

## **Southeast Alaska / Tlinglit, Tsimshian, Haida Regional Listening Session Notes**

### **Climate change items**

Climate adaptation plan complete but would like to redo it already to focus on local adaptation and impacts. Many local adaptations are climate adaptations, so community is already doing many climate adaptations that are tied to indigenous knowledges as we are doing things naturally and collaboratively. Great need to help tribes implement adaptation strategies.

Many communities have climate adaptation strategies, some are looking to put in hydropower a long expensive process (\$150 million).

Anecdotal evidence of effects of climate change and drought on different species (distribution shifts/latitudinal movement).

Warmer temperatures can lead bears to come out of hibernation early, leading to more out-of-season bear attacks.

Weather extremes are a concern going from way too dry / drought to excessively wet.

### **Adaptation**

Was drought in SE a 'new normal' or a short-term occurrence? Not clear what changes it will lead to in the future now that it is over. Unclear what the 2018-2019 drought means for the future of hydropower, and impacts to fish, wildlife, and local economies.

Southeast Alaska Power raised a dam 15' to be able to store more water.

Installation of heat pumps, LED lights use less energy.

Pandemic affecting current demand for energy and may have long-lasting impacts on future demand.

Stream restoration, thermal refugia in streams to mitigate the effects of logging, create pools, community forest concept like the Hoonah and Kake forestry partnership.

Mariculture is a growing sector for the local economy.

Youth development, awareness of climate issues. Have youth involved in collecting monitoring data for snowpack and stream temperatures, doing restoration efforts.

Support local communities to collect local data to help with planning efforts and modeling capabilities.

### **Throughout Southeast**

Hemlock sawfly (native SE AK) biggest defoliator western hemlock, also mtn hemlock and Sitka spruce. Fungus usually keeps hemlock sawfly populations in control and drought limited fungus and allowed for hemlock sawfly outbreak.

Seen hemlock outbreaks since 1960s, 2018 and 2019 outbreaks largest since 1966. Report of major outbreak in 1950s likely similar to what was observed in 2018-2019.

Hemlock sawfly affected 48,500 acres in 2018 and 380,000 acres in 2019 as determined through aerial surveys.

Impacts of hemlock sawfly can be seen in months May 2019 normal, obvious impacts July 2019.

Reduces canopy and trees can be mostly defoliated.

No formal ground surveys or aerial surveys in 2020. Recruited locals to do limited field observations and saw number of sawflies go down in 2020.

Imagery survey for Prince of Wales and Wrangell and Juneau. Bugnet: deep learning detection of insect defoliation in satellite imagery. Bugnet determined 2018 32,725 acres, 2019 645,431 acres, 2020 649,232 acres. Indicates damage is more extensive and is longer lasting than initially expected that resulted in a lot of mortality. 2-3 year outbreak and then crash. 80,000 acres record of mortality related to hemlock sawfly activity also other factors contributing as wood borers and drought stress.

Full extent of drought damage yet to be seen due to heavy rains and pandemic. Pandemic as limited ability to conduct field surveys to evaluate conditions.

Drought affects vegetation reducing its forage quality for deer and mountain goats.

If you get the kids involved, you have the community involved too.

Tree ring data keeps a record of the climate experienced in terms of recovery, growth rate or not.

Pictures tell a compelling story and help to engage community.

LEO network is a place to put observations of the unusual, i.e. caterpillar outbreak and impacts to natural foods.

Social media: iNaturalist and Facebook helped to capture caterpillar outbreak. Hashtags help to connect observations. This is a place for scientists to be checking for local observations. **There is a need for feedback to give value/acknowledgement of observations.** (Ex: LEO network and iNaturalists gives you best guess identification information). Reach out to public affairs of National Forest to post signs about making observations while in the forest.

Place QR codes on trail heads to encourage logging observations of insects, dry plants, etc.

## **Hoonah**

Lack of berry production, fish entrapped because could not move throughout creek lead to fish mortality, bone dried muskegs with cracks in it.

Low berries and fish lead to nuisance bears. City put down 13 nuisance bears in city limits.

Summer 2019 city worried about drinking water.

Rivers base flows bank flow width decreased 75% at most extreme cases.

Harder to remember 2018-2019 drought now after excessive rains and the pandemic.

There is a need for constant monitoring at the local scale so that local communities can make informed decisions.

After the drought came excessive rains. High amount of rain changed estuaries because of large increase in sediment transportation, rivers were 9-10' above base flow. This is concerning for fish runs and worry that water scoured eggs for future fry, fish and runs. Heavy rains also scoured out clam beds an important resource. Heavy rains increased concerns about landslides.

Hoonah currently has 33% of its power from hydropower provided through IPEC (Inside Passage Electric Cooperative). There is a need to source future, clean energy options.

Did not observe sawfly outbreak in Hoonah it was more on Admiralty island.

