fishing Day

9.2.1 Project Description

In 2016, the Klawock Cooperative Association began a predation study on Klawock Lake, with the primary objective of determining the impacts that rearing coho salmon smolt may have on emerging sockeye salmon fry. During the course of the three year study, it was apparent that large trout were also a large predator. It was observed that trout tend to hang around the Klawock River Hatchery rearing pens, feeding on food that seeps down through the net pens until the coho smolt are moved to salt water. Then the trout could be found distributed throughout the lake in search of other food sources, including sockeye salmon. This prompted the Prince of Wales Tribal Conservation District to implement a Klawock River Fishing Day, during the Spring of 2019. The effort was supported and primarily funded by the SSRAA.

Having an annual Family Fishing Day would be an opportune education and outreach event. Continuing to host the event at the Klawock River Hatchery could allow for other education opportunities discussed in this document to occur. For example, providing an understanding on how the weir operation works by giving participants a visual tour. The event also gives the Klawock River Hatchery the opportunity to engage with the public. The steps to implement the annual Family Fishing Day include securing the funding early in the year. Planning the event and scheduling for late May or early June.

9.2.2 Lead Entity and Potential Partners

The Prince of Wales Tribal Conservation District, Klawock Cooperative Association, and Prince of Wales Tribal Environmental Coalition have all discussed and supported the idea of having an annual Family Fishing Day at Klawock Lake, with the event being hosted at the Klawock River Hatchery and supported by SSRAA.

9.2.3 Cost Considerations and Funding Options

The cost of continuing the project annually includes staff time to organize the event, potential cost of hosting the event in a central location, and refreshments for the event. In 2019, SSRAA supported the project by providing all the refreshments and hosting the event at the Klawock River Hatchery. Mr. Dennis Nickerson intends to submit a request for the 2020 event, and stated that SSRAA supported continuing to host the event annually. If this sponsorship does not happen, then other funding would need to be secured. Donations, sponsorship and/or admittance fees could be considered. In addition, the National Oceanic and Atmospheric Administration (NOAA) National Fish Habitat Partnerships Program has a [grant](#) entitled “Increasing Recreational Fisheries Engagement” which may apply.

9.2.4 Project Timeline

The 2019 event was likely held too early in the season. It was discussed that late May and/or early June would be a more appropriate timeframe when trout are more active and moving around the lake. Annual events should be scheduled for that timeframe. A funding request to SSRAA for their support of the event will be put forward at their January 2020 Board of Directors meeting, and this could be an annual request.

9.3 Secondary Priority Education and Outreach Projects

There were two projects considered as secondary priority education and outreach projects. The first was “Engaging in K-12 education in the Klawock School” with the idea of helping educate future generations and fishers about Klawock sockeye. In 2017, a local workforce development initiative supported by Sealaska Corporation began implementing a high school natural resource curriculum into Prince of Wales Schools. The Klawock City School District is one of the participating schools, where speakers from different natural resource sectors guest lecture at the high school science class, and incorporate hands on activities associated with the subject matter. There is not a current speaker identified for Klawock Lake Sockeye Salmon, however Bob Girt at Sealaska Corporation has indicated that there would be room for inclusion of the subject matter for the 2020-2021 school year. Further, a funding initiative to strengthen the program has recently sought funding through the [EPA Environmental Education Grant](#). Mr. Girt has included the subject of Klawock Lake sockeye salmon for the next school year for Klawock Schools.

Additionally, the Prince of Wales Vocational and Technical Education Center has a Department of Forestry grant with a line item task of coordinating K-12 education in natural resources. Cathy Needham will be working with Bob Girt and the Klawock City School District to incorporate Klawock Lake Sockeye Salmon lessons for other youth outside of the high school program, starting with the middle school.

The other secondary priority project for education and outreach was developing a fish consumption rate for the community of Klawock. A fish consumption rate is an estimated amount of fish that is eaten over a specific period of time. These rates are important when developing the criteria used for protecting human health from certain toxic chemicals potentially

found in water in which fish live. The Environmental Protection Agency has set a nationwide fish consumption rate of 22 grams/day for general population, and 142.2 grams/day for subsistence users. However, a State of Alaska study showed wide variation between rural communities at 141-379 grams/day on the high end (Polissar and Neradilek, 2019). Developing a local fish consumption rate for Klawock could be useful in assessing the risk to Klawock residents to potential contaminants from past development, however, it was deemed not to be a priority given that this research would likely have little impact on sockeye salmon populations.

10.0 Conclusions

The Klawock Lake Sockeye Salmon Action Plan is intended to be a living document with the vision of guiding landowners, stakeholders and the Klawock community in *promoting healthy and sustainable sockeye salmon populations in Klawock Lake for local communities*. The action planning process began after the completion of Woll and Prussian's "*Klawock Lake Sockeye Salmon Retrospective Analysis*" in 2016. Stakeholders have continuously engaged in the development of this action plan by bringing forward project ideas at stakeholder meetings, such as the one in November 2017, as well as assisting with prioritizing projects. Details for projects were filled in, after numerous discussions with stakeholders and subject area experts.

Over the course of one year, during the action planning process, many priority projects gained traction. Some stakeholders have stepped forward and taken ownership of projects and are able to use the Klawock Lake Sockeye Salmon Action Plan to show funders project prioritization across a diverse stakeholder group. Individual project status may be tracked by contacting the authors of the Southeast Alaska Watershed Coalition or The Nature Conservancy.

11.0 References

- Central Council Tlingit and Haida Indian Tribes of Alaska (CCTHITA), and US Forest Service (USFS). 2002. Klawock Watershed Condition Assessment, Klawock, Alaska.
- Conitz, J. M. 2010. Klawock Lake Subsistence Sockeye Salmon Project. 2008. Annual Report. Alaska Department of Fish and Game, Division of Sport Fish and Commercial Fisheries, Juneau, Alaska.
- Darrow, 1934. Unpublished interview transcripts. Interviewed by R.L. Olson in Klawock, Alaska. Information extracted from Ratner, et al (2006).
- Keta Engineering. 2003. Klawock Watershed Restoration Master Plan. Prepared for Klawock Watershed Council, Klawock, Alaska.
- Langdon, S.J. 2006. Traditional knowledge and harvesting of salmon by Huna and Hinyaa Tlingit. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report (Project No. 02-104), Anchorage, Alaska.
- Needham, C., R. Moyer, C. Woll and M. Richards. 2018. Klawock Lake Watershed Sockeye Spawning Habitat Assessment, Prince of Wales Island, Alaska. Kai Environmental Consulting Services, LLC and The Nature Conservancy.
- Polissar, N and M. Neradilek. 2019. Alaska Statewide and Regional Estimates of Consumption Rates in Rural Communities for Salmon, Halibut, Herring, Non-Marine fish, and Marine Invertebrates. Final report prepared by The Mountain-Whisper-Light Statistics and Tetra Tech EPA Contract EP-C-14-016.
- Ratner, N. C., P. Brown, J. Rowan, D. Yates, M. Smith, J. A. Dizard, A. Paige, and M. F. Turek. 2006. Local knowledge, customary practices, and harvest of sockeye salmon from the Klawock and Sarkar Rivers, Prince of Wales Island, Alaska. Alaska Department of Fish and Game, Division of Subsistence.
- Roppel, P. 1982. Alaska's salmon hatcheries, 1891-1959. Alaska Pacific University Press.
- Thornton, T.F. 2012. Haa Leelk'w Has Aani Saax'u: Our Grandparents' Names on the Land. Sealaska Heritage Foundation. University of Washington Press.
- Williams, D.J. 2008. Klawock Watershed Restoration Master Plan Update. Prepared for the Klawock Watershed Council, Klawock, Alaska.
- Woll, Christine and Aaron Prussian. 2016. Klawock Lake Sockeye Salmon Retrospective Analysis. The Nature Conservancy and Alaska Watershed Consultants.

12.0 Embedded Website Links (in order of appearance)

- Page 7: Klawock Lake Stakeholder Meeting Documents from November 2017:
<http://www.seakfhp.org/wp-content/uploads/2018/01/Klawock-Lake-Sockeye-Stakeholder-Meeting-2017-Report.pdf>.
- Page 17: Alaska Department of Fish and Game – Local Advisory Committee:
<https://www.adfg.alaska.gov/index.cfm?adfg=process.advisory>
- USDA Forest Service Resource Advisory Committee Funding page for Prince of Wales Island: <https://cloudapps-usda.gov.secure.force.com/FSSRS/CreateNewProjectPage?rac=001t0000002JcukAAC>
- Alaska Department of Fish and Game Hatchery Planning Page:
<https://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesPlanning.regional>
- Page 23 Office of Subsistence Management Fisheries Resources Monitoring Program Funds application page: <https://www.doi.gov/subsistence/frmp/funding>
- Page 26 USDA Forest Service Citizen Science Competitive Funding Program:
<https://www.fs.usda.gov/working-with-us/citizen-science>
- Alaska Department of Fish and Game Alaska Sustainable Salmon Fund;
<http://www.akssf.org/CFP/>
- Page 27 Alaska Department of Fish and Game Board of Fisheries Proposal Information:
<https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>
- Federal Subsistence Management Program Proposal Information:
<https://www.doi.gov/subsistence/proposal/current>
- Page 34 Southeast Alaska Watershed Coalition’s Living Next to a Watershed document:
https://www.alaskawatershedcoalition.org/juneauwatersheds/publications/JWP_StreamBrochure.pdf
- Page 40 Office of Subsistence Management Fisheries Resources Monitoring Program Funds application page: <https://www.doi.gov/subsistence/frmp/funding>
- Bureau of Indian Affairs Subsistence Program: <https://www.bia.gov/regional-offices/alaska/subsistence-branch>
- Page 42 National Oceanic and Atmospheric Administration Fisheries Funding and Financial Services Information: <https://www.fisheries.noaa.gov/funding-opportunities>
- Environmental Protection Agency Environmental Education Grants:
<https://www.epa.gov/education/grants>

This page intentionally left blank

APPENDIX A
Extended Action Planning Process

This page intentionally left blank

Klawock Lake Sockeye Salmon Action Plan Extended Action Planning and Landowner Involvement

Action planning process:

The initial task was to construct a project list of all recommendations that were outlined in recent technical papers, such as the Retrospective Analysis (Woll and Prussian, 2016) and the Klawock Lake Watershed Sockeye Spawning Habitat Assessment (Needham, et al., 2018), as well as the projects that were identified during Klawock Lake stakeholder meetings in November of 2017. The Klawock Lake Stakeholder Steering Committee (mentioned in Section 1.0) has remained active through the planning process of this Klawock Lake Sockeye Salmon Action Plan. A list of steering committee members may be found in Appendix B.

The project list developed by Kai Environmental was sent to the Klawock Lake stakeholder steering committee for review. There were five main categories of projects, which were identified with (E) for an enhancement projects, (H) for a habitat projects, (FA) for a fish abundance projects, and (CP) for community perspective projects (mainly education and outreach style projects), and (R) for projects identified in reports. The initial project list may be found in Appendix A. The steering committee members were given the opportunity to add projects, which were eventually placed in a sixth category and identified with (O) for other projects.

In November 2018, a briefing paper and the project list were given to the major landowners within the Klawock Lake Watershed (Appendix A). Kai Environmental scheduled and held meetings with landowners first. The primary purpose of the meetings, was to inform the landowners of all potential projects being discussed, as well as to assure there was buy-in for projects that may occur on lands and/or need access to lands. These meetings occurred in mid-November to mid-January.

In mid-December 2018, Kai Environmental convened the Klawock Lake Stakeholder Steering Committee and asked for assistance in how to best detail out the projects in the project list, and how to prioritize projects for the Action Plan. It was determined to put the Steering Committee back to work developing standard evaluation criteria for each project, and then hosting subcommittee teleconferences. Notes from the December 17, 2018 Steering Committee teleconference may be found in Appendix C. Subsequently, Kai Environmental, TNC and SAWC developed evaluation criteria and guidance for the teleconferences, which may be found in Appendix D. Teleconferences were held with subcommittee in January through mid-February, and summary notes by subcommittee may be found in Appendix C.

In order to incorporate community perspectives into the planning process, local residents were asked to take a survey on Survey Monkey. Respondents were asked to rate their support of each individual project from the project list, where 0 indicated they did not support the project and 10

indicated that they strongly supported the project. Respondents were then asked to explain why they made their decision. Alternatively, respondents were also asked to choose the five projects they would support the most. The community perspectives score (CP) is attached to each project in the master project list table in Appendix A, and on Tables 1-3 of this document

Landowner involvement:

On November 15, 2018, Kai Environmental attended a Board of Directors meeting with Klawock Heenya Corporation to present the action planning process. Briefing materials to accompany a comprehensive project list were developed and a copy may be found in Appendix A. After a presentation, the Board of Directors was invited to remove potential projects from the list if it was a project on their land and they would not support it. Klawock Heenya Corporation did not remove any projects and asked that they be given the chance to read the Action Plan before it is distributed. Further, the Chief Executive Officer Mary Edenshaw serves on the steering committee for the stakeholder group and would remain a conduit for keeping the Klawock Heenya Corporation Board of Directors informed.

On December 11, 2018, Kai Environmental met with the Natural Resource Department and Corporate Council of Sealaska Corporation. Because Sealaska does not own surface land rights within the Klawock Watershed, they mainly wanted to defer to the ANSCA Village Corporations that do. They would appreciate a copy of any final product, and emphasized the importance of involving the local community members.

On January 18, 2019, Kai Environmental met with the General Manager Edward Douville of Shaan-Seet Corporation. Mr. Douville was supportive of the Action Plan, and shared his knowledge of use of Klawock Lake sockeye salmon by Craig residents. He did not feel that any projects needed to be removed because they were a conflict with Shaan Seet landownership. And he said that Shaan Seet would be particularly interested in seeing projects that could put Shaan Seet Corporation shareholders to work. Therefore, he was very supportive of some of the habitat data collection projects on the list. Mr. Douville said he would remain the conduit for keeping the Shaan Seet Corporation Board of Directors informed.

The USDA Forest Service did not respond to requests for meetings.

APPENDIX B
Original Project List

This page intentionally left blank

Klawock Lake Sockeye Salmon Action Plan Projects

Project ID	Title	Project Type (subcommittee)	Location	Description	Complimentary Projects
H1	Review previous road condition surveys	Habitat	Klawock Watershed	Take RCS data on all roads previous assessed and conduct a comparative analysis and decide next steps	H2, H3, H15
H2	Review previous landslide stabilization work	Habitat	Threemile/Halfmile	Identify areas where landslide stabilization occurred and evaluate/measure, define next steps	H1, H3, H15
H3	Review previous habitat thinning projects	Habitat	Klawock Watershed	Identify areas where habitat thinning occurred and evaluate/measure changes, define next steps	H1, H2
H4	Complete habitat surveys on spawning creeks	Habitat	Threemile/Halfmile/Inlet/Hatchery	Conduct Tier I or Tier II habitat surveys to compliment previous spawning surveys	
H5	Evaluate City Water Reservoir	Habitat	Halfmile	Determine if any work was completed on restoring sediment losses to Halfmile due to reservoir, and if so determine if it was effective	R4
H6	Sockeye smolt monitoring in Klawock Lake	Habitat	Klawock Lake	Set up and monitor sockeye smolt	FA6, R6
H7	Lake nutrient monitoring	Habitat	Klawock Lake	Set up and monitor lake nutrients for the long term data collection	
H8	Assess Halfmile Creek spawning habitat	Habitat	Halfmile	Conduct assessment of spawning habitat, use some existing data and provide more focus on surveys	
H9	Assess Klawock Lake spawning habitat	Habitat	Klawock Lake	Collect spawning habitat data on Klawock Lake shoreline	
H10	Develop Klawock Lake Watershed Beaver Management Plan	Habitat	Klawock Watershed		H13
H11	Klawock Hollis Highway Fish Passage at Threemile	Habitat	Threemile Creek	Evaluate and construct a bridge on Threemile Creek at the Klawock Hollis Highway Crossing	
H12	Water Quality Monitoring at Viking Lumber	Habitat	Klawock Inlet		
H13	Assessment of Hatchery Creek beaver dam removal	Habitat	Hatchery Creek	Collect sedimentation data to determine if there were downstream impacts of beaver dam removal	H10
H14	Stream rehabilitation	Habitat	Klawock Watershed	Identify and prioritize stream rehabilitation opportunities	
H15	Expanded assessment of Threemile Creek	Habitat	Threemile Creek	Expand assessment of completed restoration efforts and assess if efforts are working, particularly evaluate road closures and erosion control effects on sedimentation	H1, H2
H16	2018 Predation Study	Habitat	Klawock watershed	Data will provide information and help determine next steps	
H17	Klawock Hollis Highway Fish Passage at Halfmile	Habitat	Halfmile Creek	Evaluate and propose fish passage improvement for the Halfmile Creek crossing at the Klawock Hollis Highway	
E1	Develop Local Committee	Enhancement	Klawock	Establish local committee to examine enhancement goals, benefits and risks	FA5, CP5
E2	Evaluate small scale sockeye enhancement	Enhancement	Klawock	Example discussed is flying a small amount of eggs to be reared in remote hatchery and then back to Klawock hatchery for release	

Klawock Lake Sockeye Salmon Action Plan Projects

Project ID	Title	Project Type (subcommittee)	Location	Description	Complimentary Projects
E3	Establish long term hatchery production of sockeye salmon	Enhancement	Klawock	Evaluate and apply for FTP permit for the permitted 1 million green sockeye salmon eggs	FA6, CP5
E4	Hatchery coho plan	Enhancement	Klawock Hatchery	Hatchery prioritize release of coho at off-site locations, and continue to minimize coho escapement into Klawock Lake	
E5	Evaluate what is limiting sockeye production in Klawock Lake	Enhancement	Klawock Watershed	For sockeye rehabilitation, must know what is limiting sockeye production, including: habitat, spawning area, lake nutrients, predation, competition	
FA1	Continue to monitor escapement	Fish Abundance	Klawock River	Continue to monitor sockeye escapement starting July 1 and assure SSRAA has funding to continue this	R10
FA2	Sockeye salmon genetic sampling	Fish Abundance	Commercial Fisheries	Sample sockeye salmon for genetics in the commercial fisheries for 3 years to estimate commercial catch in the mixed stock fishery	
FA3	Improve subsistence harvest reporting	Fish Abundance	Prince of Wales	Hire an in-season subsistence surveyor to collect harvest data on the fishing grounds, have a permit drop box location in Klawock, design a smart phone application for reporting	CP7
FA4	Change Subsistence Fishing Regulations	Fish Abundance	Klawock River	Explore options for changing subsistence harvest dates and limits, including staggering subsistence and commercial openings	
FA5	Develop Klawock sockeye salmon management plan	Fish Abundance	Klawock River	Develop a Klawock sockeye salmon management plan and develop escapement goals	
FA6	Sockeye salmon productivity study	Fish Abundance	Klawock River	Determine the productivity of sockeye salmon from Klawock Lake	H6, R6
FA7	Voluntary closures of subsistence harvest	Fish Abundance	Klawock River	Community can decide when, based on escapement numbers, to voluntarily close harvest and not have it in regulation	
CP1	Fish Consumption	Fish Abundance	Klawock	Develop a fish consumption rate for the community of Klawock	
CP2	Local representation on SSRAA board	Enhancement	Klawock	Potential for a local advisory committee to report to the SSRAA board	C9, C10
CP3	Household Harvest Surveys	Community Perspectives	Klawock	Conduct/update Klawock household Harvest Surveys	
CP4	Klawock TEK Harvest study	Community Perspectives	Klawock	Look at changes in run-timing of sockeye, as well as changes in community harvest patterns	
CP5	Establish local Klawock Watershed Committee	Community Perspectives	Klawock	Establish a local committee to examine enhancement goals (benefits/risks) and decide if it should move forward with a proposal to BOG	E3, E1
CP6	Engage in K-12 education	Community Perspectives	Klawock	Develop education/outreach opportunities regarding value of Klawock Watershed in Klawock school	
CP7	Educate subsistence users on value of accurate harvest reporting	Community Perspectives	Klawock	Educate subsistence users. Also leadership, so they may encourage more accurate reporting of harvest	CP3, FA3
CP8	Community outreach/education on fish weir	Community Perspectives	Klawock	Educate community on the importance and function of the fish weir on the Klawock River	

Klawock Lake Sockeye Salmon Action Plan Projects

Project ID	Title	Project Type (subcommittee)	Location	Description	Complimentary Projects
CP9	Improve stakeholder communications	Community Perspectives	Klawock	Improve communications between government agencies, stakeholders and harvesters	CP10, C2
CP10	Improve communications between stakeholders and SSRAA	Community Perspectives	Klawock	Identify ways communications between local stakeholders and SSRAA can happen regarding hatchery operations	CP9, C2
CP11	Continue stakeholder meetings on Klawock Watershed	Community Perspectives	Klawock	Have SAFHP coordinate the next meeting of stakeholders	
CP12	Quantify/Qualify coho concerns in Klawock Watershed	Community Perspectives	Klawock	Identify specific concerns with coho salmon, investigate scientific responses, and respond	
R1	Hatchery Creek Spawning Surveys	Habitat	Hatchery Creek	Conduct spawning surveys and assess spawning habitat on reaches that were not included in the 2018 report	H8, H9
R2	Inlet Creek Monitoring	Habitat	Inlet Creek	Regularly monitor habitat (through stream surveys, i.e. every 5 years) to assure good habitat is not becoming degraded	
R3	TEK for sockeye spawning		Klawock Watershed	Collect TEK from traditional use of sockeye on historical extent and abundance of sockeye spawning to potentially identify, evaluate and prioritize restoration activities	
R4	Sediment reintroduction into Halfmile Creek	Habitat	Halfmile Creek	Reintroduce sediments into Halfmile Creek to replace sediment no longer transported downstream due to water impoundment	H5
R5	Evaluate restoration efforts at sockeye spawning grounds	Habitat	Klawock Watershed	Evaluate and prioritize restoration actions at current or historic spawning areas	
R6	Quantify spawners entering and fry existing each tributary	Fish Abundance	Klawock Watershed	The best way to quantify the condition and productivity of current spawning habitat for sockeye abundance is to quantify the relationship between spawners entering each tributary, and fry emerging from each tributary	FA6, H6
R7	Paleolimnologic sampling of Klawock Lake	Habitat	Klawock Lake	Assessing the food base using paleolimnologic sampling to provide insights to recent trends in sockeye productivity	
R8	Klawock Lake fertilization	Habitat	Klawock Lake	Assess if Klawock Lake would respond positively to lake fertilization to boost productivity	
R9	Spatial distribution of sockeye in the Klawock estuary	Habitat	Klawock Estuary	Preliminary investigation into the spatial distribution throughout time of sockeye and coho smolt in Klawock estuary	
R10	Weir count validation	Fish Abundance	Klawock Watershed	Periodic validation of weir counts to increase confidence in escapement estimates (mark-recapture?)	FA1

This page intentionally left blank

APPENDIX C
Landowner Briefing Paper

This page intentionally left blank

Klawock Lake Sockeye Salmon Community Action Plan Landowner Meeting Briefing Paper, November 2018

The community of Klawock has long been concerned with the depletion of sockeye salmon returns into the Klawock River/Lake Watershed. In the early 2000's, large scale assessment and watershed restoration efforts began, when the Klawock Lake Watershed Council was successful in securing funding to address the concerns that may have been affecting sockeye salmon populations. Efforts waned as funding diminished; sockeye salmon returns continue to remain a primary concern within the community.

In 2013, The Nature Conservancy began a Retrospective Analysis which serves as a single source of information for comprehensively looking at past work conducted in the Klawock Lake watershed. The analysis was completed and presented back to the community of Klawock in 2016. Simultaneous to the analysis, a couple of assessment projects were being conducted. One was to collect data on sockeye salmon spawning habitat in major tributaries in the watershed, and the other was to assess predation on rearing juvenile sockeye salmon.

In early 2017, the Klawock Cooperative Association hosted a public meeting where they asked those working on Klawock Lake watershed issues to present a status of current work. From that effort, an ad hoc stakeholder group was formed. The Nature Conservancy secured funds to host a two-day Klawock Lake Sockeye Salmon Stakeholder meeting. A steering committee for the meeting was formed. The steering committee developed the following working sub-committees:

- Community Perspectives
- Fish Habitat and Restoration/Lake Ecology
- Fish Abundance
- Salmon Enhancement

The stakeholder meeting was held November 14-15, 2017 and all meeting materials and presentations may be found at: <http://www.seakfhp.org/klawock-lake-sockeye-salmon-stakeholder-meeting-fall-2017/>.

One recommendation from the stakeholder meeting was to develop a Klawock Lake Action Plan, that would identify next steps for each of the above formed subcommittee. This effort received funding through the Southeast Alaska Watershed Coalition (SAWC) in Fall in 2018, and Kai Environmental Consulting Services, LLC was hired to develop a Klawock Lake Sockeye Salmon Community Action Plan. Kai Environmental will use the following approach:

1. **Develop a project list:** a preliminary list would be developed from all of the potential projects identified in recent assessment work (i.e. the Retrospective Analysis and the sockeye salmon spawning surveys), as well as projects identified from the subcommittees at the stakeholder meeting. The preliminary list is attached to this briefing paper.
2. **Meet with landowners:** Kai Environmental strongly felt that the success of an action plan begins with support from the Klawock Lake watershed landowners. Landowners would be asked to choose their own level of involvement in the action planning process.
3. **Meet with stakeholders:** Kai Environmental would work with stakeholder groups on flushing out the details of the projects on the project list. The steering committee of the

stakeholder group will be engaged to assist in developing a prioritization process for projects.

4. **Draft the Klawock Lake Sockeye Salmon Community Action Plan:** An outline for the action plan will be drafted by December 31, 2018 and available for review. A draft action plan will be completed by March 15, 2019, and available for review and feedback. A community meeting on the action plan will be held by April 15, 2019 to receive community feedback.
5. **Finalize Klawock Lake Sockeye Salmon Community Action Plan:** After the community meeting, the plan will be finalized with an expected completion date of April 15, 2019.

At this time, we are asking landowners to identify and express their interest and level of involvement in the development of the Klawock Lake Sockeye Salmon Community Action Plan.

Cathy Needham
Kai Environmental Consulting Services
907-723-4426
cathy@kaienvironmental.com

APPENDIX D
Evaluation Criteria for Project Prioritization

This page intentionally left blank

Klawock Lake Community Sockeye Salmon Action Plan Stakeholder Sub-Committee Project Prioritization

Thank you for your continued interest in providing feedback into the Klawock Lake Community Sockeye Salmon Action Plan. We have set up a Google Sheets database on-line, which lists the potential projects that the Klawock Lake Stakeholder Group came up with in sub-committees in the Fall of 2017. We are currently asking members of each of the sub-committees to provide information directly into the on-line database, pertaining the projects that you are most familiar with or may have brought forward to the group.

In January, 2019, we will be asking for each of the sub-committees to hold a teleconference meeting, in order to help us prioritize projects on the list those sub-committees put forward. In the teleconference meeting, members will be asked to use the following criteria, for prioritizing projects, and a form for each project should be filled out. Staff from Kai Environmental will be participating in each of the teleconferences, to answer questions, make clarifications and to fill out the forms.

