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Annual Survey of Juvenile Salmon, Ecologically-Related Species, and Biophysical Factors in the Marine Waters of Southeastern Alaska, May–August 2016

by

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ABSTRACT

Juvenile Pacific salmon (*Oncorhynchus* spp.), ecologically-related species, and associated biophysical data were collected from the marine waters of the northern region of southeastern Alaska (SEAK) in 2016. This annual survey, conducted by the Southeast Coastal Monitoring (SECM) project, marks 20 consecutive years of systematically monitoring how juvenile salmon utilize marine ecosystems during a period of climate change. The survey was implemented to identify the relationships between year-class strength of juvenile salmon and biophysical parameters that influence their habitat use, marine growth, prey fields, predation, and stock interactions. Up to 13 stations were sampled monthly in epipelagic waters from May to August (total of 23 sampling days). Fish, zooplankton, surface water samples, and physical profile data were collected during daylight at each station using a surface rope trawl, bongo nets, a water sampler, and a conductivity-temperature-depth profiler. Surface (3-m) temperatures and salinities ranged from approximately 9 to 16 ºC and 16 to 32 PSU across inshore, strait, and coastal habitats for the four months. Integrated (top 20-m) temperatures and salinities ranged from approximately 8 to 15 ºC and 24 to 31 PSU, notably the warmest 20-m integrated temperatures recorded by the SECM project. A total of 72,073 fish and squid, representing 27 taxa, were captured in 89 rope trawl hauls fished from June to August. Juvenile salmon comprised approximately 49% of the catch. For all months and habitats, juvenile pink (*O. gorbuscha*), chum (*O. keta*), sockeye (*O. nerka*), and coho (*O. kisutch*) salmon occurred in 58-87% of the hauls, while juvenile Chinook salmon (*O. tshawytscha*) occurred in about 18% of the hauls. Abundance of juvenile salmon was high in 2016; peak CPUE occurred in June strait and coastal habitats. Coded-wire tags were recovered from 28 juvenile coho, that primarily originated from hatchery and wild stocks in SEAK sampled in the strait habitat; an additional 17 adipose-clipped juvenile coho and Chinook salmon without tags were present. The only non-Alaskan stocks were juvenile coho salmon recovered off Icy Point, one from the Solduc River, WA and the other from the Methow River, Washington. Of the juvenile salmon examined for otolith marks, Alaska enhanced stocks comprised 69% of the juvenile chum (503 of 726) and 18% of the juvenile sockeye salmon (107 of 489). Of the 96 potential predators of juvenile salmon, predation on juvenile salmon was observed in three of eight fish species examined. The long term seasonal time series of SECM juvenile salmon stock assessment and biophysical data is used in conjunction with basin-scale ecosystem metrics to annually forecast pink salmon harvest in SEAK. Long term seasonal monitoring of key stocks of juvenile salmon and associated ecologically-related species, including fish predators and prey, permits researchers to understand how growth, abundance, and interactions affect year-class strength of salmon in marine ecosystems during a period of rapid climate change.

INTRODUCTION

The Southeast Coastal Monitoring (SECM) project, an ecosystem study in the northern region of southeastern Alaska (SEAK), was initiated in 1997 to annually study the early marine ecology of Pacific salmon (*Oncorhynchus* spp.) and associated epipelagic ichthyofauna and to better understand effects of climate change on salmon production. Salmon are a keystone species in SEAK whose role in marine ecosystems remains poorly understood. Fluctuations in the survival of this important living marine resource have broad ecological and socio-economic implications for coastal localities throughout the Pacific Rim.

Relationships between climate shifts and production have impacted year-class strength of Pacific salmon throughout their distribution (Beamish et al. 2010a, b). In particular, climate variables such as temperature have been associated with freshwater production (Bryant 2009; Taylor 2008) and ocean production and survival of both wild and hatchery salmon (Wertheimer et al. 2001; Beauchamp et al. 2007). Biophysical attributes of climate may influence trophic linkages and lead to variable growth and survival of salmon (Francis et al. 1998; Brodeur et al. 2007; Coyle et al. 2011). However, research is lacking on the links between salmon production and climate variability, intra- and interspecific competition and carrying capacity, and biological interactions among stock groups (Beamish et al. 2010a). In addition, past research has not provided adequate time series data to explain these links (Pearcy 1997; Beamish et al. 2008). Increases in salmon production throughout the Pacific Rim in recent decades has elevated the need to understand the consequences of population changes and potential interactions on the growth, distribution, migratory rates, timing, and survival of all salmon species and stock groups (Rand et al. 2012). Furthermore, region-scale spatial effects that are important to salmon production (Pyper et al. 2005) may be linked to local dynamics in complex marine ecosystems like SEAK (Weingartner et al. 2008).

A goal of the SECM project is to identify mechanisms linking salmon production to climate change using a time series of synoptic data related to ocean conditions and salmon, including stock-specific life history characteristics. The SECM project obtains stock information from coded-wire tags (CWT; Jefferts et al. 1963) or otolith thermal marks (Hagen and Munk 1994; Courtney et al. 2000) from all five Pacific salmon species: pink (*O. gorbuscha*), chum (*O. keta*), sockeye (*O. nerka*), coho (*O. kisutch*), and Chinook (*O. tshawytscha*). Portions of wild and hatchery salmon stocks are tagged or marked prior to ocean entry by enhancement facilities or state and federal agencies in SEAK, Canada, and the Pacific Northwest states. Catches of these marked fish by the SECM project in the northern, southern, and coastal regions of SEAK have provided information on habitat use, migration rates, and timing (e.g., Orsi et al. 2004, 2007, 2008); in addition, interceptions in the regional common property fisheries have documented substantial contributions of enhanced fish to commercial harvests (White 2011). Therefore, examining trends in early marine ecology and potential interactions of these marked stock groups provides an opportunity to link increasing wild and hatchery salmon production to climate change (Ruggerone and Nielsen 2009; Rand et al. 2012 and papers in Special Volume).

Examining the extent of interactions between salmon stock groups and co-occurring species in marine ecosystems is also important with regard to carrying capacity, and should examine both “bottom-up” and “top-down” production controls (Miller et al. 2013). For example, increased hatchery production of juvenile chum salmon coincided with declines of some wild chum salmon stocks, suggesting the potential for negative stock interactions in the marine environment (Seeb et al. 2004; Reese et al. 2009). In SEAK, however, SECM and other studies have indicated that growth is not food limited and that stocks interact extensively with little negative impact (Bailey et al. 1975; Orsi et al. 2004; Sturdevant et al. 2004, 2012a).

Zooplankton prey fields are more likely to be cropped by the more abundant planktivorous forage fish, including walleye pollock (*Gadus chalcogrammus*) and Pacific herring (*Clupea pallasi*) (Orsi et al. 2004; Sigler and Csepp 2007), than by juvenile salmon. Seasonal and interannual changes in abundance of planktivorous jellyfish, another potential competitor with juvenile salmon, have been reported by SECM (Orsi et al. 2009). Therefore, monitoring abundance of jellyfish may be an important indicator of potential "bottom-up" trophic interactions (Purcell and Sturdevant 2001), particularly during periods of environmental change (Brodeur et al. 2008; Cieciel et al. 2009). Therefore, monitoring the composition, abundance, energetic content, and timing of zooplankton taxa with different life history strategies may permit the detection of climate-related changes in the seasonality and interannual abundance of prey fields (Coyle and Paul 1990; Park et al. 2004; Coyle et al. 2011; Fergusson et al. 2013, 2015, 2016). In contrast, "top-down" predation events can also influence salmon year-class strength (Sturdevant et al. 2009, 2012b, 2013). Highly abundant smaller juvenile salmon species, such as wild pink salmon, may be a predation buffer for less abundant, larger species, such as juvenile coho salmon (LaCroix et al. 2009; Weitkamp et al. 2011). These findings also stress the need to examine the entire epipelagic community in the context of trophic interactions (Cooney et al. 2001; Sturdevant et al. 2012b) and to compare ecological processes, community structure, and life history strategies among salmon production areas (Brodeur et al. 2007; Orsi et al. 2007, 2013).

In 2016, SECM sampling was conducted in the northern region of SEAK for the 20th consecutive year to continue annual ecosystem and climate monitoring, to document juvenile salmon abundance in relation to biophysical parameters, and to support models to forecast adult pink salmon returns. This document summarizes data collected by the SECM project in 2016 on juvenile salmon, ecologically-related species, and associated biophysical parameters. Subsets of the long term time series are examined in several recent documents (e.g., Fergusson et al. 2015, 2016; Orsi et al. 2015a, b, 2016a, b).

METHODS

Sampling was conducted in the northern region of SEAK monthly from May to August 2016. Spatially, sampling stations extended 250 km from inshore waters of the Alexander Archipelago along Chatham and Icy Straits to coastal waters 65 km offshore from Icy Point into the Gulf of Alaska (GOA), over the continental shelf break (Figure 1). At each station, the physical environment, zooplankton, and fish were sampled during daylight hours. Oceanographic sampling was conducted in May, while both oceanographic and trawl sampling were conducted June through August. The 12 m NOAA vessel R/V *Sashin* was used for sampling in May. The chartered fishing vessel, FV *Northwest Explorer* (*NWE*), a 52 m stern trawler with twin engines producing 1,800 HP, was used for sampling June through August.

Sampling stations (Table 1; Figure 1) were chosen to: 1) continue historical time series of biophysical data, 2) sample primary seaward migration corridors used by juvenile salmon, and 3) accommodate vessel logistics. Historical data existed for the inshore station and the four Icy Strait stations (e.g., Bruce et al. 1977; Jaenicke and Celewycz 1994; Orsi et al. 1997). The four Upper Chatham Strait stations were selected to intercept juvenile salmon entering Icy Strait from both the north and the south. To meet vessel sampling constraints, stations in strait habitat were approximately 3 or 6 km offshore, whereas stations in coastal habitat were approximately 7, 23, 40, and 65 km offshore, stations were also constrained to bottom depths > 75 m. Bottom depth at ABM was too shallow to permit trawling (Table 1).

Oceanographic sampling

The oceanographic data collected at each station consisted of one conductivity-temperature-depth profiler (CTD) cast, one Secchi depth, four water samples, one light reading, and one plankton tow. The CTD data were collected with a Sea-Bird[1] SBE 25 profiler deployed to 200 m or within 10 m of the bottom. A CTD cast was typically taken for each haul. The CTD profiles were used to determine the 3-m sea surface temperature (SST, °C) and salinity (PSU), the average 20-m integrated water column temperature and salinity, and the mixed layer depth (MLD, m). The 20-m water column depth bracketed typical seasonal pycnoclines, MLD, and the stratum fished by the surface trawl. The MLD established the active mixing layer and was defined as the depth where temperature was ≤ 0.2 °C colder than the water at 5 m (Kara et al. 2000). Secchi depths (m) were estimated as the disappearance depth of the white CTD top during deployment. Water samples for chlorophyll (µg/L) concentrations were taken with Niskin bottles at 0, 10, 20, and 30-m depths once at each station per month. Ambient light levels (W/m^2) were measured with a Li-Cor Model LI-250A light meter.

Zooplankton was sampled monthly with a double oblique bongo haul made at stations along the Icy Strait and Icy Point transects and at ABM (≤ 200 m or within 20 m of bottom) using a 60-cm diameter tandem frame with 333- and 505-µm meshes. General Oceanics Model 2031 flow meters were placed inside the bongo nets for calculation of water volumes filtered.

Zooplankton samples were immediately preserved in a 5% formalin-seawater solution. In the laboratory, displacement volumes (DV, ml), standing stock (DV/m^3), and density ($number/m^3$) were determined for various samples. Standing stock was calculated using DV and filtered water volumes. Detailed zooplankton species composition from the 333-µm samples was determined microscopically from subsamples obtained using a Folsom splitter. Densities were then estimated using the subsample counts, split fractions, and water volumes filtered. Percent total composition was summarized across species by major taxa, including small calanoid copepods (≤ 2.5 mm total length, TL), large calanoid copepods (> 2.5 mm TL), euphausiids (principally larval and juvenile stages), larvaceans, decapod larvae, hyperiid amphipods, chaetognaths, pteropods, and combined minor taxa.

Fish sampling

Fish sampling was accomplished with a Nordic 264 rope trawl modified to fish the surface water directly astern of the trawl vessel. The trawl was 184 m long and had a mouth opening of approximately 24 m wide by 30 m deep, with actual fishing dimensions of 18 m wide by 24 m deep (Sturdevant et al. 2012b). A pair of 3-m foam-filled Lite trawl doors, each weighing 544 kg (91 kg submerged), were used to spread the trawl open. Trawl mesh sizes from the jib lines aft to the cod end were 162.6 cm, 81.3 cm, 40.6 cm, 20.3 cm, 12.7 cm, and 10.1 cm over the 129.6-m meshed length of the rope trawl. A 6.1-m long, 0.8-cm knotless liner mesh was sewn into the cod end. The trawl also contained a small mesh panel of 10.2-cm mesh sewn along the jib lines on the top panel between the head rope and the 162.6-cm mesh to reduce loss of small fish. Two 50-kg chain-link weights were added to the corners of the foot rope as the trawl was deployed to maximize fishing depth. To keep the trawl head rope fishing at the surface, two clusters of three A-4 Polyform buoys (inflated to 0.75 m diameter and encased in knotted mesh bags) were clipped on the opposing corner wingtips of the head rope and one A-3 Polyform float

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[1]Reference to trade names does not imply endorsement by the Auke Bay Laboratories, National Marine Fisheries Service, NOAA Fisheries.

(inflated to 0.5 m diameter) was clipped into a mesh kite pocket in the center of the head rope with a third-wire unit to monitor the net spread. Two acoustic pingers (10 kHz, 132 dB) were attached to the corners of the head rope to deter porpoise interactions. The trawl was fished with approximately 150 m of 1.6-cm wire main warp attached to each door, a 9.1 m length of 1.6-cm TS-II Dyneema line trailing off the top and bottom of each trawl door (back strap). Each back strap was connected with a “G” hook and flat link to an 80-m parallel rigging system constructed of 1.6-cm TS-II Dyneema bridles. A marine mammal exclusion device (Dotson et al. 2010) was used inside the trawl when the Icy Point transect was trawled.

For each haul, the trawl was fished across a station for 20 min at approximately 1.5 m/sec (3 knots) to cover 1.9 km (1.0 nautical mile) with the exception of the offshore Icy Point stations which were fished for 30 min at approximately 1.5m/sec. Station coordinates were targeted as the midpoint of the trawl haul, and current, swell, and wind conditions usually dictated the setting direction. Twenty-eight hauls were scheduled in the strait habitat to meet sampling requirements for the forecasting model and to ensure that sufficient samples of marked juvenile salmon were obtained for interannual comparisons.

After each trawl haul, the fish were separated from the jellyfish, identified, enumerated, measured, labeled, bagged, and frozen. Jellyfish were identified to species when possible, counted, and total volume (including fragments) was measured to the nearest 0.1 liter (L) as a proxy for biomass. After the catch was sorted, all fish and squid were typically measured to the nearest mm fork length (FL) or mantle length. In instances of very large catches, all fish were counted, a subsample of each species (≤ 100) was processed, and excess fish were discarded. All Chinook and coho salmon were examined for missing adipose fins that could indicate the presence of implanted CWTs. Additionally, in the laboratory, all juvenile Chinook and coho salmon were screened with a magnetic detector and any CWTs detected were excised from the snouts. All tags were decoded and verified to determine the stock of origin.

Adult salmon captured in the trawl were identified, measured (FL, mm), weighed (g), and stomachs were frozen for diet analysis. In the laboratory, stomachs were weighed (0.1 g) and visually classified by percent fullness (0, 10, 25, 50, 75, 100, and distended). Stomach content weight was determined by subtracting the empty stomach weight from the full stomach weight. Feeding intensity was reported as percentage of fish with food in their guts. General prey composition was determined by visually estimating the contribution of major taxa to the nearest 10% of total volume, and the wet-weight contribution to the diets was calculated by multiplying the % by the total content weight (%W). Overall diets of each species were summarized by %W of major prey taxa. Whenever possible, fish prey was identified to species and FLs were measured.

In the laboratory, frozen individual juvenile salmon were weighed (0.1 g) and otoliths were removed from the chum and sockeye salmon. Mean lengths, weights, and residuals from a length-weight linear regression (condition residuals, CR) were computed for each species by locality or habitat and sampling month. To determine stock of origin, sagittal otoliths were extracted from the crania and preserved in 95% ethyl alcohol, then later mounted on slides, ground down to the primordia, and examined for potential thermal marks (Secor et al. 1992). Stock composition and growth trajectories of thermally marked fish were determined for each month and habitat.

RESULTS AND DISCUSSION

In 2016, 13 stations were sampled from Auke Bay to Icy Strait monthly from May to August, and four additional stations were sampled from Icy Point to 65 km offshore in the Gulf of Alaska monthly from June to August (Table 1; Figure 1). In total, data were collected from 89 rope trawl hauls, 102 CTD casts, 32 tandem bongo net samples, 38 surface water samples, 88 Secchi readings, and 70 ambient light measures during 23 days at-sea (Table 2, Appendix 1).

Oceanography

Overall, sea surface (3-m) temperature (SST) values ranged from 8.9 to 15.5 ºC from May to August and averaged 12.5 ºC while the integrated (20-m) temperature values ranged from 8.4 to 15.3 °C from May to August and averaged 11.0 °C (Table 3; Figure 2; Appendix 1). The integrated 20-m temperature values were the highest recorded by the SECM project. Seasonal SST and integrated 20-m temperature patterns were similar among habitats, with a peak in June or July. Monthly mean SSTs and integrated 20-m temperatures were lowest in the inshore and strait habitats and highest in the coastal habitat.

Surface (3-m) salinities ranged from 15.7 to 32.3 PSU from May to August and averaged 26.3 PSU while the integrated (top 20-m) salinity values ranged from 24.4 to 30.8 PSU from May to August and averaged 28.9 (Table 3; Figure 2; Appendix 1). Salinities were lowest in inshore habitat and highest in coastal habitat. Seasonal PSU values generally trended downward from May to August in inshore and strait habitats, whereas minimal seasonal variation occurred in coastal PSU values.

Water clarity depths ranged from 2 to 15 m and averaged 5.9 m (Appendix 1). The MLD ranged from 6 to 20 m and averaged 8.0 m. Thus, trawl sampling depths (~ 20 m) usually spanned a range of habitat conditions, including the active surface layer and the stable waters below the MLD. Ambient light measurements at each station ranged from 8 to 742 W/m^2, and averaged 222 W/m^2.

Chlorophyll concentrations ranged from 1.2 to 10.8 µg/L from June to August and averaged 1.3 µg/L for all depths (Table 4; Figure 3). In all habitats, chlorophyll concentrations were similar between the surface and 10-m depth samples and between the 20- and 30-m depth samples. Chlorophyll concentrations were highest in strait habitats and lowest in inshore and coastal habitats, with an overall peak in August for all habitats, perhaps indicative of a secondary phytoplankton bloom.

