

Southeast Alaska

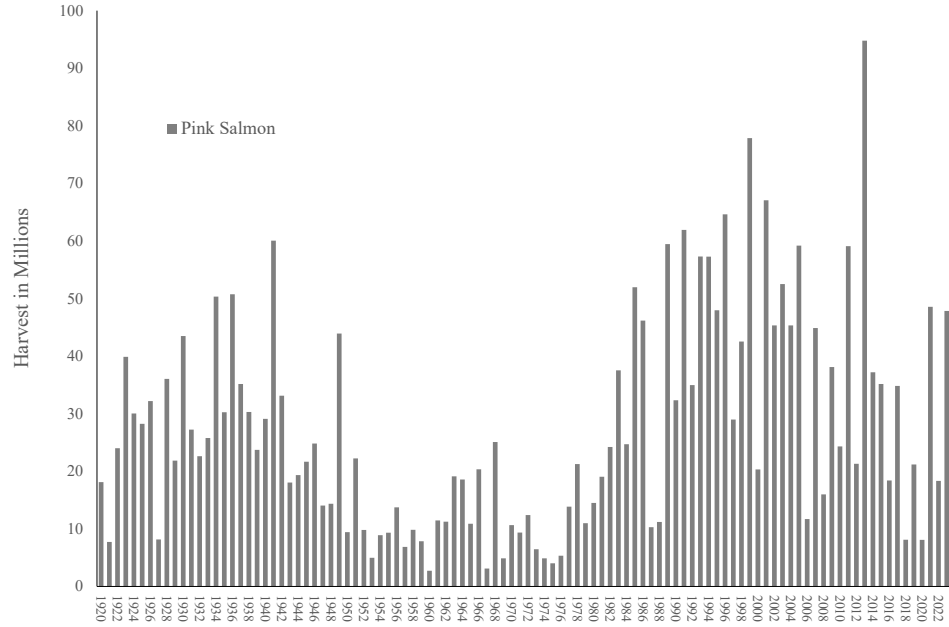
- Andy Piston, ADF&G, Southeast Alaska Salmon Research Supervisor
- Andrew Munro, ADF&G, Fisheries Scientist
- Bill Templin, ADF&G, Chief Fishery Scientist
- Ed Farley, NOAA, Ecosystem Monitoring and Assessment Program
- Caroline Brown, ADF&G, Subsistence Research Director
- Austin Estabrooks, At-sea Processors Association
- Megan Williams, Arctic Program, Ocean Conservancy/ University of Alaska Fairbanks
- Megan McPhee, University of Alaska, Fairbanks
- Tommy Sheridan, University of Alaska, Fairbanks

Southeast Alaska

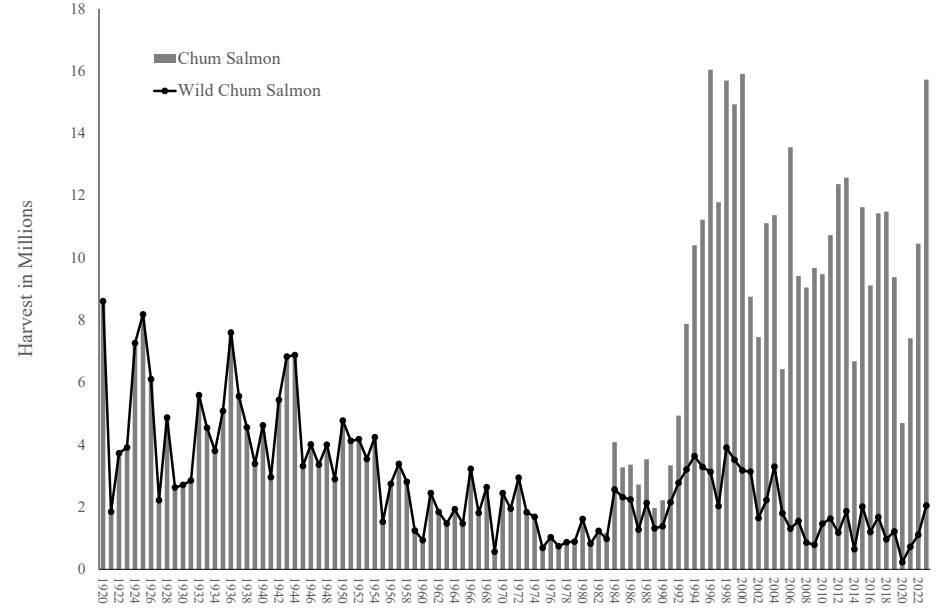
- Production of pink, chum, and coho salmon comes largely from dispersed production from 2-3 thousand small to medium sized streams.
- Chinook salmon production primarily limited to large mainland river systems.
- Sockeye salmon primarily in streams and rivers with lakes.
- Wide variety of habitats and life history diversity.



