

**Annual Survey of Juvenile Salmon, Ecologically-Related Species,
and Biophysical Factors in the Marine Waters of
Southeastern Alaska, May–August 2013**

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 2013. This annual survey, conducted by the Southeast Coastal Monitoring (SECM) project, marks 17 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. Thirteen 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, Norpac and bongo nets, a water sampler, and a conductivity-temperature-depth profiler. Surface (3-m) temperatures and salinities ranged from approximately 7 to 16 °C and 16 to 32 PSU across inshore, strait, and coastal habitats for the four months. A total of 25,730 fish and squid, representing 27 taxa, were captured in 98 rope trawl hauls fished from June to August. Juvenile salmon comprised approximately 94% of the total fish catch with the exception of one large haul of capelin ($n = 10,452$). Juvenile pink (*O. gorbuscha*), chum (*O. keta*), sockeye (*O. nerka*), and coho (*O. kisutch*) salmon occurred in 57-84% of the hauls by month and habitat, while juvenile Chinook salmon (*O. tshawytscha*) occurred in 34% of the hauls. Abundance of juvenile salmon was moderate in 2013; peak CPUE occurred in July in strait and coastal habitats. Coded-wire tags were recovered from 20 coho salmon and 14 Chinook salmon, mainly including hatchery and wild stocks originating in SEAK and captured in strait habitat; an additional 20 adipose-clipped individuals without tags (presumably originating from the Pacific Northwest) were recovered mainly in coastal habitat. Alaska enhanced stocks comprised 59%, 19%, and < 1% of chum, sockeye, and coho salmon, respectively. Predation on juvenile salmon was observed in 3 of 11 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 during climate change in marine ecosystems.

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, 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 (*Theragra chalcogramma*) and Pacific herring (*Clupea pallasii*) (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). Companion studies in Icy Strait also indicated that food quantity can be more important than food quality for growth and survival of juvenile salmon (Weitkamp and Sturdevant 2008). As a result, monitoring the composition, abundance, 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; Sturdevant et al. 2013a; Fergusson et al. 2014). In contrast, “top-down” predation events can also affect salmon year-class strength (Sturdevant et al. 2009, 2012b, 2013b). 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, 2013a).

In 2013, SECM sampling was conducted in the northern region of SEAK for the 17th 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 on juvenile salmon, ecologically-related species, and associated biophysical parameters collected by the SECM project in 2013. Subsets of the long term time series are examined in several recent documents (e.g., Fergusson et al. 2014; Orsi et al. 2014); a comprehensive report of the time series of catch and ecosystem metrics will be reported in a forthcoming NOAA Technical Memorandum.

METHODS

Sampling was conducted in the northern region of SEAK monthly from May to August 2013 (Table 1). 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. Hatchery and wild salmon captured in Icy Strait have included

stocks released from throughout SEAK (Orsi et al. 2013b). 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 (Figure 1). Sampling operations in the different localities were also constrained to bottom depths > 75 m, sea wave height < 2.5 m, and winds < 12.5 m/sec. 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, one surface water sample, one light reading, and one or two plankton tows. The CTD data were collected with a Sea-Bird¹ SBE 19 plus Seacat profiler deployed to 200 m or within 10 m of the bottom. A CTD cast was typically taken for each haul unless hauls occurred less than two hours apart at the same station. 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. Surface water samples for chlorophyll ($\mu\text{g/L}$) concentrations were taken 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 two net types. One shallow (20-m) vertical Norpac haul was made with a 50-cm, single ring frame with 243- μm mesh net. One double oblique bongo haul was 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. A VEMCO ML-08-TDR time-depth recorder was attached to the bongo frame to record the maximum sampling depth of each haul. 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, zooplankton settled volumes (ZSV, ml), total settled volumes (TSV, ml), displacement volumes (DV, ml), standing stock (DV/m^3), and density (number/m^3) were determined for various samples. For Norpac samples, ZSV and TSV were measured after a 24-hr period in Imhof cones. Mean SVs were determined for stations pooled by habitat and month. For bongo 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), oikopleurans (Larvacea), decapod larvae, amphipods, chaetognaths, pteropods, and combined minor taxa.

Fish sampling

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

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), was 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 (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 AQUAMark 300 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.

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 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.

Potential predators of juvenile salmon from each haul were identified, measured (FL, mm), weighed (g), and stomach contents were examined onboard the vessel. Stomachs were excised, 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.

Juvenile salmon catch data were adjusted using calibration coefficients between vessels to allow comparisons with the long term data collected using the NOAA ship *John N. Cobb* (1997-2007). No direct calibration of the *NWE* with a previously-used vessel was possible. The *NWE* was assumed to be comparable to the similarly-sized and -powered chartered vessel FV *Chellissa* that was calibrated to the RV *Medeia*, which was previously calibrated to the NOAA ship *John N. Cobb* (Wertheimer et al. 2010). These paired comparisons permitted the computation of species-specific calibration factors which were applied to the Ln (CPUE+1) for each trawl haul of the *NWE* to convert the data into “Cobb units” directly comparable to the previous 16 years of the SECM time series.

In the laboratory, frozen individual juvenile salmon were weighed (0.1 g) and otoliths were removed from the chum, sockeye, and coho salmon. Mean lengths, weights, Fulton condition factor ($\text{g}/\text{mm}^3 \cdot 10^5$; Cone 1989), 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. An index of seasonal condition was obtained via calorimetry, using a 1425 Parr micro-bomb calorimeter. Whole body energy content (cal/g wet weight) was determined from ten fish of each species captured in July (Fergusson et al. 2010, 2013).

RESULTS AND DISCUSSION

Thirteen stations were sampled near the end of each month from May to August 2013 (Figure 1). In total, data were collected from 98 rope trawl hauls, 100 CTD casts, 32 tandem bongo net samples, 36 Norpac net samples, 48 surface water samples, 109 Secchi readings, and 108 ambient light measures during 23 days at-sea (Table 2, Appendix 1).

Oceanography

Overall, station mean SST values ranged from 6.5 to 16.0 °C from May to August, and averaged 12.0 °C (Table 3; Appendix 1). Seasonal SST patterns were similar among habitats (Figure 2a), with a peak in July. Monthly mean SSTs were lowest in strait habitat and highest in inshore or coastal habitat, differing by as much as ~3 °C among localities. Compared to the SSTs, the monthly means for the 20-m integrated temperatures were colder yet followed the same seasonal pattern.

Surface salinities ranged from 16.3 to 32.2 PSU from May to August, and averaged 26.9 PSU (Table 3; Appendix 1). Salinities were lowest in inshore habitat and highest in coastal habitat. Seasonal PSU values trended downward from May to August in inshore and strait habitats (Figure 2b), whereas minimal seasonal variation occurred in coastal PSU values. Mean salinities for the 20-m integrated water column were higher and more seasonally stable than the 3-m values.

Water clarity depths ranged from 2.0 to 7.0 m (average 4.6 m; Appendix 1). Water clarity reached a seasonal low in June and/or July in all habitats and was lowest in inshore habitat (Figure 3a). The MLD ranged from 6 to 24 m (average 8.4 m; Appendix 1). Seasonal MLD patterns varied by habitat; the deepest values occurred in May in strait habitat, in August in

coastal habitat, and in May and July in inshore habitat (Figure 3b). Thus, trawl sampling depths (~ 20 m) usually spanned a range of habitat conditions that varied with depth and location, including the active surface layer and the stable waters below the MLD.

Other physical data also showed seasonal and spatial differences across the stations and sampling season. Ambient light measurements ranged from 13 to 766 W/m² (Appendix 1). Chlorophyll concentrations ranged from 0.3 to 10.6 µg/L (mean of 2.2 µg/L), while phaeopigment concentrations ranged from 0.0 to 1.3 µg/L (mean of 0.4 µg/L) (Table 4). Chlorophyll was highest in May in inshore and strait habitats and in August in coastal habitat, but converged to similarly low values in July in all habitats (Figure 4a).

Zooplankton ZSVs from the Norpac net hauls ranged from 1 to 20 ml per station with an overall average of 8 ml from May to August (Appendix 1; Table 5). Seasonal patterns for ZSV differed by habitat and locality. Peak mean ZSVs occurred in June in all habitats (Figure 4b).

Zooplankton standing stock from bongo net hauls ranged from < 0.5 to 1.5 ml/m³ for 333-µm mesh (mean of 0.7 ml/m³) and from 0.1 to 0.9 ml/m³ for 505-µm mesh (mean of 0.5 ml/m³; Table 6) from May to August. Mean standing stock was highest in strait habitat and lowest in inshore and coastal habitats for both mesh size fractions. Seasonal patterns varied between habitats (Figure 5).

Seasonal total density of zooplankton prey fields (333-µm mesh) at stations in Icy Strait ranged from 653 to 1,639 organisms/m³ (mean of 999 organisms/m³; Table 6). Mean density was lowest in August and station variability was highest in May (Figure 6a). Zooplankton composition was dominated by either large and/or small calanoid copepods in all months (Figure 6b). Small calanoids included *Pseudocalanus*, *Centropages*, and *Acartia* and accounted for 30-75% of the composition from May through August. Large calanoids included *Metridia* spp., *Neocalanus plumchrus/flemingeri*, and *Calanus marshallae* and accounted for 11-37% of the composition from May through August. Zooplankton taxa such as barnacle, euphausiid, and decapod larvae, larvaceans, pteropods, and pelagic amphipods comprised a much smaller portion of the zooplankton composition (< 15%) despite being the prey selected by juvenile salmon and other planktivores (Coyle and Paul 1992; Landingham et al. 1998; Sturdevant et al. 2004, 2012b).

Catch composition

Jellyfish catches included five species (*Aequorea* sp., *Aurelia labiata*, *Chrysaora melanaster*, *Cyanea capillata*, and *Staurophora* sp.) and an “other” category (Table 7). Total biomass (volume) of jellyfish ranged from 0 to 52 L per haul from June to August. Jellyfish monthly biomass and species composition varied by month and habitat (Figure 7). In coastal habitat, the dominant species was *Chrysaora melanaster* in June and July then switched to *Aequorea* sp. in August. In strait habitat, small numbers (<0.5 L) of *Chrysaora melanaster* and *Cyanea capillata* were present in June, however high abundances of *Aequorea* sp. (9-12 L) and *Cyanea capillata* (1-3 L) were caught in July and August.

In total, 25,730 fish and squid, representing 27 taxa, were captured in 98 rope trawl hauls in strait and coastal habitats (Table 8). Excluding one large haul of capelin ($n = 10,452$) in August, juvenile salmon comprised approximately 94% of the total fish catch (Figure 8) and occurred more frequently in strait habitat than in coastal habitat. Adult salmon were most abundant in June and July, whereas immature Chinook salmon were most abundant in June. Juvenile pink, chum, sockeye, and coho salmon occurred in 57-84% of the trawls, while juvenile Chinook salmon occurred in 34% of the hauls (Table 9). Juvenile pink, chum, and sockeye salmon catches peaked in July in both strait and coastal habitats. In contrast, juvenile coho

catches were high in both June and July in strait habitat and July in coastal habitat. Juvenile Chinook salmon catches were highest in August in strait habitat and July in coastal habitat (Table 10, Figure 9). Non-salmonids were not very abundant in catches in either strait or coastal habitats, with the exception of walleye pollock (June) and capelin (August; Table 8).

Length, weight, and condition of juvenile salmon differed among species and months (Tables 11–15, Figures 10–13). Most species 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 102 to 170 mm for pink; 95 to 165 mm for chum; 132–171 mm for sockeye; 172 to 240 mm for coho; and 233–259 mm for Chinook salmon (Tables 11–15, Figure 10). Mean weights of juvenile salmon increased monthly from 10 to 50 g for pink; 9 to 49 g for chum; 26 to 55 g for sockeye; 67 to 164 g for coho; and 173 to 224 for Chinook salmon (Tables 11–15, Figure 11). Juvenile coho and Chinook salmon were consistently larger than the other three species, and coho captured in coastal habitat were generally larger than those captured in strait habitat. Mean conditions of juvenile salmon were fairly consistent in both strait and coastal habitats. In strait habitat, the CRs for juvenile pink, chum, and sockeye salmon were positive while the CRs for juvenile coho and Chinook salmon were negative (Figure 13). In coastal habitat (with limited sample sizes), the CRs were negative for pink, chum and sockeye salmon and positive for coho salmon. These positive CRs suggest favorable marine conditions for juvenile salmon growth in 2013.

All coho ($n = 931$) and Chinook ($n = 193$) salmon were scanned (either visually onboard the vessel or electronically in the laboratory) for the presence of CWTs. Stock-specific information was obtained from 34 CWT recoveries from a total of 53 salmon lacking the adipose fin and one with the adipose fin intact. For coho salmon, a total of 20 CWTs were recovered from 19 juveniles and 1 adult. For Chinook salmon, a total of 14 CWTs were recovered from 4 juveniles and 10 immatures (Table 16). All of the tagged coho salmon originated from hatchery and wild stocks in the northern region of SEAK except for three coho salmon that originated from Washington (WA), including one whose adipose fin was intact. The tagged Chinook salmon originated from SEAK, Idaho (ID), British Columbia (BC), and Oregon (OR). In the coastal habitat, most adipose-clipped juvenile salmon were not tagged and presumably originated from Pacific Northwest (PNW) hatcheries. These facilities are mandated to adipose-clip but not necessarily tag all fish released, a practice not used in Alaska. Migration rates of the 34 CWT juvenile salmon ranged from 0.1 to 19.0 km/day and averaged 4.4 km/day.

Stock-specific information was also obtained from recoveries of otolith-marked hatchery chum, sockeye, and coho 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), Armstrong Keta Incorporated (AKI), Prince of Wales Hatchery Association (PWHA), and Kake Non-profit Fisheries Corporation (KNFC). A total of 2,346 juvenile chum, sockeye, and coho salmon otoliths were examined for thermal marks (Tables 17–19; Figures 14–17).

For juvenile chum salmon, stock-specific information was derived from a subsample of 1,204 fish, representing 14% of the 8,881 caught (Tables 8 and 17; Figure 14). Of all chum salmon otoliths examined, 710 (59%) were marked by hatcheries in SEAK and 494 (41%) were not marked. Of the marked fish, 552 (78%) were from DIPAC, 132 (19%) were from NSRAA, 16 (2%) were from SSRAA, 4 (1%) were from AKI, and 6 (1%) were from KNFC. Hatchery chum salmon catch composition was relatively stable for all months and across habitats, ranging

from 52% to 62%. Catches of SSRAA and KNFC hatchery chum salmon indicated northward movement by these stocks, particularly during August (Table 17).

For juvenile sockeye salmon, stock-specific information was derived from the otoliths of a subsample of 692 fish, representing 60% of the 1,161 caught (Tables 8 and 18; Figure 15). Of all the sockeye salmon otoliths examined, 134 (19%) were marked and 558 (81%) were not marked. Of the marked fish, 117 (87%) were from Speel Arm, SEAK, 13 (10%) were from Tahltan Lake/Stikine River, British Columbia, 3 (2%) were from Tuya Lake/Stikine River, British Columbia, and 1 (1%) was from Sweetheart Lake, SEAK. The two stocks that migrated through the Stikine River drainage to marine waters in central SEAK were sampled in Icy Strait in July and August, suggesting a protracted northward migration.

For juvenile coho salmon, stock-specific information was derived from the otoliths of a subsample of 450 fish representing 50% of the 902 caught (Tables 8 and 19; Figure 16). Of all the coho salmon otoliths examined, 3 (< 1%) were marked and originated from the PWHA hatchery in Klawock. The remaining 932 (91%) were unmarked and presumably from wild stocks. This is the first year that DIPAC had not otolith marked their coho.

Stock-specific sizes of otolith-marked juvenile chum and sockeye salmon increased monthly for all stock groups. Average weights of these fish were used to plot monthly growth trajectories (Figure 17). In 2013, chum salmon were released in April–May at 1–4 g and sockeye salmon were released in April–June at 5–10 g. Weights of chum salmon that out-migrated as fry generally doubled from June to July and from July to August; weights of sockeye salmon that out-migrated as smolts showed a similar increase from July to August. The limited recovery of marked coho salmon prevented stock-specific size analysis.

Stomachs of 450 potential predators of juvenile salmon were examined onboard from a suite of 11 fish species (Table 20). Juvenile salmon were consumed by three predator species: black rockfish (*Sebastes melanops*, $n = 3$ of 5), adult coho ($n = 7$ of 30) and pink salmon ($n = 1$ of 179; Table 21; Figure 18). Most fish examined for diet had been feeding (79%) and diet composition varied considerably among the species (Table 21; Figure 18). Other major prey taxa included non-salmonid fish and fish remains, amphipods, and decapod larvae.

Summary

This document summarizes SECM data collected on juvenile salmon, ecologically-related species, and associated biophysical parameters collected from May to August in 2013 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 adult pink salmon harvest in SEAK (e.g., Orsi et al. 2012; Wertheimer et al. 2013) and to explore year-class strength relationships for other species such as Chinook salmon and sablefish (*Anoplopoma fimbria*; Martinson et al. 2013; Orsi et al. 2013a). Subsets of the 17-year long term time series are also examined in recent ecosystem documents (Fergusson et al. 2014; Orsi et al. 2014; Yasumiishi et al. 2014). Comparing annual effects of biophysical parameters to long term mean values permits climate-related changes in marine conditions to be detected. Therefore, a comprehensive report of the time series of catch and ecosystem metrics will be reported in a forthcoming NOAA Technical Memorandum. 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 2013. Transect and station positions are shown in Figure 1.

Station	Latitude N	Longitude W	Distance		Bottom depth (m)
			Offshore (km)	Between adjacent station (km)	
Auke Bay Monitor					
ABM	58°22.00'	134°40.00'	1.5	—	60
Upper Chatham Strait transect					
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
Icy Strait transect					
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
Icy Point transect					
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	57°53.50'	137°42.60'	65.0	24.8	1,300

Table 2.—Numbers and types of samples collected in inshore, strait, and coastal habitats by month in the marine waters of the northern region of southeastern Alaska, May–August 2013.

Dates (days)	Vessel	Habitat	Data collection type ¹				Chlorophyll & nutrients
			Rope trawl	CTD cast	Oblique bongo	20-m Norpac	
22-23 May (2 days)	R/V <i>Sashin</i>	Inshore	0	1	1	1	1
		Strait	0	8	4	8	8
		Coastal	0	0	0	0	0
23-29 June (7 days)	F/V <i>Northwest Explorer</i>	Inshore	0	1	1	1	1
		Strait	28	28	4	8	8
		Coastal	4	4	4	4	4
25-31 July (7 days)	F/V <i>Northwest Explorer</i>	Inshore	0	1	1	1	1
		Strait	28	4	4	8	8
		Coastal	4	28	4	4	4
27 August- 2 September (7 days)	F/V <i>Northwest Explorer</i>	Inshore	0	1	1	1	1
		Strait	30	4	4	9	7
		Coastal	4	20	4	4	4
Total			98	100	32	49	47

¹Rope trawl = 20-min hauls with Nordic 264 surface trawl 18 m wide by 24 m deep; CTD casts = to 200 m or within 10 m of the bottom; oblique bongo = 60-cm diameter frame, 505- and 333- μ m meshes, towed double obliquely down to and up from a depth of 200 m or within 20 m of the bottom; 20-m Norpac = 50-cm diameter frame, 243- μ m conical net towed vertically from 20 m; chlorophyll and nutrients are from surface seawater samples.

Table 3.—cont.

Month	<i>n</i>	Temp (°C)	Salinity (PSU)									
Icy Point transect												
	IPA			IPB			IPC			IPD		
May	—	—	—	—	—	—	—	—	—	—	—	—
June	1	13.3	32.0	1	12.5	32.0	1	13.3	31.9	1	13.3	31.9
July	1	15.5	32.0	1	14.0	31.9	1	12.4	31.9	1	16.0	32.2
August	1	14.2	31.7	1	13.9	31.5	1	14.0	31.5	1	14.9	32.2

Table 4.—Chlorophyll and phaeopigment ($\mu\text{g/L}$) concentrations from 200-ml surface water samples collected monthly at stations in the marine waters of the northern region of southeastern Alaska, May–August 2013. Station code acronyms are listed in Table 1.

Month	Chloro ($\mu\text{g/L}$)	Phaeo ($\mu\text{g/L}$)						
Auke Bay Monitor								
ABM								
May	3.25	0.24						
June	2.39	0.39						
July	0.86	0.12						
August	0.49	0.10						
Upper Chatham Strait transect								
UCA UCB UCC UCD								
May	6.63	0.66	5.40	0.41	8.93	1.09	10.61	1.30
June	1.56	0.05	1.71	0.21	1.51	0.23	2.63	0.32
July	0.25	0.04	0.27	0.06	0.72	0.23	0.58	0.18
August	0.95	0.31	0.62	0.13	0.77	0.22	0.70	0.22
Icy Strait transect								
ISA ISB ISC ISD								
May	1.92	0.33	2.44	0.37	5.53	0.98	7.60	0.76
June	2.95	0.50	2.37	0.31	3.46	0.71	3.14	0.63
July	3.70	0.57	1.32	0.23	1.36	0.30	1.76	0.51
August	1.26	0.29	1.16	0.35	1.32	0.26	1.92	0.40
Icy Point transect								
IPA IPB IPC IPD								
May	—	—	—	—	—	—	—	—
June	0.74	0.16	2.46	0.41	0.73	0.20	0.57	0.14
July	0.38	0.12	1.36	0.46	1.14	0.39	0.51	0.15
August	1.69	0.62	1.34	0.51	1.13	0.46	1.04	0.24

Table 5.—Mean zooplankton settled volumes (ZSV, ml) and total plankton settled volumes (TSV, ml) from vertical 20-m Norpac hauls (0.5 m diameter, 243- μ m mesh) collected monthly at stations in the marine waters of the northern region of southeastern Alaska, May–August 2013. Station code acronyms are listed in Table 1. Volume differences between ZSV and TSV are caused by presence of phytoplankton or slub in the sample. Standing stock (ml/m³) can be computed by dividing by the water volume filtered, a constant factor of 3.9 m³ for these samples.

