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Summer 2018 Issue

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# Takshanuk Watershed Council

***The Current*** - Summer 2018

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## WELCOME MARIE!

In the Spring we said goodbye to Jolanta Ryan as she moved on to a position with the Haines Borough Public Library, and we welcomed Marie Boisvert as our new Education Coordinator. While we were sad to see Jolanta go, we are very excited to have Marie on board!

Marie moved to Haines in 2017 to farm with her sister, Sally, who owns Four Winds Farm. Though the original plan was to leave in the fall when the farming season ended, Marie hasn't managed to move back to the east coast yet. With more than a decade of small farm experience, including three years running her own farm in Vermont, Marie is enthusiastic about working with the Haines community to keep the Starvin' Marvin Garden growing strong. In addition to farming and gardening, Marie enjoys yoga, hiking and experimental cooking.

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## Summer Interns

Through a partnership with Southeast Alaska Independent Living ([SAIL](#)), we have an ambitious crew of summer interns who have been working hard. They've been busy assisting at the Starvin' Marvin Garden, doing maintenance at TWC's Jones Point property, and working on various Watershed Council projects around town. If you see them, please stop and say "Hi!"





Top left: Kyle assists campers during Chilkoot Culture Camp in removing the spines of a devil's club. Top Right: Kamakana finds the outlet of a stormdrain near the Haines Harbor. Bottom Left: Kyle and Karl move compost at the Starvin' Marvin garden. Bottom Right: Kamakana and Kyle collect sawdust to mulch trees at the Starvin' Marvin garden.

## Summer Garden Club

Summer Garden Club has been meeting every week at Starvin' Marvin Garden. Club participants helped plant the outside garden beds and greenhouse, and with seeding and transplanting lettuce, kale, chard, beans, tomatoes, cucumbers, peppers, squash, carrots, beets, flowers and so much more! At the end of each club, participants can harvest their own produce to take home and share with their families. This week the club is picking strawberries, kale, chard, lettuce and radishes.



We have also done fun projects such as a garden scavenger hunt, making chia people and harvesting and preparing rhubarb to make rhubarb soda. The rhubarb soda was such a hit that we decided to make a big batch to share with everyone at our upcoming Garden Party! So far this summer, Garden Club has served over 100 participants and received great support from the community.



## Klukwan School Environmental Education

Starting this fall, TWC staff will conduct monthly “field courses” at the Klukwan School. A part of these programs will take place in the classroom, teaching the students about the impacts of climate change on aquatic habitats and wildlife, and how a desire to mitigate those impacts have informed the goals and methods of TWC research projects. Students will assist with the preparation and calibration of scientific equipment. They will then pull on waders and accompany TWC staff into the