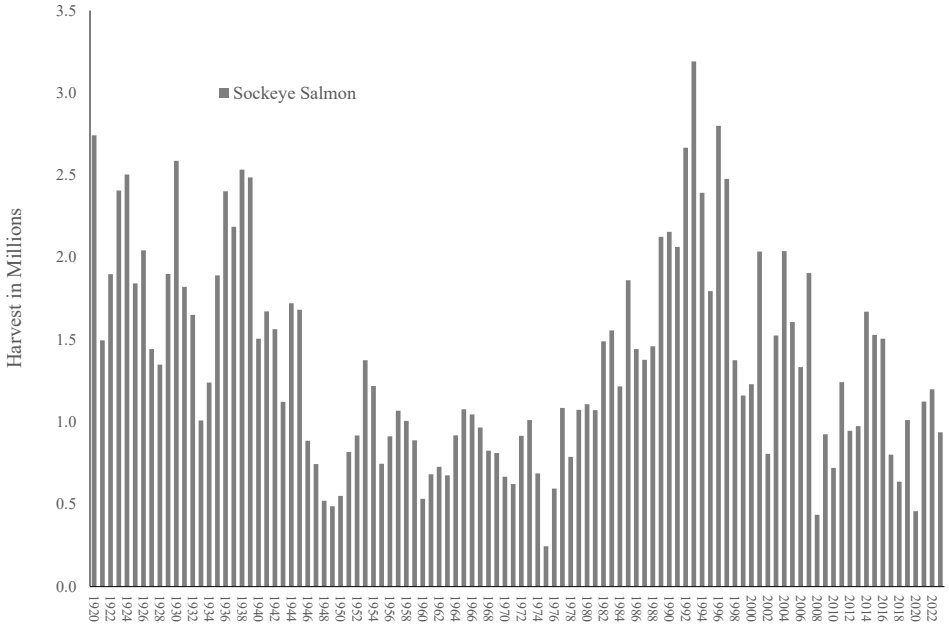
Southeast Alaska Commercial Pink Salmon Harvest



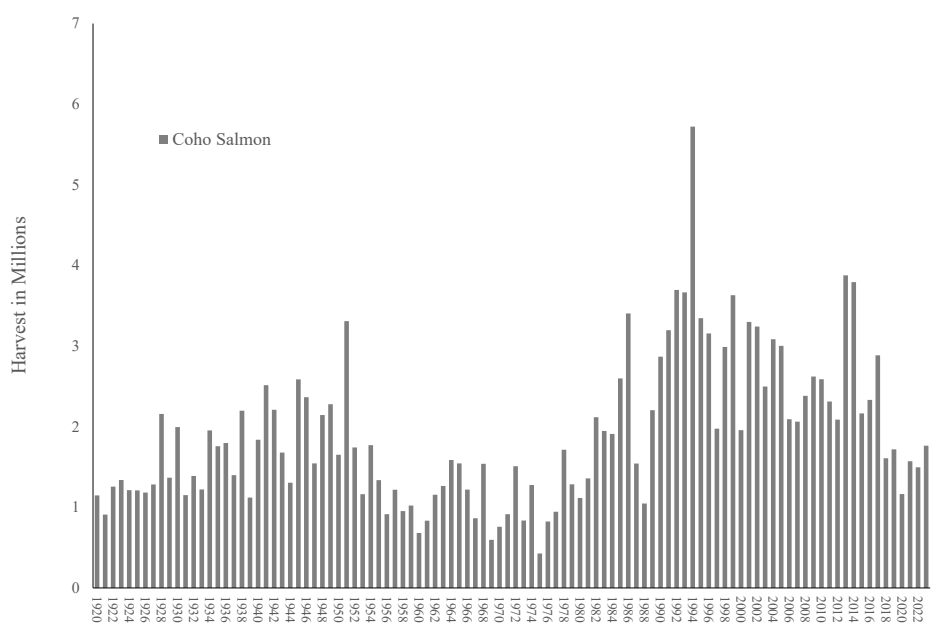
Southeast Alaska Commercial Chum Salmon Harvest



Southeast Alaska Commercial Sockeye Salmon Harvest



Southeast Alaska Commercial Coho Salmon Harvest



Impact : [Climate]

Related impact info:

- Yearly impacts on marine food web.
- Potential changing impacts from predation.
- Potential changing impacts from competition.

Gap Description:

- *Lack of broadscale data on nearshore marine ecosystem processes and juvenile salmon (all species) growth, distribution, and abundance.*
- Little understanding of the mechanisms by which the last marine heatwave impacted salmon growth and survival in inshore and offshore waters.

Species:

- All species

Lifecycle:

- Juvenile, immature, adult

Why should we prioritize this, what are the factors that make this a priority?

- Stock assessment projects for some species in SEAK have identified the marine environment as driving survival issues.
- Program methods well developed for SECM project in northern SEAK.

Research Need / Project Idea:

- Expanded Southeast Coastal Monitoring Survey to cover central and southern SEAK (Vessel time a primary limitation).
- Standardized annual offshore surveys incorporating oceanography and trawling.
- Dedicated vessel for inshore and offshore trawl surveys.

Submitted by: SEAK

Region(s) Impacted: _x_AYK, _x__West, _x__SE, _x__Central

Impact : [Hatchery/Wild Interactions]

Related impact info:

- Marine food web; potential interactions related to diet overlap.
- Predation; potential impacts related to returning adults consuming outmigrating juveniles in the marine environment.
- Tbd

Gap Description:

- *There is no mechanistic understanding for competition among Pacific salmon stocks/species at sea.*
- It is unknown if odd/even year differences in survival/growth of many salmon species is a top-down effect from pink salmon.
- The level to which there is inter- and intra-specific competition among salmon at sea is unknown.
- Annual distribution of pink salmon in relation to other salmon species during ocean residence unknown.

Species:

- All

Lifecycle:

- juvenile, immature, maturing

Why should we prioritize this, what are the factors that make this a priority?

- This is currently one of the most debated topics in salmon biology.
- Answers to these questions have huge implications for salmon management.

Research Need / Project Idea:

- Broad scale marine surveys throughout ocean residency to identify where location and diet overlap occurs through time.