Month	<i>n</i>	ZSV	TSV									
Auke Bay Monitor												
ABM												
May	1	9.0	14.0									
June	1	15.0	15.0									
July	1	2.0	4.0									
August	1	8.0	8.0									
Upper Chatham Strait transect												
UCA UCB UCC UCD												
May	1	11.0	16.0	—	—	—	1.0	15.0	22.0	1.0	7.0	9.0
June	1	20.0	40.0	1.0	15.0	30.0	1.0	14.0	28.0	1.0	10.0	20.0
July	1	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0	1.0	2.0
August	1	3.0	3.0	1.0	2.0	2.0	1.0	3.5	3.5	1.0	4.0	4.0
Icy Strait transect												
ISA ISB ISC ISD												
May	1	7.0	10.0	1	5.0	10.0	1	8.0	10.0	1	4.0	5.0
June	1	7.5	15.0	1	20.0	40.0	1	15.0	30.0	1	7.0	14.0
July	1	10.0	20.0	1	2.0	4.0	1	3.5	6.5	1	2.0	4.0
August	1	12.0	12.0	1	20.0	20.0	1	13.0	13.0	1	9.5	9.5
Icy Point transect												
IPA IPB IPC IPD												
May	—	—	—	—	—	—	—	—	—	—	—	—
June	1	11.0	11.0	1	16.0	16.0	1	10.0	10.0	1	17.0	17.0
July	1	13.0	13.0	1	5.0	5.0	1	15.0	15.0	1	4.0	4.0
August	1	8.0	8.0	1	2.5	2.5	1	5.0	5.0	1	5.0	5.0

Table 6.—Zooplankton displacement volumes (DV, ml), standing stock (DV/m³), and total density (number/m³, 333- μ m mesh only) from double oblique bongo (0.6 m diameter, 333- and 505- μ m mesh) hauls collected monthly at stations in the marine waters of the northern region of southeastern Alaska, May–August 2013. 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. Station code acronyms are listed in Table 1.

Month	Depth			Total density	Depth			Total density	Depth			Total density	Depth			Total density
	(m)	DV	DV/m ³		(m)	DV	DV/m ³		(m)	DV	DV/m ³		(m)	DV	DV/m ³	
Auke Bay Monitor (ABM)																
333- μ m mesh																
May					42	50	0.9	—					42	30	0.4	—
June					43	25	0.4	—					43	15	0.2	—
July					30	10	0.2	—					30	5	0.1	—
August					30	5	0.1	—					30	5	0.1	—
Icy Strait																
333- μ m mesh																
ISA				ISB				ISC				ISD				
May	79	50	0.9	1,185.1	164	150	1.3	1,638.9	225	145	1.5	771.9	214	150	0.8	1,424.7
June	163	65	0.5	1,018.9	195	140	0.5	789.4	223	165	0.7	1,107.8	207	135	0.5	737.5
July	92	85	0.8	1,080.5	177	105	0.6	933.4	217	145	0.6	887.6	215	185	0.7	938.8
August	80	55	0.6	1,013.3	149	85	0.5	963.5	225	145	0.6	839.9	220	120	0.5	653.3
505- μ m mesh																
ISA				ISB				ISC				ISD				
May	79	55	0.4	—	164	100	0.6	—	225	140	0.9	—	214	130	0.6	—
June	163	40	0.3	—	195	100	0.3	—	223	125	0.4	—	207	105	0.3	—

Table 6.—cont.

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
July	0	75	0.7	—	0	85	0.5	—	0	115	0.4	—	215	170	0.7	—
August	80	10	0.1	—	149	50	0.3	—	225	100	0.4	—	220	105	0.4	—
Icy Point																
333- μ m mesh																
	IPA				IPB				IPC				IPD			
May																
June	155	55	0.3	—	108	45	0.3	—	119	50	0.3	—	215	65	0.2	—
July	140	45	0.2	—	93	25	0.2	—	101	35	0.2	—	236	25	0.1	—
August	151	25	0.1	—	106	30	0.2	—	114	15	0.1	—	196	10	0.0	—
505- μ m mesh																
	IPA				IPB				IPC				IPD			
May																
June	155	35	0.2	—	108	55	0.4	—	119	55	0.4	—	215	45	0.2	—
July	140	30	0.2	—	93	15	0.1	—	101	15	0.1	—	236	25	0.1	—
August	151	20	0.1	—	106	10	0.1	—	114	5	0.0	—	196	45	0.2	—

Table 7.—Mean volume (L) of jellyfish captured in rope trawl hauls monthly at stations in the marine waters of the northern region of southeastern Alaska, June-August 2013.

	Icy Strait				Upper Chatham Strait				Icy Point			
	ISA	ISB	ISC	ISD	UCA	UCB	UCC	UCD	IPA	IPB	IPC	IPD
<i>Aequorea</i> sp.												
June	1.2	2.5	0.5	1.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
July	4.0	2.3	5.2	5.5	1.6	7.1	12.5	20.9	4.0	1.5	10.4	6.3
August	12.0	13.5	3.4	2.5	17.0	26.1	7.6	7.9	12.5	3.5	3.6	5.7
<i>Aurelia labiata</i>												
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.1	0.0	0.0	0.3	0.2	1.8	0.7	0.2	2.3	2.8	1.7
August	1.4	0.1	0.0	0.5	1.7	1.0	1.7	2.9	2.3	0.3	1.6	3.7
<i>Chrysaora melanaster</i>												
June	5.0	8.4	6.0	52. ₂	0.0	0.4	0.3	0.0	0.0	0.0	0.1	0.0
July	9.0	2.0	27.5	0.6	0.1	0.1	0.1	0.2	0.0	0.1	0.3	0.1
August	1.3	0.3	0.0	0.0	0.2	0.0	0.4	0.0	0.0	0.2	0.4	0.2
<i>Cyanea capillata</i>												
June	0.4	0.4	0.0	0.2	0.0	0.2	0.1	0.1	0.3	0.4	0.2	0.2
July	1.0	0.5	1.5	1.0	3.4	1.4	1.7	1.0	0.2	0.4	0.3	0.3
August	0.8	0.0	0.0	0.0	3.8	2.2	1.1	0.9	2.5	4.5	2.8	2.8

Table 7.—cont.

	Icy Strait				Upper Chatham Strait				Icy Point			
	ISA	ISB	ISC	ISD	UCA	UCB	UCC	UCD	IPA	IPB	IPC	IPD
	<i>Staurophora</i> sp.											
June	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other ¹											
June	0.1	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0

¹ Other: Ctenophores, *Phacellophora* sp., and unknown species

Table 8.—Salmonid and non-salmonid catches from rope trawl hauls in strait ($n = 86$) and coastal ($n = 12$) marine habitats of the northern region of southeastern Alaska, June–August 2013. 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; see Appendix 2 and Table 10.

Common Name	Scientific name	Strait			Coastal		
		June	July	August	June	July	August
Salmonids							
Chum salmon ¹	<i>Oncorhynchus keta</i>	810	7,342	624	—	83	22
Pink salmon ¹	<i>O. gorbuscha</i>	185	2,816	344	—	62	15
Sockeye salmon ¹	<i>O. kisutch</i>	117	817	213	—	13	1
Coho salmon ¹	<i>O. nerka</i>	371	365	82	18	52	14
Pink salmon ³	<i>O. gorbuscha</i>	51	100	22	31	2	1
Chinook salmon ²	<i>O. tshawytscha</i>	97	5	12	8	2	—
Chum salmon ³	<i>O. keta</i>	40	3	5	3	2	—
Chinook salmon ¹	<i>O. tshawytscha</i>	14	6	16	7	4	—
Coho salmon ³	<i>O. kisutch</i>	4	6	19	—	—	—
Dolly Varden	<i>Salvelinus malma</i>	22	—	—	—	—	—
Chinook salmon ³	<i>O. tshawytscha</i>	20	1	—	1	—	—
Sockeye salmon ³	<i>O. nerka</i>	3	—	—	—	—	—
Sockeye salmon ²	<i>O. nerka</i>	—	—	1	1	—	—
Steelhead	<i>O. mykiss</i>	—	—	—	1	—	—
Salmonid subtotals		1,735	11,461	1,338	70	220	53
Non-salmonids							
Capelin	<i>Mallotus villosus</i>	1	—	10,455	—	—	—
Walleye pollock ³	<i>Gadus chalcogramma</i>	146	—	7	2	1	—
Crested sculpin	<i>Blepsias bilobus</i>	4	26	46	1	—	—
Pacific saury	<i>Cololabis saira</i>	—	—	—	—	—	37

Table 8.—cont.

Common Name	Scientific name	Strait			Coastal		
		June	July	August	June	July	August
Arrowtooth flounder	<i>Reinhardtius stomias</i>	—	—	—	21	—	—
Smooth Lumpsucker	<i>Aptocyclus ventricosus</i>	8	1	5	—	—	—
Pacific herring	<i>Clupea pallasii</i>	1	7	3	—	1	—
Spiny Lumpsucker	<i>Eumicrotremus orbis</i>	—	5	3	—	—	—
Soft sculpin	<i>Gilbertidia sigalutes</i>	7	—	—	3	—	—
Walleye pollock ⁴	<i>Theragra chalcogramma</i>	6	—	1	2	5	—
Prowfish	<i>Zaprora silenus</i>	—	4	1	—	1	—
Pacific sandfish	<i>Trichodon trichodon</i>	4	—	1	—	—	1
Black rockfish	<i>Sebastes melanops</i>	—	—	—	2	3	—
Lingcod	<i>Ophiodon elongatus</i>	—	—	—	5	—	—
Salmon shark	<i>Lamna ditropis</i>	—	1	1	—	—	—
Poacher	Agonidae	1	—	—	—	—	—
Wolf-eel	<i>Anarrhichthys ocellatus</i>	—	1	—	—	—	—
Squid	Gonatidae	1	—	—	17	—	1
Skate	Rajidae	—	—	1	—	—	—
Spiny dogfish	<i>Squalus acanthias</i>	—	—	—	—	1	—
Jack mackerel	<i>Trachurus symmetricus</i>	—	—	—	1	—	—
Non-salmonid subtotals		179	45	10,524	54	12	39

¹Juvenile²Immature³Adult⁴Larvae or young-of-the-year

Table 9.—Frequency of occurrence of monthly salmonid and non-salmonid catches from rope trawl hauls in strait ($n = 86$) and coastal ($n = 12$) marine habitats of the northern region of southeastern Alaska, June–August 2013. The percent frequency of occurrence is shown in parentheses. Dash indicates no samples. See Table 2 for sampling effort by month and habitat.

Common name	Scientific name	Strait				Coastal			
		June	July	August	(%)	June	July	August	(%)
Salmonids									
Chum salmon ¹	<i>Oncorhynchus keta</i>	12	27	27	(77)	—	3	3	(50)
Pink salmon ¹	<i>O. gorbuscha</i>	8	22	22	(60)	—	3	1	(33)
Sockeye salmon ¹	<i>O. kisutch</i>	16	26	24	(77)	—	3	1	(33)
Coho salmon ¹	<i>O. nerka</i>	22	26	24	(84)	3	3	4	(83)
Pink salmon ³	<i>O. gorbuscha</i>	19	22	11	(60)	4	2	1	(58)
Chinook salmon ²	<i>O. tshawytscha</i>	25	5	8	(44)	3	1	—	(33)
Chum salmon ³	<i>O. keta</i>	16	2	4	(26)	1	2	—	(25)
Chinook salmon ¹	<i>O. tshawytscha</i>	12	6	11	(34)	2	2	—	(33)
Coho salmon ³	<i>O. kisutch</i>	3	5	11	(22)	—	—	—	(0)
Dolly Varden	<i>Salvelinus malma</i>	13	—	—	(15)	—	—	—	(0)
Chinook salmon ³	<i>O. tshawytscha</i>	7	1	—	(9)	1	—	—	(8)
Sockeye salmon ³	<i>O. nerka</i>	3	—	—	(3)	—	—	—	(0)
Sockeye salmon ²	<i>O. nerka</i>	—	—	1	(1)	1	—	—	(8)
Steelhead	<i>O. mykiss</i>	—	—	—	(0)	1	—	—	(8)
Non-salmonids									
Capelin	<i>Mallotus villosus</i>	1	—	2	(3)	—	—	—	(0)
Walleye pollock ³	<i>Gadus chalcogramma</i>	23	—	6	(34)	2	1	—	(25)
Crested sculpin	<i>Blepsias bilobus</i>	4	15	24	(50)	1	—	—	(8)
Pacific saury	<i>Cololabis saira</i>	—	—	—	(0)	—	—	1	(8)
Arrowtooth flounder	<i>Reinhardtius stomias</i>	—	—	—	(0)	2	—	—	(17)
Smooth Lumpsucker	<i>Aptocyclus ventricosus</i>	7	1	4	(14)	—	—	—	(0)

Table 9.—cont.

Common name	Scientific name	Strait				Coastal			
		June	July	August	(%)	June	July	August	(%)
Pacific herring	<i>Clupea pallasii</i>	1	5	3	(10)	—	1	—	(8)
Spiny Lumpsucker	<i>Eumicrotremus orbis</i>	—	5	3	(9)	—	—	—	(0)
Soft sculpin	<i>Gilbertidia sigalutes</i>	3	—	—	(3)	3	—	—	(25)
Walleye pollock ⁴	<i>Theragra chalcogramma</i>	3	—	1	(5)	2	1	—	(25)
Prowfish	<i>Zaprora silenus</i>	—	4	1	(6)	—	1	—	(8)
Pacific sandfish	<i>Trichodon trichodon</i>	4	—	1	(6)	—	—	1	(8)
Black rockfish	<i>Sebastes melanops</i>	—	—	—	(0)	2	2	—	(33)
Lingcod	<i>Ophiodon elongatus</i>	—	—	—	(0)	2	—	—	(17)
Salmon shark	<i>Lamna ditropis</i>	—	1	1	(2)	—	—	—	(0)
Poacher	Agonidae	1	—	—	(1)	—	—	—	(0)
Wolf-eel	<i>Anarrhichthys ocellatus</i>	—	1	—	(1)	—	—	—	(0)
Squid	Gonatidae	1	—	—	(1)	3	—	1	(33)
Skate	Rajidae	—	—	1	(1)	—	—	—	(0)
Spiny dogfish	<i>Squalus acanthias</i>	—	—	—	(0)	—	1	—	(8)
Pacific jack mackerel	<i>Trachurus symmetricus</i>	—	—	—	(0)	1	—	—	(8)

¹Juvenile²Immature³Adult⁴Larvae or young-of-the-year (YOY)

Table 10.—Juvenile salmon catch conversions for the FV *Northwest Explorer* (NWE) from rope trawl hauls in strait habitat of the marine waters of the northern region of southeastern Alaska, June-August 2013: mean catch-per-unit-effort (CPUE); mean Ln(CPUE+1); calibration factors; mean calibrated Ln(CPUE+1); and back-calculated mean nominal CPUE. Calibration factors were developed from paired comparisons between commercial and research vessels, and were used to standardize catches to the NOAA ship *John N. Cobb* (“Cobb units”; Wertheimer et al. 2010).

Species	Month	NWE		Calibration Factor	“Cobb units”	
		CPUE	Ln(CPUE+1)		Ln(CPUE+1)	CPUE
Pink	June	6.6	2.36	0.659	0.46	1.7
	July	100.3	4.78		1.91	15.0
	August	11.5	4.30		1.12	3.4
Chum	June	28.9	1.78	0.705	0.92	6.4
	July	262.2	4.26		2.98	40.7
	August	20.8	2.73		1.58	6.5
Sockeye	June	4.1	0.99	0.848	0.91	2.8
	July	29.4	2.71		2.35	16.1
	August	7.1	1.69		1.34	4.6
Coho	June	13.3	1.51	0.803	1.48	6.6
	July	13.0	2.92		1.84	7.0
	August	2.7	2.27		0.89	1.8

Table 11.—Length (mm, fork), weight (g), Fulton’s condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis of juvenile pink salmon captured in the marine waters of the northern region of southeastern Alaska by rope trawl, June–August 2013.

Locality	Factor	June				July				August			
		<i>n</i>	range	mean	se	<i>n</i>	range	mean	se	<i>n</i>	range	mean	se
Upper	Length	178	74-121	102	1	105	94-168	133	1	79	145-214	182	2
Chatham	Weight	143	3.6-18.7	10.6	0.2	82	8.2-44.5	23.0	0.7	79	29.6-104.1	62.6	2.1
Strait	Condition	143	0.8-1.1	1.0	0.0	82	0.6-1.1	0.9	0.0	79	0.8-1.5	1.0	0.0
	CR	143	-0.08-0.25	0.08	0.01	82	-0.51-0.21	0.02	0.01	79	-0.18-0.41	0.02	0.01
Icy Strait	Length	7	73-103	85	5	764	94-170	133	0	222	125-215	167	1
	Weight	7	3.2-9.6	5.5	1.0	502	6.7-45.7	22.0	0.3	172	17.0-93.8	44.0	0.9
	Condition	7	0.8-0.9	0.9	0.0	502	0.7-1.7	0.9	0.0	172	0.4-1.1	0.9	0.0
	CR	7	-0.09-0.09	0.01	0.02	502	-0.22-0.62	0.00	0.00	172	-0.89-0.16	-0.03	0.01
Icy Point	Length	—	—	—	—	62	104-181	130	2	15	134-197	166	5
	Weight	—	—	—	—	62	8.4-58.3	20.7	1.0	15	24.3-74.0	44.2	3.6
	Condition	—	—	—	—	62	0.7-1.1	0.9	0.0	15	0.9-1.0	0.9	0.0
	CR	—	—	—	—	62	-0.20-0.15	-0.01	0.01	15	-0.14-0.09	-0.03	0.01
Total	Length	185	73-121	102	1	931	94-181	132	0	316	125-215	170	1
	Weight	150	3.2-18.7	10.4	0.2	646	6.7-58.3	22.0	0.3	266	17.0-104.1	49.6	1.0
	Condition	150	0.8-1.1	1.0	0.0	646	0.6-1.7	0.9	0.0	266	0.4-1.5	1.0	0.0
	CR	150	-0.09-0.25	0.08	0.01	646	-0.51-0.62	0.00	0.00	266	-0.89-0.41	-0.01	0.01

Table 12.—Length (mm, fork), weight (g), Fulton’s condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis of juvenile chum salmon captured in the marine waters of the northern region of southeastern Alaska by rope trawl, June–August 2013.

Locality	Factor	June				July				August			
		<i>n</i>	range	mean	se	<i>n</i>	range	mean	se	<i>n</i>	range	mean	se
Upper	Length	441	79-128	96	0	301	96-174	128	1	174	110-230	171	2
Chatham	Weight	290	4.5-19.9	8.7	0.1	201	10.6-50.3	20.9	0.4	136	14.3-125.5	58.0	2.1
Strait	Condition	290	0.7-1.2	0.9	0.0	201	0.8-1.1	1.0	0.0	136	0.9-1.2	1.0	0.0
	CR	290	-0.27-0.27	0.01	0.00	201	-0.17-0.16	0.00	0.00	136	-0.13-0.17	0.02	0.01
Icy	Length	27	73-116	90	2	810	95-175	132	0	389	110-229	163	1
Strait	Weight	26	3.0-15.1	6.7	0.6	505	7.6-51.7	23.2	0.3	285	11.6-121.4	44.5	1.0
	Condition	26	0.8-1.0	0.9	0.0	505	0.8-1.2	1.0	0.0	285	0.8-1.2	1.0	0.0
	CR	26	-0.17-0.08	-0.07	0.01	505	-0.21-0.21	0.01	0.00	285	-0.19-0.20	-0.01	0.00
Icy Point	Length	—	—	—	—	83	89-209	130	2	22	128-206	170	4
	Weight	—	—	—	—	83	5.9-91.7	22.5	1.3	22	18.5-87.1	50.3	3.7
	Condition	—	—	—	—	83	0.8-1.2	1.0	0.0	22	0.9-1.1	1.0	0.0
	CR	—	—	—	—	83	-0.23-0.17	-0.02	0.01	22	-0.09-0.10	-0.01	0.01
Total	Length	468	73-128	95	0	1194	89-209	131	0	585	110-230	165	1
	Weight	316	3.0-19.9	8.5	0.1	789	5.9-91.7	22.5	0.3	443	11.6-125.5	48.9	1.0
	Condition	316	0.7-1.2	0.9	0.0	789	0.8-1.2	1.0	0.0	443	0.8-1.2	1.0	0.0
	CR	316	-0.27-0.27	0.00	0.00	789	-0.23-0.21	0.00	0.00	443	-0.19-0.20	0.00	0.00

Table 13.—Length (mm, fork), weight (g), Fulton’s condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis of juvenile sockeye salmon captured in the marine habitat of the northern region of southeastern Alaska by rope trawl, June–August 2013. Dash indicates no samples.

Locality	Factor	June				July				August			
		<i>n</i>	range	mean	se	<i>n</i>	range	mean	se	<i>n</i>	range	mean	se
Upper	Length	73	87-182	118	2	192	79-195	134	1	133	135-231	173	1
Chatham	Weight	73	6.4-65.5	18.5	1.3	152	4.2-80.1	27.4	1.0	133	27.9-135.6	57.5	1.5
Strait	Condition	73	0.8-1.2	1.0	0.0	152	0.8-1.2	1.0	0.0	133	0.8-1.2	1.1	0.0
	CR	73	-0.16-0.18	0.01	0.01	152	-0.19-0.20	0.03	0.01	133	-0.26-0.19	0.04	0.01
Icy Strait	Length	43	97-215	154	3	474	90-219	149	1	77	102-204	167	2
	Weight	43	9.5-105.5	38.6	2.8	391	6.8-116.8	36.9	0.8	77	10.7-87.6	50.6	1.7
	Condition	43	0.9-1.1	1.0	0.0	391	0.8-1.2	1.0	0.0	77	1.0-1.2	1.1	0.0
	CR	43	-0.15-0.07	-0.04	0.01	391	-0.32-0.19	0.02	0.00	77	-0.06-0.18	0.03	0.01
Icy Point	Length	—	—	—	—	13	140-200	164	5	1		178	
	Weight	—	—	—	—	13	28.6-80.9	47.9	5.0	1		55.1	
	Condition	—	—	—	—	13	0.9-1.2	1.0	0.0	1		1.0	
	CR	—	—	—	—	13	-0.09-0.15	0.01	0.02	1		-0.06	
Total	Length	116	87-215	132	3	679	79-219	145	1	211	102-231	171	1
	Weight	116	6.4-105.5	25.9	1.6	556	4.2-116.8	34.6	0.7	211	10.7-135.6	55.0	1.1
	Condition	116	0.8-1.2	1.0	0.0	556	0.8-1.2	1.0	0.0	211	0.8-1.2	1.1	0.0
	CR	116	-0.16-0.18	-0.01	0.01	556	-0.32-0.20	0.03	0.00	211	-0.26-0.19	0.03	0.00

Table 14.—Length (mm, fork), weight (g), Fulton’s condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis of juvenile coho salmon captured in the marine habitat of the northern region of southeastern Alaska by rope trawl, June–August 2013.