Zooplankton standing stock from bongo net hauls (333-µm mesh) ranged from 0.1 to 0.9 ml/m^3 from May to August and averaged 0.4 ml/m^3 (Table 5; Figure 4). Mean standing stock was highest in strait and inshore habitats and lowest in coastal habitats, and peaked in June in coastal and inshore habitats and peaked in August in strait habitat. Seasonal total density of zooplankton prey fields (333-µm mesh) at stations in Icy Strait ranged from 425 to 4,192 organisms/m^3 from May to August and averaged 1,580 organisms/m^3 (Table 5; Figure 5). Mean density was generally lowest in May and station variability was highest in July.

Catch composition

Jellyfish catches included four species (*Aequorea* sp., *Aurelia* sp., *Chrysaora melanaster*, and *Cyanea capillata*) and an "other" category (Figure 6). Total biomass (volume, L) of jellyfish ranged from 0 to 403 L per haul from June to August. Jellyfish biomass and species composition varied by month and habitat. In coastal habitat, the dominant species were *Aequorea* sp., *Aurelia* sp., and “other” (salps). In strait habitat, the dominant species were *Aequorea* sp. and *Cyanea capillata,* the biomass of these species increased from June to August.

In total, 72,073 fish and squid, representing 27 taxa, were captured in 89 rope trawl hauls in strait and coastal habitats (Table 6; Figures 7-8). Juvenile salmon comprised approximately 49% of the total fish catch and occurred more frequently in strait habitat than in coastal habitat. In general, adult salmon were most abundant in June and July compared to August. In the strait habitat, juvenile pink, chum, sockeye, and coho salmon occurred in 85-87% of the trawls, while juvenile Chinook salmon occurred in 19% of the hauls (Table 7). In contrast, in the coastal habitat, juvenile pink, chum, sockeye, and coho salmon occurred in 58-75% of the trawls, while juvenile Chinook salmon occurred in 17% of the hauls. In the strait habitat, catches of juvenile pink, chum, sockeye, and coho salmon peaked in June while catches of juvenile Chinook salmon peaked in August. In the coastal habitat, catches of juvenile pink, chum, sockeye, and Chinook salmon peaked in June while catches of juvenile coho salmon peaked in July. Catches of non-salmonids were relatively minor in strait and coastal habitats, with the exception of a large catch of walleye pollock larvae in the strait habitat in July and a large catch of Pacific herring (*Clupea pallasii*) in coastal habitat in July and strait habitat in August (Table 6).

Length, weight, and condition of juvenile salmon differed among species and months (Tables 8-12; Figures 9-11). Most species generally increased monthly in both length and weight, indicating growth despite the influx of additional stocks with varied times of saltwater entry. From June to August, mean FLs of juvenile salmon increased from approximately 79 to 245 mm for pink; 80 to 292 mm for chum; 57 to 229 mm for sockeye; 110 to 364 mm for coho; and 151 to 293 mm for Chinook salmon. Mean weights of juvenile salmon increased monthly from 4 to 163 g for pink; 7 to 238 g for chum; 1.4 to 134 g for sockeye; 31 to 661 g for coho; and 117 to 384 for Chinook salmon. FLs and weights of sockeye were stable in August on account of the influx of newly emergent zero-check fish. Mean FLs, weights, and conditions of juvenile salmon were fairly consistent in both strait and coastal habitats. In strait habitat, the CRs for all species of juvenile salmon were above 0.0, while in the coastal habitat the CRs were below 0.0.

All juvenile coho (n = 2,293) and juvenile and immature Chinook (n = 29) salmon were scanned (either visually onboard the vessel or electronically in the laboratory) for the presence of CWTs. Stock-specific information was obtained from 28 CWT recoveries from a total of 45 juvenile coho salmon lacking the adipose fin and one with the adipose fin intact (Table 13). The juvenile Chinook salmon missing the adipose fin was not tagged. All but two of the 28 CWT coho salmon originated from hatchery and wild stocks in the northern region of SEAK: the two exceptions originated from the Solduc River, Washington and the Methow River, Washington. The two non-Alaska stocks were recovered in the coastal habitat along the Icy Point transect, where there were seven additional adipose-clipped juvenile salmon untagged which may have originated from Pacific Northwest (PNW) hatcheries that are mandated to adipose-clip but not necessarily tag all fish released, a practice not used in Alaska. Migration rates of the 28 CWT juvenile coho salmon ranged from 0.7 to 20.3 km/day and averaged 4.0 km/day.

Stock-specific information was also obtained from recoveries of otolith-marked hatchery chum and sockeye salmon, using the same individuals that were subsampled for weight and condition. Releases of these species from SEAK enhancement facilities are commonly mass-marked and not tagged. These facilities include: Douglas Island Pink and Chum Hatchery (DIPAC), Northern Southeast Regional Aquaculture Association (NSRAA), Southern Southeast Regional Aquaculture Association (SSRAA), and Armstrong Keta Incorporated (AKI). A total of 1,319 juvenile salmon were examined for thermal marks: 723 chum salmon and 596 sockeye salmon (Tables 14-15; Figures 12-13).

For juvenile chum salmon, stock-specific information was derived from a subsample of 726 from the 8,437 fish caught, representing 10% of the catch (Tables 6 and 14). Of all the chum salmon otoliths examined, 503 (69%) were marked by hatcheries in SEAK and 223 (31%) were not marked. Of the marked fish, 209 (42%) were from NSRAA, 157 (31%) were from DIPAC, 88 (17%) were from SSRAA, and 49 (10%) were from AKI. Hatchery chum salmon catch composition shifted monthly through Icy Strait, with northern stocks such as DIPAC peaking in June, central stocks such as NSRAA peaking in July, and southern stocks such as SSRAA peaking in August (Figure 12).

For juvenile sockeye salmon, stock-specific information was derived from a subsample of 596 from the 1,985 fish caught, representing 30% of the catch (Tables 6 and 15). Of all the sockeye salmon otoliths examined, 107 (18%) were marked and 489 (82%) were not marked. Of the marked fish, 95 (89%) were from Speel Arm, SEAK, 4 (4%) were from Sweetheart Lake, 6 (6%) were from Tahltan Lake/Stikine River, British Columbia, 1 (1%) was from Tatsumenie Lake, and 1 (1%) was from Tatsumenie Lake early release (Table 15). Hatchery sockeye salmon catch composition peaked in June, with very few hatchery fish caught in July and August (Figure 13).

Stomachs of 96 potential predators of juvenile salmon were examined onboard from a suite of eight fish species. Of the fish examined, 42% were feeding and juvenile salmon were identified as prey in the stomachs of adult chum (4.9%) and coho (8.3%) salmon in strait habitat and spiny dogfish (12.5%) in coastal habitat (Table 17). Diet compositions differed by month and habitat (Figures 14-15). For feeding fish in strait habitat, the planktivorous adult chum, pink, and sockeye salmon had very diverse diets that included gelatinous zooplankton and decapod larvae as well as fish. Piscivorous immature Chinook and adult coho salmon consumed fish (juvenile salmon, herring, pollock larvae, and sandlance (Ammodytes hexapterus)) and decapod larve while Dolly varden (*Salvelinus malma*) diets consisted of 100% fish (Myctophidae and walleye pollock larvae). For feeding fish in coastal habitat, the planktivorous adult chum, sockeye, and pink salmon and spiny dogfish (*Squalus acanthias*) consumed gelatinous prey and decapod larvae, additionally, pink salmon and dogfish also consumed herring, Hexagrammidae larvae, and juvenile salmon. Piscivorous adult coho salmon and sablefish (*Anoplopoma fimbria*) consumed herring and Osmeridae larvae.

Summary

This document summarizes SECM data collected on juvenile salmon, ecologically-related species, and associated biophysical parameters collected from May to August in 2016 in the northern region of SEAK. These data continue to be used in conjunction with basin-scale data to develop forecast models and predictive tools for pink salmon and Chinook salmon production in SEAK (e.g., Orsi et al. 2012, Orsi 2016a; Wertheimer et al. 2014, 2015) and to explore year-class strength relationships for other species such as Chinook salmon (Orsi et al. 2013, 2016b) and sablefish (Martinson et al. 2013; Yasumiishi et al. 2014, 2015b). Subsets of the 19-year long-term time series are also examined in recent ecosystem documents (Fergusson and Orsi 2015, 2016; Orsi et al. 2014, 2015b, 2016c; Yasumiishi et al. 2014, 2015a, 2015b). Comparing annual effects of biophysical parameters to long term mean values permits climate-related changes in marine conditions to be detected. Long term monitoring of key stocks of juvenile salmon, on seasonal and interannual time scales, will permit researchers to understand how growth, abundance, and ecological interactions affect year-class strength of salmon in SEAK and to better understand their role in North Pacific marine ecosystems.

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Table 1: Localities and coordinates of thirteen stations sampled by the Southeast Coastal Monitoring (SECM) project in the marine waters of the northern region of southeastern Alaska, May–August 2016. Transect and station positions are shown in Figure 1.

Station[a]	Latitude N	Longitude W	Offshore (km)	Between adjacent station (km)	Bottom depth (m)
ABM	58°22.00’	134°40.00’	0.5	–	60
UCA	58°04.57’	135°00.08’	3.2	3.2	400
UCB	58°06.22’	135°00.91’	6.4	3.2	100
UCC	58°07.95’	135°01.69’	6.4	3.2	100
UCD	58°09.64’	135°02.52’	3.2	3.2	200
ISA	58°13.25’	135°31.76’	3.2	3.2	128
ISB	58°14.22’	135°29.26’	6.4	3.2	200
ISC	58°15.28’	135°26.65’	6.4	3.2	200
ISD	58°16.38’	135°23.98’	3.2	3.2	234
IPA	58°20.12’	137°07.16’	6.9	16.8	160
IPB	58°12.71’	137°16.96’	23.4	16.8	130
IPC	58°05.28’	137°26.75’	40.2	16.8	150
IPD	58°53.50’	137°42.60’	65.0	24.8	1300

[a] ABM = Auke Bay Monitor; UC* = Upper Chatham Strait; IS* = Icy Strait; IP* = Icy Point

Table 2: Numbers and types of samples collected by habitat and month, May–August 2016.

			Data Collection Type			
Dates (days)	Vessel	Habitat	Rope trawl[a]	CTD[b]	Oblique bongo[c]	Chlorophyll & nutrients[d]
05/24-05/25 (2)	R/V SASHIN	Inshore	0	1	1	1
		Strait	0	8	4	0
		Coastal	0	0	0	0
06/25-07/01 (7)	F/V NW Explorer	Inshore	0	1	1	1
		Strait	21	21	4	8
		Coastal	4	4	4	4
07/27-08/02 (7)	F/V NW Explorer	Inshore	0	1	1	1
		Strait	28	28	4	8
		Coastal	4	4	4	2
08/23-08/29 (7)	F/V NW Explorer	Inshore	0	1	1	1
		Strait	28	29	4	8
		Coastal	4	4	4	4

[a] 20-min hauls with Nordic 264 surface trawl 18m wide by 24m deep

[b] To 200m or within 10m of the bottom

[c] 60-cm frame, 505- & 333-µm mesh, double oblique tows down to & up from 200m or within 20m of bottom.

[d] chlorophyll and nutrients are from surface seawater samples.

Table 3: Mean surface (3m) temperature (°C) and salinity (PSU) collected monthly at stations during SECM surveys, May–August 2016. n = number of station visits.

	May			June			July			August		
Station[a]	n	Temp	Salinity	n	Temp	Salinity	n	Temp	Salinity	n	Temp	Salinity
ABM	1	9.2	-	1	15.5	17.3	1	12.5	16.8	1	13.6	17.4
IPA	-	-	-	1	13.6	31.4	1	14.5	31.8	1	14.7	31.5
IPB	-	-	-	1	13.7	31.5	1	14.6	32.0	1	14.0	31.5
IPC	-	-	-	1	12.5	31.6	1	14.3	32.2	1	15.3	32.0
IPD	-	-	-	1	12.8	32.3	1	14.3	32.1	1	15.4	32.0
ISA	1	9.4	29.8	3	10.1	30.1	4	11.2	28.0	5	11.3	26.9
ISB	1	9.4	29.8	4	11.8	28.4	4	12.7	25.2	4	11.9	25.9
ISC	1	9.3	23.0	3	11.8	28.1	4	13.3	23.4	4	12.5	25.2
ISD	1	-	-	3	12.2	27.8	4	13.4	23.5	4	12.2	26.0
UCA	1	9.3	29.6	2	12.9	29.2	3	13.3	22.4	3	13.2	20.4
UCB	1	9.0	29.8	2	13.0	27.7	3	13.0	24.8	3	12.6	20.8
UCC	1	10.0	29.2	2	12.8	26.5	3	13.4	23.8	3	13.4	20.1
UCD	1	9.7	29.6	2	12.7	27.2	3	13.2	23.8	3	13.6	17.1

[a]ABM = Auke Bay Monitor; UC* = Upper Chatham Strait; IS* = Icy Strait; IP* = Icy Point

Table 4: Chlorophyll (Chl) and phaeopigment (Phaeo) concentrations from 200-ml surface samples collected from May–August 2016.

	May		June		July		August	
Station[a]	Chl	Phaeo	Chl	Phaeo	Chl	Phaeo	Chl	Phaeo
ABM	-	-	0.61	0.38	0.29	0.35	1.03	0.34
IPA	-	-	0.97	0.54	1.62	0.47	1.08	0.59
IPB	-	-	1.41	0.47	0.61	0.13	1.58	0.85
IPC	-	-	1.25	0.57	0.45	0.11	0.57	0.18
IPD	-	-	0.52	0.14	0.21	0.05	0.29	0.08
ISA	-	-	0.06	0.04	1.36	0.51	4.32	0.87
ISB	-	-	0.44	0.13	0.99	0.55	5.86	1.06
ISC	-	-	0.04	0.05	0.82	0.48	2.48	0.87
ISD	-	-	2.61	0.97	1.07	0.61	2.13	0.69
UCA	-	-	2.41	0.59	1.03	0.67	0.45	0.32
UCB	-	-	1.32	0.48	1.42	0.92	0.70	0.46
UCC	-	-	1.84	0.51	1.33	0.97	1.00	0.79
UCD	-	-	2.08	0.62	1.13	0.98	1.18	0.64

[a]ABM = Auke Bay Monitor; UC* = Upper Chatham Strait; IS* = Icy Strait; IP* = Icy Point

Table 5: Zooplankton displacement volumes (DV, ml), standing stock (DV/m3), and total density (number/m3) from double oblique bongo hauls from monthly stations, May–August 2016. Standing stock (ml/m3) is computed using flowmeter readings to determine water volume filtered. A 1 ml zooplankton volume approximates 1 g biomass. Dash indicates no data.

	May				June				July				August			
Month	Depth (m)	DV	DV/m^3	Total density	Depth (m)	DV	DV/m^3	Total density	Depth (m)	DV	DV/m^3	Total density	Depth (m)	DV	DV/m^3	Total density
ABM	38	20	0.2	—	40	40	0.6	—	38	25	0.4	—	40	10	0.1	—
IPA	—	—	—	—	158	110	0.4	—	146	60	0.3	—	148	70	0.3	—
IPB	—	—	—	—	108	75	0.5	—	111	45	0.3	—	110	12	0.1	—
IPC	—	—	—	—	117	40	0.2	—	118	75	0.4	—	118	16	0.1	—
IPD	—	—	—	—	202	25	0.1	—	201	105	0.3	—	203	45	0.2	—
ISA	57	25	0.3	425.4	78	75	0.5	2533.4	77	45	0.4	821.0	83	50	0.4	746.2
ISB	174	185	0.7	—	170	175	0.7	1198.8	162	125	0.5	4044.7	175	160	0.9	4192.0
ISC	201	145	0.5	790.2	200	150	0.5	805.8	202	230	0.5	2001.5	201	160	0.4	1191.5
ISD	220	120	0.5	855.9	200	185	0.8	1149.8	203	180	0.5	1703.1	201	190	0.9	1393.8

[a]ABM = Auke Bay Monitor; UC* = Upper Chatham Strait; IS* = Icy Strait; IP* = Icy Point

Table 6: Salmonid and non-salmonid catches from rope trawl hauls in strait (n = 86) and coastal (n = 12) habitats, June–August 2016. Dash indicates no samples. See Table 2 for sampling effort by month and habitat. Catches were not adjusted for standard 20-min trawl durations or vessel calibrations.

		Strait			Coastal		
Species	*Scientific name*	June	July	August	June	July	August
Salmonids							
Pink (juvenile)	*Oncorhynchus gorbuscha*	13401	7640	940	363	77	16
Chum (juvenile)	*Oncorhynchus keta*	4145	3173	761	330	24	4
Coho (juvenile)	*Oncorhynchus kisutch*	1247	445	519	18	51	13
Sockeye (juvenile)	*Oncorhynchus nerka*	961	457	512	41	11	3
Chum (adult)	*Oncorhynchus keta*	18	10	4	0	1	2
Chinook (juvenile)	*Oncorhynchus tshawytscha*	9	1	13	2	0	0
Pink (adult)	*Oncorhynchus gorbuscha*	5	3	0	1	2	2
Chinook (imm.)	*Oncorhynchus tshawytscha*	3	1	0	0	0	0
Coho (adult)	*Oncorhynchus kisutch*	2	8	4	0	0	1
Dolly Varden	*Salvelinus malma*	1	0	0	0	0	0
Sockeye (adult)	*Oncorhynchus nerka*	0	3	0	3	0	1
Steelhead	*Oncorhynchus mykiss*	0	0	0	1	0	0
Salmonid subtotals		**19792**	**11741**	**2753**	**759**	**166**	**42**
Non-salmonids							
Walleye pollock larvae	*Gadus chalcogramma*	8169	2	7	3	0	0
Pacific herring	*Clupea pallasii*	872	20	20808	1	5294	4
Soft sculpin	*Gilbertidia sigalutes*	16	1	1	0	0	0
Crested sculpin	*Blepsias bilobus*	10	29	16	0	0	0
Wolf-eel	*Anarrhichthys ocellatus*	4	25	7	1	0	0
Pacific sandfish	*Trichodon trichodon*	3	0	0	0	0	0
Prowfish	*Zaprora silenus*	3	5	2	3	1	0
Smooth lumpsucker	*Aptocyclus ventricosus*	3	0	1	0	0	0
Walleye pollock	*Gadus chalcogramma*	3	7	2	2	0	0
Hexagrammidae	*Hexagrammos spp.*	2	0	0	402	0	0
Shiner perch	*Cymatogaster aggregata*	2	0	0	0	0	0
Capelin	*Mallotus villosus*	1	0	0	0	0	0

Species	*Scientific name*	Strait June	Strait July	Strait August	Coastal June	Coastal July	Coastal August
Salmon shark	*Lamna ditropis*	1	0	0	0	0	0
3 spine stickleback	*Gasterosteus aculeatus*	0	0	1	0	0	0
Lingcod	*Ophiodon elongatus*	0	0	0	1	0	0
Pacific saury	*Cololabis saira*	0	0	0	0	0	82
Ragfish (juvenile)	*Icosteus aenigmaticus*	0	0	0	0	0	2
Sablefish (juvenile)	*Anoplopoma fimbria*	0	0	0	1	4	102
Sebastes spp.	Sebastes spp.	0	0	0	56	741	1
Spiny dogfish	*Squalus acanthias*	0	0	0	34	0	0
Squid	Gonatidae	0	0	1	11	9	30
Unknown larvae	Teseostei	0	1	6	0	4	0
Non-salmonid subtotals		**9089**	**90**	**20852**	**515**	**6053**	**221**

Table 7: Frequency of occurrence of monthly salmonid and non-salmonid catches from rope trawl hauls in strait (n=86) and coastal (n=12) habitats, June–August 2016. Percent frequency of occurrence is shown in parentheses. Dash indicates no samples.

