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SALINITY EFFECTS DUE TO CHANNEL DEEPENING ON ESTUARINE-DEPENDENT NEKTON IN THE LOWER ST. JOHNS RIVER ESTUARY

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SUMMARY

The U.S Army Corps of Engineers (USACE) is investigating the feasibility of increasing the depth of the existing federally-maintained shipping channel in the lower St. Johns River (LSJR) between the mouth (Mayport, Florida) and river-kilometer 21 (approximately Dunn Creek confluence). Channel dredging within the LSJR has the potential to affect salinity gradients and water quality within the estuary. These changes may affect spawning and nursery habitats within the LSJR and ultimately influence the reproductive success and recruitment of estuarine-dependent nekton. In particular, there is concern for 1) the potential effects of salinity changes on the spawning success, recruitment, and population dynamics of important recreational, commercial, and forage nekton and, 2) potential effects of salinity changes on critical nekton habitat within the LSJR estuary.

The Florida Fish and Wildlife Conservation Commission's (FWCC) Fisheries-Independent Monitoring (FIM) program began sampling in northeast Florida estuaries, including the LSJR, in 2001 to assess nekton populations. Although not specifically designed to assess salinity impacts upon the distribution and abundance of nekton in the LSJR, the FIM data are suitable for analyses that assess nekton community composition and investigate relationships between these communities and their coinciding environmental and habitat associations.

The objective of this data analysis was to document the abundance and distribution of nekton in the LSJR and its tidal tributaries between the mouth and river-kilometer 64 (approximately Julington Creek confluence). We analyzed existing FIM data to assess nekton species composition and to define nekton distribution and

abundance along salinity gradients in LSJR. This information can then be integrated with hydrologic, ecological, and water quality modeling data from other sources to provide an assessment of the potential effects of channel dredging on nekton populations in the LSJR.

The FIM program survey used a stratified-random sampling design to select sampling sites from four zones in the LSJR. Samples were collected monthly with 21.3-m seines, 183-m seines, and 6.1-m otter trawls between May 2001 and December 2011. Water chemistry parameters (salinity, water temperature, dissolved oxygen and pH measurements), and habitat assessments (bottom type, presence of submerged aquatic vegetation, shore habitat) were taken in association with each net deployment. A large body of descriptive habitat-use information was generated and is presented in the accompanying document.

Catch summaries of total number collected, frequency of occurrence, abundance (animals·100 m^{-2}), and central tendencies in distribution (km_U) and salinity (S_U) were prepared for each taxa collected in each sampling gear. Plots of monthly length-frequency for individual taxa were examined in order to determine appropriate sizes and months for further analyses. A specific size class of a species collected within a single gear type during a defined time period (months) is defined as a 'pseudo-species'.

A total of 5,467 nets were set within the LSJR study area from May 2001 through December 2011. Gear specific sampling effort (all zones combined) during the study period included: 2,117 21.3-m seines, 2,207 6.1-m otter trawls, and 1,143 183-m seines. A total of 2,975 sites were sampled in the mainstem of the LSJR and 2,492 sites sampled in tidal tributaries.

Over 84% of the 21.3-m seine catch was represented by ten taxa that included: bay anchovy, spot, Atlantic silversides, striped mullet, white shrimp, *Menidia* silversides, striped anchovy, menhaden's, Atlantic croaker, and pinfish. Bay anchovy dominated the catch numerically, accounting for over 25% of all nekton collected in the 21.3-m seine. The nekton collected in the 183-m seine tended to be larger bodied animals than in the 21.3-m seine; menhaden's, pinfish, striped mullet, spot, and white mullet comprised over 62% of the catch in this gear. Fish collections from deeper, trawled habitats were dominated by Atlantic croaker, which represented over 32% of the catch. Over 82% of the 6.1-m otter trawl catch was represented by five taxa that included: Atlantic croaker, bay anchovy, spot, white shrimp, and blue crab.

The nekton community in the studied portion of the LSJR was generally typical of a Florida tidal river. Small schooling species such as bay anchovy and menidia silversides dominated the overall abundance of the collected nekton. We observed some interesting characteristics of the system, however, such as the relatively high prevalence of estuarine species well upriver at young-of-the-year, juvenile, and adult sizes (e.g., spotted seatrout) and the existence of freshwater species (e.g., largemouth bass, white catfish) well downstream in both the mainstem of the LSJR and its tidal tributaries. These biological features are likely a result of the physical and hydrodynamic characteristics of this river which provide for a long tidal reach.

Density-weighted distribution analyses were conducted on pseudo-species that were found throughout the LSJR, from multiple life history strategies (tidal-river resident, offshore spawners, near-shore spawners, and estuarine spawners), and from multiple seasons. Each of the life-history strategies assessed included taxa and pseudo-species that used all sections of the LSJR study area. Pseudo-species within the offshore and nearshore spawners tended to be distributed as far upstream as estuarine spawners and tidal river residents. Similarly, there were no overall trends between mainstem and tidal tributary habitats; there were pseudo-species with centers of abundance below 6.0 km and above 50 km for both mainstem and tidal tributary habitats.

Pseudo-species from each of the life history strategies were collected from a wide range of the available salinities in the LSRJ study area. Tidal river residents tended to have the smallest 10-90 percentile range (average range <8 psu) while the offshore and nearshore spawners had the largest (>16 psu). With the exception of estuarine spawners collected with 21.3-m seines, all life history stages had at least one pseudo-species where the density-weighted salinity was less than 5 psu. There were no overarching trends between mainstem and tidal tributary habitats. Pseudo-species in each habitat type had average density-weighted salinities ranging from freshwater (0.4 psu, tidal tributaries) and oligohaline (0.5 psu, mainstem) to euhaline (≥30 psu), and similar 10-90 percentile ranges (average range of 14.7 and 15.0 for mainstem and tidal tributaries, respectively). Over 63% of the pseudo-species assessed had density-weighted mean salinity values less than 12 psu, underscoring the critical importance of these lower salinity habitats in the LSJR study area.

INTRODUCTION

The productivity and importance of estuaries as nursery areas for many nekton (finfish and macro-invertebrate) species have been well documented (Miller *et al.* 1985; Szedlmayer and Able 1996; Able and Fahay 1998; Beck *et al.* 2001; Paperno *et al.* 2001; Akin *et al.* 2003; Peterson 2003; Able 2005; and others). Along the Atlantic coast of the United States, estuaries provide nursery habitat for approximately two-thirds of the economically important nekton species (Bozeman and Dean 1980; Able and Fahay 1998). Estuarine fisheries constitute a large portion of the total U.S. fisheries yield by weight with estimates from 66% of finfish and shellfish harvest (Day *et al*. 1989) to 82% of finfish harvest (Imperial *et al*. 1992). Estuaries typically contribute in excess of 80% of the total catch by weight of the fishery landings in the U.S. states along the Gulf of Mexico (Day *et al*. 1989).

Coastal development activities such as changes in land use, shoreline modification, channel dredging operations, and fishing activities can alter estuarine productivity and species composition (Bilkovic 2011). These modifications can affect estuarine habitats in complex and diverse ways (Bilkovic 2011) impacting the organisms that utilize these habitats by causing disruptions to habitat structure, energy flow, trophic ecology, and overall nekton assemblages (Ruiz *et al.* 1993; Livingston *et al.* 1997; Peterson 2003). Furthermore, these anthropogenic modifications can lead to significant habitat losses (Coleman *et al.* 2008) and reduce the nursery function of estuarine systems (Able *et al*. 1999; Jones *et al*. 2002; Whitfield and Elliott 2002; Gilliers *et al*. 2006; Courrat *et al*. 2008).

Channel dredging activities and operations are being conducted by many coastal communities to improve port access for larger commercial cargo and passenger vessels. While local communities receive obvious economic and navigational benefits associated with dredging activities, there are also potential adverse environmental effects including: habitat removal, increased turbidity, alterations to current patterns, water quality, decreased flushing, and changes in salinity regimes (Morton 1977; Johnston 1981; Newell *et al*. 1998; Wilber and Clarke 2001; Bilkovic 2011).

Estuaries are inherently dynamic systems characterized by strong fluctuations and spatial variability in both short-term and long-term environmental conditions, and as such the structure of estuarine biological communities is influenced by the physical environment (Peterson and Ross 1991; Wagner and Austin 1999; Whitfield 1999; Kupschus and Tremain 2001). The salinity gradient within an estuary helps determine faunal composition (Xu *et al*. 2011; Guenther and MacDonald 2012). Most estuarine nekton have adapted physiological capabilities that allow them to utilize different habitats and salinity regimes throughout their ontogeny, though few are able to take advantage of the entire salinity gradient within estuaries at all life history stages (Peterson 2003). Instead, estuarine nekton typically inhabit relatively narrow ranges within the available salinity gradient due to their species-specific salinity tolerances or the intersection of a particular salinity range with other ecological features (e.g., habitat, food sources). It is this interaction of static (habitat) and dynamic (salinity) habitats that likely play a critical role in defining nekton community structure (Peterson 2003; Guenther and MacDonald 2012). These optimal habitats can vary between nekton species and between estuaries for the same nekton species, but when they overlap, estuarine productivity and diversity are maximized (Browder and Moore 1981; Sklar and Browder 1998).

Estuarine-dependent nekton that utilize lower salinity and freshwater regions of the estuary may be particularly susceptible to anthropogenic disturbances. Dredging operations that include significant bathymetric changes in areas of sharp salinity gradients have the potential to alter salinity distributions within an estuary, potentially subjecting nekton to long-term changes in salinity or requiring shifts in static habitat associations (Nightingale and Simenstad 2001). Salinity increases in tidal tributaries could reduce the amount of habitat available to resident freshwater taxa and constrict remnant populations that are not able to migrate to more preferred habitats. For juvenile marine taxa utilizing specific habitats and salinity regimes, the timing, positioning, and the amount of overlap of the static and dynamic habitats may influence their survival (Peterson 2003).

Recently, Guenther and MacDonald (2012) examined the estuarine nekton inhabiting the lower St. Johns River (LSJR), in northeast Florida. Rapid and abrupt changes in the nekton community structure were seen at the lowest (0.1-2 psu) and highest (32-39 psu) salinity increments, with gradual community structure changes in between (3-31 psu). They suggested the lack of intermediate biological salinity zones within the system was due to the gradual change in salinity gradients created by the hydrology and minimal slope of the LSJR system. These characteristics of the LSJR resulted in gradual changes in the habitats within the estuary, thus allowing nekton to utilize relatively large areas of similar habitat. These finding suggest that there may be distinct biological transition zones at the lower and upper ends of the salinity gradient that could be particularly sensitive to changes in the salinity structure caused by channel dredging operations within the LSJR. To this extent, it is necessary to understand the current salinity and habitat associations of nekton inhabiting the LSJR so that effects of any future anthropogenic changes to the system can be examined.

The U.S Army Corps of Engineers (USACE) is investigating the feasibility of increasing the depth of the existing federally-maintained shipping channel in the LSJR between the mouth (Mayport, Florida) and river-kilometer 21 (approximately Dunn Creek confluence). Quantitative ecological criteria are needed to better understand the potential impacts of this dredging on the LSJR ecosystem. The channel dredging would allow larger cargo vessels (Panamax and New Panamax classes) access to the existing Jaxport terminals around Blount Island. Channel dredging within the LSJR has the potential to affect salinity gradients and water quality within the estuary. These changes may affect spawning and nursery habitats within the LSJR and ultimately influence the reproductive success and recruitment of estuarine-dependent nekton. In particular, there is concern for 1) the potential effects of salinity changes on the spawning success, recruitment, and population dynamics of important recreational, commercial, and forage nekton and, 2) potential effects of salinity changes on critical nekton habitat within the LSJR estuary.

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METHODS

Study Area

The St. Johns River is the longest north-flowing river in the United States, with an overall drainage basin area of approximately 24,424 square kilometers (km^2). The St. Johns River originates near Blue Cypress Lake in Indian River County along the east coast of Florida and has a direct watershed, not including tributaries, of approximately 6,799 km^2 (ECT 2002). The St. Johns River discharges into the Atlantic Ocean east of Jacksonville, more than 483 kilometers (km) from the source. It has an average discharge of approximately 6,500 cubic feet per second (cfs) at its mouth and is classified as a major river (Morris 1995). The St. Johns River is an elongated, shallow river with a very low gradient. The lower St. Johns River (LSJR) is defined as the 162-km segment of the river from the confluence of the Ocklawaha River to the mouth, and includes the St. Johns River estuary as well as a tidal, freshwater reach. Tidal influence exists throughout the LSJR from the river mouth to Lake George, approximately 177 km from the ocean. The average annual tidal amplitude is 1.5 m at the mouth of the river (Brody 1994). Negative (south) river flow also occurs on a relatively frequent basis throughout the LSJR (Morris 1995).

There are several tidal tributaries and saltwater marsh areas located in the FIM study area within the LSJR basin (*Figure 1*). Each tributary is influenced, to varying degrees depending upon the size of their respective drainage areas, by freshwater inflow. In general, these tributaries have unique salinity gradients dictated by the distance from the mouth of the St. Johns River and the size of its respective watershed. Tributaries and marsh systems closest to the mouth generally have higher salinities than do the tributaries located further upstream. This would be expected as the amount of saltwater intrusion generally decreases in upstream habitats. Major tributaries and saltwater marsh areas listed in order of proximity to the St. Johns River mouth (closest to farthest) include: the southern Intracoastal Waterway (SICW), the northern Intracoastal Waterway and associated saltwater marsh system (Sisters Creek), the northern Blount Island channel (Blount Island), Clapboard Creek, Browns Creek, Dunn Creek, Broward River, Trout River, Arlington River, Ortega River, Doctors Lake, and Julington Creek.

The salinity characteristics of the LSJR differ from more typical Florida estuaries. Vertical salinity stratification, typical in other estuaries, is rarely present with the river remaining thoroughly mixed throughout most of its extent (Brody 1994). Salinities also tend to increase slightly upriver of the city of Palatka, approximately 134 km from the mouth, due to ground water inflows from springs containing relatively large amounts of dissolved sodium, calcium, and chloride ions (Brody 1994).

The LSJR is generally divided into four sections based on salinity characteristics and water residence times (Sagan 2009): the confluence of the Ocklawaha River to Palatka is freshwater riverine; Palatka to the confluence of Julington Creek is freshwater lacustrine; Julington Creek to downtown Jacksonville is oligohaline lacustrine and from downtown Jacksonville to the mouth of the river is mesohaline to polyhaline riverine (Sagan 2009). These salinity demarcations can change according to seasonal fluctuations in precipitation (McGrail *et al*. 1998) and due to extreme climatic events such as drought, which occurred, from 1999 through 2002 and again in 2006 through 2007.

From river-km 43 to the upper extent of the LSJR, there are approximately 2,140 acres of submerged aquatic vegetation (SAV). Submerged aquatic vegetation routinely seen within the LSJR includes eleven freshwater and brackish species (Sagan 2009) with *Vallisneria americana* (tapegrass) being the dominant species. True seagrasses have not been found in the mesohaline and polyhaline sections of the LSJR from river-km 40 to the mouth in part due to the absence of littoral shelves. Extremes in light attenuation most likely exclude seagrasses while extremes in salinity exclude brackish and freshwater species of SAV (Sagan 2009).

Upland forests and wetlands dominate the watershed within the LSJR composing 35% and 24% of the total land use throughout the basin, respectively

(Environmental Protection Board 2009). Within the LSJR, the proportion of lands designated as urban and developed have increased from 8% in 1970 to 18% in 2004 and wetlands have decreased 3% during this same time period (Environmental Protection Board 2009). The majority of the LSJR wetlands are considered freshwater; however, salt marshes containing emergent vegetation such as *Spartina* species (cordgrass) and *Juncus* species (rushes) dominate the lower section of the river from the mouth to near downtown Jacksonville (FIM unpublished data). Within the downtown Jacksonville area, salt marshes begin to merge with, and then transition to, freshwater marshes as salinity decreases and the distance from the mouth of the river increases. Much of this transitional area has been heavily urbanized and shorelines consist mostly of seawalls and other artificial structures.

The LSJR has had numerous documented impairments and areas of degraded surface water quality. Agriculture, development, mining, and point source discharges are the primary factors affecting water quality throughout the basin. The LSJR has been identified through the State and Federal Total Maximum Daily Load (TMDL) process as an impaired water body, exhibiting the symptoms of eutrophication brought about by nutrient enrichment. One of the chief symptoms of eutrophication in the LSJR is low dissolved oxygen events that occur as algal blooms, which primarily result from an overabundance of nitrogen and phosphorous, die and decay (Hendrickson *et al*. 2003). Other issues affecting the LSJR include the accumulation of a number of toxic pollutants in sediments, including heavy metals and organic contaminants, especially around the urbanized Jacksonville area. The highest metal concentrations occur between the Arlington River and Julington Creek, which is not only the freshwater and saltwater mixing zone, but also the area with the most residential and industrial development (Keller and Schell 1993). Bacteria in the form of fecal coliform from failing septic tanks, animal waste, broken sewer lines and wastewater treatment plants also presents a major problem within the LSJR. Many of the tributary streams to the LSJR have been listed as “impaired” due to elevated levels of fecal coliform (Environmental Protection Board 2009).

Survey Design

The present study uses data collected in the LSJR from May 2001 to December 2011 by staff from the Fisheries-Independent Monitoring (FIM) program of the Florida Fish and Wildlife Conservation Commission’s Fish and Wildlife Research Institute (FWRI). The FIM program uses a stratified-random sampling design and a multi-gear approach to collect data on fish and select macro-invertebrates from a wide range of habitats and life history stages. This sampling design provides comprehensive data on size-specific, spatial and temporal patterns of abundance for the nekton community and for individual species. Three sampling gears were used: 1) 21.3-m center-bag seines; 2) 6.1-m otter trawls; and 3) 183-m seines. Generally speaking, the data from seine hauls document habitat use by shallow-water shoreline-associated organisms whereas the data from trawls document habitat use in deeper areas. The dominant catch for the 21.3-m seines and trawls is juvenile fishes, although the adults of smaller species are also commonly caught. The 183-m seine is used to catch larger sub-adult and adult fishes. These gears regularly collect a few taxa of larger macro-invertebrate species, including blue crabs (*Callinectes sapidus*) and white shrimp (*Litopenaeus setiferus)*.