Locality	Factor	June				July				August			
		<i>n</i>	range	mean	se	<i>n</i>	range	mean	se	<i>n</i>	range	mean	se
Upper Chatham Strait	Length	211	111-244	165	2	78	152-260	198	3	47	200-285	235	3
	Weight	143	15.2-171.7	59.4	2.2	78	36.0-204.6	94.8	4.0	47	93.4-267.0	155.1	7.1
	Condition	143	1.0-1.4	1.2	0.0	78	1.0-1.4	1.2	0.0	47	1.0-1.4	1.2	0.0
	CR	143	-0.09-0.22	0.04	0.01	78	-0.13-0.20	0.01	0.01	47	-0.13-0.15	-0.01	0.01
Icy Strait	Length	160	96-242	174	2	287	143-269	198	1	35	196-275	237	3
	Weight	159	10.0-163.1	64.6	2.2	287	32.2-229.3	92.1	1.9	35	85.4-246.3	151.4	7.2
	Condition	159	1.0-1.3	1.2	0.0	287	0.9-1.4	1.1	0.0	35	0.9-1.3	1.1	0.0
	CR	159	-0.13-0.19	0.02	0.00	287	-0.33-0.21	-0.01	0.00	35	-0.27-0.07	-0.07	0.01
Icy Point	Length	18	179-281	228.1	6.4	52	170-289	236	3	14	227-305	265	7
	Weight	18	64.9-310.7	153.0	14.7	52	55.0-297.2	163.8	6.3	14	128-402.2	222.9	20.6
	Condition	18	1.1-1.4	1.2	0.0	52	1.0-1.4	1.2	0.0	14	1-1.4	1.2	0.0
	CR	18	-0.06-0.15	0.04	0.01	52	-0.12-0.23	0.03	0.01	14	-0.19-0.15	-0.04	0.03
Total	Length	389	96-281	172	1	417	143-289	203	1	96	196-305	240	2
	Weight	320	10.0-310.7	67.2	2.0	417	32.2-297.2	101.5	2.1	96	85.4-402.2	163.6	5.8
	Condition	320	1.0-1.4	1.2	0.0	417	0.9-1.4	1.2	0.0	96	0.9-1.4	1.1	0.0
	CR	320	-0.13-0.22	0.03	0.00	417	-0.33-0.23	0.00	0.00	96	-0.27-0.15	-0.04	0.01

Table 15.—Length (mm, fork), weight (g), Fulton’s condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis of juvenile Chinook salmon captured in the marine habitat of the northern region of southeastern Alaska by rope trawl, June–August 2013. Dash indicates no samples.

Locality	Factor	June				July				August			
		<i>n</i>	range	mean	se	<i>n</i>	range	mean	se	<i>n</i>	range	mean	se
Upper Chatham Strait	Length	8	197-282	233	11	2	221-247	234	13	11	196-305	252	11
	Weight	8	96.1-286.3	170.7	24.3	2	133.4-194.1	163.8	30.4	11	86.7-376	221.0	28.4
	Condition	8	1.2-1.4	1.3	0.0	2	1.2-1.3	1.3	0.0	11	1.2-1.4	1.3	0.0
	CR	8	-0.08-0.08	-0.01	0.02	2	-0.04--0.03	-0.04	0.00	11	-0.12-0.11	-0.03	0.02
Icy Strait	Length	6	175-251	211	11	4	194-260	228	14	5	228-318	274	15
	Weight	6	59.2-224.1	123.2	24.3	4	109.2-172.7	143.8	13.5	3	148.6-331.2	235.6	52.9
	Condition	6	1.1-1.4	1.2	0.0	4	1.0-1.5	1.2	0.1	3	1.3-1.4	1.3	0.0
	CR	6	-0.09-0.06	-0.04	0.02	4	-0.32-0.19	-0.07	0.11	3	-0.04-0.02	-0.02	0.02
Icy Point	Length	7	190-290	253	13	4	218-230	222	3	—	—	—	—
	Weight	7	89.9-312.2	217.7	28.3	4	135.4-146.8	142.6	2.5	—	—	—	—
	Condition	7	1.2-1.4	1.3	0.0	4	1.2-1.4	1.3	0.0	—	—	—	—
	CR	7	-0.12-0.06	-0.03	0.02	4	-0.08-0.07	0.01	0.03	—	—	—	—
Total	Length	21	175-290	233	7	10	194-260	227	6	16	196-318	259	9
	Weight	21	59.2-312.2	172.8	16.4	10	109.2-194.1	147.3	7.3	14	86.7-376	224.1	24.1
	Condition	21	1.1-1.4	1.3	0.0	10	1.0-1.5	1.3	0.0	14	1.2-1.4	1.3	0.0
	CR	21	-0.12-0.08	-0.03	0.01	10	-0.32-0.19	-0.03	0.04	14	-0.12-0.11	-0.03	0.02

Table 16.—Release and recovery information decoded from coded-wire tags (CWT) recovered from coho and Chinook salmon lacking an adipose fin. Fish were captured in the marine waters of the northern region of southeastern Alaska by rope trawl, June–August 2013. Station code acronyms and coordinates are shown in Table 1.

Species	CWT code	Release information						Recovery information					Days ² since release	Distance traveled (km)	
		Brood year	Agency ¹	Locality	Date	FL (mm)	W (g)	Locality	Station code	2013 Date	FL (mm)	W (g)			Age
June															
Chinook	041991	2009	ADFG	Chilkat River (Wild)	9/19/10	68	—	Icy Strait	ISC	6/23	510	1700	1.2	1008	145
Chinook	041991	2009	ADFG	Chilkat River (Wild)	9/19/10	68	—	Icy Strait	ISB	6/24	530	2400	1.2	1009	145
Chinook	042399	2010	ADFG	Chilkat River (Wild)	9/26/11	—	3.9	Icy Strait	ISA	6/25	393	750	1.1	638	150
Chinook	042466	2010	DIPAC	Pullen Creek	6/20/12	—	27.0	Icy Strait	ISB	6/24	315	450	1.1	369	—
Chinook	042772	2010	NSRAA	Kasnyku Bay	5/10/12	—	59.3	Icy Strait	ISB	6/25	450	1500	1.1	411	135
Chinook	042969	2010	DIPAC	Gastineau Channel	6/18/12	—	31.7	Chatham Str.	UCA	6/27	308	300	1.1	374	76
Chinook	042969	2010	DIPAC	Gastineau Channel	6/18/12	—	31.7	Chatham Str.	UCA	6/28	330	450	1.1	375	76
Chinook	042970	2010	DIPAC	Fish Creek	6/18/12	—	25.8	Icy Strait	ISB	6/25	370	850	1.1	372	80
Chinook	042970	2010	DIPAC	Fish Creek	6/18/12	—	25.8	Chatham Str.	UCB	6/27	334	450	1.1	374	65
Chinook	042994	2011	NSRAA	Bear Cove, AK	5/3/13	—	58.6	Icy Point	IPA	6/26	227	151	1.0	54	200
Chinook	090678	2011	ODFW	McKenzie River	3/5/13	—	44.9	Icy Point	IPA	6/26	263	219	1.0	113	1600
Chinook	no tag	—	—	—	—	—	—	Icy Strait	ISC	6/23	480	1800	—	—	—
Chinook	no tag	—	—	—	—	—	—	Icy Strait	ISD	6/24	310	400	—	—	—
Chinook	no tag	—	—	—	—	—	—	Icy Point	IPA	6/26	272	270	—	—	—
Chinook	no tag	—	—	—	—	—	—	Icy Point	IPA	6/26	258	234	—	—	—
Chinook	no tag	—	—	—	—	—	—	Icy Point	IPA	6/26	340	450	—	—	—
Chinook	no tag	—	—	—	—	—	—	Icy Point	IPA	6/26	327	400	—	—	—
Chinook	no tag	—	—	—	—	—	—	Icy Point	IPA	6/26	330	500	—	—	—
Coho	041552	2011	ADFG	Berners River (Wild)	6/11/13	—	—	Chatham Str.	UCD	6/27	159	45	1.0	16	75
Coho	042599	2011	NMFS	Auke Creek (Wild)	5/17/13	115	14.17	Icy Strait	ISD	6/24	189	87	1.0	38	70
Coho	042692	2011	ADFG	Chilkat River (Wild)	5/14/13	—	—	Chatham Str.	UCC	6/27	172	63	1.0	44	120
Coho	042780	2011	ADFG	Berners River (Wild)	6/14/13	—	—	Chatham Str.	UCD	6/28	142	33	1.0	14	75
Coho	042780	2011	ADFG	Berners River (Wild)	6/14/13	—	—	Chatham Str.	UCC	6/28	133	28	1.0	14	80
Coho	042990	2011	AKI	Port Armstrong	5/29/13	—	21.85	Icy Strait	ISB	6/25	193	82	1.0	27	230
Coho	043035	2011	NSRAA	Kasnyku Bay, AK	5/23/13	—	24.50	Chatham Str.	UCD	6/27	171	55	1.0	35	110

Table 16.—cont.

Species	CWT code	Release information					Recovery information					Days ² since release	Distance traveled (km)		
		Brood year	Agency ¹	Locality	Date	FL (mm)	W (g)	Locality	Station code	2013 Date	FL (mm)			W (g)	Age
July															
Chinook	100197	2011	IDFG	Rapid River Hatchery, ID	4/26/13	136	25.11	Icy Point	IPC	7/27	230	147	1.0	92	1650
Chinook	181986	2011	CDFO	Wannock R., B.C.	6/13/12	—	4.40	Icy Point	IPA	7/27	360	500	0.1	409	1600
Chinook	No tag	—	—	—	—	—	—	Icy Point	IPA	7/27	220	135	—	—	—
Chinook	No tag	—	—	—	—	—	—	Icy Point	IPA	7/27	218	143	—	—	—
Chinook	No tag	—	—	—	—	—	—	Icy Point	IPA	7/27	220	145	—	—	—
Coho	042698	2011	NSRAA	Deer Lake, AK	7/16/13	129	19.50	Icy Strait	ISD	7/28	227	125	1.0	12	200
Coho	043040	2011	NSRAA	Deer Lake, AK	5/24/13	133	24.00	Icy Strait	ISB	7/25	250	134	1.0	62	200
Coho	043071	2011	DIPAC	Gastineau Channel, AK	6/18/13	—	20.71	Icy Strait	ISC	7/25	170	55	1.0	37	89
Coho	043071	2011	DIPAC	Gastineau Channel, AK	6/18/13	—	20.71	Icy Strait	ISD	7/25	170	57	1.0	37	87
Coho	043071	2011	DIPAC	Gastineau Channel, AK	6/18/13	—	20.71	Icy Strait	ISD	7/25	170	51	1.0	37	87
Coho	043071	2011	DIPAC	Gastineau Channel, AK	6/18/13	—	20.71	Chatham Str.	UCB	7/29	185	69	1.0	41	73
Coho	043071	2011	DIPAC	Gastineau Channel, AK	6/18/13	—	20.71	Chatham Str.	UCD	7/30	181	64	1.0	42	67
Coho	19	—	YAKA	—	—	—	—	Icy Point	IPA	7/27	240	194	—	—	—
Coho	636396	2011	WDFW	Fork Creek, WA	4/1/13	136	27.65	Icy Point	IPA	7/27	238	187	1.0	117	1600
Coho	636408	2011	WDFW	Cowlitz River, WA	5/1/13	139	30.03	Icy Point	IPD	7/27	255	215	1.0	87	1650
Coho	No tag	—	—	—	—	—	—	Icy Strait	ISA	7/25	215	120	—	—	—
Coho	No tag	—	—	—	—	—	—	Icy Point	IPD	7/27	265	222	—	—	—
Coho	No tag	—	—	—	—	—	—	Icy Point	IPA	7/27	240	162	—	—	—
Coho	No tag	—	—	—	—	—	—	Icy Point	IPA	7/27	258	204	—	—	—
Coho	No tag	—	—	—	—	—	—	Icy Point	IPA	7/27	254	192	—	—	—
Coho	No tag	—	—	—	—	—	—	Icy Point	IPA	7/27	241	184	—	—	—
Coho	No tag	—	—	—	—	—	—	Chatham Str.	UCA	7/30	220	120	—	—	—
Coho	No tag	—	—	—	—	—	—	Chatham Str.	UCD	7/30	216	112	—	—	—
August															
Chinook	042993	2011	NSRAA	Kasnyku Bay, AK	5/7/13	174	66.20	Icy Strait	ISB	8/29	310	250	1.0	114	135
Chinook	No tag	—	—	—	—	—	—	Chatham Str.	UCA	8/31	283	284	—	—	—
Coho	041552	2011	ADFG	Berners R., AK (Wild)	6/11/13	—	—	Chatham Str.	UCA	8/31	240	172	1.0	81	85
Coho	042092	2010	ADFG	Auke Creek, AK (Wild)	6/20/12	—	—	Chatham Str.	UCC	9/1	582	2100	1.1	438	50

Table 16.—cont.

Species	CWT code	Release information					Recovery information					Days ² since release	Distance traveled (km)		
		Brood year	Agency ¹	Locality	Date	FL (mm)	W (g)	Locality	Station code	2013 Date	FL (mm)			W (g)	Age
Coho	043071	2011	DIPAC	Gastineau Channel, AK	6/18/13		20.71	Icy Strait	ISC	8/27	225	116	1.0	70	89
Coho	No tag	—	—	—	—	—	—	Icy Point	IPC	8/28	289	310	—	—	—

¹ ADFG = Alaska Department of Fish and Game; AKI = Armstrong Keta Inc.; CDFO = Canadian Department of Fisheries and Oceans; DIPAC = Douglas Island Pink and Chum Inc.; IDFG = Idaho Department of Fish and Game; KNFC = Kake Non-profit Fisheries Corporation; NMFS = National Marine Fisheries Service; NSRAA = Northern Southeast Regional Aquaculture Association; ODFW = Oregon Department of Fish and Wildlife; PWHA = Prince of Wales Hatchery Association; SSRAA = Southern Southeast Regional Aquaculture Association; WDFW = Washington Department of Fish and Wildlife; YAKA = Yakama Hatchery.

² Days since release may potentially include freshwater residence periods, such as for salmon fry marked and released in fall that over-wintered in freshwater and smolted the subsequent year.

Table 17.—Stock-specific information on 1,204 juvenile chum salmon released from regional enhancement facility sites and captured in the marine waters of the northern region of southeastern Alaska by rope trawl, June-August 2013. Length (mm, fork), weight (g), Fulton's condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis are reported for each stock group. Dash indicates no samples. L/L = late large fish releases. See Table 16 for agency acronyms.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
DIPAC													
Upper	Length	134	80-112	94	1	93	109-154	129	1	51	116-190	165	2
Chatham	Weight	134	4.5-12.4	7.8	0.2	93	12.2-33.7	20.6	0.5	51	14.3-69.5	45.9	1.7
Strait	Condition	134	0.8-1.1	0.9	0.0	93	0.8-1.1	1.0	0.0	51	0.9-1.1	1.0	0.0
	CR	134	-0.15-0.19	0.01	0.01	93	-0.17-0.16	0.00	0.01	50	-0.13-0.12	0.01	0.01
Icy	Length	13	73-97	84	2	134	105-160	129	1	85	113-200	159	1
Strait	Weight	13	3.0-7.7	5.1	0.5	134	11.0-35.2	21.2	0.4	85	11.6-93.5	39.8	1.1
	Condition	13	0.8-0.9	0.8	0.0	134	0.8-1.1	1.0	0.0	85	0.8-1.2	1.0	0.0
	CR	13	-0.16-0.01	-0.09	0.02	134	-0.21-0.13	0.01	0.00	85	-0.16-0.17	-0.01	0.01
Icy Point	Length	—	—	—	—	37	95-148	124	2	5	128-175	154	8
	Weight	—	—	—	—	37	7.7-33.7	18.2	0.8	5	18.5-55.8	38.3	6.2
	Condition	—	—	—	—	37	0.8-1.0	0.9	0.0	5	0.9-1.0	1.0	0.0
	CR	—	—	—	—	37	-0.19-0.07	-0.03	0.01	5	-0.1-0.1	0.00	0.00
Total	Length	147	73-112	93	1	264	95-160	128	1	141	113-200	161	1
	Weight	147	3.0-12.4	7.6	0.2	264	7.7-35.2	20.6	0.3	141	11.6-93.5	42.0	1.0
	Condition	147	0.8-1.1	0.9	0.0	264	0.8-1.1	1.0	0.0	141	0.8-1.2	1.0	0.0
	CR	147	-0.16-0.19	0.00	0.01	264	-0.21-0.16	0.00	0.00	141	-0.16-0.17	0.00	0.00

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
NSRAA													
Deep Inlet													
Icy Point (Total)	Length	—	—	—	—	2	123-162	142.5	19.5	—	—	—	—
	Weight	—	—	—	—	2	19.6-46.5	33.1	13.5	—	—	—	—
	Condition	—	—	—	—	2	1.1-1.1	1.1	0.1	—	—	—	—
	CR	—	—	—	—	2	0.1-0.11	0.11	0.01	—	—	—	—
Deep Inlet L/L													
Icy Point (Total)	Length	—	—	—	—	3	142-148	145.0	1.8	—	—	—	—
	Weight	—	—	—	—	3	28.7-34.7	32.2	1.8	—	—	—	—
	Condition	—	—	—	—	3	1.0-1.2	1.1	0.1	—	—	—	—
	CR	—	—	—	—	3	-0.04-0.18	0.09	0.07	—	—	—	—
Kasnyku Bay													
Upper Chatham Strait	Length	10	87-111	102	2	2	124-163	144	20	1		168	
	Weight	10	5.8-12.5	9.7	0.6	2	20.2-44.4	32.3	12.1	1		44.0	
	Condition	10	0.8-1.0	0.9	0.0	2	1.0-1.1	1.0	0.0	1		0.9	
	CR	10	-0.14-0.07	-0.03	0.02	2	0.04-0.10	0.07	0.03	1		-0.06	
Icy Strait	Length	1		81		8	114-148	133	3	3	152-171	163	6
	Weight	1		4.1		8	12.8-32.7	24.5	2.1	3	33.9-51.4	43.2	5.1
	Condition	1		0.8		8	0.9-1.2	1.0	0.0	3	1.0-1.0	1.0	0.0
	CR	1		-0.17		8	-0.09-0.21	0.05	0.04	3	-0.02-0.04	0.01	0.02

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Icy Point	Length	—	—	—	—	2	136-140	138	2	2	170-195	183	13
	Weight	—	—	—	—	2	23.3-28.5	25.9	2.6	2	49.4-68.3	58.9	9.5
	Condition	—	—	—	—	2	0.93-1.04	1.0	0.1	2	0.9-1.0	1.0	0.0
	CR	—	—	—	—	2	-0.04-0.07	0.01	0.06	2	-0.08-0.02	0.00	0.10
Total	Length	11	81-111	100	3	12	114-163	136	4	6	152-195	170	6
	Weight	11	4.1-12.5	9.2	0.8	12	12.8-44.4	26.0	2.2	6	33.9-68.3	48.6	4.7
	Condition	11	0.8-1.0	0.9	0.0	12	0.9-1.2	1.0	0.0	6	0.9-1.0	1.0	0.0
	CR	11	-0.17-0.07	-0.04	0.02	12	-0.09-0.21	0.05	0.03	6	-0.08-0.04	-0.02	0.02
Kasnyku Bay L/L													
Upper Chatham Strait	Length	4	90-103	99	3	3	135-149	143	4	—	—	—	—
	Weight	4	6.8-11.4	9.3	1.0	3	23.2-28.9	26.4	1.7	—	—	—	—
	Condition	4	0.9-1.0	1.0	0.0	3	0.9-0.9	0.9	0.0	—	—	—	—
	CR	4	-0.04-0.10	0.02	0.03	3	-0.11--0.02	-0.07	0.02	—	—	—	—
Icy Strait	Length	2	98-103	101	3	3	138-152	146	4	1	—	175	—
	Weight	2	9.0-9.1	9.1	0.0	3	25.2-34.6	31.4	3.1	1	—	46.7	—
	Condition	2	0.8-1.0	0.9	0.1	3	1.0-1.1	1.0	0.0	1	—	0.9	—
	CR	2	-0.13-0.03	-0.05	0.08	3	-0.01-0.09	0.03	0.03	1	—	-0.13	—
Icy Point	Length	—	—	—	—	—	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—	—	—	—	—	—
	Condition	—	—	—	—	—	—	—	—	—	—	—	—
	CR	—	—	—	—	—	—	—	—	—	—	—	—
Total	Length	6	90-103	99	2	6	135-152	144	3	1	—	175	—
	Weight	6	6.8-11.4	9.2	0.6	6	23.2-34.6	28.9	1.9	1	—	46.7	—
	Condition	6	0.8-1.0	0.9	0.0	6	0.9-1.1	1.0	0.0	1	—	0.9	—
	CR	6	-0.13-0.10	0.00	0.03	6	-0.11-0.09	-0.02	0.03	1	—	-0.13	—

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Takatz Bay													
Upper	Length	5	96-112	103	3	1		126		1		170	
Chatham	Weight	5	7.7-12.6	10.2	0.9	1		19.2		1		51.5	
Strait	Condition	5	0.9-1.0	0.9	0.0	1		1.0		1		1.0	
	CR	5	-0.07-0.08	-0.01	0.03	1		0.00		1		0.06	
Icy	Length	—	—	—	—	3	132-142	137	3	1		170	
	Weight	—	—	—	—	3	22-29.3	25.6	2.1	1		49.6	
	Condition	—	—	—	—	3	1.0-1.0	1.0	0.0	1		1.0	
	CR	—	—	—	—	3	-0.01-0.05	0.03	0.02	1		0.02	
Icy	Length	—	—	—	—	—	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—	—	—	—	—	—
	Condition	—	—	—	—	—	—	—	—	—	—	—	—
	CR	—	—	—	—	—	—	—	—	—	—	—	—
Total	Length	5	96-112	103	3	4	126-142	134	3	2	170-170	170	0
	Weight	5	7.7-12.6	10.2	0.9	4	19.2-29.3	24.0	2.2	2	49.6-51.5	50.6	1.0
	Condition	5	0.9-1.0	0.9	0.0	4	1.0-1.0	1.0	0.0	2	1.0-1.1	1.0	0.0
	CR	5	-0.07-0.08	-0.01	0.03	4	-0.01-0.05	0.02	0.02	2	0.02-0.06	0.04	0.02
Takatz Bay L/L													
Upper	Length	6	107-114	112	1	2	127-174	151	24	—	—	—	—
Chatham	Weight	6	11.6-13.8	12.8	0.4	2	19.1-50.3	34.7	15.6	—	—	—	—