Criteria:

- Project vision: determine how well the project fits into the vision of providing healthy and sustainable sockeye salmon populations in Klawock Lake for the community.
- Project feasibility: determines whether the project would receive a commitment from stakeholders to pursue, would be cost effective to implement, and would be allowable under current rules and regulations.
- Project integrity: determines whether the project is science-based, would provide improvements and/or information for making improvements to sockeye salmon population and/or sockeye salmon habitat in Klawock Lake and would not impact or harm sockeye salmon populations in Klawock Lake
- Project support: determines how supported the project is among the landowners and the community

Klawock Lake Community Sockeye Salmon Action Plan
Project Prioritization Form for Habitat, Abundance and Enhancement sub-Committees

Project Number: _____ Project Title _____

Sub-Committee: _____

Project Vision

Please rate how well the project will meet the objective of providing a healthy and sustainable sockeye salmon population in Klawock Lake (1 not very well, 5 extremely well)

1 2 3 4 5 N/A

Please explain how the project will address the above stated vision:

Project Feasibility- Please rate the following statements (1 is least likely, 5 is most likely)

The project would be successful because it has buy-in from landowners (if needed) and key stakeholders

1 2 3 4 5 N/A

The project would be cost-effective and likely receive funding support

1 2 3 4 5 N/A

The project would be allowable under current state and federal rules and regulations

1 2 3 4 5 N/A

Please list any known funding support the project may receive:

Project Integrity

Is the project supported by science? Yes No N/A

If yes, please explain provide reference or contacts for Kai Environmental to pursue

Please check all statements that apply

- The project directly increases sockeye salmon populations into Klawock Lake
- The project improves sockeye salmon spawning habitat
- The project improves sockeye salmon rearing habitat
- The project provides information for assessing sockeye salmon populations
- The project provides information for assessing sockeye salmon habitat
- The project provides information needed for managing sockeye salmon populations

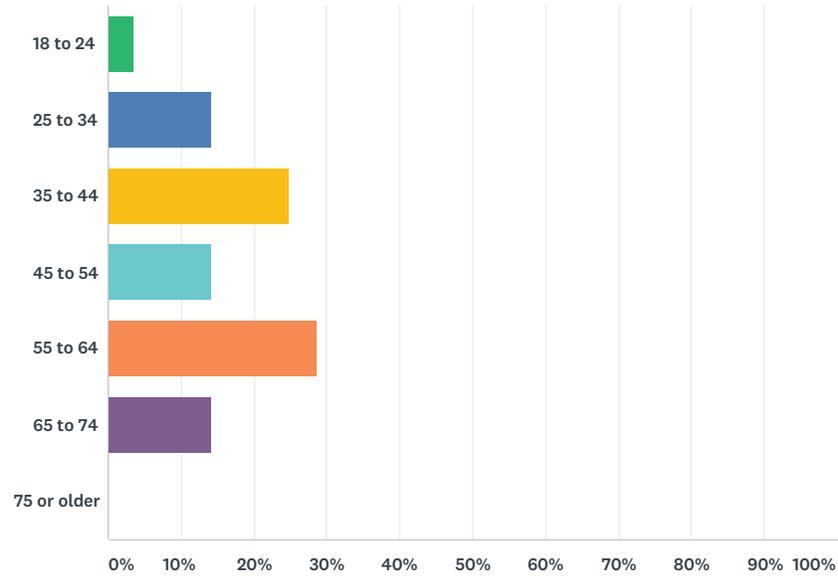
This page intentionally left blank

APPENDIX E
Results of Community Survey (Survey Monkey)

This page intentionally left blank

Q1 What is your age?

Answered: 28 Skipped: 0



ANSWER CHOICES	RESPONSES	
18 to 24	3.57%	1
25 to 34	14.29%	4
35 to 44	25.00%	7
45 to 54	14.29%	4
55 to 64	28.57%	8
65 to 74	14.29%	4
75 or older	0.00%	0
TOTAL		28

Klawock Lake Sockeye Salmon Community Perspectives

Q2 What city do you currently live in?

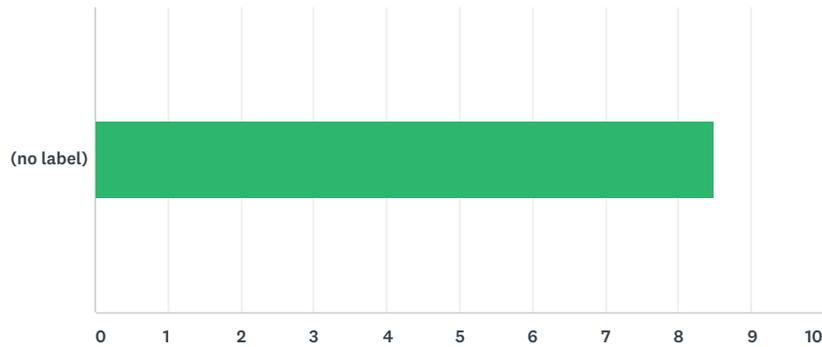
Answered: 28 Skipped: 0

#	RESPONSES	DATE
1	Klawock	1/29/2019 4:50 AM
2	Klawock	1/28/2019 2:44 PM
3	Klawock	1/28/2019 2:29 PM
4	Klawock, Alaska	1/28/2019 8:26 AM
5	klawock	1/27/2019 2:41 PM
6	Craig	1/26/2019 9:03 PM
7	Craig	1/26/2019 7:07 PM
8	Klawock	1/25/2019 4:02 PM
9	Craig	1/25/2019 2:49 PM
10	Klawock	1/24/2019 9:48 PM
11	Seattle	1/24/2019 8:42 PM
12	Rural	1/24/2019 7:48 PM
13	Craig	1/24/2019 7:27 PM
14	Craig	1/24/2019 5:25 PM
15	Klawock	1/24/2019 3:13 PM
16	Craig	1/24/2019 2:46 PM
17	Craig AK	1/24/2019 2:17 PM
18	Klawock	1/24/2019 12:48 PM
19	Klawock	1/24/2019 12:42 PM
20	Craig	1/24/2019 12:41 PM
21	Klawock	1/24/2019 12:23 PM
22	Ketchikan	1/24/2019 12:14 PM
23	Klawock	1/24/2019 11:29 AM
24	Klawock	1/24/2019 9:50 AM
25	Klawock	1/24/2019 9:47 AM
26	Craig	1/24/2019 9:40 AM
27	Klawock	1/24/2019 9:20 AM
28	Klawock	1/24/2019 9:16 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q3 Conduct a local fish consumption study to determine the amount of fish eaten.

Answered: 23 Skipped: 5



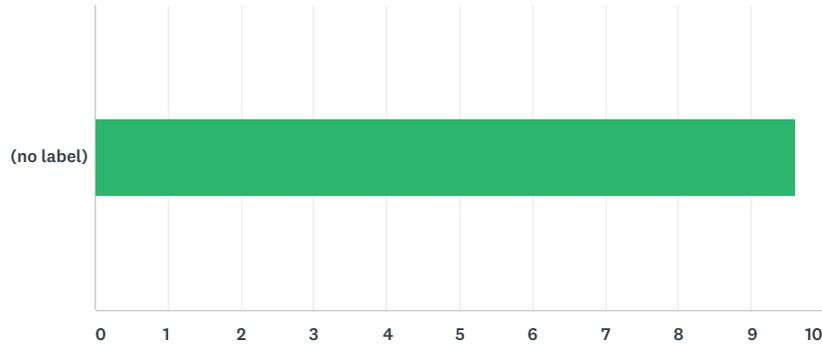
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	0.00%	4.35%	4.35%	4.35%	0.00%	4.35%	4.35%	8.70%	4.35%		60.87%	4.35%	23	
	0	1	1	1	0	1	1	2	1		14	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	People don't have much money and groceries are to expensive to afford	1/29/2019 5:18 AM
2	It would be great to have information for the Tribal Members as they harvest sockeye as their "Way of Life". Very important this provides meals for them year around. Thank you! When surveys are being collected it should be done by local hire as tribal members will be more comfortable answering the questions.	1/28/2019 4:00 PM
3	Need a baseline of what is happening.	1/28/2019 2:32 PM
4	This doesn't take into consideration in the affects of sockeye harvest reduction. Less salmon means less consumption. A historical perspective needs to be conveyed to the public during a proposed survey process.	1/28/2019 8:38 AM
5	1. I am not sure people would answer honestly - nobody would admit to wasting yet have seen jarred salmon dumped in several locations in the past including the boat launch	1/27/2019 2:47 PM
6	Helps for better management overall	1/26/2019 7:14 PM
7	show's local need	1/24/2019 10:29 PM
8	It's important information	1/24/2019 9:50 PM
9	Gives an idea of how much fish is taken locally	1/24/2019 7:58 PM
10	I believe that the current consumption estimates are below actual	1/24/2019 7:49 PM
11	Because my family and I depend on it for the wonder season to survive on	1/24/2019 12:59 PM
12	I think the project listed at No. 5 of this survey would accomplish this.	1/24/2019 12:49 PM
13	Hoping we find out fish taken out of the area versus fish consumed here.	1/24/2019 12:34 PM
14	We all eat fish	1/24/2019 12:18 PM
15	It appears what fd&g have as an amount is wrong.	1/24/2019 11:37 AM
16	Need accurate info	1/24/2019 10:50 AM
17	We don't want waste and I feel some people waste.	1/24/2019 10:00 AM
18	Fish consumed in general or Klawock River fish consumed? Question is ambiguous	1/24/2019 9:35 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q4 Maintain local representation of the Southern Southeast Regional Aquaculture Association (SSRAA) board (current local representation is Dennis Nickerson).

Answered: 23 Skipped: 5



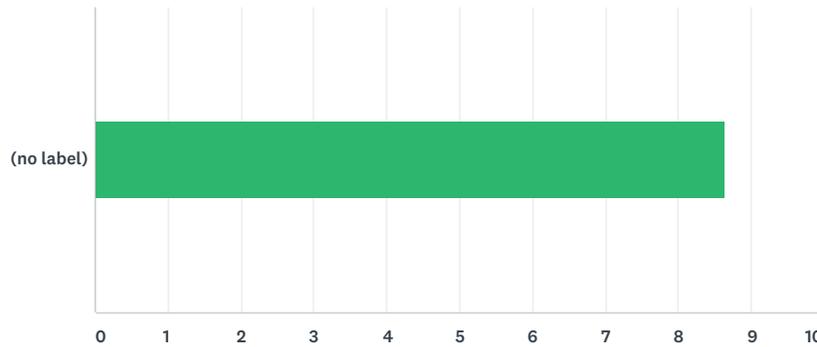
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	4.35% 1	0.00% 0	8.70% 2	4.35% 1	82.61% 19	0.00% 0	23	

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	I know Dennis. He's in the same boat as the rest of us when it comes to making a living.	1/29/2019 5:18 AM
2	It's good to have tribal representation, as non-commercial status.	1/28/2019 4:00 PM
3	He's attended every meeting in 2018 to become capacitated in the hatchery process and the economic and cultural benefits.	1/28/2019 8:38 AM
4	I think it is important for there to be local representation on the board/local hatchery	1/27/2019 2:47 PM
5	Local support provides local knowledge and better management overall	1/26/2019 7:14 PM
6	SSRAA is not the answer to reestablishing a healthy sockeye run in the watershed. Good to have them for tech info on fish but enhancement is not the issue.	1/24/2019 10:29 PM
7	We need a voice	1/24/2019 9:50 PM
8	Good to maintain local voice	1/24/2019 7:58 PM
9	Local representation on the SSRAA board is important so the community's voice can be heard	1/24/2019 7:49 PM
10	He's a very smart person	1/24/2019 12:59 PM
11	SSRAA operates Klawock River Hatchery. POW input to SSRAA is important to maintain. Likewise, POW should offer formal input opportunities to SSRAA on issues of mutual concern.	1/24/2019 12:49 PM
12	Because they operate hatchery.we	1/24/2019 12:34 PM
13	Keep info up to date	1/24/2019 12:18 PM
14	He's knowledgeable	1/24/2019 11:37 AM
15	Local is good	1/24/2019 10:50 AM
16	People who living in Klawock know what is needed in KLAWOCK.	1/24/2019 10:00 AM
17	SSRAA has a larger footprint on island. POW needs representation	1/24/2019 9:35 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q5 Conduct household harvest surveys to determine the amount necessary for subsistence and to document harvest and use patterns.

Answered: 23 Skipped: 5



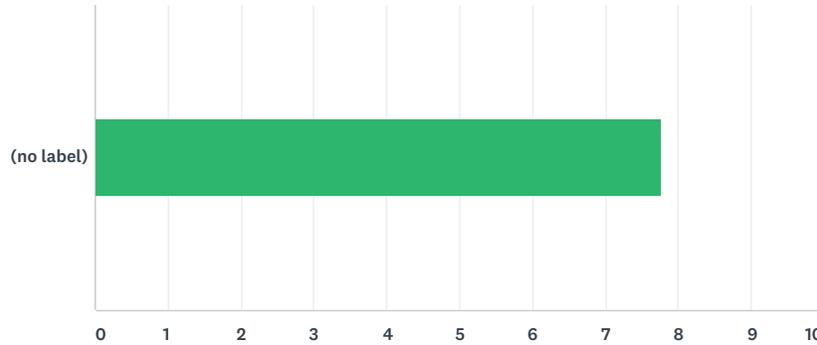
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	4.35%	0.00%	0.00%	0.00%	0.00%	13.04%	8.70%	4.35%	8.70%	60.87%	0.00%	23		
	1	0	0	0	0	3	2	1	2	14	0			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Consumption totals might help give a target number of fish needed in recovery efforts.	1/29/2019 5:18 AM
2	This may help in bringing up the actual consumption amount.	1/28/2019 4:00 PM
3	This should also include what is and was needed for community events for potlucks and other traditional ceremonies.	1/28/2019 8:38 AM
4	again, not sure folks would be honest - lots of people "don't want government involvement" it would have to be explained right to get good info	1/27/2019 2:47 PM
5	This will help to work to ensure that people can live the subsistence lifestyle consistently	1/26/2019 7:14 PM
6	good info to help develop long term use and need	1/24/2019 10:29 PM
7	The more data the beter	1/24/2019 7:58 PM
8	Accurate documentation of needs and uses should be considered to influence management decisions of sockeye salmon	1/24/2019 7:49 PM
9	Its are lovely hood	1/24/2019 12:59 PM
10	We should be first to harvest out of bay.	1/24/2019 12:34 PM
11	needed	1/24/2019 11:37 AM
12	Goes back to the waste.	1/24/2019 10:00 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q6 Conduct a Klawock traditional ecological knowledge study on sockeye salmon harvest methods to determine how harvest methods have changed over time.

Answered: 23 Skipped: 5



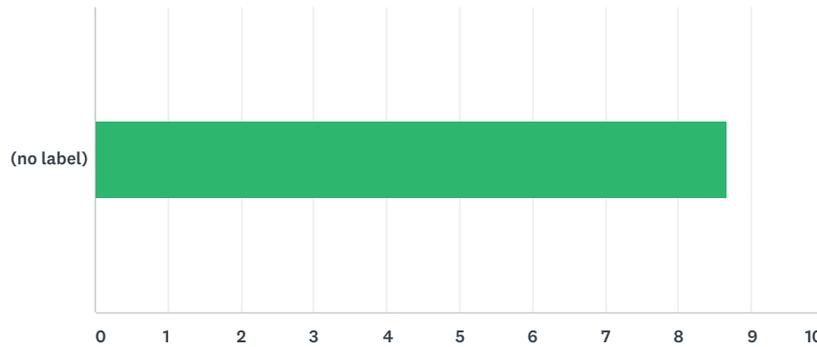
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	4.35%	0.00%	0.00%	13.04%	8.70%	0.00%	17.39%	0.00%	0.00%	52.17%	4.35%	23		
	1	0	0	3	2	0	4	0	0	12	1			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	All harvest methods should be know in case we have to go back to those methods.	1/29/2019 5:18 AM
2	This will help with Historical aspects of Sockeye Salmon in the Klawock River.	1/28/2019 4:00 PM
3	This should be completed without federal or state funds. Local, private or non-governmental funds should be used. An outreach campaign needs to be completed on historical salmon harvesting on the Klawock River.	1/28/2019 8:38 AM
4	I find this very interesting as would many folks - does it actually have a benefit to maintaining the stock?	1/27/2019 2:47 PM
5	May help to better understand how changes have impacted numbers and info can be used for management	1/26/2019 7:14 PM
6	not that important to reestablishing a healthy run	1/24/2019 10:29 PM
7	TEK should be strongly considered regarding the management of sockeye salmon	1/24/2019 7:49 PM
8	Unknown	1/24/2019 12:59 PM
9	I think a better approach is to study traditional ecological knowlege and other knowledge sources. I don't see value in relying on only a traditional knowledge source.	1/24/2019 12:49 PM
10	This is history.	1/24/2019 12:34 PM
11	Kinda iffy because it seems to have been done.	1/24/2019 11:37 AM
12	Global warming has to play a part in it too.	1/24/2019 10:00 AM
13	Unless it is written records the data is less usable. Memories are inaccurate and change over time	1/24/2019 9:35 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q7 Establish a local Klawock Watershed Committee and/or watershed council and continue stakeholder meetings.

Answered: 23 Skipped: 5



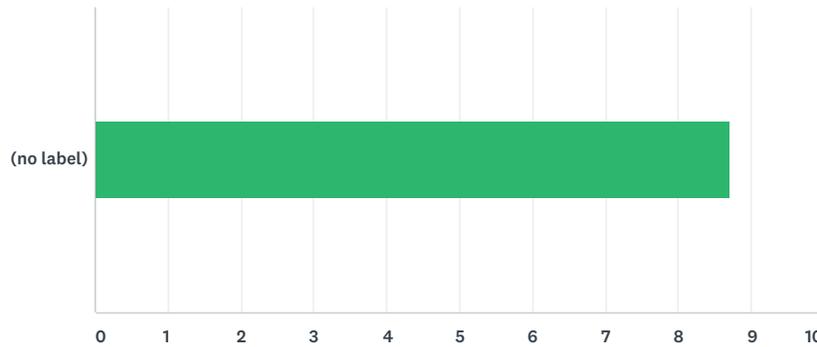
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	4.35%	0.00%	4.35%	0.00%	0.00%	0.00%	4.35%	17.39%	4.35%	56.52%	8.70%	23		
	1	0	1	0	0	0	1	4	1	13	2			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Water is life. We should know exactly what's going on with it	1/29/2019 5:18 AM
2	This is something that Tribe has discussed before, not sure on new council.	1/28/2019 4:00 PM
3	This council needs to form- solely on the basis of sockeye enhancement and habitat improvement.	1/28/2019 8:38 AM
4	Will ensure proper management	1/26/2019 7:14 PM
5	will help provide continuity for project and work going forward	1/24/2019 10:29 PM
6	Not necessary	1/24/2019 7:58 PM
7	Continued shareholder collaboration is key to watershed health	1/24/2019 7:49 PM
8	There seems to be a lot of "committees" formed but no real action is or has taken place.	1/24/2019 5:29 PM
9	It's a helpful thing	1/24/2019 12:59 PM
10	What is meant by "local" in this context?	1/24/2019 12:49 PM
11	We had that in the past and its needed	1/24/2019 11:37 AM
12	Repair and restoration of the spawning beds and streams is very important they need	1/24/2019 10:50 AM
13	Goes back to people who living in KLAWOOCK know KLAWOOCK and the history.	1/24/2019 10:00 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q8 Engage and educate Klawock school kids on Klawock watershed issues and management.

Answered: 23 Skipped: 5

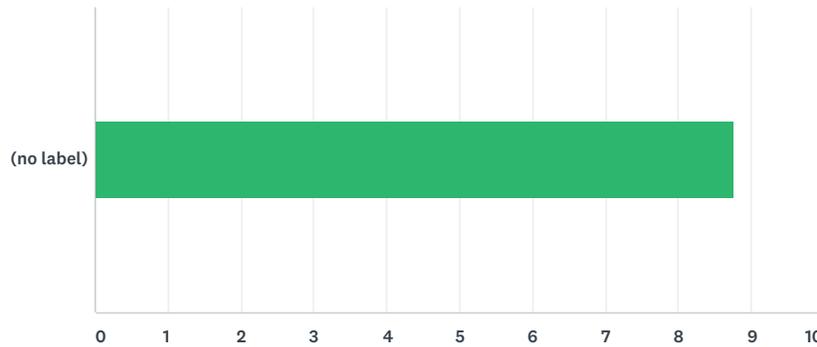


	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	4.35%	0.00%	0.00%	8.70%	0.00%	0.00%	0.00%	0.00%	17.39%	4.35%	65.22%	0.00%	23	
	1	0	0	2	0	0	0	0	4	1	15	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	The future...	1/29/2019 5:18 AM
2	It is always great to educate students on education and outreach, as this may help them on maybe creating a career.	1/28/2019 4:00 PM
3	Create a curriculum for all grade levels. We can start cultivating our own natural resource managers and researchers.	1/28/2019 8:38 AM
4	I would love to see this included in the younger studies and also high school science classes.	1/27/2019 2:47 PM
5	Will encourage youth to move into leadership positions related to management and long term sustainability	1/26/2019 7:14 PM
6	help insure local users understand the value of protecting all aspects of salmon habitat	1/24/2019 10:29 PM
7	Dont push leftist environmental ideology on the children	1/24/2019 7:58 PM
8	Engaging youth is important to ensuring the continued health of the watershed	1/24/2019 7:49 PM
9	There young enough to learn what to do	1/24/2019 12:59 PM
10	This effort should be available to any school district.	1/24/2019 12:49 PM
11	We have to encourage our youth.	1/24/2019 11:37 AM
12	They need to know the history of how the watershed changed and the solutions to getting it restored	1/24/2019 10:50 AM
13	At this point kids won't absorb the issues. Talk to them about waste and the value of the resource.	1/24/2019 10:00 AM
14	Knowledge is powerful stuff	1/24/2019 9:35 AM

Q9 Educate subsistence users on value of accurate harvest reporting and work to improve harvest reporting.

Answered: 23 Skipped: 5



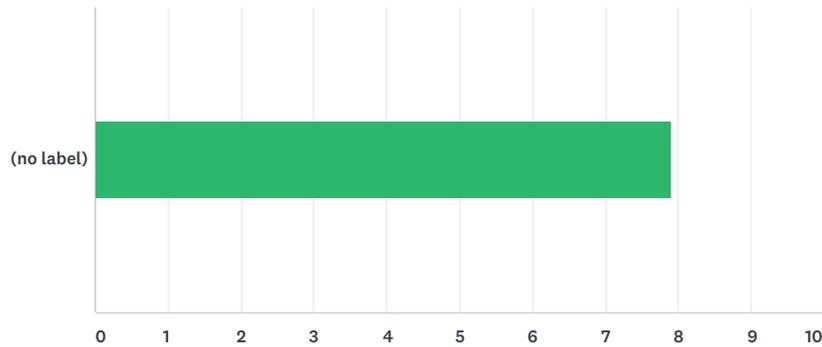
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	0.00%	0.00%	0.00%	8.70%	4.35%	4.35%	0.00%	0.00%	26.09%		52.17%	4.35%	23	
	0	0	0	2	1	1	0	0	6		12	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Try to get it through their heads that without those numbers they could be helping to kill off the run	1/29/2019 5:18 AM
2	I am pretty sure harvesters know how to report. Maybe to the new ones that may need help.	1/28/2019 4:00 PM
3	This will help with future return of sockeye and estimates.	1/28/2019 8:38 AM
4	I think this is important as I don't think people understand WHY its important for the info to be accurate	1/27/2019 2:47 PM
5	Ensure better management and sustainability	1/26/2019 7:14 PM
6	accurate return and harvest numbers help insure good management decisions are made	1/24/2019 10:29 PM
7	Harvest reports are important to informing management of subsistence needs	1/24/2019 7:49 PM
8	Unknown	1/24/2019 12:59 PM
9	Isn't that done already?	1/24/2019 11:37 AM
10	Individual responsibility for accuracy is important	1/24/2019 10:50 AM
11	Depends on how you educate. Town meetings are not effective.	1/24/2019 10:00 AM
12	Must to have a baseline to start with	1/24/2019 9:35 AM
13	Neutral. I suspect this will be difficult to achieve.	1/24/2019 9:20 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q10 Provide community outreach and education on the value of having a fish weir and continuing to operate one.

Answered: 23 Skipped: 5



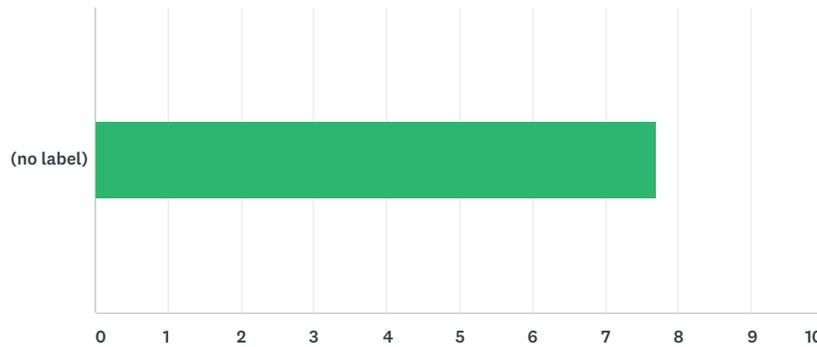
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	8.70%	0.00%	0.00%	8.70%	4.35%	0.00%	4.35%	8.70%	8.70%		47.83%	8.70%	23	
	2	0	0	2	1	0	1	2	2		11	2		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	a weir might be helpful if it was ONLY for sockeye. Historically Klawock was a sockeye system. Now it's a coho stream	1/29/2019 5:18 AM
2	Not sure what my decision is on this. It would be great to educate the community and tribal members, and let them make a decision.	1/28/2019 4:00 PM
3	Local outreach on weir impacts can create awareness and support.	1/28/2019 8:38 AM
4	This will help to likely help locals understand it better and ensure it continues	1/26/2019 7:14 PM
5	long term ability to show changes in returning salmon. are things getting better, same or worse. are program efforts working or not.	1/24/2019 10:29 PM
6	The continued operation of the weir is important to ensure accurate escapement counts	1/24/2019 7:49 PM
7	Let our fish be free and not dying off by getting stuck in wires	1/24/2019 12:59 PM
8	Tear it down	1/24/2019 12:18 PM
9	And not just on social media	1/24/2019 11:37 AM
10	Educting our community memebbers on the weir is very important. Not know what affects we will face without it is scary. It's been there for over 40 years.	1/24/2019 10:00 AM
11	Again, more data is better	1/24/2019 9:35 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q11 Identify coho concerns in Klawock Watershed.

Answered: 23 Skipped: 5



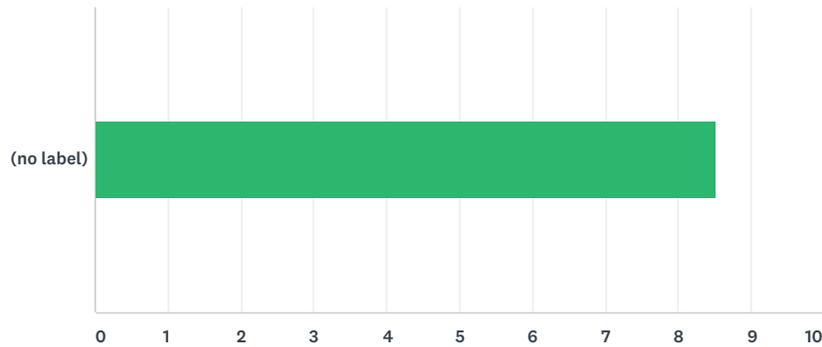
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	4.35% 1	4.35% 1	8.70% 2	0.00% 0	4.35% 1	8.70% 2	8.70% 2	4.35% 1	4.35% 1	52.17% 12	0.00% 0	23		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	I just did... Get rid of the coho, get rid of the concerns	1/29/2019 5:18 AM
2	This would be great to educate Everyone on this subject on how it affects the sockeye salmon.	1/28/2019 4:00 PM
3	We have an abundance of coho in our river. This is how our sockeye used to be.	1/28/2019 8:38 AM
4	Helps for subsistence in the long run and sustainability	1/26/2019 7:14 PM
5	good to let people know the best science regarding coho verses sockeye	1/24/2019 10:29 PM
6	Not a bad idea	1/24/2019 7:58 PM
7	Coho are not as much of a concern as public/common conception	1/24/2019 7:49 PM
8	I love getting cohos for the winter all the time	1/24/2019 12:59 PM
9	All about the sockeye	1/24/2019 12:18 PM
10	Only if something gets done and it can be managed better	1/24/2019 11:37 AM
11	They've been identified, so why would we need to do that again?	1/24/2019 10:00 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q12 Implement a Klawock River Fishing Day to help "Get The Trout Out" and reduce predation on sockeye fry.