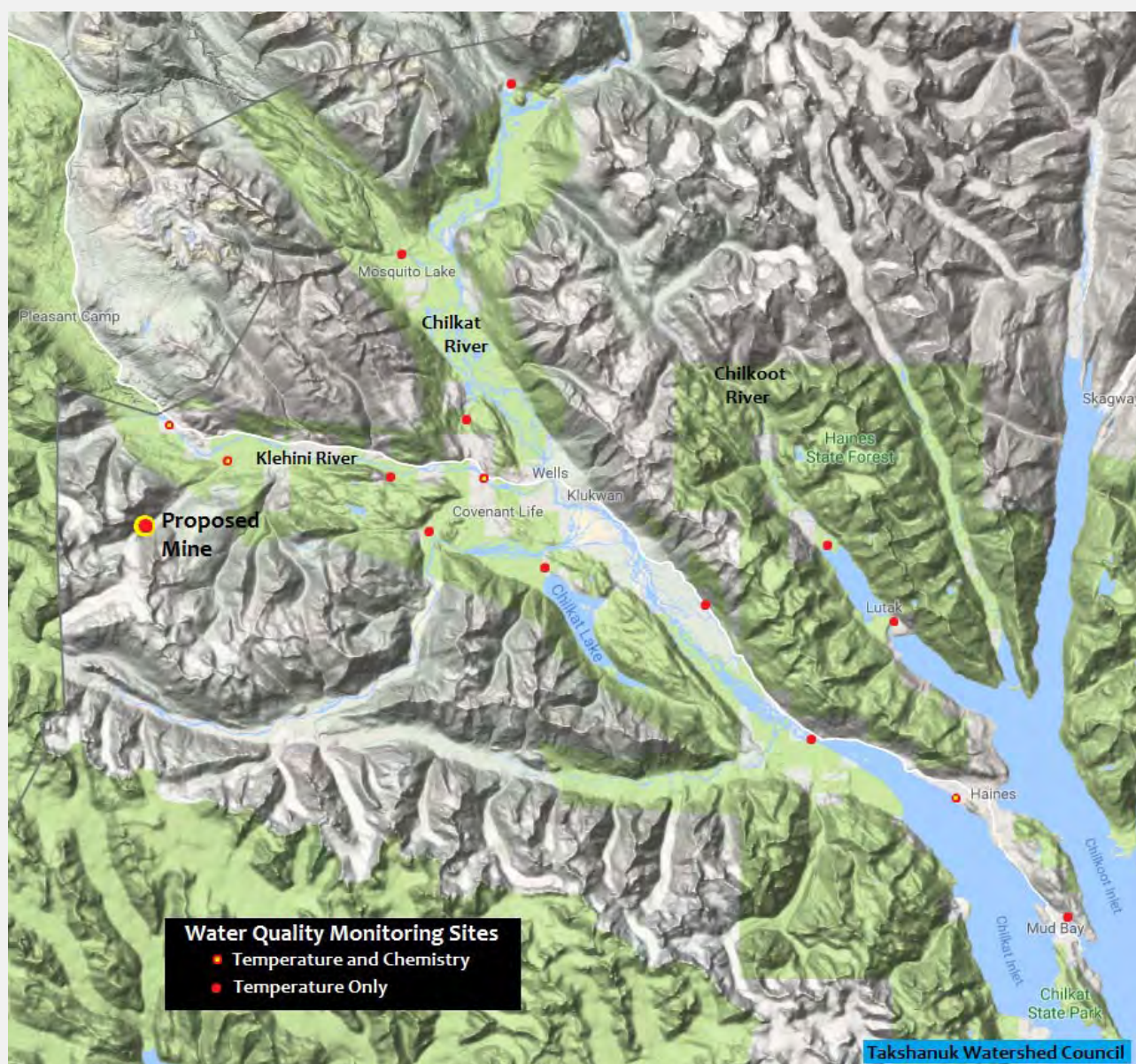


field to collect water samples, gather field measurements, download data from electronic temperature monitors, and help to install and maintain instruments.

It is hoped that Klukwan School students will gain an appreciation not only of the fun things that scientists do while collecting data in the field, but also of why we are working so hard to understand climate change and to develop strategies for preserving biodiversity and ecological resiliency.

Funding for this program has been provided by the Charlotte Martin Foundation.

## Watershed Research and Restoration





# Klehini River Baseline Water Quality

The Chilkat and Chilkoot Rivers are two of the most productive salmon systems on the west coast of North America. They host significant wild runs of all five species of Pacific salmon, as well as steelhead, Dolly Varden, cutthroat trout, and eulachon. This abundance has supported the Chilkat and Chilkoot people since time immemorial, and is now the basis of a commercial fishing industry that accounts for 15% of local incomes. Although local freshwater habitats are relatively intact, they are nonetheless facing two significant near-term threats: the unpredictable effects of climate change, and ongoing pressure from human development.

The Takshanuk Watershed Council (TWC) and the Chilkat Indian Village of Klukwan (CIV) have been working together to collect baseline water quality data in Glacier Creek and the Klehini River. This project is in response to ongoing mineral exploration in the area, and the need to record baseline conditions in these waters before a large-scale mine is developed. Neither the State of Alaska nor the BLM collect baseline water quality data. The mineral exploration company, Constantine Metal Resources, is collecting data for its own uses, but treats the information as proprietary, and is not required to make the data available to the public.