Impact : [Climate]

Related impact info:

- Changes to marine food web.
- Competition

Gap Description:

- *Little understanding of cause of reduced size at age in many stocks and what is driving age structure changes in Chinook salmon (loss of older age classes) and other species.*

Species: Sockeye, Coho, Chum, Chinook

Lifecycle: Presumably immature and maturing?

Why should we prioritize this, what are the factors that make this a priority?

- Reduced size at age reduces fecundity.
- Loss of older age classes also reduces resilience and fecundity.
- Reduced size of fish has many biological, cultural, and economic impacts.

Research Need / Project Idea:

- Tbd
- Tbd
- Tbd

Impact : [Marine and Freshwater Harvest]

Related impact info:

- Climate
- Freshwater habitat changes
- Disease

Gap Description:

- *Limited number of salmon stocks statewide that have estimates of juvenile production, harvest rates, marine survival, and other detailed biological data.*
- Little current information on SEAK wild chum salmon juvenile production harvest rates, marine survival, and other data.
-

Species:

- Chinook, coho, sockeye, chum

Lifecycle:

- Nearly entire lifecycle

Why should we prioritize this, what are the factors that make this a priority?

- Chinook and coho indicator stocks in SEAK provide models of how successful project can be developed.
- Projects like these allow us to identify where in the lifecycle survival issues occur and help to better understand stock dynamics.

Research Need / Project Idea:

- Develop more full or partial indicator stocks for additional stocks and species across the state.
- SEAK wild chum salmon indicator stocks (beyond escapement indices)
- SEAK summer-run coho indicator stock.
- Central SEAK coho indicator stock.
- Projects like Auke Creek weir where feasible.

Submitted by: SEAK

Region(s) Impacted: _x_AYK, _x_West, _x_SE, _x_Central

Impact : [Freshwater habitat changes]

Related impact info:

- Marine food web may be impacted especially for inshore waters.
- Largely driven by climate.

Gap Description:

- *Lack of understanding of the effects of changing climate on freshwater habitat quality, and salmon survival, growth and abundance.*
- Lack of understanding of how changing freshwater inputs affecting nearshore primary and secondary production, food webs, and predation.

Species:

- All Species

Lifecycle:

- Egg, alevin, fry, smolt, maturing, spawning

Why should we prioritize this, what are the factors that make this a priority?

- Freshwater inputs are likely a primary driver of early life history survival.
- Certain areas in SEAK have experienced dramatic change over past Century due to glacial recession and isostatic rebound.

Research Need / Project Idea:

- Tbd
- Tbd
- Tbd

Impact : [Hatchery/Wild Interactions]

Related impact info:

- Fresh water habitat changes-redd superimposition.
-

Gap Description:

- *Limited understanding of genetic changes sustained by wild salmonids due to H/W interactions, if adaptive consequences have occurred, and whether accumulated effects inhibit their capacity to keep pace with climate change.*
- There is currently little understanding of the relative reproductive success of enhanced salmon spawning in the wild.
- Little understanding of how captive breeding affects phenotypes and are there ways to minimize those changes.
- **Species:** All **Lifecycle:** spawning

Why should we prioritize this, what are the factors that make this a priority?

- Hatchery releases are large in SEAK and not likely to decrease in near future (trend is still increasing).
- This is an issue a lot of Alaskans care about.
- Tbd

Research Need / Project Idea:

- Fund existing research hatcheries (e.g., Little Port Walter) to carry out targeted studies.
- Updated sampling of areas in SEAK near new chum salmon release sites.
- Tbd

Impact : [Predation]

Related impact info:

- Marine food web
- Climate

Gap Description:

- *Limited understanding of current predation pressures on SEAK salmon.*
- Limited understanding of how increases in marine mammal abundance are impacting wild salmon stocks.
- Little understanding of whether hatchery releases are creating predator fields that may reduce wild stock survival.
- Little understanding of armhook squid populations and whether they are a major predator.

Species: All Species

Lifecycle: All

Why should we prioritize this, what are the factors that make this a priority?

- May greatly increase understanding of survival bottlenecks for some stocks.

Research Need / Project Idea:

- Estimate consumption of Chinook salmon adults by seals in Stikine and Taku estuaries and lower rivers.
- Continue investigating predation near hatchery release sites (ideally at new release sites before first release).
- Research to better understand population dynamics of Magister Armhook Squid in SEAK.

Submitted by: SEAK

Region(s) Impacted: AYK, West, SE, Central

Bonus Material



Pink Salmon

Pink salmon spawn in over 2,500 streams in the region. ADF&G maintains escapement indices based on peak aerial survey counts to 702 streams in the region, divided into three subregions.

Auke Creek weir (NOAA) allows for near complete sampling of downstream and upstream migrating juvenile and adult salmon.

Adult pink salmon counts obtained at a few additional stock assessment projects.

Genetic baseline under development.