Answered: 23 Skipped: 5



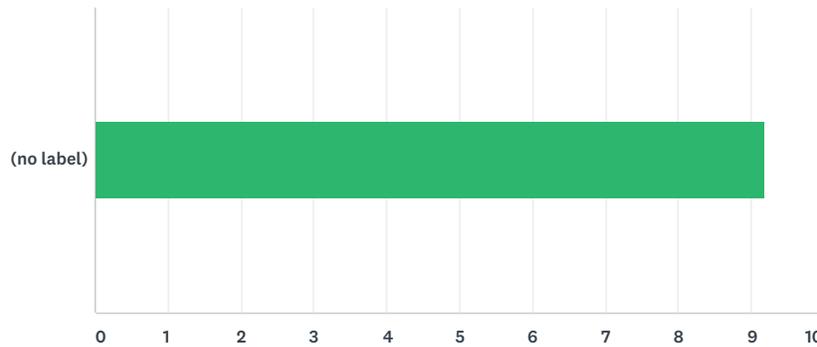
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	4.35%	0.00%	0.00%	0.00%	13.04%	0.00%	4.35%	13.04%	4.35%	60.87%	0.00%	23		
	1	0	0	0	3	0	1	3	1	14	0			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Any effort to help the sockeye is good	1/29/2019 5:18 AM
2	This will help in the Sockeye Run as it did in the past. Tribes would go up to the river and fish the trout when runs were low.	1/28/2019 4:00 PM
3	This is an Ancestral form to protect salmon migrating during the month of May.	1/28/2019 8:38 AM
4	Yes, yes, yes! - great way to benefit the community and the river	1/27/2019 2:47 PM
5	Better management and sustainability	1/26/2019 7:14 PM
6	neutral on this one.	1/24/2019 10:29 PM
7	Remove trout limits on the lake and create better lake access way too many trout in the lake	1/24/2019 7:58 PM
8	If landowners are willing to work with the public this can be a great community event	1/24/2019 7:49 PM
9	This is a great creative idea!	1/24/2019 5:29 PM
10	Trout are our part of lively hood	1/24/2019 12:59 PM
11	I like the idea of promoting fishing in the lake and river.	1/24/2019 12:49 PM
12	They are not the problem.	1/24/2019 12:34 PM
13	Fun	1/24/2019 12:18 PM
14	Definitely	1/24/2019 11:37 AM
15	I don't know much about this one	1/24/2019 10:50 AM
16	Educate people about trout, the benefits	1/24/2019 10:00 AM
17	Advertising it as a trout elimination program is irresponsible. Trout and sockeye evolved together. Trout are managed as a gamefish not a predator. There are size and possession limits for trout established by ADFG.	1/24/2019 9:35 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q13 Continue to count sockeye at the Klawock weir

Answered: 21 Skipped: 7



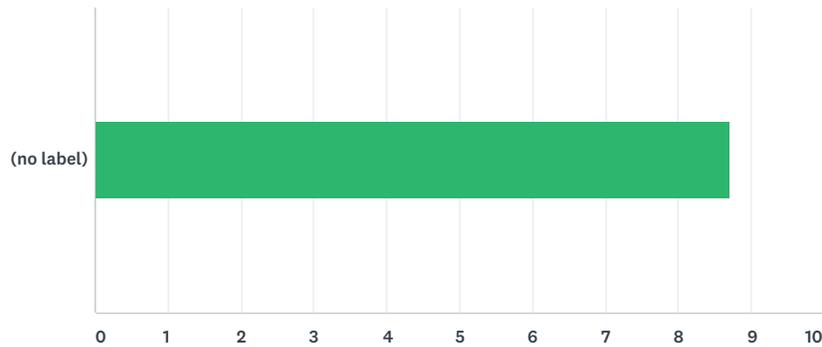
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	0.00%	0.00%	0.00%	0.00%	4.76%	4.76%	4.76%	9.52%	4.76%	71.43%	0.00%	21		
	0	0	0	0	1	1	1	2	1	15	0			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	You have to know the numbers in recovery	1/29/2019 5:38 AM
2	Very important to know what the counts are so it would make a better decision when to harvest or not.	1/28/2019 4:14 PM
3	Once we start to increase the return of sockeye, we will have comparative data to show the success.	1/28/2019 8:47 AM
4	Sustainability and proper management	1/26/2019 7:17 PM
5	helps show ups and downs. use data to determine if efforts in watershed are working. Also help evaluate what other influences may be impacting sockeye returns	1/24/2019 10:37 PM
6	Accurate weir counts are important but may be more beneficial if the numbers are shared with the community	1/24/2019 8:01 PM
7	Let the sockeye be free	1/24/2019 1:03 PM
8	I think harvest number is important too.	1/24/2019 12:39 PM
9	Good intel	1/24/2019 12:20 PM
10	It seems like a moot point. We know it's low!	1/24/2019 11:53 AM
11	Watch for major declines.	1/24/2019 10:05 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q14 Conduct sockeye salmon genetic sampling in the commercial fishery.

Answered: 21 Skipped: 7



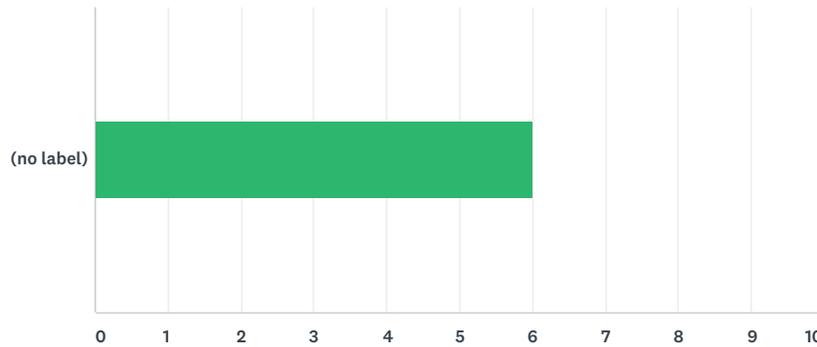
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	0.00%	4.76%	0.00%	0.00%	4.76%	0.00%	0.00%	28.57%	4.76%	52.38%	4.76%		21	
	0	1	0	0	1	0	0	6	1	11	1			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Might help determine how many Klawock fish they are killing off,which in my opinion,is probably lots of them.	1/29/2019 5:38 AM
2	I agree, it this is the one where it tells you which river the sockeye is coming from.	1/28/2019 4:14 PM
3	Our local commercial fisherman must also be educated on the potential effects of this sampling project.	1/28/2019 8:47 AM
4	Better research for management	1/26/2019 7:17 PM
5	helps determine what fish are being caught, timing of catch and how many from Klawock Lake are being harvested commercially	1/24/2019 10:37 PM
6	For what?	1/24/2019 8:05 PM
7	Genetic data can be used for more responsible fisheries management	1/24/2019 8:01 PM
8	Unknown	1/24/2019 1:03 PM
9	This is already happening.	1/24/2019 10:05 AM
10	Important to know how much of catch is returning to Klawock River.	1/24/2019 9:40 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q15 Change subsistence fishing regulations, such as extending the fishing season.

Answered: 20 Skipped: 8



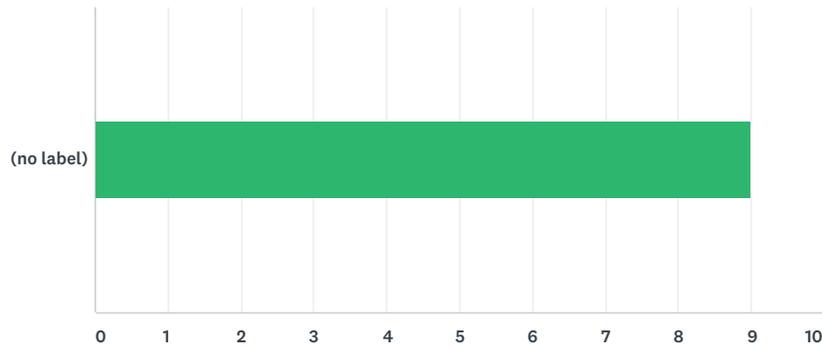
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	20.00%	0.00%	10.00%	5.00%	10.00%	10.00%	0.00%	5.00%	0.00%		35.00%	5.00%	20	
	4	0	2	1	2	2	0	1	0		7	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	World is changing. Fish runs are not as predictable as before. Change as needed	1/29/2019 5:38 AM
2	Change as the sockeye salmon runs are changing with seasonal changes.	1/28/2019 4:14 PM
3	Our season needs to start one week later, and end one week later. An extension can cause harm. The first run of sockeye has been impacted the most. I can remember harvesting a majority of my sockeye before the 4th of July. That doesn't happen anymore.	1/28/2019 8:47 AM
4	I think this needs to be looked at and maybe not extend so much as change the dates to match the changes we have seen in the return of the fish	1/27/2019 2:50 PM
5	Conflicted and unsure how this would effect sustainability	1/26/2019 7:17 PM
6	don't disagree with possibly extending season but this has to be considered in context with many other impacts as well.	1/24/2019 10:37 PM
7	Shut down all sockeye subsistence before its too late. Give them a chance to recover.	1/24/2019 8:05 PM
8	I believe the harvest season needs to be modified so that the community isn't overharvesting an earlier run of sockeye salmon.	1/24/2019 8:01 PM
9	This would solely depend on current year fish counts prior to extending any season for any subsistence activity.	1/24/2019 5:33 PM
10	It helps	1/24/2019 1:03 PM
11	The fishing season, regulations, and catch limits should be based on abundance.	1/24/2019 12:54 PM
12	It's worth a try!	1/24/2019 11:53 AM
13	How would killing more fish help the sockeye population?	1/24/2019 10:05 AM
14	Until the genetics data is compiled this could cause irreparable harm	1/24/2019 9:40 AM
15	Neutral. I'd want to understand data in support of the changes first.	1/24/2019 9:24 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q16 Develop a Klawock sockeye salmon management plan that includes target levels of fish to return to the lake.

Answered: 21 Skipped: 7



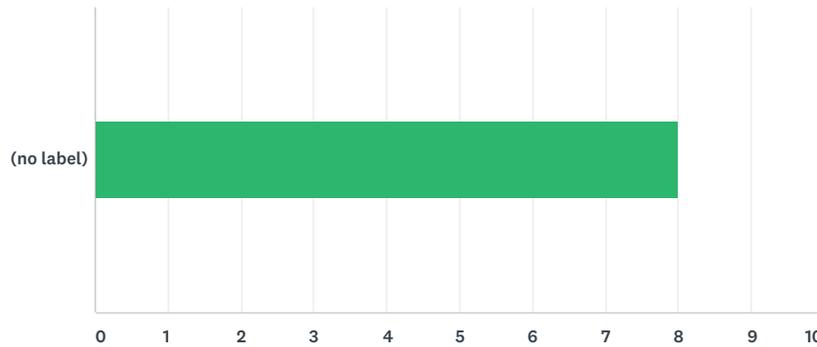
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	4.76%	19.05%	9.52%		61.90%	0.00%	21	
	0	1	0	0	0	0	1	4	2		13	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Again,you have to know the numbers	1/29/2019 5:38 AM
2	Please explain more, I am not understanding. If it will benefit the Klawock Sockeye Salmon then yes!	1/28/2019 4:14 PM
3	This management plan must include target levels of sockeye returns on the Klawock River in 1936. Over 65,000 sockeye returned, after customary & traditional harvesting (when fish consumption rate was very high), commercial fishing and commercial fish traps.	1/28/2019 8:47 AM
4	as much as we can influence a good return, this is good. There are many influences tho so have to be objective with data.	1/24/2019 10:37 PM
5	A sockeye salmon management plan that also addresses other salmon would be very important	1/24/2019 8:01 PM
6	Unknown	1/24/2019 1:03 PM
7	Needs to be implemented!	1/24/2019 11:53 AM
8	This is in the works as will.	1/24/2019 10:05 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q17 Implement a voluntary closure system on subsistence harvesting when sockeye returns are low.

Answered: 20 Skipped: 8



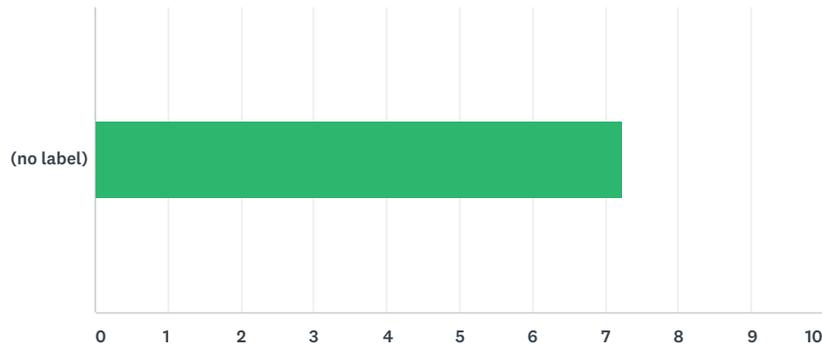
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	(NO LABEL)	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'						
(no label)	10.00% 2	0.00% 0	5.00% 1	0.00% 0	0.00% 0	5.00% 1	5.00% 1	10.00% 2	10.00% 2		50.00% 10	5.00% 1	20	

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	I think most people would rather not fish than see no fish at all in the future.	1/29/2019 5:38 AM
2	Yes, if this will help with the sockeye runs.	1/28/2019 4:14 PM
3	Our residents shouldn't sacrifice anymore rights to our salmon harvesting. Commercial interests must be greatly reduced first.	1/28/2019 8:47 AM
4	as a subsistence harvester - I already voluntarily changed my harvest to another location due to the lowered numbers of returning sockeye	1/27/2019 2:50 PM
5	common sense if you want to improve and maintain healthy overall runs.	1/24/2019 10:37 PM
6	Make it mandatory	1/24/2019 8:05 PM
7	If the community buys into voluntary closures this may be an excellent option	1/24/2019 8:01 PM
8	?	1/24/2019 1:03 PM
9	Commercial should stop first.	1/24/2019 12:39 PM
10	No community member will agree	1/24/2019 11:53 AM
11	Love to see this happen.	1/24/2019 10:05 AM
12	Neutral. I suspect this will be difficult to implement.	1/24/2019 9:24 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q18 Count adult spawners into each tributary, and count fry coming out of each tributary.

Answered: 21 Skipped: 7



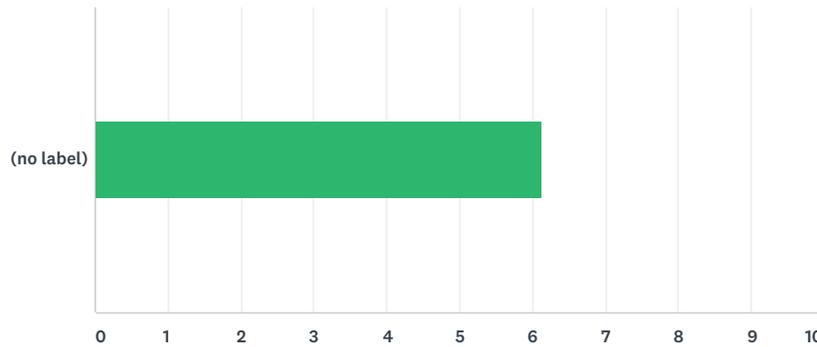
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	14.29%	0.00%	0.00%	0.00%	0.00%	9.52%	23.81%	19.05%	0.00%		33.33%	0.00%	21	
	3	0	0	0	0	2	5	4	0		7	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Might help determine the health of the water	1/29/2019 5:38 AM
2	If this is important to the sockeye run, then yes!	1/28/2019 4:14 PM
3	I'm not too sure how this can benefit. Weir counts should be sufficient.	1/28/2019 8:47 AM
4	is this feasible? Is is cost productive? if so then yes, otherwise what other options would there be	1/27/2019 2:50 PM
5	This data could help determine how effective stream restoration and rehabilitation are going.	1/24/2019 10:37 PM
6	Waste of time	1/24/2019 8:05 PM
7	This would certainly help provide resource managers with more accurate numbers	1/24/2019 8:01 PM
8	This seems to be quite time consuming and will need many seasonal hires to assist with counting each fry.	1/24/2019 5:33 PM
9	?	1/24/2019 1:03 PM
10	Interesting	1/24/2019 10:05 AM
11	Expensive but excellent data. Add a count of smolts leaving lake through river to obtain productivity of lake information	1/24/2019 9:40 AM
12	I believe this will be nearly impossible to do such that the data will be accurate.	1/24/2019 9:24 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q19 Validate weir counts using alternative weir structures or mark-recapture studies.

Answered: 21 Skipped: 7



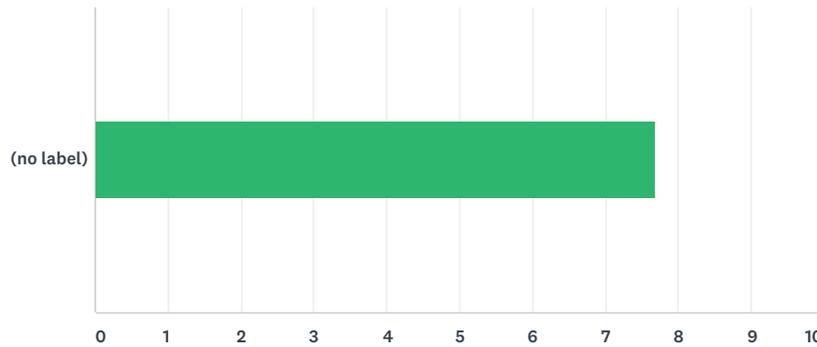
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL								
(no label)	14.29%	0.00%	4.76%	4.76%	9.52%	0.00%	23.81%	0.00%	4.76%	19.05%	19.05%		21
	3	0	1	1	2	0	5	0	1	4	4		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Anything that could be used to help the fish make their way should be used	1/29/2019 5:38 AM
2	not sure on this one, don't want to damage the sockeye salmon run.	1/28/2019 4:14 PM
3	Begin creating qualified local hire for these types of projects, and it can generate local support and awareness.	1/28/2019 8:47 AM
4	not sure this will change much. I think the weir does fairly well already.	1/24/2019 10:37 PM
5	Not sure if an alternate weir structure would help anything	1/24/2019 8:01 PM
6	Again, this may be cost prohibitive.	1/24/2019 5:33 PM
7	?	1/24/2019 1:03 PM
8	OK, if valuable/useful data comes out of these efforts. Another weir seems superfluous.	1/24/2019 12:54 PM
9	Why duplicate.	1/24/2019 10:05 AM
10	Weir is tight but it cant hurt to validate every 3-5 years	1/24/2019 9:40 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q20 Form a local committee to address enhancement goals, benefits, and risks.

Answered: 20 Skipped: 8



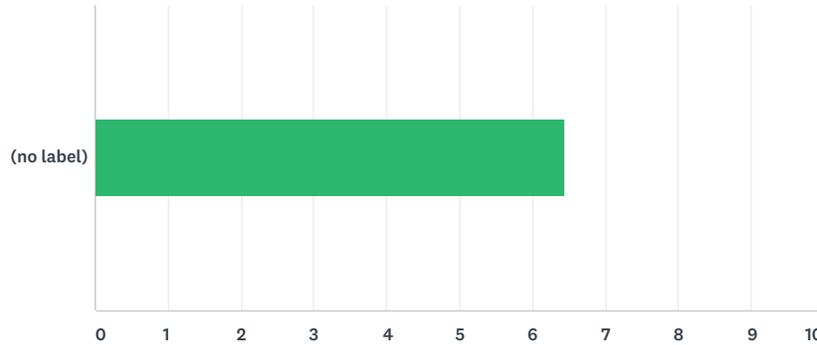
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'
(no label)	5.00% 1	0.00% 0	10.00% 2	0.00% 0	10.00% 2	5.00% 1	0.00% 0	15.00% 3	5.00% 1	45.00% 9	5.00% 1	20		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Community involvement is very important in any future enhancements	1/29/2019 5:54 AM
2	Yes from tribes, corporation, tribal members, public in Klawock only.	1/28/2019 4:19 PM
3	Proposals to change regulations from a local perspective can have lasting benefits for Alaskans and salmon.	1/28/2019 8:52 AM
4	thought this was already in progress	1/27/2019 2:53 PM
5	forming a committee is ok. should have a good cross sections of local and biologists on it.	1/24/2019 10:41 PM
6	Couldn't this be covered by the existing committees (I.e. the Klawock lake sockeye salmon steering committee, future klawock watershed council, etc.)	1/24/2019 8:09 PM
7	Some sort of POW input on this is important.	1/24/2019 12:55 PM
8	Idk	1/24/2019 12:21 PM
9	Hear from people who live in Klawock.	1/24/2019 10:08 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q21 Conduct a feasibility study of non-Prince of Wales hatchery sockeye enhancement opportunities/methods.

Answered: 20 Skipped: 8



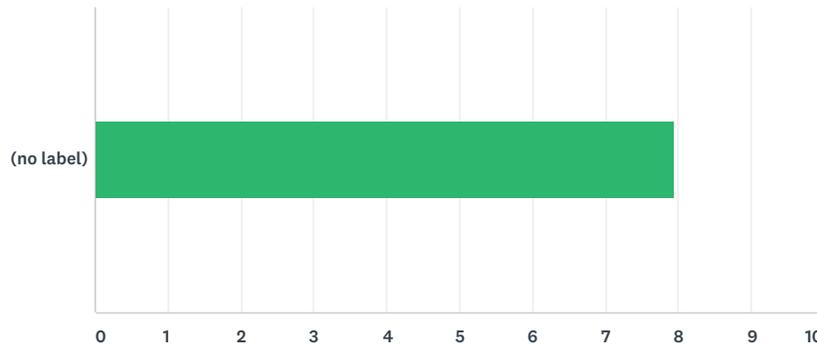
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	15.00%	5.00%	10.00%	5.00%	5.00%	10.00%	0.00%	5.00%	5.00%		40.00%	0.00%	20	
	3	1	2	1	1	2	0	1	1		8	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Any knowledge of other enhancement methods may be useful for Klawock	1/29/2019 5:54 AM
2	I wouldn't want travel miles and miles to harvest unless its the only way.	1/28/2019 4:19 PM
3	This can help with sockeye enhancement. We can discuss and prioritize alternatives.	1/28/2019 8:52 AM
4	not really productive. habitat is the issue we need to focus on.	1/24/2019 10:41 PM
5	Until habitat is fully assessed and restoration efforts are completed it does not make sense to implement sockeye salmon enhancement	1/24/2019 8:09 PM
6	Just call other enities and get information. They would gladly share for the sake of the speicies.	1/24/2019 10:08 AM
7	Not sure how this would help POW sockeye	1/24/2019 9:43 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q22 Establish long term Prince of Wales hatchery production and release of sockeye salmon.

Answered: 19 Skipped: 9



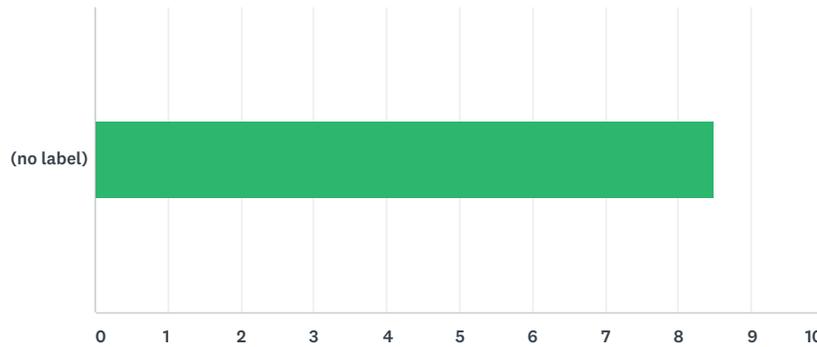
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	5.26%	5.26%	5.26%	0.00%	5.26%	5.26%	5.26%	5.26%	5.26%	5.26%	57.89%	0.00%	19	
	1	1	1	0	1	1	1	1	1	1	11	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	There's plenty of coho, why not sockeye too. If there was lots of hatchery fish, subsistence users could afford to turn back the wild fish they catch	1/29/2019 5:54 AM
2	If this will benefit the sockeye salmon run only!	1/28/2019 4:19 PM
3	We need more sockeye to return to the Klawock River.	1/28/2019 8:52 AM
4	this has proven to be tough to do here as well as other places. habitat	1/24/2019 10:41 PM
5	Refer to previous explanation about habitat concerns	1/24/2019 8:09 PM
6	I dont think it would be very successful	1/24/2019 8:07 PM
7	It's hard to say on this, given all the variables as to sockeye production. I prefer restoration over enhancement, for now.	1/24/2019 12:55 PM
8	No state run hatcheries	1/24/2019 12:21 PM
9	It's neede but not sure it can happen.	1/24/2019 11:55 AM
10	I support this, but not in the Klawock River. It is to big of a system to mess with now with all of it's issues. We need to focus on habitat restoration in the Klawock River.	1/24/2019 10:08 AM
11	Until all potential harms of enhancement are identified this should be shelved	1/24/2019 9:43 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q23 Evaluate what is limiting sockeye production in Klawock Lake before enhancement.

Answered: 20 Skipped: 8



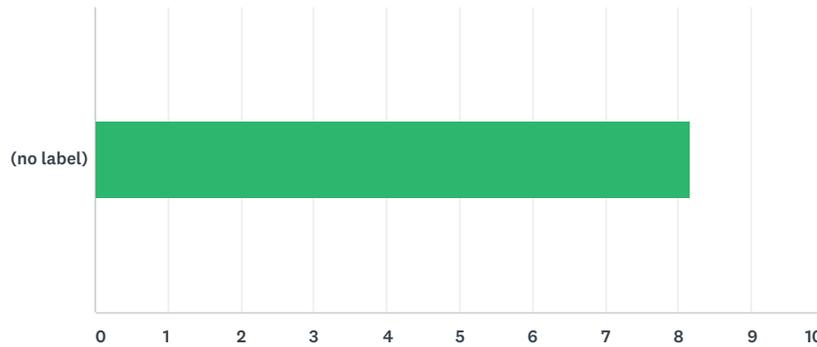
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	10.00%	0.00%	0.00%	0.00%	5.00%	0.00%	5.00%	5.00%	10.00%		65.00%	0.00%	20	
	2	0	0	0	1	0	1	1	2		13	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	All concerns may be limiting enhancement. Water health, predation, harvest, etc	1/29/2019 5:54 AM
2	Maybe, only if it helps the Sockeye Salmon Run!	1/28/2019 4:19 PM
3	Any enhancement efforts must assure that enough food is out there for our sockeye while in their lake.	1/28/2019 8:52 AM
4	It's important to know why production is down - if not enhancement won't be long term	1/27/2019 2:53 PM
5	determine what the issues are first is always the way to address conservation issues of any kind.	1/24/2019 10:41 PM
6	Before any sockeye enhancement is done, other issues should be addressed	1/24/2019 8:09 PM
7	Thats easy its overfishing	1/24/2019 8:07 PM
8	I agree. we need to figure out why before we add money into something that might not work or that might kill what little bit we have now.	1/24/2019 10:08 AM
9	If productivity of lake is low, a fertilizer application strategy may be all it takes to increase numbers	1/24/2019 9:43 AM
10	Enhancement opportunities are valid concurrent with evaluations ongoing.	1/24/2019 9:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q24 Review and/or update road condition surveys, on logging roads adjacent to spawning streams to assure fish passage.

Answered: 19 Skipped: 9

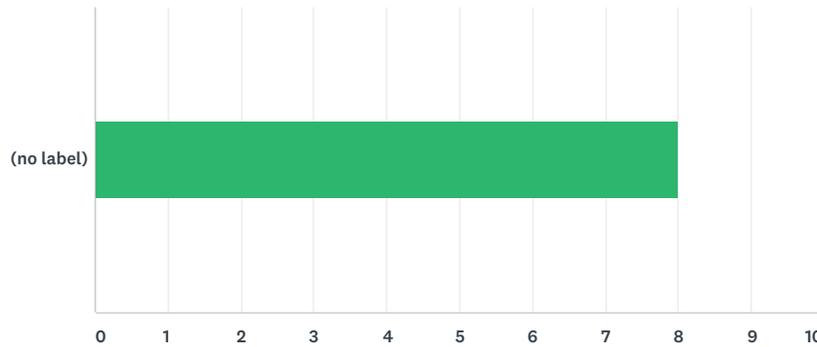


	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	5.26%	0.00%	5.26%	0.00%	0.00%	10.53%	10.53%	5.26%	15.79%	47.37%	0.00%	19	
	1	0	1	0	0	2	2	1	3	9	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	It's all about helping the fish in any way possible	1/29/2019 6:53 AM
2	I wouldn't want it to disturb the sockeye salmon run.	1/28/2019 4:44 PM
3	Also include the large culverts on the Klawock/Hollis Highway at Halfmile Creek and Threemile Creek.	1/28/2019 9:30 AM
4	focusing on habitat conditions and improvement is the best approach to reestablishing a strong run	1/24/2019 10:58 PM
5	It needs updating.	1/24/2019 10:26 AM
6	agree for roads left open. disagree for roads closed and impassable.	1/24/2019 9:42 AM

Q25 Review previous landslide stabilization work to assure less erosion from the upper creeks.

