Submitted at the request of Mr. Ruffner

Sitka Tribe of Alaska

Tribal Government for Sitka, Alaska

RC 407

Dear Board of Fisheries,

I write on behalf of the Sitka Tribe of Alaska (STA), a federally recognized tribal government for over 4,000 tribal citizens located in Sitka, Alaska. STA is responsible for the health, welfare, safety, and preserving the culture of its citizens. This comment serves to supplement STA's first written comment to the Board of Fisheries (BoF), PC147.

The Sitka Tribe of Alaska supports Board of Fisheries proposal 98.

The Sitka Tribe of Alaska opposes Board of Fisheries proposal 107.

Proposal 98

Sitka Sound is the last population of herring in Alaska that consistently provides a substantial subsistence harvest. It is a rare and precious resource, particularly in light of the decline and extirpation of many herring populations, globally and throughout Southeast Alaska.

Some historical perspective may be helpful in considering Southeast herring populations. Herring reduction fisheries began in Southeast Alaska in 1882 and collapsed in the 1930s; reduction fisheries continued on and off until 1967, most intensively in Chatham Strait. Severely depleted populations led to the closure of reduction fisheries (Thornton et al, 2010). It should be noted that Chatham Strait herring still have not recovered, 50 years after the closure of reduction fisheries. Management of herring has improved since the reduction fisheries, but some Southeast populations appear to violate the state's sustained yield principle as outlined by Article VIII of the Alaska State Constitution: the Juneau-Lynn Canal population was once considered among the largest in the state and has not had a fishery since 1982; similarly, Kah Shakes was closed in 1990; Kah Shakes' boundaries were moved to become Revilla Channel and this area has not had a fishery since 1998; Seymour Canal appears to have declined after record harvests from 2002-2008; Hobart-Houghton has had a total of seven fisheries since 1976; West Behm Canal has had a single fishery, in 2011 (Thynes et al, 2017; Figure 1 and 2). Causes of declines are not fully known. To avoid the misfortunes of many other Southeast Alaska herring populations, we must manage Sitka herring conservatively.

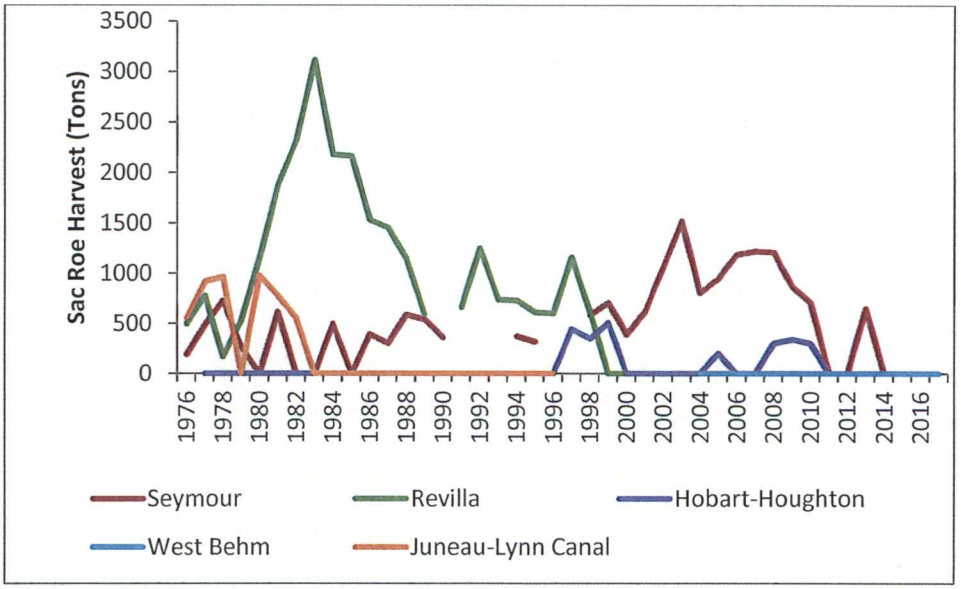

Figure 1. Sac roe harvest for several Southeast herring populations, 1976-2017. Harvest data from Seymour Canal fisheries in 2011 and 2014 were confidential. West Behm Canal had a single fishery in 2011, but harvest data is confidential. Data from Thynes et al, 2017.