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Strait	Condition	6	0.8-1.0	0.9	0.0	2	0.9-1.0	0.9	0.0	—	—	—	—
	CR	6	-0.11-0.05	-0.03	0.02	2	-0.03--0.03	-0.03	0.00	—	—	—	—
Icy Strait	Length	—	—	—	—	8	124-165	143	5	2	190-191	191	1
	Weight	—	—	—	—	8	18.3-44.8	28.8	3.3	2	66.9-69.9	68.4	1.5
	Condition	—	—	—	—	8	0.9-1.0	1.0	0.0	2	1.0-1.0	1.0	0.0
	CR	—	—	—	—	8	-0.06-0.04	0.00	0.01	2	-0.02-0.01	-0.01	0.01
Icy Point	Length	—	—	—	—	1		150		—	—	—	—
	Weight	—	—	—	—	1		31.4		—	—	—	—
	Condition	—	—	—	—	1		0.9		—	—	—	—
	CR	—	—	—	—	1		-0.05		—	—	—	—
Total	Length	6	107-114	112	1	11	124-174	145	5	2	190-191	191	1
	Weight	6	11.6-13.8	12.8	0.4	11	18.3-50.3	30.1	3.2	2	66.9-69.9	68.4	1.5
	Condition	6	0.8-1.0	0.9	0.0	11	0.9-1.0	1.0	0.0	2	1.0-1.0	1.0	0.0
	CR	6	-0.11-0.05	-0.03	0.02	11	-0.06-0.04	-0.01	0.01	2	-0.02-0.01	-0.01	0.01
Southeast Cove													
Upper Chatham Strait	Length	—	—	—	—	6	129-154	145	4	2	170-176	173	3
	Weight	—	—	—	—	6	21.5-36.7	29.3	2.5	2	50.9-55.3	53.1	2.2
	Condition	—	—	—	—	6	0.8-1.0	1.0	0.0	2	1.0-1.0	1.0	0.0
	CR	—	—	—	—	6	-0.14-0.04	-0.02	0.03	2	0.03-0.05	0.04	0.01
Icy Strait	Length	—	—	—	—	20	130-167	148	2	20	153-193	171	2
	Weight	—	—	—	—	20	20.1-42.6	30.9	1.3	20	31.9-76.7	46.5	2.3
	Condition	—	—	—	—	20	0.9-1.0	0.9	0.0	20	0.8-1.1	0.9	0.0
	CR	—	—	—	—	20	-0.1-0.06	-0.03	0.01	20	-0.19-0.07	-0.07	0.01

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Icy Point	Length	—	—	—	—	6	132-165	151	5	1		185	
	Weight	—	—	—	—	6	21.0-38.4	32.1	2.6	1		60.6	
	Condition	—	—	—	—	6	0.8-1.0	0.9	0.0	1		1.0	
	CR	—	—	—	—	6	-0.18-0.06	-0.06	0.03	1		-0.04	
Total	Length	—	—	—	—	32	129-167	148	2	23	153-193	171	2
	Weight	—	—	—	—	32	20.1-42.6	30.8	1.0	23	31.9-76.7	47.7	2.1
	Condition	—	—	—	—	32	0.8-1.0	0.9	0.0	23	0.8-1.1	0.9	0.0
	CR	—	—	—	—	32	-0.18-0.06	-0.03	0.01	23	-0.19-0.07	-0.06	0.01
KNFC													
Gunnuk Creek													
Upper Chatham Strait	Length	—	—	—	—	—	—	—	—	1		179	
	Weight	—	—	—	—	—	—	—	—	1		51.8	
	Condition	—	—	—	—	—	—	—	—	1		0.9	
	CR	—	—	—	—	—	—	—	—	1		-0.09	
Icy Strait	Length	—	—	—	—	1		132		3	155-185	172	9
	Weight	—	—	—	—	1		22.3		3	38.1-64.4	51.6	7.6
	Condition	—	—	—	—	1		1.0		3	1.0-1.0	1.0	0.0
	CR	—	—	—	—	1		0.01		3	-0.03-0.05	0.01	0.02
Icy Point	Length	—	—	—	—	—	—	—	—	1		178	0
	Weight	—	—	—	—	—	—	—	—	1		59.4	0.0
	Condition	—	—	—	—	—	—	—	—	1		1.1	0.0
	CR	—	—	—	—	—	—	—	—	1		0.10	0.00
Total	Length	—	—	—	—	1		132		5	155-185	175	5
	Weight	—	—	—	—	1		22.3		5	38.1-64.4	53.2	4.4

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
	Condition	—	—	—	—	1		1.0		5	0.9-1.1	1.0	0.0
	CR	—	—	—	—	1		0.01		5	-0.09-0.06	0.00	0.03
AKI													
Port Armstrong													
Icy Strait (Total)	Length	—	—	—	—	2	149-155	152	3	2	165-172	169	4
	Weight	—	—	—	—	2	31.7-36.9	34.3	2.6	2	39.0-51.5	45.3	6.3
	Condition	—	—	—	—	2	1.0-1.0	1.0	0.0	2	0.9-1.0	0.9	0.1
	CR	—	—	—	—	2	-0.02-0.01	0.00	0.01	2	-0.12-0.03	-0.05	0.07
SSRAA													
Anita Bay													
Upper Chatham Strait	Length	—	—	—	—	1		149		4	155-185	168	7
	Weight	—	—	—	—	1		31.6		4	36.1-66.1	49.1	6.3
	Condition	—	—	—	—	1		1.0		4	1.0-1.1	1.0	0.0
	CR	—	—	—	—	1		-0.02		4	-0.02-0.12	0.03	0.03
Icy Strait	Length	—	—	—	—	1		170		2	172-174	173	1
	Weight	—	—	—	—	1		46.9		2	48.2-50.7	49.5	1.3
	Condition	—	—	—	—	1		1.0		2	0.9-1.0	1.0	0.0
	CR	—	—	—	—	1		-0.03		2	-0.04--0.03	-0.03	0.01
Icy Point	Length	—	—	—	—	—	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—	—	—	—	—	—
	Condition	—	—	—	—	—	—	—	—	—	—	—	—

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
	CR	—	—	—	—	—	—	—	—	—	—	—	—
Total	Length	—	—	—	—	2	149-170	160	11	6	155-185	170	5
	Weight	—	—	—	—	2	31.6-46.9	39.3	7.6	6	36.1-66.1	49.2	4.0
	Condition	—	—	—	—	2	1.0-1.0	1.0	0.0	6	0.9-1.1	1.0	0.0
	CR	—	—	—	—	2	-0.03--0.02	-0.03	0.01	6	-0.04-0.12	0.01	0.03
Kendrick Bay L/L													
Icy Strait (Total)	Length	—	—	—	—	1	—	148	—	—	—	—	—
	Weight	—	—	—	—	1	—	30.9	—	—	—	—	—
	Condition	—	—	—	—	1	—	1.0	—	—	—	—	—
	CR	—	—	—	—	1	—	-0.02	—	—	—	—	—
Neets Bay (summer)													
Upper Chatham Strait	Length	—	—	—	—	—	—	—	—	4	189-217	198.3	6.4
	Weight	—	—	—	—	—	—	—	—	4	67.7-111.5	82.6	9.8
	Condition	—	—	—	—	—	—	—	—	4	1.0-1.1	1.0	0.0
	CR	—	—	—	—	—	—	—	—	4	0.00-0.09	0.04	0.02
Icy Strait	Length	—	—	—	—	—	—	—	—	2	178-210	194.0	16.0
	Weight	—	—	—	—	—	—	—	—	2	53.2-87.8	70.5	17.3
	Condition	—	—	—	—	—	—	—	—	2	0.9-0.9	0.9	0.0
	CR	—	—	—	—	—	—	—	—	2	-0.06--0.05	-0.05	0.01
Icy Point	Length	—	—	—	—	—	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—	—	—	—	—	—
	Condition	—	—	—	—	—	—	—	—	—	—	—	—
	CR	—	—	—	—	—	—	—	—	—	—	—	—
Total	Length	—	—	—	—	—	—	—	—	6	178-217	196.8	5.8

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
	Weight	—	—	—	—	—	—	—	—	6	53.2-111.5	78.6	8.1
	Condition	—	—	—	—	—	—	—	—	6	0.9-1.1	1.0	0.0
	CR	—	—	—	—	—	—	—	—	6	-0.06-0.09	0.01	0.02
Neets Bay (fall)													
Upper	Length	—	—	—	—	—	—	—	—	1		189	
Chatham	Weight	—	—	—	—	—	—	—	—	1		69.7	
Strait	Condition	—	—	—	—	—	—	—	—	1		1.0	
(Total)	CR	—	—	—	—	—	—	—	—	1		0.04	
Unmarked stocks													
Upper	Length	92	80-112	97	1	89	101-169	126	1	68	128-230	182	3
Chatham	Weight	92	5.2-15.6	9.0	0.2	89	10.6-43.5	19.8	0.6	68	19.8-125.5	66.0	3.4
Strait	Condition	92	0.7-1.2	1.0	0.0	89	0.9-1.1	1.0	0.0	68	0.9-1.2	1.0	0.0
	CR	92	-0.27-0.27	0.04	0.01	89	-0.12-0.15	0.01	0.01	68	-0.10-0.18	0.04	0.01
Icy	Length	10	83-116	98	4	91	106-173	133	1	101	110-229	166	2
Strait	Weight	10	4.6-15.1	8.6	1.1	91	11.0-46.6	23.7	0.7	101	11.8-121.4	48.0	2.1
	Condition	10	0.8-1.0	0.9	0.0	91	0.8-1.1	1.0	0.0	101	0.9-1.2	1.0	0.0
	CR	10	-0.13-0.08	-0.05	0.02	91	-0.14-0.12	0.02	0.01	101	-0.13-0.20	0.01	0.01
Icy	Length	—	—	—	—	30	89-209	131	4	13	132-206	172	6
Point	Weight	—	—	—	—	30	5.9-91.7	23.5	2.9	13	22.6-87.1	52.1	5.1
	Condition	—	—	—	—	30	0.8-1.1	1.0	0.0	13	0.9-1.1	1.0	0.0
	CR	—	—	—	—	30	-0.23-0.16	-0.01	0.01	13	-0.07-0.11	0.00	0.00

Table 17.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Total	Length	102	80-116	97	1	210	89-209	129	1	182	110-230	172	2
	Weight	102	4.6-15.6	8.9	0.2	210	5.9-91.7	22.0	0.6	182	11.8-125.5	55.0	1.9
	Condition	102	0.7-1.2	1.0	0.0	210	0.8-1.1	1.0	0.0	182	0.9-1.2	1.0	0.0
	CR	102	-0.27-0.27	0.03	0.01	210	-0.23-0.16	0.01	0.00	182	-0.13-0.20	0.02	0.00

Table 18.—Stock-specific information on 693 juvenile sockeye salmon released from regional enhancement facility sites and captured in the marine waters of the northern region of southeastern Alaska by rope trawl, June-August 2013. Length (mm, fork), weight (g), Fulton's condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis are reported for each stock group. Dash indicates no samples. See Table 16 for agency acronyms.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
DIPAC													
Speel Arm													
Upper Chatham Strait	Length	12	97-126	113	3	14	129-170	149	3	22	167-198	184	2
	Weight	12	9.8-23.4	15.8	1.2	14	20.8-51.2	34.6	2.3	22	49.6-83.7	68.3	1.7
	Condition	12	1.0-1.2	1.1	0.0	14	1.0-1.1	1.0	0.0	22	1.0-1.2	1.1	0.0
	CR	12	-0.01-0.18	0.08	0.02	14	-0.06-0.10	0.02	0.01	22	-0.05-0.16	0.05	0.01
Icy Strait	Length	1		114		54	125-176	154	2	12	160-199	180	3
	Weight	1		14.9		54	20.5-57.2	39.0	1.2	12	45.7-85.2	62.2	3.3
	Condition	1		1.0		54	1.0-1.2	1.1	0.0	12	1.0-1.1	1.1	0.0
	CR	1		0.02		54	-0.08-0.16	0.03	0.01	12	-0.05-0.10	0.02	0.01
Icy Point	Length	—	—	—	—	2	155-156	156	1	—	—	—	—
	Weight	—	—	—	—	2	40.2-42.4	41.3	1.1	—	—	—	—
	Condition	—	—	—	—	2	1.1-1.1	1.1	0.0	—	—	—	—
	CR	—	—	—	—	2	0.05-0.09	0.07	0.02	—	—	—	—
Total	Length	13	97-126	113	3	70	125-176	153	1	34	160-199	182	2
	Weight	13	9.8-23.4	15.7	1.1	70	20.5-57.2	38.2	1.0	34	45.7-85.2	66.1	1.7
	Condition	13	1.0-1.2	1.1	0.0	70	1.0-1.2	1.1	0.0	34	1.0-1.2	1.1	0.0
	CR	13	-0.01-0.18	0.08	0.02	70	-0.08-0.16	0.03	0.01	34	-0.05-0.16	0.04	0.01

Table 18.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Sweetheart Lake													
Icy Strait (Total)	Length	—	—	—	—	1	—	152	—	—	—	—	—
	Weight	—	—	—	—	1	—	37.1	—	—	—	—	—
	Condition	—	—	—	—	1	—	1.1	—	—	—	—	—
	CR	—	—	—	—	1	—	0.04	—	—	—	—	—
Tahltan Lake													
Upper Chatham Strait	Length	—	—	—	—	—	—	—	—	6	175-200	189	4
	Weight	—	—	—	—	—	—	—	—	6	54.0-88.3	72.3	5.4
	Condition	—	—	—	—	—	—	—	—	6	1.0-1.1	1.1	0.0
	CR	—	—	—	—	—	—	—	—	6	-0.03-0.06	0.01	0.02
Icy Strait	Length	—	—	—	—	7	152-176	165	3	—	—	—	—
	Weight	—	—	—	—	7	36.3-56.9	46.0	2.8	—	—	—	—
	Condition	—	—	—	—	7	1.0-1.1	1.0	0.0	—	—	—	—
	CR	—	—	—	—	7	-0.07-0.02	-0.01	0.01	—	—	—	—
Icy Point	Length	—	—	—	—	—	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—	—	—	—	—	—
	Condition	—	—	—	—	—	—	—	—	—	—	—	—
	CR	—	—	—	—	—	—	—	—	—	—	—	—
Total	Length	—	—	—	—	7	152-176	165	3	6	175-200	189	4
	Weight	—	—	—	—	7	36.3-56.9	46.0	2.8	6	54.0-88.3	72.3	5.4
	Condition	—	—	—	—	7	1.0-1.1	1.0	0.0	6	1.0-1.1	1.1	0.0
	CR	—	—	—	—	7	-0.07-0.02	-0.01	0.01	6	-0.03-0.06	0.01	0.02

Table 18.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Tuya Lake													
Upper	Length	—	—	—	—	1		161		1		175	
Chatham	Weight	—	—	—	—	1		40.8		1		53.1	
Strait	Condition	—	—	—	—	1		1.0		1		1.0	
	CR	—	—	—	—	1		-0.05		1		-0.05	
Icy Strait	Length	—	—	—	—	—	—	—	—	1		174	
	Weight	—	—	—	—	—	—	—	—	1		56.5	
	Condition	—	—	—	—	—	—	—	—	1		1.1	
	CR	—	—	—	—	—	—	—	—	1		0.03	
Icy Point	Length	—	—	—	—	—	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—	—	—	—	—	—
	Condition	—	—	—	—	—	—	—	—	—	—	—	—
	CR	—	—	—	—	—	—	—	—	—	—	—	—
Total	Length	—	—	—	—	1		161		2	174-175	175	0
	Weight	—	—	—	—	1		40.8		2	53.1-56.5	54.8	1.7
	Condition	—	—	—	—	1		1.0		2	1.0-1.1	1.0	0.0
	CR	—	—	—	—	1		-0.05		2	-0.05-0.03	-0.01	0.04
Unmarked stocks													
Upper	Length	60	87-182	120	3	109	79-195	134	2	102	135-231	170	2
Chatham	Weight	60	6.4-65.5	19.1	1.6	109	4.2-80.1	27.0	1.2	102	27.9-135.6	54.4	1.7
Strait	Condition	60	0.8-1.1	1.0	0.0	109	0.8-1.2	1.0	0.0	102	0.8-1.2	1.1	0.0
	CR	60	-0.16-0.12	0.00	0.01	109	-0.19-0.20	0.03	0.01	102	-0.26-0.19	0.04	0.01

Table 18.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Icy Strait	Length	42	97-215	155	3	170	107-219	146	2	63	102-204	164	2
	Weight	42	9.5-105.5	39.2	2.8	170	12.7-116.8	34.5	1.4	63	10.7-87.6	48.5	1.8
	Condition	42	0.9-1.1	1.0	0.0	170	0.8-1.2	1.0	0.0	63	1.0-1.2	1.1	0.0
	CR	42	-0.15-0.07	-0.04	0.01	170	-0.32-0.19	0.03	0.00	63	-0.06-0.18	0.03	0.01
Icy Point	Length	—	—	—	—	11	140-200	166	6	1	—	178	—
	Weight	—	—	—	—	11	28.6-80.9	49.1	5.9	1	—	55.1	—
	Condition	—	—	—	—	11	0.9-1.2	1.0	0.0	1	—	1.0	—
	CR	—	—	—	—	11	-0.09-0.15	-0.01	0.02	1	—	-0.06	—
Total	Length	102	87-215	134	3	290	79-219	142	1	166	102-231	168	1
	Weight	102	6.4-105.5	27.4	1.8	290	4.2-116.8	32.3	1.0	166	10.7-135.6	52.1	1.3
	Condition	102	0.8-1.1	1.0	0.0	290	0.8-1.2	1.0	0.0	166	0.8-1.2	1.1	0.0
	CR	102	-0.16-0.12	-0.01	0.01	290	-0.32-0.20	0.03	0.00	166	-0.26-0.19	0.03	0.00

Table 19.—Stock-specific information on 1025 juvenile coho salmon released from regional enhancement facility sites and captured in the marine waters of the northern region of southeastern Alaska by rope trawl, June-August 2012. Length (mm, fork), weight (g), Fulton's condition $[(g/mm^3) \cdot (10^5)]$, and condition residuals (CR) from length-weight regression analysis are reported for each stock group. Dash indicates no samples. See Table 16 for agency acronyms.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
PWHA													
Klawock													
Icy Point (Total)	Length	1		198		1		236.0		1		254.0	
	Weight	1		91.5		1		150.3		1		161.8	
	Condition	1		1.2		1		1.1		1		1.0	
	CR	1		0.02		1		-0.03		1		-0.2	
Unmarked stocks													
Upper Chatham Strait	Length	66	120-244	176.2	2.9	52	152-260	198.9	3.5	46	200-285	234.7	3.4
	Weight	66	20.5-171.7	67.6	3.4	52	36.0-204.6	96.0	5.1	46	93.4-267.0	154.8	7.3
	Condition	66	1.0-1.4	1.2	0.0	52	1.0-1.3	1.2	0.0	46	1.0-1.4	1.2	0.0
	CR	66	-0.09-0.22	0.03	0.01	52	-0.08-0.17	0.01	0.01	46	-0.12-0.16	-0.01	0.01
Icy Strait	Length	91	96-242	172.6	2.7	84	146-238	192.3	2.3	33	196-275	238.3	3.5
	Weight	91	10.0-160.6	63.5	3.0	84	33.3-147.0	84.4	2.8	33	85.4-246.3	153.5	7.5
	Condition	91	1.0-1.3	1.2	0.0	84	1.0-1.3	1.2	0.0	33	0.9-1.3	1.1	0.0
	CR	91	-0.13-0.18	0.02	0.01	84	-0.20-0.16	0.00	0.01	33	-0.26-0.07	-0.06	0.01
Icy Point	Length	16	179.0-281.0	231.2	6.8	47	170-289	235.0	3.3	12	227-305	264.3	7.6
	Weight	16	64.9-310.7	159.2	15.9	47	55.0-297.2	161.6	6.8	12	128.0-402.2	220.8	22.4
	Condition	16	1.1-1.4	1.2	0.0	47	1.0-1.4	1.2	0.0	12	1.0-1.4	1.2	0.0
	CR	16	-0.06-0.15	0.04	0.02	47	-0.12-0.23	0.03	0.01	12	-0.18-0.16	-0.03	0.03

Table 19.—cont.

Locality	Factor	June				July				August			
		n	range	mean	se	n	range	mean	se	n	range	mean	se
Total	Length	173	96-281	179.4	2.3	183	146-289	205.2	2.1	91	196-305	239.9	2.5
	Weight	173	10.0-310.7	73.9	3.2	183	33.3-297.2	107.5	3.5	91	85.4-402.2	163.0	5.9
	Condition	173	1.0-1.4	1.2	0.0	183	1.0-1.4	1.2	0.0	91	0.9-1.4	1.1	0.0
	CR	173	-0.13-0.22	0.03	0.01	183	-0.20-0.23	0.01	0.01	91	-0.26-0.16	-0.03	0.01

Table 20.—Number examined, length (mm, fork), wet weight (g), stomach content as percent body weight (%BW), and feeding intensity (0-100% volume fullness) of 453 potential predators of juvenile salmon captured in marine waters of the northern region of southeastern Alaska by rope trawl, June–August 2013. Dash indicates no samples. For scientific names, see Table 8. For additional feeding data, see Table 21 and Figure 18.

Species	Factor	June				July				August			
		<i>n</i>	range	mean	sd	<i>n</i>	range	mean	sd	<i>n</i>	range	mean	sd
Pink salmon ¹	Length	73	445-930	525	7	78	361-560	480	3	28	441-542	498	5
	Weight	73	205-3,400	1,961	71	78	700-2,900	1,367	58	28	700-1,700	1,196	47
	%BW	73	0.0-2.9	0.5	0.1	78	0.0-3.2	0.3	0.1	28	0.0-2.0	0.2	0.1
	Fullness	73	0-110	49	4	78	0-110	39	4	28	0-100	26	8
Chinook salmon ¹	Length	105	240-465	343	4	8	305-393	349	10	14	310-437	373	8
	Weight	105	160-1,900	658	29	8	200-700	465	52	14	250-1,100	546	56
	%BW	105	0.0-5.3	1.5	0.1	8	0.0-6.2	3.1	0.8	14	0.0-6.5	1.1	0.5
	Fullness	105	10-110	80	3	8	0-110	80	16	14	0-110	46	13
Chinook salmon ²	Length	21	410-640	513	12	1		451		—	—	—	—
	Weight	21	1,200-3,410	2,203	139	1		1,050		—	—	—	—
	%BW	21	0.0-4.1	1.3	0.2	1		0.0		—	—	—	—
	Fullness	21	0-110	83	8	1		0		—	—	—	—
Chum salmon ¹	Length	43	560-740	636	7	5	560-742	636	32	6	585-757	678	26
	Weight	43	700-5,800	3,531	147	5	1,950-5,300	3,240	608	6	2,100-5,700	3,583	586
	%BW	43	0.0-1.8	0.1	0.0	5	0.0-0.1	0.0	0.0	6	0.0-0.3	0.1	0.0
	Fullness	43	0-75	10	3	5	0-10	6	2	6	0-25	6	4
Chum salmon ²	Length	1		495		—	—	—	—	—	—	—	—
	Weight	1		1,400		—	—	—	—	—	—	—	—
	%BW	1		0.0		—	—	—	—	—	—	—	—

Table 20.—cont.