		Strait				Coastal			
Common name	Scientific name	June	July	August	(%)	June	July	August	(%)
Salmonids									
Chum (juvenile)	*Oncorhynchus keta*	21	26	28	87	3	3	3	75
Pink (juveniles)	*O. gorbuscha*	21	25	27	85	3	2	3	67
Sockeye (juveniles)	*O. nerka*	21	25	28	86	3	2	2	58
Coho (juveniles)	*O. kisutch*	20	28	27	87	3	2	3	67
Chinook (juveniles)	*O. tshawytscha*	6	1	9	19	2	0	0	17
Chum (adult)	*O. keta*	6	6	4	19	0	1	1	17
Chinook (immature)	*O. tshawytscha*	3	1	0	5	0	0	0	0
Pink (adult)	*O. gorbuscha*	3	2	0	6	1	2	1	33
Coho (adult)	*O. kisutch*	2	5	4	13	0	0	1	8
Dolly Varden	*Salvelinus malma*	1	0	0	1	0	0	0	0
Sockeye (adult)	*O. nerka*	0	3	0	3	2	0	1	25
Steelhead	*O. mykiss*	0	0	0	0	1	0	0	8
Non-salmonids									
Pacific herring	*Clupea pallasii*	15	11	14	47	1	1	1	25
Crested sculpin	*Blepsias bilobus*	8	17	14	45	0	0	0	0
Walleye pollock larvae	*Gadus chalcogramma*	7	2	6	17	1	0	0	8
Soft sculpin	*Gilbertidia sigalutes*	6	1	1	9	0	0	0	0
Wolf-eel	*Anarrhichthys ocellatus*	4	14	5	27	1	0	0	8
Pacific sandfish	*Trichodon trichodon*	3	0	0	3	0	0	0	0
Prowfish	*Zaprora silenus*	3	3	2	9	2	1	0	25
Walleye pollock	*Gadus chalcogramma*	3	5	2	12	1	0	0	8
Hexagrammidae	Hexagrammidae	2	0	0	2	2	0	0	17
Smooth lumpsucker	*Aptocyclus ventricosus*	2	0	1	3	0	0	0	0
Capelin	*Mallotus villosus*	1	0	0	1	0	0	0	0
Salmon shark	*Lamna ditropis*	1	0	0	1	0	0	0	0

		Strait				Coastal			
Common name	Scientific name	June	July	August	(%)	June	July	August	(%)
Shiner perch	*Cymatogaster aggregata*	1	0	0	1	0	0	0	0
3 spine stickleback	*Gasterosteus aculeatus*	0	0	1	1	0	0	0	0
Lingcod	*Ophiodon elongatus*	0	0	0	0	1	0	0	8
Pacific saury	*Cololabis saira*	0	0	0	0	0	0	1	8
Ragfish (juvenile)	*Icosteus aenigmaticus*	0	0	0	0	0	0	2	17
Sablefish (juvenile)	*Anoplopoma fimbria*	0	0	0	0	1	2	2	42
Sebastes sp.	*Sebastes spp.*	0	0	0	0	1	3	1	42
Spiny dogfish	*Squalus acanthias*	0	0	0	0	3	0	0	25
Squid	Gonatidae	0	0	1	1	4	2	1	58
Unknown larvae	Teleostei	0	1	1	2	0	1	0	8

Table 8: Length (mm, fork), weight (g), and condition residuals (CR) from length-weight regression analysis of juvenile pink salmon captured in during SECM surveys, June–August 2016.

		June				July				August			
Locality	Factor	*n*	range	mean	se	*n*	range	mean	se	*n*	range	mean	se
Upper Chatham Strait	Length	514	82-169	114	0.6	615	95-217	155	0.7	246	125-240	190	1.3
	Weight	299	4.8-48.1	15.7	0.4	400	8.3-106.6	41.3	0.8	245	17.5-163.4	73.4	1.7
	CR	299	-0.16-0.25	0.05	0.00	400	-0.16-0.22	0.04	0.00	245	-0.21-0.17	0.03	0.00
Icy Strait	Length	724	79-193	117	0.5	674	103-215	155	0.6	544	124-245	190	0.8
	Weight	425	4.3-32.7	15.9	0.3	415	16.7-106.5	41.0	0.6	434	17.0-159.5	74.2	1.2
	CR	425	-0.27-0.28	-0.02	0.00	415	-0.24-0.21	0.05	0.00	434	-0.18-0.22	0.04	0.00
Icy Point	Length	205	79-180	116	1.0	77	100-170	140	1.6	16	168-197	184	2.0
	Weight	153	6.9-62.1	16.0	0.7	50	13.2-44.2	28.2	1.0	16	44.4-75.6	61.0	2.5
	CR	153	-0.26-0.22	-0.01	0.01	50	-0.17-0.22	-0.01	0.01	16	-0.10-0.05	-0.03	0.01

Table 9: Length (mm, fork), weight (g), and condition residuals (CR) from length-weight regression analysis of juvenile chum salmon captured in during SECM surveys, June–August 2016.

		June				July				August			
Locality	Factor	*n*	range	mean	se	*n*	range	mean	se	*n*	range	mean	se
Upper	Length	591	88-175	124	0.6	626	112-223	155	0.7	464	110-245	193	1.0
Chatham	Weight	384	6.6-62.9	20.9	0.4	403	14.1-120.0	42.8	0.8	386	19.9-174.1	84.0	1.5
Strait	CR	384	-0.17-0.25	0.04	0.00	403	-0.47-0.46	0.06	0.00	386	-0.15-2.04	0.07	0.01
Icy	Length	437	80-170	122	0.7	534	102-220	157	0.9	245	140-292	196	1.6
Strait	Weight	305	6.6-52.0	19.8	0.5	349	13.4-111.7	44.7	1.0	209	25.6-237.5	88.0	2.5
	CR	305	-0.15-0.21	0.06	0.00	349	-0.21-0.19	0.03	0.00	209	-0.17-0.23	0.06	0.00
Icy	Length	195	100-185	124	0.8	23	125-192	153	3.8	4	139-214	175	15.8
Point	Weight	144	9.3-68.5	19.4	0.6	23	19.1-75.4	36.6	3.1	4	22.8-98.8	54.2	16.3
	CR	144	-0.19-0.23	-0.02	0.01	23	-0.09-0.10	-0.01	0.01	4	-0.15–0.03	-0.10	0.02

Table 10: Length (mm, fork), weight (g), and condition residuals (CR) from length-weight regression analysis of juvenile sockeye salmon captured in during SECM surveys, June–August 2016.

		June				July				August			
Locality	Factor	*n*	range	mean	se	*n*	range	mean	se	*n*	range	mean	se
Upper Chatham Strait	Length	463	82-188	135	0.7	263	68-198	133	1.5	289	89-229	140	1.4
	Weight	340	5.6-75.9	27.8	0.5	261	2.6-90.0	28.0	0.9	288	6.5-134.0	31.4	1.1
	CR	340	-0.32-0.19	0.04	0.00	261	-1.61-2.98	0.07	0.02	288	-1.37-1.42	0.01	0.01
Icy Strait	Length	127	94-180	132	1.5	158	57-212	134	2.3	190	108-220	146	1.6
	Weight	127	8.3-61.9	25.9	0.9	150	1.4-105.5	29.4	1.5	165	11.3-118.3	35.5	1.5
	CR	127	-0.18-0.20	0.04	0.01	150	-0.18-0.19	0.05	0.01	165	-0.18-0.18	0.01	0.01
Icy Point	Length	41	83-196	131	4.7	12	97-172	152	5.5	3	157-166	160	2.8
	Weight	28	4.6-83.1	31.1	4.3	11	9.0-47.4	36.5	3.1	3	37.6-43.8	40.2	1.9
	CR	28	-0.17-0.12	-0.03	0.01	11	-0.16-0.08	-0.03	0.02	3	-0.08–0.04	-0.06	0.01

Table 11: Length (mm, fork), weight (g), and condition residuals (CR) from length-weight regression analysis of juvenile coho salmon captured in during SECM surveys, June–August 2016.

		June				July				August			
Locality	Factor	*n*	range	mean	se	*n*	range	mean	se	*n*	range	mean	se
Upper Chatham Strait	Length	540	110-260	194	0.8	347	161-314	244	1.2	175	173-363	278	1.8
	Weight	346	30.8-224.8	94.5	1.4	320	52.1-469.2	188.0	3.1	175	55.8-661.3	277.6	5.7
	CR	346	-0.32-0.27	0.06	0.00	320	-0.31-0.28	0.05	0.00	175	-0.16-0.28	0.03	0.01
Icy Strait	Length	134	145-258	183	1.7	98	160-297	236	2.9	342	165-459	283	1.3
	Weight	134	35.1-206.2	74.5	2.2	95	50.7-293.6	171.2	5.8	56	57.7-547.8	303.0	11.4
	CR	134	-0.17-0.18	0.02	0.01	95	-0.18-0.48	0.05	0.01	56	-0.16-0.21	0.04	0.01
Icy Point	Length	18	173-266	231	5.8	51	217-330	266	3.0	13	263-326	291	7.0
	Weight	18	52.1-251.4	165.9	12.7	27	138.7-381.5	259.4	9.5	13	215.0-510.9	336.4	25.3
	CR	18	-0.12-0.21	0.08	0.02	27	-0.20-0.36	0.10	0.02	13	-0.03-0.38	0.08	0.03

Table 12: Length (mm, fork), weight (g), and condition residuals (CR) from length-weight regression analysis of juvenile Chinook salmon captured in during SECM surveys, June–August 2016.

		June				July				August			
Locality	Factor	*n*	range	mean	se	*n*	range	mean	se	*n*	range	mean	se
Upper	Length	5	151-250	202	15.8	1	265	—	—	5	257-293	281	6.8
Chatham	Weight	5	46.3-199.5	125.0	24.5	1	296.7	—	—	5	254.5-383.5	326.5	23.4
Strait	CR	5	0.05-0.20	0.12	0.04	1	0.16	—	—	5	0.02-0.11	0.06	0.02
Icy	Length	4	183-262	216	18.5	—	—	—	—	8	211-290	256	8.8
Strait	Weight	4	77.2-268.5	150.9	45.5	—	—	—	—	8	117.6-346.6	231.6	27.4
	CR	4	-0.10-0.10	0.04	0.05	—	—	—	—	8	-0.11-0.07	-0.01	0.02
Icy	Length	2	225-292	258	33.5	—	—	—	—	—	—	—	—
Point	Weight	2	154.5-310.5	232.5	78.0	—	—	—	—	—	—	—	—
	CR	2	-0.11-0.04	-0.04	0.08	—	—	—	—	—	—	—	—

Table 13: Coded-wire tag (CWT) data from coho and Chinook salmon lacking an adipose fin, recovered from June–August, 2016.

		Release Information						Recovery Information						
Species	CWT code	Brood year	Agency	Locality	Date	FL (mm)	W (g)	Station	2015 date	FL (mm)	W (g)	Age	Days since release	Distance traveled (km)
						June								
Chinook	No tag													
Coho	040372	2014	ADFG	Berners R., AK (Wild)	6 /8 /16	100		ISC	6/27	192	84	1.0	19	90
Coho	043298	2014	ADFG	Auke Creek, AK (Wild)	6 /14/16	118	15.8	ISC	6/26	208	119	1.0	12	70
Coho	043298	2014	ADFG	Auke Creek, AK (Wild)	6 /14/16	118	15.8	ISC	6/26	194	96	1.0	12	70
Coho	043298	2014	ADFG	Auke Creek, AK (Wild)	6 /14/16	118	15.8	ISD	6/26	202	116	1.0	12	70
Coho	043298	2014	ADFG	Auke Creek, AK (Wild)	6 /14/16	118	15.8	ISD	6/26	205	108	1.0	12	70
Coho	043298	2014	ADFG	Auke Creek, AK (Wild)	6 /14/16	118	15.8	ISD	6/27	198	102	1.0	13	75
Coho	043891	2014	AKI	Port Armstrong, AK	5 /15/16		29.4	ISB	6/27	195	86	1.0	43	235
Coho	043966	2014	ADFG	Taku River, AK (Wild)	5 /24/16	101	10.3	UCA	6/30	179	66	1.0	37	105
Coho	043983	2014	NSRAA	Kasnyku Bay, AK	5 /20/16		21.6	ISC	6/26	197	84	1.0	37	130
Coho	043993	2014	NSRAA	Kasnyku Bay, AK	5 /20/16		21.6	ISB	6/27	199	101	1.0	38	135
Coho	044065	2014	NSRAA	Kasnyku Bay, AK	4 /25/16		22.4	ISC	6/27	185	67	1.0	63	130
Coho	044293	2014	DIPAC	Gastineau Channel, AK	5 /20/16		35.5	UCC	6/28	184	60	1.0	38	70
Coho	044318	2014	DIPAC	Thane net pens, AK	5 /16/16		27.3	ISC	6/27	203	99	1.0	42	90
Coho	044318	2014	DIPAC	Thane net pens, AK	5 /16/16		27.3	ISB	6/30	206	103	1.0	45	90
Coho	636865	2014	WDFW	Solduc River	4 /11/16	144	34.9	IPB	6/29	255	234	1.0	79	1600
Coho	No tag							ISB	6/25	232	159			
Coho	No tag							ISD	6/26	201	90			
Coho	No tag							ISB	6/27	198	86			
Coho	No tag							ISC	6/27	192	91			
Coho	No tag							ISC	6/27	193	80			
Coho	No tag							ISC	6/27	186	69			
Coho	No tag							IPC	6/29	260	226			
Coho	No tag							IPA	6/29	266	251			
Coho	No tag							UCB	6/30	179	66			
						July								
Coho	041209	2014	ADFG	Berners R., AK (Wild)	5 /24/16	100		ISD	7/28	246	203	1.0	65	90
Coho	043298	2014	ADFG	Auke Creek, AK (Wild)	6 /14/16	118	15.77	ISA	7/28	272	242	1.0	44	65
Coho	043891	2014	AKI	Port Armstrong, AK	5 /15/16		29.43	ISD	7/29	272	237	1.0	75	235
Coho	043891	2014	AKI	Port Armstrong, AK	5 /15/16		29.43	IPB	7/30	265	324	1.0	76	500

Coho	No tag							ISC	7/28	260	230			
Coho	No tag							ISD	7/29	232	157			
Coho	No tag							IPB	7/30	289	244			
Coho	No tag							IPB	7/30	278	259			
Coho	No tag							IPB	7/30	266	287			
Coho	No tag							IPA	7/30	287	295			
Coho	No tag							UCB	7/31	282	288			
August														
Coho	041209	2014	ADFG	Berners R., AK (Wild)	5 /24/16	100		ISC	8/23	273	230	1.0	91	90
Coho	043970	2014	ADFG	Chilkat R., AK (Wild)	5 /13/16	91	8.00	UCD	8/27	273	258	1.0	106	120
Coho	043970	2014	ADFG	Chilkat R., AK (Wild)	5 /13/16	91	8.00	UCD	8/28	257	243	1.0	107	120
Coho	043983	2014	NSRAA	Kasnyku Bay, AK	5 /20/16		21.56	ISD	8/26	300	322	1.0	98	130
Coho	043983	2014	NSRAA	Kasnyku Bay, AK	5 /20/16		21.56	UCC	8/27	321	377	1.0	99	110
Coho	043993	2014	NSRAA	Kasnyku Bay, AK	5 /20/16		21.56	ISD	8/26	289	307	1.0	98	130
Coho	044292	2014	DIPAC	Gastineau Channel, AK	5 /20/16		35.53	UCA	8/28	329	492	1.0	100	76
Coho	044318	2014	DIPAC	Thane net pens, AK	5 /16/16		27.25	UCC	8/27	322	422	1.0	103	70
Coho	190426	2014	YAKA	Methow River	5 /3/16	131	24.10	IPB	8/24	265	329	1.0	113	1670
Coho	No tag	2014						UCC	8/28	331	534			
Coho	No tag	2014						UCA	8/28	304	375			

Table 14: Information on 718 juvenile chum salmon released from regional enhancement facility sites and captured during SECM surveys (June–August 2016). Factor includes length (mm, fork), weight (g), and condition residuals (CR) from length-weight regression analysis are reported for each stock group. LL in Agency-Release site denotes a late, large release.