The CIV/TWC water quality project began in 2016 with the development of a Quality Assurance Project Plan (QAPP). Water quality sampling commenced in December of 2017 and has been ongoing. Three sites are being sampled: 1) lower Glacier Creek, 2) the Klehini River upstream of Glacier Creek, and 3) the Klehini River downstream of Glacier Creek at the 26-Mile bridge. Sites will be sampled quarterly, at as wide a variety of weather and flow conditions as possible, for five years. Parameters being recorded include both a dissolved and total metals analysis of 27 elements, including copper, silver, lead, zinc, and mercury; also hydrocarbons (petroleum), sulfate, total organic carbon, total suspended solids, and basic water quality parameters such as salinity, pH, alkalinity, hardness, turbidity, and dissolved oxygen. All information will be shared publicly via EPA and DEC online databases. Results so far indicate that the water at all three sampling sites is of the highest quality and far exceeds any standard for either drinking water or aquatic life.



On May 25, TWC staff assisted Breanna Walker from the University of Alaska Southeast (UAS)

and her partner and field assistant, Tristan Sebens, with the collection of sediment, soil, and water quality samples on upper Glacier Creek, just below Constantine Metal Resources' mineral exploration developments. The information gathered will contribute to the baseline data set already being compiled via the TWC and CIV water quality programs. Funding for Breanna's research has come from both the Undergraduate Research and Creative Activity (URECA) award from UAS and the Biomedical Learning and Student Training (BLaST) program through the University of Alaska Fairbanks.

Baseline water quality data for the Klehini watershed will be used to make decisions on how to best safeguard the health of our waters and aquatic habitats. Should industrial development occur, this information will be used to set discharge permit limits, provide guidance in monitoring standards and practices, and it will provide a point of reference that can guide clean-up and restoration efforts in the event of a tailings spill or other industrial accident.

Funding has been provided by the Chilkat Indian Village and also by generous donations from the public. Both TWC and CIV would like to say **Thank You!** and **Gunalchéesh!** to everyone who has contributed to this important project. We need to collect four more years of data, and fundraising is ongoing.

[KHNS News Story](#)

## Water Temperature Monitoring

The climate is changing rapidly in the North. Over the next 50 years, Southeast Alaska can expect to see an increase in mean annual air temperature of 2 to 4 °C, as well as drier summers and wetter autumns (Schoen et al. 2017), and it is highly likely that there will be widespread and rapid changes occurring in the local aquatic environment. The region is heavily glaciated, and we expect to see significant changes in both glacial runoff and precipitation patterns, which will greatly impact habitat. The generalized effects of water temperature and chemistry on aquatic life, especially salmon, are well studied and well understood. What are not well documented are the specific local processes that are occurring on the landscape and within the habitat, especially over a time scale of years and decades. The Alaska Department of Fish and Game's *Chinook Salmon Stock Assessment and Research Plan* states that "there is a lack of basic physical data on stream temperature, stream flow, and explanatory landscape features that can be analyzed and compared at the regional and statewide scale. "The implementation of a program for the long-term monitoring of water chemistry and temperature will contribute to future assessments of the effects of industrial development (e.g. mining), climate change, and geologic processes, on fish and freshwater habitats specifically in the Chilkat and Chilkoot watersheds. The knowledge gained will be used to guide resource management, as well as research objectives, in the years and decades to come.

Long-term surface water temperature monitoring will attempt to answer the following questions:

1. How do temperature regimes vary between locations and years?
2. What are the causes of the variation and trends?
3. What are the implications for aquatic life, especially salmon?
4. Are some waters and habitats more or less resistant to the effects of climate change or human development? And if so, why?





Derek Poinsette, Johnnie Gamble, and Daniel Klanott install temperature monitors in the Little Salmon River.

(Photo by Jessica Kayser-Forster)

TWC will monitor 15 sites throughout the Chilkat and Chilkoot Valleys, Sawmill Creek near the Haines townsite, and Mud Bay Creek south of Haines on the Chilkat Peninsula. At each site, we will deploy electronic data loggers that will record water and air temperature at 30-minute intervals, 24 hours-a-day, year-round. Water quality and aquatic habitat data will also be gathered at each site.