Species	Factor	June				July				August			
		<i>n</i>	range	mean	sd	<i>n</i>	range	mean	sd	<i>n</i>	range	mean	sd
	Fullness	1		0		—	—	—	—	—	—	—	—
Coho salmon ²	Length	4	570-700	618	29	6	501-663	575	23	20	520-724	620	14
	Weight	4	2,500-5,500	3,463	687	6	1,550-3,800	2,567	343	20	900-4,700	3,025	264
	%BW	4	0.0-1.9	0.7	0.4	6	0.0-4.5	1.7	0.7	20	0.0-4.0	1.1	0.3
	Fullness	4	0-110	55	29	6	0-110	82	19	20	0-110	60	10
Sockeye salmon ¹	Length	3	580-680	633	29	1		640		—	—	—	—
	Weight	3	2,750-3,600	3,217	249	1		3,050		—	—	—	—
	%BW	3	0.0-0.0	0.0	0.0	1		0.0		—	—	—	—
	Fullness	3	0-0	0	0	1		0		—	—	—	—
Sockeye salmon ²	Length	1		295		—	—	—	—	1		367	
	Weight	1		350		—	—	—	—	1		400	
	%BW	1		0.3		—	—	—	—	1		0.1	
	Fullness	1		50		—	—	—	—	1		50	
Walleye pollock ²	Length	13	395-690	522	24	1		535		—	—	—	—
	Weight	13	335-2,500	973	158	1		700		—	—	—	—
	%BW	13	0.0-4.6	0.7	0.3	1		0.0		—	—	—	—
	Fullness	13	0-100	60	12	1		0		—	—	—	—
Dolly varden ²	Length	8	255-290	271	6	—	—	—	—	—	—	—	—
	Weight	8	190-300	253	14	—	—	—	—	—	—	—	—
	%BW	8	0.0-4.3	2.2	0.6	—	—	—	—	—	—	—	—
	Fullness	8	0-100	75	13	—	—	—	—	—	—	—	—
Black	Length	2	490-525	508	18	3	356-430	393	21	—	—	—	—

Table 20.—cont.

Species	Factor	June				July				August			
		<i>n</i>	range	mean	sd	<i>n</i>	range	mean	sd	<i>n</i>	range	mean	sd
rockfish ²	Weight	2	2,750-3,400	3,075	325	3	650-1,550	1,133	262	—	—	—	—
	%BW	2	0.2-1.1	0.7	0.4	3	1.4-5.7	3.7	1.2	—	—	—	—
	Fullness	2	50-100	75	25	3	75-110	98	12	—	—	—	—
Pacific sandfish ²	Length	2	230-240	235	5	—	—	—	—	—	—	—	—
	Weight	2	160-170	165	5	—	—	—	—	—	—	—	—
	%BW	2	1.1-2.1	1.6	0.5	—	—	—	—	—	—	—	—
Jack mackerel ²	Fullness	2	75-100	88	13	—	—	—	—	—	—	—	—
	Length	1		295		—	—	—	—	—	—	—	—
	Weight	1		475		—	—	—	—	—	—	—	—
Spiny dogfish ²	%BW	1		1.4		—	—	—	—	—	—	—	—
	Fullness	1		100		—	—	—	—	—	—	—	—
	Length	—	—	—	—	1		935		—	—	—	—
	Weight	—	—	—	—	1		5,500		—	—	—	—
	%BW	—	—	—	—	1		0.0		—	—	—	—
	Fullness	—	—	—	—	1		0		—	—	—	—

¹ Immature² Adult

Table 21.—Feeding intensity of 450 potential predators of juvenile salmon captured in rope trawl hauls in the marine waters of the northern region of southeastern Alaska, June–August 2013. Fish were captured in both strait and coastal habitats. For scientific names, see Table 8. See also Table 20 and Figure 18.

Predator species	Life history stage	Number examined	Number empty	Percent feeding	Number with salmon	Percent feeders with salmon
Pink salmon	Adult	179	43	76	1	1
Chinook salmon	Immature	127	5	68	0	0
Chinook salmon	Adult	22	3	11	0	0
Chum salmon	Immature	1	1	0	0	0
Chum salmon	Adult	54	26	16	0	0
Coho salmon	Adult	30	7	13	7	30
Sockeye salmon	Immature	2	0	1	0	0
Sockeye salmon	Adult	4	4	0	0	0
Walleye pollock	Adult	14	3	6	0	0
Dolly Varden	Adult	8	1	4	0	0
Black rockfish	Adult	5	0	3	2	40
Pacific sandfish	Adult	2	0	1	0	0
Pacific jack mackerel	Adult	1	0	1	0	0
Spiny dogfish	Adult	1	1	0	0	0

Appendix 1.—Temperature (°C), salinity (PSU), ambient light (W/m³), Secchi depth (m), mixed layer depth (MLD, m; see text for definition), zooplankton settled volume (ZSV, ml), and total plankton settled volumes (TSV, ml) by haul number and station sampled in the marine waters of the northern region of southeastern Alaska, May–August 2013. Station code acronyms are listed in Table 1.

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m ³)	Secchi (m)	MLD (m)	ZSV (ml)	TSV (ml)
22 May	17001	ABM	6.50	29.50	458.00	6.00	7	9.00	14.00
23 May	17002	ISA	7.80	30.30	337.00	5.50	9	7.00	10.00
23 May	17003	ISB	7.60	30.40	463.00	5.00	7	5.00	10.00
23 May	17004	ISC	7.10	30.60	541.00	4.00	7	8.00	10.00
23 May	17005	ISD	6.70	29.70	766.00	4.00	13	4.00	5.00
23 May	17006	UCA	7.00	29.10	652.00	3.00	7	11.00	16.00
23 May	17007	UCB	7.20	28.90	684.00	3.00	10	—	—
23 May	17008	UCC	7.00	28.40	503.00	3.00	15	15.00	22.00
23 May	17009	UCD	7.00	28.70	503.00	3.00	6	7.00	9.00
23 June	17014	ISA	10.80	27.70	52.70	5.00	6	7.50	15.00
23 June	17015	ISB	12.40	25.90	237.00	4.00	6	20.00	40.00
23 June	17016	ISC	11.40	27.10	470.00	4.00	6	15.00	30.00
23 June	17017	ISD	11.40	27.10	456.00	3.00	6	7.00	14.00
23 June	17018	ISC	11.60	27.10		3.00	6	—	—
23 June	17019	ISD	10.90	27.50	439.00	3.00	6	—	—
24 June	17020	ISD	12.00	26.70	147.00	4.00	7	—	—
24 June	17021	ISC	12.40	26.70	134.00	4.00	6	—	—
24 June	17022	ISB	11.20	27.70	547.00	4.00	6	—	—
24 June	17023	ISA	9.40	29.50	594.00	4.00	6	—	—
24 June	17024	ISB	10.70	28.20	585.00	4.00	6	—	—
24 June	17025	ISA	8.90	30.00	562.00	5.00	6	—	—
25 June	17026	ISD	12.70	26.30	58.00	5.00	15	—	—
25 June	17027	ISC	12.90	26.80	133.00	4.00	7	—	—

Appendix 1.—cont.

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m ³)	Secchi (m)	MLD (m)	ZSV (ml)	TSV (ml)
25 June	17028	ISB	12.30	27.50	161.00	4.00	9	—	—
25 June	17029	ISA	8.90	30.10	277.00	4.00	6	—	—
26 June	17030	IPD	13.30	31.90	115.00	6.00	13	17.00	17.00
26 June	17031	IPC	13.30	31.90	357.00	6.00	20	10.00	10.00
26 June	17032	IPB	12.50	32.00	152.00	3.00	18	16.00	16.00
26 June	17033	IPA	13.30	32.00	158.00	6.00	8	11.00	11.00
27 June	17034	UCA	12.20	26.80	34.00	4.00	6	20.00	40.00
27 June	17035	UCB			88.00	4.00	7	15.00	30.00
27 June	17036	UCC	11.70	28.00	96.00	4.00	6	14.00	28.00
27 June	17037	UCD	12.00	26.20	237.00	4.00	6	10.00	20.00
27 June	17038	UCC	12.50	26.60	194.00	4.00	10	—	—
27 June	17039	UCD	12.50	25.40	461.00	4.00	12	—	—
28 June	17040	UCD	13.20	26.10	40.00	5.00	6	—	—
28 June	17041	UCC	12.60	27.70	120.00	5.00	6	—	—
28 June	17042	UCB	11.90	28.20	569.00	5.00	7	—	—
28 June	17043	UCA	10.20	28.90	437.00	4.00	6	—	—
28 June	17044	UCB	13.50	27.30	650.00	6.00	7	—	—
28 June	17045	UCA	13.20	26.60	657.00	6.00	10	—	—
29 June	17046	ABM	14.20	18.00	68.00	2.00	6	15.00	15.00
25 July	17047	ISA	9.10	29.90	45.00	5.00	8	10.00	20.00
25 July	17048	ISB	13.20	25.00	160.00	6.00	6	2.00	4.00
25 July	17049	ISC	14.00	23.70	508.00	7.00	6	3.50	6.50
25 July	17050	ISD	13.20	26.70	302.00	4.00	6	2.00	4.00
25 July	17051	ISC	12.90	26.60	140.00	5.00	7	—	—
25 July	17052	ISD	13.50	25.90	176.00	5.00	10	—	—
26 July	17053	ISD	13.70	25.10	68.00	5.00	6	—	—
26 July	17054	ISC	13.70	23.90	125.50	5.00	8	—	—

Appendix 1.—cont.

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m ³)	Secchi (m)	MLD (m)	ZSV (ml)	TSV (ml)
26 July	17055	ISB	11.10	27.80	201.00	3.00	7	—	—
26 July	17056	ISA	9.90	29.30	299.00	4.00	11	—	—
27 July	17057	IPD	16.00	32.20	47.86	7.00	22	4.00	4.00
27 July	17058	IPC	12.40	31.90	549.00	3.00	6	15.00	15.00
27 July	17059	IPB	14.00	31.90	627.00	5.00	14	5.00	5.00
27 July	17060	IPA	15.50	32.00	391.00	6.00	12	13.00	13.00
28 July	17061	ISD	13.40	25.90	42.00	5.00	6	—	—
28 July	17062	ISC	13.40	26.20	261.40	5.00	6	—	—
28 July	17063	ISB	14.20	24.10	231.00	7.00	9	—	—
28 July	17064	ISA	14.10	24.40	522.40	5.00	9	—	—
28 July	17065	ISB	14.80	24.20	532.00	7.00	16	—	—
28 July	17066	ISA	13.40	26.20	374.00	5.00	6	—	—
29 July	17067	UCD	13.70	23.00	213.50		8	1.00	2.00
29 July	17068	UCC	13.00	25.10	346.00	5.00	6	0.50	1.00
29 July	17069	UCB	13.30	21.80	430.00	5.00	7	0.50	1.00
29 July	17070	UCA	15.30	16.30	579.00	4.00	6	0.50	1.00
29 July	17071	UCB	15.80	14.10	534.00	5.00	6	—	—
29 July	17072	UCA	15.40	17.20	606.70	6.00	6	—	—
30 July	17073	UCA	14.20	22.80	101.00	7.00	13	—	—
30 July	17074	UCB	13.90	23.50	200.00	5.00	15	—	—
30 July	17075	UCC	12.90	26.50	418.00	5.00	17	—	—
30 July	17076	UCD	12.80	25.20	454.00	4.00	6	—	—
30 July	17077	UCC	13.30	24.70	599.00	6.00	6	—	—
30 July	17078	UCD	12.90	23.80	622.00	5.00	6	—	—
31 July	17079	ABM	15.10	18.00	195.40	3.00	7	2.00	4.00
27 August	17080	ISD	13.00	21.10	31.09	5.00	6	—	—
27 August	17081	ISC	13.00	21.40	142.00	5.00	6	13.00	13.00

Appendix 1.—cont.

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m ³)	Secchi (m)	MLD (m)	ZSV (ml)	TSV (ml)
27 August	17082	ISB	12.20	24.00	394.60	5.00	7	20.00	20.00
27 August	17083	ISA	10.70	27.70	631.00	6.00	7	12.00	12.00
28 August	17084	IPD	14.90	32.20	15.98	6.00	16	5.00	5.00
28 August	17085	IPC	14.00	31.50	115.00	6.00	24	5.00	5.00
28 August	17086	IPB	13.90	31.50	138.00	5.00	18	2.50	2.50
28 August	17087	IPA	14.20	31.70	134.72	5.00	10	8.00	8.00
29 August	17088	ISD	13.40	21.20	42.90	5.00	6	9.50	9.50
29 August	17089	ISC	13.40	21.00	361.00	6.00	6	—	—
29 August	17090	ISB	13.80	20.00	267.00	5.00	7	—	—
29 August	17091	ISA	13.50	20.70	223.00	6.00	6	—	—
29 August	17092	ISB	13.80	20.00	267.00	5.00	—	—	—
29 August	17093	ISA	13.50	20.70	223.00	6.00	—	—	—
29 August	17094	ISD	13.40	21.20	42.90	5.00	—	—	—
29 August	17095	ISC	13.40	21.00	361.00	6.00	—	—	—
30 August	17096	ISA	11.50	26.20	37.95	5.00	8	—	—
30 August	17097	ISB	13.80	20.40	78.40	6.00	6	—	—
30 August	17098	ISC	14.10	15.00		6.00	6	—	—
30 August	17099	ISD	14.20	18.50	156.00	6.00	6	—	—
30 August	17100	ISA	11.50	26.20	37.95	5.00	—	—	—
30 August	17101	ISB	13.80	20.40	78.40	6.00	—	—	—
31 August	17102	UCA	12.50	23.10	14.50	5.00	6	3.00	3.00
31 August	17103	UCA	12.50	23.10	14.50	5.00	—	—	—
31 August	17104	UCB	13.20	16.30	45.00	5.00	6	2.00	2.00
31 August	17105	UCB	13.20	16.30	45.00	5.00	—	—	—
31 August	17106	UCC	13.40	17.70	169.40	5.00	6	3.50	3.50
31 August	17107	UCD	12.00	26.60	158.00	4.00	8	4.00	4.00
01 September	17108	UCD	11.20	27.90	13.00	4.00	10	—	—
01 September	17109	UCD	11.20	27.90	13.00	4.00	—	—	—

Appendix 1.—cont.

Date	Haul #	Station	Temperature (°C)	Salinity (PSU)	Light level (W/m ³)	Secchi (m)	MLD (m)	ZSV (ml)	TSV (ml)
01 September	17110	UCC	12.00	26.00	142.40	4.00	6	—	—
01 September	17111	UCC	12.00	26.00	142.40	4.00	—	—	—
01 September	17112	UCB	10.10	26.70	125.00	5.00	6	—	—
01 September	17113	UCA	10.80	28.30	144.00	4.00	6	—	—
02 September	17114	ABM	13.20	19.70	13.00	6.00	6	8.00	8.00

Appendix 2.—Catch and life history stage of salmonids captured in 98 surface rope trawl hauls from the marine waters of the northern region of southeastern Alaska, June–August 2013. Trawl duration (minutes) is indicated for each haul. Station code acronyms are listed in Table 1.

Date	Haul #	Station	Trawl time	Juvenile salmon					Immature and adult salmon				
				Pink	Chum	Sockeye	Coho	Chinook	Pink	Chum	Sockeye	Coho	Chinook
23 June	17014	ISA	20	0	0	8	9	1	2	1	0	0	3
23 June	17015	ISB	20	0	0	9	18	0	0	1	0	0	2
23 June	17016	ISC	20	0	0	0	5	0	0	0	0	0	8
23 June	17017	ISD	20	0	0	4	0	0	1	5	1	1	1
23 June	17018	ISC	20	0	0	3	1	2	0	0	0	0	2
23 June	17019	ISD	20	0	3	11	1	0	0	0	0	0	3
24 June	17020	ISD	20	0	0	0	44	0	3	1	0	0	14
24 June	17021	ISC	20	6	18	2	10	1	4	0	0	0	12
24 June	17022	ISB	20	0	1	0	1	1	0	2	0	1	20
24 June	17023	ISA	20	0	0	0	0	0	0	0	0	0	1
24 June	17024	ISB	20	0	0	0	0	0	0	3	1	0	17
24 June	17025	ISA	20	0	0	0	0	1	2	1	0	0	1
25 June	17026	ISD	20	0	0	3	37	0	0	1	0	0	4
25 June	17027	ISC	20	1	5	0	22	0	5	0	0	0	1
25 June	17028	ISB	20	0	0	3	12	0	2	0	0	0	4
25 June	17029	ISA	20	0	0	0	0	0	2	2	0	0	2
26 June	17030	IPD	30	0	0	0	0	0	6	0	1	0	0
26 June	17031	IPC	30	0	0	0	1	0	5	1	0	0	1
26 June	17032	IPB	30	0	0	0	8	1	1	0	0	0	1
26 June	17033	IPA	30	0	0	0	9	6	19	3	0	0	7
27 June	17034	UCA	20	0	0	0	5	0	2	0	0	0	3
27 June	17035	UCB	20	0	0	0	8	1	6	3	0	0	1
27 June	17036	UCC	20	14	49	5	41	2	1	1	0	0	5
27 June	17037	UCD	20	4	12	2	10	0	2	1	0	0	2
27 June	17038	UCC	20	0	0	1	7	0	0	0	0	0	2

Appendix 2.—cont.

Date	Haul #	Station	Trawl time	Juvenile salmon					Immature and adult salmon				
				Pink	Chum	Sockeye	Coho	Chinook	Pink	Chum	Sockeye	Coho	Chinook
27 June	17039	UCD	20	3	39	19	47	1	5	9	0	2	0
28 June	17040	UCD	20	102	400	22	70	1	2	0	0	0	2
28 June	17041	UCC	20	0	30	11	5	0	2	7	0	0	3
28 June	17042	UCB	20	0	0	0	0	1	2	0	0	0	1
28 June	17043	UCA	20	32	59	9	1	0	1	1	1	0	2
28 June	17044	UCB	20	23	193	5	3	1	4	0	0	0	0
28 June	17045	UCA	20	0	1	0	14	1	3	1	0	0	1
25 July	17047	ISA	20	0	34	4	23	0	22	0	0	0	0
25 July	17048	ISB	20	23	89	14	34	1	6	1	0	0	1
25 July	17049	ISC	20	258	355	86	22	0	0	0	0	0	0
25 July	17050	ISD	20	1	27	7	6	0	4	0	0	0	0
25 July	17051	ISC	20	125	247	40	19	1	4	0	0	0	1
25 July	17052	ISD	20	70	75	46	39	0	1	0	0	1	0
26 July	17053	ISD	20	162	474	20	15	0	0	0	0	0	0
26 July	17054	ISC	20	170	175	65	20	0	1	0	0	1	0
26 July	17055	ISB	20	20	16	10	17	0	4	0	0	0	0
26 July	17056	ISA	20	3	1	5	14	0	20	0	0	1	0
27 July	17057	IPD	30	0	0	0	7	0	0	0	0	0	0
27 July	17058	IPC	30	17	20	2	2	1	1	1	0	0	0
27 July	17059	IPB	30	38	46	10	0	0	1	0	0	0	0
27 July	17060	IPA	30	7	17	1	43	3	0	1	0	0	2
28 July	17061	ISD	20	97	365	69	10	0	4	2	0	0	0
28 July	17062	ISC	20	241	1479	67	4	1	2	0	0	0	0
28 July	17063	ISB	20	897	1640	56	6	0	1	0	0	0	0
28 July	17064	ISA	20	93	260	12	10	1	1	0	0	0	1
28 July	17065	ISB	20	406	865	83	9	0	12	0	0	2	1
28 July	17066	ISA	20	145	225	39	39	0	2	0	0	0	1
29 July	17067	UCD	20	3	40	5	5	0	1	0	0	0	0

Appendix 2.—cont.

Date	Haul #	Station	Trawl time	Juvenile salmon					Immature and adult salmon				
				Pink	Chum	Sockeye	Coho	Chinook	Pink	Chum	Sockeye	Coho	Chinook
29 July	17068	UCC	20	11	130	39	3	1	2	0	0	0	0
29 July	17069	UCB	20	0	7	0	3	0	0	0	0	0	0
29 July	17070	UCA	20	24	265	48	6	0	4	0	0	0	0
29 July	17071	UCB	20	0	2	1	0	0	0	0	0	0	0
29 July	17072	UCA	20	49	376	42	7	0	0	0	0	0	0
30 July	17073	UCA	20	14	145	28	3	0	1	0	0	0	0
30 July	17074	UCB	20	0	28	10	9	0	3	0	0	0	0
30 July	17075	UCC	20	3	11	16	9	0	1	0	0	0	0
30 July	17076	UCD	20	1	5	3	8	0	1	0	0	0	0
30 July	17077	UCC	20	0	0	0	0	0	0	0	0	0	0
30 July	17078	UCD	20	0	6	2	25	1	3	0	0	1	1
27 August	17080	ISD	20	30	66	12	2	0	0	0	0	0	0
27 August	17081	ISC	20	17	76	13	3	0	1	1	0	1	1
27 August	17082	ISB	20	8	12	3	3	0	0	2	0	1	0
27 August	17083	ISA	20	125	164	6	1	0	0	0	0	0	0
28 August	17084	IPD	30	0	0	0	4	0	0	0	0	0	0
28 August	17085	IPC	30	0	1	0	3	0	0	0	0	0	0
28 August	17086	IPB	30	0	2	0	4	0	0	0	0	0	0
28 August	17087	IPA	30	15	19	1	3	0	1	0	0	0	0
29 August	17088	ISD	20	1	3	2	1	0	0	0	0	0	0
29 August	17089	ISC	20	26	35	17	0	0	0	0	0	0	0
29 August	17090	ISB	20	6	6	0	4	0	1	0	0	0	3
29 August	17091	ISA	20	0	0	0	3	0	0	0	0	0	0
29 August	17092	ISB	20	10	30	7	2	2	1	0	0	0	0
29 August	17093	ISA	20	0	1	0	6	0	0	0	0	0	0
29 August	17094	ISD	20	0	3	0	1	1	0	0	0	0	0
29 August	17095	ISC	20	4	11	11	0	0	0	0	0	0	0
30 August	17096	ISA	20	2	3	1	4	2	2	1	0	0	0

Appendix 2.—cont.