Monthly sampling in the LSJR began in May 2001 and is currently ongoing. However, for the purpose of this study, data from May 2001 through December 2011 will be used. The study area was divided into four collection zones (Zones 1–4; *Figure 1*). From May 2001 to December 2002 zones 1–4 were sampled on a monthly basis with 12 21.3-m seines, 12 6.1-m otter trawls, and 6 183-m seines per month. Beginning in January of 2003, the FIM sampling universe in LSJR was modified in response to sampling logistics and changes in funding resulting in the redistribution of monthly sampling effort. Beginning in January 2003, 18 21.3-m seine, 19 6.1-m otter trawl, and 10 183-m seine hauls were collected monthly in zones 1–4.

Tidal tributaries are not separate strata within the FIM program sampling design for the LSJR study area. They are, however, available for random site selection for the zone within which they occur. A comparison of mainstem and tidal tributary habitats, therefore, required that the data be post-stratified by the water body in which they were collected. Collections made outside of the main channel of the LSJR were categorized as tidal tributaries (TTs), including the northern Blount Island channel. All other collections, including samples collected from Mill Cove, were designated as mainstem (MS) samples.

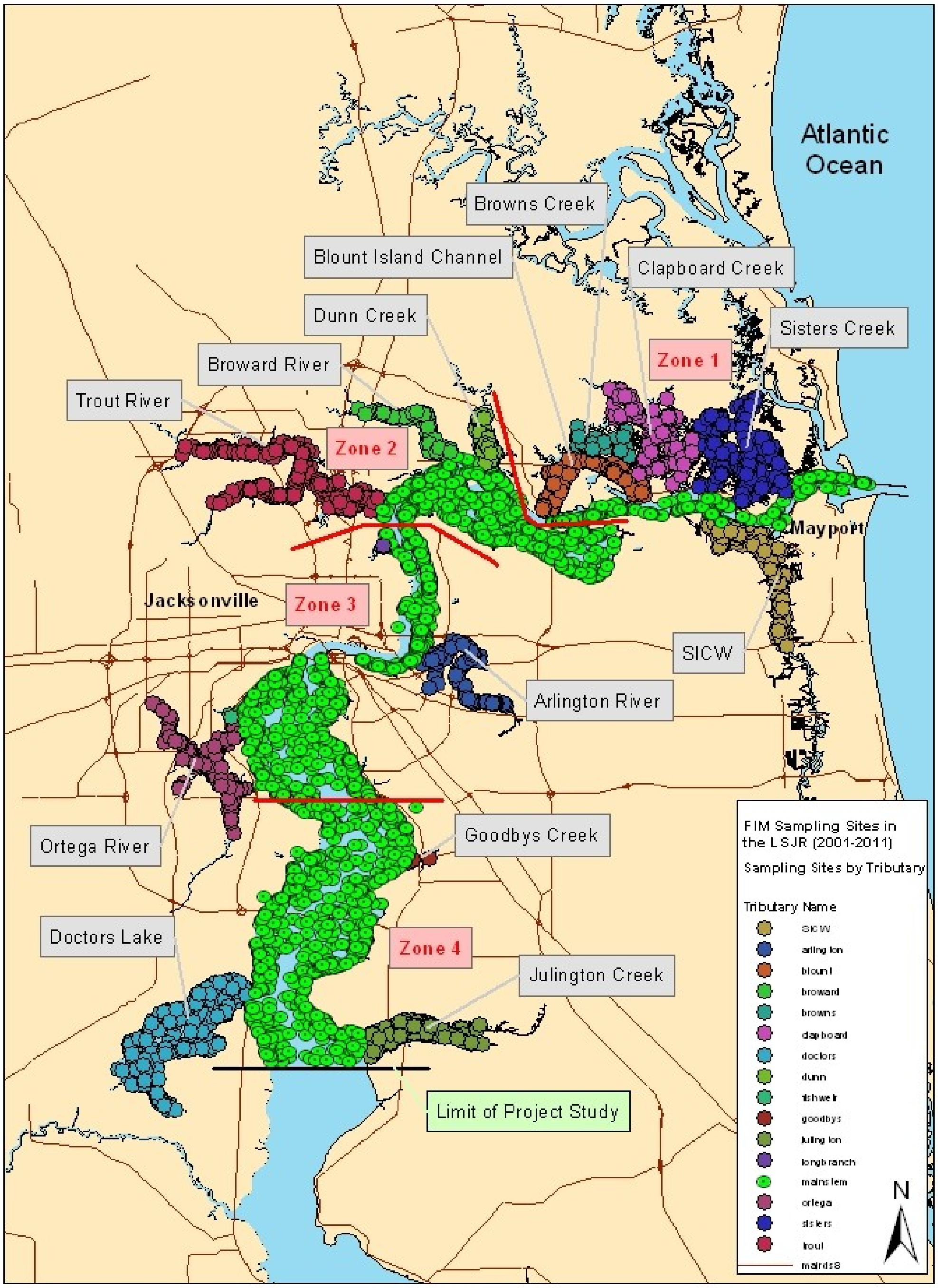


Figure 1. Map of Fisheries-Independent Monitoring program sampling sites, by tributary, in the lower St. Johns River, May 2001 through December 2011 (n=5,467). Zone boundaries are shown by the red lines and are designated 1-4. Mainstem sampling sites are designated as green circles with a black center. Samples not in the mainstem of the St. Johns River are uniquely colored by individual tributary.

Seine and Trawl Specifications and Deployment

The gear used to collect smaller nekton associated with the shallow, nearshore habitats was a 21.3-m center-bag seine with 3.2-mm mesh and leads spaced every 150 mm. To deploy the seine along a nearshore habitat (i.e., shorelines with water depth ≤1.8), the boat dropped off a member of the seine crew near the shoreline with one end of the seine, and the boat deployed the net in a semicircle until the boat reached a second drop-off point near the shoreline. The lead line was retrieved simultaneously from both ends, with effort made to keep the lead line in contact with the bottom. This process forced the catch into the bag portion of the seine. Area sampled by each boat-deployed seine collection was approximately 68 m^2.

The 6.1-m otter trawl, which targets both juvenile and adult nekton in deeper waters (1.0 – 7.6-m), had 38-mm stretched mesh, a 3.2-mm mesh liner, and a tickler chain. It was towed for five minutes in either an arc or a straight line. Tow speed averaged 0.6 m per second, resulting in a typical tow length of 180 m. Trawl width averaged 4 m, giving an approximate area sampled by a typical tow of 720 m^2.

The 183-m seine targets larger sub-adult and adult nekton that are associated with shallow, nearshore habitats. Deployment of this gear was from a boat in a standardized rectangular shape in depths <2.5 m, enclosing an approximate area of 4,120 m^2. This net was hauled in along the shore similar to the 21.3-m seine, keeping the lead lines close to the bottom while retrieving the net and forcing the catch into the bag portion of the gear.

Salinity, temperature, pH, and dissolved oxygen were measured at the surface and at 1-m intervals to the bottom in association with each gear deployment. A variety of qualitative habitat assessments were also made, such as characteristics of the shoreline (e.g., vegetation type, inundation), substrate (e.g., sediment type, presence of submerged aquatic vegetation), and bycatch (i.e., total volume, type, and composition). Full details of the FIM habitat assessment protocol are available in the Fisheries-Independent Monitoring Program Procedure manual (contact R.H. McMichael, 100 8th Ave SE, St Petersburg, FL 33701; Bob.McMichael@MyFWC.com).

Seine and Trawl Sample Processing

Fish and selected macro-invertebrates collected in seine and trawl samples were removed from the net and processed in the field. Animals were identified to the lowest practical taxonomic category, generally species. Representative samples (three individuals of each species from the 21.3-m seines, and trawls on each sampling trip) were brought back to the FFWCC/FWRI laboratory to confirm field identification. Species for which field identification was uncertain were also brought back to the laboratory. A maximum of 20 measurements (mm) were made per taxon, unless distinct cohorts were identifiable, in which case a maximum of 20 measurements were taken from each cohort; for certain economically valuable fish species, forty individuals were measured. Standard length (SL) was used for fish (total length [TL] for seahorses and disk width [DW] for rays), post-orbital head length (POHL) for shrimp, and carapace width (CW) for crabs. Animals that were not measured were identified and counted. When large numbers of individuals (> 1,000) were captured, the total number was estimated by fractional expansion of sub-sampled portions of the total catch split with a modified Motoda box splitter (Winner and McMichael 1997). Animals not chosen for further laboratory examination were returned to the river.

Due to frequent hybridization and/or extreme difficulty in the identification of smaller individuals, members of several abundant species complexes were not identified to species. We did not separate menhaden, *Brevoortia*, species. *Brevoortia patronus* and *B. smithi* frequently hybridize, and juveniles of the hybrids and the parent species are difficult to identify (Dahlberg 1970). Two abundant silverside species (*Menidia beryllina* and *M. peninsulae*) tend to hybridize, form all-female clones, and occur in great abundance that renders identification to species impractical due to the nature of the diagnostic characters, so they are represented in this report as *Menidia* spp. (Duggins *et al*. 1986; Echelle and Echelle 1997; Chernoff, personal communication). In northeast Florida, species accounts of *Cynoscion regalis* (weakfish) and *Cynoscion arenarius* (sand seatrout) will be referred to collectively as *Cynoscion* complex. These two species mix and hybridize along the Atlantic coast of Florida and identification can only be determined with certainty by genetic testing (Tringali *et al*. 2004). Species-level identification of mojarra's (genus *Eucinostomus*) was limited to individuals ≥ 40 mm SL due to great difficulty in separating *E. gula* and *E. harengulus* below this size (Matheson 1983; Matheson and Gilmore 1995; Matheson, personal observation). The term "eucinostomus mojarras" is used for these small specimens. Species-level identification of gobies of the genus *Gobiosoma* (i.e., *G. robustum* and *G. bosc*) used in analyses was limited to individuals ≥ 20 mm SL for the same reason; smaller individuals are hereafter referred to as "gobiosoma gobies". Similarly, needlefishes (*Strongylura* spp.) other than *S. notata* were only identified to species at lengths ≥ 100 mm SL.

Data Analysis

Species Overviews

Catch summaries of total number collected, frequency of occurrence, abundance (animals·100 m^{-2}), and central tendencies in distribution (km_U) and salinity (S_U) were prepared for each taxa collected in each sampling gear. Overall and monthly length-frequencies were plotted based on 2-, 5-, 10-, or 25-mm size-classes as appropriate for the size range captured. These summaries provide an overview of nekton use within the study area.

Taxa were divided into size classes, and the monthly occurrence of size classes in the river were determined in order to select appropriate months for analysis. Livingston (1988) described the importance of sub-dividing individual species into size classes in order to appreciate ontogenetic changes in ecology. The plots of monthly length-frequency were examined for individual taxa in order to determine appropriate sizes and months for further analyses. A specific size class of a species collected within a single gear type during a defined time period (months) is defined as a 'pseudo-species'.

Gear-specific overviews of relative abundance were completed for pseudo-species that were relatively abundant and frequently collected during FIM sampling in the LSJR (n ≥ 200; frequency of occurrence ≥ 5%). Prior to analysis, catches for selected pseudo-species were standardized to area sampled (animals·100 m^{-2}). Geometric mean abundance ± 95% confidence limits (Sokal and Rohlf 1981) were calculated by year, month, river-kilometer, salinity, dominant shore type, bottom type, and dominant vegetation type for 21.3-m and 183-m seines. Data summaries of relative abundance by year, month, river-kilometer, salinity, and water depth were generated for selected pseudo-species collected with 6.1-m otter trawls. Summaries included separate relative abundance calculations for mainstem (MS) and tidal tributary (TT) collections.

Salinity (psu) and distribution (river-kilometer) were placed into categories (3 psu and 7 km, respectively) for analysis. Shore habitat was classified, depending upon the dominant shore type present, into one of seven categories: freshwater marsh, bulrush marsh, *Juncus* marsh, *Spartina* marsh, structure (seawall, rip-rap, rocks, and oysters), terrestrial vegetation (primarily trees, shrubs and terrestrial grasses), or none. In the case of several shore types within one sampling area, the dominant shore type was assessed by scoring 10 points if the shore type was inundated and adding to this the proportion of the shoreline (expressed as a score out of 10) covered by the shore type. If ties arose, the shore type was selected from an order of priority based on the likelihood that the shore type was in the water and forming structural habitat for nekton. Bottom type was classified as mud, mud-sand, sand, some oyster (at least present), and some rock (at least present). Dominant bottom vegetation was classified as *Vallisneria americana* (tapegrass), other (*Ruppia* spp., drift algae), or none (sediment with no submerged vegetation present).

Density-weighted Salinity and Distribution

Pseudo-species assessed for density-weighted salinity and distribution were limited to ones that were identified to species and that were abundant and relatively frequently collected during the time period, and in the areas being assessed. Analyses were limited to pseudo-species with at least 200 animals collected and that had at least a five percent frequency of occurrence within the study area (*Appendix 2*). Pseudo-species were typically limited to a relatively small size range that included the peak abundance within that gear to reduce the influence of population changes (mortality, immigration, emigration). Similarly, analyses were typically limited to a single month in order to limit temporal influences. A few pseudo-species of economical and/or ecological importance were retained for analysis even though they did not meet these guidelines; these pseudo-species are noted in *Appendix 2*.

Center of salinity, S_U , was calculated as:

$$S_U = \frac{\sum(S \cdot U)}{\sum U}$$

where S is the salinity (psu) at capture, and U is the number of animals per standardized area sampled (21.3-m seines: 68 m^2; 183-m seine: 4,120 m^2; 6.1-m trawls: distance towed x trawl mouth width)(Peebles 2002). The number of animals per standardized area was transformed (natural log, ln(x+1)) prior to analysis. Center of distribution, km_U , was calculated similarly:

$$km_U = \frac{\sum(km \cdot U)}{\sum U}$$

where km is distance, in kilometers, from the river mouth along the river centerline. Density-weighted summary statistics were calculated using the Proc Means (mean, 95% CI, minimum and maximum) and Proc Freq (10^{th}, 25^{th}, 75^{th} and 90^{th} percentiles) procedures in the Statistical Analysis System (SAS 2002) software and were calculated using only positive catches for each pseudo-species.

RESULTS

A total of 5,467 nets were set in zones 1-4 in the LSJR from May 2001 through December 2011 (*Figure 1*, *Table 1*). Gear specific sampling effort (all zones combined) during the study period included: 2,117 21.3-m seines, 2,207 6.1-m otter trawls, and 1,143 183-m seines. The greatest number of nets (all gears combined) were set in zone 4 (n=1,556) and the fewest set in zone 2 (n=1,263).

A total of 2,975 sites were sampled in the mainstem (MS) of the LSJR and 2,492 sites sampled in tidal tributaries (TTs; *Figure 2*). Peaks in TT percent occurrence corresponded with major tributaries to the system: 1) Sisters Creek and the SICW (river-km 6), 2) the Trout River system (river-km 26), 3) Doctors Lake (river-km 59), and 4) Julington Creek (river-km 63). The expansive salt marshes located in the downstream reaches of the LSJR (≤30 km) resulted in a disproportionately high percentage (60%) of TT habitat sites being sampled in this section. The river in downtown Jacksonville (~river-km 38) is dominated by hardened shorelines and water depths that exceed the maximum allowable depth for deployment of any of the FIM program sampling gears (7.6 m); thus there is an absence of samples collected in this area.

Sampling within the LSJR was distributed over a wide range of salinities (0-40 psu; *Figure 3.*). A relatively large percentage of samples (> 24%) in both the MS and TT habitats were collected from relatively low salinity waters (≤ 2 psu). Over 50% of the MS sites were collected at salinities ≤ 8 psu while over 50% of the TT collections were made at salinities >10 psu, indicating that collections from TT habitats tended to be made at sites with slightly higher salinity values than were those from MS habitats.

Table 1. Number of samples collected within each zone of the lower St. Johns River (May 2001–December 2011). Tidal tributary (TT) and mainstem (MS) sites combined. Zone position is measured relative to the river mouth (river-kilometer 0).

Zone	*River Kilometer*	*21.3-m seine*	*6.1-m otter trawl*	*183-m seine*	*Totals*
1	0.00 – 18.29	527	517	290	**1,334**
2	18.30 – 26.89	501	509	253	**1,263**
3	26.90 – 47.29	490	583	241	**1,314**
4	47.30 – 63.79	599	598	359	**1,556**
Totals		***2,117***	***2,207***	***1,143***	***5,467***

Figure 2. Percent occurrence and cumulative percent occurrence of sample sites at 1-km intervals within the lower St. Johns River during FIM sampling (2001-2011). White boxes and circles represent mainstem sample sites (n=2,975) while dark boxes and circles represent tidal tributary sites (n=2,492).