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
DIPAC													
Amalga/Boat Harbor													
Upper	Length	7	104-129	119	3.2	4	159-182	172	5.1	4	172-212	191	8.8
Chatham	Weight	7	11.3-22.8	17.1	1.4	4	45.4-69.5	56.2	6.3	4	61.2-112.4	82.4	12.2
Strait	CR	7	0.01-0.10	0.05	0.01	4	-0.05-0.14	0.09	0.04	4	0.05-0.18	0.12	0.03
Icy	Length	1	119	-	-	-	-	-	-	-	-	-	-
Strait	Weight	1	17.2	-	-	-	-	-	-	-	-	-	-
	CR	1	0.07	-	-	-	-	-	-	-	-	-	-
Icy	Length	7	103-137	123	4.7	5	151-197	165	8.3	6	189-209	201	3.5
Point	Weight	7	10.9-25.8	19.3	2.2	5	38.8-85.2	51	8.7	6	76.2-108.6	93.2	5.6
	CR	7	-0.04-0.18	0.05	0.03	5	0.04-0.13	0.09	0.01	6	0.02-0.17	0.1	0.02
Total	Length	15	103-137	121	2.6	9	151-197	168	5	10	172-212	197	4.2
	Weight	15	10.9-25.8	18.1	1.2	9	38.8-85.2	53.3	5.4	10	61.2-112.4	88.9	5.8
	CR	15	-0.04-0.18	0.05	0.01	9	-0.05-0.14	0.09	0.02	10	0.02-0.18	0.11	0.02
Gastineau/Limestone/Thane													
Upper	Length	26	95-147	120	2.6	3	141-185	162	12.7	2	208-218	213	5
Chatham	Weight	26	8.1-33.9	18.4	1.3	3	31.1-68.7	47.4	11.1	2	97.3-114.8	106.1	8.8
Strait	CR	26	0.00-0.14	0.07	0.01	3	0.02-0.13	0.07	0.03	2	0.05-0.06	0.05	0.01
Icy	Length	5	112-132	125	3.5	1	184	-	-	-	-	-	-
Strait	Weight	5	14.1-23.6	19.6	1.6	1	64.262	-	-	-	-	-	-
	CR	5	-0.08-0.13	0.02	0.04	1	0.02	-	-	-	-	-	-

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
Icy Point	Length	66	91-150	123	1.3	10	134-184	160	5.3	5	199-211	203	2.1
	Weight	66	7.0-34.8	19.4	0.6	10	27.3-68.8	45.2	4	5	75.7-112.8	92.8	6.5
	CR	66	-0.15-0.2	0.06	0.01	10	-0.04-0.22	0.08	0.03	5	-0.07-0.18	0.07	0.04
Total	Length	97	91-150	122	1.2	14	134-185	162	4.7	7	199-218	206	2.6
	Weight	97	7.0-34.8	19.1	0.6	14	27.3-68.8	47	3.7	7	75.7-114.8	96.6	5.5
	CR	97	-0.15-0.2	0.06	0.01	14	-0.04-0.22	0.07	0.02	7	-0.07-0.18	0.06	0.03
NSRAA													
Bear Cove													
Icy Point (Total)	Length	4	113-138	128	5.4	-	-	-	-	-	-	-	-
	Weight	4	12.0-22.9	18.8	2.4	-	-	-	-	-	-	-	-
	CR	4	-0.13–0.08	-0.11	0.01	-	-	-	-	-	-	-	-
Bear Cove LL													
Icy Point (Total)	Length	1	141	-	-	-	-	-	-	-	-	-	-
	Weight	1	26.183	-	-	-	-	-	-	-	-	-	-
	CR	1	-0.05	-	-	-	-	-	-	-	-	-	-
Crawfish Inlet													
Icy Point (Total)	Length	3	141-150	146	2.6	-	-	-	-	-	-	-	-
	Weight	3	30.4-34.1	31.7	1.2	-	-	-	-	-	-	-	-
	CR	3	-0.01-0.1	0.04	0.03	-	-	-	-	-	-	-	-
Crawfish Inlet LL													
Icy Point (Total)	Length	1	141	-	-	-	-	-	-	-	-	-	-
	Weight	1	30.713	-	-	-	-	-	-	-	-	-	-
	CR	1	0.11	-	-	-	-	-	-	-	-	-	-

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
						Deep Inlet							
Icy	Length	10	111-142	125	2.6	-	-	-	-	-	-	-	-
Point	Weight	10	12.3-27.2	17.8	1.3	-	-	-	-	-	-	-	-
(Total)	CR	10	-0.13-0.01	-0.06	0.01	-	-	-	-	-	-	-	-
						Deep Inlet L/L							
Icy	Length	1	114	-	-	-	-	-	-	-	-	-	-
Strait	Weight	1	15.77	-	-	-	-	-	-	-	-	-	-
(Total)	CR	1	0.11	-	-	-	-	-	-	-	-	-	-
						Kasnyku Bay							
Upper	Length	3	122-141	133	5.7	1	176	-	-	2	200-210	205	5
Chatham	Weight	3	20.1-26.6	24.4	2.2	1	61.16	-	-	2	89.9-101.5	95.7	5.8
Strait	CR	3	-0.03-0.14	0.06	0.05	1	0.11	-	-	2	0.06-0.09	0.07	0.02
Icy	Length	7	120-144	133	3	1	170	-	-	1	216	-	-
Strait	Weight	7	16.3-28.6	23.4	1.4	1	49.1	-	-	1	122.5	-	-
	CR	7	-0.09-0.09	0.02	0.02	1	0	-	-	1	0.16	-	-
Icy	Length	10	120-144	133	2.5	2	170-176	173	3	3	200-216	209	4.7
Point	Weight	10	16.3-28.6	23.7	1.1	2	49.1-61.2	55.1	6	3	89.9-122.5	104.6	9.5
	CR	10	-0.09-0.14	0.03	0.02	2	0-0.11	0.05	0.06	3	0.06-0.16	0.1	0.03
Total	Length	3	122-141	133	5.7	1	176	-	-	2	200-210	205	5
	Weight	3	20.1-26.6	24.4	2.2	1	61.16	-	-	2	89.9-101.5	95.7	5.8
	CR	3	-0.03-0.14	0.06	0.05	1	0.11	-	-	2	0.06-0.09	0.07	0.02
						Kasnyku Bay L/L							
Upper	Length	1	114	-	-	2	177-184	180	3.5	-	-	-	-
Chatham	Weight	1	14.15	-	-	2	60.9-64.1	62.5	1.6	-	-	-	-
Strait	CR	1	0.01	-	-	2	0.01-0.08	0.05	0.04	-	-	-	-

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
Icy Strait	Length	1	137	-	-	-	-	-	-	2	170-196	183	13
	Weight	1	25.12	-	-	-	-	-	-	2	55.0-81.2	68.1	13.1
	CR	1	0	-	-	-	-	-	-	2	0.05-0.11	0.08	0.03
Icy Point	Length	2	114-137	126	11.5	2	177-184	180	3.5	2	170-196	183	13
	Weight	2	14.1-25.1	19.6	5.5	2	60.9-64.1	62.5	1.6	2	55.0-81.2	68.1	13.1
	CR	2	0.00-0.01	0	0	2	0.01-0.08	0.05	0.04	2	0.05-0.11	0.08	0.03
Total	Length	1	114	-	-	2	177-184	180	3.5	-	-	-	-
	Weight	1	14.15	-	-	2	60.9-64.1	62.5	1.6	-	-	-	-
	CR	1	0.01	-	-	2	0.01-0.08	0.05	0.04	-	-	-	-
						Southeast Cove							
Upper Chatham Strait	Length	2	120-127	124	3.5	29	124-174	156	2.2	6	146-215	183	9.7
	Weight	2	18.7-20.2	19.5	0.8	29	17.0-51.8	38	1.5	6	25.8-104.2	64	11.6
	CR	2	0.02-0.12	0.07	0.05	29	-0.1-0.08	-0.01	0.01	6	-0.17-0.08	-0.04	0.04
Icy Strait	Length	-	-	-	-	7	136-164	150	4.4	3	139-182	162	12.5
	Weight	-	-	-	-	7	24.9-45.5	34.1	3	3	22.8-55.9	39.3	9.6
	CR	-	-	-	-	7	-0.06-0.03	0	0.01	3	-0.14–0.09	-0.12	0.02
Icy Point	Length	1	118	-	-	21	138-163	151	1.7	24	157-203	178	2.4
	Weight	1	15.53	-	-	21	25.9-46.2	35.3	1.4	24	36.7-95.4	58.3	2.8
	CR	1	-0.01	-	-	21	-0.16-0.18	0.03	0.01	24	-0.14-0.1	0.01	0.01
Total	Length	3	118-127	122	2.7	57	124-174	153	1.4	33	139-215	177	2.7
	Weight	3	15.5-20.2	18.2	1.4	57	17.0-51.8	36.5	1	33	22.8-104.2	57.6	3.1
	CR	3	-0.01-0.12	0.05	0.04	57	-0.16-0.18	0.01	0.01	33	-0.17-0.1	-0.01	0.01

Locality	Factor	June n	June range	June mean	June se	July n	July range	July mean	July se	August n	August range	August mean	August se
						Southeast Cove LL							
Upper	Length	1	130	-	-	19	124-163	145	2.8	8	155-183	170	3.7
Chatham	Weight	1	20.99	-	-	19	17.6-45.0	31.2	1.9	8	35.7-66.3	50.9	4
Strait	CR	1	-0.01	-	-	19	-0.1-0.1	0.01	0.01	8	-0.1-0.07	0.02	0.02
Icy	Length	-	-	-	-	11	124-169	150	3.6	17	159-203	179	2.8
Strait	Weight	-	-	-	-	11	17.8-52.4	35.2	2.7	17	38.0-86.5	60.8	3.2
	CR	-	-	-	-	11	-0.11-0.09	0.02	0.02	17	-0.13-0.13	0.02	0.02
Icy	Length	1	130	-	-	30	124-169	147	2.2	25	155-203	176	2.4
Point	Weight	1	20.99	-	-	30	17.6-52.4	32.6	1.6	25	35.7-86.5	57.6	2.7
	CR	1	-0.01	-	-	30	-0.11-0.1	0.01	0.01	25	-0.13-0.13	0.02	0.01
Total	Length	1	130	-	-	19	124-163	145	2.8	8	155-183	170	3.7
	Weight	1	20.99	-	-	19	17.6-45.0	31.2	1.9	8	35.7-66.3	50.9	4
	CR	1	-0.01	-	-	19	-0.1-0.1	0.01	0.01	8	-0.1-0.07	0.02	0.02
						Takatz Bay							
Upper	Length	4	122-145	134	5.7	2	151-167	159	8	-	-	-	-
Chatham	Weight	4	17.5-30.5	23.6	3	2	40.0-46.8	43.4	3.4	-	-	-	-
Strait	CR	4	-0.05-0.03	0	0.02	2	0.00-0.16	0.08	0.08	-	-	-	-
Icy	Length	2	129-137	133	4	2	150-153	152	1.5	-	-	-	-
Strait	Weight	2	23.0-24.6	23.8	0.8	2	38.1-38.8	38.5	0.4	-	-	-	-
	CR	2	-0.02-0.1	0.04	0.06	2	0.09-0.13	0.11	0.02	-	-	-	-
Icy	Length	6	122-145	134	3.8	4	150-167	155	4	-	-	-	-
Point	Weight	6	17.5-30.5	23.7	1.9	4	38.1-46.8	40.9	2	-	-	-	-
	CR	6	-0.05-0.1	0.02	0.02	4	0.00-0.16	0.1	0.03	-	-	-	-

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
Total	Length	4	122-145	134	5.7	2	151-167	159	8	-	-	-	-
	Weight	4	17.5-30.5	23.6	3	2	40.0-46.8	43.4	3.4	-	-	-	-
	CR	4	-0.05-0.03	0	0.02	2	0.00-0.16	0.08	0.08	-	-	-	-
Takatz Bay LL													
Upper Chatham Strait	Length	2	119-151	135	16	1	187	-	-	-	-	-	-
	Weight	2	17.1-39.9	28.5	11.4	1	71.09	-	-	-	-	-	-
	CR	2	0.06-0.16	0.11	0.05	1	0.07	-	-	-	-	-	-
Icy Strait	Length	1	126	-	-	1	174	-	-	1	209	-	-
	Weight	1	18.94	-	-	1	61.34	-	-	1	107	-	-
	CR	1	-0.02	-	-	1	0.14	-	-	1	0.13	-	-
Icy Point	Length	3	119-151	132	9.7	2	174-187	180	6.5	1	209	-	-
	Weight	3	17.1-39.9	25.3	7.3	2	61.3-71.1	66.2	4.9	1	107	-	-
	CR	3	-0.02-0.16	0.07	0.05	2	0.07-0.14	0.11	0.04	1	0.13	-	-
Total	Length	2	119-151	135	16	1	187	-	-	-	-	-	-
	Weight	2	17.1-39.9	28.5	11.4	1	71.09	-	-	-	-	-	-
	CR	2	0.06-0.16	0.11	0.05	1	0.07	-	-	-	-	-	-
AKI													
Port Armstrong													
Upper Chatham Strait	Length	11	130-163	148	3.1	8	166-217	192	5.6	6	210-270	237	9.3
	Weight	11	21.6-45.9	33.8	2.4	8	45.1-109.1	75.6	7.3	6	112.6-222.6	154.3	18
	CR	11	-0.03-0.15	0.05	0.02	8	-0.05-0.08	0.02	0.02	6	0.01-0.16	0.08	0.02
Icy Strait	Length	1	157	-	-	-	-	-	-	-	-	-	-
	Weight	1	42.438	-	-	-	-	-	-	-	-	-	-
	CR	1	0.1	-	-	-	-	-	-	-	-	-	-

Locality	Factor	June n	June range	June mean	June se	July n	July range	July mean	July se	August n	August range	August mean	August se
Icy	Length	14	134-155	146	1.6	6	161-202	181	6.2	3	224-228	226	1.2
Point	Weight	14	24.8-35.4	30.3	1	6	38.1-79.6	60.7	6.2	3	113.5-130.2	121.4	4.8
	CR	14	-0.09-0.06	0	0.01	6	-0.09-0.06	-0.01	0.03	3	-0.03-0.05	0.01	0.02
		26	130-163	147	1.6	14	161-217	187	4.3	9	210-270	233	6.3
Total	Length	26	21.6-45.9	32.3	1.2	14	38.1-109.1	69.2	5.2	9	112.6-222.6	143.4	12.9
	Weight	26	-0.09-0.15	0.02	0.01	14	-0.09-0.08	0	0.01	9	-0.03-0.16	0.06	0.02
	CR	11	130-163	148	3.1	8	166-217	192	5.6	6	210-270	237	9.3
SSRAA													
Anita Bay													
Upper	Length	-	-	-	-	3	183-185	184	0.6	7	184-233	216	6.8
Chatham	Weight	-	-	-	-	3	59.0-67.6	64.7	2.8	7	62.2-155.2	120.3	12.6
Strait	CR	-	-	-	-	3	-0.05-0.07	0.02	0.04	7	-0.02-0.2	0.1	0.02
Icy	Length	-	-	-	-	-	-	-	-	1	214	-	-
Strait	Weight	-	-	-	-	-	-	-	-	1	98.802	-	-
	CR	-	-	-	-	-	-	-	-	1	-0.03	-	-
Icy	Length	-	-	-	-	9	152-197	175	5.3	6	198-228	213	4.7
Point	Weight	-	-	-	-	9	35.5-84.3	58.5	5.5	6	84.4-152.5	109.7	9.8
	CR	-	-	-	-	9	0.01-0.10	0.06	0.01	6	0.02-0.21	0.08	0.03
Total	Length	-	-	-	-	12	152-197	177	4.1	14	184-233	215	3.8
	Weight	-	-	-	-	12	35.5-84.3	60	4.2	14	62.2-155.2	114.2	7.5
	CR	-	-	-	-	12	-0.05-0.1	0.05	0.01	14	-0.03-0.21	0.08	0.02

Locality	Factor	June n	June range	June mean	June se	July n	July range	July mean	July se	August n	August range	August mean	August se
							Burnett Inlet						
Upper	Length	-	-	-	-	-	-	-	-	4	197-235	221	8.3
Chatham	Weight	-	-	-	-	-	-	-	-	4	80.8-142.8	116.1	12.9
Strait	CR	-	-	-	-	-	-	-	-	4	-0.05-0.06	0.02	0.02
Icy	Length	-	-	-	-	2	187-188	188	0.5	1	216	-	-
Strait	Weight	-	-	-	-	2	65.5-69.4	67.5	1.9	1	110.794	-	-
	CR	-	-	-	-	2	-0.03-0.04	0.01	0.04	1	0.06	-	-
Icy	Length	-	-	-	-	-	-	-	-	-	-	-	-
Point	Weight	-	-	-	-	-	-	-	-	-	-	-	-
	CR	-	-	-	-	-	-	-	-	-	-	-	-
Total	Length	-	-	-	-	2	187-188	188	0.5	5	197-235	220	6.5
	Weight	-	-	-	-	2	65.5-69.4	67.5	1.9	5	80.8-142.8	115	10.1
	CR	-	-	-	-	2	-0.03-0.04	0.01	0.04	5	-0.05-0.06	0.03	0.02
							Burnett Inlet (fall)						
Upper	Length	-	-	-	-	5	171-192	180	3.6	1	211	-	-
Chatham	Weight	-	-	-	-	5	51.6-72.5	60.8	4	1	112.439	-	-
Strait	CR	-	-	-	-	5	-0.03-0.06	0.02	0.02	1	0.15	-	-
Icy	Length	-	-	-	-	2	172-175	174	1.5	1	200	-	-
Strait	Weight	-	-	-	-	2	53.4-54.8	54.1	0.7	1	82.877	-	-
	CR	-	-	-	-	2	-0.01-0.07	0.03	0.04	1	0.01	-	-
Icy	Length	-	-	-	-	-	-	-	-	-	-	-	-
Point	Weight	-	-	-	-	-	-	-	-	-	-	-	-
	CR	-	-	-	-	-	-	-	-	-	-	-	-

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
Total	Length	-	-	-	-	7	171-192	178	2.8	2	200-211	206	5.5
	Weight	-	-	-	-	7	51.6-72.5	58.9	3	2	82.9-112.4	97.7	14.8
	CR	-	-	-	-	7	-0.03-0.07	0.02	0.01	2	0.01-0.15	0.08	0.07
Kendrick Bay													
Upper Chatham Strait	Length	-	-	-	-	3	167-195	180	8.1	4	211-243	227	6.9
	Weight	-	-	-	-	3	48.0-79.1	62.5	9	4	111.0-172.9	135.6	13.5
	CR	-	-	-	-	3	0.03-0.04	0.04	0	4	0.04-0.13	0.1	0.02
Icy Strait	Length	-	-	-	-	1	200	-	-	7	201-230	216	4.5
	Weight	-	-	-	-	1	78.07	-	-	7	84.9-149.2	112.6	9
	CR	-	-	-	-	1	-0.05	-	-	7	0.01-0.16	0.06	0.02
Icy Point	Length	-	-	-	-	-	-	-	-	-	-	-	-
	Weight	-	-	-	-	-	-	-	-	-	-	-	-
	CR	-	-	-	-	-	-	-	-	-	-	-	-
Total	Length	-	-	-	-	4	167-200	185	7.6	11	201-243	220	4
	Weight	-	-	-	-	4	48.0-79.1	66.4	7.5	11	84.9-172.9	120.9	7.9
	CR	-	-	-	-	4	-0.05-0.04	0.01	0.02	11	0.01-0.16	0.07	0.01
Neets Bay (fall)													
Upper Chatham Strait	Length	-	-	-	-	-	-	-	-	1	203	-	-
	Weight	-	-	-	-	-	-	-	-	1	96.388	-	-
	CR	-	-	-	-	-	-	-	-	1	0.11	-	-
Icy Strait	Length	-	-	-	-	1	171	-	-	-	-	-	-
	Weight	-	-	-	-	1	50.71	-	-	-	-	-	-
	CR	-	-	-	-	1	0.01	-	-	-	-	-	-