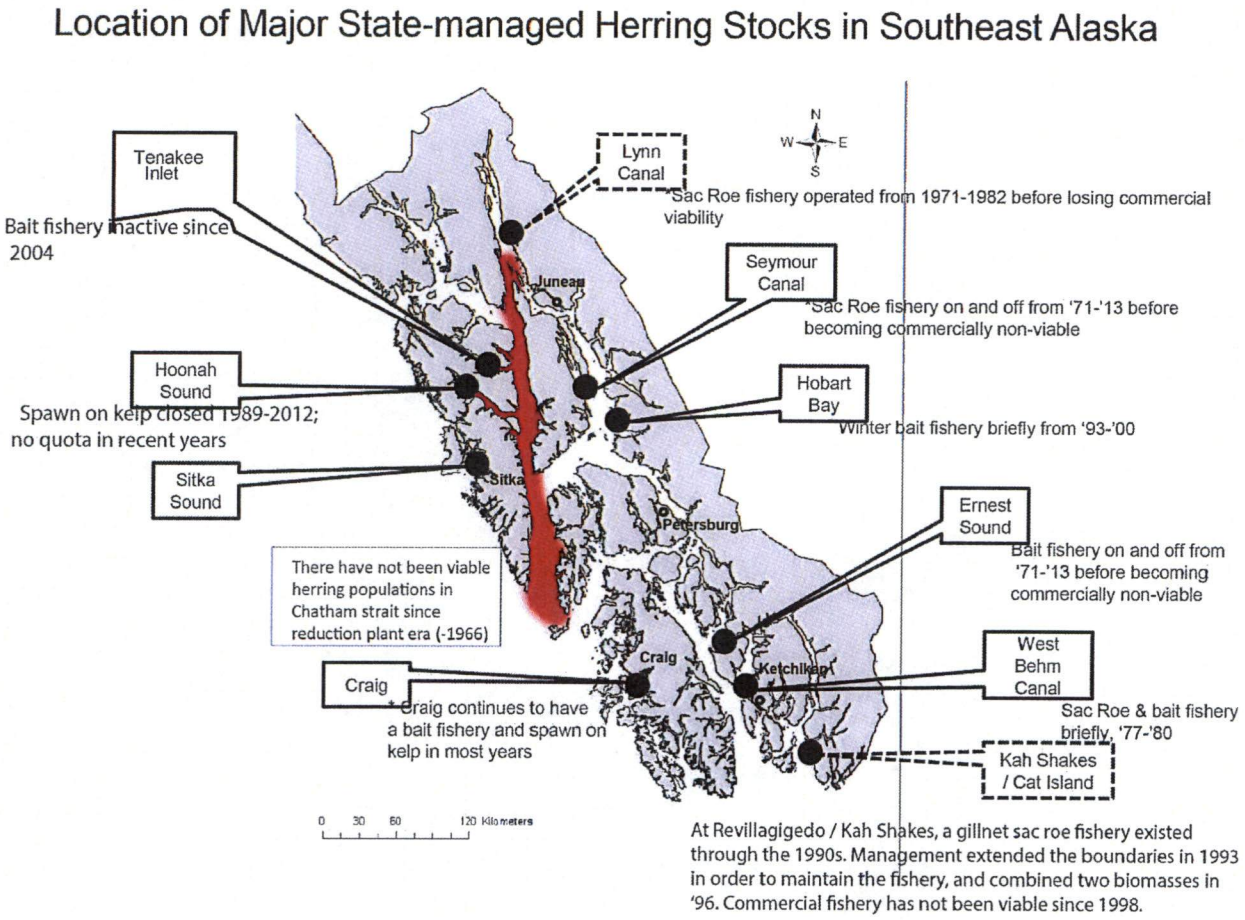

Figure 2. Historical and current status of Southeast herring populations. Note the number of fisheries that are closed. Figure adapted Herbert 2012. Data from Hebert 2018 and Thynes et al, 2017.