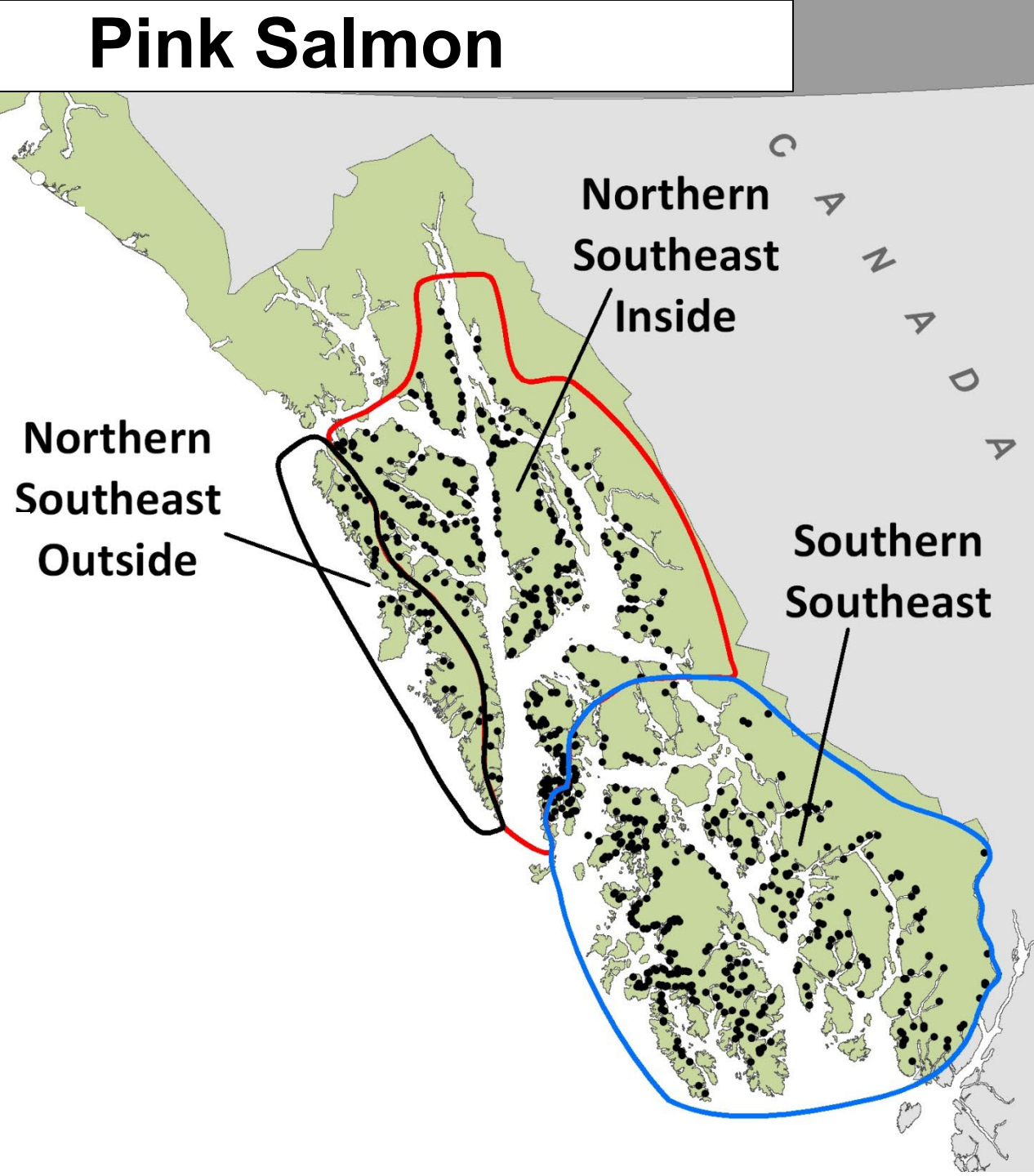
Inseason and preseason harvest forecasts.

Detailed harvest by statistical area, gear type.

Southeast Coastal Monitoring survey

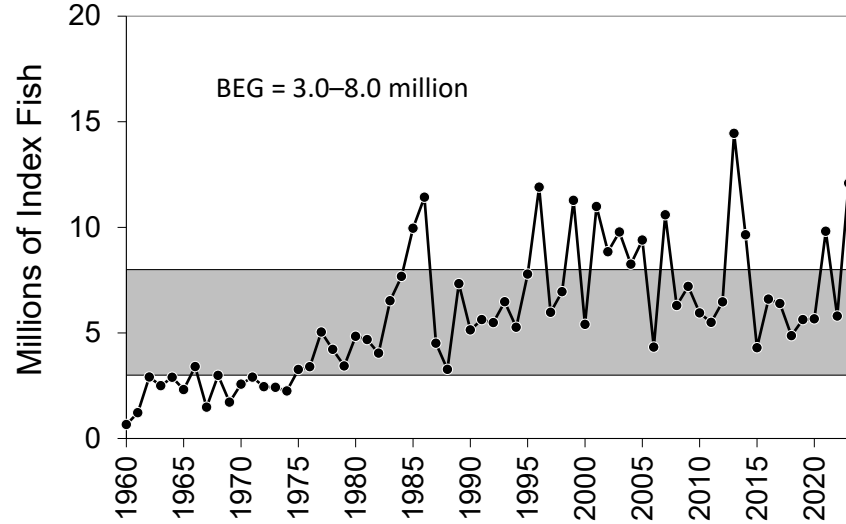
Juvenile abundance index.

Early marine diet, growth, timing.