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
Icy	Length	-	-	-	-	-	-	-	-	-	-	-	-
Point	Weight	-	-	-	-	-	-	-	-	-	-	-	-
	CR	-	-	-	-	-	-	-	-	-	-	-	-
Total	Length	-	-	-	-	1	171	-	-	1	203	-	-
	Weight	-	-	-	-	1	50.71	-	-	1	96.388	-	-
	CR	-	-	-	-	1	0.01	-	-	1	0.11	-	-
Neets Bay (summer)													
Upper	Length	-	-	-	-	4	187-215	196	6.4	11	202-243	228	4.4
Chatham	Weight	-	-	-	-	4	65.6-111.7	82.8	10.3	11	101.0-172.8	138.4	7.7
Strait	CR	-	-	-	-	4	-0.01-0.13	0.05	0.03	11	0.01-0.17	0.1	0.02
Icy	Length	-	-	-	-	4	166-223	197	12.1	10	204-245	222	4.1
Strait	Weight	-	-	-	-	4	49.3-120.0	86	14.9	10	94.7-163.0	125.9	6.1
	CR	-	-	-	-	4	0.04-0.09	0.06	0.01	10	0.01-0.16	0.09	0.01
Icy	Length	-	-	-	-	-	-	-	-	-	-	-	-
Point	Weight	-	-	-	-	-	-	-	-	-	-	-	-
	CR	-	-	-	-	-	-	-	-	-	-	-	-
Total	Length	-	-	-	-	8	166-223	196	6.3	21	202-245	225	3
	Weight	-	-	-	-	8	49.3-120.0	84.4	8.4	21	94.7-172.8	132.4	5
	CR	-	-	-	-	8	-0.01-0.13	0.06	0.02	21	0.01-0.17	0.09	0.01
Unmarked stocks													
Upper	Length	22	7.1-28.5	16.9	1.4	36	19.3-77.3	43.3	2.4	28	34.3-125.3	78.8	4.8
Chatham	Weight	22	-0.07-0.19	0.05	0.02	36	-0.09-0.19	0.06	0.01	28	-0.06-0.19	0.05	0.01
Strait	CR	4	102-131	116	6.4	7	125-192	156	10	-	-	-	-
		4	10.6-21.1	14.4	2.4	7	19.1-75.4	40.7	8	-	-	-	-

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Icy Strait	Length	4	-0.14-0.1	-0.04	0.05	7	-0.07-0.1	0	0.02	-	-	-	-
	Weight	16	93-145	123	3.5	46	131-201	159	2.5	64	157-245	191	2.1
	CR	16	6.6-32.3	19.7	1.7	46	23.4-83.6	44.1	2.1	64	39.9-161.2	79.2	2.9
Icy Point	Length	16	-0.12-0.19	0.04	0.02	46	-0.03-0.21	0.07	0.01	64	-0.06-0.25	0.08	0.01
	Weight	42	93-145	119	2.1	89	125-201	158	1.9	92	152-245	191	1.8
	CR	42	6.6-32.3	17.7	1	89	19.1-83.6	43.5	1.6	92	34.3-161.2	79.1	2.4
Total	Length	42	-0.14-0.19	0.04	0.01	89	-0.09-0.21	0.06	0.01	92	-0.06-0.25	0.07	0.01
	Weight	22	7.1-28.5	16.9	1.4	36	19.3-77.3	43.3	2.4	28	34.3-125.3	78.8	4.8
	CR	22	-0.07-0.19	0.05	0.02	36	-0.09-0.19	0.06	0.01	28	-0.06-0.19	0.05	0.01

Table 15: Information on 596 juvenile sockeye salmon released from regional enhancement facility sites and captured during SECM surveys (June–August 2016). Factor includes length (mm, fork), weight (g), and condition residuals (CR) from length-weight regression analysis are reported for each stock group. LL in Agency-Release site denotes a late, large release.

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
						DIPAC							
						Speel Arm							
Upper	Length	26	112-165	138	2.7	4	163-190	173	6.2	4	185-220	197	7.9
Chatham	Weight	26	13.7-52.7	29.3	1.8	4	45.1-76.4	59.1	6.9	4	74.3-118.3	88.8	10.3
Strait	CR	26	-0.06-0.14	0.05	0.01	4	-0.03-0.13	0.07	0.04	4	0.03-0.12	0.07	0.02
Icy	Length	51	108-157	137	1.7	5	122-180	150	9.5	2	212-229	220	8.5
Strait	Weight	51	14.1-41.4	28	0.9	5	19.5-65.7	40.2	7.7	2	110.8-134.0	122.4	11.6
	CR	51	-0.11-0.19	0.05	0.01	5	0.07-0.14	0.1	0.02	2	0.02-0.08	0.05	0.03
Icy	Length	3	117-148	129	9.6	-	-	-	-	-	-	-	-
Point	Weight	3	16.6-33.2	22.6	5.3	-	-	-	-	-	-	-	-
	CR	3	-0.01-0.04	0.01	0.02	-	-	-	-	-	-	-	-
Total	Length	80	108-165	137	1.4	9	122-190	160	7	6	185-229	205	7.3
	Weight	80	13.7-52.7	28.2	0.9	9	19.5-76.4	48.6	5.9	6	74.3-134.0	100	10.1
	CR	80	-0.11-0.19	0.05	0.01	9	-0.03-0.14	0.09	0.02	6	0.02-0.12	0.06	0.01
						Sweetheart Lake							
Upper	Length	2	148-154	151	3	-	-	-	-	-	-	-	-
Chatham	Weight	2	29.7-40.5	35.1	5.4	-	-	-	-	-	-	-	-
Strait	CR	2	-0.11-0.07	-0.02	0.09	-	-	-	-	-	-	-	-
Icy	Length	2	147-154	150	3.5	-	-	-	-	-	-	-	-
Strait	Weight	2	33.8-39.8	36.8	3	-	-	-	-	-	-	-	-
	CR	2	0.04-0.06	0.05	0.01	-	-	-	-	-	-	-	-
Icy	Length	-	-	-	-	-	-	-	-	-	-	-	-

		June				July				August			
Locality	Factor	n	range	mean	se	n	range	mean	se	n	range	mean	se
Point	Weight	-	-	-	-	-	-	-	-	-	-	-	-
	CR	-	-	-	-	-	-	-	-	-	-	-	-
Total	Length	4	147-154	151	1.9	-	-	-	-	-	-	-	-
	Weight	4	29.7-40.5	36	2.6	-	-	-	-	-	-	-	-
	CR	4	-0.11-0.07	0.02	0.04	-	-	-	-	-	-	-	-
Tahltan Lake													
Upper	Length	-	-	-	-	-	-	-	-	1	117	-	-
Chatham	Weight	-	-	-	-	-	-	-	-	1	14.1	-	-
Strait	CR	-	-	-	-	-	-	-	-	1	-0.12	-	-
Icy	Length	-	-	-	-	3	174-197	187	6.8	2	175-213	194	19
Strait	Weight	-	-	-	-	3	58.3-85.0	73.1	7.9	2	54.4-101.4	77.9	23.5
	CR	-	-	-	-	3	0.04-0.05	0.05	0	2	-0.03–0.03	-0.03	0
Icy	Length	-	-	-	-	-	-	-	-	-	-	-	-
Point	Weight	-	-	-	-	-	-	-	-	-	-	-	-
	CR	-	-	-	-	-	-	-	-	-	-	-	-
Total	Length	-	-	-	-	3	174-197	187	6.8	3	117-213	168	27.9
	Weight	-	-	-	-	3	58.3-85.0	73.1	7.9	3	14.1-101.4	56.6	25.2
	CR	-	-	-	-	3	0.04-0.05	0.05	0	3	-0.12–0.03	-0.06	0.03
Tatsamenie Lake													
Icy	Length	1	126	-	-	-	-	-	-	-	-	-	-
Strait	Weight	1	19.537	-	-	-	-	-	-	-	-	-	-
(Total)	CR	1	-0.02	-	-	-	-	-	-	-	-	-	-
Tatsamenie Lake ER													
Icy	Length	1	132	-	-	-	-	-	-	-	-	-	-
Point	Weight	1	23.06	-	-	-	-	-	-	-	-	-	-
	CR	1	0	-	-	-	-	-	-	-	-	-	-

Locality	Factor	June n	June range	June mean	June se	July n	July range	July mean	July se	August n	August range	August mean	August se
Unmarked stocks													
Upper Chatham Strait	Length	42	95-180	129	3.2	76	57-212	132	3.3	56	111-202	148	3
	Weight	42	8.3-61.9	23.7	1.9	76	1.4-105.5	27.9	2	56	12.9-87.3	36.2	2.5
	CR	42	-0.18-0.14	0.02	0.01	76	-0.17-0.17	0.05	0.01	56	-0.18-0.18	0.01	0.01
Icy Strait	Length	17	83-191	134	8.8	11	97-172	152	6	3	157-166	160	2.8
	Weight	17	4.6-83.1	30	5.9	11	9.0-47.4	36.5	3.1	3	37.6-43.8	40.2	1.9
	CR	17	-0.15-0.12	-0.02	0.02	11	-0.16-0.08	-0.02	0.02	3	-0.08–0.04	-0.06	0.01
Icy Point	Length	64	92-188	141	2.2	106	86-198	138	2.1	114	98-218	148	2.2
	Weight	64	8.0-75.9	31	1.6	106	2.7-90.0	30.5	1.3	114	9.2-105.6	36.7	1.7
	CR	64	-0.14-0.18	0.04	0.01	106	-1.39-0.26	0.07	0.02	114	-1.37-1.42	0.02	0.02
Total	Length	123	83-191	136	2	193	57-212	136	1.8	173	98-218	148	1.7
	Weight	123	4.6-83.1	28.4	1.4	193	1.4-105.5	29.9	1.1	173	9.2-105.6	36.6	1.4
	CR	123	-0.18-0.18	0.03	0.01	193	-1.39-0.26	0.06	0.01	173	-1.37-1.42	0.02	0.01

Table 16: Number examined, length (mm, fork), wet weight (g), stomach content as percent body weight (%BW), and feeding intensity (0–100% volume fullness) of 95 potential predators of juvenile salmon captured in marine waters of the northern region of southeastern Alaska by rope trawl, June–August 2016. Dash indicates no samples. See Tables 6 and 7 for species information.

		June				July				August			
Species	Factor	*n*	range	mean	sd	*n*	range	mean	sd	*n*	range	mean	sd
						Strait Habitat							
Chum	Length	18	579-720	641	35	10	598-764	661	54	4	586-747	645	70
salmon	Weight	18	2500-4850	3348	590	10	2400-6300	3325	1271	4	2150-4400	2988	980
(adult)	%BW	18	0.3-6.7	2	2	10	0-0.6	0	-	4	0-0.2	0	-
	Fullness	18	25-110	67	34	10	0-25	4	8	4	0-25	9	12
Sockeye	Length	1	585-585	585	-	3	568-633	603	33	-	-	-	-
salmon	Weight	1	2700-2700	2700	-	3	2000-2900	2533	473	-	-	-	-
(adult)	%BW	1	0.3-0.3	0	-	3	0-0.3	0	-	-	-	-	-
	Fullness	1	50-50	50	-	3	0-100	33	58	-	-	-	-
Pink	Length	5	530-601	567	30	3	527-568	546	21	-	-	-	-
salmon	Weight	5	1950-3350	2720	593	3	1800-2300	2000	265	-	-	-	-
(adult)	%BW	5	0-4.2	1	2	3	0.1-0.2	0	-	-	-	-	-
	Fullness	5	0-110	57	40	3	18537	37	23	-	-	-	-
Coho	Length	2	583-685	634	72	8	470-704	552	75	4	632-710	684	35
salmon	Weight	2	182805	1204	1692	8	1100-4600	2325	1134	4	3650-4600	4212	409
(adult)	%BW	2	2.7-2428.6	1216	1715	8	0-4.6	1	2	4	0-2.5	1	1
	Fullness	2	110-110	110	-	8	0-110	51	50	4	0-100	31	47
Chinook	Length	3	352-389	371	19	1	371		-	-	-	-	-
salmon	Weight	3	600-800	683	104	1	600		-	-	-	-	-
(imm.)	%BW	3	0.2-2.9	1	2	1	-	0	-	-	-	-	-
	Fullness	3	10-75	45	33	1	-	0	-	-	-	-	-

Species	Factor	June				July				August			
		n	range	mean	sd	*n*	range	mean	sd	*n*	range	mean	sd
Coastal habitat													
Chum salmon (adult)	Length	-	-	-	-	1	570-570	570	-	2	630-669	650	28
	Weight	-	-	-	-	1	2300-2300	2300	-	2	2600-2900	2750	212
	%BW	-	-	-	-	1	-	0	-	2	0-0.4	0	-
	Fullness	-	-	-	-	1	-	0	-	2	0-50	25	35
Coho salmon (adult)	Length	-	-	-	-	-	-	-	-	1	673-673	673	-
	Weight	-	-	-	-	-	-	-	-	1	4000-4000	4000	-
	%BW	-	-	-	-	-	-	-	-	1	3.6-3.6	4	-
	Fullness	-	-	-	-	-	-	-	-	1	100-100	100	-
Pink salmon (adult)	Length	1	590-590	590	-	2	522-584	553	44	2	560-575	568	11
	Weight	1	2650-2650	2650	-	2	1900-2600	2250	495	2	2300-2500	2400	141
	%BW	1	0.2-0.2	0	-	2	0.4-0.5	0	-	2	0.1-0.2	0	-
	Fullness	1	10-10	10	-	2	75-75	75	-	2	50-75	62	18
Sablefish	Length	1	340-340	340	-	-	-	-	-	-	-	-	-
	Weight	1	350-350	350	-	-	-	-	-	-	-	-	-
	%BW	1	1.4-1.4	1	-	-	-	-	-	-	-	-	-
	Fullness	1	50-50	50	-	-	-	-	-	-	-	-	-
Sockeye salmon (adult)	Length	3	555-630	588	38	-	-	-	-	1	570-570	570	-
	Weight	3	2000-3050	2583	535	-	-	-	-	1	1800-1800	1800	-
	%BW	3	0-0.8	0	-	-	-	-	-	1	0.4-0.4	0	-
	Fullness	3	10-75	45	33	-	-	-	-	1	100-100	100	-
Spiny dogfish	Length	19	460-1060	903	134	-	-	-	-	-	-	-	-
	Weight	19	2050-5200	3534	1090	-	-	-	-	-	-	-	-
	%BW	19	0-1.8	1	1	-	-	-	-	-	-	-	-
	Fullness	19	0-25	13	11	-	-	-	-	-	-	-	-

Table 17: Feeding intensity of 95 potential predators of juvenile salmon captured during SECM surveys, June–August 2016 (See previous table).

Predator species	Life history stage	Number examined	Number empty	Percent feeding	Number with salmon	Percent feeders with salmon
		Strait habitat				
Chinook salmon	Immature	4	1	75	0	0
Chum salmon	Adult	53	12	77	2	4.9
Coho salmon	Adult	17	5	71	1	8.3
Pink salmon	Adult	15	1	93	0	0
Sockeye salmon	Adult	4	2	50	0	0
		Coastal habitat				
Chum salmon	Adult	4	2	50	0	0
Coho salmon	Adult	1	0	100	0	0
Pink salmon	Adult	7	0	100	0	0
Sablefish	Adult	2	0	100	0	0
Sockeye salmon	Adult	5	0	100	0	0
Spiny dogfish	Adult	25	17	32	1	12.5

Appendix 1. Temperature, salinity, ambient light, Secchi depth, and mixed layer depth by haul number and station sampled during SECM surveys, May–August 2016.

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m^3)	Secchi (m)	MLD (m)
24-May	20001	ABM	9.2	NA	157	3.8	9
25-May	20003	ISC	9.3	23	317	5	6
25-May	20004	ISB	9.4	29.8	183	5	7
25-May	20005	ISA	9.4	29.8	574	4.5	9
25-May	20006	UCA	9.3	29.6	280	4	13
25-May	20007	UCB	9	29.8	245	2.5	15
25-May	20008	UCC	10	29.2	267	3	8
25-May	20009	UCD	9.7	29.6	478	4	10
25-Jun	20010	ISA	10.3	29.8	29	2	6
25-Jun	20011	ISB	11.7	28.3	126	8	6
26-Jun	20012	ISC	11.7	28	43	5	7
26-Jun	20013	ISD	12.3	27.6	158	5	8
26-Jun	20014	ISB	11.3	29.1	158	5	7
26-Jun	20015	ISA	9.8	30.2	64	10	6
27-Jun	20016	ISC	11.9	28.1	51	4.8	10
27-Jun	20017	ISD	12.3	27.6	-	-	7
27-Jun	20018	ISA	10.2	30.2	239	4.3	8
27-Jun	20019	ISB	11.6	28.3	301	3.5	6
27-Jun	20020	ISC	11.9	28.1	372	4.5	6
27-Jun	20021	ISD	11.9	28.2	266	4.3	6
28-Jun	20022	UCD	12.3	27.1	96	4	15
28-Jun	20023	UCC	12.7	27.2	361	4.7	12
28-Jun	20024	UCB	12.6	29.1	370	5.8	6
28-Jun	20025	UCA	12.4	29.2	742	6.8	6
28-Jun	20026	UCD	13.1	27.3	495	4.1	7
29-Jun	20027	IPD	12.8	32.3	55	10.3	7
29-Jun	20028	IPC	12.5	31.6	301	6.7	7
29-Jun	20029	IPB	13.7	31.5	446	10.2	10
29-Jun	20030	IPA	13.6	31.4	476	8.6	6
30-Jun	20031	ISB	12.7	27.8	128	5.3	6
30-Jun	20032	UCA	13.5	29.1	151	4.6	7
30-Jun	20033	UCB	13.4	26.2	378	4.8	13
30-Jun	20034	UCC	13	25.7	177	5.7	7
1-Jul	20035	ABM	15.5	17.3	66	4.2	6
27-Jul	20036	ISA	9.7	30.5	40	4.4	7
27-Jul	20037	ISB	11.6	27.8	63	6.3	7
27-Jul	20038	ISC	13.1	23.9	90	6.8	8
27-Jul	20039	ISD	13.1	24.5	68	6.8	12
28-Jul	20040	ISD	13.4	22.9	51	5.4	9
28-Jul	20041	ISC	13.2	23.2	118	6.6	6
28-Jul	20042	ISB	13.1	23.9	245	4.8	6
28-Jul	20043	ISA	11.6	26.9	318	5	6