TWC has partnered with the Chilkat Indian Village of Klukwan, the Chilkoot Indian Association, the Alaska Department of Fish and Game, and the Southeast Alaska Watershed Coalition in implementing the temperature monitoring program. Funding has been provided by the National Fish and Wildlife Foundation.

#### References

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Schoen, Erik R., Mark S. Wipfli, E. Jamie Trammell, Daniel J. Rinella, Angelica L. Floyd, Jess Grunblatt, Molly D. McCarthy, Benjamin E. Meyer, John M. Morton, James E. Powell, Anupma Prakash, Matthew N. Reimer, Svetlana L. Stuefer, Horacio Toniolo, Brett M. Wells & Frank D. W. Witmer. 2017. Future of Pacific Salmon in the Face of Environmental Change: Lessons from One of the World's Remaining Productive Salmon Regions, *Fisheries*, 42:10, 538-553.

<http://www.alaskawatershedcoalition.org/wp-content/uploads/2017/10/management-applications-October->



## 26-Mile Pond Recreation and Habitat Enhancement

The borrow-pit pond near the Klehini River bridge is an eight-acre water body that is part of the Klehini River floodplain. In 1969 the area was isolated from the river by the installation of a steel bridge and construction of a riprap revetment, and it was operated as a private gravel mine into the early 2000's. The eastern portion of the pond is State of Alaska property and is within the boundaries of the Alaska Chilkat Bald Eagle Preserve. The pond is now used for swimming and other recreation, and the gravel pad is used for parking.



26-Mile Pond (SAWC Photo)

TWC and the Southeast Alaska Watershed Coalition (SAWC) have been working with Alaska State Parks, the US Fish and Wildlife Service, the Haines Borough, private landowners, and user groups, to evaluate opportunities to:

- Enhance fish and wildlife habitat through wetland creation on the north end of the pond;
- Maintain and enhance recreational activities such as swimming and picnicking, including the potential construction of a pavilion, barbeque pit, and outhouse;
- Improve site safety by reducing the steepness of the pond shoreline;
- Improve access to the water for the filling of fire trucks by the Klehini Valley Volunteer Fire Department;
- Maintain adequate parking for ATV and snowmachine trailers.

SAWC is proposing to finance this project via the Southeast Alaska Mitigation Fund as a wetland mitigation project. The US Army Corps of Engineers requires mitigation whenever an existing wetland is filled and destroyed, as in the expansion of the Haines Highway. Enhancement of the 26-Mile Pond would fill the need for local wetland mitigation opportunities, and would allow development projects to move forward.

SAWC and TWC are currently soliciting public and stakeholder input to improve the concept, and a public meeting will be held in August. If the proposal were to proceed, the enhancement work could begin in the spring of 2019.

## Sarah Creek Water Reservation

In 2010, TWC began collecting stream flow measurements on Sarah Creek, in the upper Klehini Valley. Sarah Creek is a ground-water fed system that supports coho salmon, Dolly Varden, and cutthroat trout spawning and rearing. In October of 2019, TWC will have sufficient data to request an instream flow reservation from the State of Alaska. This reservation will provide legal protection for Sarah Creek's valuable fish habitats. This project is supported by USFWS, ADF&G, and Patagonia.



January 2018. Jeremy Taylor uses an ice chisel to open a hole in Sarah Creek large enough for measuring stream flow. While there were three feet of overflow ice out on the Klehini River, due to groundwater upwelling the thickness of the ice on Sarah Creek was never greater than about six inches, and rearing fish remained mostly undisturbed by the ravages of an unusually icy winter.

**QUESTIONS?** Contact Derek Poinsette, TWC's Science Director. [derek@takshanuk.org](mailto:derek@takshanuk.org)

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# Eulachon Population Monitoring

TWC has been partnering with the Chilkoot Indian Association (CIA) on a eulachon population monitoring project since 2010. The 2018 season was the second year of our expanded regional study looking to gather eulachon population data from 10 rivers in northern Lynn Canal (Chilkoot, Chilkat, Ferebee, Taiya, Skagway, Katzechin, Berners, Lace, Antler, and Mendenhall) comparing three different methods.