Answered: 19 Skipped: 9



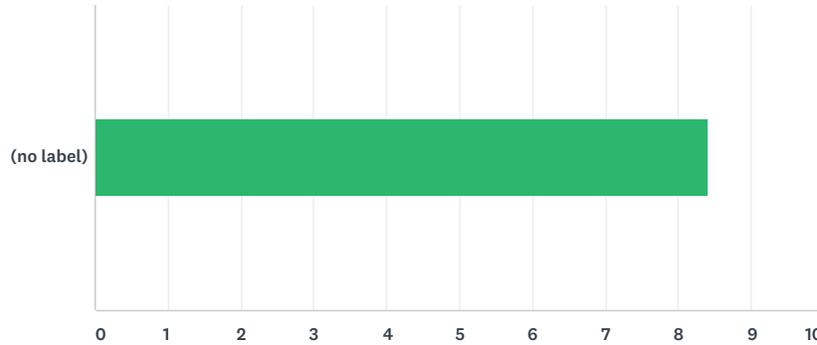
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	10.53%	0.00%	0.00%	0.00%	5.26%	10.53%	0.00%	15.79%	5.26%		52.63%	0.00%	19	
	2	0	0	0	1	2	0	3	1		10	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Stream health, gotta have it...	1/29/2019 6:53 AM
2	To help protect our creeks.	1/28/2019 4:44 PM
3	We should expect an increase and severity of storm events. Stabilization of land in our watershed is critical for a pristine watershed.	1/28/2019 9:30 AM
4	habitat is the most critical aspect for spawning salmon.	1/24/2019 10:58 PM
5	Debris and silt from landslides can choke out salmon eggs and baby salmon	1/24/2019 8:38 PM
6	slides will continue to occur. previous stabilization work will therefore have little effect.	1/24/2019 9:42 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q26 Review previous habitat thinning projects to assure they were completed, and implement additional riparian thinning projects to improve fish and wildlife habitat.

Answered: 19 Skipped: 9



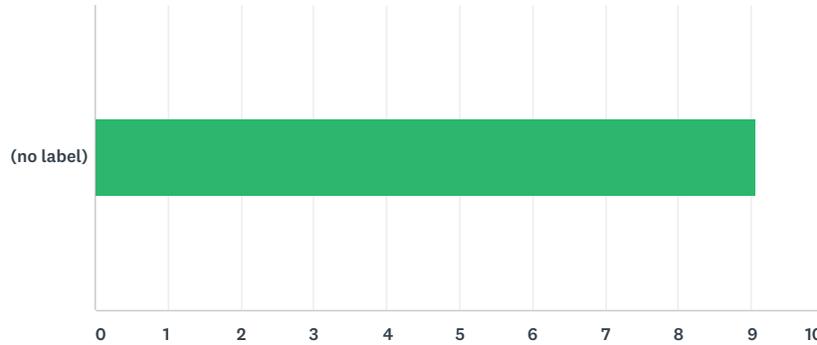
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	5.26%	0.00%	0.00%	0.00%	0.00%	15.79%	0.00%	21.05%	5.26%		52.63%	0.00%	19	
	1	0	0	0	0	3	0	4	1		10	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Poor habitat projects, poor fish and game habitat	1/29/2019 6:53 AM
2	If this helps improve the fish and wildlife?	1/28/2019 4:44 PM
3	Recommendations, if any should be prioritized.	1/28/2019 9:30 AM
4	more knowledge is useful in making long term decisions	1/24/2019 10:58 PM
5	Riparian zones must be managed and maintained to ensure proper steam functioning	1/24/2019 8:38 PM
6	focus on the new implementation only	1/24/2019 9:42 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q27 Complete habitat surveys on spawning creeks that were not recently done (i.e. in Halfmile, in Hatchery, in unnamed tributaries, and on lakeshore).

Answered: 19 Skipped: 9



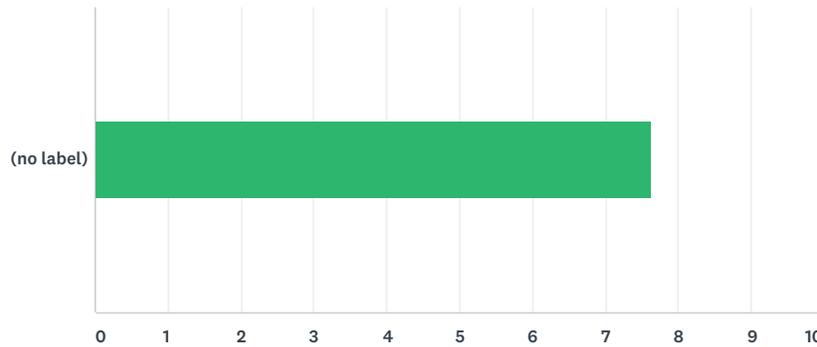
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.79%	15.79%	63.16%	0.00%	19	
	1	0	0	0	0	0	0	0	3	3	12	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Habitat is very important in the recovery effort	1/29/2019 6:53 AM
2	Long as it does not disturb the runs.	1/28/2019 4:44 PM
3	This can help to update the Anadromous Waters Catalog.	1/28/2019 9:30 AM
4	yes, helps determine where fish are spawning and also where they aren't. I'm more interested in where they are not spawning and why	1/24/2019 10:58 PM
5	There are a number of primary spawning streams but many other streams may be just as important	1/24/2019 8:38 PM
6	I support if it already hasn't been done. Seems like a lot of these question could have been answered in the meetings we already had.	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q28 Evaluate city reservoir to determine if there can be a sediment reintroduction into Halfmile Creek for fish habitat.

Answered: 19 Skipped: 9

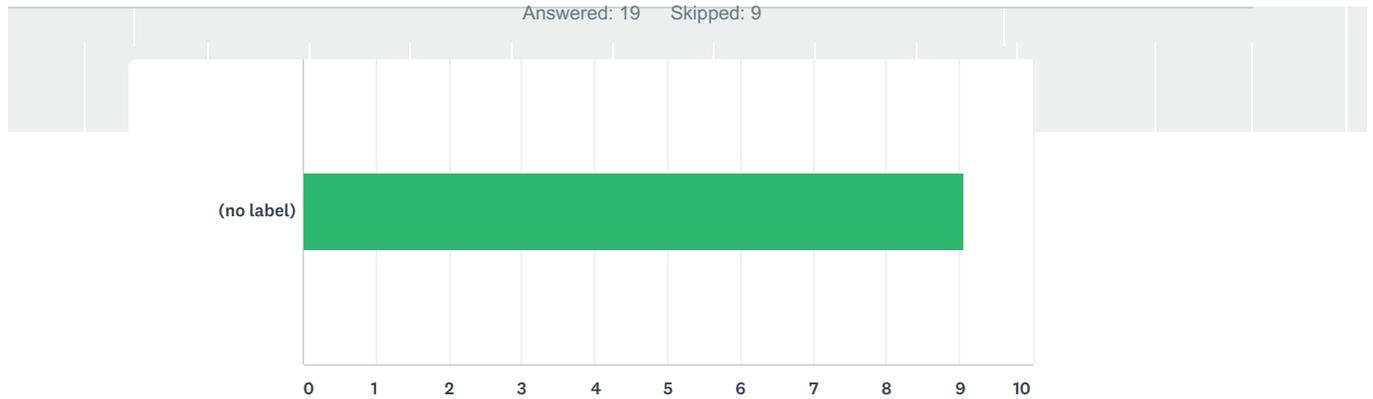


	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	10.53%	0.00%	0.00%	0.00%	0.00%	15.79%	15.79%	15.79%	0.00%	42.11%	0.00%	19		
	2	0	0	0	0	3	3	3	0	8	0			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Health of the stream...	1/29/2019 6:53 AM
2	If it helps the salmon runs.	1/28/2019 4:44 PM
3	All potential issues must be considered for our future efforts for salmon and habitat improvements.	1/28/2019 9:30 AM
4	limits to how much this can help the stream. may be best to focus on other streams and tribs	1/24/2019 10:58 PM
5	Sediment withheld by city water reservoir should be reintroduced to improve spawning habitat	1/24/2019 8:38 PM
6	Need more information to make an informed decision.	1/24/2019 5:39 PM
7	Function of city water source should be predominant concern here.	1/24/2019 1:00 PM
8	In the works already	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q29 Conduct a study to determine sockeye production (how many sockeye salmon are leaving the lake).



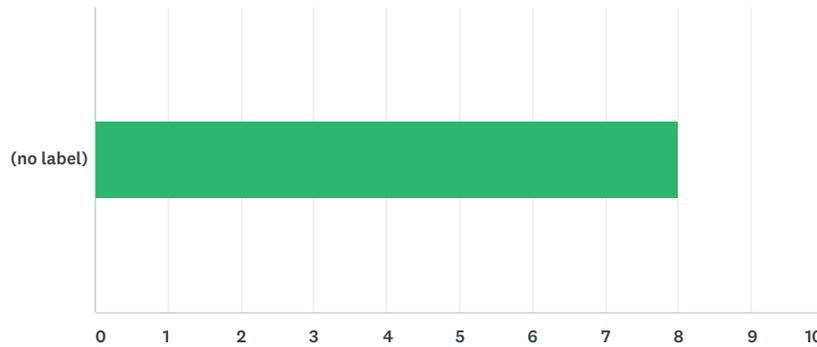
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL							
(no label)	0.00%	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	26.32%	10.53%	47.37%	10.53%	19
	0	0	0	0	0	1	0	5	2	9	2	

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Numbers, numbers,numbers...	1/29/2019 6:53 AM
2	Long as it does not disturb the sockeye salmon runs.	1/28/2019 4:44 PM
3	This can be used with the data on returning sockeye.	1/28/2019 9:30 AM
4	as much as possible this is a good idea.	1/24/2019 10:58 PM
5	This is similar to other proposed projects	1/24/2019 8:38 PM
6	Very curious	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q30 Monitor lake nutrients, which provide food resources for sockeye salmon

Answered: 18 Skipped: 10



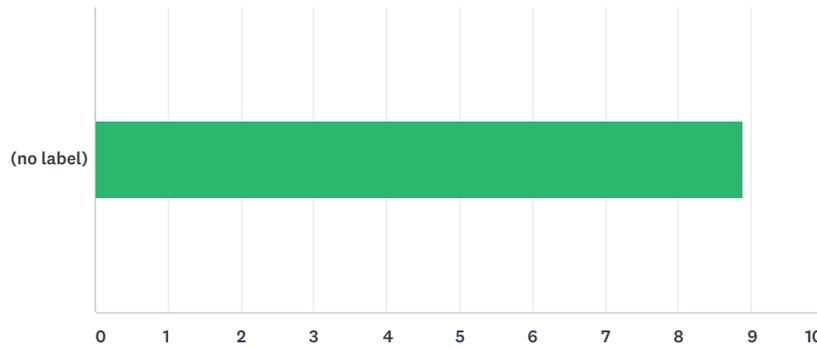
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	5.56%	0.00%	0.00%	0.00%	11.11%	11.11%	5.56%	11.11%	11.11%	44.44%	0.00%	18	
	1	0	0	0	2	2	1	2	2	8	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	no food resources, no fish. very important to know the health of the lake	1/29/2019 6:53 AM
2	If it helps with how things are going with the runs.	1/28/2019 4:44 PM
3	Our sockeye need to eat.	1/28/2019 9:30 AM
4	important to know as this is a critical aspect for juvenile salmon.	1/24/2019 10:58 PM
5	Lake nutrients support more than salmon species	1/24/2019 8:38 PM
6	On the fence with this one. Fertilization was already looked into and our lake can't handle it.	1/24/2019 10:26 AM
7	not sure of the benefits that would be realized.	1/24/2019 9:42 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q31 Develop a Klawock Lake Watershed Beaver Management Plan that addresses when and where to pull beaver dams for fish passage.

Answered: 18 Skipped: 10



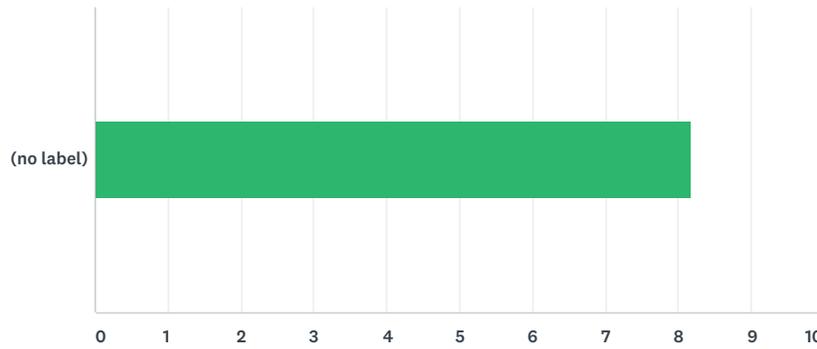
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	0.00%	0.00%	5.56%	0.00%	5.56%	0.00%	0.00%	16.67%	11.11%	61.11%	0.00%	18	
	0	0	1	0	1	0	0	3	2	11	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	This may be a very important plan to develop	1/29/2019 6:53 AM
2	important	1/28/2019 4:44 PM
3	A market for beaver pelts must be created.	1/28/2019 9:30 AM
4	loss of habitat due to logging, then beaver is significant. Much habitat has been lost to the combination of issues. a long term plan can be very beneficial	1/24/2019 10:58 PM
5	Fish passage is important so sockeye salmon can reach spawning areas	1/24/2019 8:38 PM
6	Bever dams are bad	1/24/2019 8:16 PM
7	Again would need to see what this idea entails.	1/24/2019 5:39 PM
8	Something the Tribe should definately do.	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q32 Continue to address the Klawock-Hollis Highway fish passage issue from culverts at Threemile Creek.

Answered: 18 Skipped: 10



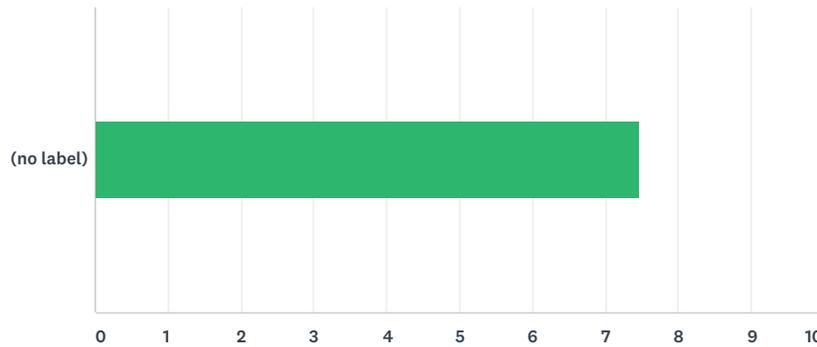
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	5.56%	0.00%	0.00%	0.00%	0.00%	11.11%	11.11%	16.67%	11.11%	38.89%	5.56%	18	
	1	0	0	0	0	2	2	3	2	7	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Stream flow changes around culverts a lot	1/29/2019 6:53 AM
2	If it is important to the Sockeye Salmon Runs.	1/28/2019 4:44 PM
3	Also include the Halfmile Culverts.	1/28/2019 9:30 AM
4	a lot to consider with this but returning to a better passage is a good idea.	1/24/2019 10:58 PM
5	The three mile culvert should be removed and a bridge should be built in its place	1/24/2019 8:38 PM

Klawock Lake Sockeye Salmon Community Perspectives

Q33 Monitor water quality near Viking Lumber (estuary for Klawock River).

Answered: 17 Skipped: 11



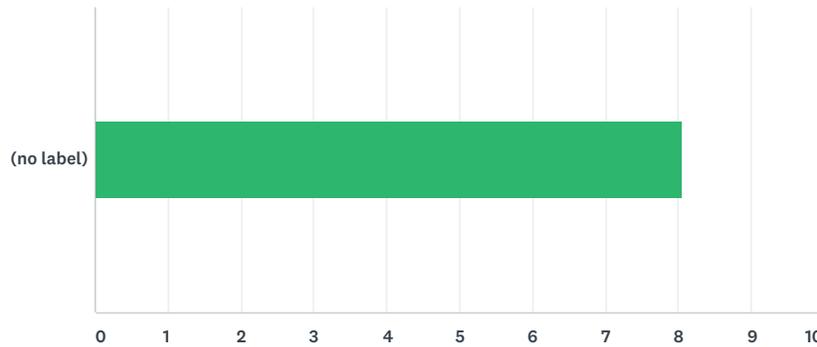
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	11.76%	0.00%	0.00%	5.88%	5.88%	11.76%	5.88%	5.88%	5.88%	5.88%	47.06%	0.00%	17	
	2	0	0	1	1	2	1	1	1	1	8	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Toxins....	1/29/2019 6:53 AM
2	KCA Environmental Department is already monitoring there. Not sure if it is close enough.	1/28/2019 4:44 PM
3	KCA Environmental is already doing this one.	1/28/2019 2:44 PM
4	This should be at multiple locations along Klawock Inlet. Include the Viking Lumber dumpsite on Klawock Island. The sort yard, municipal and Tribal docks need to be monitored for illegal dumping (marine battery and oil).	1/28/2019 9:30 AM
5	base info is always good to have.	1/24/2019 10:58 PM
6	I believe the KCA is already monitoring water quality in the estuary	1/24/2019 8:38 PM
7	Not sure if our environmental dept. has done that	1/24/2019 12:19 PM
8	Tribal EPA Department	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q34 Assess if the Hatchery Creek beaver dam removal was successful in providing fish habitat.

Answered: 18 Skipped: 10



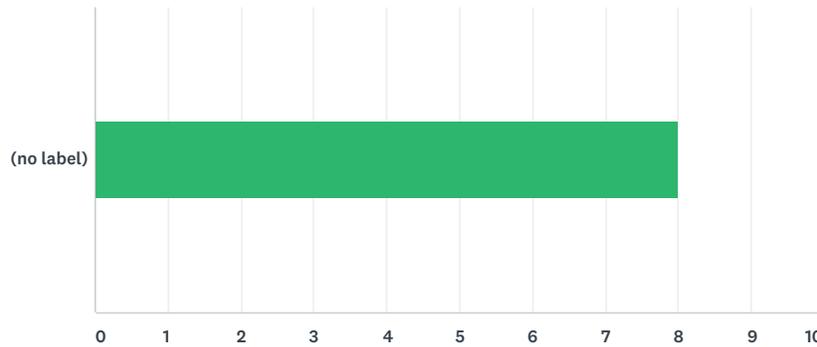
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	5.56%	0.00%	5.56%	0.00%	5.56%	0.00%	5.56%	22.22%	5.56%	44.44%	5.56%	18	
	1	0	1	0	1	0	1	4	1	8	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Gotta know if habitat enhancements are successful	1/29/2019 6:53 AM
2	Good to see if it is working.	1/28/2019 4:44 PM
3	Consider Citizen Science and potential student monitoring for these.	1/28/2019 9:30 AM
4	this will help inform whether we should continue this kind of work. miles of habitat could be recovered if this is succesful.	1/24/2019 10:58 PM
5	I believe the KCA and the corporations are already doing this but it could be used to identify other dams that needed removal to improve fish passage	1/24/2019 8:38 PM

Klawock Lake Sockeye Salmon Community Perspectives

Q35 Continue to assess and address predation on sockeye salmon fry in Klawock Lake.

Answered: 18 Skipped: 10



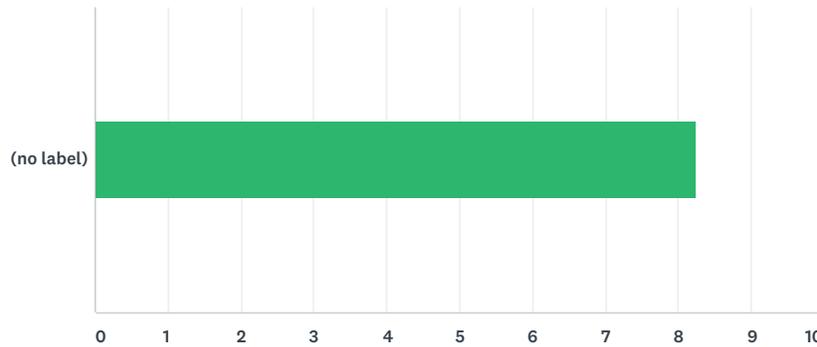
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	5.56%	0.00%	0.00%	5.56%	5.56%	0.00%	5.56%	22.22%	16.67%	33.33%	5.56%	18	
	1	0	0	1	1	0	1	4	3	6	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	With the amount of coho entering the system, assessing and addressing depredation is very important	1/29/2019 6:53 AM
2	Only if there is a need, if not, I wouldn't want to disturb what is there.	1/28/2019 4:44 PM
3	This type of data is needed for our efforts.	1/28/2019 9:30 AM
4	good to know for long term management	1/24/2019 10:58 PM
5	I believe the KCA is already doing this	1/24/2019 8:38 PM
6	Need a commercial trout fishery in klawock lake, the trout are out of control	1/24/2019 8:16 PM
7	After 2019 there will be 3 years of data. To continue until you get the results you want (if possible) is unscientific	1/24/2019 9:49 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q36 Assess the culvert crossing at Halfmile Creek and the Klawock Hollis Highway to determine if it can improve fish passage.

Answered: 18 Skipped: 10



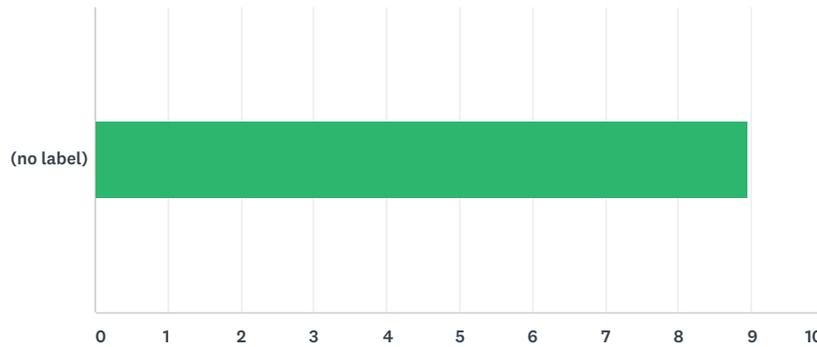
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	0.00%	0.00%	5.56%	0.00%	11.11%	0.00%	11.11%	11.11%	16.67%	38.89%	5.56%	18	
	0	0	1	0	2	0	2	2	3	7	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Any improvement...	1/29/2019 6:53 AM
2	Only if it improves the runs.	1/28/2019 4:44 PM
3	This is one of our primary sockeye producing streams.	1/28/2019 9:30 AM
4	upstream habitat is limited so this should be approach objectively.	1/24/2019 10:58 PM
5	Is the habitat above the roads good for spawning?	1/24/2019 8:38 PM

Klawock Lake Sockeye Salmon Community Perspectives

Q37 Complete sockeye spawning surveys in Hatchery Creek to determine how many sockeye use the drainage for spawning.

Answered: 19 Skipped: 9



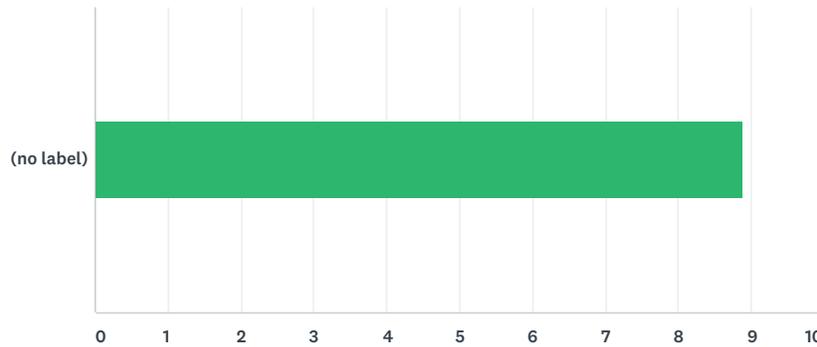
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	0.00%	0.00%	0.00%	0.00%	5.26%	5.26%	5.26%	15.79%	10.53%	57.89%	0.00%	19	
	0	0	0	0	1	1	1	3	2	11	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Well yeah...	1/29/2019 6:53 AM
2	It would be good to know if its working.	1/28/2019 4:44 PM
3	Any and all data can help with our efforts to improve sockeye in our Klawock Lake Watershed.	1/28/2019 9:30 AM
4	Likely the spawning system that can be recovered most successfully	1/24/2019 10:58 PM
5	And how much of the hatchery creek habitat been affected by prior timber harvest?	1/24/2019 8:38 PM

Klawock Lake Sockeye Salmon Community Perspectives

Q38 Maintain and monitor habitat in Inlet Creek because it provides high value intact sockeye spawning habitat.

Answered: 19 Skipped: 9



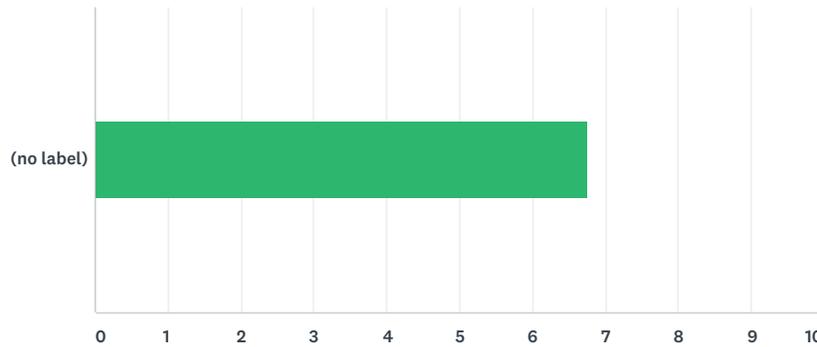
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	0.00%	0.00%	0.00%	5.26%	0.00%	5.26%	0.00%	21.05%	10.53%	52.63%	5.26%	19	
	0	0	0	1	0	1	0	4	2	10	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	High value habitat requires high value monitoring	1/29/2019 6:53 AM
2	Long as it does not disturb the runs.	1/28/2019 4:44 PM
3	Maintaining prime habitat conditions is needed for salmon.	1/28/2019 9:30 AM
4	this is the reference system for the watershed	1/24/2019 10:58 PM
5	All efforts should be taken to preserve existing key habitat.	1/24/2019 8:38 PM

Klawock Lake Sockeye Salmon Community Perspectives

Q39 Conduct local interviews on where sockeye salmon are spawning along the lakeshore and smaller tributaries.

Answered: 18 Skipped: 10



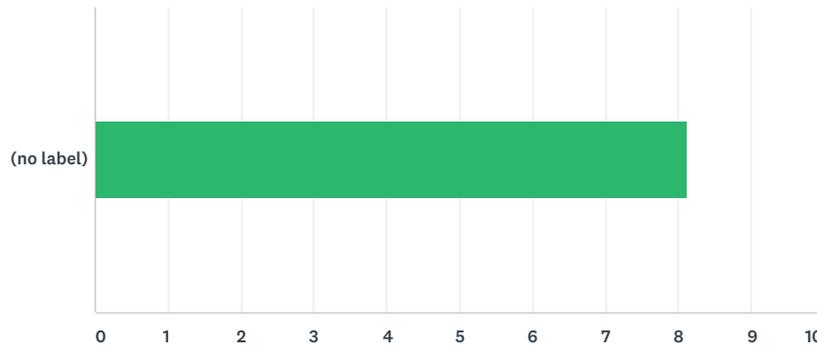
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	11.11%	0.00%	5.56%	5.56%	11.11%	5.56%	5.56%	16.67%	5.56%	27.78%	5.56%	18	
	2	0	1	1	2	1	1	3	1	5	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Not that many people recreate or fish in the lake, but interviews would be good to gain any knowledge helps	1/29/2019 6:53 AM
2	Local native hire to do the interviews, you will get better answers from tribal members.	1/28/2019 4:44 PM
3	This can help efforts on areas that are not within a scope of work to improve sockeye returns.	1/28/2019 9:30 AM
4	Should have the answers to this if other studies are being done correctly	1/27/2019 2:57 PM
5	knowledge is always good and people see alot	1/24/2019 10:58 PM
6	Don't believe the information is valuable enough. Use resources elsewhere.	1/24/2019 9:42 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q40 Evaluate restoration efforts at sockeye spawning grounds and identify and prioritize new restoration projects.