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m^3)	Secchi (m)	MLD (m)
28-Jul	20044	ISB	12.9	25.1	591	4.9	7
28-Jul	20045	ISA	11.3	28.5	241	4.1	6
29-Jul	20046	ISA	12.3	26.3	53	5.2	6
29-Jul	20047	ISB	13.3	24	148	4.6	6
29-Jul	20048	ISC	13.2	24.2	464	4.2	6
29-Jul	20049	ISD	13.1	24.2	160	4.2	6
29-Jul	20050	ISC	13.8	22.2	294	4.1	6
29-Jul	20051	ISD	13.9	22.3	395	-	6
30-Jul	20052	IPD	14.3	32.1	246	15.3	16
30-Jul	20053	IPC	14.3	32.2	198	12.8	19
30-Jul	20054	IPB	14.6	32	617	12.2	20
30-Jul	20055	IPA	14.5	31.8	600	5.8	15
31-Jul	20060	UCB	12.8	25.4	182	6	7
31-Jul	20061	UCA	13.3	21.4	58	4.5	7
1-Aug	20062	UCA	13.3	23.4	28	5.5	7
1-Aug	20063	UCB	13.2	24.2	114	5	7
1-Aug	20064	UCC	13.8	21.9	243	5.6	7
1-Aug	20065	UCD	13.5	22.7	388	4.9	6
1-Aug	20066	UCC	13	25.7	675	7.3	9
1-Aug	20067	UCD	13	24.9	181	4.5	8
2-Aug	20068	ABM	12.5	16.8	22	4	8
23-Aug	20069	ISA	10.3	28.4	8	5.6	7
23-Aug	20070	ISB	11.8	25.8	76	5.6	7
23-Aug	20071	ISC	12.9	23.2	139	8.3	6
23-Aug	20072	ISD	13.4	21.1	202	8.7	6
23-Aug	20073	ISC	12.6	24.4	32	-	6
24-Aug	20074	IPD	15.4	32	18	13.4	19
24-Aug	20075	IPC	15.3	32	102	14.5	10
24-Aug	20076	IPB	14	31.5	170	7.2	12
24-Aug	20077	IPA	14.7	31.5	-	8	8
25-Aug	20078	ISA	10	28.7	-	5.9	6
25-Aug	20079	ISB	12.7	24.1	-	-	6
25-Aug	20080	ISA	12.4	24.8	-	5.6	6
25-Aug	20081	ISB	11.7	26.4	-	5.1	6
25-Aug	20082	ISC	12	26.6	-	7.6	7
25-Aug	20083	ISD	12.2	27.2	-	-	9
26-Aug	20084	ISD	11.5	27.8	-	5.8	8
26-Aug	20085	ISC	12.7	26.7	-	5.4	6
26-Aug	20086	ISD	11.6	27.7	-	6.2	8
26-Aug	20087	ISA	12.3	26.1	-	5.2	6
26-Aug	20088	ISB	11.4	27.4	-	5.7	8
26-Aug	20089	ISA	11.6	26.6	-	4.4	6
27-Aug	20090	UCA	13	24.7	-	6.3	6
27-Aug	20094	UCC	13.3	22.3	-	4.7	6
27-Aug	20095	UCD	13.7	18.5	-	3.5	8

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m^3)	Secchi (m)	MLD (m)
28-Aug	20096	UCD	13.5	15.7	-	4.1	9
28-Aug	20097	UCC	13.5	18	-	5.1	8
28-Aug	20098	UCB	12	23.3	-	3.9	7
28-Aug	20099	UCA	13.2	18.3	-	4.4	6
28-Aug	20100	UCB	13.2	18.3	-	2.3	6
28-Aug	20101	UCA	13.4	18.1	-	3.8	9
29-Aug	20102	ABM	13.6	17.4	-	-	6

Figure 1: Stations sampled at inshore, strait, and coastal habitats during SECM surveys. See Table 1 for stations details.

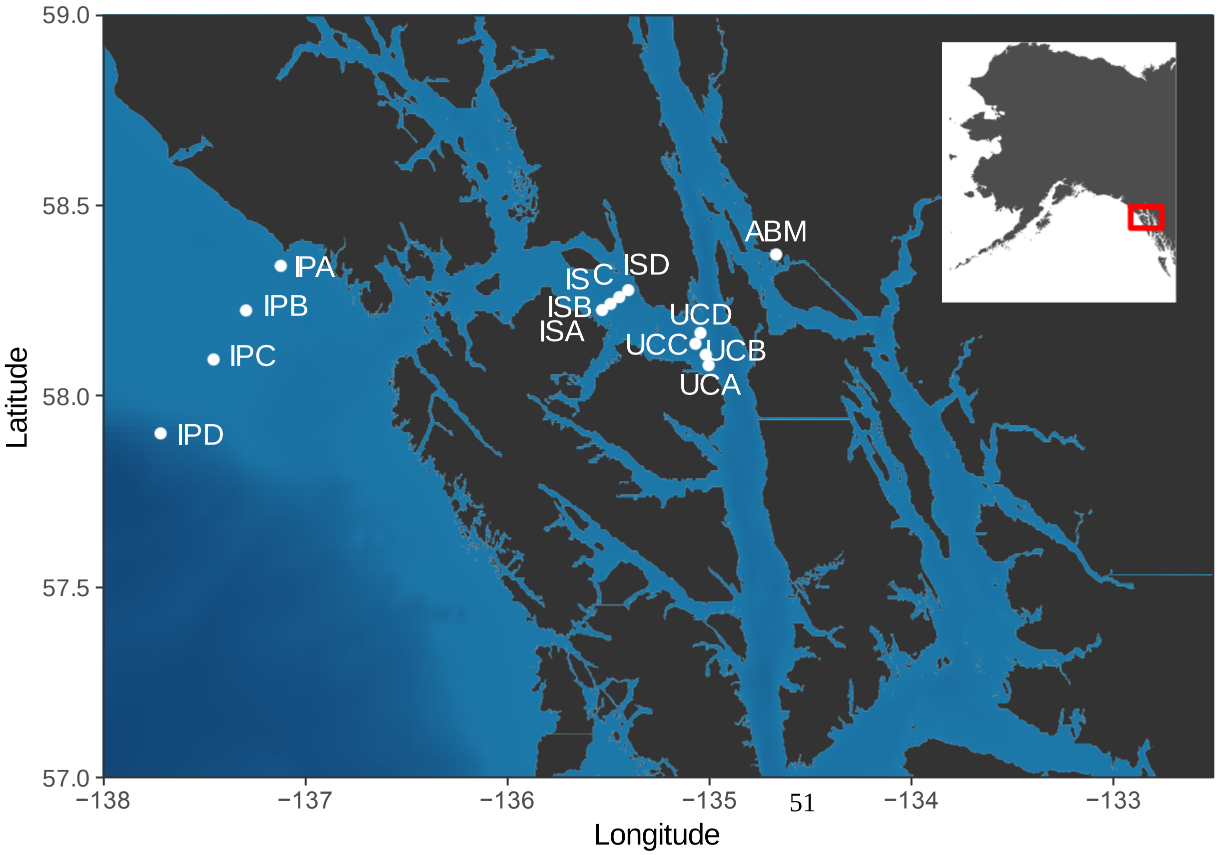


Figure 2: Mean surface (3-m) and 20-m integrated temperature (°C) (top) and salinity (PSU) (bottom). The 3-m represent the move active segment of the water column, while the 20-m represent more stable waters sampled by trawl.

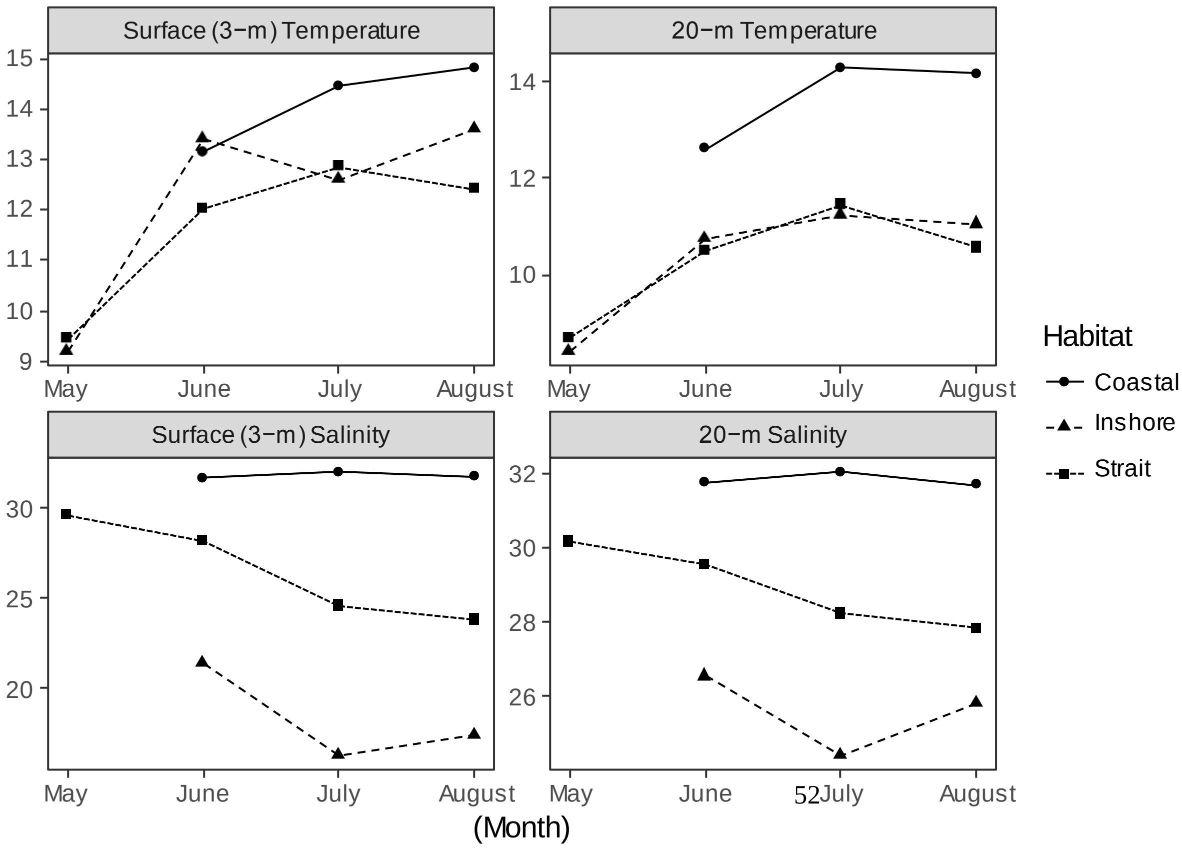


Figure 3: Mean chlorophyll-a concentration (ug/L) from surface water samples. Chlorophyll was estimate from single monthly samples per station.

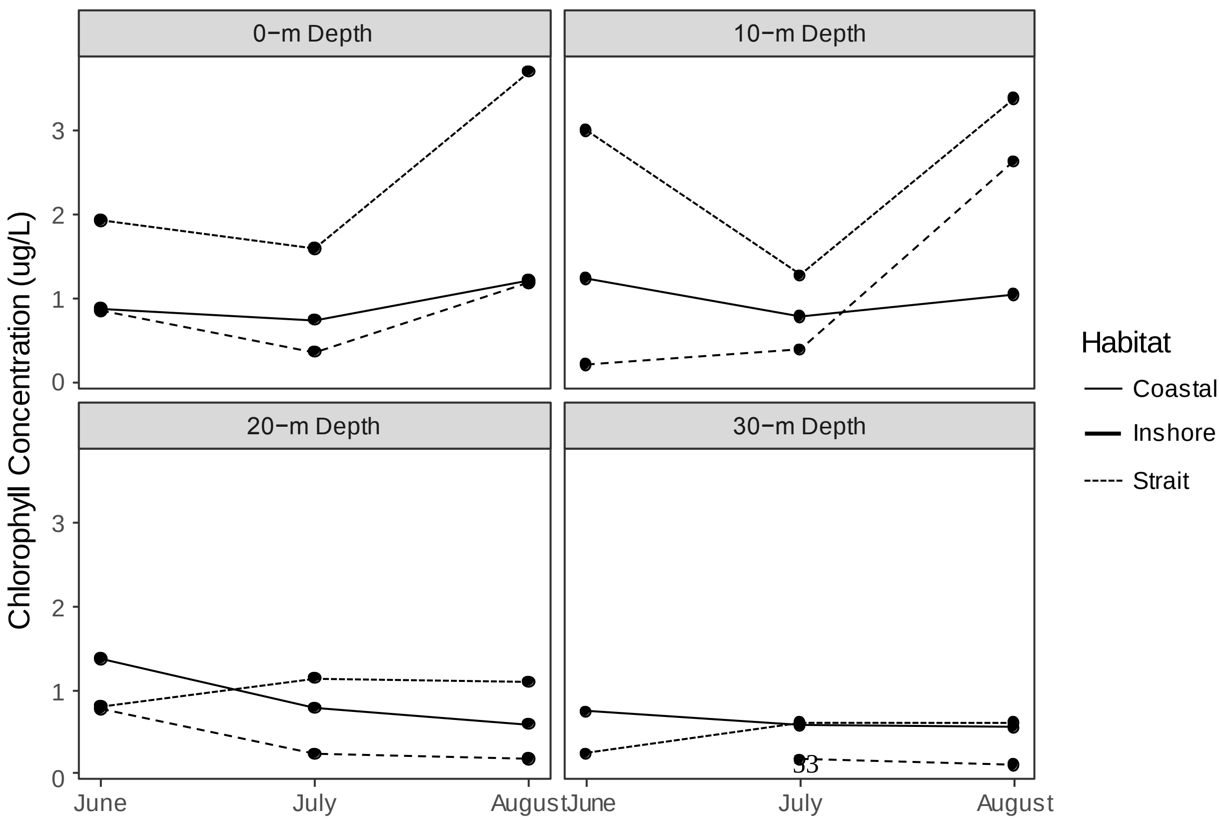
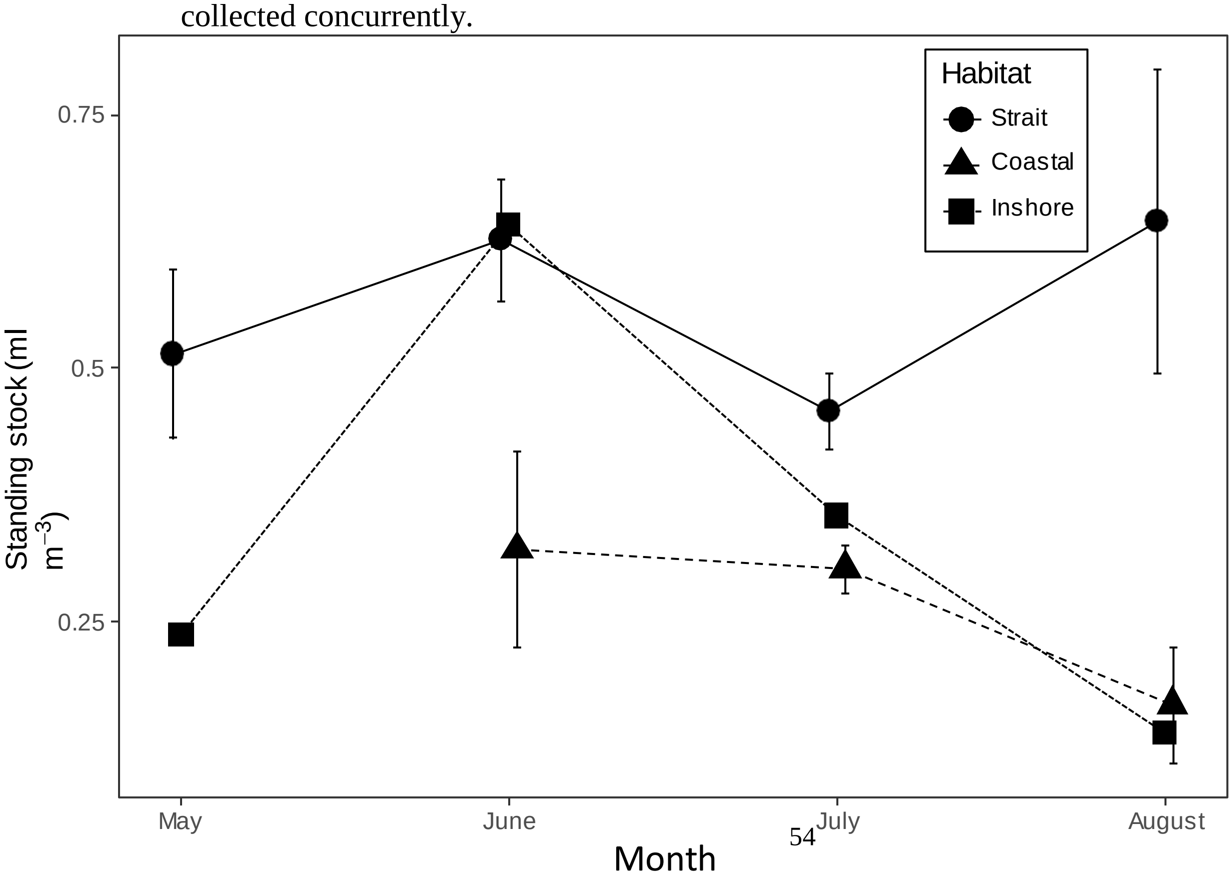


Figure 4: Monthly zooplankton standing stock (+/- 1 standard error) from 333-um mesh double oblique bongo net samples hauled from less than or equal to 200-m depths during daylight. Values have been staggered slightly along the x-axis to better display data but samples were collected concurrently.