Our longest running method has been the mark-recapture technique utilized at the Chilkoot River since the project's beginning in 2010. For this method, a trap is placed near the Chilkoot River Bridge, fish are captured in the trap, and the adipose fin is clipped. The fish are released back into the river to continue their spawning migration upstream. Above the Chilkoot River weir, fish are recaptured using dip nets, cast nets, or through subsistence fishermen. These fish are counted and the adipose fin is examined to see if it had been clipped. The mark-recapture formula accounts for the proportion of fish counted that are clipped initially, recaptured without a clip, and recaptured with a clipped fin.



In 2014, through a partnership with Oregon State University, we began using a new technology, environmental DNA (eDNA) as a means of determining a population index from the amount of DNA found in a 1-liter water sample. The DNA concentration compared with the mark-recapture population estimate has proved that eDNA could be an easy, non-invasive, and inexpensive method for determining eulachon population estimates.

In 2017 through funding from the Bureau of Indian Affairs we were able to further expand our study to look regionally at the eulachon population trends. For this we look eDNA samples at all 10 rivers across the region and compared the DNA concentration with population estimates through mark-recapture (Chilkoot) and catch-per-unit-effort (Taiya & Katzechin). Since it is thought that eulachon do not necessarily return to their natal stream to spawn, but rather choose a river from within a region, to fully understand the northern Lynn Canal eulachon population trends it is necessary to develop regional population estimates. The use of eDNA technology has enabled us to collect this data with little/no interference with the fish and more cost effectively than using traditional population estimation techniques.



Top left: Students from Haines and Klukwan learn about eulachon at the Chilkoot River. Top right: Crews at the Chilkoot clip the adipose fin as part of the mark-recapture protocol. Bottom left: Crews at the Chilkoot recapture eulachon above the weir. Bottom right: Crews at the Katzehein collect water for eDNA samples.

## Stormdrain Mapping

Have you ever wondered where all that rain goes that falls on a road or near your house? Well, that's something we're looking to figure out this summer! TWC is partnering with the Haines Borough to map the stormdrain infrastructure in the townsite. So far we've been collecting GPS points of all the stormdrain locations including inlets, outlets, culverts, ditches, flow direction, and where the water ultimately ends up. This information is being compiled into a map that will become available via the Borough's online mapping tool. We're also identifying sediment source areas and locations where green infrastructure techniques such as rain gardens and bioswales could help reduce the input of pollutants into our waterways. Stay tuned for more updates on this project throughout the summer and fall, and if you see some folks looking curiously into stormdrains, it's probably just us!

Special thanks to the Alaska Department of Environmental Conservation's Alaska Clean Water Actions grant program for funding this project.





**Stormdrain Infrastructure Mapping  
Survey Area 2018**

**Legend**

- > Ditch\_Road Conveyed Stormwater
- > Culvert Conveyed Stormwater
- Survey Area

0 0.04 0.08 0.16 Miles



# TWC has a fresh new website!

Check it out at [www.takshanuk.org](http://www.takshanuk.org)



Special thanks to Lexie DeWitt of White Raven Web Design for her stellar design services!

## Check out our YouTube Channel

Now you can watch all the great TWC videos from over the years in one place!



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## Upcoming Events



Garden Party: Friday August 24th 4-8pm at the Starvin' Marvin Garden. This event features a live auction, children's activities, music, games, and beer and wine for sale. ***New this year: A Local Food Dish Competition! Bring a potluck dish that features a locally grown or harvested ingredient. Categories include sweet or savory. Prizes will be available for the winning dishes!*** Check out our Facebook page for updates on this event.



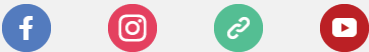
# Become a Friend of the Watershed

## Check out our new t-shirts and hoodies!

Without membership: \$50 for hoodies, \$25 for t-shirt  
With membership: \$75 for hoodies, \$50 for t-shirt



Click to Become a Friend of TWC!





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