The challenges of herring management are not limited to Southeast Alaska. Globally, 41 of 56 stocks of clupeids (73%) studied by Hutchings and Reynolds (2004) have experienced historic declines of 80% of more; **additionally, those populations had a median maximum known decline of 91%.** However, it should be noted that the authors also found that clupeids were more likely to recover than other taxa (Hutchings and Reynolds, 2004), though many populations have been extirpated of parts of their range in the past 100 years (Dulvy, 2003). This decline is best demonstrated by the Hokkaido-Sahkalin herring population in Japan, which was once considered the largest herring population in the world and collapsed in the 1950s. Hay, et al (2001) wrote that the Hokkaido-Sakhalin population

> "was once one of the world's largest, with nearly 1 million t landed annually. There is no clear explanation for the failure of this stock to recover after all fishing has stopped, unless the population has been depleted beyond a point of no return. Although there is still hope that this stock may recover some day, after a decline of 50 years perhaps a 'recovery' is not possible. There still are herring in the area but it is not clear if the small local stocks that still occupy those areas are part of the same biological entity that was once the great migratory Hokkaido-Sakhalin herring stock. The virtual disappearance of the Hokkaido-Sakhalin herring, when considered relative to the last century of herring fisheries in other areas of the world, indicates that herring stocks are remarkably resilient, but perhaps not indestructible."

Management of Sitka Sound herring is dependent upon ADF&G's model of herring biomass. The model has had uneven results in its history, highlighted by 2012, when the model predicted a biomass of 144,143 tons and only 77,460 tons arrived on the spawning grounds. Sitka Sound herring biomass fell short of forecasts again in 2017, this time by about 10,000 tons. There are no publically available data on the model's precision, making it difficult to evaluate the efficacy of the model. There are a number of sources of uncertainty: juvenile ocean survival, age-3 recruitment to the fishery, distribution of herring outside of the spawning season, natural mortality, and changing ocean conditions, among others. STA requests that the uncertainty around the biomass estimate be published and the fishery managed in view of that uncertainty. STA understands that ADF&G is working to make progress on this front and appreciates those efforts (pers comm. S. Dressel, ADF&G, 12 December 2017). ADF&G manages other fisheries, such as demersal shelf rockfish or sea cucumber fisheries, by basing the guideline harvest level on the lower bound of the confidence interval around the biomass estimate (5 AAC 38.140). As ADF&G has noted in RC002 (comments on Proposal 88), using the lower bound of the confidence interval is a conservative measure to prevent overharvest in the face of high uncertainty around a biomass estimate. As the uncertainty for herring biomass estimates is unknown, it must be assumed to be high.

Given that the model is built on historical data collected by ADF&G since 1980, the model is vulnerable to so-called "Black Swan" events, phenomena with low frequency but extremely high impact on the population (Taleb, 2007). ADF&G acknowledged this vulnerability in RC002, stating the models "do not factor in changes to herring mortality that are caused by phenomena in the forecast year that are outside of historical patterns such as a sudden large influx of new predators or a large reduction in prey items due to extreme ocean temperature" (ADF&G, 2018). A large disease outbreak would be another Black Swan-type event with the potential to have a huge negative impact on the population (Marty et al, 2003). Given that Sitka Sound is the last significant herring stock in Southeast and the potential for a catastrophic negative Black Swan impact on the population, Sitka Sound herring need more conservative management.

Proposals 98 and 99 do not seek to close the sac roe fishery – rather they seek to grow the biomass. Survival outside of the sac roe fishery for Sitka Sound herring has been estimated at 78% from 1999-2013 and 70% from 2014-2016 (pers comm. S. Dressel, ADF&G, 12 December 2017). Given recent estimates of harvest and survival, the sac roe harvest accounts for a substantial amount of the total annual mortality of Sitka Sound herring and occurs in a few brief, intense fisheries. If a 10% harvest cap had been in place in 2017, it would have left tens of millions of individual older, larger herring to return to spawn in 2018. Building the biomass is in the best interest of all users.