Date	Haul #	Station	Trawl time	Juvenile salmon					Immature and adult salmon				
				Pink	Chum	Sockeye	Coho	Chinook	Pink	Chum	Sockeye	Coho	Chinook
30 August	17097	ISB	20	4	9	2	1	0	0	0	0	0	0
30 August	17098	ISC	20	7	6	0	0	0	0	0	0	0	0
30 August	17099	ISD	20	0	1	1	0	0	5	0	0	0	0
30 August	17100	ISA	20	0	16	1	4	0	0	0	0	0	0
30 August	17101	ISB	20	7	9	3	0	0	0	0	0	0	1
31 August	17102	UCA	20	11	31	22	5	1	0	0	0	4	0
31 August	17103	UCA	20	7	7	5	3	0	0	0	0	0	0
31 August	17104	UCB	20	7	8	17	3	0	0	0	0	1	1
31 August	17105	UCB	20	3	2	9	5	1	0	0	0	1	1
31 August	17106	UCC	20	7	6	11	4	4	0	0	0	2	0
31 August	17107	UCD	20	30	57	26	2	1	0	0	0	0	0
01 Sept	17108	UCD	20	13	25	7	11	1	2	0	1	2	3
01 Sept	17109	UCD	20	10	26	27	2	0	3	0	0	0	1
01 Sept	17110	UCC	20	0	1	4	6	1	1	0	0	3	0
01 Sept	17111	UCC	20	9	10	4	4	1	1	1	0	1	1
01 Sept	17112	UCB	20	0	0	2	0	1	2	0	0	1	0
01 Sept	17113	UCA	20	0	0	0	2	0	3	0	0	2	0

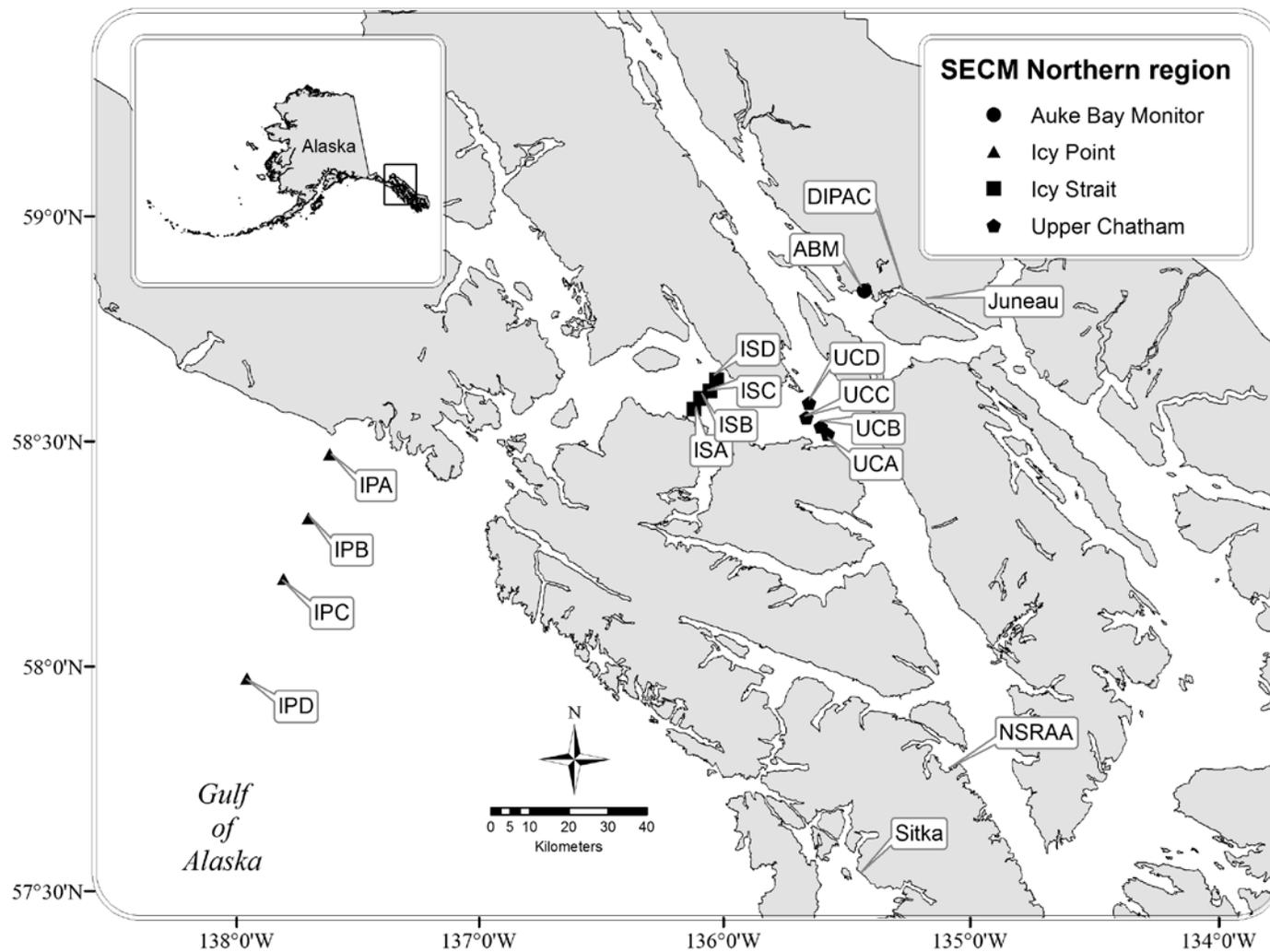


Figure 1.—Stations sampled at inshore, strait, and coastal habitats in the marine waters of the northern region of southeastern Alaska, May–August 2013 by the Southeast Coastal Monitoring (SECM) project. Transect and station coordinates and station code

acronyms are shown in Table 1.

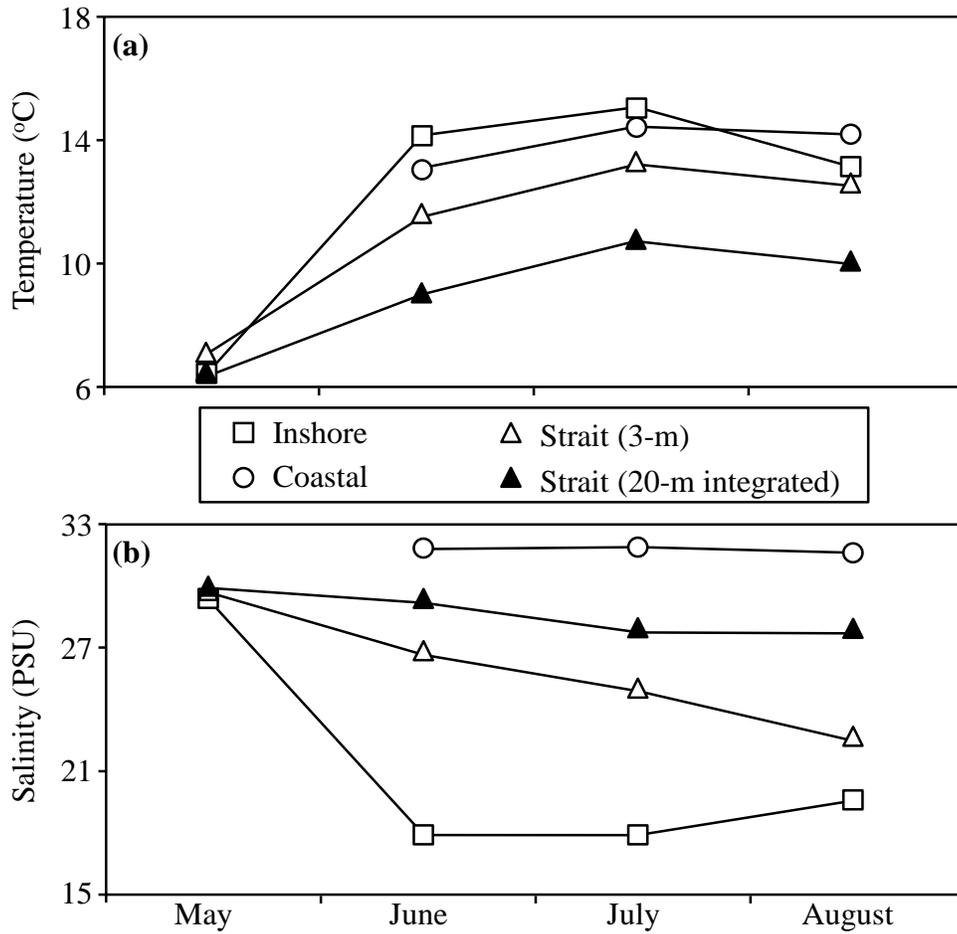


Figure 2.—Mean surface (3-m) and 20-m integrated temperature (a; °C) and salinity (b; PSU) for the marine waters of the northern region of southeastern Alaska, May–August 2013. The 3-m measures represent the most active segment of the water column, while the 20-m integrated measures represent more stable waters also sampled by the trawl (see also Figure 3). See Table 2 for monthly sample sizes and Appendix 1 for data values.

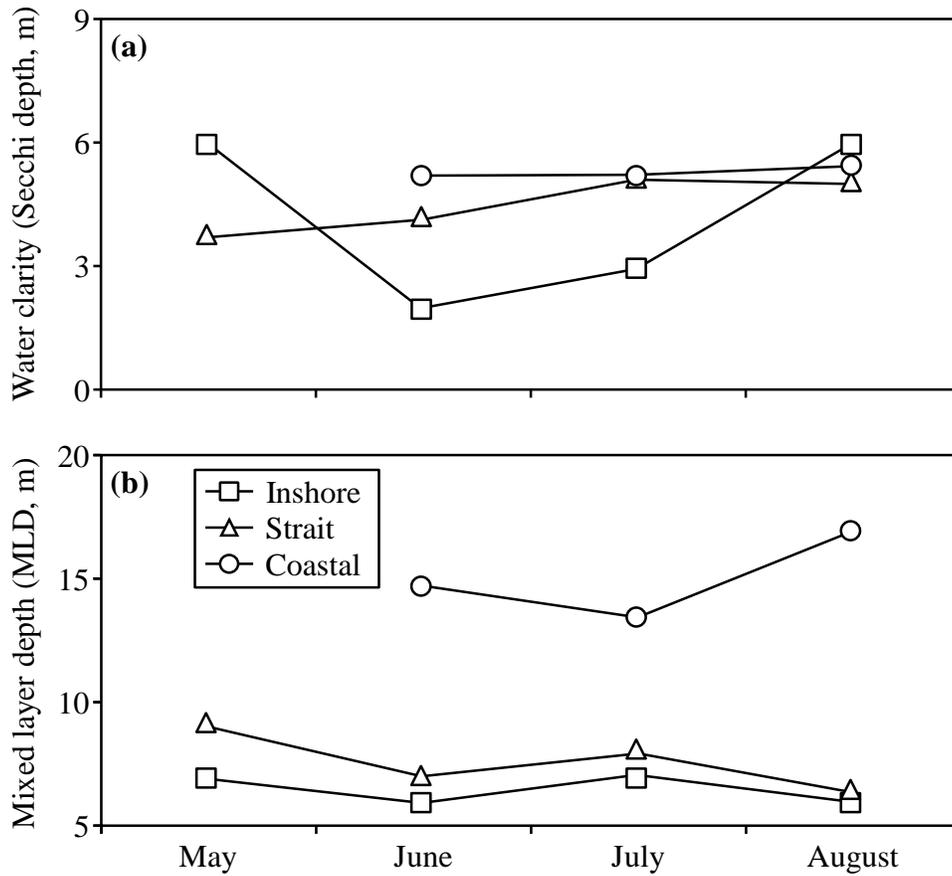


Figure 3.—Water clarity as mean depth (a; m) of Secchi disappearance and mixed layer depth (b; MLD, m; see text for definition) calculated from CTD profiles from the marine water column in the northern region of southeastern Alaska, May–August 2013. See Table 2 for monthly sample sizes and Appendix 1 for data values.

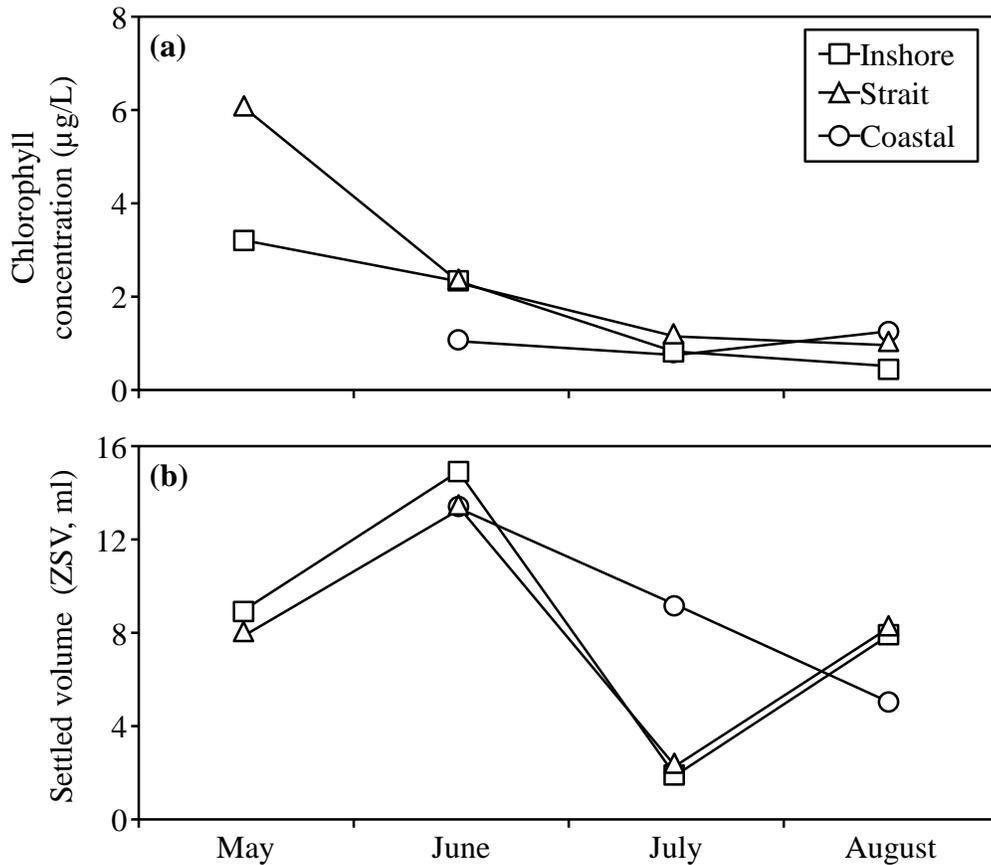


Figure 4.—Mean chlorophyll-a concentration (a; µg/L) from surface water samples and zooplankton settled volumes (b; ZSV, ml) from 20-m Norpac net hauls in the marine waters of the northern region of southeastern Alaska, May–August 2013. Chlorophyll was estimated from single monthly samples per station, while mean ZSV was estimated from all replicate hauls at each station. See Table 2 for monthly sample sizes and Appendix 1 for data values. Zooplankton standing stock (ml/m³) can be computed by dividing ZSV by the water volume filtered, a constant factor of 3.9 m³ for these samples.

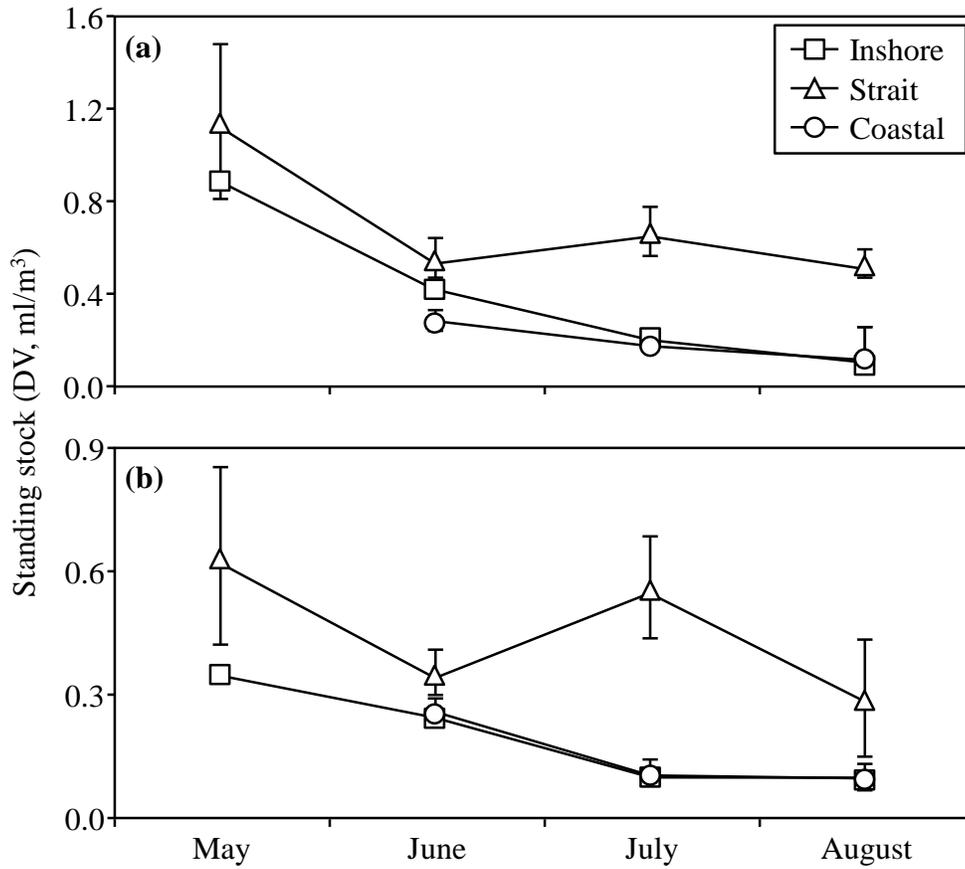


Figure 5.—Monthly zooplankton standing stock (mean ml/m³, \pm 1 standard error) from (a) 333- μ m, and (b) 505- μ m mesh double oblique bongo net samples hauled from \leq 200 m depths during daylight in strait habitat in marine waters of the northern region of southeastern Alaska, May–August 2013.

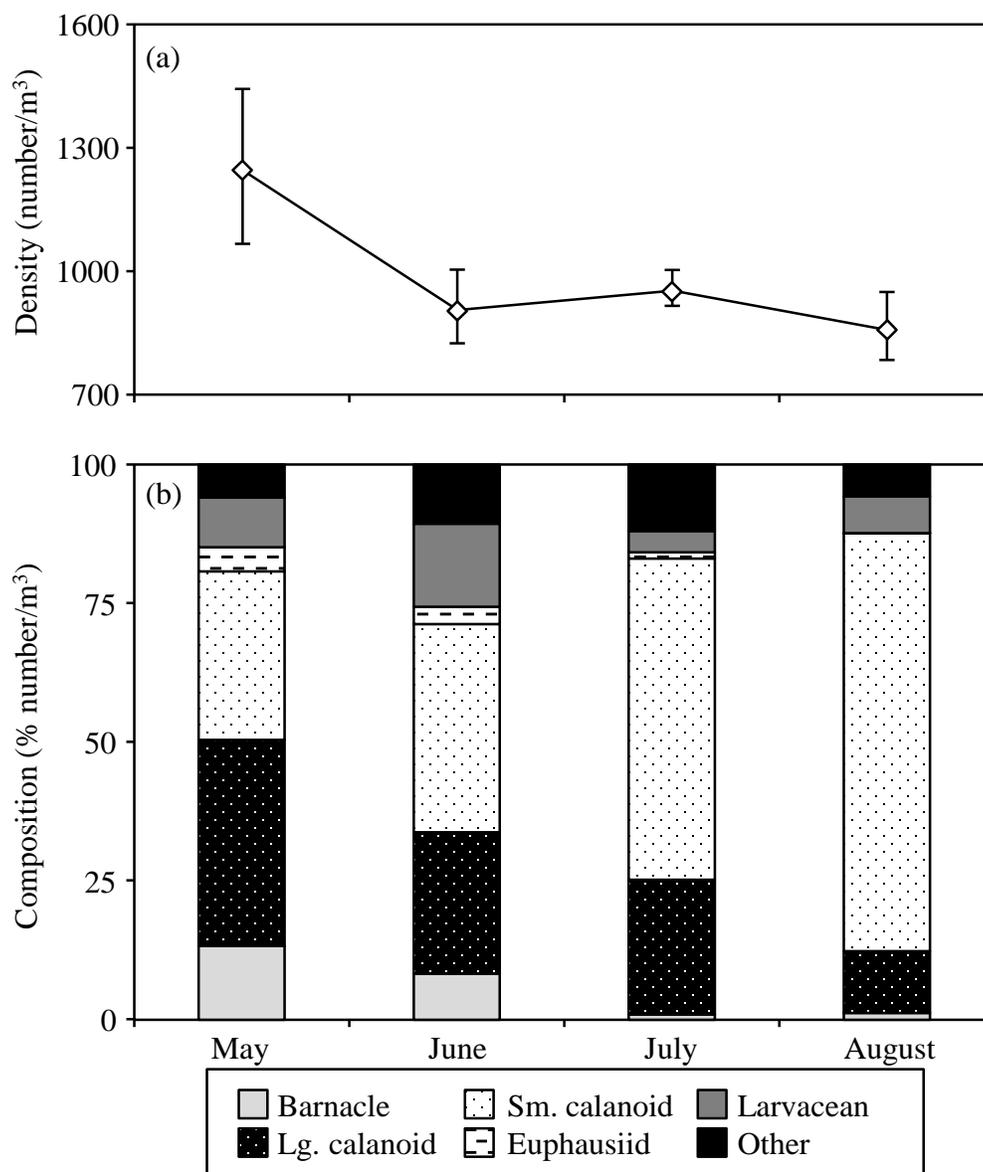


Figure 6.—Monthly “deep” (≤ 200 m depth) zooplankton collected in strait habitat in marine waters of the northern region of southeastern Alaska, May–August 2013. Data include (a) mean total density of organisms (thousands/m³) ± 1 standard error, and (b) taxonomic composition (mean percent/m³). Samples were collected in daylight using a 333- μ m mesh bongo net (double oblique tow) at 4 stations in Icy Strait each month.