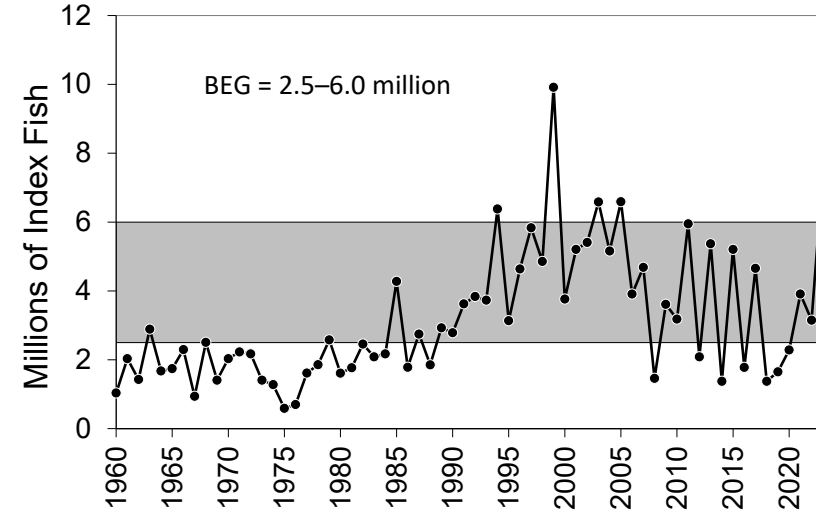


SEAK Pink Salmon Escapement Indices

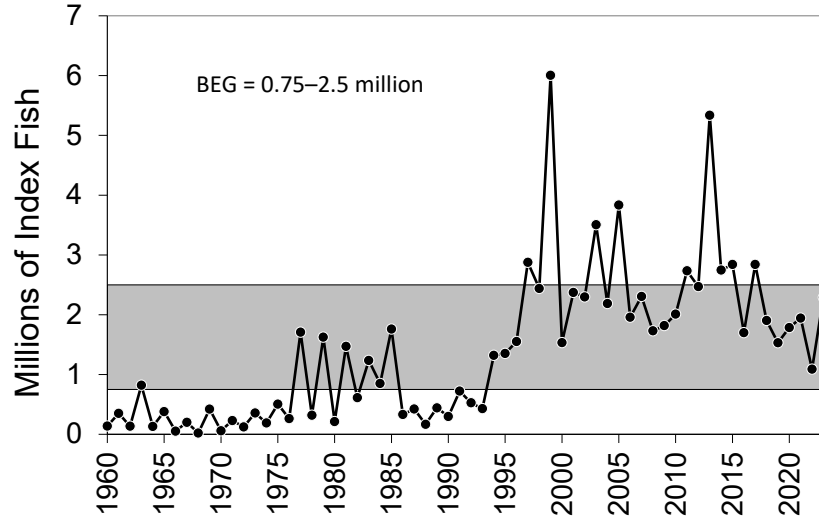
Southern Southeast (Aerial Survey)



Northern Southeast Inside (Aerial Survey)



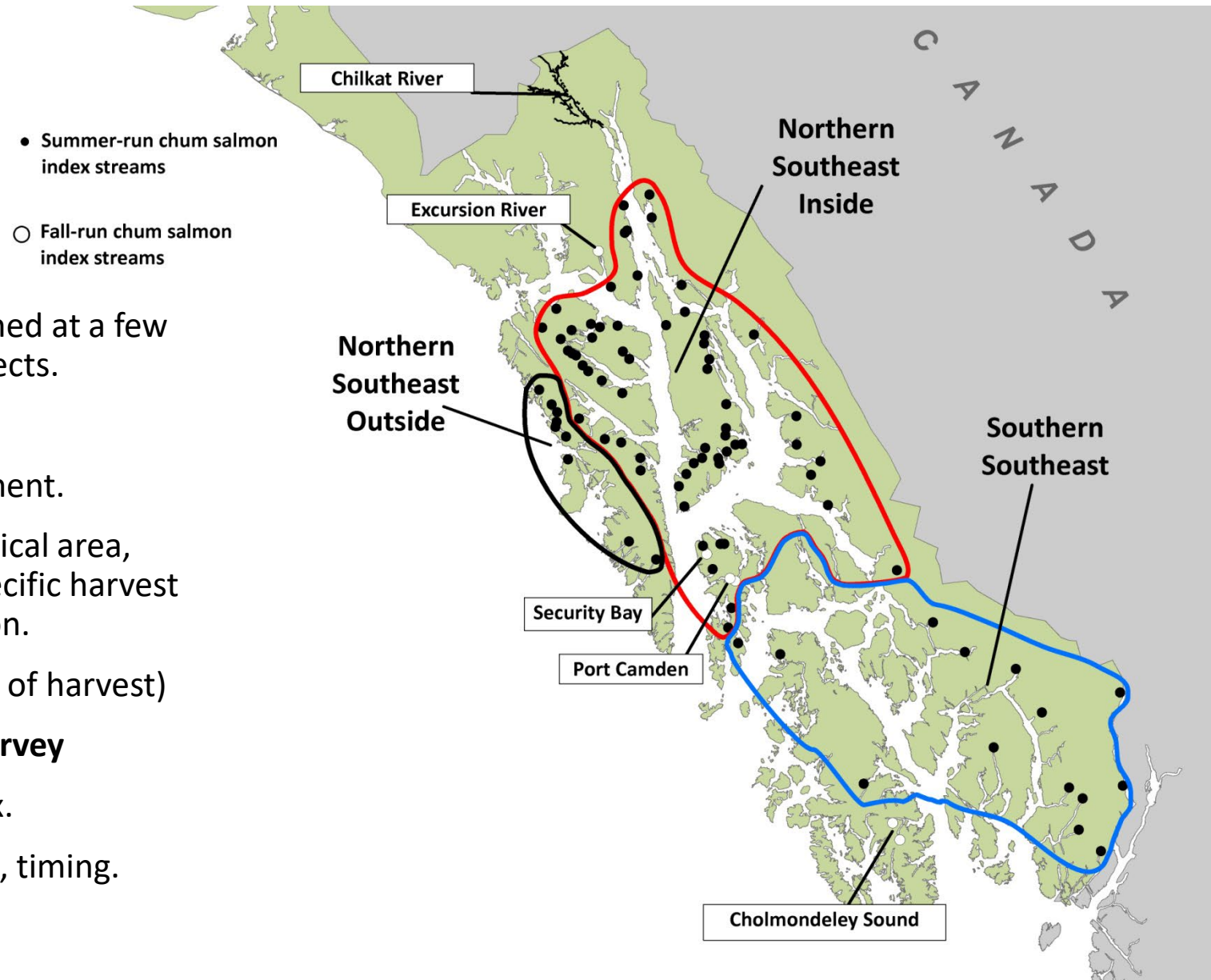
Northern Southeast Outside (Aerial Survey)