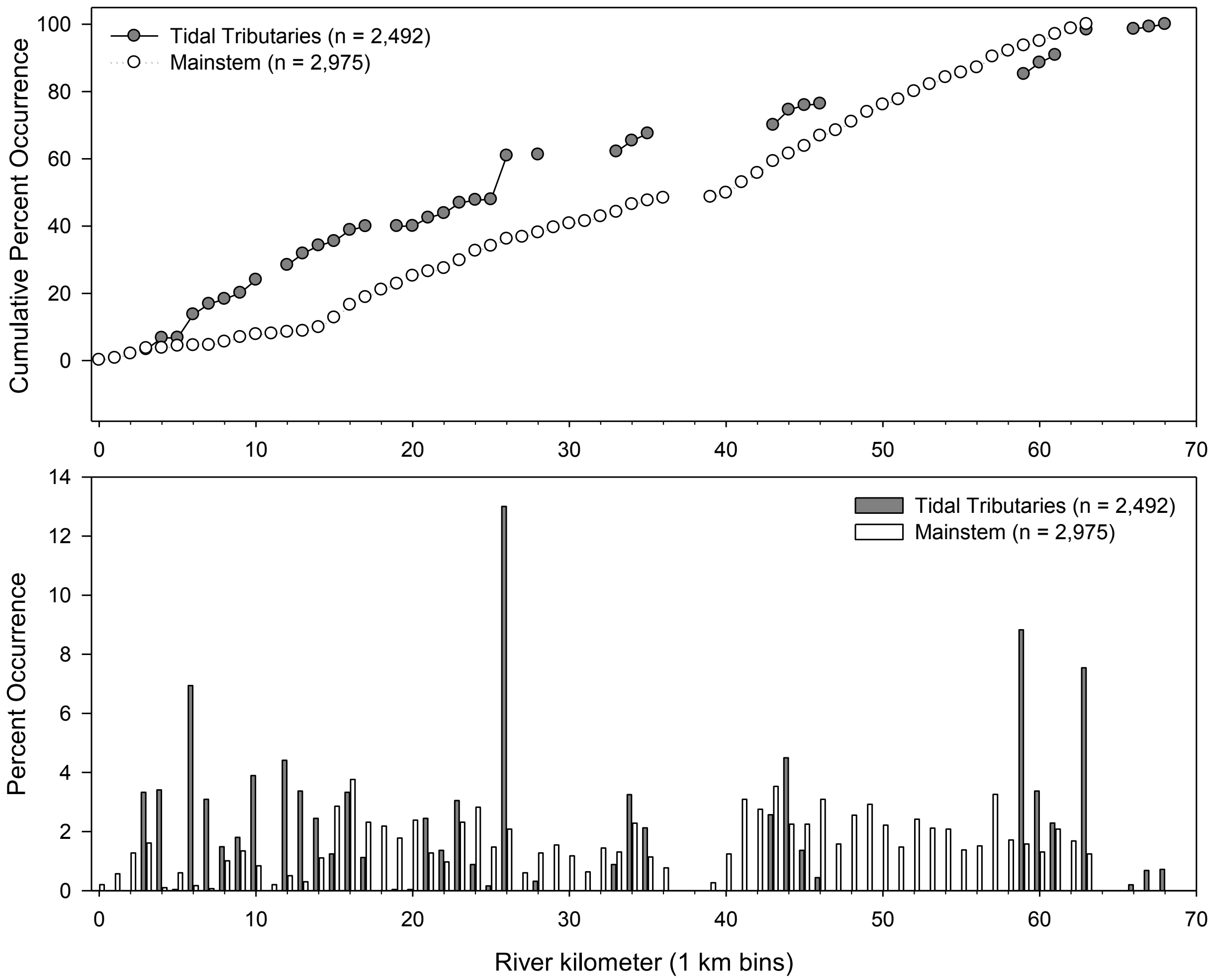
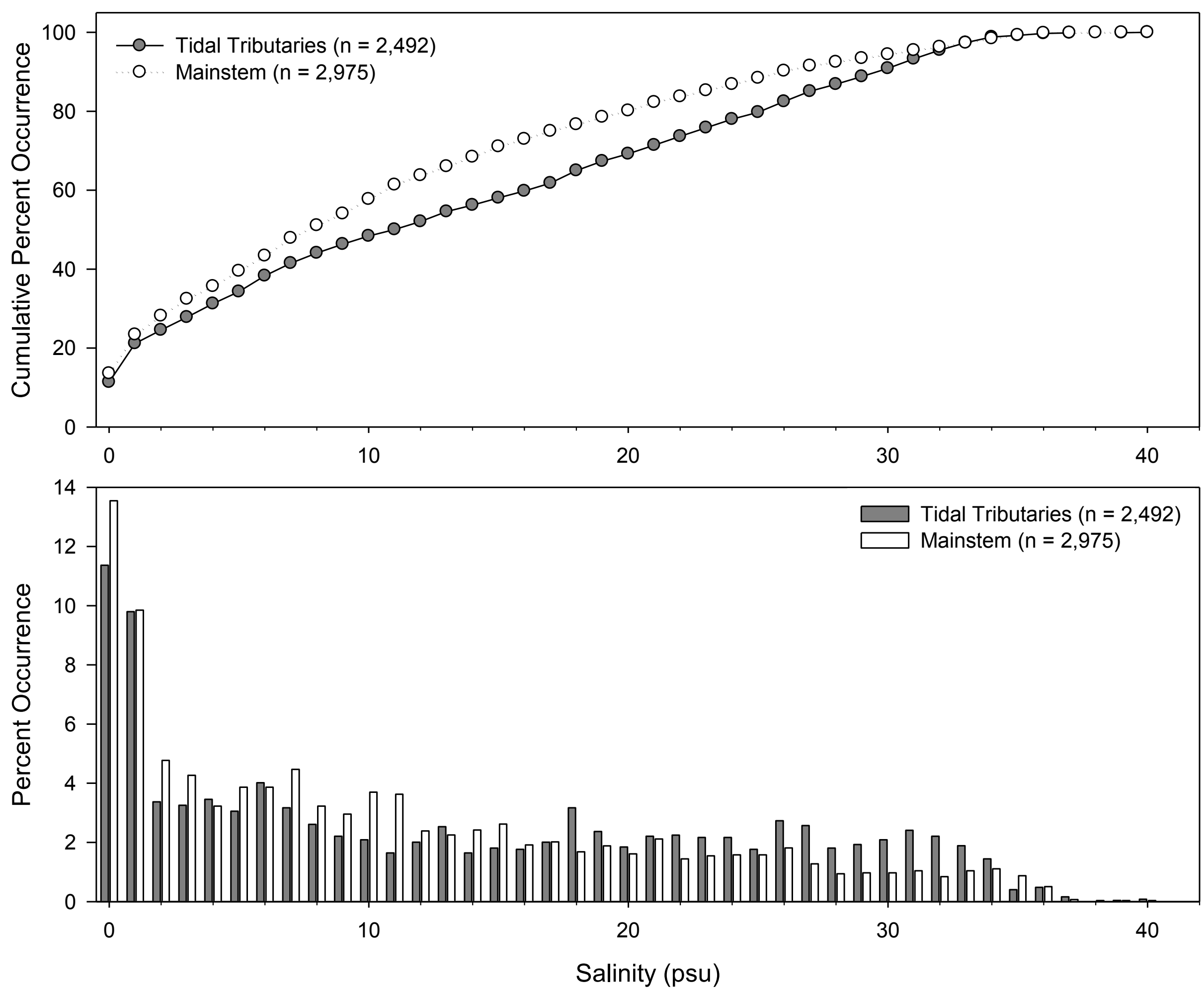


Figure 3. Percent occurrence and cumulative percent occurrence of sample sites in 1-psu salinity intervals within the lower St. Johns River during FIM sampling (2001-2011). White boxes and circles represent mainstem sample sites (n=2,975) while dark boxes and circles represent tidal tributary sites (n=2,492).



Physicochemical conditions

The mean water depth sampled by each of the gear types tended to decrease with distance from the river mouth for both the MS and TT habitats (*Table 2*). Collections with 21.3-m seines sampled the shallowest water depths (ranged from 0.1-1.8 m in the MS habitats and 0.1-2.2 m in TT habitats), while the trawls sampled the deepest depths (ranged from 0.6-7.7 m in MS habitats and 0.7-7.2 m in TT habitats). Although mean water temperatures for collections made with each gear type varied little between MS and TT habitats and were fairly consistent between zones, there was generally a broader range of temperatures recorded in Zones 3 and 4 than in Zones 1 and 2. With the exception of TT habitats in Zone 3 (1.8 $mg{\cdot}l^{-1}$; 21.3-m seines) and MS habitats in Zone 4 (0.3 $mg{\cdot}l^{-1}$; 6.1-m otter trawls) where hypoxic conditions (<2 $mg{\cdot}l^{-1}$) were encountered, dissolved oxygen values were above 2.0, and as high as 24.3 (mean of 7.5 to 9.9 $mg{\cdot}l^{-1}$) within each zone, sampling gear, and habitat type. The mean pH value had a fairly wide range (3.2 to 9.9), but mean values (7.6 – 8) were very consistent between zones, habitat types and gears.

Salinity varied considerably within and between zones for each of the gear types, with oligohaline (0.5–4.99 psu) conditions occasionally being encountered near the mouth and mesohaline (5.0-17.99 psu) conditions occurring as far upstream as Zone 4 in both MS and TT habitats (*Table 2*). With all gears combined, MS habitats showed the expected trend of higher mean salinity near the LSJR river mouth and lower mean salinity further upstream (*Figure 4.*). In general, low mesohaline (5.00-11.99 psu) to euhaline (≥30 psu) salinity ranges were seen from the mouth to river-km 12; oligohaline (0.5–4.99 psu) to euhaline (≥30 psu) ranges were seen from river-km 12 to river-km 18;

limnetic (< 0.5 psu) to euhaline (≥30 psu) ranges were seen from river-km 18 to river-km 33; limnetic (< 0.5 psu) to polyhaline (18.0-29.99 psu) ranges were seen from river-km 33 to river-km 51; limnetic (< 0.5 psu) to mesohaline (5.0-17.99 psu) ranges were seen from river-km 51 to the upriver boundary of the study area. Annual salinity ranges for MS habitats (all gears combined) also varied within and between zones, especially in Zones 1 and 4, though the same general yearly trends were seen in all zones (*Figure 5*). Detailed salinity statistics for MS habitats can be found in *Appendix 10*.

Water depths sampled with seines within individual TTs ranged from 0.1 to 2.2 m and from 0.4 to 3.0 m for 21.3-m and 183-m seines, respectively (*Table 3*). Trawls sampled deeper mean depths (1.9 to 7.2 m) over a wider range of depths (0.7 to 7.2 m) than either seine. Mean dissolved oxygen demonstrated no trend between tributaries or sampling gears with individual tributaries ranging from 6.6 to 9.4 $mg \cdot l^{-1}$ with hypoxic conditions (<2 $mg \cdot l^{-1}$) being encountered only in the Ortega River. The two upstream tributaries (Doctors Lake and Julington Creek) had slightly higher mean pH values for most of the gear types, but generally each of the tributaries had very similar pH values.

Salinity values within the TTs ranged from 0 to 39.9 and varied considerably for each of the gear types and zones (*Table 3*). Freshwater (0 psu) was only sampled in two of the tributaries (Julington Creek with 21.3-m seines and Ortega River with 6.1-m trawls). Salinity generally decreased with increased distance of the tributary mouth from the LSJR river mouth (*Figure 6*): SICW, Sisters Creek, and Browns Creek had a range of salinities from low mesohaline (5.00-11.99 psu) to euhaline (≥30 psu); Blount Island, Clapboard Creek, and Dunn Creek ranged from oligohaline (0.5–4.99 psu) to euhaline (≥30 psu); Broward River, Trout River, and Arlington River Creek ranged from limnetic

(< 0.5 psu) to polyhaline (18.0-29.99 psu); Ortega River, Doctors Lake, and Julington Creek ranged from limnetic (< 0.5 psu) to mesohaline (5.0-17.99 psu). Salinity values, with all gears combined, varied considerably, especially in the most upstream tributaries (Arlington River, Ortega River, Doctors Lake, and Julington Creek), but similar annual trends were observed in all sampled TTs (*Figure 7*). Detailed salinity statistics for selected tributaries can be found in *Appendix 10*.

Table 2. Physiochemical parameters (water-column averages) in the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. Data is presented as Mainstem and Tidal Trib. (tidal tributaries) sites within each zone. The total number of observations used in calculations for each parameter is denoted by "n". Also shown are the calculated mean values (mean), the associated standard deviations (S.D.), the minimum value recorded (min.), and the maximum value recorded (max.).

			Water Depth (m)				Water Temperature (°C)				Salinity (psu)				Dissolved oxygen ($mg \cdot l^{-1}$)				pH			
Zone	Water Type	n	mean	S.D.	min.	max.	mean	S.D.	min.	max.	mean	S.D.	min.	max.	mean	S.D.	min.	max.	mean	S.D.	min.	max.
21.3-m Seine																						
1	Mainstem	119	0.6	0.3	0.2	1.8	23.4	5.5	11.8	30.9	25.9	8.1	3.4	38.1	8.0	2.4	3.3	17.0	7.8	0.3	6.8	8.7
	Tidal Trib.	408	0.8	0.4	0.2	2.2	22.9	5.7	10.3	32.2	23.1	7.7	3.0	39.6	7.7	2.3	2.6	15.4	7.7	0.3	5.2	8.6
2	Mainstem	230	0.6	0.3	0.3	1.7	22.7	6.0	11.1	40.4	17.1	8.1	0.9	35.4	8.7	2.5	3.2	17.9	7.7	0.3	5.2	8.7
	Tidal Trib.	271	0.7	0.4	0.2	2.2	23.4	6.2	11.3	34.5	11.5	7.4	0.1	30.0	7.9	2.8	2.2	19.6	7.6	0.4	5.2	9.2
3	Mainstem	298	0.7	0.3	0.2	1.8	23.0	6.1	9.1	33.4	7.9	6.8	0.2	30.3	8.8	2.4	2.6	17.4	7.8	0.4	5.4	9.0
	Tidal Trib.	192	0.7	0.4	0.2	2.0	22.7	6.5	5.6	34.6	4.9	5.1	0.1	23.1	7.7	3.0	1.8	16.3	7.7	0.6	4.7	9.3
4	Mainstem	333	0.5	0.2	0.1	1.4	22.5	6.7	5.5	34.6	3.2	4.0	0.2	23.9	9.9	2.9	2.2	24.3	8.0	0.5	3.2	9.6
	Tidal Trib.	266	0.6	0.3	0.1	1.5	23.9	6.2	6.9	34.0	2.3	2.8	0.0	13.4	8.6	2.9	2.2	17.5	8.0	0.6	4.8	9.5
183-m Seine																						
1	Mainstem	80	1.9	0.5	0.7	2.8	22.4	5.8	12.2	31.1	23.9	9.3	3.5	39.0	7.9	2.2	4.1	16.2	7.8	0.3	5.5	9.0
	Tidal Trib.	210	1.8	0.5	0.4	3.0	22.7	5.9	10.2	31.8	24.1	7.3	6.5	36.9	7.7	2.2	3.0	15.7	7.7	0.3	5.3	8.8
2	Mainstem	234	1.4	0.5	0.4	2.5	22.6	5.9	9.1	32.5	16.9	8.6	0.5	35.5	8.5	2.6	3.0	19.0	7.7	0.3	5.4	9.0
	Tidal Trib.	19	1.6	0.5	0.7	2.7	24.2	7.1	10.9	32.1	12.9	8.2	1.1	25.6	7.5	2.3	3.4	12.7	7.7	0.3	7.1	8.1
3	Mainstem	222	1.3	0.5	0.4	3.1	23.2	6.2	8.8	32.8	8.1	6.7	0.2	28.0	8.8	2.5	3.2	17.8	7.8	0.4	5.5	9.0
	Tidal Trib.	19	1.1	0.3	0.5	1.7	21.2	5.8	12.8	31.1	3.5	4.0	0.2	12.7	8.3	2.5	3.7	13.7	7.7	0.6	5.5	8.8
4	Mainstem	244	0.9	0.3	0.3	2.1	22.6	6.7	6.2	35.5	3.4	4.0	0.2	20.5	9.7	2.5	3.2	17.7	8.0	0.5	5.4	9.9
	Tidal Trib.	115	1.2	0.4	0.4	2.2	23.6	5.7	12.6	32.7	2.5	2.7	0.3	10.5	9.1	2.8	3.5	17.6	8.0	0.5	7.1	9.2
6.1-m Otter Trawl																						
1	Mainstem	139	4.3	1.5	1.9	7.7	21.8	5.4	10.7	30.7	26.6	8.4	3.3	40.2	7.9	1.8	4.7	14.1	7.8	0.2	7.0	8.9
	Tidal Trib.	378	3.6	1.3	1.0	7.0	22.9	5.8	10.6	31.6	24.2	7.6	3.1	39.9	7.6	2.2	3.0	15.1	7.7	0.3	5.2	8.6
2	Mainstem	277	2.7	1.2	0.6	6.5	22.8	6.1	10.6	31.7	17.0	8.2	0.3	35.5	8.2	2.5	3.0	19.4	7.8	0.3	5.2	9.2
	Tidal Trib.	232	2.6	0.9	0.7	7.2	22.8	5.8	11.0	32.5	13.3	7.7	0.1	33.8	8.1	2.8	3.1	19.5	7.6	0.3	5.3	8.4
3	Mainstem	414	3.9	1.4	1.1	7.3	22.9	6.1	8.2	32.1	8.7	6.7	0.2	28.9	8.7	2.4	2.4	17.6	7.8	0.3	5.5	9.0
	Tidal Trib.	169	2.3	0.7	1.0	5.9	21.9	6.5	5.8	32.3	5.2	5.3	0.0	27.1	8.2	3.3	2.7	17.0	7.7	0.5	4.9	9.2
4	Mainstem	385	3.4	1.2	1.4	7.3	22.5	6.4	6.1	32.1	3.4	4.0	0.2	21.4	8.8	2.4	0.3	17.6	7.8	0.4	5.5	9.2
	Tidal Trib.	213	2.4	0.7	1.0	5.4	23.2	5.9	8.9	31.9	2.2	2.8	0.1	13.0	8.9	2.6	2.2	16.3	8.0	0.5	5.1	9.3

Figure 4. Salinity statistics for mainstem samples (all gears combined) in the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. Data was analyzed in 3 river-km bins. Points represent mean salinity values; error bars represent the 10th to 90th percentile range; boxes define the minimum and maximum salinity values recorded. Blue numbers above the plots represent the number of observations used in the calculations. Approximate zonal designation (1-4) of river-km samples is indicated at top of graphic.