Answered: 19 Skipped: 9



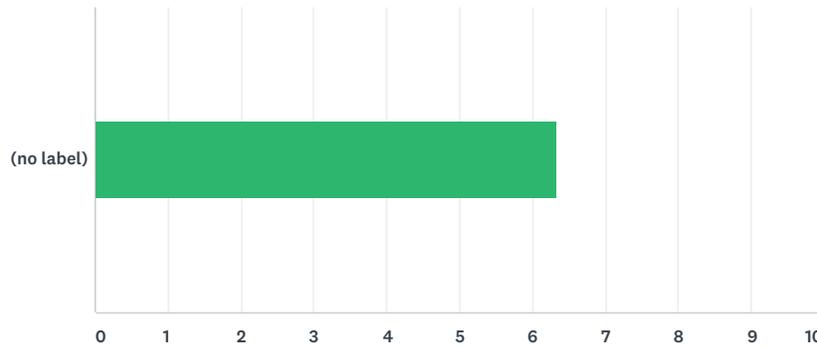
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	0.00%	5.26%	0.00%	5.26%	5.26%	0.00%	21.05%	10.53%	5.26%	47.37%	0.00%	19	
	0	1	0	1	1	0	4	2	1	9	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Good to know results of restoration efforts,learn,improve future efforts	1/29/2019 6:53 AM
2	Agree, if it will help the runs.	1/28/2019 4:44 PM
3	A timeline of restoration efforts can help with future efforts. We can and must demonstrate the effect of the National Environmental Policy Act, or lack thereof.	1/28/2019 9:30 AM
4	i'm more focused on improving habitat. improve habitat and the fish will take care of themselves.	1/24/2019 10:58 PM
5	Habitat restoration is key to sockeye salmon health	1/24/2019 8:38 PM
6	I think over harvesting plays a larger part of problem.	1/24/2019 12:53 PM

Klawock Lake Sockeye Salmon Community Perspectives

Q41 Determine if the lake needs to be fertilized in order to provide more food resources for sockeye salmon

Answered: 19 Skipped: 9



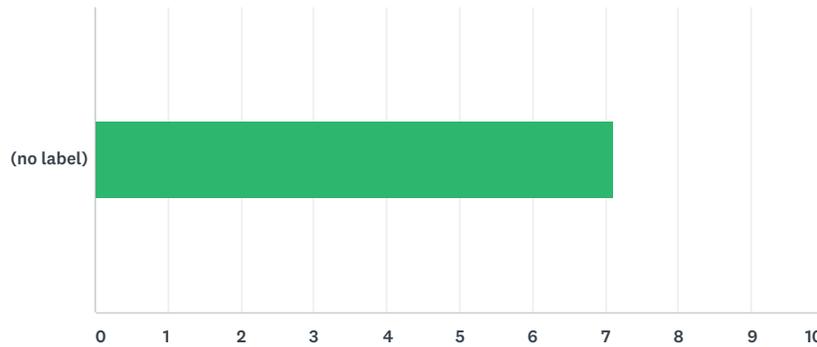
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	21.05%	0.00%	10.53%	0.00%	10.53%	0.00%	5.26%	0.00%	15.79%	31.58%	5.26%	19	
	4	0	2	0	2	0	1	0	3	6	1		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Wouldn't hurt to know what the lake needs until results of other watershed enhancements are known	1/29/2019 6:53 AM
2	I disagree with foreign fertilization. It would like fish farming, and I am strictly against that.	1/28/2019 4:44 PM
3	I have a mixed feeling about this project. We must outreach and educate the public on "what is fertilization? Where did it come from? How is it made?"	1/28/2019 9:30 AM
4	this should be included in other studies	1/27/2019 2:57 PM
5	good to learn more about but be very methodical and careful.	1/24/2019 10:58 PM
6	If other habitat restoration projects are implemented successfully the lake should be able to produce an appropriate amount of nutrients	1/24/2019 8:38 PM
7	Already done	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q42 Study the lake environment to determine the lake can support food resources for sockeye salmon.

Answered: 19 Skipped: 9



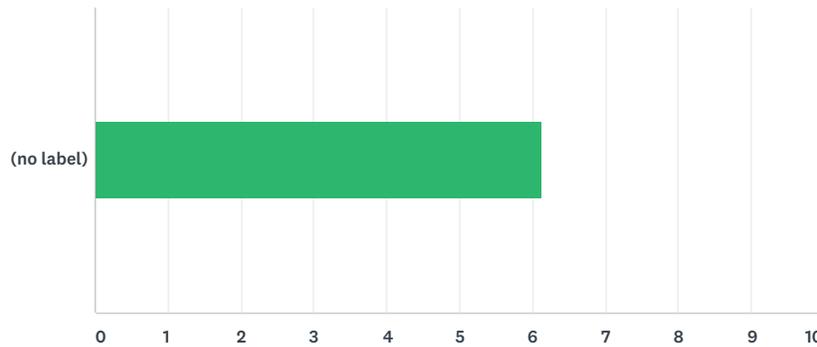
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'								
(no label)	15.79%	0.00%	0.00%	10.53%	0.00%	10.53%	0.00%	15.79%	10.53%	36.84%	0.00%	19		
	3	0	0	2	0	2	0	3	2	7	0			

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	What the lake needs...	1/29/2019 6:53 AM
2	same as answer in question 41.	1/28/2019 4:44 PM
3	We must consider what is below the surface of the water. Past logging and how they disposed of waste was never identified. Logging in the early 20th century tells about boom boats creating log rafts in the Klawock Lake. A portion of the Klawock River was blasted with dynamite, to open it up to transport logs to salt water.	1/28/2019 9:30 AM
4	again - this feels like a duplicate question and should be included in other studies	1/27/2019 2:57 PM
5	reasonable to do if we want to see stocks improve.	1/24/2019 10:58 PM
6	See previous explanation	1/24/2019 8:38 PM
7	it has supported it before, so why would it not support it now? competing fish?	1/24/2019 9:42 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q43 Determine the spatial distribution of sockeye in the Klawock estuary.

Answered: 17 Skipped: 11



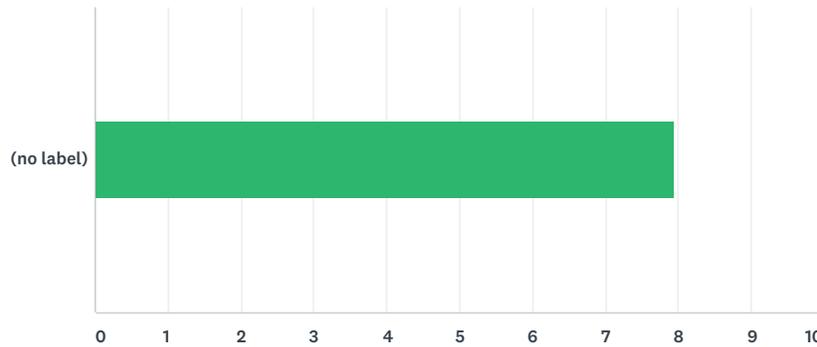
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL							
(no label)	17.65%	0.00%	0.00%	5.88%	23.53%	0.00%	5.88%	5.88%	0.00%	29.41%	11.76%	17
	3	0	0	1	4	0	1	1	0	5	2	

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Distribution knowledge would help to know how many fish the estuary can support	1/29/2019 6:53 AM
2	Only if it helps the Sockeye Salmon Runs	1/28/2019 4:44 PM
3	If this project happens, you must inform the public on what spatial distribution is, why it's needed and how it can impact our efforts.	1/28/2019 9:30 AM
4	better data helps make better management desisions	1/24/2019 10:58 PM

Klawock Lake Sockeye Salmon Community Perspectives

Q44 Set aside portions of land in the Klawock Lake Watershed for carbon credit program.

Answered: 18 Skipped: 10



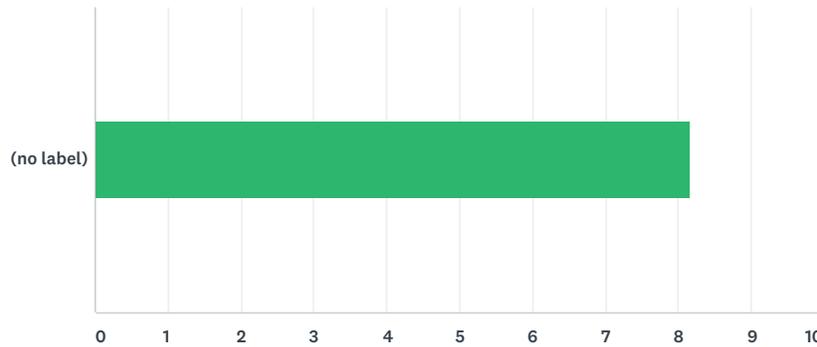
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL							
(no label)	11.11%	0.00%	0.00%	0.00%	11.11%	5.56%	0.00%	0.00%	5.56%	55.56%	11.11%	18
	2	0	0	0	2	1	0	0	1	10	2	

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	Don't know much about a project like this	1/29/2019 6:53 AM
2	This is a great idea, and will help protect the lake and salmon runs.	1/28/2019 4:44 PM
3	The whole watershed should be set up for carbon credit.	1/28/2019 9:30 AM
4	unsure of how I feel about Carbon credits - how does this affect things long term - what if future needs are different and land is still locked into the credit program	1/27/2019 2:57 PM
5	This would be great to do.	1/24/2019 10:58 PM
6	Stream buffers that can't be harvested should be placed into the carbon credit program (make money off land that can't be harvested)	1/24/2019 8:38 PM
7	Land owner is a private company.	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q45 Develop a guidance document for land planners to assist in minimizing impacts to sockeye populations and/or habitat.

Answered: 19 Skipped: 9



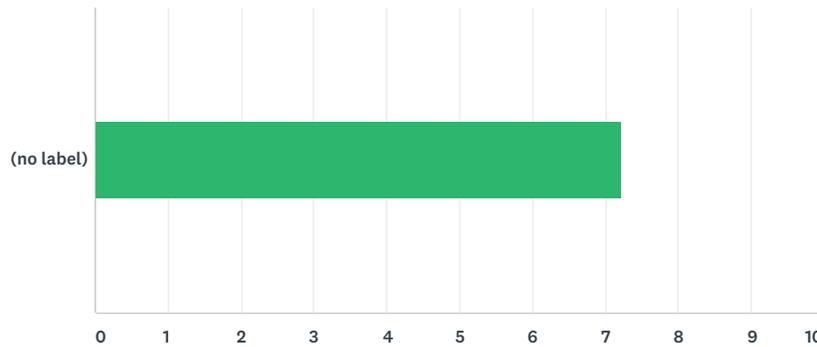
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	10.53%	0.00%	0.00%	0.00%	5.26%	5.26%	5.26%	10.53%	5.26%	57.89%	0.00%	19	
	2	0	0	0	1	1	1	2	1	11	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	All land use is important for populations and habitat	1/29/2019 6:53 AM
2	I am always in protection for the sockeye salmon.	1/28/2019 4:44 PM
3	This can help with our efforts.	1/28/2019 9:30 AM
4	It's all about habitat!!!!!!!!!!!!	1/24/2019 10:58 PM
5	Three mile creek sub-division is a perfect example of why a guidance document is needed to minimize habitat impacts	1/24/2019 8:38 PM
6	Land owner is a private company.	1/24/2019 10:26 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q46 Place conservation easements in Klawock Lake Watershed.

Answered: 18 Skipped: 10



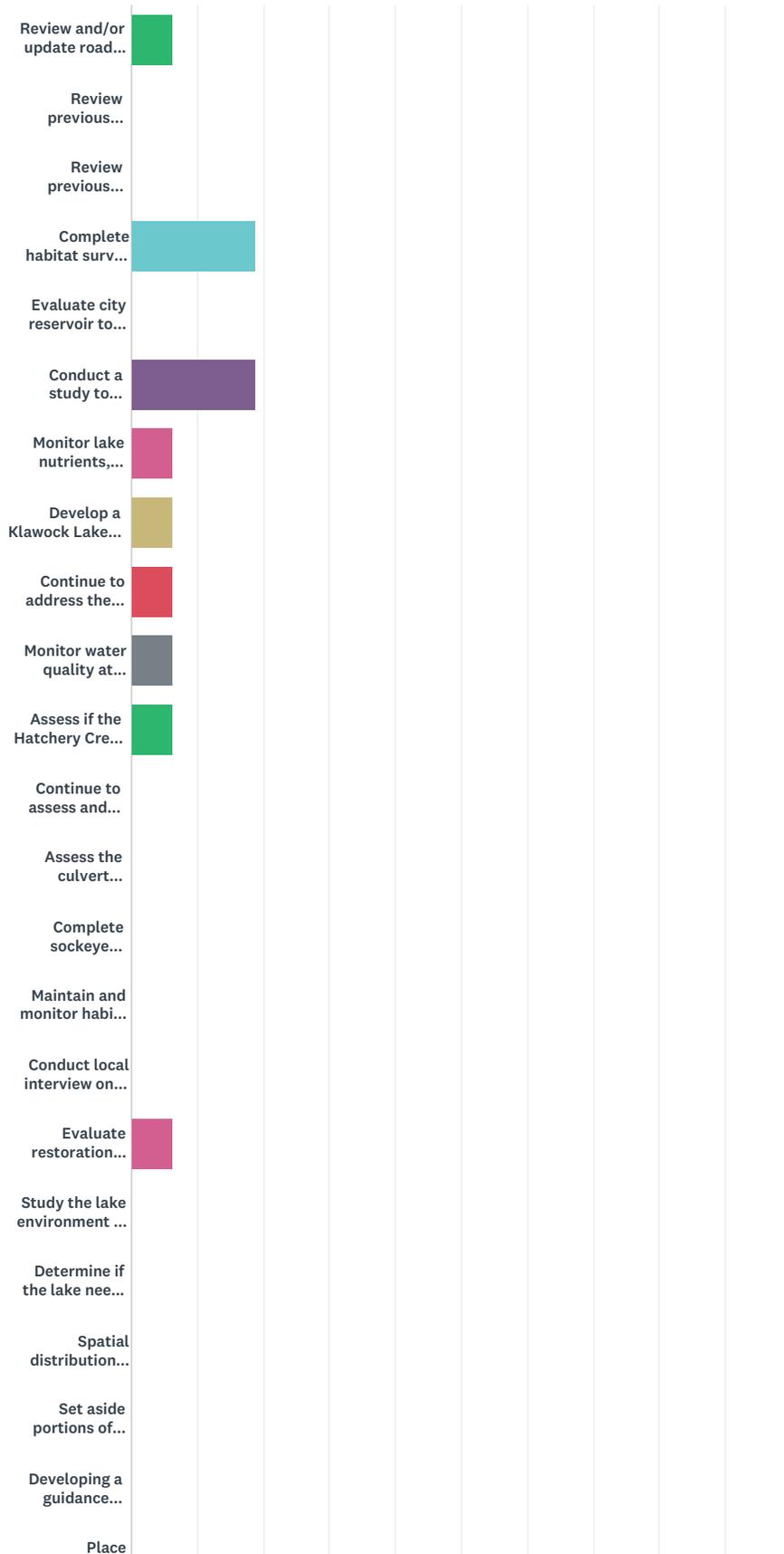
	I DO NOT SUPPORT THIS PROJECT	(NO LABEL)	I STRONGLY SUPPORT THIS PROJECT	N/A	TOTAL	W A'							
(no label)	11.11%	5.56%	0.00%	0.00%	16.67%	0.00%	11.11%	5.56%	5.56%	44.44%	0.00%	18	
	2	1	0	0	3	0	2	1	1	8	0		

#	PLEASE EXPLAIN WHY YOU MADE YOUR DECISION	DATE
1	If deemed necessary after other projects are evaluated and found to need more help	1/29/2019 6:53 AM
2	Not quite sure what it means, yes if it will protect the fish and habitat.	1/28/2019 4:44 PM
3	This can create confusion to our residents. If this occurs, stakeholders must be compensated and retain ownership of land.	1/28/2019 9:30 AM
4	would be great if land holders would consider this.	1/24/2019 10:58 PM
5	Stream buffers would be good areas for conservation easements	1/24/2019 8:38 PM
6	This would be up to KHC and SSI.	1/24/2019 1:00 PM
7	Habitat is the key issue!!!	1/24/2019 9:49 AM

Klawock Lake Sockeye Salmon Community Perspectives

Q47 Please select the five projects that you support the most.

Answered: 16 Skipped: 12



Klawock Lake Sockeye Salmon Community Perspectives



ANSWER CHOICES

- Review and/or update road condition surveys, on logging roads adjacent to spawning streams to assure fish passage
- Review previous landslide stabilization work to assure less erosion from the upper creeks

RESPONSES

6.25%	1
0.00%	0

Klawock Lake Sockeye Salmon Community Perspectives

Review previous habitat thinning projects to assure they were complete, and implement additional riparian thinning projects to improve fish and wildlife habitat	0.00%	0
Complete habitat surveys on spawning creeks that were not recently done (i.e. in Halfmile, in Hatchery, in unnamed tributaries, and on lakeshore)	18.75%	3
Evaluate city reservoir to determine if there can be a sediment reintroduction into Halfmile Creek for fish habitat	0.00%	0
Conduct a study to determine sockeye production (how many sockeye salmon are leaving the lake)	18.75%	3
Monitor lake nutrients, which provide food resources for sockeye salmon	6.25%	1
Develop a Klawock Lake Watershed Beaver Management Plan that addresses when and where to pull beaver dams for fish passage	6.25%	1
Continue to address the Klawock Hollis Highway fish passage issue from culverts at Threemile Creek	6.25%	1
Monitor water quality at Viking Lumber (estuary for Klawock River)	6.25%	1
Assess if the Hatchery Creek beaver dam removal was successful in providing fish habitat	6.25%	1
Continue to assess and address predation on sockeye salmon fry in Klawock Lake	0.00%	0
Assess the culvert crossing at Halfmile Creek and the Klawock Hollis Highway, to see if it can improve fish passage	0.00%	0
Complete sockeye spawning surveys in Hatchery Creek to determine how many sockeye use the drainage for spawning	0.00%	0
Maintain and monitor habitat in Inlet Creek because it provides high value intact sockeye spawning habitat	0.00%	0
Conduct local interview on where sockeye salmon are spawning along the lakeshore and smaller tributaries	0.00%	0
Evaluate restoration efforts at sockeye spawning grounds and identify and prioritize new restoration projects	6.25%	1
Study the lake environment to determine the lake can support food resources for sockeye salmon.	0.00%	0
Determine if the lake needs to be fertilized in order to provide more food resources for sockeye salmon	0.00%	0
Spatial distribution of sockeye in the Klawock estuary	0.00%	0
Set aside portions of land in the Klawock Lake Watershed for carbon banking	0.00%	0
Developing a guidance document for land planners to assist minimizing impacts to sockeye populations and/or habitat	0.00%	0
Place conservation easements in Klawock Lake Watershed	0.00%	0
Conduct a local fish consumption study to determine the amount if fish eaten	0.00%	0
Maintain local representation on SSRAA board (currently Dennis Nickerson)	0.00%	0
Conduct Household Harvest Surveys to determine amount necessary for subsistence and to document harvest and use patterns	0.00%	0
Conduct a Klawock traditional ecological knowldge study on sockeye salmon harvest methods to determine how they have changed over time	0.00%	0
Establish local Klawock Watershed Committee and/or watershed council and continue stakeholder meetings	0.00%	0
Engage and educate Klawock school kids on Klawock Watershed issues and management	0.00%	0
Educate subsistence users on value of accurate harvest reporting and work to improve harvest reporting	0.00%	0
Provide community outreach/education on the value of having a fish weir and continuing to operate one	0.00%	0
Identify coho concerns in Klawock Watershed	0.00%	0
Implement a Klawock River Fishing Day to help "get the trout out" and reduce predation on sockeye fry	0.00%	0
Form a local committee to address enhancement goals, benefits, and risks	0.00%	0
Conduct a feasibility study of non-POW hatchery sockeye enhancement opportunities/methods	0.00%	0
Establish long term POW hatchery production and release of sockeye salmon	6.25%	1
Evaluate what is limiting sockeye production in Klawock Lake before enhancement	6.25%	1
Continue to count sockeye at the Klawock weir	0.00%	0
Conduct sockeye salmon genetic sampling in the commercial fishery	0.00%	0
Change subsistence fishing regulations, such as extending the fishing season	0.00%	0
Develop a Klawock sockeye salmon management plan that includes target levels of fish to return to the lake	0.00%	0

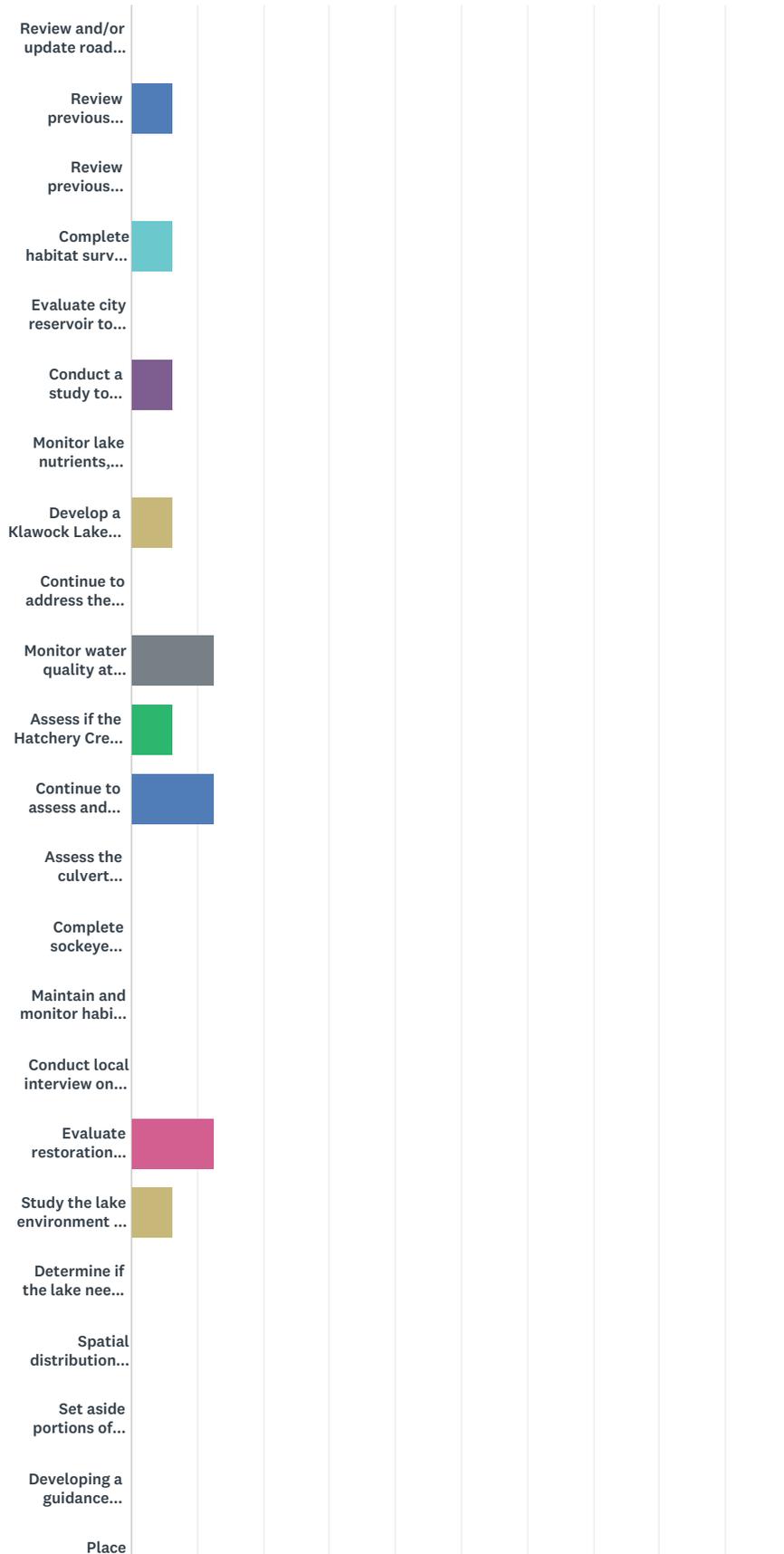
Klawock Lake Sockeye Salmon Community Perspectives

Implement a voluntary closure system on subsistence harvest when sockeye returns are low	0.00%	0
Count adult spawners into each tributary, and count fry coming out of each tributary	0.00%	0
Validate weir counts using alternative weir structures or mark-recapture studies	6.25%	1
TOTAL		16

Klawock Lake Sockeye Salmon Community Perspectives

Q48 Please select the five projects that you support the most.

Answered: 16 Skipped: 12



Klawock Lake Sockeye Salmon Community Perspectives



ANSWER CHOICES

- Review and/or update road condition surveys, on logging roads adjacent to spawning streams to assure fish passage
- Review previous landslide stabilization work to assure less erosion from the upper creeks

RESPONSES

0.00%	0
6.25%	1

Klawock Lake Sockeye Salmon Community Perspectives

Review previous habitat thinning projects to assure they were complete, and implement additional riparian thinning projects to improve fish and wildlife habitat	0.00%	0
Complete habitat surveys on spawning creeks that were not recently done (i.e. in Halfmile, in Hatchery, in unnamed tributaries, and on lakeshore)	6.25%	1
Evaluate city reservoir to determine if there can be a sediment reintroduction into Halfmile Creek for fish habitat	0.00%	0
Conduct a study to determine sockeye production (how many sockeye salmon are leaving the lake)	6.25%	1
Monitor lake nutrients, which provide food resources for sockeye salmon	0.00%	0
Develop a Klawock Lake Watershed Beaver Management Plan that addresses when and where to pull beaver dams for fish passage	6.25%	1
Continue to address the Klawock Hollis Highway fish passage issue from culverts at Threemile Creek	0.00%	0
Monitor water quality at Viking Lumber (estuary for Klawock River)	12.50%	2
Assess if the Hatchery Creek beaver dam removal was successful in providing fish habitat	6.25%	1
Continue to assess and address predation on sockeye salmon fry in Klawock Lake	12.50%	2
Assess the culvert crossing at Halfmile Creek and the Klawock Hollis Highway, to see if it can improve fish passage	0.00%	0
Complete sockeye spawning surveys in Hatchery Creek to determine how many sockeye use the drainage for spawning	0.00%	0
Maintain and monitor habitat in Inlet Creek because it provides high value intact sockeye spawning habitat	0.00%	0
Conduct local interview on where sockeye salmon are spawning along the lakeshore and smaller tributaries	0.00%	0
Evaluate restoration efforts at sockeye spawning grounds and identify and prioritize new restoration projects	12.50%	2
Study the lake environment to determine the lake can support food resources for sockeye salmon.	6.25%	1
Determine if the lake needs to be fertilized in order to provide more food resources for sockeye salmon	0.00%	0
Spatial distribution of sockeye in the Klawock estuary	0.00%	0
Set aside portions of land in the Klawock Lake Watershed for carbon banking	0.00%	0
Developing a guidance document for land planners to assist minimizing impacts to sockeye populations and/or habitat	0.00%	0
Place conservation easements in Klawock Lake Watershed	0.00%	0
Conduct a local fish consumption study to determine the amount if fish eaten	0.00%	0
Maintain local representation on SSRAA board (currently Dennis Nickerson)	12.50%	2
Conduct Household Harvest Surveys to determine amount necessary for subsistence and to document harvest and use patterns	0.00%	0
Conduct a Klawock traditional ecological knowldge study on sockeye salmon harvest methods to determine how they have changed over time	0.00%	0
Establish local Klawock Watershed Committee and/or watershed council and continue stakeholder meetings	0.00%	0
Engage and educate Klawock school kids on Klawock Watershed issues and management	0.00%	0
Educate subsistence users on value of accurate harvest reporting and work to improve harvest reporting	0.00%	0
Provide community outreach/education on the value of having a fish weir and continuing to operate one	0.00%	0
Identify coho concerns in Klawock Watershed	0.00%	0
Implement a Klawock River Fishing Day to help "get the trout out" and reduce predation on sockeye fry	0.00%	0
Form a local committee to address enhancement goals, benefits, and risks	0.00%	0
Conduct a feasibility study of non-POW hatchery sockeye enhancement opportunities/methods	0.00%	0
Establish long term POW hatchery production and release of sockeye salmon	0.00%	0
Evaluate what is limiting sockeye production in Klawock Lake before enhancement	0.00%	0
Continue to count sockeye at the Klawock weir	6.25%	1
Conduct sockeye salmon genetic sampling in the commercial fishery	0.00%	0
Change subsistence fishing regulations, such as extending the fishing season	0.00%	0
Develop a Klawock sockeye salmon management plan that includes target levels of fish to return to the lake	0.00%	0

Klawock Lake Sockeye Salmon Community Perspectives

Implement a voluntary closure system on subsistence harvest when sockeye returns are low	6.25%	1
Count adult spawners into each tributary, and count fry coming out of each tributary	0.00%	0
Validate weir counts using alternative weir structures or mark-recapture studies	0.00%	0
TOTAL		16

Klawock Lake Sockeye Salmon Community Perspectives

Q49 Please select the five projects that you support the most.