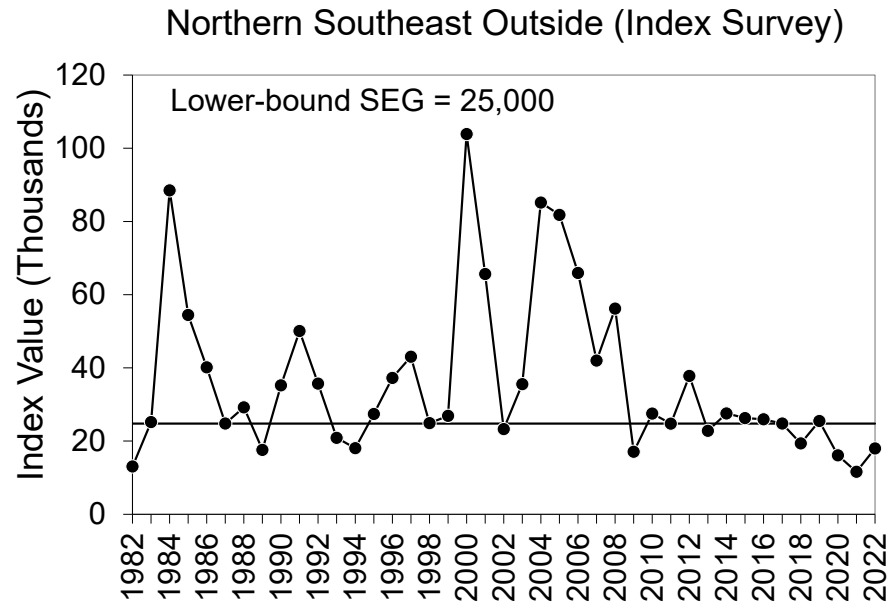
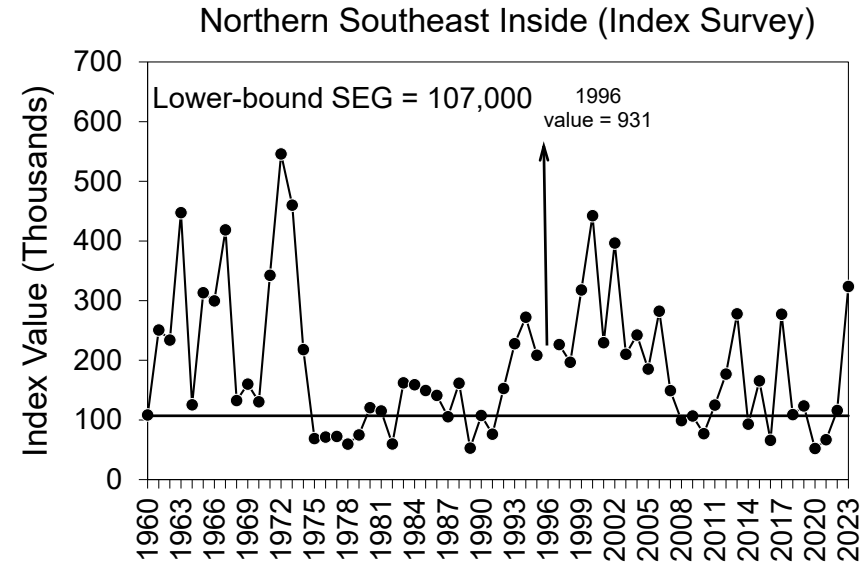
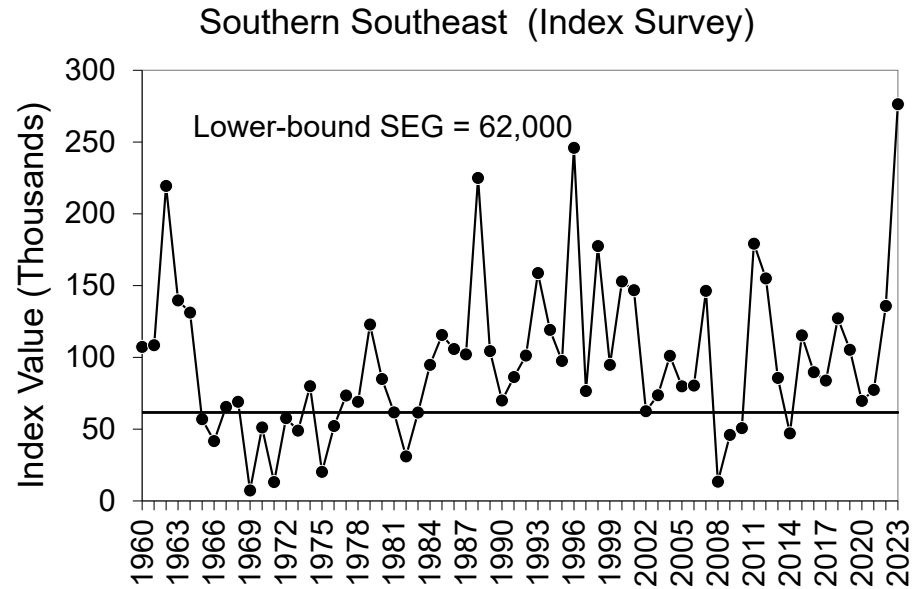
Chum Salmon

Chum salmon spawn in over 1,200 streams in the region. ADF&G maintains escapement indices based on peak survey counts to 87 summer-run and 5 fall-run stocks in the region.

