Klawock Lake Sockeye Salmon Stakeholder Meeting

Lake Ecology Workgroup Meeting notes

Facilitator: Christine Woll

Chair: Megan McPhee

Meeting #1: 09/01/2017

Participants: Christine Woll, Megan McPhee, Jeff Nichols, Anne Beaudreau, Jeff Lundberg, Mark Minnillo, Neil Stichert, Jan Conitz, Quinn Aboudara, Steven SueWing

Introduction to meeting and working group:

* Christine introduced the stakeholder meeting and its [goals](http://www.seakfhp.org/wp-content/uploads/2017/06/KlawockLakeSockeyeStakeholderMeetings_Overview.docx)
* Christine introduced the lake ecology working group and its goals:
  + ID current information
  + Determine information needs and speakers/presentations for meeting
  + ID new potential “next steps” for Klawock Lake, to discuss further at meeting
* Christine clarified that this group was intended to focus on Klawock lake itself – and that there was an additional “Freshwater habitat” group that would focus on watershed condition.

Lake ecology topics:

Christine had the group brainstorm questions that one would want to know about a sockeye salmon lake to understand its dynamics and how that would impact sockeye salmon populations.

* Bathymetry of the lake
* Know whether there has been a loss or change of shoreline habitat
* Know whether there has been changes in the surrounding habitat and inlet streams, and sediment input
* Changes to spawning areas within the lake
* What are the native fish? What are the introduced fish?
* History of fertilization or enhancement in the lake
* What does the prey base for sockeye look like? Zooplankton? Terrestrial insects?
* Do we know anything about juvenile or smolt abundance over time?
* Do we know anything about how long juveniles stay in the freshwater and their survival rates?
* Water quality parameters including: water temperature, nutrients, turbidity
* Sediment input timing
* Condition of fish as outmigrants
* Ice and ice out conditions and timing
* Historical uses and users of lake and land around it
* Outmigration timing
* Local weather patterns

Current information:

We began to review existing information, but only made it through a few topics. Many of the current information is reviewed in TNC’s [Retrospective Analysis](https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/seak/Documents/TNC_Klawock_Lake_Retrospective_Analysis.pdf)

* Watershed condition and land use
  + History of logging on many of the inlet streams
  + Past watershed condition surveys indicate degraded habitat on inlet streams, likely increased sedimentation rates and altered hydrology
  + Minimal current “shoreline” development, but major highway close to shore. Development in alluvial fan of 3 mile creek near mouth
  + Existence of allotments along Southern shore for potential development. Learn more?
  + De-watering on ½ mile creek
    - **Can we get info on how much water is taken?** May impact spawning conditions, and inputs into lake
  + Previous sediment core work demonstrates major changes in sediment loading
* Water quality parameters
  + Profiles of water temp, DO, turbidity, and other chemical and nutrient parameters taken periodically in consistent locations between 90s and 2000s.
  + Water temperature and river height monitored by hatchery continually since 2012
  + KCA has funding to do water temperature monitoring for next 3-4 years
  + ADEC collecting lake profiles for many lakes in SE Alaska, including Klawock, in 2017 -m **Can we get this data or find out what was taken from where?**

Participants agreed to continue review of material at next meeting – to be scheduled by Christine soon

Meeting #2: 09/26/2017

Participants: Christine Woll, Megan McPhee, Jeff Lundberg, Jan Conitz, Steven SueWing, Mark Tollselvt, Ryan Bellmore

We began by finishing our “review” of current information.

* Species composition / predators / prey
  + Predation studies by KCA and ADFG have preliminary data on predators
  + ADFG studies have summary info about zooplankton and phytoplankton
  + ADFG core samples have historical data on zooplankton
* Juvenile sockeye abundance and condition
  + ADFG took population estimates of sockeye in the lake but numbers were unreliable / difficult
  + Some years of measuring smolt condition / age / size but not many
  + Asit Mazunder suggested using condition of smolt as best proxy for lake conditions
  + Questions raised about whether there was ever an assessment of the fertilization potential by FRED division – Steve found the report

Discussed ideas about what to present

* Tailor it to other similar lake systems in SE islands – oligotrophic
* Suggestion to use a box and arrow diagram as to how all the pieces interact – to show that it is complicated, but also what the major pieces are
  + Can include “highlighting” areas where we have data
* Discussed that it would be useful to present a conceptual model / presentation on sockeye life history that includes the limiting factors for sockeye productivity at ALL stages – Megan to help or present if she decides to go??
* Discussed whether there were any expert limnologists to have speak or be a resource –
  + Megan said she would contact Azit Mazumder to see if he has any insights to share, or interest in the project moving forward
  + Christine said she would follow up with Anne Beaudreau similarly
  + General agreement that we might not need this expertise IN THE ROOM, but would need it down the line if there is an appetite for it
* Discussed other examples that might be good models – redfish lake, Kodiak
* Discussed the idea that it would be good to get an understanding of the appetite in the room for conservation goals around the future stocks