Some reference for scale may be useful. By weight, the sac roe harvest removes two orders of magnitude more herring and eggs than the subsistence harvest removes eggs (Figure 3). **It should also be noted that herring in the sac roe fishery have a 100% mortality rate whereas the herring involved in the subsistence fishery have a 0% mortality as a result of the fishery.**

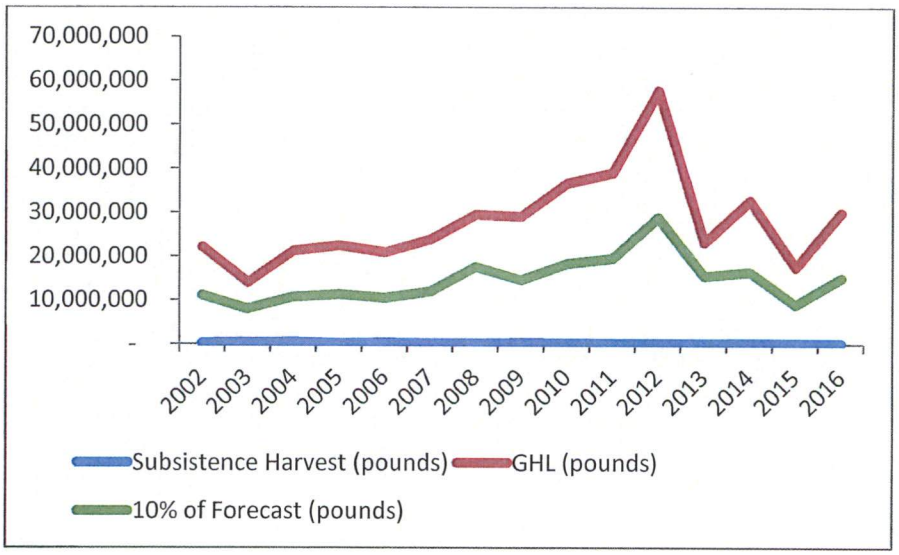

Figure 3. Removals from the ecosystem: subsistence harvest of Sitka Sound eggs, GHL, and 10% of forecast biomass estimate, 2002-2016. Note that the subsistence harvest is the blue line along the x-axis of the figure. Data from Sill and Cunningham, *in press* and Thynes et al, 2017.

Generally speaking, the GHL has greatly increased since the start of the sac roe fishery in the 1970s. A two-hour fishery has turned into a two-week or sometimes longer fishery. TEK suggests that the increased fishing pressure has led to increased stress and induced behavioral changes in spawning herring, as evidenced by the spatial and temporal contraction of herring spawn as well as the uneven spawn deposition seen in recent decades. TEK also suggests that the oldest, largest fish act to "lead" younger fish and harvesting the older, "more experienced" individuals has a negative impact on the population as a whole. The largest, oldest fish are also the fish most often targeted by the sac roe fishery. As the GHL has increased, the subsistence harvest has decreased (Figure 4). While it is difficult to separate causation and correlation, it is possible that the sac roe fishery is disrupting spawning behavior of herring in a significant manner.