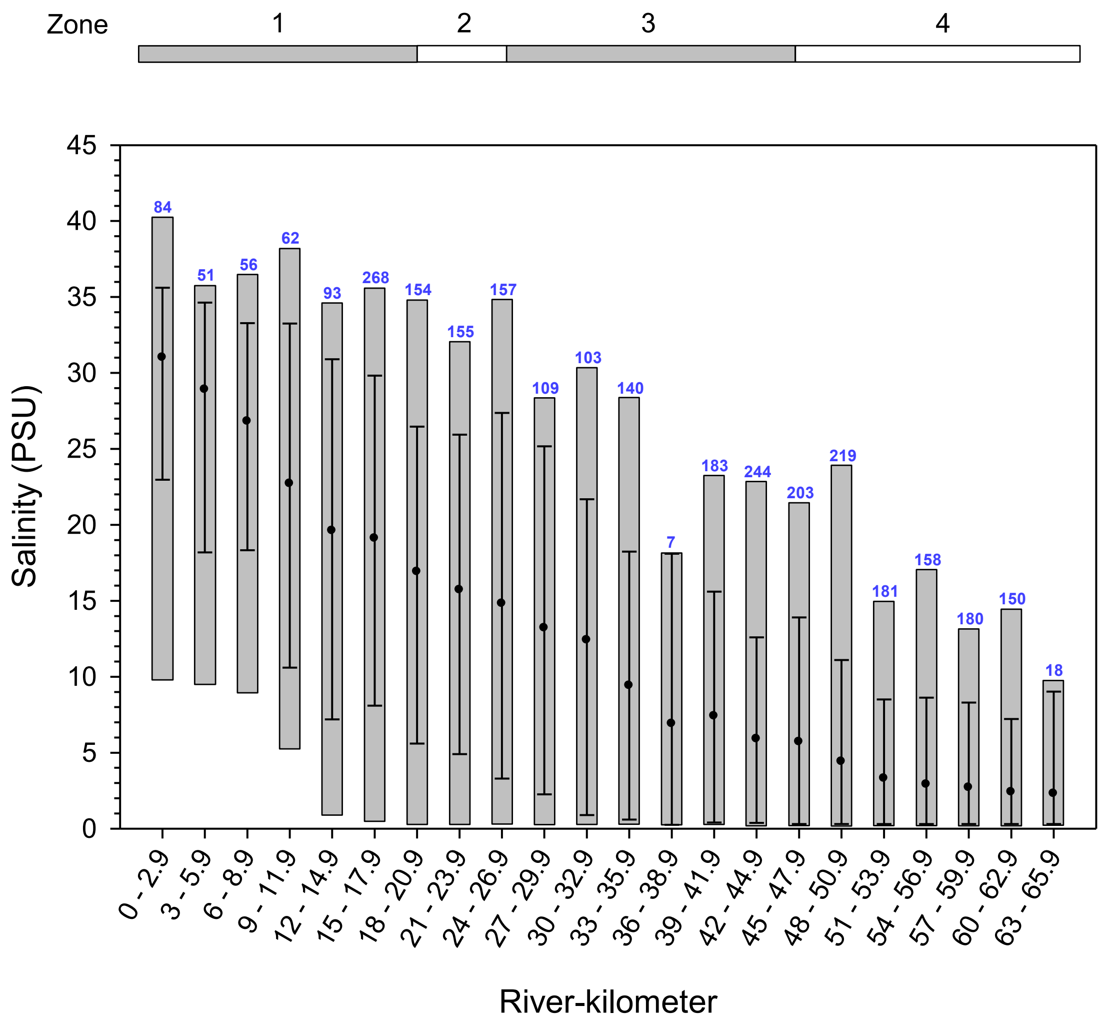


Figure 5. Annual salinity statistics for mainstem samples by zone (all gears combined) in the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. Points represent mean salinity values; error bars represent the 10th to 90th percentile range; boxes define the minimum and maximum salinity values recorded.

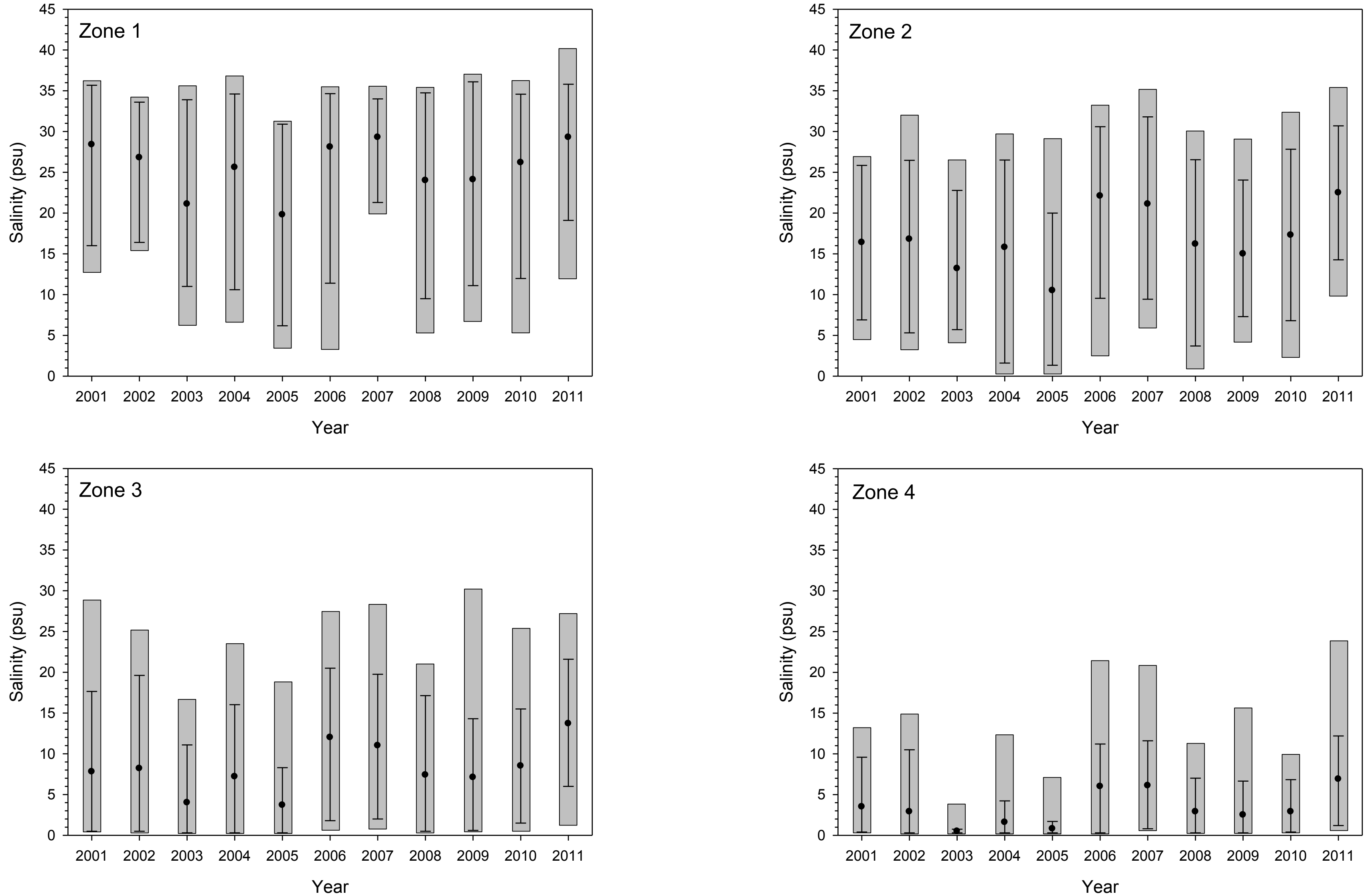


Table 3. Physiochemical parameters (water-column averages) of selected tidal tributaries to the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. The total number of observations used in calculations for each parameter is denoted by "n". Also shown are the calculated mean values (mean), the associated standard deviations (S.D.), the minimum value recorded (min.), and the maximum value recorded (max.). Tributaries are listed in order of proximity to the St. Johns River mouth (closest to farthest).

		Water Depth (m)				*Water Temperature (°C)*				*Salinity (psu)*				*Dissolved oxygen (mg·l⁻¹)*				*pH*			
Tributary	*n*	*mean*	*S.D.*	*min.*	*max.*	*mean*	*S.D.*	*min.*	*max.*	*mean*	*S.D.*	*min.*	*max.*	*mean*	*S.D.*	*min.*	*max.*	*mean*	*S.D.*	*min.*	*max.*
21.3-m Seine																					
SICW	79	0.7	0.4	0.3	1.9	23.0	5.8	10.4	31.9	23.6	6.5	6.8	39.6	7.4	2.3	2.6	14.6	7.7	0.5	5.2	8.4
Sisters Creek	119	0.9	0.4	0.2	2.2	22.5	5.5	11.8	31.6	23.7	8.1	7.5	36.0	7.7	2.1	3.3	14.9	7.7	0.3	5.5	8.1
Blount Island	79	0.8	0.3	0.2	1.7	23.0	5.3	10.3	31.6	21.2	8.6	3.0	36.0	8.0	2.4	3.2	15.0	7.7	0.3	5.2	8.1
Clapboard Creek	95	0.8	0.4	0.3	2.0	23.0	6.2	10.4	32.2	22.4	7.4	4.7	36.9	7.6	2.5	4.0	15.3	7.7	0.2	7.1	8.5
Browns Creek	36	0.7	0.3	0.3	1.3	23.6	5.9	11.9	31.5	25.3	5.9	8.0	34.4	7.8	2.6	3.7	15.4	7.8	0.2	7.1	8.6
Dunn Creek	56	0.6	0.3	0.3	1.6	24.7	5.7	12.0	31.5	15.2	8.2	1.2	30.0	7.9	2.3	4.0	13.6	7.7	0.2	7.0	8.2
Broward River	60	0.7	0.3	0.3	1.8	22.4	6.3	11.8	33.0	11.2	7.4	0.5	26.3	8.2	3.1	3.7	19.6	7.7	0.3	7.1	9.2
Trout River	155	0.7	0.4	0.2	2.2	23.2	6.3	11.3	34.5	10.3	6.7	0.1	26.5	7.8	2.9	2.2	18.9	7.6	0.5	5.2	8.8
Arlington River	79	0.7	0.4	0.2	2.0	22.3	6.8	5.6	34.6	5.4	5.2	0.1	19.2	7.3	3.2	2.6	15.4	7.7	0.5	5.3	8.7
Ortega River	103	0.7	0.3	0.2	1.8	23.2	6.4	7.5	33.6	3.8	4.0	0.1	15.1	7.8	3.0	1.8	16.3	7.8	0.6	4.7	9.3
Doctors Lake	157	0.6	0.2	0.1	1.5	24.5	6.3	6.9	34.0	2.7	2.8	0.2	11.2	9.3	2.7	2.6	16.8	8.0	0.6	4.8	9.3
Julington Creek	105	0.7	0.3	0.3	1.2	23.0	5.9	7.2	32.8	1.7	2.6	0.0	13.4	7.7	2.9	2.2	17.5	8.0	0.5	6.5	9.5
183-m Seine																					
SICW	66	1.7	0.5	0.8	3.0	22.8	5.9	11.9	31.6	23.2	7.4	9.2	35.3	7.3	1.8	3.2	12.7	7.7	0.3	6.1	8.1
Sisters Creek	62	1.8	0.4	0.9	2.5	21.9	6.1	11.0	30.8	26.7	6.7	11.7	35.8	7.8	2.3	3.1	13.1	7.7	0.4	5.4	8.8
Blount Island	55	1.8	0.5	0.4	2.5	22.7	5.8	10.2	30.4	22.4	7.1	7.6	36.9	8.1	2.3	5.3	15.7	7.7	0.4	5.3	8.0
Clapboard Creek	19	1.9	0.6	0.4	2.6	23.5	5.9	14.0	31.8	21.9	7.4	6.5	34.3	8.0	2.3	4.4	14.7	7.7	0.2	7.2	8.0
Browns Creek	8	1.5	0.6	0.4	2.2	25.7	6.3	15.3	30.2	27.3	6.3	14.2	34.9	6.6	2.0	3.0	9.5	7.8	0.1	7.7	8.0
Trout River	19	1.6	0.5	0.7	2.7	24.2	7.1	10.9	32.1	12.9	8.2	1.1	25.6	7.5	2.3	3.4	12.7	7.7	0.3	7.1	8.1
Ortega River	19	1.1	0.3	0.5	1.7	21.2	5.8	12.8	31.1	3.5	4.0	0.2	12.7	8.3	2.5	3.7	13.7	7.7	0.6	5.5	8.8
Doctors Lake	104	1.2	0.4	0.4	2.2	23.5	5.6	12.6	32.7	2.5	2.7	0.3	10.5	9.2	2.8	3.5	17.6	8.1	0.5	7.1	9.2
Julington Creek	11	1.1	0.4	0.5	1.7	25.4	5.7	13.1	30.8	2.4	3.0	0.3	9.4	7.6	2.2	4.1	11.6	7.7	0.3	7.1	8.2
6.1-m Otter Trawl																					
SICW	102	3.5	1.4	1.0	7.0	23.3	5.7	12.0	31.1	24.6	7.1	8.0	39.9	7.3	2.1	3.1	14.9	7.7	0.4	5.3	8.0
Sisters Creek	100	3.2	0.9	1.8	6.5	22.6	6.0	11.4	30.8	27.7	6.4	7.7	39.3	7.7	2.2	3.9	15.1	7.7	0.2	7.3	8.1
Blount Island	71	4.4	1.3	1.8	6.7	23.4	5.8	10.6	30.6	22.5	7.8	3.1	33.6	7.5	2.1	3.1	13.4	7.7	0.2	7.1	8.0
Clapboard Creek	77	3.6	1.2	1.5	6.8	22.5	5.8	10.8	31.5	21.1	7.8	4.9	36.9	7.8	2.3	3.2	14.3	7.7	0.4	5.2	8.6
Browns Creek	28	3.1	1.4	1.6	7.0	22.2	6.2	11.8	31.6	23.6	6.9	9.1	36.0	8.1	2.5	3.0	11.6	7.7	0.2	7.2	8.0
Dunn Creek	34	2.2	0.7	1.1	3.5	22.0	5.5	12.4	31.1	16.2	8.7	4.0	33.8	8.9	2.8	3.1	17.3	7.8	0.2	7.2	8.2
Broward River	48	2.2	1.1	0.7	7.2	22.6	5.4	12.3	32.2	15.5	7.7	0.9	30.6	8.3	2.7	4.6	18.6	7.7	0.2	7.3	8.4
Trout River	150	2.9	0.8	1.8	5.5	23.0	6.0	11.0	32.5	12.0	7.2	0.1	27.4	7.8	2.8	3.8	19.5	7.6	0.4	5.3	8.4
Arlington River	77	2.4	0.9	1.1	5.9	22.3	6.3	5.8	32.3	6.5	6.1	0.1	27.1	7.8	3.1	2.8	16.6	7.7	0.3	6.8	8.9
Ortega River	93	2.1	0.6	1.0	5.0	21.6	6.6	7.1	32.0	4.0	4.2	0.0	14.2	8.5	3.5	2.5	17.0	7.7	0.6	4.9	9.2
Doctors Lake	140	2.7	0.6	1.0	5.4	23.0	5.8	8.9	31.6	2.4	2.8	0.2	13.0	9.4	2.4	2.2	16.1	8.1	0.5	5.2	9.3
Julington Creek	72	1.9	0.5	1.2	4.2	23.5	6.1	10.1	31.9	1.8	2.6	0.1	12.5	8.1	2.8	3.0	16.3	7.8	0.6	5.1	9.2

Figure 6. Salinity statistics for selected tidal tributaries (all gears combined) to the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. Points represent mean salinity values; error bars represent the 10th to 90th percentile range; boxes define the minimum and maximum salinity values recorded. Tributaries are listed in order of proximity to the St. Johns River mouth (closest to farthest). Blue numbers above the plots represent the number of observations used in the calculations. Zonal designation (1-4) of tidal tributary is indicated at top of graphic.

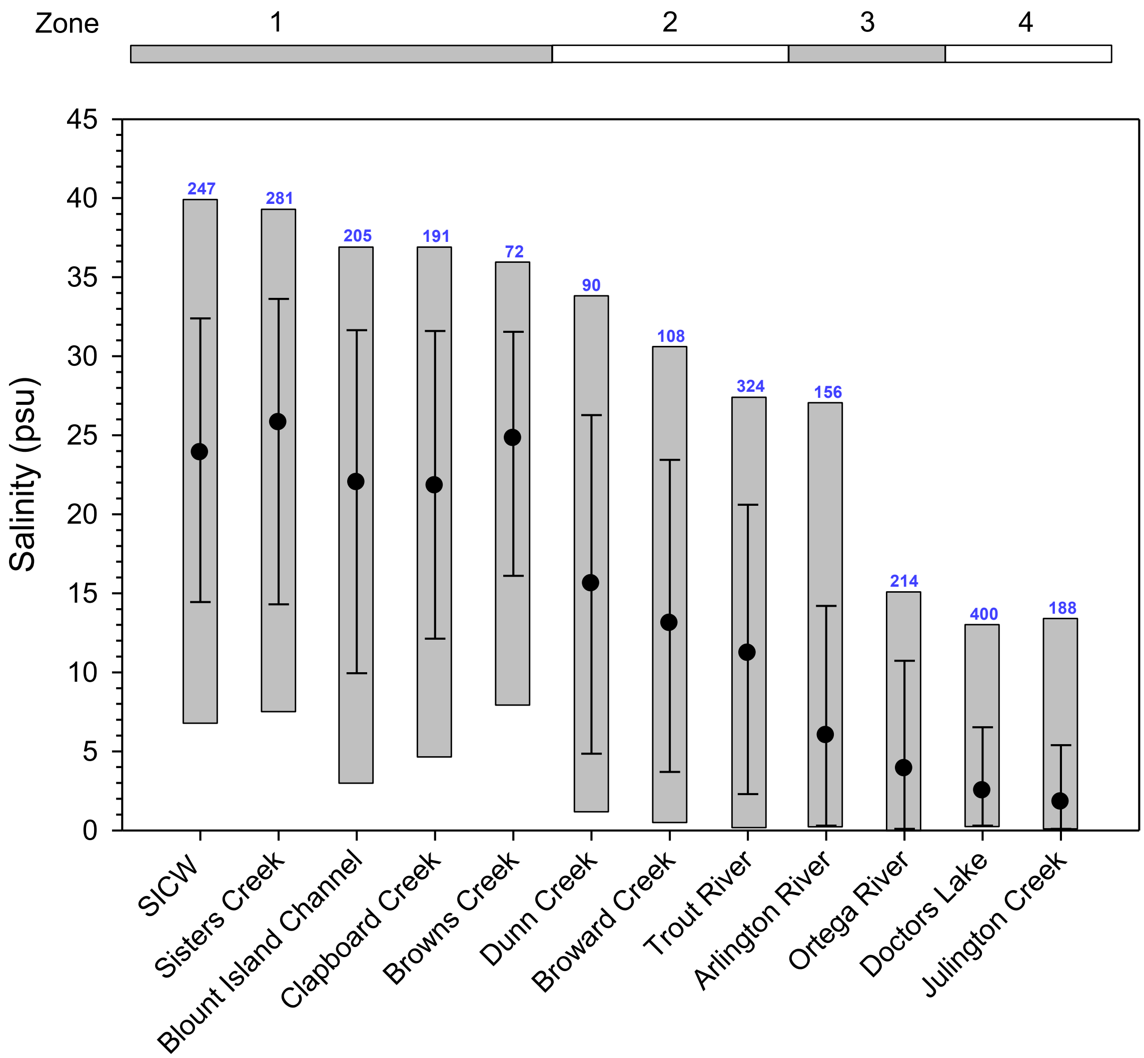


Figure 7. Salinity statistics by year for selected tidal tributaries (all gears combined) to the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. Points represent mean salinity values; error bars represent the 10th to 90th percentile range; boxes define the minimum and maximum salinity values recorded. Tributaries are listed in order of proximity to the St. Johns River mouth (closest to farthest). Note different salinity scales in some plots.