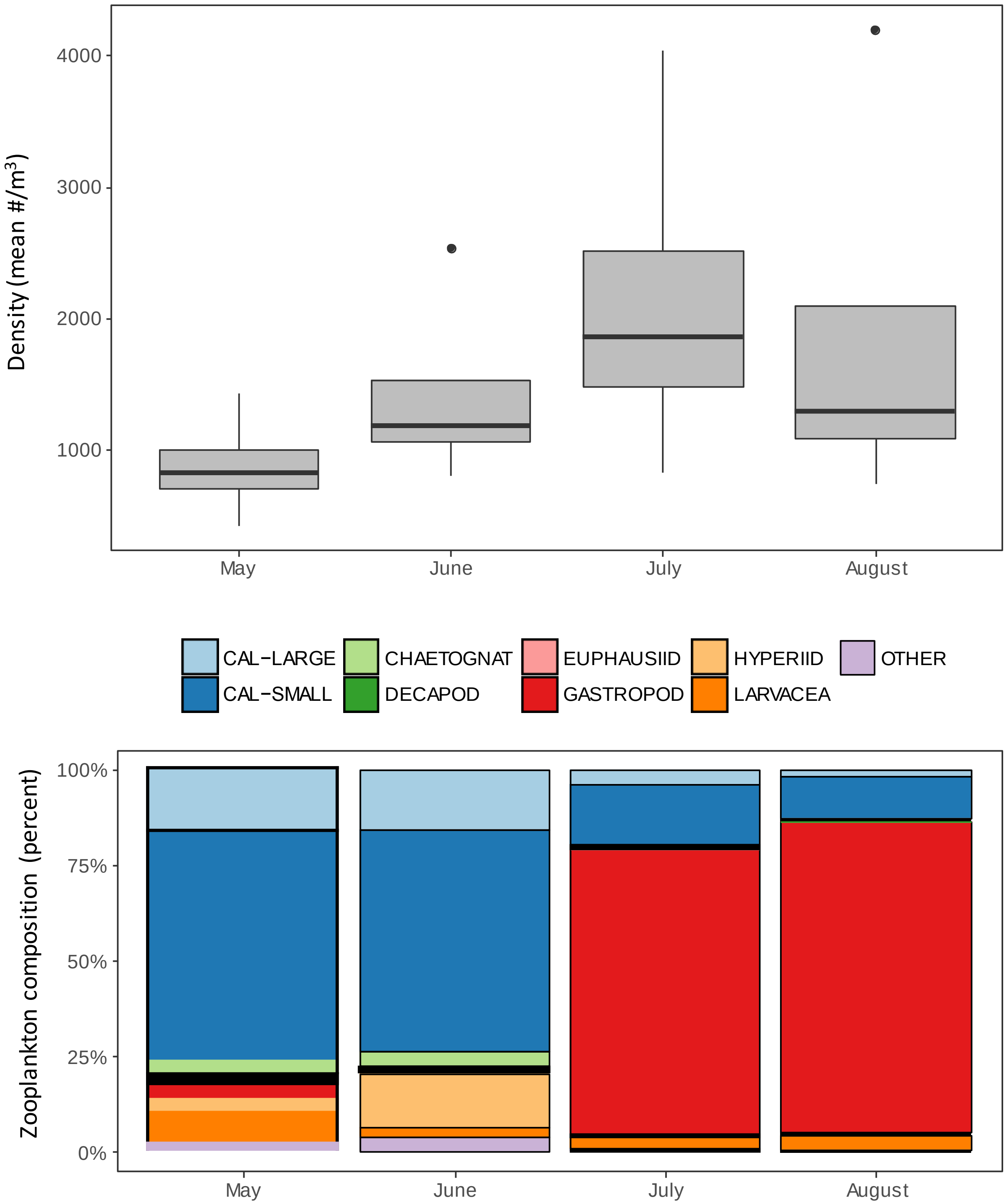


Figure 5: Monthly zooplankton density with standard error (top); and taxonomic composition (bottom) from 333-um mesh double oblique bongo net samples hauled from less than or equal to 200-m depths during daylight. Cal-large and Cal-small are calanoid copepods.

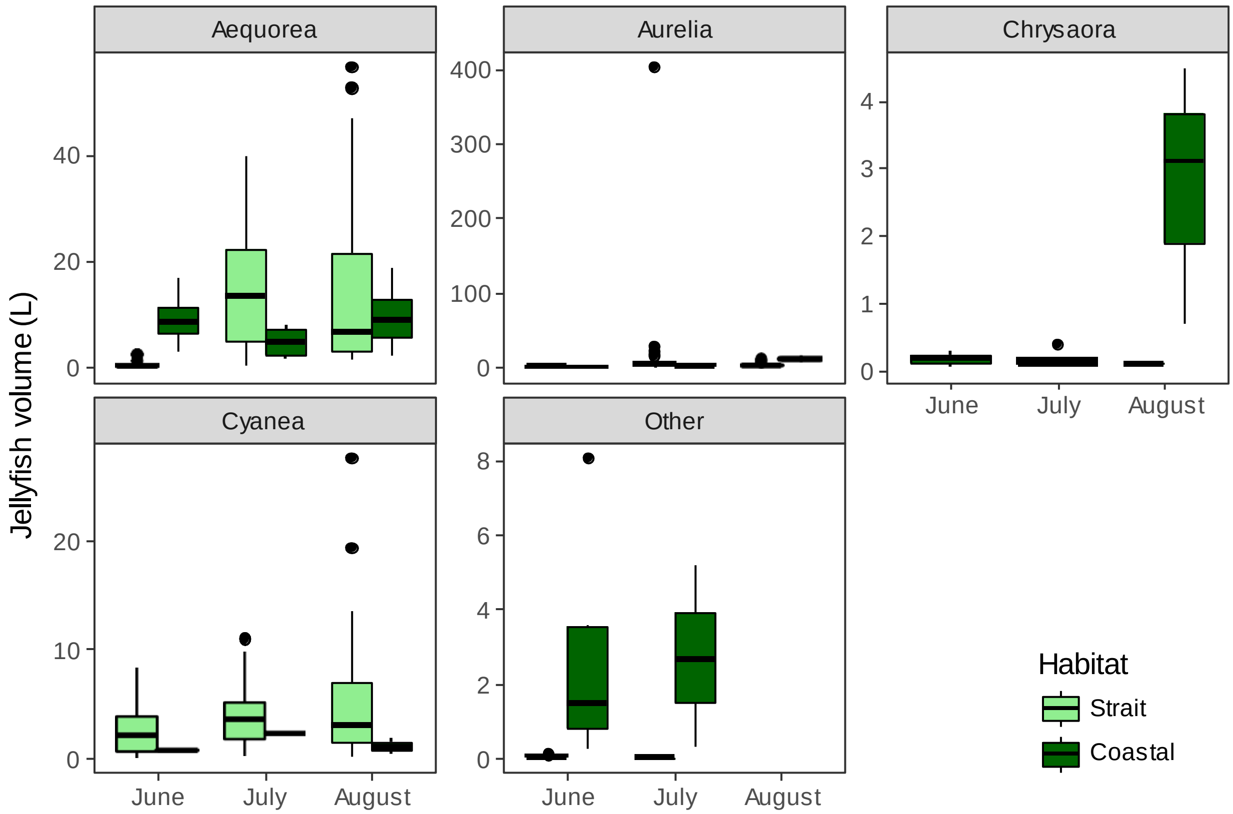


Figure 6: Mean volume (L) of jellyfish captured in the strait and coastal habitats by rope trawl (June–August).

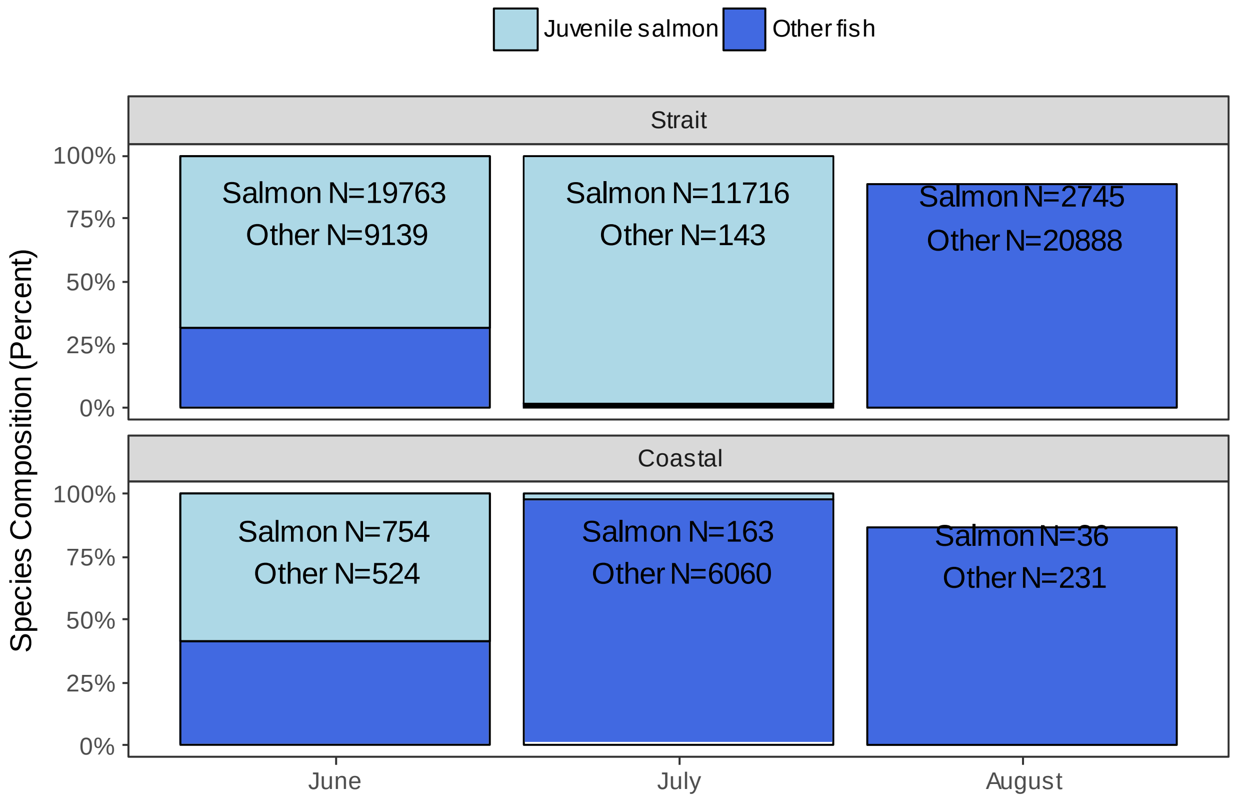


Figure 7: Fish composition from rope trawl catches in the strait and coastal habitats (June–August). Total numbers of fish are indicated in bars.

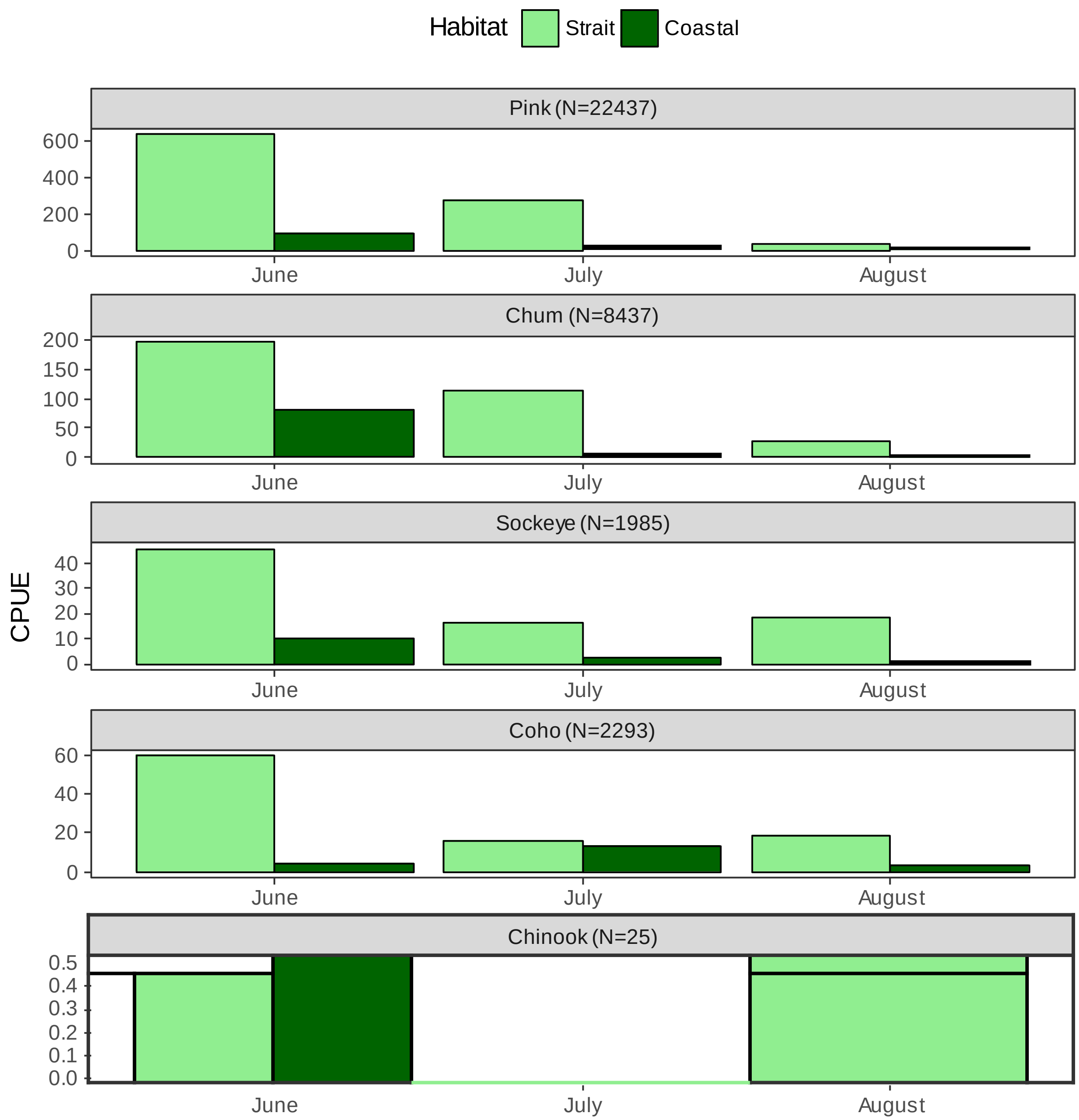


Figure 8: Catch-per-unit-effort (CPUE, catch per haul) of juvenile salmon, June–August. Total season catch (N) is indicated for each species.

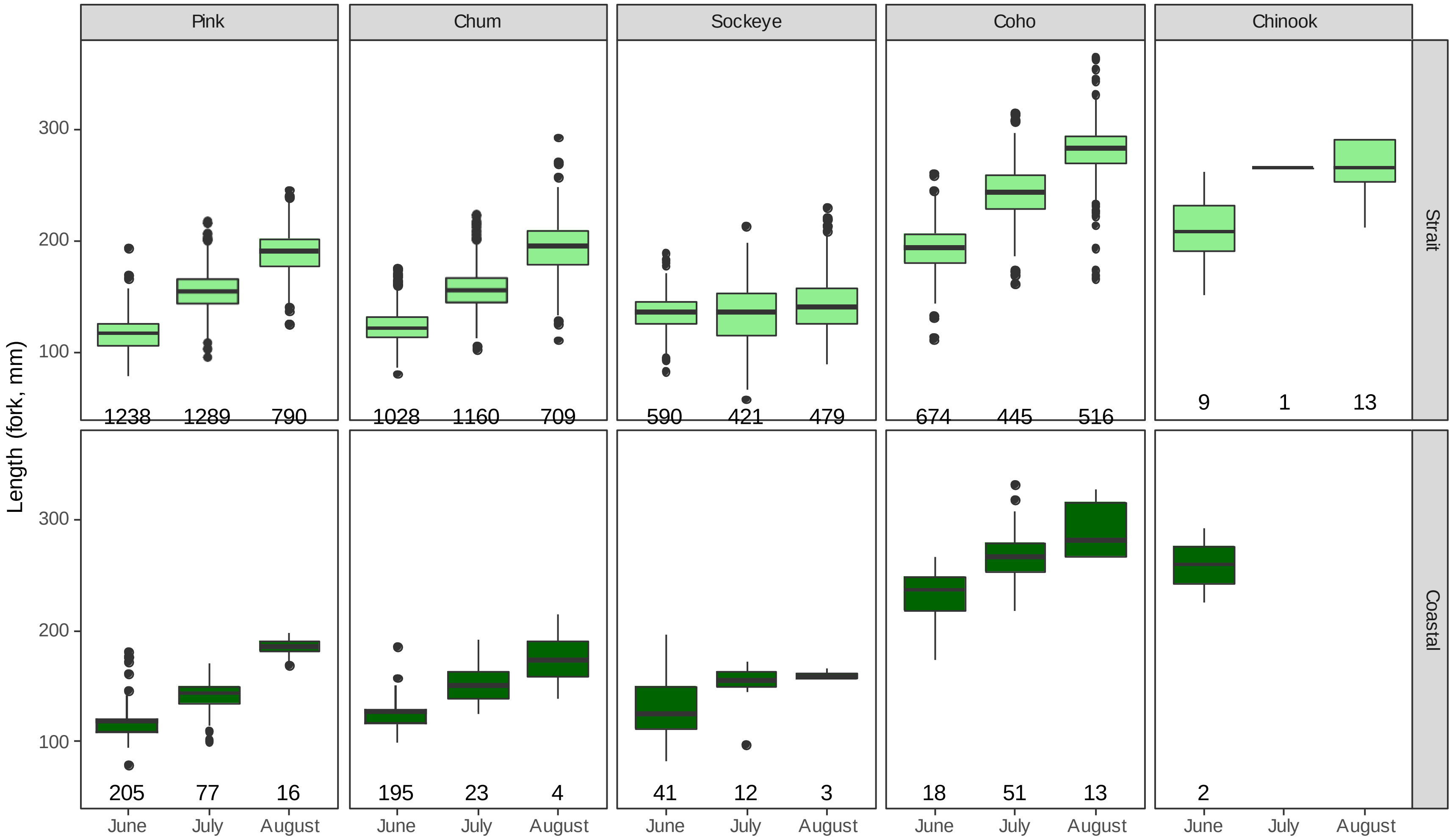


Figure 9: Monthly length (mm, fork) distributions of juvenile salmon caught from June–August. Horizontal bars represent medians and box widths are the 25th and 75th percentiles. Whiskers extend 1.5 times the box span (interquartileZ range.)