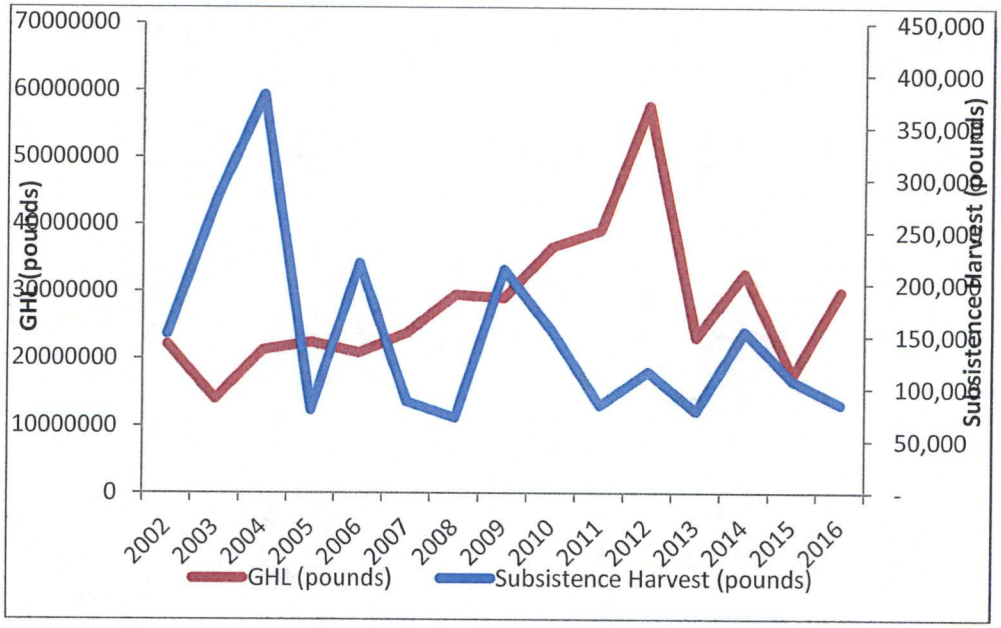

Figure 4. Sitka Sound sac roe GHL and subsistence harvest, 2002-2016. Note that the subsistence harvest has decreased as the GHL has increased. Also note that the GHL is typically two orders of magnitude greater than the subsistence harvest. Data from Sill and Cunningham, *in press* and Thynes et al, 2017.

Much of the opposition to Proposal 98 and 99 has centered on economic impact. Again, there are no proposals at this meeting that seek to close the sac roe fishery. While Proposals 98 and 99 may result in short-term economic loss to the sac roe industry, STA believes that conservative management will yield long-term benefit for all user groups. Looking at the history of all other herring fisheries, both globally and in Southeast, STA urges the Board to take a long view and ensure that herring will be here for future generations of all users. **Currently, the direct economic impact of Auke Bay herring is $0 annually; the direct economic impact of Kah Shakes herring is $0 annually.** Conservative management will ensure there are herring to harvest well in to the future. Additionally, more conservative management will provide indirect benefits to many other fisheries, including commercial king and coho salmon, halibut, and lingcod fishermen, sport and subsistence users targeting the same species, seal hunters, charter fishing operations, and ecotourism.

The community of Sitka strongly supports herring conservation. The local Sitka ADF&G Advisory Committee unanimously passed an amended version of Proposal 99 to manage Sitka Sound herring more conservatively, though the processor seat recently reversed his position. The City and Borough of Sitka Assembly passed a resolution in support of Proposal 99 and Proposal 106. The Board of Fisheries received 51 on-time written comments in support of herring conservation, the vast majority from Sitka. **Only one on-time comment against conservation measures was received from a Sitka mailing address.** The Sitka Tribe of Alaska urges the Board to consider the overwhelming support the community of Sitka has given to herring conservation – these are the only herring we have.

Proposal 107

The Sitka Tribe of Alaska has historically opposed closed pound fisheries in Sitka Sound. STA has concerns that closed pound fisheries likely increase the prevalence of disease in the stock and this would have the potential for significant negative

impacts on the stock. Disease, such as *Ichthyophonus* or viral hemorrhagic septicemia, has both been shown to have detrimental impacts on herring in Alaska (Marty et al, 2003).

Typically impoundments for closed pound fisheries are anchored near likely capture locations to minimize the stress in transporting fish from the seine net to the impoundment. STA is concerned that pounds would be anchored near subsistence harvest location and the execution of the pound fishery could disturb and negatively impact subsistence harvest.

Finally, the Sitka Tribe of Alaska has historically opposed closed pound fisheries on grounds of social justice. The original commercial herring fishery was a spawn-on-kelp fishery in which the majority of participants were Alaska Natives. When the State of Alaska closed the fishery due to concerns about degradation of kelp beds, individuals involved in the fishery lost their permits. The Board of Fisheries later allocated the fishery to the sac roe industry. The proposed closed pound fishery would allocate permits to existing northern Southeast permit holders, once again overlooking the original permit holders.

In closing, as archaeologist Iain McKechnie (2010) said, "[Herring] are the central node of the marine ecosystem. They aren't the base, they aren't the top, but they are the thing through which everything else flows." We must conserve Sitka Sound herring to conserve our marine ecosystem.

Sincerely,

KathyHope Erickson
Chair, Tribal Council, Sitka Tribe of Alaska

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