Answered: 16 Skipped: 12



Klawock Lake Sockeye Salmon Community Perspectives



ANSWER CHOICES

- Review and/or update road condition surveys, on logging roads adjacent to spawning streams to assure fish passage
- Review previous landslide stabilization work to assure less erosion from the upper creeks

RESPONSES

0.00%	0
0.00%	0

Klawock Lake Sockeye Salmon Community Perspectives

Review previous habitat thinning projects to assure they were complete, and implement additional riparian thinning projects to improve fish and wildlife habitat	0.00%	0
Complete habitat surveys on spawning creeks that were not recently done (i.e. in Halfmile, in Hatchery, in unnamed tributaries, and on lakeshore)	6.25%	1
Evaluate city reservoir to determine if there can be a sediment reintroduction into Halfmile Creek for fish habitat	0.00%	0
Conduct a study to determine sockeye production (how many sockeye salmon are leaving the lake)	12.50%	2
Monitor lake nutrients, which provide food resources for sockeye salmon	0.00%	0
Develop a Klawock Lake Watershed Beaver Management Plan that addresses when and where to pull beaver dams for fish passage	12.50%	2
Continue to address the Klawock Hollis Highway fish passage issue from culverts at Threemile Creek	0.00%	0
Monitor water quality at Viking Lumber (estuary for Klawock River)	0.00%	0
Assess if the Hatchery Creek beaver dam removal was successful in providing fish habitat	6.25%	1
Continue to assess and address predation on sockeye salmon fry in Klawock Lake	0.00%	0
Assess the culvert crossing at Halfmile Creek and the Klawock Hollis Highway, to see if it can improve fish passage	0.00%	0
Complete sockeye spawning surveys in Hatchery Creek to determine how many sockeye use the drainage for spawning	0.00%	0
Maintain and monitor habitat in Inlet Creek because it provides high value intact sockeye spawning habitat	12.50%	2
Conduct local interview on where sockeye salmon are spawning along the lakeshore and smaller tributaries	0.00%	0
Evaluate restoration efforts at sockeye spawning grounds and identify and prioritize new restoration projects	6.25%	1
Study the lake environment to determine the lake can support food resources for sockeye salmon.	0.00%	0
Determine if the lake needs to be fertilized in order to provide more food resources for sockeye salmon	6.25%	1
Spatial distribution of sockeye in the Klawock estuary	0.00%	0
Set aside portions of land in the Klawock Lake Watershed for carbon banking	0.00%	0
Developing a guidance document for land planners to assist minimizing impacts to sockeye populations and/or habitat	6.25%	1
Place conservation easements in Klawock Lake Watershed	0.00%	0
Conduct a local fish consumption study to determine the amount if fish eaten	0.00%	0
Maintain local representation on SSRAA board (currently Dennis Nickerson)	0.00%	0
Conduct Household Harvest Surveys to determine amount necessary for subsistence and to document harvest and use patterns	0.00%	0
Conduct a Klawock traditional ecological knowldge study on sockeye salmon harvest methods to determine how they have changed over time	0.00%	0
Establish local Klawock Watershed Committee and/or watershed council and continue stakeholder meetings	0.00%	0
Engage and educate Klawock school kids on Klawock Watershed issues and management	0.00%	0
Educate subsistence users on value of accurate harvest reporting and work to improve harvest reporting	0.00%	0
Provide community outreach/education on the value of having a fish weir and continuing to operate one	0.00%	0
Identify coho concerns in Klawock Watershed	6.25%	1
Implement a Klawock River Fishing Day to help "get the trout out" and reduce predation on sockeye fry	0.00%	0
Form a local committee to address enhancement goals, benefits, and risks	12.50%	2
Conduct a feasibility study of non-POW hatchery sockeye enhancement opportunities/methods	0.00%	0
Establish long term POW hatchery production and release of sockeye salmon	12.50%	2
Evaluate what is limiting sockeye production in Klawock Lake before enhancement	0.00%	0
Continue to count sockeye at the Klawock weir	0.00%	0
Conduct sockeye salmon genetic sampling in the commercial fishery	0.00%	0
Change subsistence fishing regulations, such as extending the fishing season	0.00%	0
Develop a Klawock sockeye salmon management plan that includes target levels of fish to return to the lake	0.00%	0

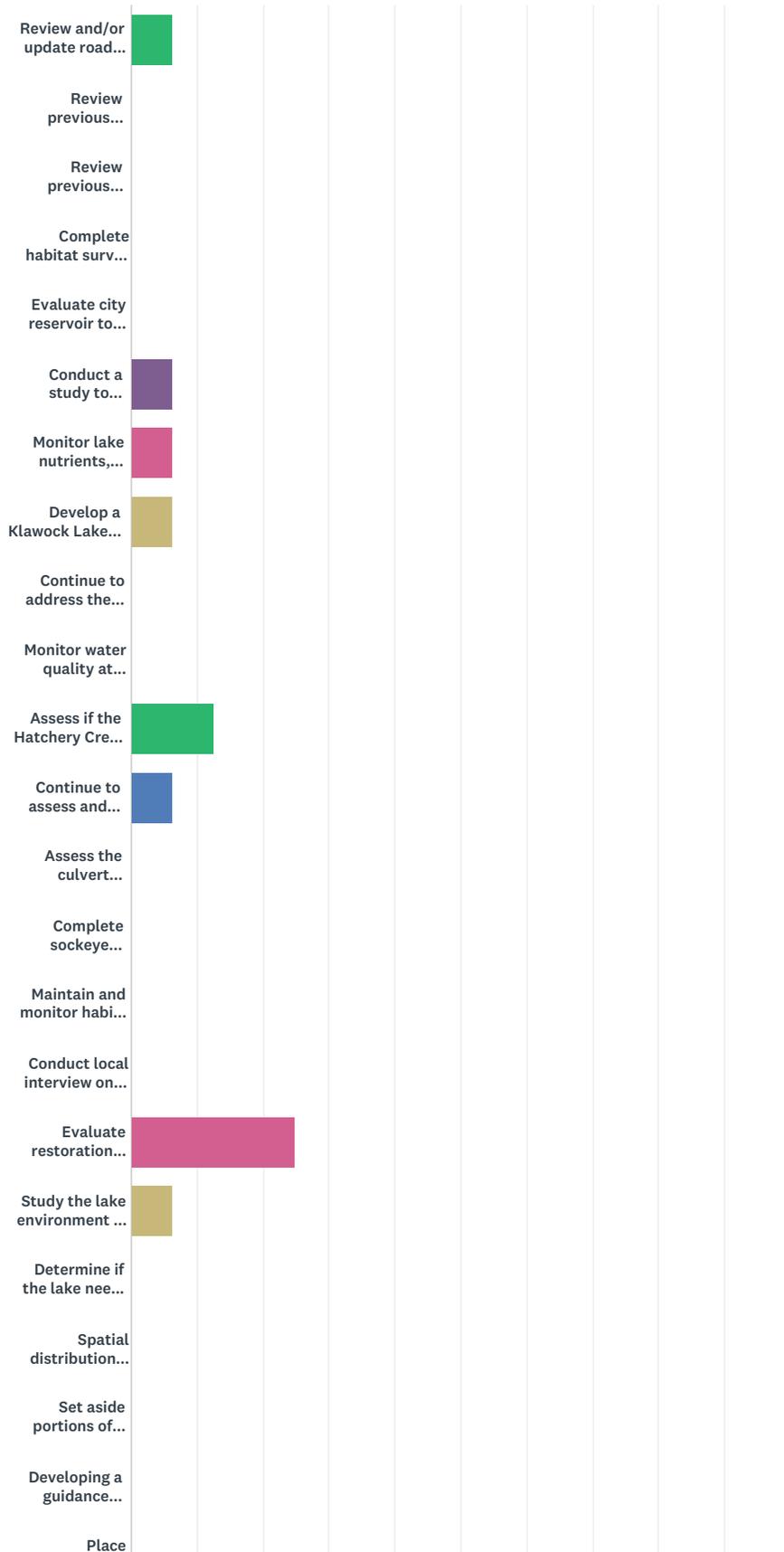
Klawock Lake Sockeye Salmon Community Perspectives

Implement a voluntary closure system on subsistence harvest when sockeye returns are low	0.00%	0
Count adult spawners into each tributary, and count fry coming out of each tributary	0.00%	0
Validate weir counts using alternative weir structures or mark-recapture studies	0.00%	0
TOTAL		16

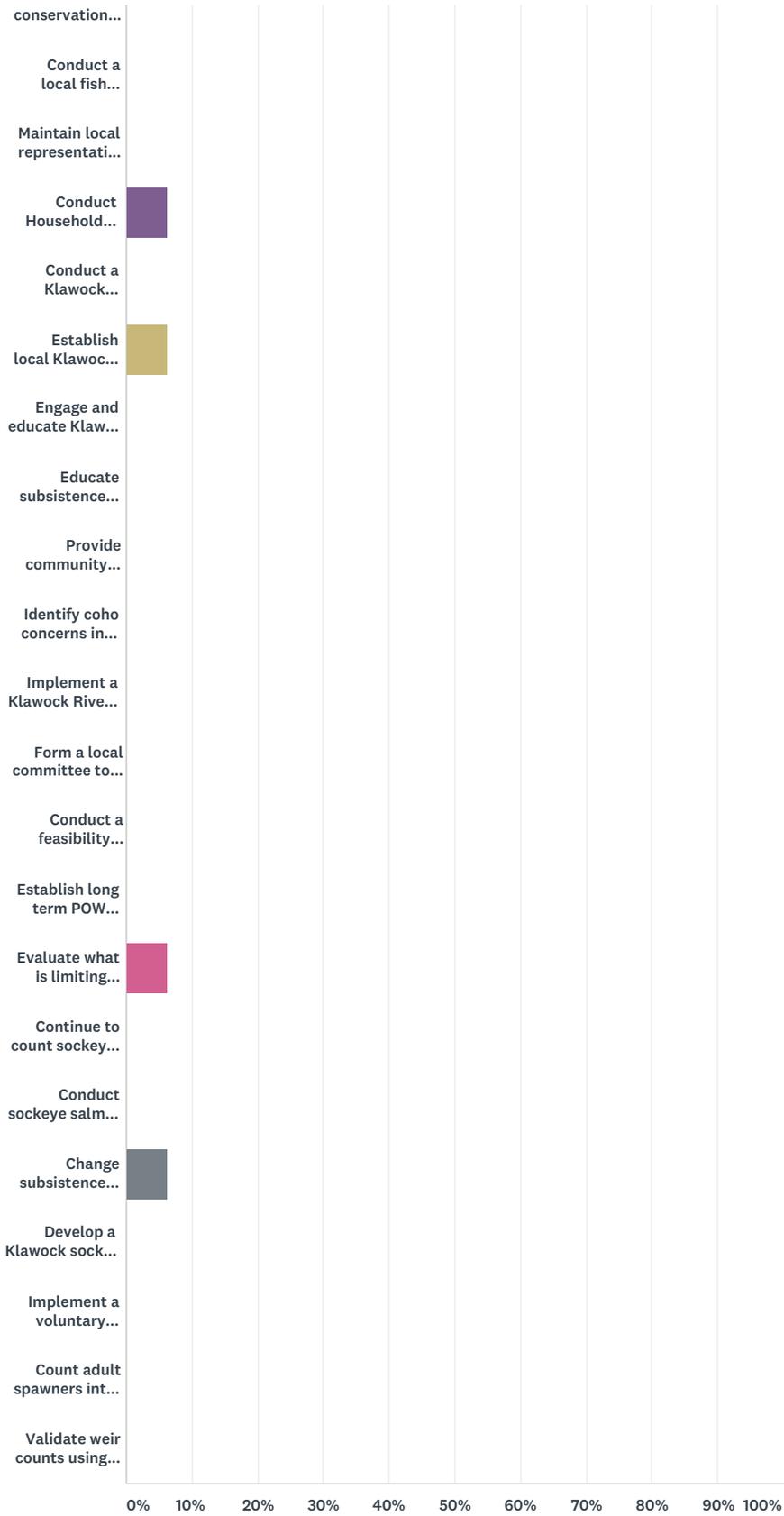
Klawock Lake Sockeye Salmon Community Perspectives

Q50 Please select the five projects that you support the most.

Answered: 16 Skipped: 12



Klawock Lake Sockeye Salmon Community Perspectives



ANSWER CHOICES

- Review and/or update road condition surveys, on logging roads adjacent to spawning streams to assure fish passage
- Review previous landslide stabilization work to assure less erosion from the upper creeks

RESPONSES

6.25%	1
0.00%	0

Klawock Lake Sockeye Salmon Community Perspectives

Review previous habitat thinning projects to assure they were complete, and implement additional riparian thinning projects to improve fish and wildlife habitat	0.00%	0
Complete habitat surveys on spawning creeks that were not recently done (i.e. in Halfmile, in Hatchery, in unnamed tributaries, and on lakeshore)	0.00%	0
Evaluate city reservoir to determine if there can be a sediment reintroduction into Halfmile Creek for fish habitat	0.00%	0
Conduct a study to determine sockeye production (how many sockeye salmon are leaving the lake)	6.25%	1
Monitor lake nutrients, which provide food resources for sockeye salmon	6.25%	1
Develop a Klawock Lake Watershed Beaver Management Plan that addresses when and where to pull beaver dams for fish passage	6.25%	1
Continue to address the Klawock Hollis Highway fish passage issue from culverts at Threemile Creek	0.00%	0
Monitor water quality at Viking Lumber (estuary for Klawock River)	0.00%	0
Assess if the Hatchery Creek beaver dam removal was successful in providing fish habitat	12.50%	2
Continue to assess and address predation on sockeye salmon fry in Klawock Lake	6.25%	1
Assess the culvert crossing at Halfmile Creek and the Klawock Hollis Highway, to see if it can improve fish passage	0.00%	0
Complete sockeye spawning surveys in Hatchery Creek to determine how many sockeye use the drainage for spawning	0.00%	0
Maintain and monitor habitat in Inlet Creek because it provides high value intact sockeye spawning habitat	0.00%	0
Conduct local interview on where sockeye salmon are spawning along the lakeshore and smaller tributaries	0.00%	0
Evaluate restoration efforts at sockeye spawning grounds and identify and prioritize new restoration projects	25.00%	4
Study the lake environment to determine the lake can support food resources for sockeye salmon.	6.25%	1
Determine if the lake needs to be fertilized in order to provide more food resources for sockeye salmon	0.00%	0
Spatial distribution of sockeye in the Klawock estuary	0.00%	0
Set aside portions of land in the Klawock Lake Watershed for carbon banking	0.00%	0
Developing a guidance document for land planners to assist minimizing impacts to sockeye populations and/or habitat	0.00%	0
Place conservation easements in Klawock Lake Watershed	0.00%	0
Conduct a local fish consumption study to determine the amount if fish eaten	0.00%	0
Maintain local representation on SSRAA board (currently Dennis Nickerson)	0.00%	0
Conduct Household Harvest Surveys to determine amount necessary for subsistence and to document harvest and use patterns	6.25%	1
Conduct a Klawock traditional ecological knowledge study on sockeye salmon harvest methods to determine how they have changed over time	0.00%	0
Establish local Klawock Watershed Committee and/or watershed council and continue stakeholder meetings	6.25%	1
Engage and educate Klawock school kids on Klawock Watershed issues and management	0.00%	0
Educate subsistence users on value of accurate harvest reporting and work to improve harvest reporting	0.00%	0
Provide community outreach/education on the value of having a fish weir and continuing to operate one	0.00%	0
Identify coho concerns in Klawock Watershed	0.00%	0
Implement a Klawock River Fishing Day to help "get the trout out" and reduce predation on sockeye fry	0.00%	0
Form a local committee to address enhancement goals, benefits, and risks	0.00%	0
Conduct a feasibility study of non-POW hatchery sockeye enhancement opportunities/methods	0.00%	0
Establish long term POW hatchery production and release of sockeye salmon	0.00%	0
Evaluate what is limiting sockeye production in Klawock Lake before enhancement	6.25%	1
Continue to count sockeye at the Klawock weir	0.00%	0
Conduct sockeye salmon genetic sampling in the commercial fishery	0.00%	0
Change subsistence fishing regulations, such as extending the fishing season	6.25%	1
Develop a Klawock sockeye salmon management plan that includes target levels of fish to return to the lake	0.00%	0

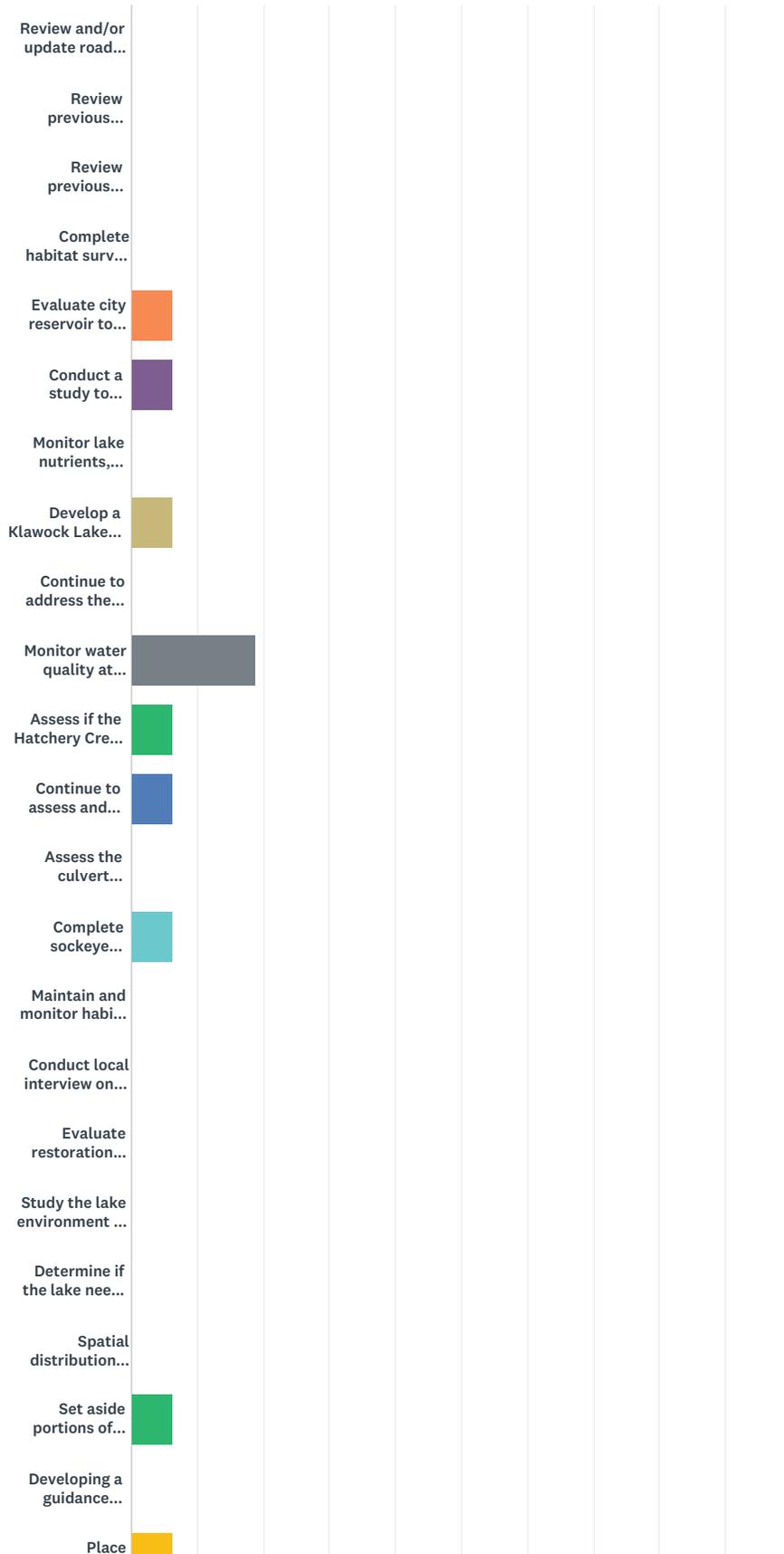
Klawock Lake Sockeye Salmon Community Perspectives

Implement a voluntary closure system on subsistence harvest when sockeye returns are low	0.00%	0
Count adult spawners into each tributary, and count fry coming out of each tributary	0.00%	0
Validate weir counts using alternative weir structures or mark-recapture studies	0.00%	0
TOTAL		16

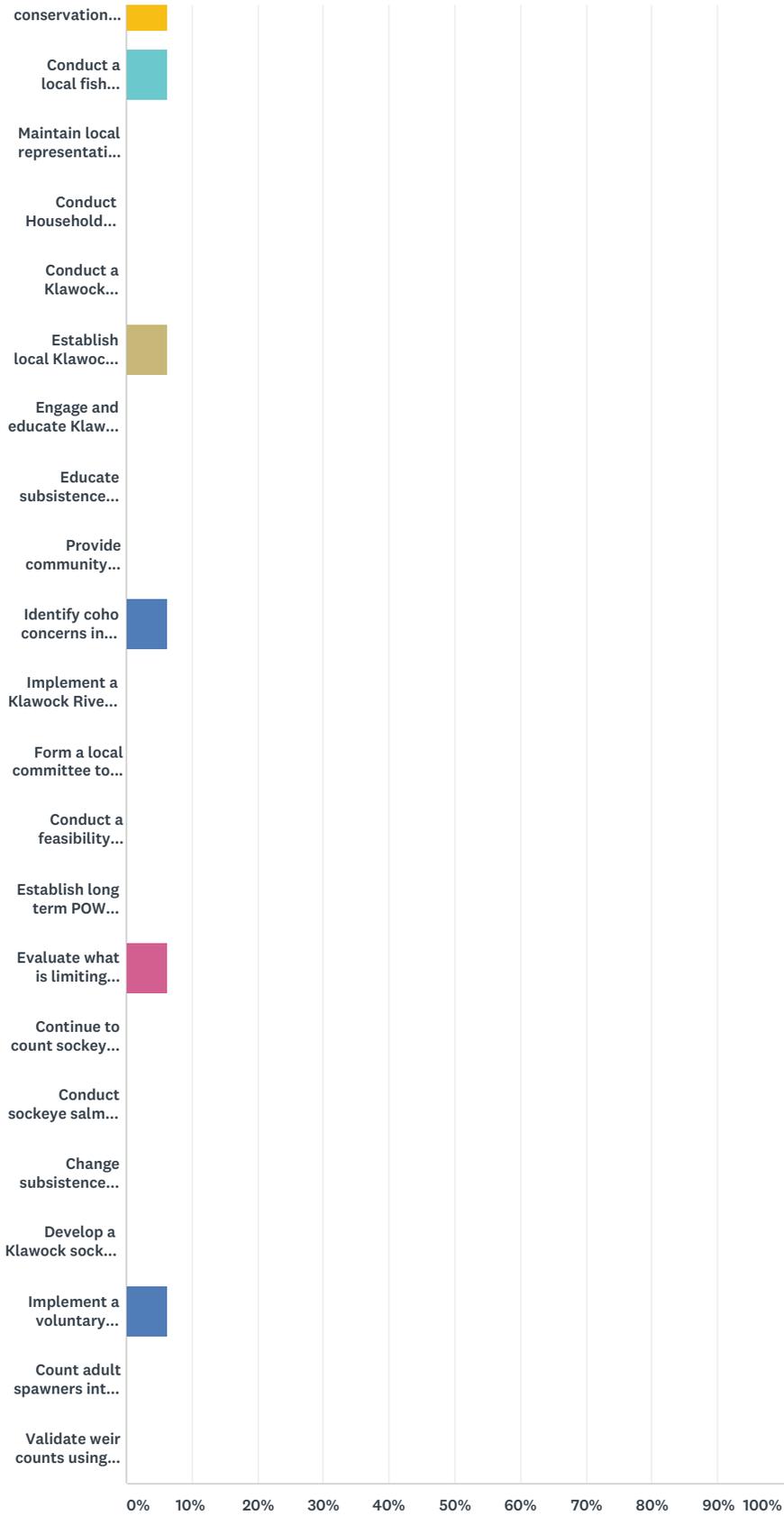
Klawock Lake Sockeye Salmon Community Perspectives

Q51 Please select the five projects that you support the most.

Answered: 16 Skipped: 12



Klawock Lake Sockeye Salmon Community Perspectives



ANSWER CHOICES

- Review and/or update road condition surveys, on logging roads adjacent to spawning streams to assure fish passage
- Review previous landslide stabilization work to assure less erosion from the upper creeks

RESPONSES

0.00%	0
0.00%	0

Klawock Lake Sockeye Salmon Community Perspectives

Review previous habitat thinning projects to assure they were complete, and implement additional riparian thinning projects to improve fish and wildlife habitat	0.00%	0
Complete habitat surveys on spawning creeks that were not recently done (i.e. in Halfmile, in Hatchery, in unnamed tributaries, and on lakeshore)	0.00%	0
Evaluate city reservoir to determine if there can be a sediment reintroduction into Halfmile Creek for fish habitat	6.25%	1
Conduct a study to determine sockeye production (how many sockeye salmon are leaving the lake)	6.25%	1
Monitor lake nutrients, which provide food resources for sockeye salmon	0.00%	0
Develop a Klawock Lake Watershed Beaver Management Plan that addresses when and where to pull beaver dams for fish passage	6.25%	1
Continue to address the Klawock Hollis Highway fish passage issue from culverts at Threemile Creek	0.00%	0
Monitor water quality at Viking Lumber (estuary for Klawock River)	18.75%	3
Assess if the Hatchery Creek beaver dam removal was successful in providing fish habitat	6.25%	1
Continue to assess and address predation on sockeye salmon fry in Klawock Lake	6.25%	1
Assess the culvert crossing at Halfmile Creek and the Klawock Hollis Highway, to see if it can improve fish passage	0.00%	0
Complete sockeye spawning surveys in Hatchery Creek to determine how many sockeye use the drainage for spawning	6.25%	1
Maintain and monitor habitat in Inlet Creek because it provides high value intact sockeye spawning habitat	0.00%	0
Conduct local interview on where sockeye salmon are spawning along the lakeshore and smaller tributaries	0.00%	0
Evaluate restoration efforts at sockeye spawning grounds and identify and prioritize new restoration projects	0.00%	0
Study the lake environment to determine the lake can support food resources for sockeye salmon.	0.00%	0
Determine if the lake needs to be fertilized in order to provide more food resources for sockeye salmon	0.00%	0
Spatial distribution of sockeye in the Klawock estuary	0.00%	0
Set aside portions of land in the Klawock Lake Watershed for carbon banking	6.25%	1
Developing a guidance document for land planners to assist minimizing impacts to sockeye populations and/or habitat	0.00%	0
Place conservation easements in Klawock Lake Watershed	6.25%	1
Conduct a local fish consumption study to determine the amount if fish eaten	6.25%	1
Maintain local representation on SSRAA board (currently Dennis Nickerson)	0.00%	0
Conduct Household Harvest Surveys to determine amount necessary for subsistence and to document harvest and use patterns	0.00%	0
Conduct a Klawock traditional ecological knowldge study on sockeye salmon harvest methods to determine how they have changed over time	0.00%	0
Establish local Klawock Watershed Committee and/or watershed council and continue stakeholder meetings	6.25%	1
Engage and educate Klawock school kids on Klawock Watershed issues and management	0.00%	0
Educate subsistence users on value of accurate harvest reporting and work to improve harvest reporting	0.00%	0
Provide community outreach/education on the value of having a fish weir and continuing to operate one	0.00%	0
Identify coho concerns in Klawock Watershed	6.25%	1
Implement a Klawock River Fishing Day to help "get the trout out" and reduce predation on sockeye fry	0.00%	0
Form a local committee to address enhancement goals, benefits, and risks	0.00%	0
Conduct a feasibility study of non-POW hatchery sockeye enhancement opportunities/methods	0.00%	0
Establish long term POW hatchery production and release of sockeye salmon	0.00%	0
Evaluate what is limiting sockeye production in Klawock Lake before enhancement	6.25%	1
Continue to count sockeye at the Klawock weir	0.00%	0
Conduct sockeye salmon genetic sampling in the commercial fishery	0.00%	0
Change subsistence fishing regulations, such as extending the fishing season	0.00%	0
Develop a Klawock sockeye salmon management plan that includes target levels of fish to return to the lake	0.00%	0

Klawock Lake Sockeye Salmon Community Perspectives

Implement a voluntary closure system on subsistence harvest when sockeye returns are low	6.25%	1
Count adult spawners into each tributary, and count fry coming out of each tributary	0.00%	0
Validate weir counts using alternative weir structures or mark-recapture studies	0.00%	0
TOTAL		16

Klawock Lake Sockeye Salmon Community Perspectives

Q52 Please provide us with feedback and possible projects that were not listed.