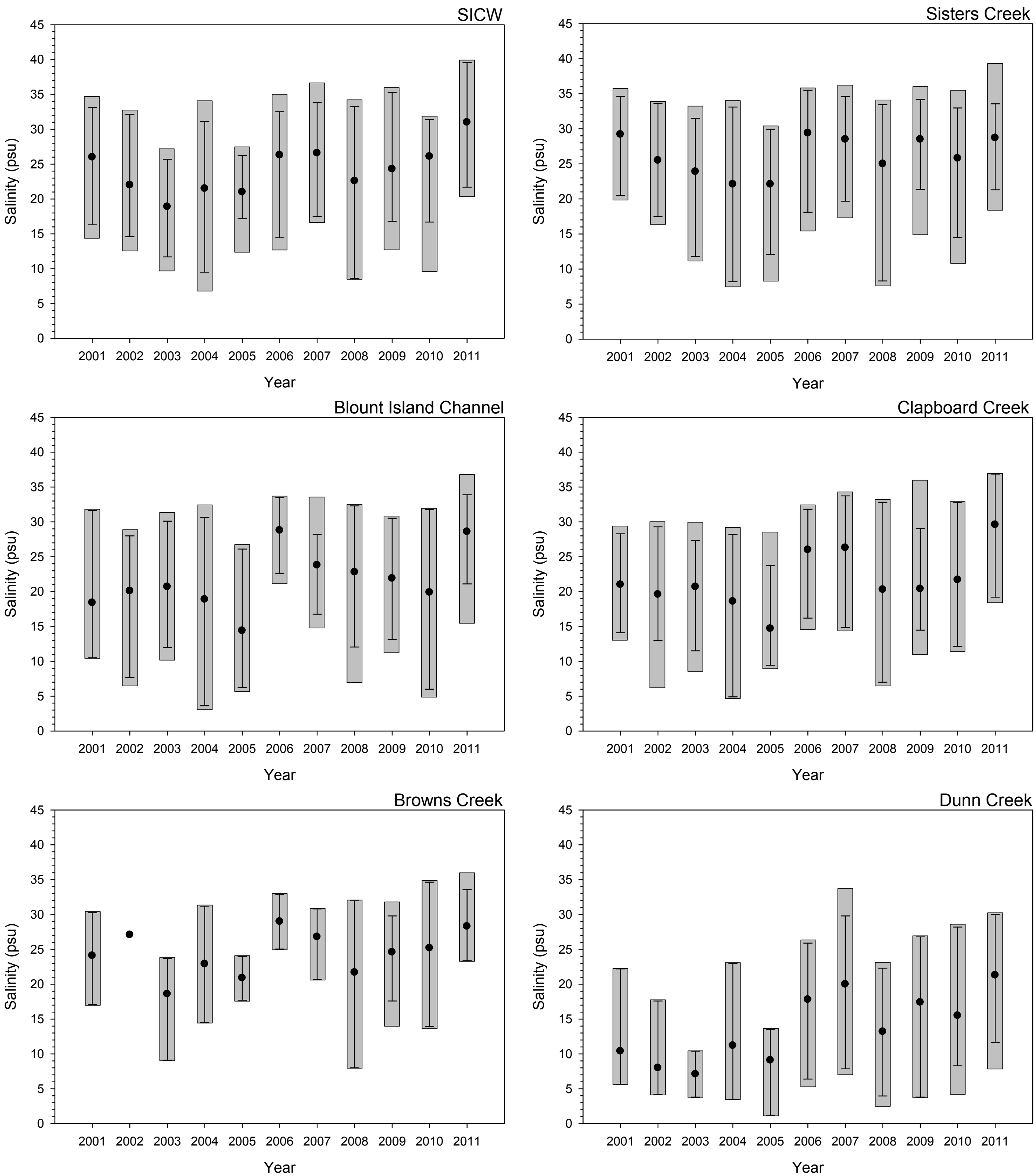
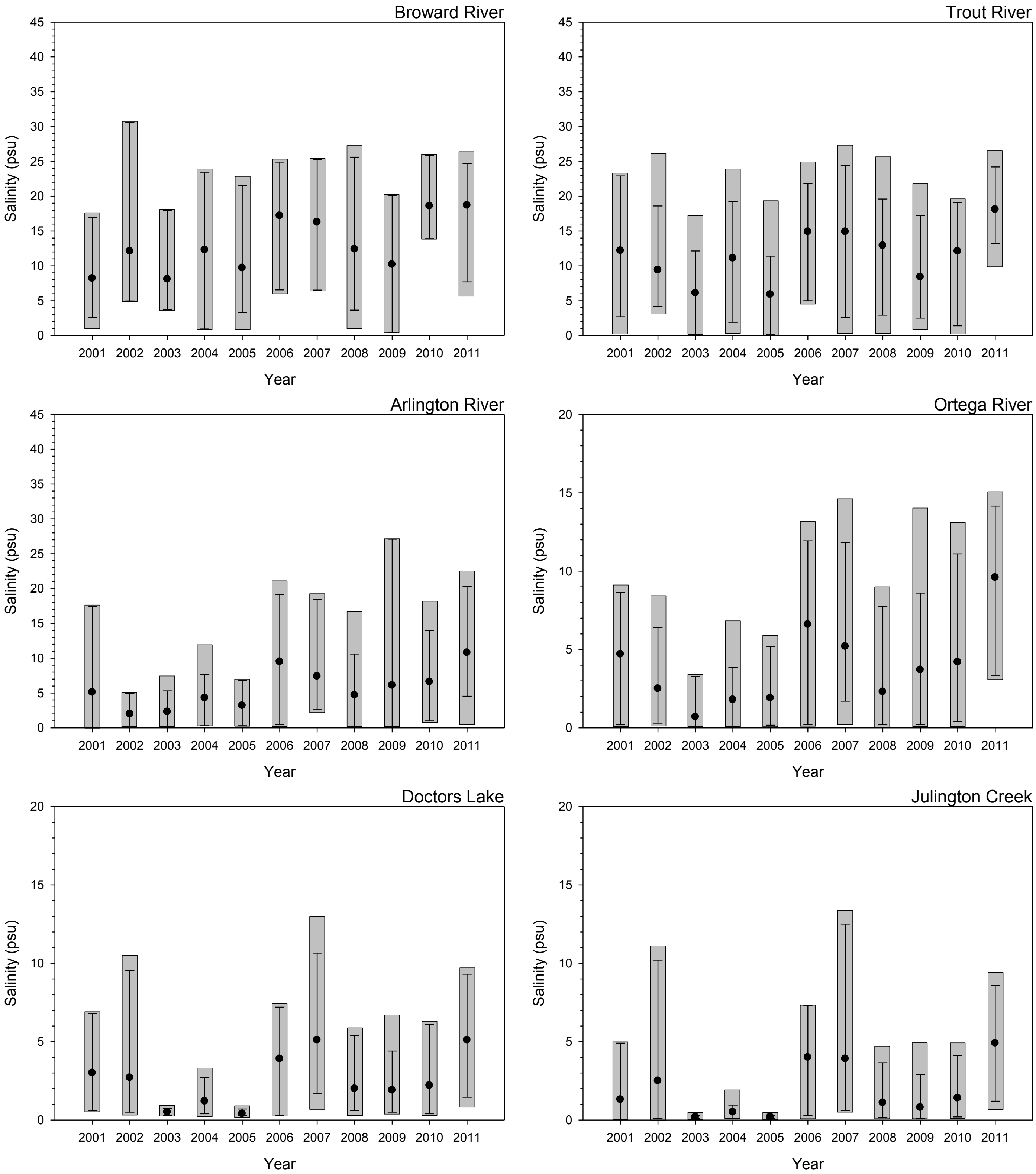


Figure 7. (Continued) Salinity statistics by year for selected tidal tributaries (all gears combined) to the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. Points represent mean salinity values; error bars represent the 10th to 90th percentile range; boxes define the minimum and maximum salinity values recorded. Tributaries are listed in order of proximity to the St. Johns River mouth (closest to farthest). Note different salinity scales in some plots.



Composition of overall nekton community

Nearshore habitat sampled with 21.3-m seines

A total of 390,665 individuals from 155 taxa (143 fish taxa and 12 selected macro-invertebrate taxa) were collected in 2,117 21.3-m seine sets in the LSJR. Bay anchovy dominated the catch numerically, accounting for over 25% of all nekton collected with this gear (*Table 4*). Over 84% of the catch was represented by ten taxa that included: bay anchovy, spot, Atlantic silversides, striped mullet, white shrimp, *Menidia* silversides, striped anchovy, menhaden's, Atlantic croaker, and pinfish. Spot and bay anchovy were the two most commonly captured taxa and were present in over 46% and 44% of all seines, respectively. Other taxa that were collected in ≥30% of seine hauls included *Menidia* silversides, pinfish, striped mullet, and blue crab. Additional catch summaries by month, year, and FIM sampling zone can be found in *Appendix 1*. Length frequency plots for some abundant species collected in this gear can be found in *Appendix 7*.

Table 4. Summary catch statistics for 21.3-m seine collections in the lower St. Johns River (FIM sampling zones 1-4, May 2001–December 2011, n=2,117). Organisms are listed in phylogenetic order by family and alphabetically within families. S_u is the central tendency in salinity (density-weighted salinity, in psu); km_u is the center of abundance (density-weighted distribution, in kilometers); and CPUE is the number per unit area (100 m^2). Tidal tributary and mainstem collections combined.

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Stomolophus meleagris	Cannonball jellyfish	23	0.6	22.10	13.80	0.02	7.35
Farfantepenaeus spp.	Commercial shrimps	3,494	17.4	18.71	23.21	2.43	672.06
Farfantepenaeus aztecus	Brown shrimp	607	2.9	16.63	27.85	0.42	272.06
Farfantepenaeus duorarum	Pink shrimp	541	5.0	16.47	23.51	0.38	89.71
Litopenaeus setiferus	White shrimp	25,596	25.7	14.22	23.91	17.78	1,894.12
Rimapenaeus constrictus	Roughneck shrimp	12	0.2	14.68	26.98	0.01	8.82
Sicyonia parri		1	<0.1	33.95	4.00	<0.01	1.47

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Macrobrachium spp.	Prawns	2	0.1	10.23	36.15	<0.01	1.47
Callinectes sp.		1	<0.1	19.70	3.90	<0.01	1.47
Callinectes sapidus	Blue crab	2,026	30.0	13.84	27.05	1.41	57.35
Callinectes similis	Lesser blue crab	430	3.1	27.74	10.06	0.30	94.12
Callinectes ornatus	Shelligs	11	0.1	32.19	6.40	0.01	13.24
Portunus spp.	Portunus crabs	20	0.3	31.70	6.33	0.01	10.29
Menippe sp.	Stone crab	1	<0.1	22.05	16.40	<0.01	1.47
Dasyatis sabina	Atlantic stingray	55	2.3	11.51	38.54	0.04	4.41
Dasyatis say	Bluntnose stingray	1	<0.1	31.10	0.10	<0.01	1.47
Lepisosteus osseus	Longnose gar	6	0.2	5.58	40.87	<0.01	2.94
Lepisosteus platyrhincus	Florida gar	13	0.4	0.41	61.59	0.01	4.41
Amia calva	Bowfin	2	0.1	3.13	48.50	<0.01	1.47
Elops saurus	Ladyfish	88	2.2	14.57	34.18	0.06	32.35
Albula vulpes	Bonefish	1	<0.1	6.45	26.10	<0.01	1.47
Anguilla rostrata	American eel	2	0.1	7.83	50.60	<0.01	1.47
Myrophis punctatus	Speckled worm eel	4	0.2	16.34	17.05	<0.01	1.47
Clupeidae spp.	Herrings	7	0.2	16.08	18.33	<0.01	4.41
Alosa sapidissima	American shad	18	0.2	2.92	43.58	0.01	13.24
Alosa aestivalis	Blueback herring	6	0.2	6.70	46.75	<0.01	4.41
Alosa mediocris	Hickory shad	12	0.3	3.79	36.22	0.01	4.41
Brevoortia spp.	Menhadens	9,693	10.7	9.23	28.91	6.73	3,177.94
Dorosoma cepedianum	Gizzard shad	87	1.7	4.54	48.18	0.06	27.94
Dorosoma petenense	Threadfin shad	349	1.5	2.70	37.81	0.24	97.06
Opisthonema oglinum	Atlantic thread herring	1,257	2.9	24.56	13.52	0.87	542.65
Harengula jaguana	Scaled sardine	1,355	1.0	23.93	15.33	0.94	1,144.12
Sardinella aurita	Spanish sardine	12	0.2	26.79	6.80	0.01	11.76
Anchoa spp.	Anchovies	6	0.1	21.20	7.65	<0.01	7.35
Anchoa hepsetus	Striped anchovy	11,821	14.4	25.86	16.21	8.21	2,217.65
Anchoa mitchilli	Bay anchovy	100,661	44.9	14.25	27.53	69.92	7,051.47
Anchoa lyolepis	Dusky anchovy	132	0.5	31.86	13.01	0.09	147.06
Esox niger	Chain pickerel	1	<0.1	3.80	63.20	<0.01	1.47
Synodus foetens	Inshore lizardfish	154	4.2	22.99	17.15	0.11	7.35
Notemigonus crysoleucas	Golden shiner	98	1.3	0.98	55.62	0.07	44.12
Notropis maculatus	Taillight shiner	152	0.3	1.04	64.68	0.11	123.53
Ictalurus punctatus	Channel catfish	10	0.4	2.14	51.89	0.01	4.41
Ameiurus catus	White catfish	32	0.9	1.61	46.06	0.02	5.88
Bagre marinus	Gafftopsail catfish	4	<0.1	2.70	43.80	<0.01	5.88
Ariopsis felis	Hardhead catfish	3	0.1	14.30	37.40	<0.01	2.94

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Pterygoplichthys sp.	Armoured catfishes	1	<0.1	0.30	34.50	<0.01	1.47
Opsanus tau	Oyster toadfish	11	0.5	17.35	13.91	0.01	2.94
Hyporhamphus spp.	Halfbeaks	6	0.1	34.13	9.27	<0.01	7.35
Hyporhamphus meeki	False silver halfbeak	14	0.1	28.21	15.90	0.01	14.71
Strongylura spp.	Needlefishes	168	5.8	9.62	42.46	0.12	8.82
Strongylura marina	Atlantic needlefish	79	3.1	10.04	38.77	0.05	4.41
Strongylura notata	Redfin needlefish	5	0.1	3.65	58.90	<0.01	5.88
Tylosurus crocodilus	Houndfish	2	0.1	22.50	8.45	<0.01	1.47
Cyprinodon variegatus	Sheepshead minnow	29	0.7	17.35	14.17	0.02	7.35
Fundulus sp.	Assorted killifish	1	<0.1	3.70	34.50	<0.01	1.47
Fundulus confluentus	Marsh killifish	7	0.2	7.90	43.47	<0.01	4.41
Fundulus heteroclitus	Mummichog	4,481	12.2	18.56	15.89	3.11	505.88
Fundulus majalis	Striped killifish	482	3.9	23.24	11.43	0.33	54.41
Fundulus chrysotus	Golden topminnow	1	<0.1	0.50	54.20	<0.01	1.47
Fundulus seminolis	Seminole killifish	487	4.1	1.31	59.75	0.34	91.18
Lucania parva	Rainwater killifish	5,200	5.9	3.38	58.15	3.61	1,102.94
Lucania goodei	Bluefin killifish	29	0.6	2.02	56.65	0.02	13.24
Jordanella floridae	Flagfish	4	0.1	3.90	60.35	<0.01	2.94
Gambusia holbrooki	Eastern mosquito fish	1,855	6.0	2.57	47.17	1.29	719.12
Poecilia latipinna	Sailfin molly	445	2.6	5.92	35.30	0.31	186.76
Heterandria formosa	Least killifish	19	0.4	0.75	60.92	0.01	5.88
Membras martinica	Rough silverside	1,199	2.5	21.36	21.31	0.83	795.59
Menidia spp.	Menidia silversides	18,348	36.6	8.52	40.02	12.75	1,967.65
Menidia menidia	Atlantic silverside	33,373	29.2	23.43	13.66	23.18	2,319.12
Labidesthes sicculus	Brook silverside	743	4.6	1.49	58.12	0.52	163.24
Hypoatherina harringtonensis	Reef silverside	1	<0.1	22.70	18.30	<0.01	1.47
Syngnathus floridae	Dusky pipefish	4	0.1	9.63	54.75	<0.01	4.41
Syngnathus fuscus	Northern pipefish	3	0.1	11.30	40.20	<0.01	1.47
Syngnathus louisianae	Chain pipefish	93	3.1	15.51	31.10	0.06	22.06
Syngnathus scovelli	Gulf pipefish	359	7.1	5.60	54.19	0.25	122.06
Microphis brachyurus	Opposum pipefish	9	0.3	6.31	32.03	0.01	4.41
Prionotus carolinus	Northern searobin	1	<0.1	32.00	12.00	<0.01	1.47
Prionotus scitulus	Leopard searobin	22	0.6	24.25	12.73	0.02	7.35
Prionotus tribulus	Bighead searobin	60	2.2	21.35	14.50	0.04	4.41
Centropomus undecimalis	Common snook	7	0.2	5.73	39.36	<0.01	2.94
Centropristis philadelphica	Rock sea bass	7	0.2	27.44	7.11	<0.01	4.41
Epinephelus itajara	Goliath grouper	2	0.1	25.60	15.85	<0.01	1.47
Mycteroperca microlepis	Gag	4	0.2	14.43	15.23	<0.01	1.47