2020 had increase in large rain events with lots of rain and strong maximum wind gusts. Life lost in Hainesn AK due to landslide after the heavy rains.

Working with Forest Service and private landowners to identify areas of concern for landslides especially post heavy rains.

Easy to set up monitoring networks for stream temperatures and snowpack monitoring. Southeast Alaska Watershed Coalition helped to establish stream temperature monitoring.

Hoonah Native Forest Partnership, snowpack monitoring, youth components in natural resources careers.

A concern for black seaweed and conducting vulnerability assessment to climate change.

## **Ketchikan**

2018-2019 Drought. Public utility electric is 98% hydropower, load range 20 megawatts in summer to 35 megawatts in winter. Usually don't use diesel only for repairs or emergency restoration during outage. Partner: Southeast Alaska power Agency. Average rain 150" of rain a year and 200" inches in some watersheds.

Dependence of diesel in late 2018 (50%). Environmental concerns running diesel as well as increases costs.

Lots of sun during the winter 2018-2019. Low snowpack.

2019 diesel rentals allowed to increase diesel capacity by 25% power generation, went into late summer, lake levels were extremely low, conditions improved by fall.

Future adaptation changes: updated permitting for diesel plants, coordinated water management to be more efficient with it, maximized efficiency and power generation with SEAPA (Southeast Alaska Power Agency), make water balance more efficient, maximizing ability to store more water post dam heights increasing to utilize improvements.

Drought lead to economic impacts due to inability to use hydropower and running generators on diesel is more expensive. This economic impact occurred mostly in the winter and thus was felt mostly by residents to cover costs of higher costing energy.

Drinking water available though quality may have been in question if met EPA standards.

Drought had a positive effect on tourism industry as with more sun more people out and about vs less light and more rain tourists don't move around as much and don't spend as much money.

Drought affected fisheries, fish processing and canneries. Hoping for better fish returns in the future. Pink salmon run was poor.

Drought was more impactful and damaging to streams and muskegs areas than high rain fall.

Streams had warmer temperatures during drought.

### **Metlakatla**

Less precipitation during the drought 80-90" down from average 118"

In last ten years experienced reduced snowfall 33.6" down from average 41.9"

Drought resulted in a low reservoir which reduced available municipal water and need to use diesel rather than hydropower for power generation. Had to supplement municipal water supplies.

Drought impacted the forests with more pests surviving and increasing damage (spruce aphid), defoliation, damage to evergreen plants, burnt salal, warmer water temperatures in streams, creeks, and the ocean, and reduced berry production or small fruits.

Warmer water temperatures increased algal blooms which affects food for marine species. Reduced survival of salmon at all life stages (fry in creeks died from low oxygen levels & too hot, not enough water for salmon to spawn, decrease survival of salmon).

Winter storms scoured eggs from impacted streams further reducing survival of salmon.

All subsistence foods, crops, wildlife, materials impact due to lack of suitability, timing of harvest or no ability to harvest, which reduced quality of life and food diversity of the community.

Environmental indicators used to guide actions (i.e. arrival of robins coincides with spring and herring season, arrival of hummingbirds it is time to plant outside, etc.). Need to understand and interpret new indicators, including those that indicate drought in a rain forest.

Where, when, how much water available in lakes and creeks in all seasons.

Increases in lake and creek water temperatures has impacts to salmon

Bird and small mammal behavior.

To maintain life standards, need to closely keep an eye on nature to change subsistence harvest behaviors to coincide with what is occurring

Need to acknowledge increased vulnerability of community due to reduced snowpack and changing rain patterns.

USDM started in 2000, dry periods occurred prior to 2000 but were not defined as drought. Looking back through council minutes found memos to conserve water during these dry periods. This occurred in the 1980s and 1990s, but those impacts were not remembered.

**Need somewhere to house this type of information, like a database to send and save it for future access.**

## **Sitka**

Fish impacts include increased predation because fish can't swim upstream, forced to go into larger streams, culverts limit their mobility and lead to increased mortality.

Yellow cedar decline

Drought impacts local communities, workers, and fisherman as locals in these areas are dependent on deer hunting, fish that they catch, local sourced food. If hunting and fishing don't provide and there are shortages and purchasing food is expensive and leads to economic hardship.

Hydropower did expansion in 2014 and 2015. Did not experience issues during 2018-2019 drought. Looking at other renewable energy options and using current water supplies more efficiently.

## **Wrangell**

Many people in Wrangell do not have or want access to city water. Major focus on water conservation during drought. Figuring out what water-wise means for Wrangell and making water collection tanks.

What methods or materials are people using locally for water collection?

## **Juneau**

Increases in water temperatures during 2018-2019 drought was impactful to fisheries. Saw several more fish kills all around than ever seen before in 20 years of living there.

Drought meant more sun, which was fun for kids to go play outside.