Answered: 2 Skipped: 26

ANSWER CHOICES	RESPONSES	
Feedback/Projects	100.00%	2

#	FEEDBACK/PROJECTS	DATE
1	Tribal community gardens on Heenya Land, work with Klawock Tribe and City.	1/28/2019 4:53 PM
2	Begin a "Sockeye Day", utilizing TEK to educate our youth and residents on harvesting and ways to preserve our "catch" for the upcoming winter.	1/28/2019 9:43 AM
#	FEEDBACK/PROJECTS	DATE
1	Evacuation building when there is a tsunami or disaster on upper Heenya Land, with garden, clinic, seed bank, etc., work Klawock Tribe and City.	1/28/2019 4:53 PM
2	Develop a curriculum for our students. Science classes can have field based education included.	1/28/2019 9:43 AM
#	FEEDBACK/PROJECTS	DATE
1	Monitor Erosion on Klawock River.	1/28/2019 4:53 PM
2	If a sockeye program doesn't start at the Klawock River Hatchery, Douglas Island Pink & Chum (DIPAC) can assist with "drops" in the Klawock Lake.	1/28/2019 9:43 AM
#	FEEDBACK/PROJECTS	DATE
1	Protection of Historical Sites on Tribal and Heenya Land, do not start tourism.	1/28/2019 4:53 PM
2	Consider cleaning the waterfront along the City of Klawock. Marine debris is in many locations.	1/28/2019 9:43 AM
#	FEEDBACK/PROJECTS	DATE
1	Work with State see if they will work with tribe and corporation on Klawock River Sockeye Salmon Management.	1/28/2019 4:53 PM
2	Create an interpretive trail that follows the "John Darrow Trail". This can create awareness.	1/28/2019 9:43 AM

This page intentionally left blank

APPENDIX F
Summary of Threemile Creek Field Investigation

This page intentionally left blank



Threemile Creek Restoration Opportunities

Klawock Lake Watershed

October 2019

For:

Klawock Sockeye Salmon Stakeholder Group

By:

Southeast Alaska Watershed Coalition: John Hudson, Rob Cadmus, and Rebecca Bellmore
and
The Nature Conservancy: Conor Reynolds.

Summary of Recommendations:

- Replace the Klawock-Hollis Highway culverts with a bridge, as these culverts are a fish passage barrier. This action should be coupled with actions to reduce flooding risk for nearby homeowners.
- Reactivate as much of the historic alluvial fan as possible by breaching Road 5028000 in numerous locations and removing the small manmade dike on the southernmost stream channel within the currently active portion of the alluvial fan. Reactivating this southernmost channel (located just north of the Klawock Lake Subdivision, 150m downstream of the Klawock-Hollis Highway, river left) should be coupled with replacing the Klawock-Hollis Highway culverts and actions to reduce flooding risk for nearby homeowners.
- We do not suggest in-stream restoration of Threemile Creek via large wood placement upstream of the Klawock-Hollis Highway at this time. Access to the area is logistically challenging, there are existing large trees in the riparian zone that could eventually fall into the stream, and a sediment slug may be moving downstream potentially affecting vertical and horizontal channel stability. Moreover, fish habitat in Threemile Creek, both above and below the Klawock-Hollis Highway crossing, generally appears to be in good condition.
- Immediately downstream of the Klawock-Hollis Highway, illegal removal of instream large woody debris has caused channel incision, resulting in downstream sediment aggradation, tree death, and channel evulsion. This issue should be addressed. Any instream restoration work in this reach should be coupled with addressing the undersized Klawock-Hollis Highway culverts, reactivating the floodplain where possible, and addressing flooding risk for nearby landowners.
- In channels lower in the alluvial fan, because the density of key pieces of wood generally appears to be adequate (although variable from reach to reach), and because the channels are likely actively responding to sediment deposition and lateral confinement following construction of the highway and neighborhood, we do not suggest in-stream wood placement. However, because many of the key pieces of wood appear to be old and are decaying, and the rate of

large wood recruitment from the riparian zone is not expected to balance decay, we recommend assessing whether actions can be taken to promote accelerated growth of conifers in the riparian zone and monitoring the density and condition of key pieces of wood periodically through the coming decades.

- We do not suggest any riparian silvicultural treatments in the near-term upstream of the Klawock-Hollis Highway, as an unharvested buffer that could serve as a source of future large woody debris is relatively intact along the stream. The new-growth forest adjacent to the buffer was thinned in 2010. However, downstream of the crossing, a small-scale riparian treatment is advised in a 23.6-acre stand adjacent to the alluvial fan, with the goal of maintaining or increasing growth rates of young growth in the riparian zone, improving riparian and upland wildlife habitat by increasing understory forage abundance, and providing wood to build instream structures to improve aquatic habitat. The latter goals will be achieved by thinning to increase light available to understory forage plant species.
- Conduct hand-tool scale instream restoration on a small tributary to lower Threemile Creek. The goal of the project is to restore natural channel functions and fish habitat altered by past logging activity. The stream provides habitat for coastal cutthroat trout, Dolly Varden char, coho and sockeye salmon.
- Beaver management is a low priority for restoration of sockeye salmon, and we do not recommend active management of beaver populations (*See Appendix 1*).

Introduction:

Sockeye salmon from Klawock Lake have been important to the livelihood and culture of the people of Klawock, Craig, and Prince of Wales Island for millennia. It is evident that abundance over the last two decades is significantly less than historical values, and this has been a concern of local residents for some time. Because of these declines, there have been numerous actions in the last two decades to attempt to address declines. In 2016, The Nature Conservancy (TNC) released the Klawock Lake Retrospective Analysis ([linked here](#)), a compilation of the information regarding the many research, management, assessment, and watershed restoration projects that concern Klawock Lake sockeye salmon. In 2017, TNC partnered with the Klawock Cooperative Association (KCA), the Southeast Alaska Fish Habitat Partnership, and many others to host the Klawock Lake Sockeye Salmon Stakeholders Meeting, a forum that allowed resource professionals and community members to interact and exchange information and concerns about the current status of sockeye salmon in this watershed.

At the November 2017 Klawock Lake Sockeye Salmon Stakeholder's meeting, a Habitat Sub-committee was created. This subcommittee made recommendations to determine if restoration of instream spawning and rearing habitat for sockeye salmon is necessary in the Klawock Lake watershed, with a focus on the Threemile Creek drainage. Recommendations from the sub-committee included:

- Review past restoration projects conducted in the Threemile Creek sub-watershed and determine effectiveness.
- Determine if the Klawock-Hollis Highway culverts should be replaced.
- Determine if instream habitat restoration or other restoration opportunities would be beneficial to sockeye salmon.

As part of the Habitat Subcommittee, the Southeast Alaska Watershed Coalition (SAWC) and TNC, along with assistance from the KCA, US Forest Service, and others, conducted a desktop and field review of the Threemile Creek sub-watershed. The Threemile Creek sub-watershed is focused on here because this stream has been heavily impacted and was historically one of the most important spawning streams in the Klawock Lake Watershed. Our findings and recommendations are included here.

Review of Past Restoration Projects in the Threemile Creek Watershed

The US Forest Service and Central Council Tlingit and Haida Indian Tribes of Alaska conducted a watershed assessment in 2002 and The Klawock Watershed Council commissioned a Klawock Watershed Restoration Master Plan (Keta Engineering 2003), which was subsequently updated (Williams 2008). These documents made recommendations for restoration in the Threemile Creek Watershed. An exhaustive report documenting when and how these restoration projects were implemented was not produced, but the 2008 document noted that all proposed road closures had been carried out in the Threemile watershed and that landslides were seeded in 2005 and 2008. To review the success of these restoration projects SAWC and TNC conducted a partial assessment of the effectiveness of road closures, road erosion control, culvert removal projects, and landslide control measures.

Culvert removal, erosion control, and road closures: The Klawock Watershed Restoration Master Plan made numerous recommendations to upgrade or remove culverts and bridges and close roads in the Threemile Creek Watershed (See Figs. 3 and 4 in the Klawock Watershed Restoration Master Plan). These projects were meant to allow fish passage, enhance hydrologic conductivity of the alluvial fan,

and reduce erosion. We surveyed roads to assess if these projects were completed successfully, including:

- Road 5015000 (mile 0 to approximately 1.5); the road east of the Threemile mainstem, north of the Klawock-Hollis Highway that parallels the creek;
- Road 5032000 (mile 0 to approximately mile 2); the road west of the Threemile mainstem, north of the Klawock-Hollis Highway that parallels the creek;
- Road 5028000, 5030000, 5031000, 5031600, and 5026000; the roads in the alluvial fan south of the Klawock-Hollis Highway.

Aside from road 5026000 (Threemile Subdivision Road), we found that the roads had been successfully closed in-line with State Forest Practices Act standards. All culverts had been removed, and most roads are beginning to be overgrown with vegetation. At some sites where culverts had been removed, the grade from the old roadbed to the waterbody was steep, causing some limited erosion. We would generally recommend pulling the roadbed back further to produce a grade that is less erodible, but given the fact that roads are now closed, it is not practical or cost effective to intervene.

Road 5028000 parallels the north side of the Threemile mainstem south of the Klawock-Hollis highway crossing and has been breached in several locations, including one area where a side channel is passing through the roadbed (Fig. 1). FS Hydrologists Keegan Krantz and Helen Sladek and a SAWC Biologist visited this site during high flows in November of 2018, and this side channel was actively flowing. Despite the four existing breaches in this road, the roadbed is containing flow in several areas, including one location, marked on Figure 1 in yellow, which had ponded water. Additional breaches or full excavation of this road would allow the stream to access a larger portion of the alluvial fan in the future, partially compensating for the inaccessibility of the south portion of the fan due to the presence of the subdivision.

Full excavation of this road would require building temporary stream crossings and backhauling the material to a waste dump. For this reason, we suggest adding 6-8 breaches west of the active breach mentioned above. Waste material would be spread onto the remaining road bed, so backhauling would not be necessary. The excavator would lessen the grade of the existing road breaches and ford the breaches. Puncture material could be used if the ground is soft, but the construction of temporary stream crossings would not be necessary. Figure 2 (A&B) shows a photo and the design plan of a typical road breach. This breach was placed along an abandoned logging road in the Pat Creek alluvial fan near Wrangell to reconnect floodplain and allow natural channel migrations. We suggest that breach locations be chosen at the time of construction based on wetland vegetation, the presence of water or historic channels, or at regular intervals. All roadbed material would be removed at breaches to an elevation equal to or slightly below the surrounding grade. We estimate that this would be about 16-24 hours of work for a mid-sized excavator (Estimated at \$250 per hour plus mobilization costs). We estimate this action should cost around \$10,000-\$15,000. An ADF&G Fish Habitat Permit would be necessary. Aside from cost, the major negative consequence of this action is that all re-growth along the road would be removed (*See Figure 2 (c) for an example from Pat Creek*).

Three-mile Alluvial Fan

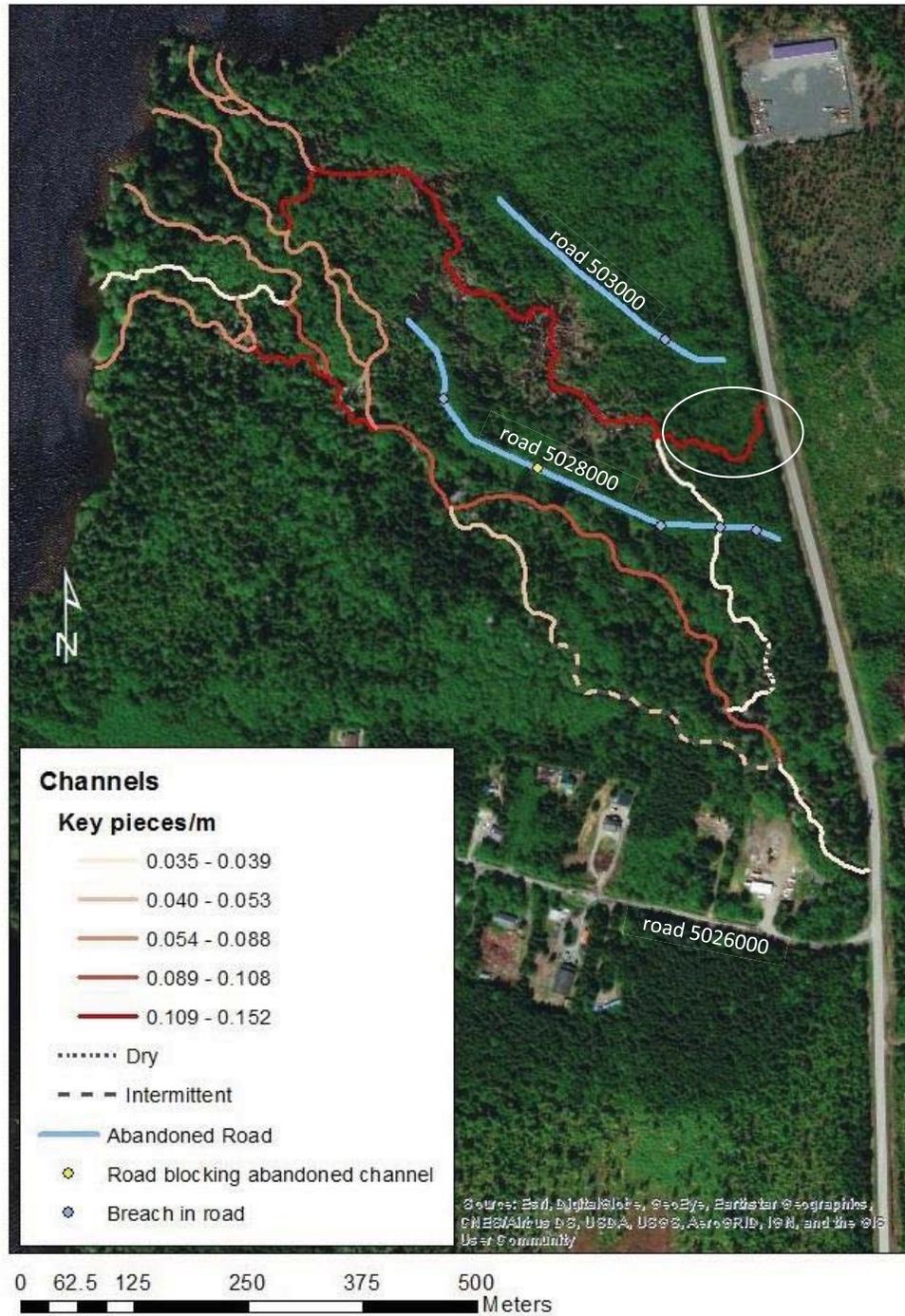
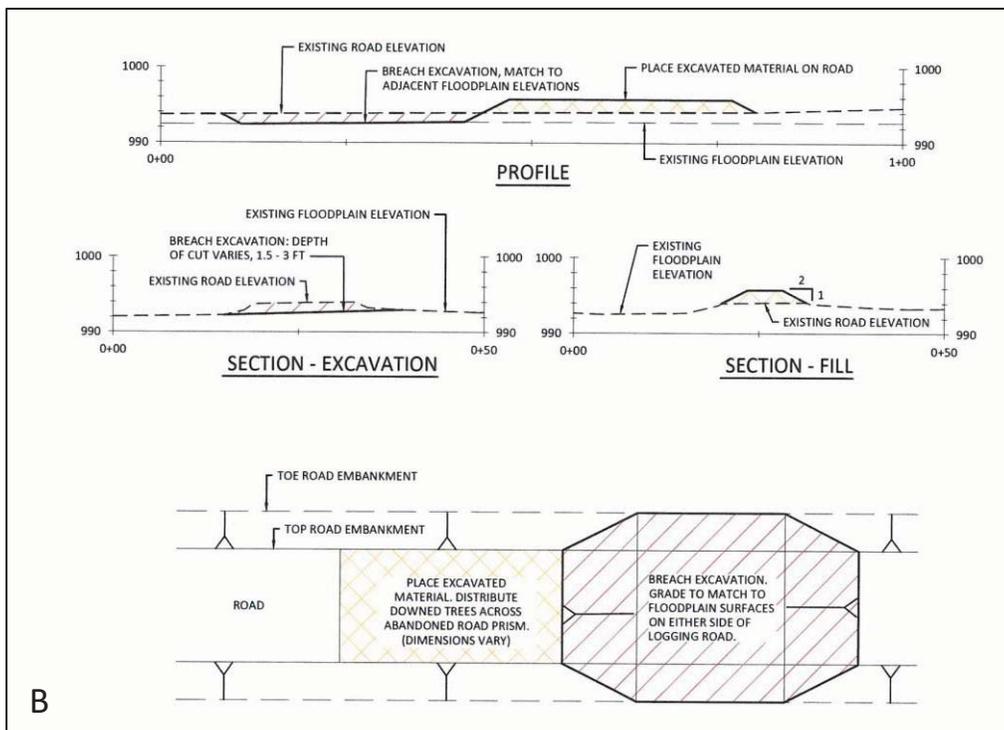


Figure 1. Active channels in the alluvial fan, density of key pieces of wood in different reaches, and abandoned (blue lines) and open roads. Note that the small northern tributary (in circle) flows through a culvert under the highway, but was only mapped downstream of the highway.

Figure 2. From the Pat Creek Fish Habitat Enhancement Project. (A) Example of a road breach excavated to the elevation of the surrounding grade on an alluvial fan. (B) Schematic of a typical road breach. (C) A logging road on an alluvial fan after removing alder trees to access breach sites.





Landslide and Erosion Control- Numerous landslides occurred in the Threemile basin post-logging and road construction. A notable storm in 1993 caused several landslides, and debris torrents scoured four small fish bearing streams to bedrock and subsequently deposited large quantities of sediment and debris into Threemile Creek (Figure 3, A). To reduce the risk of landslides, culverts were removed and waterbars were installed along roads subject to landslides. Broadcast seeding was done in at least three slide areas in 2005 and 2008 to attempt to stabilize slides.

During field surveys in August of 2018 and September 2019, several old and active landslides were visible from the Klawock-Hollis Highway and other vantage points in the watershed. Landslides associated with the 5032510 and 5032500 roads were visited. We found that all culverts had been removed from these roads, waterbars had been installed, and we saw no evidence of water flowing parallel to the road bed. There were some areas that had a small amount of ponded water on the roadbed. The road appears to have been built on a steep slope on top of highly erodible sand and small gravel (Figure 3, B). Several exposed sections of clay were also visible (Figure 3, C). Satellite imagery from 2003 and 2019 show that slides initiated directly adjacent to and on the 5035210 and 5032500 roads (Figure 3 D & E). While most older slides have regrown in alder, active debris gullies are still likely contributing some material into tributaries of Threemile Creek (Figures 3, F & G). We also inspected an older slide that crossed road 5025000, and noted that it likely contributed a limited amount of material into the stream. While walking Threemile Creek above the Klawock-Hollis Highway, a large sediment slug was noted approximately 920 meters upstream that may have been from a landslide (Fig. 4).

Logging and roadbuilding appears to have initiated landslides and elevated landslide risk. It is likely that landslide risk has been reduced since logging occurred, but it is unknown if landslide risk is still elevated above pre-logging conditions. Previous and future landslides may contribute additional sediment to the system. While this sediment certainly has an impact on the streams, we suggest naturally allowing the

streams to process and work through this material. As the roads are already decommissioned, it is impractical to do any additional larger scale road stabilization work. Also, we are hesitant to suggest additional earthworks that could cause temporary increases in landslide risk, as natural re-vegetation is likely stabilizing some of the old slides. We do suggest continued monitoring of landslides through satellite or aerial imagery, and we suggest that any instream restoration work consider the fact that some landslide deposited material is still likely working its way through the system.

Figure 3. A) Debris torrent in Threemile Creek Watershed from 1993 landslides (*taken from USFS 2002*). B) Sand and gravel underneath the 5032510 and 5032500 roads. C) Clay layer exposed in a slide along the 5032500 Road. E) 2003 satellite imagery showing slides initiating on or near 5032510 and 5032500 Roads. F) 2019 satellite imagery showing active debris gullies with some alder regrowth.

A.



B.



C.



D.



E.







Figure 4. (A) A large sediment slug in Threemile Creek approximately 920 meters upstream of the Klawock-Hollis highway. It was unclear if the sediment was the result of a landslide. (B) The channel is shifting laterally as it processes the sediment. Here, it has moved into a previously dry area where alders grew.

Klawock-Hollis Highway Crossing of Threemile Creek

We recommend replacing the two culverts at the Klawock-Hollis Highway crossing of Threemile Creek to allow for fish passage (Fig. 5, A). Needham *et al.* (2018) surveyed this double culvert crossing and classified it as “red,” because it provides inadequate passage for juvenile fish based on criteria set by Eisenmen and O’Doherty (2014). Further, this crossing is listed as “red” by the Alaska Department of Fish and Game for outfall height and culvert gradient (ADF&G 2017).

A Tier I habitat survey was conducted for approximately 2,000 m upstream of the Klawock-Hollis Highway crossing (Needham *et al.*, 2018). Based on comparisons of established metrics set by Tucker and Caouette (2008), there is at least 2.5 km of habitat for anadromous and resident fish upstream of this culvert (Needham *et al.*, 2018), and our observations during August 2018 confirm this finding and the presence of suitable fish habitat upstream of the culvert.

Immediately downstream of the Klawock-Hollis Highway crossing, bank armoring on river-left and removal of large woody debris has mobilized stored sediment, causing channel incision and decreased habitat complexity (Fig. 5, B). A sediment slug immediately downstream of these operations is likely linked to upstream wood removal and channel incision, resulting in sediment aggradation and associated tree death, as well as channel avulsion on river-right. Further, a side channel on the south side of the mainstem has been blocked by a constructed dike. These activities appear tied to homeowner-initiated flood control efforts in response to the effects of the undersized culverts at the Klawock-Hollis Highway and poor site selection for the Threemile subdivision. The undersized culverts were installed in a way that changed the alignment of stream, and during high water the flow in these culverts is very high and contributes to flooding risk (Fig. 5). Prior to the construction of the Klawock-Hollis Highway, the main channel of Threemile apparently flowed through this property and the Threemile Subdivision (See historic channel in Fig. 6.)

We recommend that the design for a new stream crossing be coupled with hydrologic and geotechnical analyses to determine if flooding risk for the adjacent landowner can be reduced sufficiently to allow for in-stream habitat restoration of the stream reach immediately downstream of the culvert, including reactivation of the side channel currently diked off.

Past efforts to replace this crossing were stalled because of high costs. The Klawock Cooperative Association has begun to investigate if tribal transportation dollars could help address this issue. We recommend that the Klawock Sockeye Stakeholders’ Habitat Subcommittee support this effort as necessary.

Figure 5. (A) Low flow through the double culvert at the Klawock-Hollis Highway crossing August, 2018. (B) Illegal cutting of large woody debris in the channel immediately downstream of the highway. (C) Downstream end of the sediment slug where sediment aggradation has caused channel avulsion and raised the water resulting in tree death.

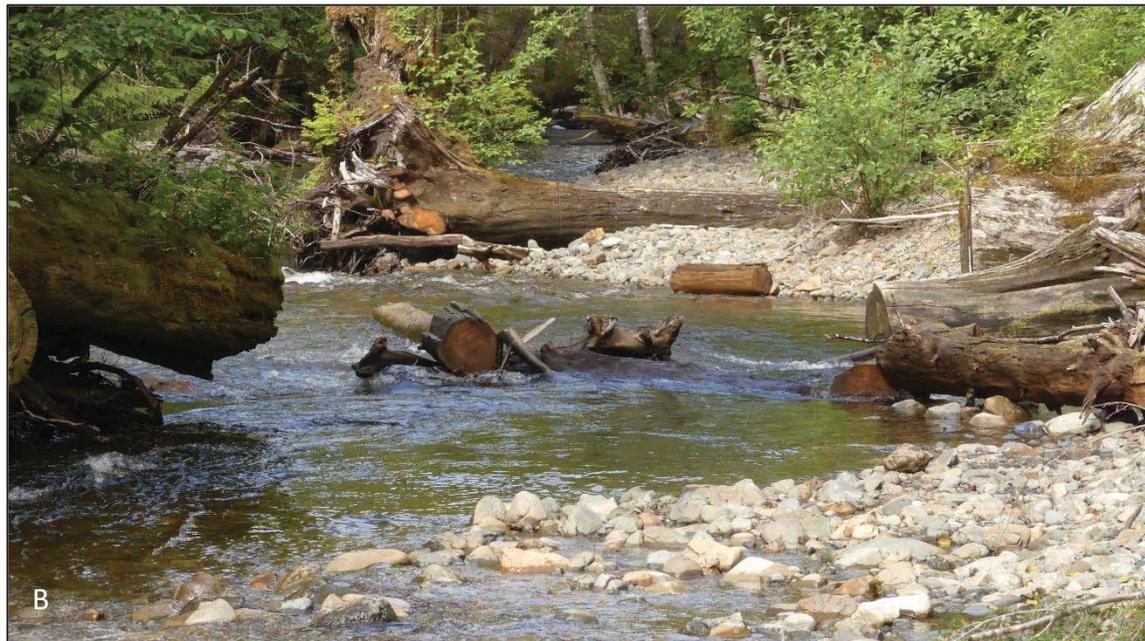






Figure 5. E) Culvert outlets at the Klawock-Hollis Highway during a flood in 2005. F) Flood waters on the property just downstream and to the south of the culverts. Photos courtesy of Mark Minnillo.