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2) Average	CPUE (No./100 m^2) Maximum
Diplectrum formosum	Sand perch	1	<0.1	15.40	5.80	<0.01	1.47
Centrarchidae sp.		1	<0.1	3.30	53.00	<0.01	1.47
Lepomis spp.	Sunfishes	259	2.7	0.42	58.43	0.18	33.82
Lepomis auritus	Redbreast sunfish	701	6.5	1.75	59.68	0.49	72.06
Lepomis macrochirus	Bluegill	1,723	10.4	1.30	58.74	1.20	142.65
Lepomis marginatus	Dollar sunfish	7	0.1	0.20	63.20	<0.01	7.35
Lepomis microlophus	Redear sunfish	319	4.4	1.94	56.81	0.22	54.41
Lepomis punctatus	Spotted sunfish	36	0.7	1.61	50.23	0.03	26.47
Micropterus salmoides	Largemouth bass	472	6.1	2.76	58.13	0.33	95.59
Pomoxis nigromaculatus	Black crappie	12	0.3	0.36	62.04	0.01	7.35
Lepomis gulosus	Warmouth	8	0.2	0.23	45.64	0.01	7.35
Etheostoma fusiforme	Swamp darter	2	0.1	0.30	65.55	<0.01	1.47
Pomatomus saltatrix	Bluefish	49	0.8	28.70	11.31	0.03	39.71
Carangidae spp.	Jacks	2	<0.1	35.45	0.90	<0.01	2.94
Caranx hippos	Crevalle jack	126	3.1	14.74	25.50	0.09	11.76
Caranx latus	Horse-eye jack	3	0.1	17.30	24.40	<0.01	1.47
Chloroscombrus chrysurus	Atlantic bumper	159	1.8	22.58	15.88	0.11	36.76
Oligoplites saurus	Leatherjacket	287	6.7	15.68	26.60	0.20	25.00
Selene vomer	Lookdown	27	0.8	20.00	20.63	0.02	8.82
Trachinotus carolinus	Florida pompano	307	1.0	30.49	6.08	0.21	141.18
Trachinotus falcatus	Permit	632	3.1	24.88	8.52	0.44	170.59
Lutjanus griseus	Gray snapper	129	3.6	16.13	25.16	0.09	13.24
Lutjanus analis	Mutton snapper	4	0.1	30.50	4.65	<0.01	2.94
Lutjanus synagris	Lane snapper	14	0.4	25.58	7.83	0.01	5.88
Lobotes surinamensis	Tripletail	1	<0.1	29.20	12.80	<0.01	1.47
Eucinostomus spp.	Eucinostomus	6,477	25.6	15.49	23.20	4.50	567.65
Eucinostomus gula	Silver jenny	666	8.4	20.58	16.40	0.46	55.88
Eucinostomus harengulus	Tidewater mojarra	3,326	25.6	13.01	29.63	2.31	117.65
Diapterus auratus	Irish pompano	518	6.8	10.15	26.00	0.36	73.53
Haemulidae spp.		3	<0.1	31.20	16.90	<0.01	4.41
Orthopristis chrysoptera	Pigfish	990	6.7	19.69	28.09	0.69	198.53
Lagodon rhomboides	Pinfish	7,662	36.1	10.86	35.95	5.32	335.29
Archosargus probatocephalus	Sheepshead	85	2.7	8.70	34.62	0.06	7.35
Cynoscion nebulosus	Spotted seatrout	652	9.5	16.17	25.87	0.45	69.12
Cynoscion complex	*C. regalis x C. arenarius*	85	1.5	12.10	29.56	0.06	22.06
Bairdiella chrysoura	Silver perch	5,683	12.7	15.68	31.48	3.95	898.53
Leiostomus xanthurus	Spot	88,118	46.8	12.96	26.79	61.21	7,088.24
Menticirrhus americanus	Southern kingfish	207	3.3	17.66	23.20	0.14	30.88

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Menticirrhus littoralis	Gulf kingfish	10	0.2	28.71	3.20	0.01	10.29
Menticirrhus saxatilis	Northern kingfish	19	0.6	28.95	10.58	0.01	4.41
Micropogonias undulatus	Atlantic croaker	8,969	27.2	8.28	35.68	6.23	683.82
Pogonias cromis	Black drum	26	0.8	17.58	24.06	0.02	7.35
Sciaenops ocellatus	Red drum	793	14.7	11.69	26.41	0.55	66.18
Stellifer lanceolatus	Star drum	1	<0.1	12.95	9.70	<0.01	1.47
Chaetodipterus faber	Atlantic spadefish	2	0.1	17.51	16.60	<0.01	1.47
Oreochromis aureus	Blue tilapia	4	<0.1	4.40	42.60	<0.01	5.88
Oreochromis mossambicus	Mozambique tilapia	1	<0.1	5.60	60.10	<0.01	1.47
Oreochromis/Sarotherodon spp.	Tilapias	9	0.1	1.96	55.40	0.01	10.29
Elassoma okefenokee	Okefenokee pygmy sunfish	5	0.1	0.24	63.20	<0.01	4.41
Mugil cephalus	Striped mullet	25,644	31.3	9.75	31.91	17.81	3,930.88
Mugil curema	White mullet	3,082	12.9	20.75	18.26	2.14	1,594.12
Agonostomus monticola	Mountain mullet	2	<0.1	18.70	21.30	<0.01	2.94
Sphyraena borealis	Northern sennet	3	0.1	29.18	11.50	<0.01	1.47
Sphyraena guachancho	Guaguanche	1	<0.1	34.60	3.40	<0.01	1.47
Sphyraena barracuda	Great barracuda	2	<0.1	21.40	22.90	<0.01	2.94
Astroscopus y-graecum	Southern stargazer	12	0.4	23.16	13.19	0.01	4.41
Hypsoblennius ionthas	Freckled blenny	1	<0.1	11.15	6.80	<0.01	1.47
Chasmodes spp.		3	0.1	3.57	24.47	<0.01	1.47
Chasmodes bosquianus	Striped blenny	10	0.4	14.88	23.42	0.01	2.94
Evorthodus lyricus	Lyre goby	9	0.2	12.26	21.84	0.01	7.35
Ctenogobius boleosoma	Darter goby	672	11.1	16.00	20.55	0.47	32.35
Gobionellus oceanicus	Highfin goby	39	1.1	7.56	28.51	0.03	8.82
Ctenogobius shufeldti	Freshwater goby	840	8.3	5.31	36.84	0.58	182.35
Ctenogobius smaragdus	Emerald goby	73	1.7	19.69	9.40	0.05	22.06
Gobiosoma spp.	Gobiosoma gobies	377	6.1	6.56	44.64	0.26	100.00
Gobiosoma bosc	Naked goby	465	9.0	12.54	29.83	0.32	69.12
Gobiosoma robustum	Code goby	67	2.0	14.47	25.56	0.05	10.29
Microgobius gulosus	Clown goby	760	10.7	3.25	53.61	0.53	102.94
Microgobius thalassinus	Green goby	117	1.8	15.37	22.54	0.08	29.41
Bathygobius soporator	Frillfin goby	84	1.7	14.86	17.00	0.06	22.06
Dormitator maculatus	Fat sleeper	2	0.1	5.40	43.15	<0.01	1.47
Scomberomorus maculatus	Spanish mackerel	7	0.2	26.84	17.53	<0.01	4.41
Peprilus triacanthus	Butterfish	2	0.1	33.23	5.20	<0.01	1.47
Citharichthys macrops	Spotted whiff	1	<0.1	31.10	0.10	<0.01	1.47
Citharichthys spilopterus	Bay whiff	536	8.6	19.27	19.30	0.37	95.59
Etropus crossotus	Fringed flounder	91	2.3	23.98	11.97	0.06	14.71

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Paralichthys dentatus	Summer flounder	21	0.8	24.48	13.36	0.01	4.41
Paralichthys albigutta	Gulf flounder	107	3.5	21.35	16.95	0.07	10.29
Paralichthys lethostigma	Southern flounder	368	9.6	11.93	29.09	0.26	16.18
Paralichthys squamilentus	Broad flounder	4	0.2	31.33	2.35	<0.01	1.47
Ancylopsetta quadrocellata	Ocellated flounder	2	0.1	21.98	7.00	<0.01	1.47
Symphurus plagiusa	Blackcheek tonguefish	561	5.9	22.77	16.17	0.39	155.88
Trinectes maculatus	Hogchoker	394	6.1	2.27	52.37	0.27	47.06
Achirus lineatus	Lined sole	124	3.6	14.78	23.28	0.09	20.59
Stephanolepis hispidus	Planehead filefish	26	0.9	26.90	11.29	0.02	5.88
Sphoeroides nephelus	Southern puffer	141	4.1	23.22	19.65	0.10	10.29
Sphoeroides spengleri	Bandtail puffer	1	<0.1	17.70	13.80	<0.01	1.47
Chilomycterus schoepfii	Striped burrfish	54	2.2	23.46	16.24	0.04	4.41

Nearshore habitat sampled with 183-m seines

A total of 108,106 individuals from 125 taxa (115 fish taxa and 10 selected macro-invertebrate taxa) were collected in 1,143 183-m seines in the LSJR. Over 62% of the catch was represented by five taxa that included: menhaden's, pinfish, striped mullet, spot, and white mullet (*Table 5*). Striped mullet were the most commonly captured taxa and were present in over 80% of all seine hauls. Other taxa that were collected in ≥30% of the 183-m seine hauls included: Atlantic stingray, pinfish, spot, white mullet, red drum, and blue crabs. Additional catch summaries by month, year, and FIM sampling zone can be found in *Appendix 1*. Length frequency plots for some abundant species collected in this gear can be found in *Appendix 8*.

Table 5. Summary catch statistics for 183-m seine collections in the lower St. Johns River (FIM sampling zones 1-4, May 2001–December 2011, n=1,143). Organisms are listed in phylogenetic order by family and alphabetically within families. S_u is the central tendency in salinity (density-weighted salinity, in psu); km_u is the center of abundance (density-weighted distribution, in kilometers); and CPUE is the number per unit area (100 m^2). Tidal tributary and mainstem collections combined.

Scientific Name	*Common Name*	*Number Collected*	*Collection Frequency*	*S_u (psu)*	*km_u (km)*	CPUE (No./100 m^2)	
						Average	*Maximum*
Stomolophus meleagris	Cannonball jellyfish	2,095	6.1	28.72	6.79	0.04	30.17
Limulus polyphemus	Horseshoe crab	3	0.2	26.18	3.20	<0.01	0.05
Farfantepenaeus spp.	Commercial shrimps	53	1.9	12.89	35.85	<0.01	0.36
Farfantepenaeus aztecus	Brown shrimp	143	1.3	14.45	36.22	<0.01	1.72
Farfantepenaeus duorarum	Pink shrimp	60	2.5	14.83	40.36	<0.01	0.29
Litopenaeus setiferus	White shrimp	1,100	9.4	12.68	25.86	0.02	9.03
Callinectes sapidus	Blue crab	1,151	31.2	12.99	39.22	0.02	1.99
Callinectes similis	Lesser blue crab	66	2.1	26.36	20.22	<0.01	0.24
Callinectes ornatus	Shelligs	2	0.2	32.98	12.40	<0.01	0.02
Portunus sp.	Portunus crabs	1	0.1	33.50	2.20	<0.01	0.02
Menippe spp.	Stone crab	2	0.2	33.21	5.80	<0.01	0.02
Dasyatis sabina	Atlantic stingray	3,232	53.8	14.74	29.40	0.07	1.58
Dasyatis say	Bluntnose stingray	34	2.2	25.91	13.28	<0.01	0.07
Gymnura micrura	Smooth butterfly ray	9	0.5	26.88	6.21	<0.01	0.07

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2) Average	CPUE (No./100 m^2) Maximum
Aetobatus narinari	Spotted eagle ray	2	0.2	26.75	13.40	<0.01	0.02
Rhinoptera bonasus	Cownose ray	4	0.3	24.78	17.90	<0.01	0.05
Lepisosteus osseus	Longnose gar	241	10.2	4.61	50.35	0.01	0.32
Lepisosteus platyrhincus	Florida gar	266	5.6	2.68	59.65	0.01	1.07
Amia calva	Bowfin	6	0.4	1.35	61.98	<0.01	0.05
Elops saurus	Ladyfish	1,617	23.3	12.46	33.21	0.03	9.00
Megalops atlanticus	Tarpon	2	0.2	1.75	52.55	<0.01	0.02
Albula vulpes	Bonefish	5	0.3	28.62	15.52	<0.01	0.05
Anguilla rostrata	American eel	6	0.4	6.24	44.65	<0.01	0.05
Alosa sapidissima	American shad	6	0.4	7.54	46.60	<0.01	0.05
Alosa aestivalis	Blueback herring	7	0.3	1.65	44.24	<0.01	0.10
Alosa mediocris	Hickory shad	9	0.4	6.99	32.34	<0.01	0.10
Brevoortia spp.	Menhadens	19,023	19.6	8.38	28.93	0.40	200.15
Dorosoma cepedianum	Gizzard shad	2,999	14.1	7.12	49.82	0.06	18.67
Dorosoma petenense	Threadfin shad	482	5.5	3.84	50.25	0.01	2.62
Opisthonema oglinum	Atlantic thread herring	1,310	8.0	25.91	19.76	0.03	6.75
Harengula jaguana	Scaled sardine	143	1.9	24.85	23.26	<0.01	1.92
Anchoa hepsetus	Striped anchovy	16	0.4	22.60	22.56	<0.01	0.17
Anchoa mitchilli	Bay anchovy	2	0.2	14.23	38.40	<0.01	0.02
Anchoa cubana	Cuban anchovy	1	0.1	27.90	6.10	<0.01	0.02
Esox niger	Chain pickerel	4	0.2	0.75	60.10	<0.01	0.07
Synodus foetens	Inshore lizardfish	66	3.5	25.26	15.80	<0.01	0.17
Notemigonus crysoleucas	Golden shiner	114	1.7	1.21	59.17	<0.01	0.87
Ictalurus punctatus	Channel catfish	377	10.9	2.63	55.56	0.01	1.60
Ameiurus catus	White catfish	1,039	11.8	4.50	56.91	0.02	9.13
Ameiurus nebulosus	Brown bullhead	22	0.7	5.22	56.87	<0.01	0.34
Bagre marinus	Gafftopsail catfish	7	0.6	21.44	24.60	<0.01	0.02
Ariopsis felis	Hardhead catfish	25	1.7	14.90	25.88	<0.01	0.05
Loricariidae sp.	Suckermouth catfish	1	0.1	1.23	58.90	<0.01	0.02
Pterygoplichthys spp.	Armoured catfishes	3	0.2	0.47	62.13	<0.01	0.05
Opsanus tau	Oyster toadfish	7	0.5	9.93	24.30	<0.01	0.05
Ogcocephalus sp.	Batfishes	1	0.1	29.73	6.40	<0.01	0.02
Ogcocephalus cubifrons	Polka-dot batfish	2	0.2	29.50	4.25	<0.01	0.02
Strongylura marina	Atlantic needlefish	575	15.0	14.72	26.85	0.01	0.80
Strongylura notata	Redfin needlefish	4	0.3	18.92	16.75	<0.01	0.02
Tylosurus crocodilus	Houndfish	7	0.4	29.53	15.34	<0.01	0.07
Fundulus heteroclitus	Mummichog	7	0.2	14.77	17.36	<0.01	0.15
Fundulus majalis	Striped killifish	9	0.6	25.04	14.18	<0.01	0.07
Fundulus seminolis	Seminole killifish	67	2.5	2.78	58.71	<0.01	0.22

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Menidia menidia	Atlantic silverside	3	0.2	22.90	9.77	<0.01	0.05
Prionotus evolans	Striped searobin	4	0.3	28.86	21.53	<0.01	0.05
Prionotus scitulus	Leopard searobin	9	0.6	29.24	8.91	<0.01	0.07
Prionotus tribulus	Bighead searobin	61	3.2	26.62	13.52	<0.01	0.19
Centropomus undecimalis	Common snook	47	0.9	4.91	53.30	<0.01	0.90
Centropristis philadelphica	Rock sea bass	13	0.9	25.23	9.26	<0.01	0.07
Lepomis auritus	Redbreast sunfish	485	6.6	2.53	57.61	0.01	0.73
Lepomis macrochirus	Bluegill	1,438	14.3	1.94	59.01	0.03	1.84
Lepomis marginatus	Dollar sunfish	1	0.1	0.40	52.30	<0.01	0.02
Lepomis microlophus	Redear sunfish	838	12.1	2.16	57.90	0.02	1.55
Lepomis punctatus	Spotted sunfish	13	0.4	3.31	55.53	<0.01	0.17
Micropterus salmoides	Largemouth bass	392	9.4	2.30	57.71	0.01	0.51
Pomoxis nigromaculatus	Black crappie	41	1.3	0.51	55.57	<0.01	0.15
Lepomis gulosus	Warmouth	9	0.3	1.48	56.48	<0.01	0.15
Pomatomus saltatrix	Bluefish	96	3.9	24.79	14.51	<0.01	0.22
Rachycentron canadum	Cobia	5	0.4	22.94	13.32	<0.01	0.02
Caranx hippos	Crevalle jack	417	13.5	14.89	26.62	0.01	0.49
Caranx latus	Horse-eye jack	29	1.1	19.01	20.34	<0.01	0.27
Caranx crysos	Blue runner	11	0.7	19.12	26.55	<0.01	0.07
Chloroscombrus chrysurus	Atlantic bumper	3,452	12.8	16.84	20.13	0.07	8.47
Oligoplites saurus	Leatherjacket	25	1.9	24.28	19.00	<0.01	0.05
Selene vomer	Lookdown	254	7.6	18.46	17.15	0.01	0.87
Selene setapinnis	Atlantic moonfish	12	0.3	30.28	5.89	<0.01	0.22
Trachinotus carolinus	Florida pompano	67	1.7	30.83	11.35	<0.01	0.56
Trachinotus falcatus	Permit	104	2.5	18.06	19.41	<0.01	0.49
Lutjanus griseus	Gray snapper	51	3.3	11.25	31.01	<0.01	0.07
Lutjanus synagris	Lane snapper	7	0.3	26.24	9.96	<0.01	0.07
Lobotes surinamensis	Tripletail	1	0.1	13.45	12.80	<0.01	0.02
Eucinostomus sp.	Eucinostomus	1	0.1	8.00	20.00	<0.01	0.02
Eucinostomus gula	Silver jenny	513	9.0	20.32	21.28	0.01	1.26
Eucinostomus harengulus	Tidewater mojarra	2,561	18.6	12.07	46.28	0.05	13.79
Diapterus auratus	Irish pompano	643	11.6	9.78	34.28	0.01	1.48
Orthopristis chrysoptera	Pigfish	381	5.4	15.89	41.17	0.01	1.84
Lagodon rhomboides	Pinfish	17,347	49.0	10.60	43.93	0.37	33.45
Archosargus probatocephalus	Sheepshead	715	23.4	17.69	20.81	0.02	0.58
Cynoscion nebulosus	Spotted seatrout	700	18.7	16.74	20.40	0.01	0.85
Cynoscion complex	*C. regalis x C. arenarius*	136	2.8	8.53	25.94	<0.01	1.14
Bairdiella chrysoura	Silver perch	1,670	10.1	12.78	34.85	0.04	10.85
Leiostomus xanthurus	Spot	11,292	48.8	11.10	41.59	0.24	12.43