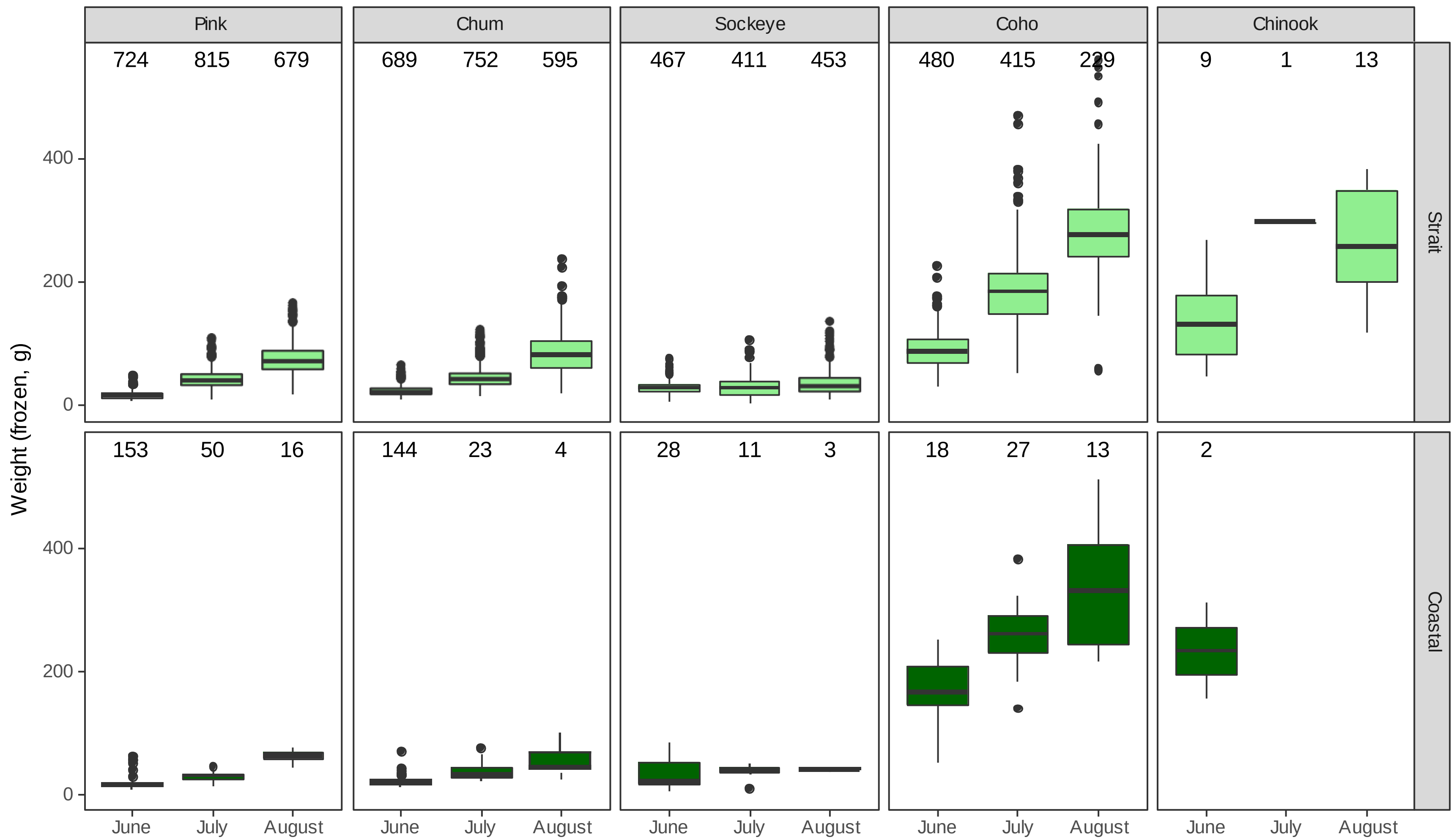


Figure 10: Monthly weight (g) distributions of juvenile salmon caught from June - August. Horizontal bars represent medians and box widths are the 25th and 75th percentiles. Whiskers extend 1.5 times the box span (interquartile range.)

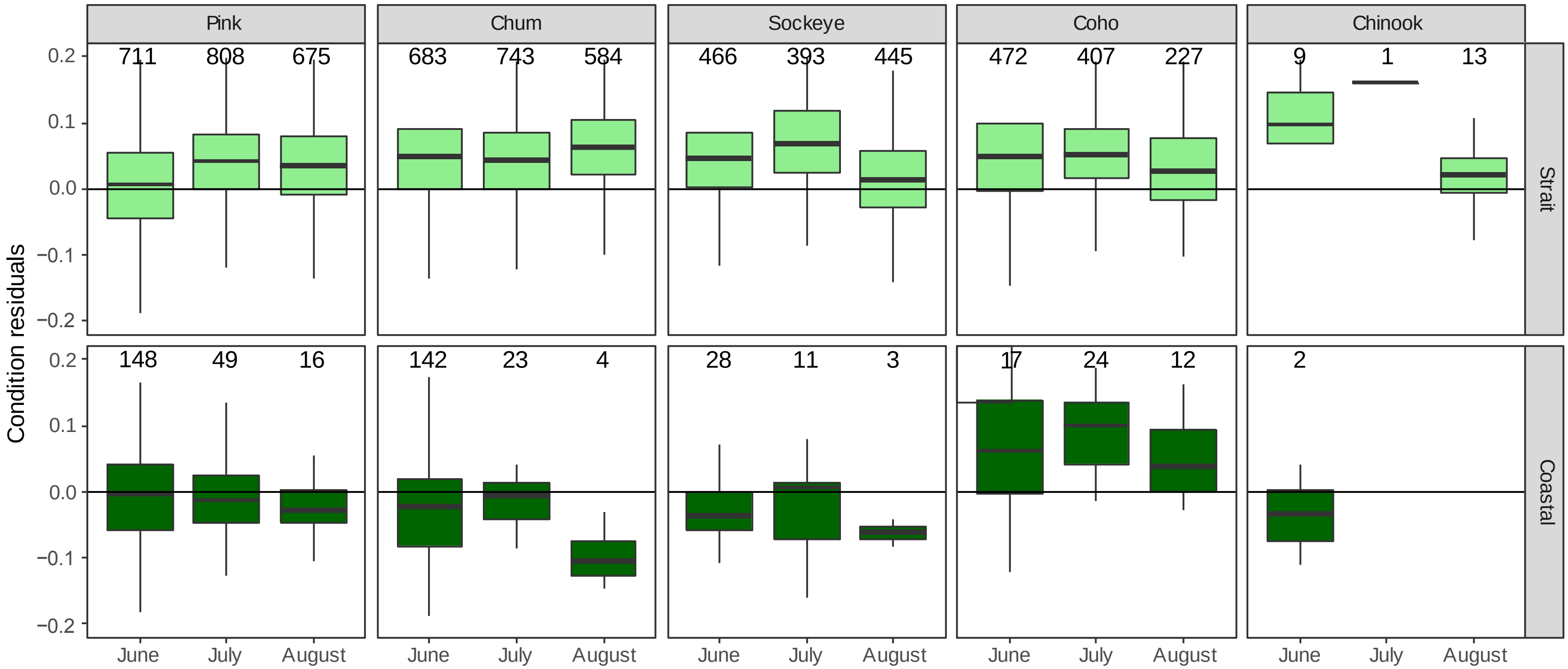


Figure 11: Condition residuals from length-weight regressions of juvenile salmon captured from June–August. Sample sizes are given as numbers in above each box.

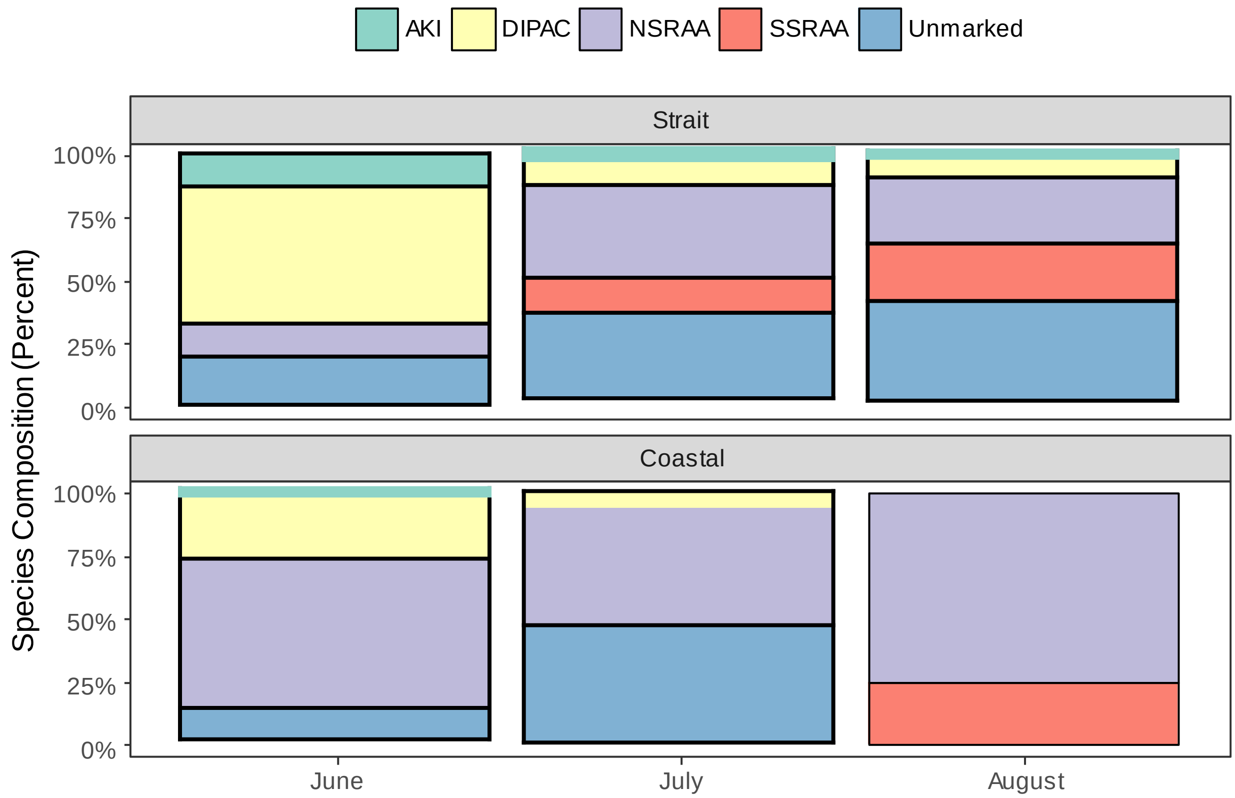


Figure 12: Monthly stock composition (based on otolith marks) of juvenile chum salmon from June–August.

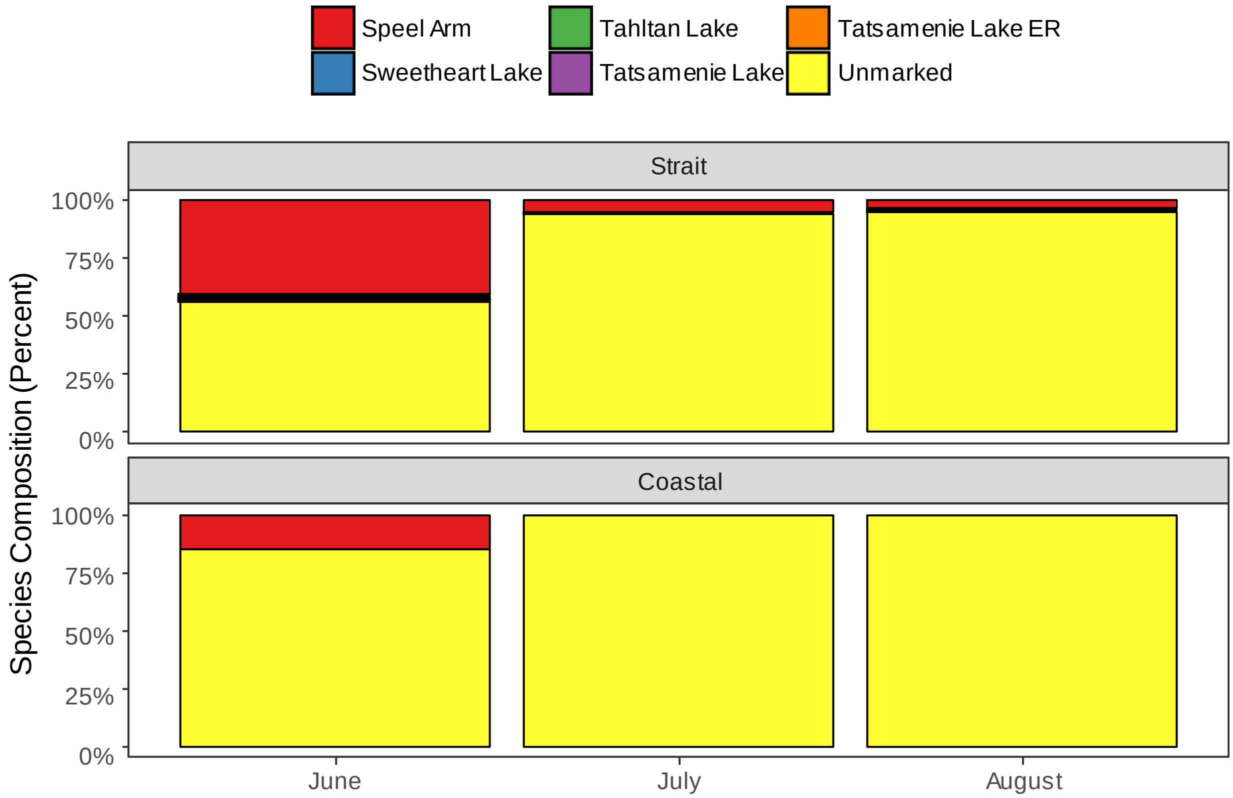


Figure 13: Monthly stock composition (based on otolith marks) of juvenile chum salmon from June–August.

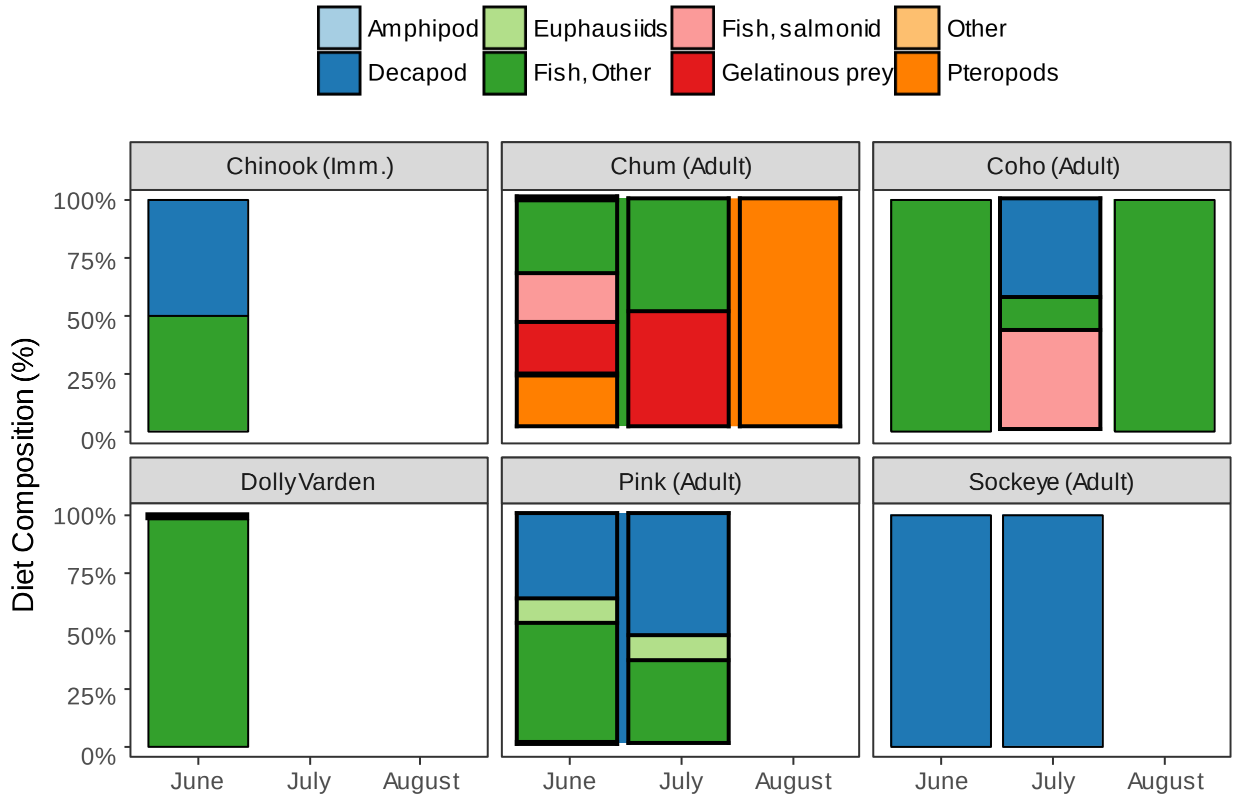


Figure 14: Diet composition (%) of immature and adult marine fishes from rope trawl catches in the Strait habitat of the northern region of southeastern Alaska, June–August 2015. See Table 18 for sample counts.

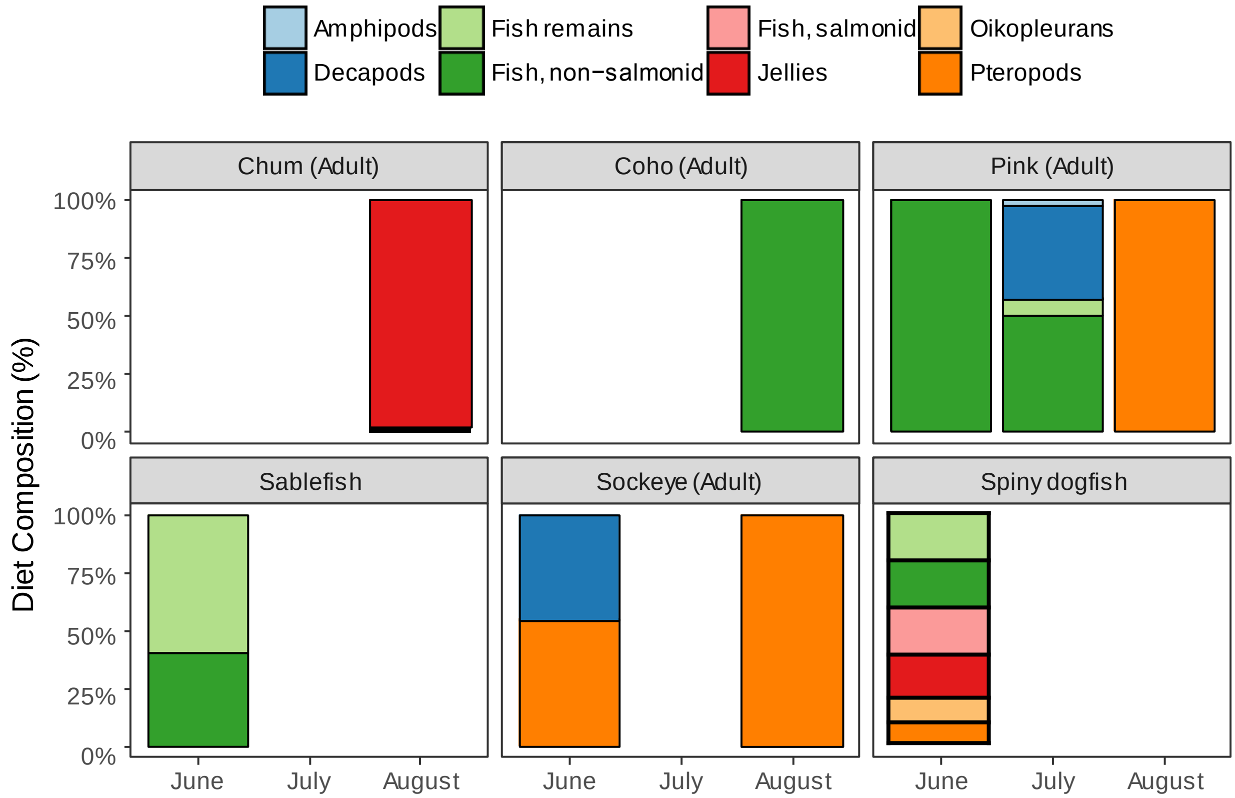


Figure 15: Diet composition (%) of immature and adult marine fishes from rope trawl catches in the Coastal habitat of the northern region of southeastern Alaska, June–August 2015. See Table 18 for sample counts.