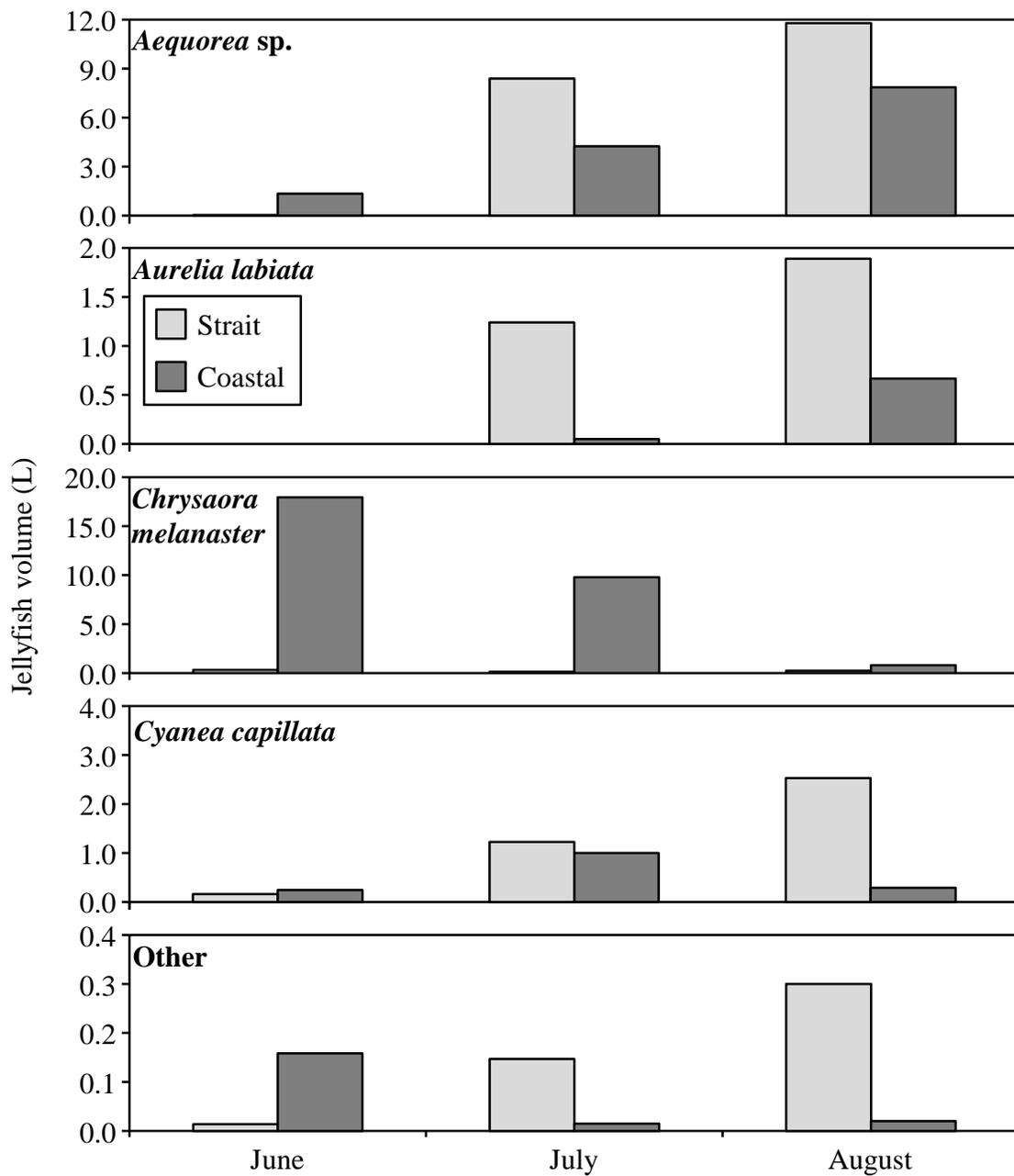


Figure 7.—Mean volume (L) of jellyfish captured in strait and coastal habitats in marine waters of the northern region of southeastern Alaska by rope trawl, June–August 2013. See Table 2 for monthly sample sizes. Other = ctenophores, *Staurophora* sp., *Phacellophora* sp. and unknown species. Note difference in y-axis scales.

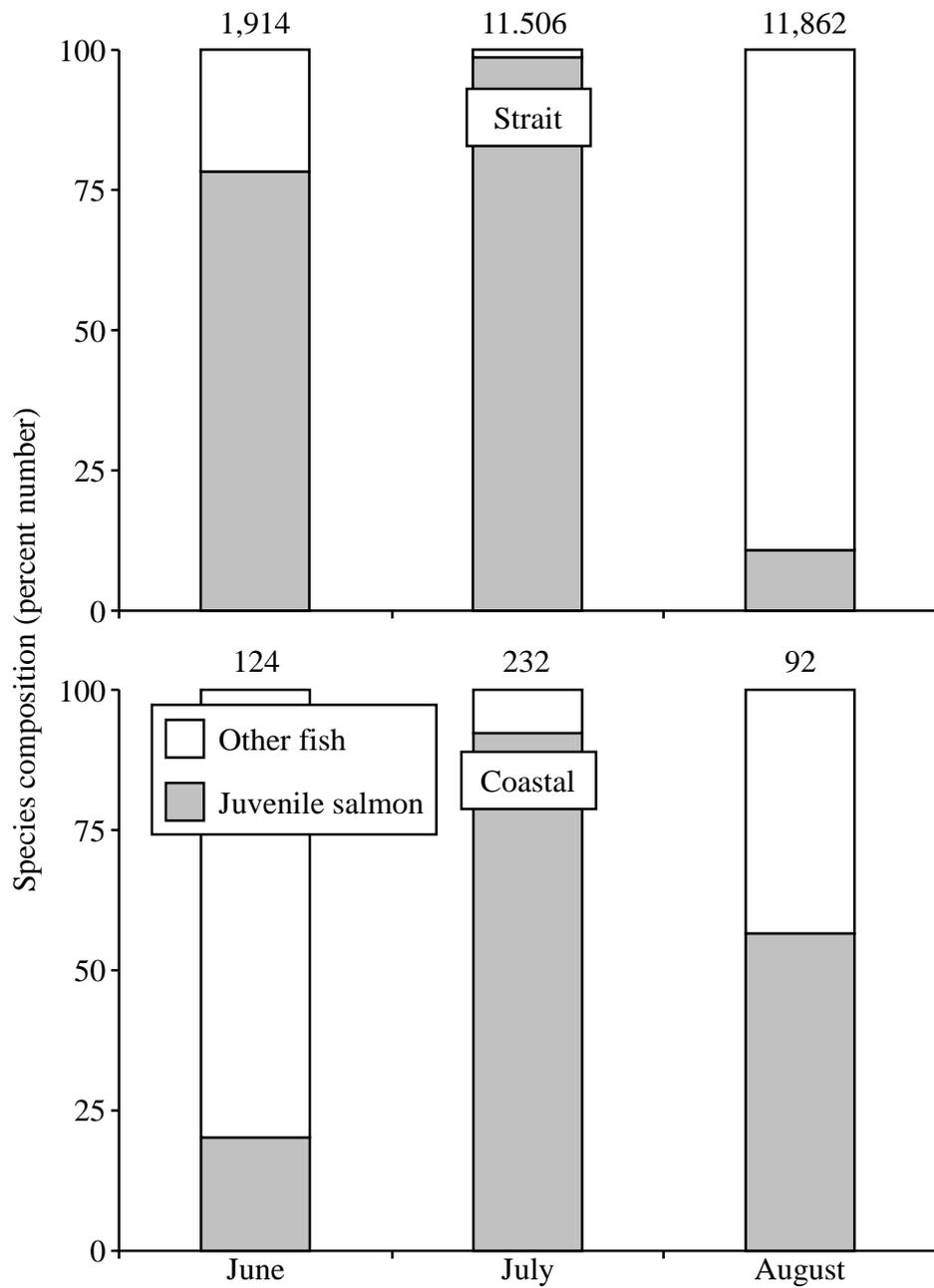


Figure 8.—Fish categories (percent number) in catch from rope trawls by month in strait and coastal marine habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Total number of fish is indicated above each bar. See Tables 2 and 8 for monthly sample sizes by species.

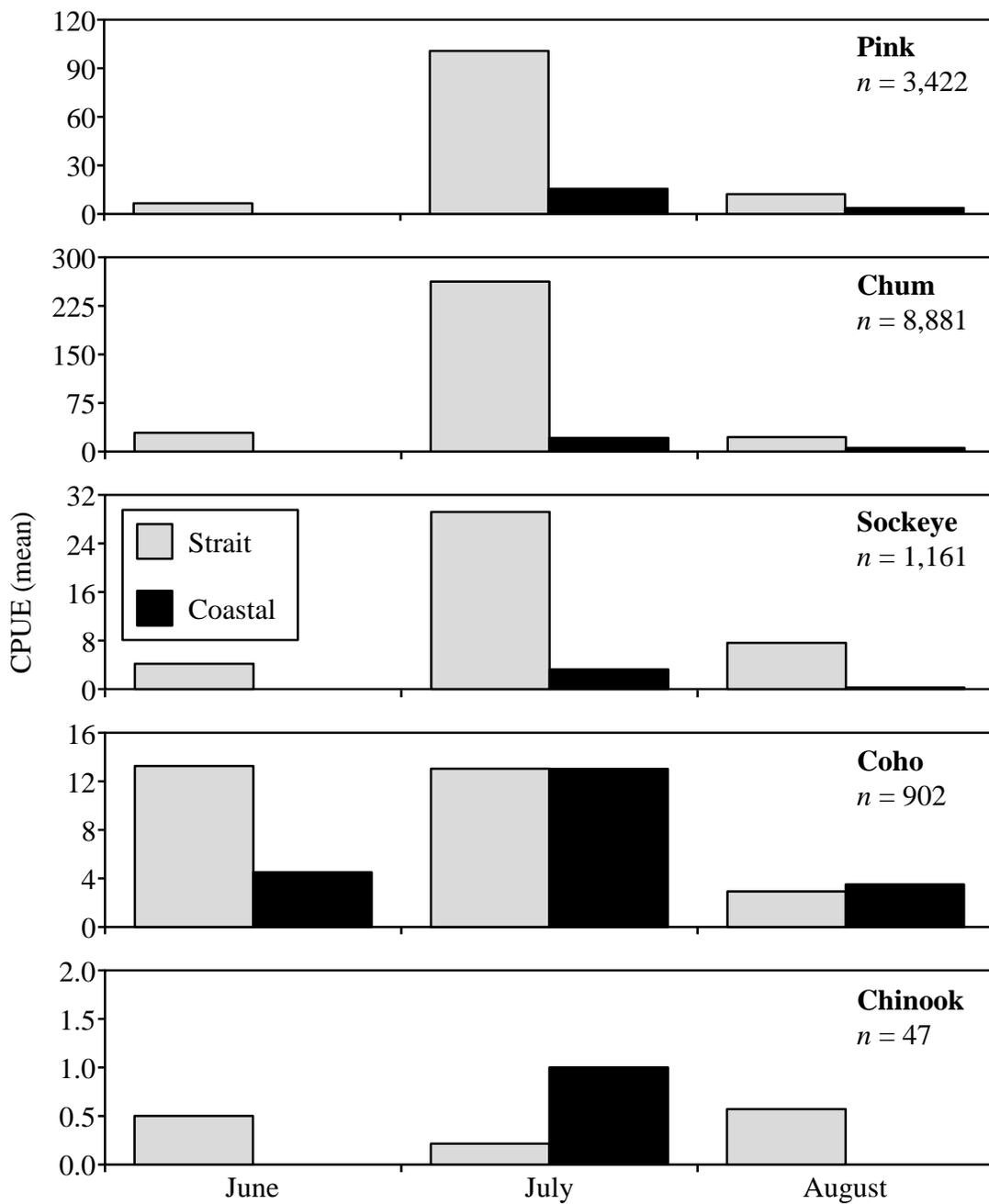


Figure 9.—Catch-per-unit-effort (CPUE, mean catch per trawl haul) for juvenile salmon captured in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Total seasonal CPUE is indicated for each species. See Table 2 for the number of trawl samples per month. Note difference in y-axis scales.

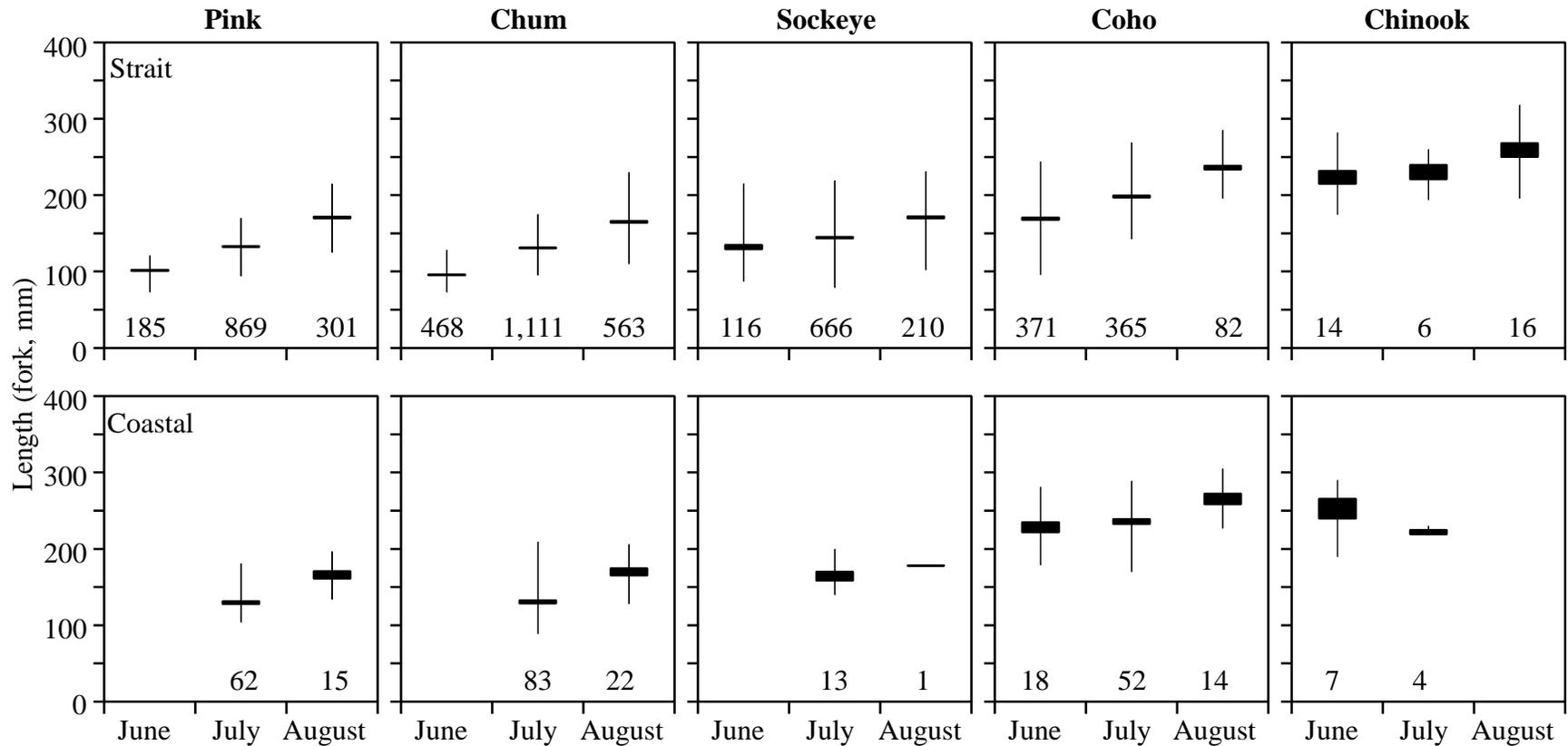


Figure 10.—Length (mm, fork) of juvenile salmon species captured by rope trawl in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Monthly range in length is represented by the vertical bars; boxes within the range are one standard error on either side of the mean. Sample sizes are indicated for each month.

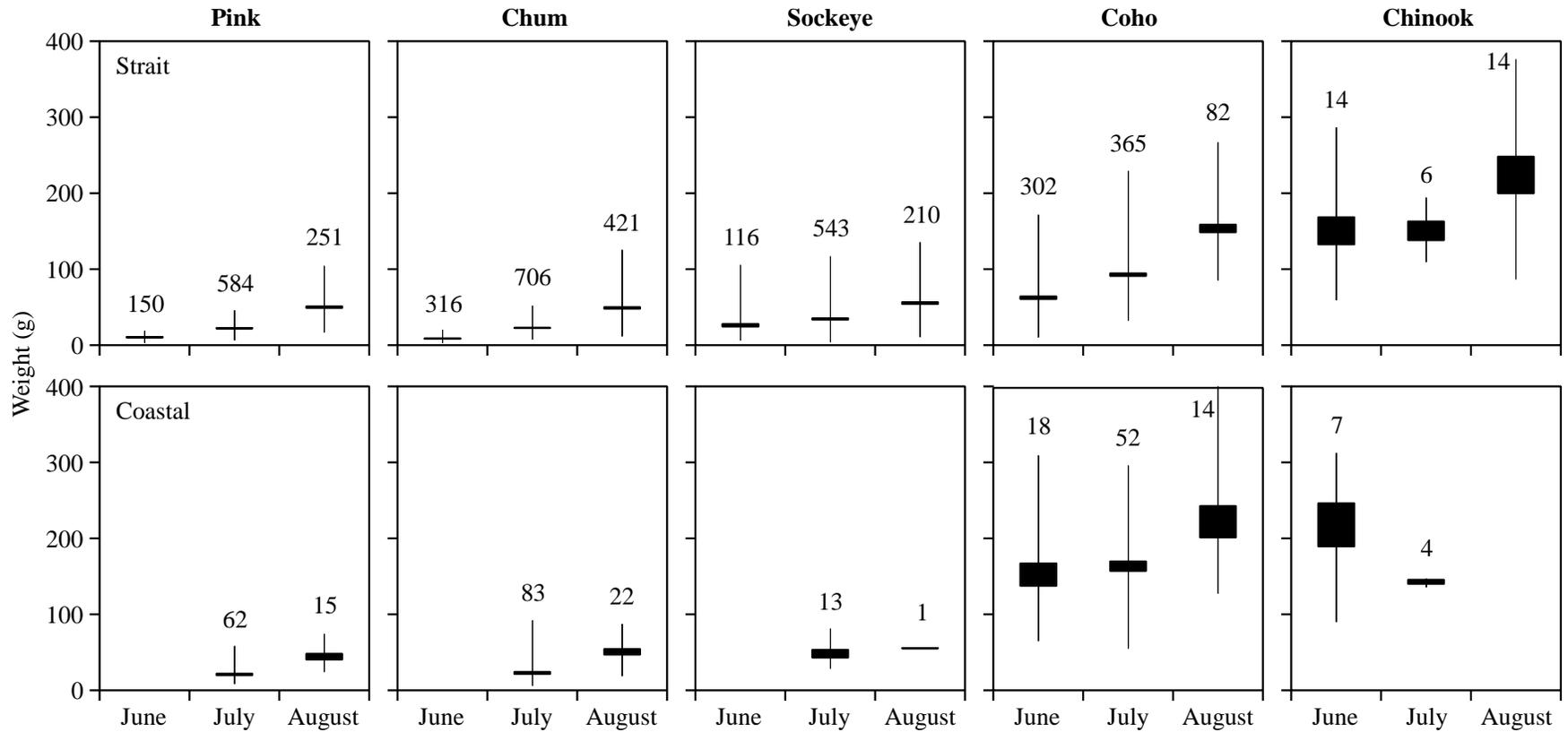


Figure 11.—Weight (g) of juvenile salmon species captured by rope trawl in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Monthly range in length is represented by the vertical bars; bars within the range are one standard error on either side of the mean. Sample sizes are indicated for each month.

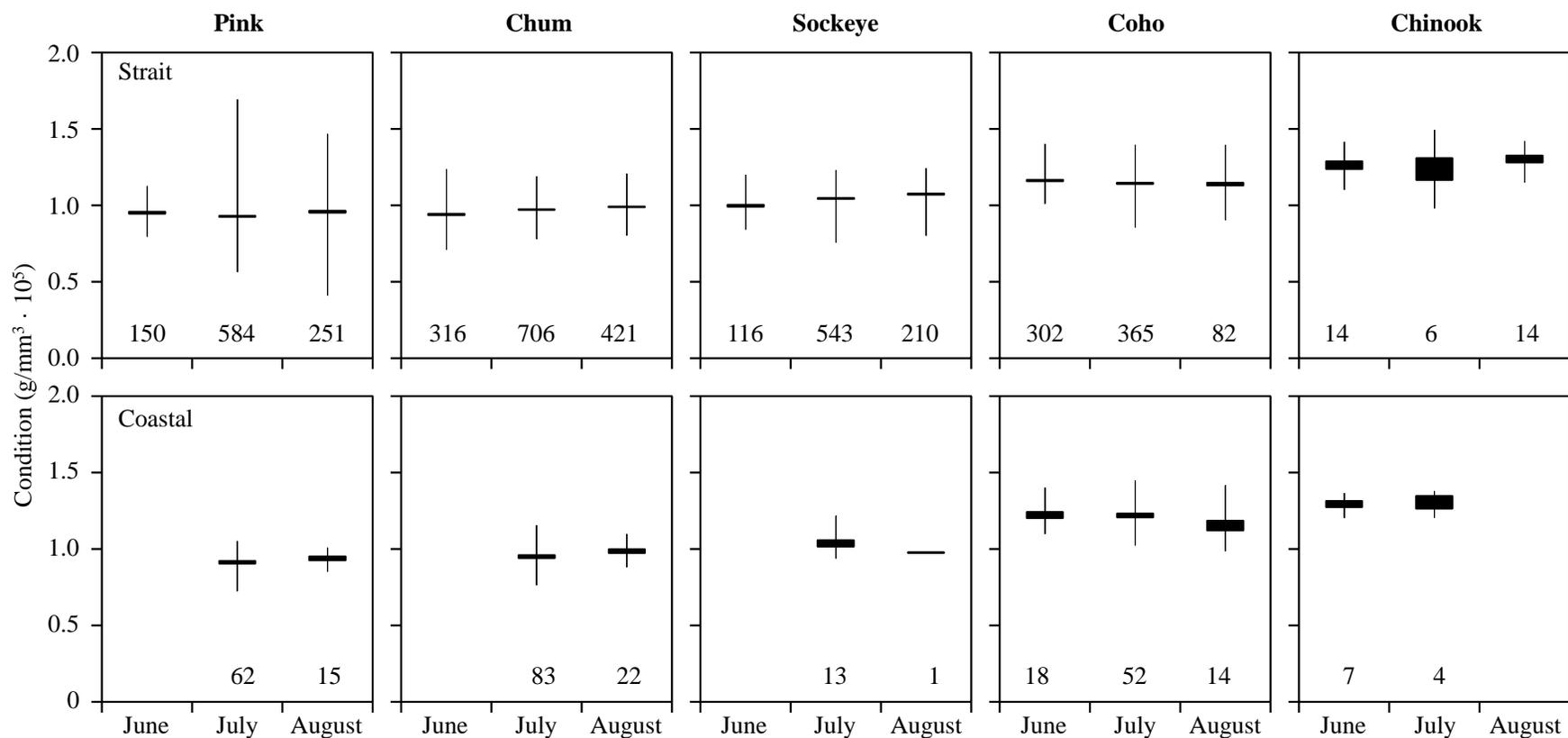


Figure 12.—Fulton's condition ($\text{g}/\text{mm}^3 \cdot 10^5$) of juvenile salmon species captured by rope trawl in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Monthly range in length is represented by the vertical bars; bars within the range are one standard error on either side of the mean. Sample sizes are indicated for each month. Note difference in y-axis scales.