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Menticirrhus americanus	Southern kingfish	94	5.1	22.31	17.63	<0.01	0.15
Menticirrhus littoralis	Gulf kingfish	1	0.1	36.30	2.70	<0.01	0.02
Menticirrhus saxatilis	Northern kingfish	9	0.4	16.22	16.27	<0.01	0.12
Micropogonias undulatus	Atlantic croaker	3,514	19.3	9.61	47.20	0.07	34.44
Pogonias cromis	Black drum	221	6.8	15.40	22.14	<0.01	1.07
Sciaenops ocellatus	Red drum	1,240	31.4	12.90	30.72	0.03	2.77
Stellifer lanceolatus	Star drum	1	0.1	18.67	5.30	<0.01	0.02
Chaetodipterus faber	Atlantic spadefish	61	1.0	28.94	11.91	<0.01	0.80
Oreochromis aureus	Blue tilapia	1	0.1	0.40	43.80	<0.01	0.02
Oreochromis/Sarotherodon spp.	Tilapias	2	0.2	3.85	53.40	<0.01	0.02
Morone saxatilis	Striped bass	3	0.3	4.62	51.53	<0.01	0.02
Mugil cephalus	Striped mullet	12,755	80.4	13.35	32.54	0.27	23.40
Mugil curema	White mullet	7,378	43.9	13.58	31.88	0.16	23.08
Sphyraena barracuda	Great barracuda	4	0.3	15.36	20.83	<0.01	0.02
Astroscopus y-graecum	Southern stargazer	16	1.1	23.91	18.08	<0.01	0.07
Chasmodes sp.		1	0.1	9.23	22.30	<0.01	0.02
Microgobius gulosus	Clown goby	1	0.1	7.40	56.80	<0.01	0.02
Gobioides broussonetii	Violet goby	1	0.1	11.60	20.30	<0.01	0.02
Dormitator maculatus	Fat sleeper	3	0.2	0.40	58.93	<0.01	0.05
Scomberomorus cavalla	King mackerel	1	0.1	32.80	10.40	<0.01	0.02
Scomberomorus maculatus	Spanish mackerel	106	4.5	22.29	14.16	<0.01	0.36
Peprilus triacanthus	Butterfish	1	0.1	23.67	5.90	<0.01	0.02
Peprilus paru	Harvestfish	57	0.7	22.76	32.33	<0.01	0.95
Citharichthys macrops	Spotted whiff	11	0.5	31.47	2.62	<0.01	0.10
Citharichthys spilopterus	Bay whiff	730	15.1	18.33	27.91	0.02	1.02
Etropus crossotus	Fringed flounder	280	6.6	22.92	21.09	0.01	0.53
Paralichthys dentatus	Summer flounder	44	1.6	22.87	11.57	<0.01	0.19
Paralichthys albigutta	Gulf flounder	204	8.1	23.17	17.14	<0.01	0.27
Paralichthys lethostigma	Southern flounder	500	20.0	16.43	30.29	0.01	0.39
Paralichthys squamilentus	Broad flounder	6	0.2	33.99	1.63	<0.01	0.12
Ancylopsetta quadrocellata	Ocellated flounder	48	2.3	28.07	8.49	<0.01	0.15
Trinectes maculatus	Hogchoker	28	1.9	11.80	34.94	<0.01	0.10
Achirus lineatus	Lined sole	91	5.0	18.24	20.21	<0.01	0.19
Aluterus monoceros	Unicorn filefish	1	0.1	32.33	2.20	<0.01	0.02
Stephanolepis hispidus	Planehead filefish	2	0.2	30.05	11.15	<0.01	0.02
Sphoeroides maculatus	Northern puffer	2	0.2	25.60	15.05	<0.01	0.02
Sphoeroides nephelus	Southern puffer	242	10.7	19.10	20.03	0.01	0.24
Chilomycterus schoepfii	Striped burrfish	167	6.9	24.05	13.34	<0.01	0.44

Channel habitat sampled with 6.1-m otter trawls

A total of 196,494 individuals from 158 taxa (140 fish taxa and 18 selected macro-invertebrate taxa) were collected in 2,207 6.1-m otter trawls in the LSJR. Atlantic croaker accounted for over 32% of all nekton collected with 6.1-m otter trawls. Over 82% of the catch was represented by five taxa that included: Atlantic croaker, bay anchovy, spot, white shrimp, and blue crab. Atlantic croaker and blue crab were the two most commonly captured taxa, both being present in over 57% of all otter trawls. Other taxa that were collected in ≥30% of trawl hauls included: bay anchovy, spot, and white shrimp (*Table 6*). Additional catch summaries by month, year, and FIM sampling zone can be found in *Appendix 1*. Length frequency plots for some abundant species collected in this gear can be found in *Appendix 9*.

Table 6. Summary catch statistics for 6.1-m otter trawl collections in the lower St. Johns River (FIM sampling zones 1-4, May 2001–December 2011, n=2,207). Organisms are listed in phylogenetic order by family and alphabetically within families. S_u is the central tendency in salinity (density-weighted salinity, in psu); km_u is the center of abundance (density-weighted distribution, in kilometers); and CPUE is the number per unit area (100 m^2). Tidal tributary and mainstem collections combined.

Scientific Name	***Common Name***	***Number Collected***	***Collection Frequency***	***S_u (psu)***	***km_u (km)***	**CPUE (No./100 m^2)**	
						Average	***Maximum***
Stomolophus meleagris	Cannonball jellyfish	315	2.6	25.19	10.46	0.02	14.17
Limulus polyphemus	Horseshoe crab	5	0.2	25.60	5.78	<0.01	0.27
Penaeidae spp.	Penaeid shrimps	106	0.2	32.86	2.51	0.01	12.63
Farfantepenaeus spp.	Commercial shrimps	2,904	22.9	10.72	30.55	0.18	17.24
Farfantepenaeus aztecus	Brown shrimp	580	6.9	11.43	40.60	0.04	4.50
Farfantepenaeus duorarum	Pink shrimp	809	10.8	12.68	30.83	0.05	6.90
Litopenaeus setiferus	White shrimp	10,832	37.9	7.58	38.99	0.67	77.02
Penaeus monodon	Giant tiger prawn	1	<0.1	13.77	16.20	<0.01	0.12
Rimapenaeus constrictus	Roughneck shrimp	130	1.1	21.92	21.44	0.01	7.42
Xiphopenaeus kroyeri	Atlantic seabob	2	0.1	25.06	13.76	<0.01	0.17
Sicyonia brevirostris	Rock Shrimp	2	0.1	32.39	5.75	<0.01	0.12
Sicyonia parri		1	<0.1	31.68	3.30	<0.01	0.11

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Macrobrachium spp.	Prawns	78	1.4	7.11	44.03	<0.01	1.84
Alpheidae sp.	Snapping shrimp	1	<0.1	7.20	14.30	<0.01	0.13
Callinectes sapidus	Blue crab	6,045	57.4	10.80	34.66	0.38	13.04
Callinectes similis	Lesser blue crab	440	6.1	23.96	19.71	0.03	2.83
Callinectes ornatus	Shelligs	8	0.2	26.85	14.36	<0.01	0.34
Portunus spp.	Portunus crabs	39	0.9	30.27	7.29	<0.01	1.10
Charybdis hellerii	Spiny hands	1	<0.1	33.07	7.90	<0.01	0.13
Menippe spp.	Stone crab	15	0.5	23.52	10.39	<0.01	0.40
Dasyatis sabina	Atlantic stingray	494	13.8	12.61	26.83	0.03	7.02
Dasyatis say	Bluntnose stingray	12	0.5	24.78	17.84	<0.01	0.25
Gymnura micrura	Smooth butterfly ray	5	0.2	31.55	2.76	<0.01	0.25
Lepisosteus osseus	Longnose gar	3	0.1	10.66	37.76	<0.01	0.12
Elops saurus	Ladyfish	401	3.9	14.34	31.96	0.03	10.49
Anguilla rostrata	American eel	11	0.4	3.63	37.96	<0.01	0.37
Ophichthidae sp.		1	<0.1	14.35	6.20	<0.01	0.13
Myrophis punctatus	Speckled worm eel	23	0.9	14.02	29.03	<0.01	0.51
Ophichthus gomesii	Shrimp eel	2	0.1	14.99	22.24	<0.01	0.17
Alosa sapidissima	American shad	3	0.1	20.67	28.27	<0.01	0.27
Alosa aestivalis	Blueback herring	3	0.1	12.16	30.63	<0.01	0.15
Alosa mediocris	Hickory shad	2	0.1	4.41	32.41	<0.01	0.13
Brevoortia spp.	Menhadens	116	2.3	10.51	33.36	0.01	3.30
Dorosoma cepedianum	Gizzard shad	13	0.5	4.94	47.79	<0.01	0.27
Dorosoma petenense	Threadfin shad	50	0.9	2.90	57.54	<0.01	1.57
Opisthonema oglinum	Atlantic thread herring	25	0.5	10.18	23.69	<0.01	1.75
Harengula jaguana	Scaled sardine	16	0.1	27.72	14.11	<0.01	2.02
Anchoa spp.	Anchovies	2	<0.1	27.30	10.20	<0.01	0.30
Anchoa hepsetus	Striped anchovy	1,744	3.9	26.91	11.07	0.12	75.70
Anchoa mitchilli	Bay anchovy	43,546	42.4	14.62	31.48	2.76	418.54
Anchoa lyolepis	Dusky anchovy	27	0.2	28.18	12.86	<0.01	3.15
Synodus foetens	Inshore lizardfish	160	4.3	24.63	14.34	0.01	1.08
Ictaluridae sp.	Bullhead catfishes	1	<0.1	0.30	50.50	<0.01	0.17
Ictalurus punctatus	Channel catfish	215	3.9	1.25	52.60	0.01	2.43
Noturus gyrinus	Tadpole madtom	1	<0.1	0.15	63.20	<0.01	0.13
Ameiurus catus	White catfish	1,571	18.7	2.62	48.09	0.09	7.50
Ameiurus natalis	Yellow bullhead	1	<0.1	0.00	44.80	<0.01	0.15
Ameiurus nebulosus	Brown bullhead	7	0.3	1.20	59.20	<0.01	0.17
Bagre marinus	Gafftopsail catfish	18	0.4	11.62	35.47	<0.01	0.81
Ariopsis felis	Hardhead catfish	339	2.7	8.83	27.13	0.02	12.41

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Loricariidae sp.	Suckermouth catfish	1	<0.1	1.00	34.50	<0.01	0.15
Opsanus tau	Oyster toadfish	250	6.3	12.40	23.72	0.02	3.71
Gobiesox strumosus	Skilletfish	20	0.5	6.66	27.29	<0.01	1.80
Ogcocephalus sp.	Batfishes	1	<0.1	33.66	3.50	<0.01	0.15
Ogcocephalus cubifrons	Polka-dot batfish	5	0.2	31.76	5.41	<0.01	0.17
Urophycis regia	Spotted hake	24	0.5	16.63	19.74	<0.01	0.67
Urophycis floridana	Southern hake	4	0.1	21.97	8.54	<0.01	0.25
Ophidiidae sp.		1	<0.1	17.49	30.40	<0.01	0.15
Lepophidium brevibarbe		23	0.2	13.83	28.18	<0.01	2.16
Ophidion sp.		1	<0.1	9.50	33.60	<0.01	0.15
Ophidion holbrookii	Bank cusk-eel	4	0.1	21.20	13.76	<0.01	0.27
Ophidion josephi	Crested cusk-eel	3	<0.1	17.14	30.70	<0.01	0.40
Fundulus heteroclitus	Mummichog	1	<0.1	19.30	23.00	<0.01	0.17
Lucania parva	Rainwater killifish	3	0.1	1.55	52.71	<0.01	0.13
Gambusia holbrooki	Eastern mosquito fish	1	<0.1	11.14	30.70	<0.01	0.13
Membras martinica	Rough silverside	2	0.1	14.05	32.94	<0.01	0.17
Menidia spp.	Menidia silversides	3	0.1	4.79	45.73	<0.01	0.13
Menidia menidia	Atlantic silverside	2	0.1	6.94	39.45	<0.01	0.15
Labidesthes sicculus	Brook silverside	1	<0.1	0.20	63.20	<0.01	0.10
Syngnathus floridae	Dusky pipefish	1	<0.1	17.70	26.20	<0.01	0.13
Syngnathus fuscus	Northern pipefish	4	0.2	26.57	17.89	<0.01	0.13
Syngnathus louisianae	Chain pipefish	67	2.6	20.27	20.32	<0.01	0.40
Syngnathus scovelli	Gulf pipefish	59	1.9	12.46	28.46	<0.01	0.58
Hippocampus erectus	Lined seahorse	5	0.2	31.79	6.44	<0.01	0.13
Scorpaena brasiliensis	Barbfish	1	<0.1	33.32	3.20	<0.01	0.15
Prionotus carolinus	Northern searobin	16	0.3	28.20	5.03	<0.01	0.74
Prionotus evolans	Striped searobin	6	0.1	26.79	18.32	<0.01	0.37
Prionotus scitulus	Leopard searobin	133	3.1	26.37	11.42	0.01	1.80
Prionotus tribulus	Bighead searobin	413	8.6	18.96	17.93	0.03	3.51
Prionotus rubio	Blackfin searobin	5	0.2	26.43	14.88	<0.01	0.15
Centropomus undecimalis	Common snook	3	0.1	5.36	32.76	<0.01	0.15
Centropristis striata	Black sea bass	7	0.2	23.74	2.21	<0.01	0.40
Centropristis philadelphica	Rock sea bass	87	3.0	23.45	12.19	0.01	0.60
Epinephelus itajara	Goliath grouper	1	<0.1	19.20	9.70	<0.01	0.15
Mycteroperca microlepis	Gag	1	<0.1	18.13	16.30	<0.01	0.13
Lepomis spp.	Sunfishes	23	0.3	0.27	53.02	<0.01	1.00
Lepomis auritus	Redbreast sunfish	57	0.6	0.64	47.37	<0.01	3.51
Lepomis macrochirus	Bluegill	247	2.0	0.82	48.45	0.01	17.89

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2) Average	CPUE (No./100 m^2) Maximum
Lepomis marginatus	Dollar sunfish	1	<0.1	0.10	43.20	<0.01	0.13
Lepomis microlophus	Redear sunfish	47	1.3	0.89	58.16	<0.01	0.74
Micropterus salmoides	Largemouth bass	7	0.3	0.85	55.67	<0.01	0.15
Pomoxis nigromaculatus	Black crappie	72	1.2	0.46	59.33	<0.01	2.45
Lepomis gulosus	Warmouth	4	0.2	0.35	63.05	<0.01	0.13
Pomatomus saltatrix	Bluefish	1	<0.1	6.95	32.10	<0.01	0.13
Rachycentron canadum	Cobia	2	0.1	28.84	15.94	<0.01	0.15
Caranx hippos	Crevalle jack	5	0.2	14.89	34.09	<0.01	0.13
Chloroscombrus chrysurus	Atlantic bumper	1,231	4.2	27.89	7.73	0.08	99.69
Oligoplites saurus	Leatherjacket	4	0.1	17.14	25.38	<0.01	0.27
Selene vomer	Lookdown	39	1.5	16.16	25.19	<0.01	0.45
Selene setapinnis	Atlantic moonfish	124	0.5	22.42	27.48	0.01	15.89
Trachinotus falcatus	Permit	3	0.1	25.87	6.01	<0.01	0.34
Lutjanus griseus	Gray snapper	29	1.0	12.10	28.49	<0.01	0.54
Lutjanus synagris	Lane snapper	16	0.5	29.01	5.92	<0.01	0.56
Eucinostomus spp.	Eucinostomus	505	3.8	18.76	18.93	0.03	10.64
Eucinostomus gula	Silver jenny	122	2.3	20.46	14.42	0.01	2.19
Eucinostomus harengulus	Tidewater mojarra	413	6.8	18.90	21.09	0.03	4.18
Diapterus auratus	Irish pompano	287	3.4	10.16	24.76	0.02	5.40
Orthopristis chrysoptera	Pigfish	485	3.1	27.45	14.32	0.03	22.94
Lagodon rhomboides	Pinfish	634	10.0	18.82	18.79	0.04	3.91
Archosargus probatocephalus	Sheepshead	159	4.9	18.18	20.12	0.01	1.08
Sciaenidae spp.	Drums	3	<0.1	19.90	3.30	<0.01	0.37
Cynoscion nebulosus	Spotted seatrout	80	2.9	12.65	29.74	<0.01	0.86
Cynoscion nothus	Silver seatrout	4	0.1	31.27	9.25	<0.01	0.27
Cynoscion complex	*C. regalis x C. arenarius*	2,840	20.8	9.09	33.89	0.17	35.20
Bairdiella chrysoura	Silver perch	1,071	15.9	12.84	24.69	0.07	4.86
Leiostomus xanthurus	Spot	38,389	38.9	14.33	28.01	2.40	279.52
Larimus fasciatus	Banded drum	24	0.2	32.96	2.39	<0.01	1.59
Menticirrhus americanus	Southern kingfish	501	8.5	15.67	18.35	0.03	3.19
Menticirrhus saxatilis	Northern kingfish	17	0.4	25.50	19.48	<0.01	0.60
Micropogonias undulatus	Atlantic croaker	63,515	58.0	4.52	44.17	3.88	604.83
Pogonias cromis	Black drum	42	1.4	5.70	31.93	<0.01	0.90
Sciaenops ocellatus	Red drum	73	1.6	6.59	34.48	<0.01	1.08
Stellifer lanceolatus	Star drum	1,767	6.2	9.52	23.57	0.11	37.33
Chaetodipterus faber	Atlantic spadefish	92	2.7	22.57	17.03	0.01	0.94
Oreochromis niloticus		1	<0.1	6.00	67.40	<0.01	0.17
Mugil cephalus	Striped mullet	22	0.8	6.25	33.37	<0.01	0.51