- Adult chum salmon counts obtained at a few additional stock assessment projects.
- Chilkat Fish Wheels
- Genetic baseline under development.
- Detailed overall harvest by statistical area, gear type. Little current stock specific harvest for wild summer-run chum salmon.
- Large hatchery production (>85% of harvest)
- **Southeast Coastal Monitoring survey**
 - Juvenile abundance index.
 - Early marine diet, growth, timing.



SEAK Summer-run Chum Salmon Escapement Indices

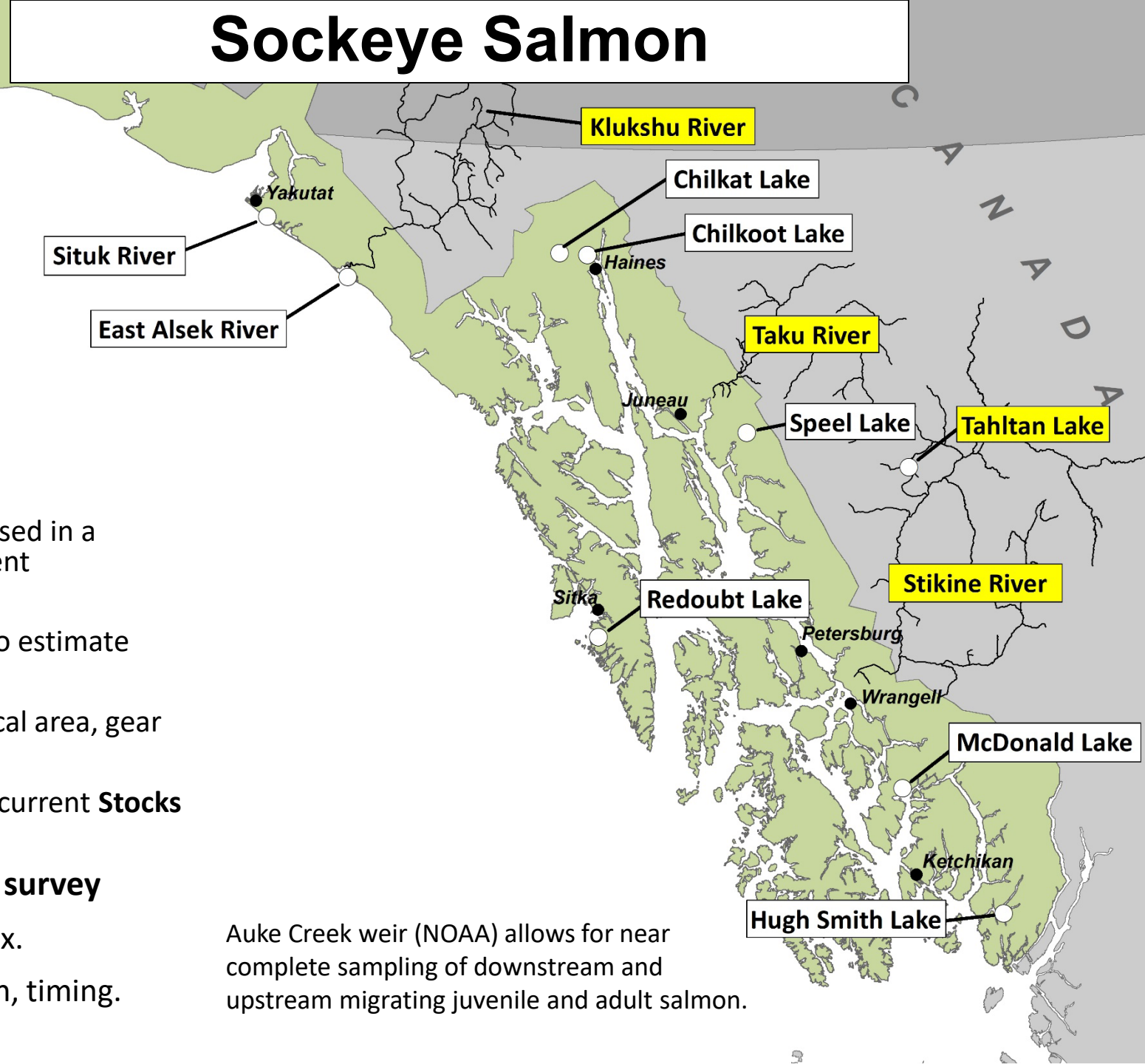


Sockeye Salmon

Sockeye salmon spawn in more than 200 systems in the region.

ADF&G has formal escapement goals for 12 stocks in the region. Escapement estimated through mark-recapture, DIDSON sonar, weirs, and foot survey counts. Additional projects have been run by, or in coordination with, SEAK Native communities and other agencies.

- Fully developed genetic baseline used in a variety of research and management applications.
- Genetic stock identification used to estimate harvests of many stocks.
- Detailed overall harvest by statistical area, gear type.
- McDonald Lake and Klukshu River current **Stocks of Concern**
- **Southeast Coastal Monitoring survey**
 - Juvenile abundance index.
 - Early marine diet, growth, timing.