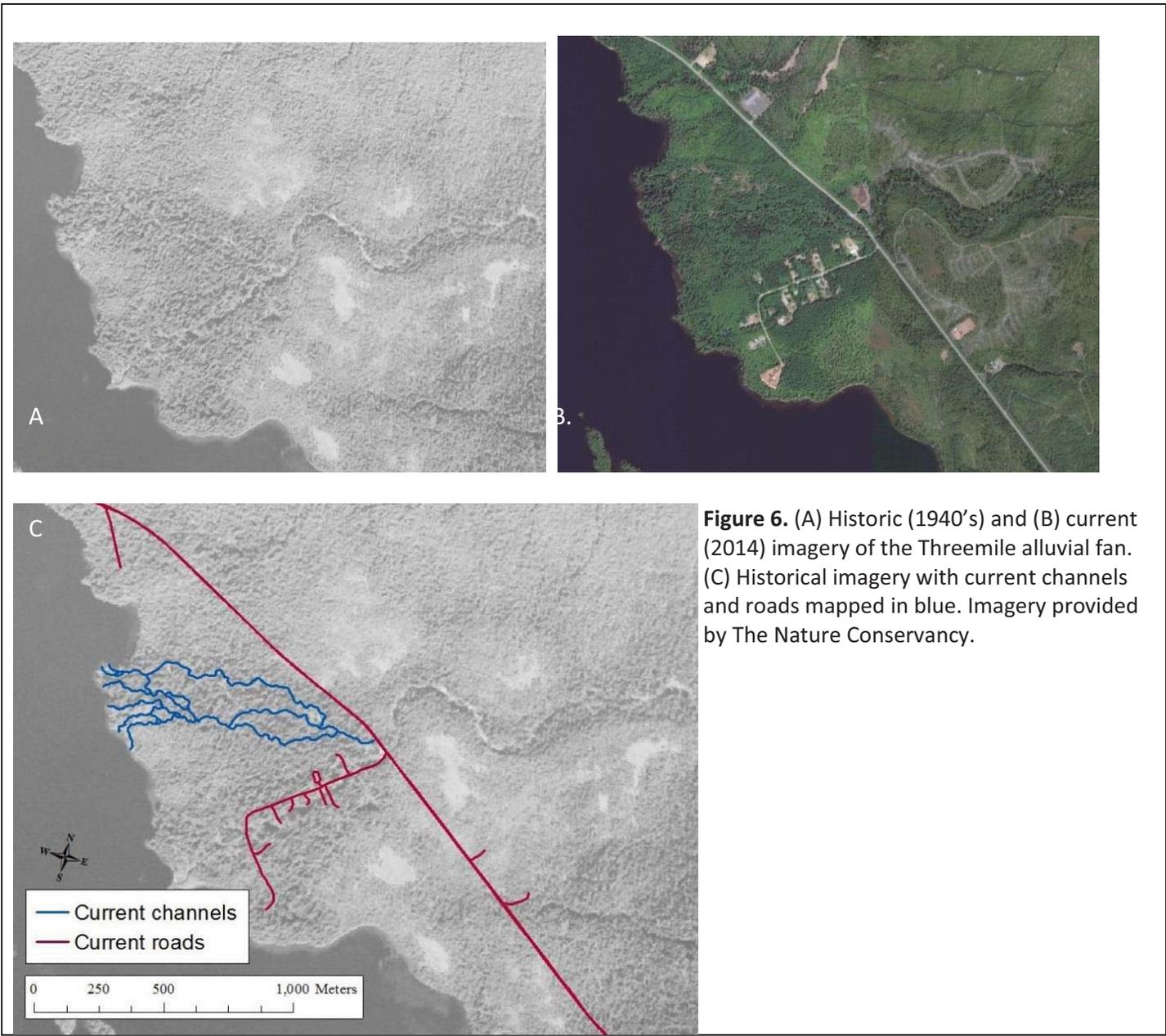


Figure 6. (A) Historic (1940's) and (B) current (2014) imagery of the Threemile alluvial fan. (C) Historical imagery with current channels and roads mapped in blue. Imagery provided by The Nature Conservancy.

Evaluation of In-stream Restoration Opportunity and Need

Large, stable pieces of wood in streams create important habitat diversity by promoting pool formation, channel migration and sediment storage/sorting and providing cover for fish. Various logging practices can alter the amount of wood in streams immediately and for decades to centuries in the future. For example, stream cleaning (removing logs from streams) results in an immediate decline in in-stream wood, while the practice of leaving narrow buffers of trees along stream banks can increase rates of wood recruitment in streams in the decades following logging by making those trees more susceptible to windthrow. Logging large trees in the riparian area that would have eventually fallen into the stream, replacing decaying wood, can result in a decline in key pieces of in-stream wood decades or centuries after logging until new trees have matured and begin falling into the stream.

Previous surveys of Threemile Creek indicated that in-stream restoration in the form of large woody debris placement might be appropriate in a few reaches (Needham *et al.*, 2018). These included a 300 m stream reach just downstream of the highway crossing, 400 m just upstream of the highway, and another 250 m reach about 1500 m upstream of the highway (reaches 1, 2, and 7 in Needham *et al.*, 2018), which all had stream conditions scores of 1.5 or lower due to low large wood and/or pool spacing scores. Stream Condition Scores are based on comparison to metrics in similar reaches in unmanaged watersheds in Southeast Alaska: Fair=1, Good=2, and Excellent=3.

Results upstream of the highway: Along with Forest Service hydrologists, Keegan Krantz and Helen Sladek, and fish biologist, Neal Schoenfelder, SAWC biologists walked Threemile Creek upstream of the highway through the areas that had previously been surveyed, focusing on in-stream wood abundance, distribution and condition, riparian condition, and any factors that might affect the appropriateness or feasibility of in-stream restoration. Except for a few short reaches, habitat in Threemile Creek upstream of the highway appears to be in fairly good condition. The upper reaches that could possibly benefit from large wood placement would be extremely difficult to access because the logging roads along both sides of the stream have been decommissioned and are impassible by vehicles, and because the slope from the road to the channel is very steep. Additionally, the riparian zone does not appear to have been heavily logged and many large standing trees remain, so wood recruitment should continue in the coming decades. The reach just upstream of the highway could possibly benefit from large wood placement, but a large debris dam just upstream of this reach and a sediment slug is located approximately 920 meters upstream of the highway crossing that appears to be working its way downstream (Fig. 2.), and it is possible that any in-stream work may be undermined as the sediment moves downstream and the channel adjusts.

Results downstream of the highway: To better understand existing stream habitat quality and quantity, the SAWC field crew mapped the active channels in the alluvial fan and marked the locations of key pieces of wood (>0.3 m diameter, >7.6 m length) that were within the bankful width (zones 1 and 2 in Tier II) (Fig. 1). The number of key pieces of wood per meter averaged 0.09, and ranged from 0.04 to 0.15 across reaches, with the lowest value observed just downstream of the culvert where large wood is being removed from the stream, and the highest in the northern-most channel, which flowed through very dense young-growth riparian forest (Fig. 1). Because of the variability within and among alluvial

fans, no habitat condition scores related to wood have been developed for alluvial fans in southeast Alaska (E. Tucker, personal communication), so there are no “reference” conditions to compare with the data. Of channel types with reference condition statistics, the mainstem in the alluvial fan is most similar to small floodplains, based on channel width and slope. The observed values for key pieces per meter are on the low end of those reported for unmanaged small floodplains (25th percentile is 0.1, median is 0.25 key pieces per meter) (Kelliher 2010). Additionally, most of the key pieces are old and degrading, suggesting that the habitat, with respect to large wood, may be on a downward trajectory. Channel instability in alluvial fans represents an additional risk to any in-stream restoration work. Based on historical aerial imagery, a main channel crossed what is now the highway at a different location than the current culvert and flowed through the area with the housing development (Fig. 5), so the current channels may be carrying more water and sediment than historically and may still be responding to these changes.

We suggest that large woody debris introductions should be considered for the section of the mainstem of Threemile Creek immediately downstream of the Klawock-Hollis Highway culverts to replace the wood that has been removed. This instream restoration is only feasible if the design for a new stream crossing for the Klawock-Hollis Highway is coupled with hydrologic and geotechnical analyses to determine if flooding risk for the adjacent landowner can be reduced sufficiently to allow for in-stream habitat restoration. Further, we recommend assessing the riparian areas to determine whether or not actions can be taken to promote the growth of large conifers (e.g. thinning). Because most of the existing large wood in Threemile Creek is old and degrading, we suggest periodically assessing in-stream wood over the coming decades and revisiting the option of adding wood in the future. Table 1. outlines a basic monitoring protocol to help determine when and if introduction of large wood would be beneficial.

Table 1. Outline of Monitoring Protocol for Large Woody Debris in Threemile Creek Alluvial Fan.

Purpose: To determine when and if introduction of large wood would be beneficial for sockeye salmon habitat in the Threemile Creek alluvial fan.

Timeframe: Initial survey was conducted in 2018. Next survey should occur 2025 or earlier and every 5-10 years thereafter.

Scope of Work: Map active and inactive channels in the Threemile alluvial fan downstream of the Klawock-Hollis Highway Culvert and compare to channels mapped in Figure 1. This can be done by simply walking all channels with a GPS on "Track."

Mark locations of key pieces of wood (>0.3 m diameter and >7.6 m length) that are within the bankfull width of the stream channels. This can be done while mapping the stream channels by simply creating a GPS Waypoint for every key piece.

Compare tracks and key pieces of wood per meter to previous surveys and the values for unmanaged small floodplain channels outlined by Kelliher, 2010 (*25th percentile is 0.1, median is 0.25 key pieces per meter*).

When to take action? If the average values for key pieces per meter drops below .05, consult with experts on the potential to enhance habitat by adding large woody debris.

Three-mile Creek Tributary Restoration

In August 2018, SAWC staff visited and mapped the lower reach of a tributary to Threemile Creek to look for restoration opportunities (Fig. 1). SAWC staff returned to the site in April 2019 to gather additional information. The second-order stream begins on a hillside north of the Klawock-Hollis highway and passes under the highway through a culvert about 1,600 ft. northwest of the Threemile Creek culverts. Downstream of the culvert, the stream flows about 450 ft. through an old clearcut before entering a distributary channel on the north side of the Threemile Creek alluvial fan/delta. The anadromous stream is used by sockeye and coho salmon, Dolly Varden char, and coastal cutthroat trout. A portion of the channel upstream of the highway is also designated anadromous and arises in both old-growth and new-growth forest. This upstream reach, which was not visited by SAWC, does not appear to be accurately mapped on the ADFG Anadromous Waters Catalog mapper.



Figure 7. An abandoned and failing beaver dam on a tributary to Threemile Creek near the west side of the alluvial fan. Stream flow is from left to right.

Logging and beaver activity have altered the stream channel and riparian zone (Figs. 7 & 8). In the downstream reach, riparian forest is dominated by dense stands of young Sitka spruce; red alder is also present but limited to the streambanks (Fig. 8). With the exception of mosses, most understory plants have died following closure of the new-growth forest canopy.



Figure 8. A section of formerly ponded channel about 70 feet downstream of the highway. View looking upstream.

The beaver dam, which is located about 200 feet downstream of the highway, is abandoned and has partially failed. Before the dam failed, sediments trapped behind the dam had completely filled the channel and portions of the floodplain. Following dam failure, the stream has begun to process and route the sediment downstream. Stream flow is alternately incising through this bedload in some areas and depositing sediment in other areas. Aggrading areas have become over-widened and often

contain mid-channel bars; frequent lateral channel shifts in aggrading reaches are eroding stream banks and exposing tree roots (Fig. 8). The abundance of large woody debris in the active channel appears to be low for a channel of this size. Downstream of the dam the channel generally has a normal appearance.

Instream and riparian restoration are recommended for this stream, both downstream and, if warranted, upstream of the highway. The goal of a restoration project would be to improve fish habitat quality and quantity and enhance plant species and structural diversity in the riparian zone, including promoting conifer growth. Large pieces of wood sourced from riparian spruce trees can be placed in the channel using hand tools (i.e. shovels, picks, winches). The large-wood structures will be located at specific sites to route excess sediment accumulations through the reach, restore natural channel dimensions, and create riffles and pools for fish habitat. Riparian trees could be thinned or pruned to



Figure 9. A large-wood structure constructed with hand tools in the Spaski Creek watershed on Hoonah Totem land on Chichagof Island. Photo by Ian Johnson.

improve understory light levels, enhance tree growth, and encourage greater plant species diversity. Appendix 2 provides the proposed prescriptions for thinning in the Threemile Creek alluvial Fan. Additional assessment work is necessary to better understand existing conditions so that specific restoration objectives and plans can be developed. A hand-tool instream restoration project in the lower reach of this channel would require a 4-person crew for 6 days. Total cost, including planning and permitting, is estimated at around \$15,000.

References

- Alaska Department of Fish and Game (ADF&G). 2017. Fish Passage Site 10103562. <http://www.adfg.alaska.gov/sf/reports/FishPassage/rptSite.cfm?site=10103562>
- Eisenman, M., and G. O’Doherty. 2014. [Culvert inventory and assessment manual for fish passage in the State of Alaska](#): A guide to the procedures and techniques used to inventory and assess stream crossings 2009-2014. Alaska Department of Fish and Game, Special Publication No. 14-08, Anchorage
- Keta Engineering. 2003. [Klawock Watershed Restoration Master Plan](#). Prepared for Klawock Watershed Council., Klawock, Alaska.
- Needham, C., R. Moyer, C. Woll, and M. Richards. 2018. [Klawock Lake Watershed Sockeye Spawning Habitat Assessment](#).
- Tucker, Emil and John Caouette. 2008. Statistical Analyses of Aquatic Habitat Variables in the Tongass National Forest. Unpublished report. U.S. Forest Service, Petersburg, Alaska.
- Williams, D.J. 2008. [Klawock Watershed Restoration Master Plan Update](#). Prepared for the Klawock Watershed Council, Klawock, Alaska.
- Central Council Tlingit and Haida Tribes of Alaska (CCTHTA), and US Forest Service (USFS). 2002. [Klawock Watershed Condition Assessment](#), Klawock, Alaska.

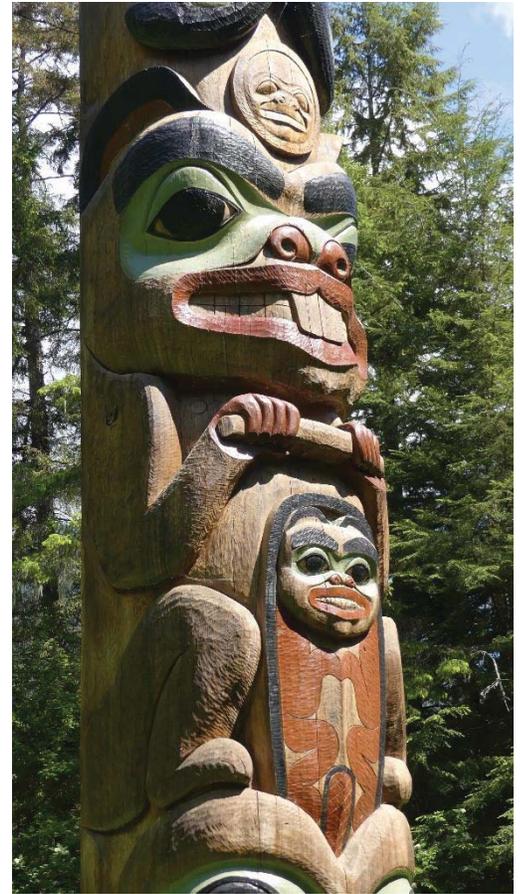
Appendix 1: Beavers and Salmon in the Klawock Lake Watershed

In the 19th Century, fur trading in North America drove beavers to near extinction. Since that time, populations have rebounded, experiencing exponential growth as beavers recolonize habitats throughout their historical distribution. As populations recover, beavers frequently come into conflict with humans, especially when their feeding and dam-building activities impact agriculture, transportation infrastructure, and residential areas. While many new techniques are available to reduce or prevent the adverse impacts of beavers, problem beavers are commonly trapped or relocated.

Despite these conflicts, beavers have long been considered a keystone species. A keystone species is a species that numerous other species depend on and whose presence in an ecosystem is necessary to maintain community structure. For example, beaver dams on small streams create ponds, an entirely different type of aquatic habitat used by waterfowl, fish, aquatic invertebrates, amphibians, and other mammals that would not otherwise inhabit the area (Collen and Gibson 2000, Pollock et al. 2004).

In recent years, a growing body of scientific evidence indicates that beavers often have positive impacts on salmon and trout populations. Compared to watersheds without beavers, beaver watersheds overall support a greater abundance of salmon (Pollock 2004) and fish experience higher survival rates and faster growth (Bouwes et al. 2016, Sigourney 2006). In contrast to the impounded stream reach, beaver ponds provide more food resources (McDowell and Naiman 1986), as well as more favorable temperatures for growth (Sigourney 2006) and a refuge from predators and high flows (Pollock et al. 2003). Beaver ponds also can improve habitat for salmon and trout by trapping sediment (Pollock et al. 2007) and increasing groundwater recharge (Westbrook et al. 2006). Not all fish species, life stages, or populations respond to the presence of beavers in the same way, and more research is necessary to better understand the full scope and scale of their impacts on fish. Nonetheless, beavers are being protected and reintroduced into their former habitats throughout their global distribution, not just to restore ecosystems, but also to reduce flood damage and water shortages related to climate change.

Beavers are common throughout the Klawock watershed, including in the Hatchery Creek and Threemile Creek watersheds, the two largest sockeye salmon streams entering Klawock Lake. Recent efforts to assess watershed health and identify habitat restoration opportunities have brought attention to beavers and their impacts on sockeye salmon habitat. There are concerns that beaver dams and ponds negatively impact sockeye salmon by blocking or impeding upstream migration and impounding stream reaches used for spawning. There is also concern that past logging has altered the forest composition to



Beaver forms are common on Tlingit totem poles.

favor deciduous trees, primarily red alder, which beavers appear to prefer over conifers as a food source. The exceptionally high alder component in the Klawock watershed, particularly in floodplain riparian areas occupied by beaver and salmon, may be sustaining unnaturally high numbers of beavers, with unknown consequences for sockeye, other fish, and wildlife species.



The remains of an abandoned beaver dam on Hatchery Creek that was partially removed to expose potential spawning habitat. View looking upstream.

Within the Klawock watershed, beavers are legally trapped and one inactive beaver dam has been removed from Hatchery Creek. The intent of the dam removal project was to restore easier access to over a mile of high-quality sockeye spawning habitat above the dam. In this case, beavers had built a dam on a channel spanning log that had been felled by humans. This dam

removal was predicated on concerns that sockeye spawning habitat throughout the watershed has been degraded by logging, roadbuilding, and

housing development, and exposing potential spawning habitat through dam removal could compensate for some of that loss.

Considering the current scientific evidence that beavers often enhance salmon and trout populations, watershed stakeholders and managers should use caution when considering beaver control and dam removal as a means of restoring sockeye populations. Keystone species like beaves exert a disproportionately large influence on natural processes and community structure within the ecosystems they inhabit, and spawning salmon are known to be adept at navigating beaver dams to access spawning areas. Without a full understanding of the distribution and ecological role of beavers in the Klawock watershed, beaver control measures could have unintended negative consequences for sockeye salmon, other species, and the hydrologic and physical environment. Further, beaver population control is time consuming and costly, and results are often only temporary. Managers should have clear long-term and short-term goals, targets, and endpoints before investing in beaver population control measures.

Before any targeted beaver population control measures or dam removals are attempted in the watershed to restore or maintain historical sockeye spawning habitat, it is recommended that the following steps are taken:

1. Document the location and size of beaver dams and ponds in the watershed
2. Determine the amount of known or potential salmon spawning habitat impacted by beaver ponds
3. Document fish species and life stages living in beaver ponds
4. Measure the influence of beaver ponds on water temperature and sediment transport/storage
5. Assess the potential for beaver dams to block or impede fish passage.

Literature cited

Bouwes, N., N. Weber, C. E. Jordan, W. C. Saunders, I. A. Tattam, C. Volk, J. M. Wheaton, and M. M. Pollock. 2016. Ecosystem experiment reveals benefits of natural and simulated beaver dams to a threatened population of steelhead (*Oncorhynchus mykiss*). *Scientific Reports* 6:28581.

Collen, P. and R. J. Gibson. 2000. The general ecology of beavers (*Castor* spp.), as related to their influence on stream ecosystems and riparian habitats, and the subsequent effects on fish - a review. *Reviews in Fish Biology and Fisheries* 10:439-461.

McDowell, D. M. and R. J. Naiman. 1986. Structure and function of a benthic invertebrate stream community as influenced by beaver (*Castor canadensis*). *Oecologia* 68(4): 481-489.

Pollock, M. M., M. Heim, and D. Werner. 2003. Hydrologic and geomorphic effects of beaver dams and their influence on fishes. Pages 213-233 in S. V. Gregory, K. Boyer, and A. Gurnell, editors. *The ecology and management of wood in world rivers*. American Fisheries Society, Bethesda, Maryland.

Pollock, M. M., G. R. Pess, T. J. Beechie and D. R. Montgomery. 2004. The Importance of Beaver Ponds to Coho Salmon Production in the Stillaguamish River Basin, Washington, USA. *North American Journal of Fisheries Management* 24:749–760.

Pollock, M. M., T. J. Beechie, and C. E. Jordan. 2007. Geomorphic changes upstream of beaver dams in Bridge Creek, an incised stream in the interior Columbia River basin. *Earth Surface Processes and Landforms* 32:1174-1185.

Sigourney, D. B., B. H. Letcher and R. A. Cunjak. 2006. Influence of Beaver Activity on Summer Growth and Condition of Age-2 Atlantic Salmon Parr. *Transactions of the North American Fisheries Society* 135: 1068-1075.

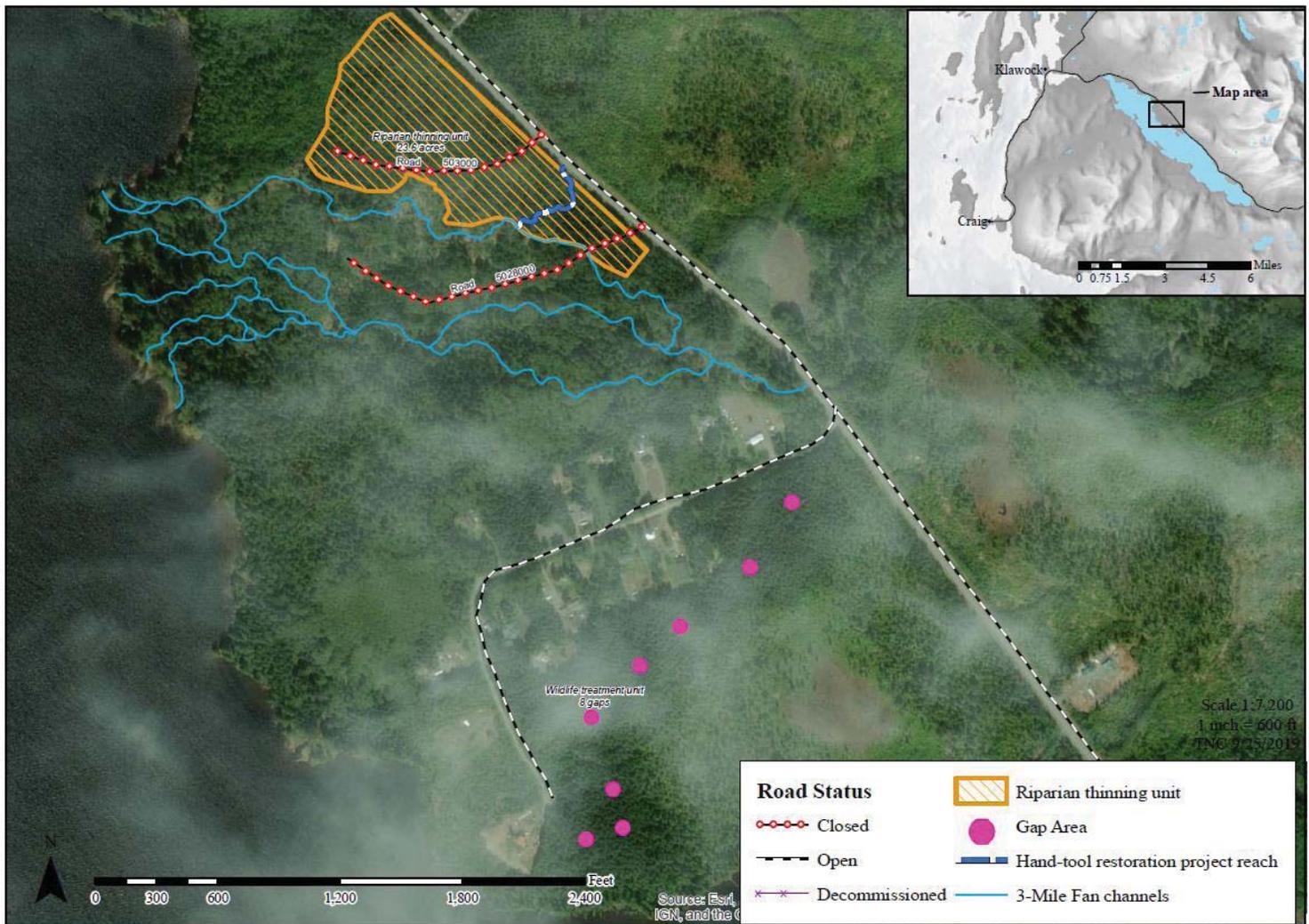
Westbrook, C. J., D. J. Cooper, and B. W. Baker. 2006. Beaver dams and overbank floods influence groundwater-surface water interactions of a Rocky Mountain riparian area. *Water resources research* 42:1-12.

Appendix 2. Threemile Creek Fan Riparian Thinning

Summary

This proposed project is to thin a ~23-acre, stem-excluded second growth stand between the road and Threemile Creek fan to concentrate resources on residual tree diameter growth, improve wildlife habitat, increase the rate of recruitment of future large woody debris into the fan, and provide wood for the handcrew restoration project. This proposed project would also create eight “radial tree release” gaps to improve wildlife habitat and forest structure.

Threemile fan riparian and wildlife thinning units



Due to the density of the stand and the desire for intensive slash treatment, this project is projected to take a 4-man saw crew 25-30 days, at a cost of approximately \$28,000. The per-acre rate paid to

contract crews from the lower-48 for thinning and slash treatment is frequently \$800-\$1,000/acre; we expect this treatment to cost at least this much.

Stand condition (derived from LiDAR remote sensing inventory)

Quadratic Mean Diameter: 8 inches

Trees per acre ≥ 2 " dbh: 724

Trees per acre ≥ 6 " dbh: 172

Crown Competition Factor: 277.48%

Species composition: Spruce, western hemlock, red alder

Prescription

Thinning: The treatment prescribed for this stand is a 12X12' spaced thinning to reduce tree stocking to approximately 300 trees per acre, with slash treatment to maintain access to the stand for wildlife, and also featuring girdling wherever safe and feasible. Specifically, the treatment should feature:

- 12-ft spacing, with 50% variance encouraged to favor larger trees and create variability in the stand.
- Retention of dominant, largest trees with good form
- Girdling of any thinned trees > 7 " DBH
- Upper diameter limit of 10"; **any trees > 10 " dbh are to be left alive**
- Bucking and limbing any trees felled while thinning (maximum acceptable slash depth 2 ft.)
- Red alder will not be cut. It will not be counted when determining spacing.

The riparian stand in question, not having undergone any intermediate treatment since harvest in ~1987, is in a state of stem exclusion ("dog-hair") due to being overstocked with conifers. There is currently very little understory forage except in places where red alder is growing (generally old skid trails and accumulations of logging debris).

This treatment is focused on maximizing diameter growth in selected residual trees for timber value; selecting for dominant crop trees; increasing long-term stand stability; placing the stand on a trajectory that provides opportunities for future stand treatments that benefit multiple resources; increasing short-term forage biomass for wildlife; maintaining low-elevation winter wildlife cover; and avoiding creating a large, persistent slash load that restricts human and wildlife access.

A stand of this size and age has already passed the optimal window for precommercial treatment and is rapidly approaching a point beyond which any treatment would risk undermining stand stability. It is important for stand health to implement a treatment that decreases height/diameter ratios. The thinning prescribed above is designed to address this in the short term while avoiding wider spacing that might lead to the stand unraveling, and is expected to provide temporary benefits to wildlife. A second entry (potentially commercial) thinning should be considered in 20 years to maintain a high growth rate and benefit bear and deer that use this stand.

Radial Tree Release Gaps: Between one individual tree up to five clumped trees of above-average diameter and form will be selected and flagged at each of the eight locations on the map to be the live

centers of radial tree release openings. A “gap” (shaped like a donut) of radius 37 ft. will then be created surrounding the flagged tree(s) to create persistent wildlife forage, while also maximizing the growth rate of the center tree(s) and the trees on the edge of the opening. The flagged center trees will be left alive (residuals), while all trees >2 ft. tall within 37 ft. of the center trees will be killed by felling or girdling, depending on diameter.

This creates an opening of roughly 0.1 acre in area, intended to mimic the small windthrow events that are the predominant natural disturbance regime of Southeast Alaska forests. Various studies have shown this opening size to be a sweet spot between maintaining or encouraging understory forage growth, while avoiding a “conifer flush” of hemlock seedlings that would result from a larger opening. Leaving center trees will further benefit wildlife by encouraging the rapid growth of large, wolfy trees that, over time, will grow large boughs capable of capturing snow.