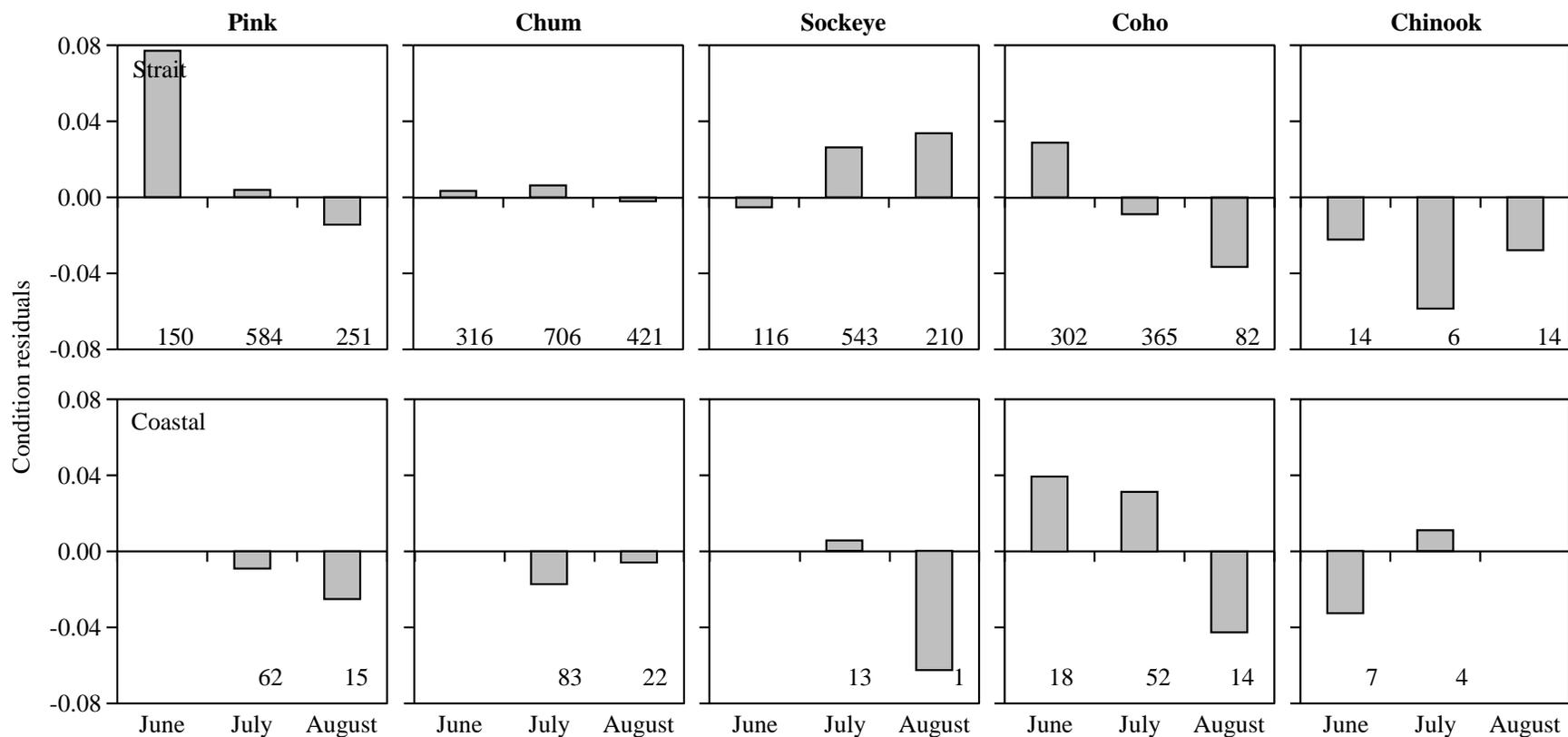


Figure 13.—Condition residuals from length-weight regression analysis of juvenile salmon species captured by rope trawl in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Sample sizes are indicated for each month.

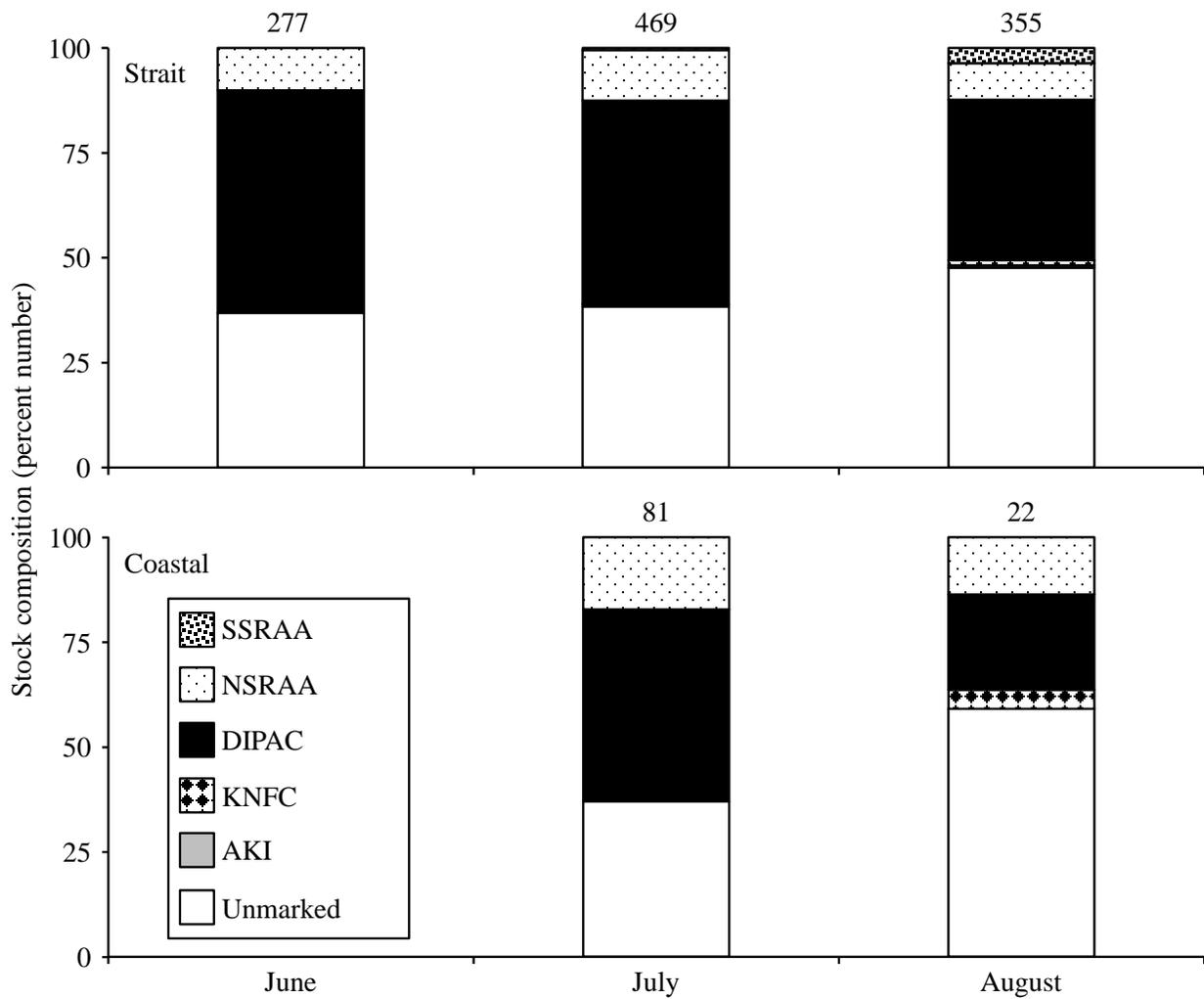


Figure 14.—Monthly stock composition (based on otolith thermal marks) of juvenile chum salmon captured by rope trawl in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Number of salmon sampled per month is indicated above each bar.

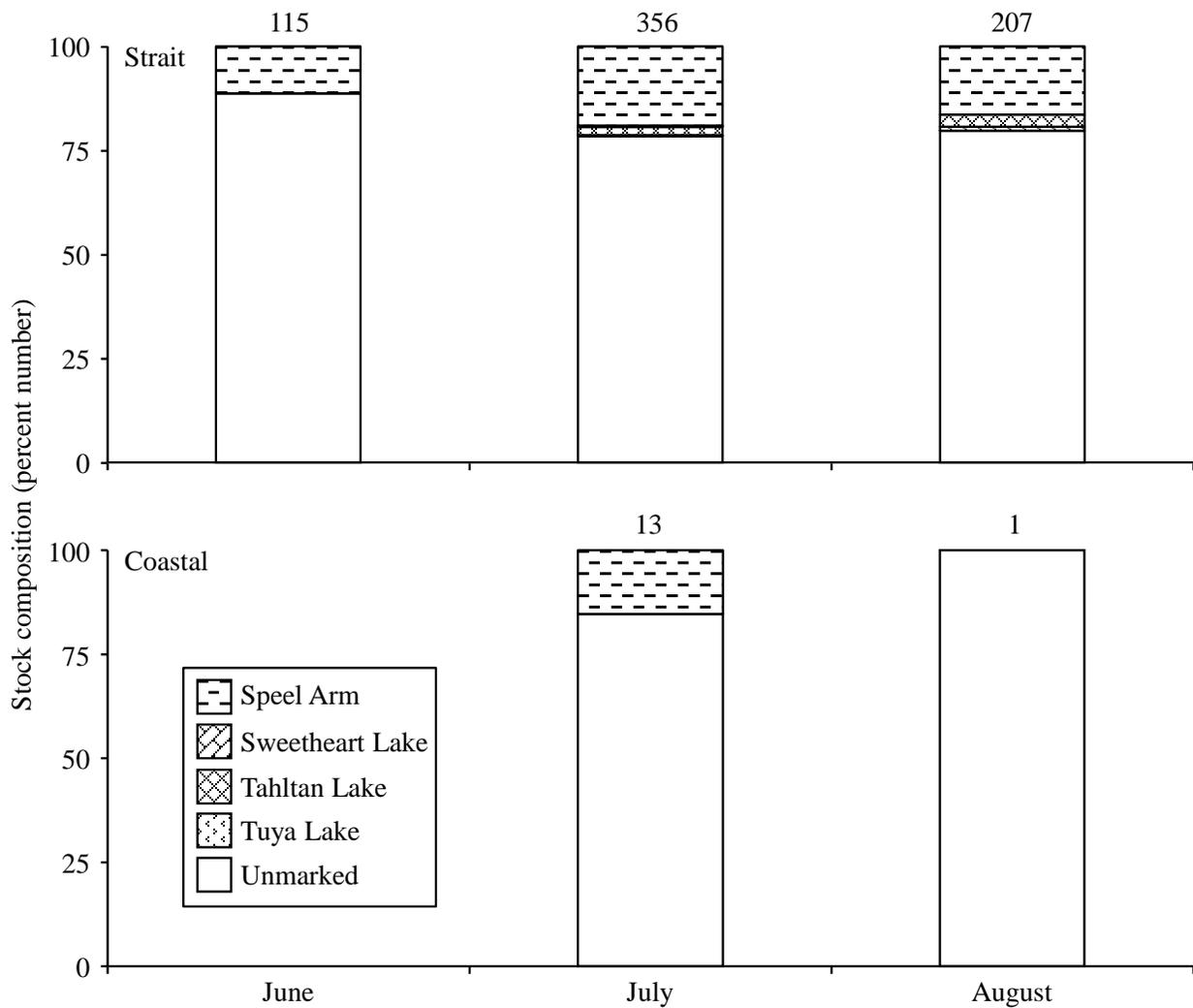


Figure 15.—Monthly stock composition (based on otolith thermal marks) of juvenile sockeye salmon captured by rope trawl in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Number of salmon sampled per month is indicated above each bar. No sockeye salmon were caught in June in the coastal habitat.

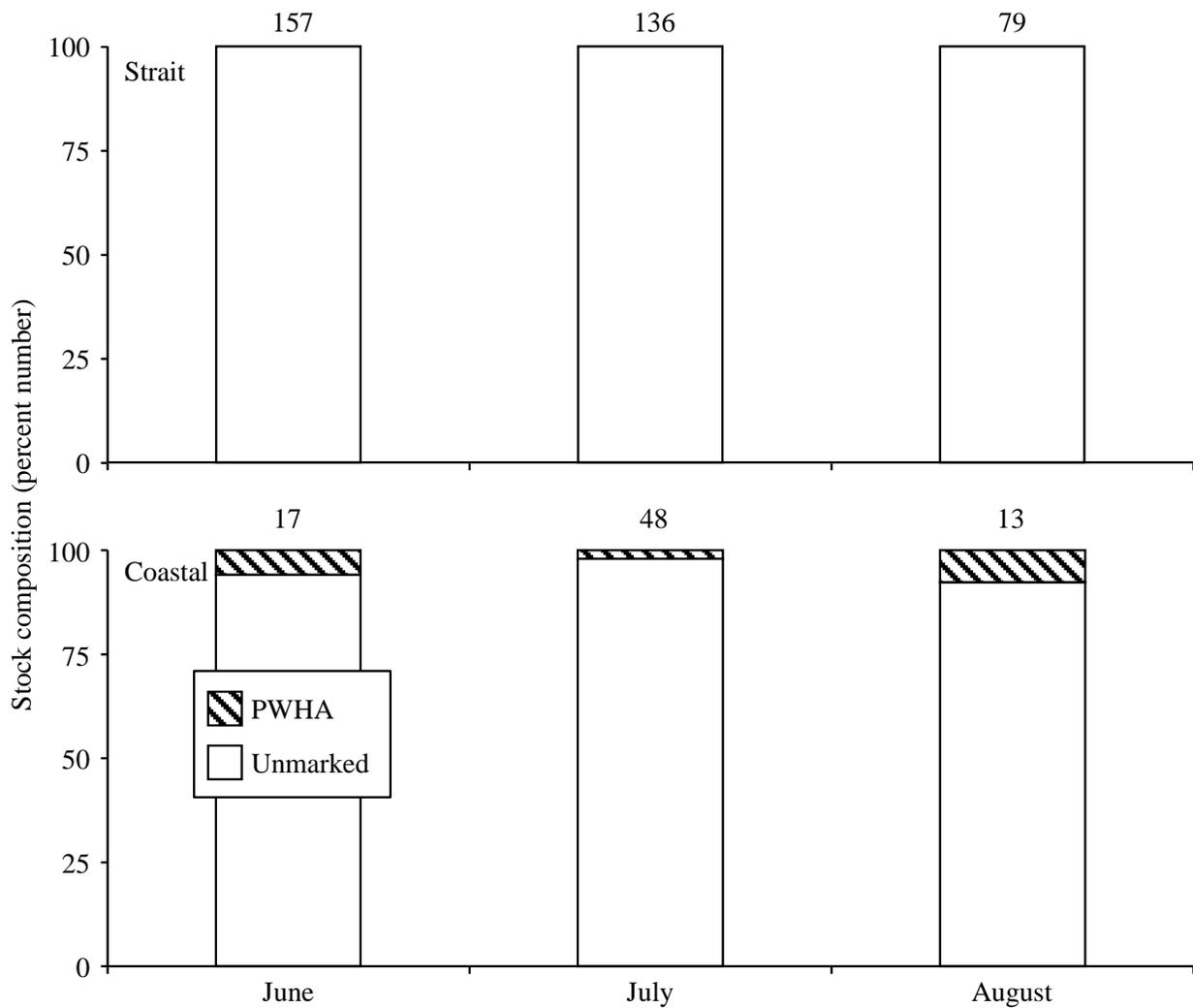


Figure 16.—Monthly stock composition (based on otolith thermal marks) of juvenile coho salmon captured by rope trawl in strait and coastal habitats in marine waters of the northern region of southeastern Alaska, June–August 2013. Number of salmon sampled per month is indicated above each bar.

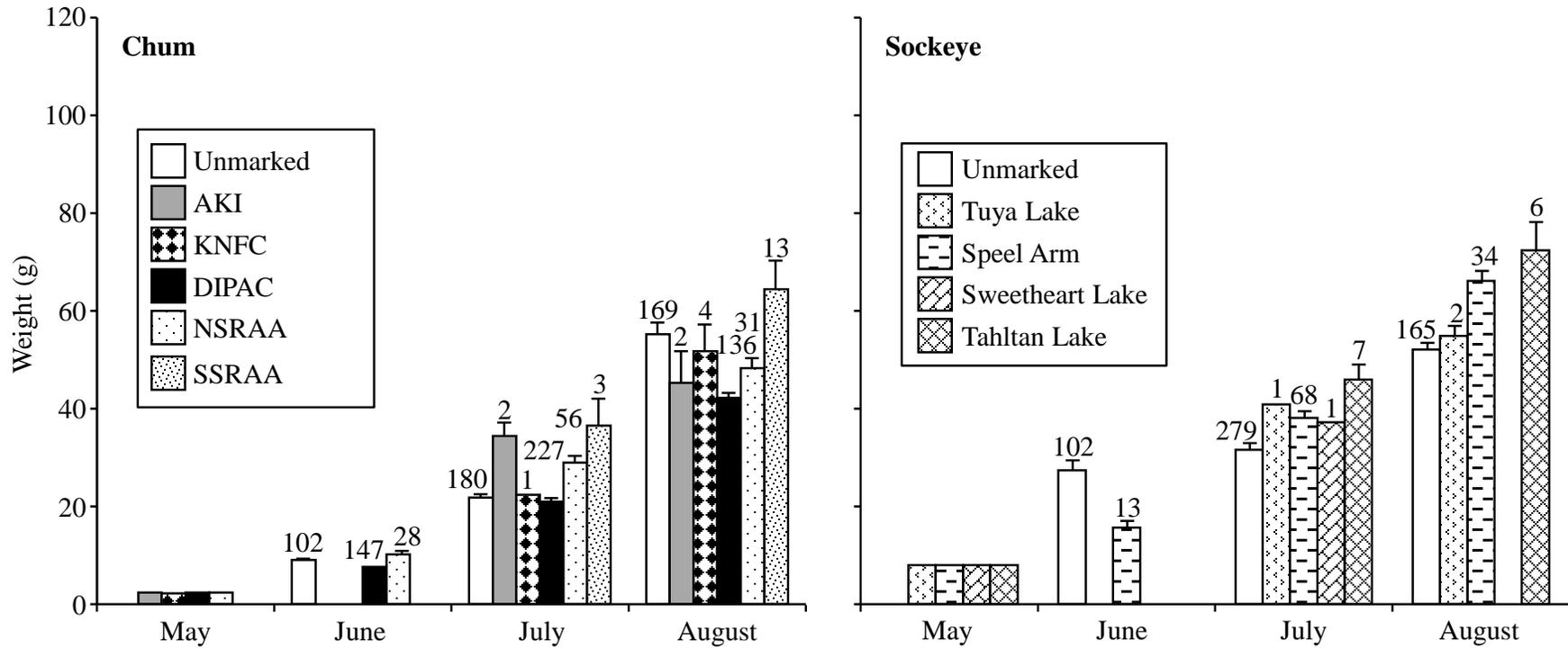


Figure 17.—Stock-specific growth trajectories of juvenile chum and sockeye salmon (mean weight, g, \pm 1 standard error) captured by rope trawl in strait habitat in marine waters of the northern region of southeastern Alaska, June–August 2013. Weights of May fish are mean values at time of hatchery release. The sample sizes are indicated above each bar.

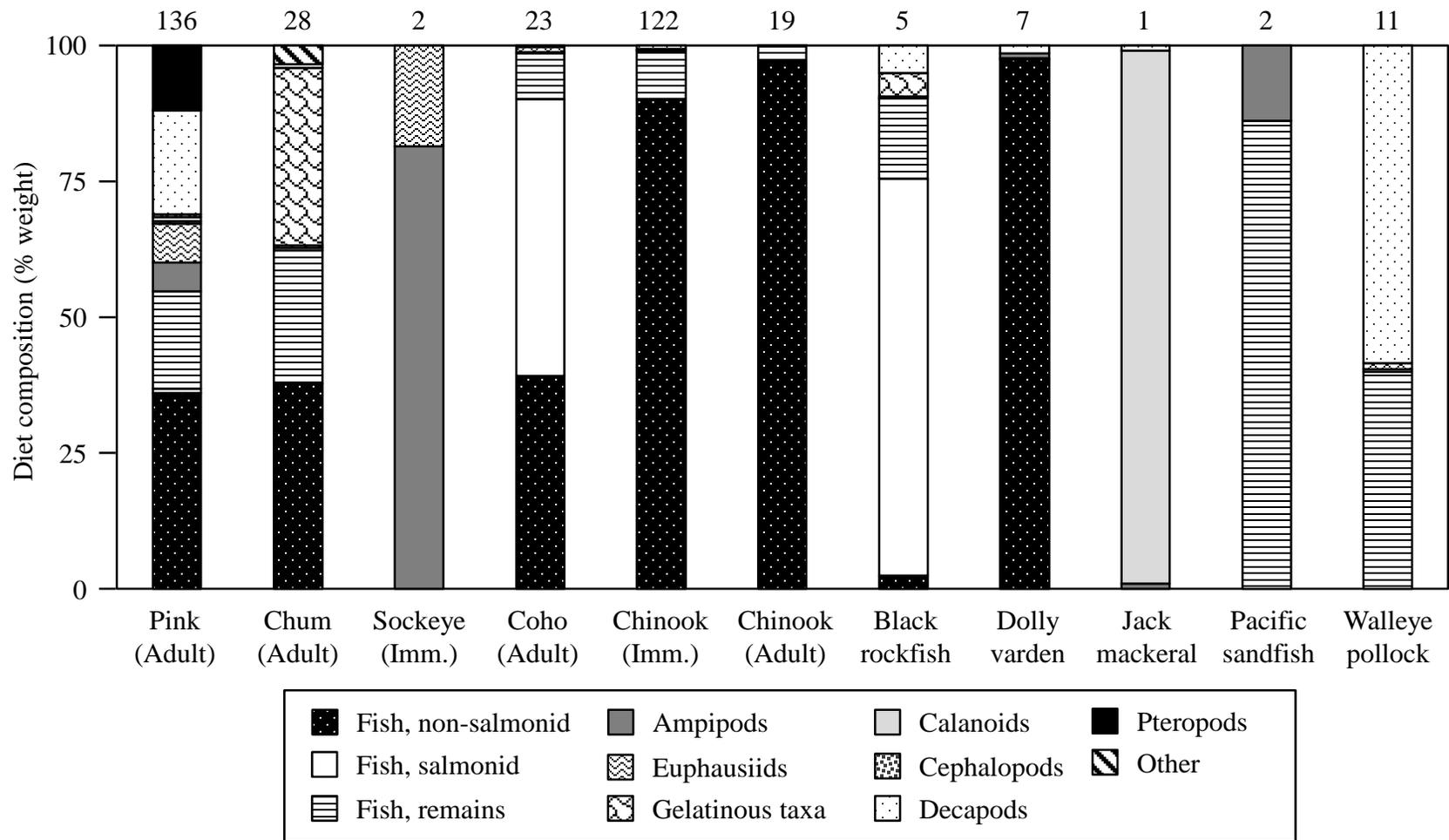


Figure 18.—Prey composition of 450 feeding potential predators of juvenile salmon captured in 98 rope trawl hauls in strait and coastal habitats in marine waters of the northern region of Southeast Alaska, June–August 2013. The numbers of fish examined per species are shown above the bars. The potential predators with empty stomachs ($n = 94$) were not included in this analysis. See Tables 20-21 for additional feeding attributes.