Auke Creek weir (NOAA) allows for near complete sampling of downstream and upstream migrating juvenile and adult salmon.

Coho Salmon

Coho Salmon spawn in over 2,300 streams in Southeast Alaska

ADF&G has formal escapement goals for 13 stocks in the region. Escapement estimated through mark-recapture, weirs, and helicopter and foot survey counts.

Genetic baseline under development.

CWT Indicator Stocks:

Berners River, Auke creek, Hugh Smith Lake, Chilkat River, Taku River

CWT Indicator Stocks:

Juvenile marking/tagging

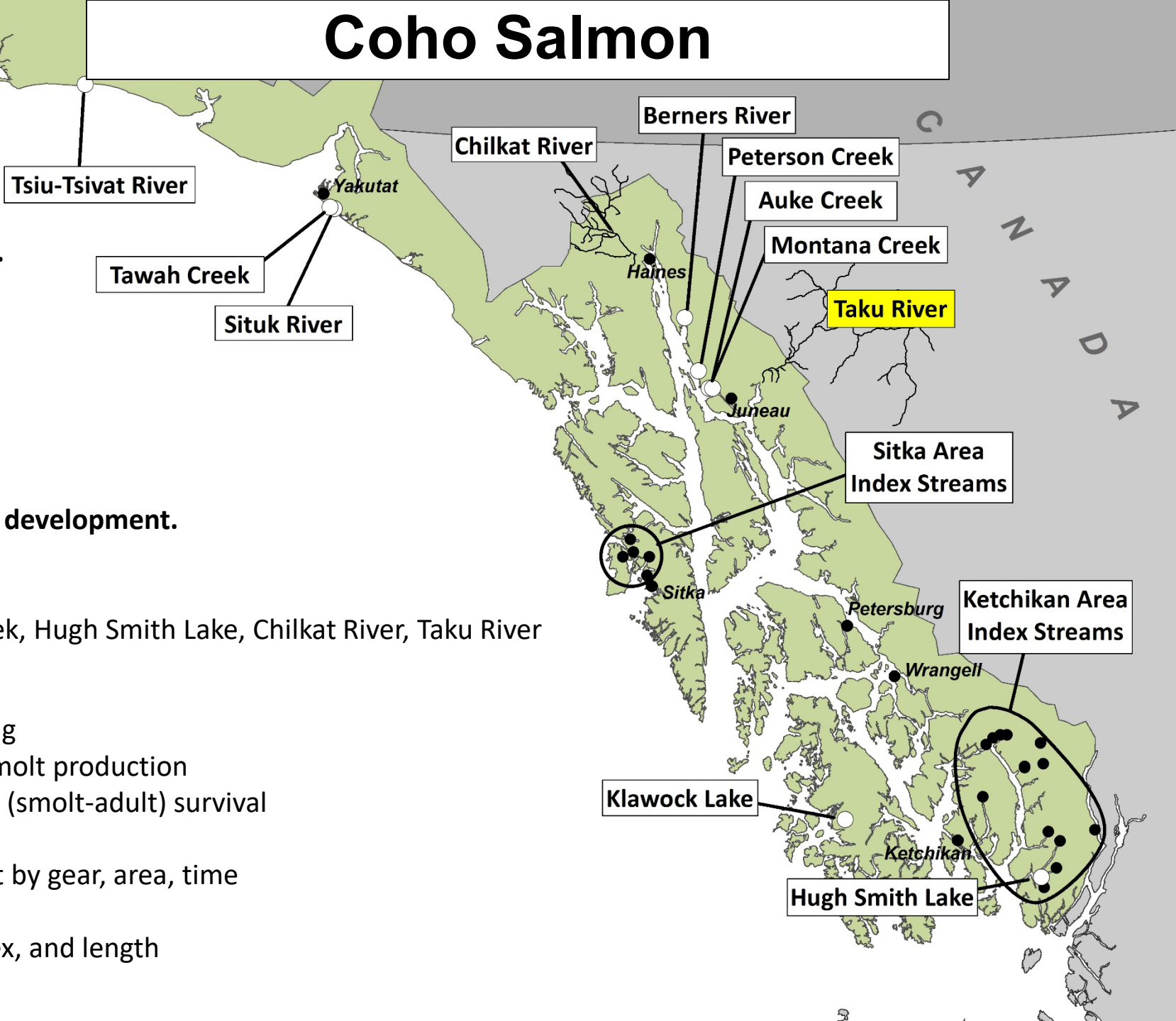
- Estimates of total smolt production
- Estimates of marine (smolt-adult) survival

Harvest Sampling

- Estimates of harvest by gear, area, time

Adult Escapement

- Estimates by age, sex, and length



Chinook Salmon

Chinook Salmon spawn in approximately 34 rivers in Southeast Alaska (only 1 island stock).

ADF&G has formal escapement goals for 11 stocks in the region. Escapement estimated through mark-recapture, weirs, and helicopter and foot survey counts.

- The majority (90%+) of the region's known wild stock production is monitored annually

Full Indicator Stocks:

Chilkat River, Taku River, Stikine River, Unuk River

Full Indicator Stocks:

Juvenile marking/tagging

- Estimates of total smolt production
- Estimates of marine (smolt-adult) survival
- Estimates of freshwater (overwinter) survival

Harvest Sampling

- Estimates of harvest by gear, area, time

Adult Escapement

- Estimates by age, sex, and length

Fully developed genetic baseline.

7 Stocks of Concern:

Chilkat River, Taku River, Stikine River, Andrew Creek
King Salmon River, Unuk River, Chickamin River