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Mugil curema	White mullet	33	0.4	7.42	37.12	<0.01	1.20
Sphyraena borealis	Northern sennet	1	<0.1	29.82	16.20	<0.01	0.17
Sphyraena guachancho	Guaguanche	2	0.1	15.98	32.09	<0.01	0.17
Astroscopus y-graecum	Southern stargazer	67	1.6	22.69	13.10	<0.01	1.80
Hypsoblennius hentz	Feather blenny	4	0.2	23.32	10.94	<0.01	0.17
Chasmodes bosquianus	Striped blenny	2	0.1	5.19	24.58	<0.01	0.13
Chasmodes saburrae	Florida blenny	1	<0.1	21.70	6.00	<0.01	0.13
Hypleurochilus geminatus	Crested blenny	1	<0.1	33.07	7.90	<0.01	0.13
Gobiidae sp.	Gobies	1	<0.1	27.00	26.20	<0.01	0.15
Ctenogobius boleosoma	Darter goby	123	2.9	12.81	20.82	0.01	0.98
Gobionellus oceanicus	Highfin goby	110	2.8	11.38	30.79	0.01	1.08
Ctenogobius shufeldti	Freshwater goby	596	6.8	2.01	49.76	0.04	5.26
Ctenogobius stigmaticus	Marked goby	5	0.2	16.02	16.03	<0.01	0.30
Ctenogobius smaragdus	Emerald goby	47	0.5	19.39	11.20	<0.01	5.40
Gobiosoma spp.	Gobiosoma gobies	84	2.4	6.80	39.85	0.01	1.20
Gobiosoma bosc	Naked goby	117	3.4	10.94	29.72	0.01	1.10
Gobiosoma robustum	Code goby	38	1.4	17.27	23.76	<0.01	0.30
Microgobius gulosus	Clown goby	501	6.1	3.64	54.50	0.03	9.58
Microgobius thalassinus	Green goby	568	6.6	11.38	32.93	0.04	4.80
Bathygobius soporator	Frillfin goby	8	0.4	10.15	23.09	<0.01	0.15
Gobioides broussonetii	Violet goby	82	2.5	7.13	48.98	0.01	1.08
Erotelis smaragdus	Emerald sleeper	1	<0.1	17.97	15.40	<0.01	0.13
Dormitator maculatus	Fat sleeper	3	0.1	6.68	40.66	<0.01	0.15
Ctenogobius spp.		5	<0.1	21.83	26.20	<0.01	0.61
Eleotris amblyopsis		2	0.1	9.75	26.50	<0.01	0.15
Trichiurus lepturus	Atlantic cutlassfish	48	1.4	21.72	22.63	<0.01	0.75
Scomberomorus cavalla	King mackerel	1	<0.1	14.68	26.20	<0.01	0.13
Peprilus spp.		2	<0.1	23.43	8.60	<0.01	0.27
Peprilus triacanthus	Butterfish	10	0.3	25.83	4.52	<0.01	0.40
Peprilus paru	Harvestfish	11	0.4	26.66	17.63	<0.01	0.27
Bothidae sp.	Sand flounders	1	<0.1	14.40	25.20	<0.01	0.15
Citharichthys macrops	Spotted whiff	5	0.1	32.89	4.35	<0.01	0.30
Citharichthys spilopterus	Bay whiff	1,238	19.8	15.04	30.48	0.08	4.86
Etropus crossotus	Fringed flounder	666	11.7	21.99	17.73	0.04	3.37
Paralichthys sp.		1	<0.1	20.18	10.00	<0.01	0.13
Paralichthys dentatus	Summer flounder	134	2.1	18.73	19.58	0.01	7.29
Paralichthys albigutta	Gulf flounder	118	4.1	20.79	15.81	0.01	0.67
Paralichthys lethostigma	Southern flounder	895	20.1	10.36	34.42	0.06	11.30

Scientific Name	Common Name	Number Collected	Collection Frequency	S_u (psu)	km_u (km)	CPUE (No./100 m^2)	
						Average	Maximum
Paralichthys squamilentus	Broad flounder	2	0.1	34.11	2.39	<0.01	0.17
Scophthalmus aquosus	Windowpane	2	0.1	26.93	4.01	<0.01	0.17
Ancylopsetta quadrocellata	Ocellated flounder	65	1.9	26.88	9.27	<0.01	0.58
Symphurus plagiusa	Blackcheek tonguefish	636	12.5	11.94	27.46	0.04	3.00
Symphurus civitatium	Offshore tonguefish	7	0.2	13.06	22.85	<0.01	0.27
Trinectes maculatus	Hogchoker	4,152	28.7	4.41	44.88	0.26	15.11
Achirus lineatus	Lined sole	512	12.2	13.99	19.88	0.03	4.61
Aluterus schoepfii	Orange filefish	1	<0.1	26.27	5.90	<0.01	0.15
Stephanolepis hispidus	Planehead filefish	50	1.6	29.66	6.47	<0.01	1.20
Sphoeroides nephelus	Southern puffer	221	6.5	19.02	18.63	0.01	1.08
Sphoeroides spengleri	Bandtail puffer	3	0.1	28.60	7.77	<0.01	0.15
Chilomycterus schoepfii	Striped burrfish	68	2.4	24.27	11.55	<0.01	0.75

<u>Density-weighted distribution (river-kilometer) results</u>

Density-weighted distribution analyses emphasized pseudo-species that were newly recruited into the LSJR and/or that were not highly mobile, resulting in most of the presented pseudo-species having been collected with 21.3-m seines and 6.1-m otter trawls (*Appendix 3*). Analyses were conducted on pseudo-species that were found throughout the LSJR, from multiple life history strategies (tidal river resident, offshore spawners, near shore spawners, and estuarine spawners), and from multiple seasons.

Each of the life-history strategies assessed included taxa and pseudo-species that used all sections of the LSJR study area. Pseudo-species within the offshore and nearshore spawners tended to be distributed as far upstream (centers of abundance from 11.3-41.6 km and 18.5-51.2 km in 21.3-m seine and trawl collections, respectively) as estuarine spawners (22.0-40.9 km and 13.1-60.2 km) and tidal river residents (11.6-61.6 and 30.6-53.4 km; *Appendix 3*). Similarly, there were no overall trends between mainstem and tidal tributary habitats; there were pseudo-species with centers of abundance below 6.0 km and above 50 km for both mainstem and tidal tributary habitats (*Appendix 3*).

Eight pseudo-species collected with 21.3-m seines, from *Appendix 3*, were selected for graphical presentation (*Figure 8*). Of these, the three tidal-river resident pseudo-species (bluegill, *L. macrochirus*; rainwater killifish, *L. parva*; largemouth bass, *M. salmoides*) were generally found in the upper reaches of the study area (>river-km 40; *Figure 8*), areas that typically had lower salinity ranges (*Table 1*, *Table 2*). Mean river-kilometers of bluegill were similar for collections from both MS and TT habitats. Rainwater killifish were collected exclusively from the most upper reaches of the study area (≥48 km) in May and June and, therefore had a relatively small range of distribution within the study area for both the MS and TT collections. Largemouth bass had a larger range in distribution than either the blue gill or rainwater killifish; in May, MS habitat collections had occurrences slightly downriver of collections from TT habitats, likely due to the lack of TT habitats between river-km 25 and river-km 45 (*Figure 1*). Each of the four offshore-spawning, estuary-dependent pseudo-species presented here (pinfish, *L. rhomboides*; spot, *L. xanthurus*, striped mullet, *M. cephalus*; white shrimp, *L. setiferus*) had broad distributions in both MS and TT habitats (*Figure 8*). Centers of distribution for each of these pseudo-species in TTs were downstream of the mean river-km for MS habitat, indicating that these pseudo-species were recruiting to habitats in both the downstream TT and in more upstream MS areas. Pigfish (*O. chrysoptera*), an estuarine/nearshore spawner, also had a broad distribution in both MS and TT habitats (*Figure 8*) with their TT center of distribution being further downstream in the estuary than their MS center of distribution

The six pseudo-species collected with 6.1-m otter trawls that were selected for graphical presentation (*Figure 9*) each had broad ranges of distributions in both MS and TT habitats. Hogchoker (*T. maculatus*), a tidal-river resident, had a broader distribution and a center of distribution further downstream in TT habitats than in MS habitats. Three of the four offshore-spawning, estuarine-dependent pseudo-species (Atlantic croaker, *M. undulatus*; white shrimp, *L. setiferus*; brown shrimp, *F. aztecus*) had similar centers of abundance between MS and TT habitats, but slightly broader distributions in the MS habitats (*Figure 9*). Spot (*L. xanthurus*) had a slightly higher mean distribution in TT habitats, indicating the utilization of both upstream tributary habitats and more downstream mainstem habitats. Bay anchovy (*A. mitchilli*), an estuarine spawner, had broad distributions within the LSJR study area and centers of abundance that were similar for MS and TT habitats (*Figure 9*).

Additional density-weighted distribution (river-kilometer) statistics for select pseudo-species can be found in the *Species Profiles* section of this report as well as in *Appendix 3*.

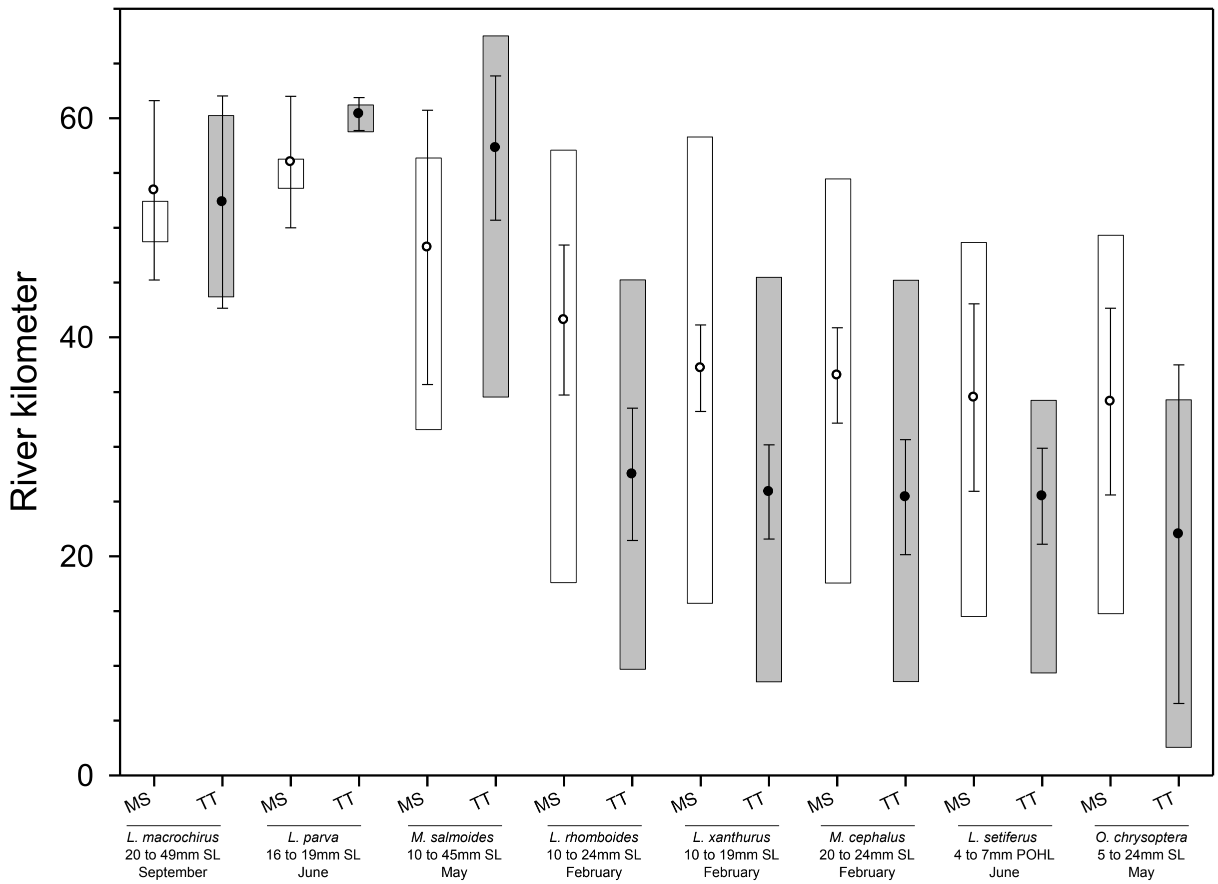


Figure 8. Density-weighted distribution (river-kilometer) statistics for eight pseudo-species collected with 21.3-m seines in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

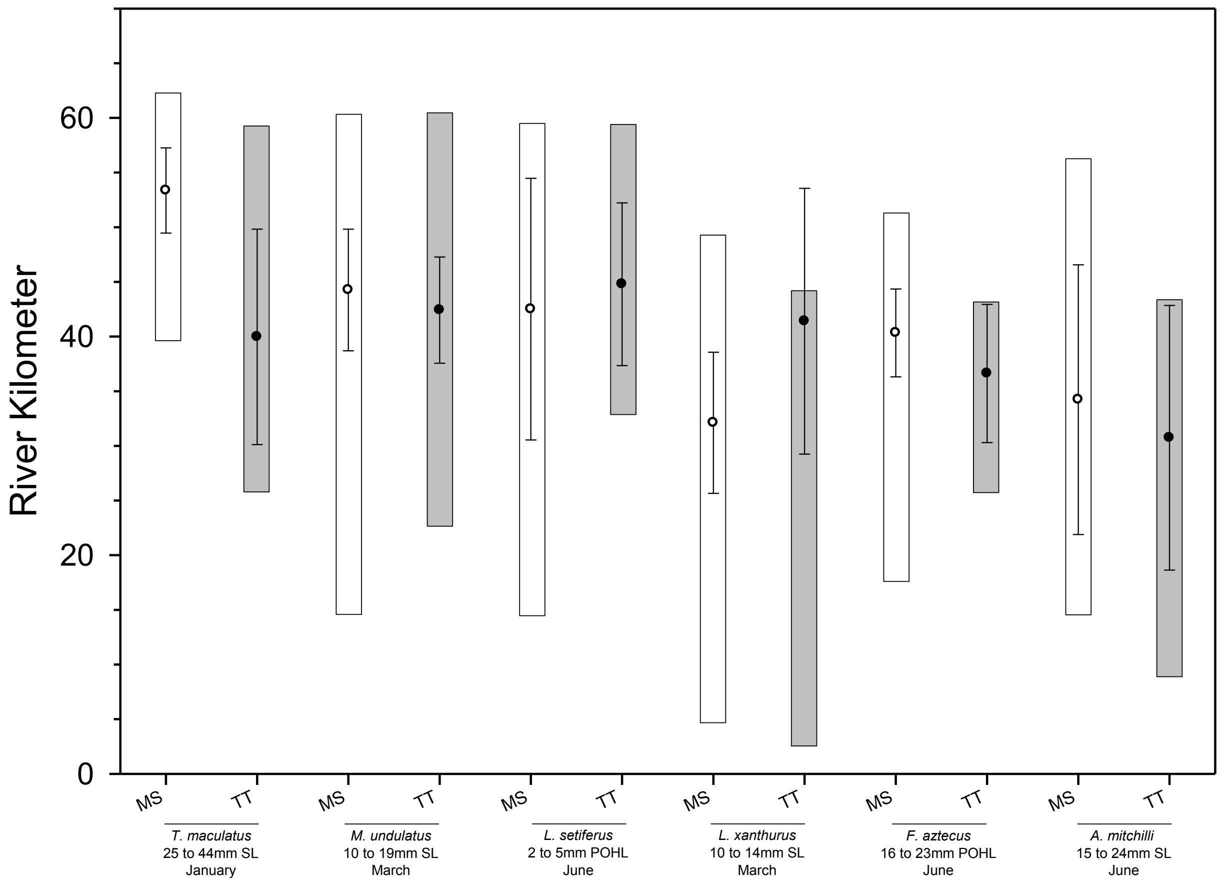


Figure 9. Density-weighted distribution (river-kilometer) statistics for six pseudo-species collected with 6.1-m otter trawls in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

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Density-weighted salinity results

Density-weighted salinity analyses emphasized pseudo-species that were newly recruited into the LSJR and/or that were not highly mobile, resulting in most of the presented pseudo-species having been collected with 21.3-m seines and 6.1-m otter trawls (*Appendix 3*). Analyses were conducted on pseudo-species that were found throughout the LSJR, from multiple life history strategies (tidal river resident, offshore spawners, near shore spawners, and estuarine spawners), and from multiple seasons.

Pseudo-species from each of the life history strategies were collected from a wide range of the available salinities in the LSRJ study area. Over 63% of the pseudo-species assessed had density-weighted salinity values less than 12 psu, underscoring the critical importance of these lower salinity habitats in the LSJR study area (*Appendix 3*). Tidal river residents tended to have the smallest 10-90 percentile range (average range <8 psu) while the offshore and nearshore spawners had the largest (>16 psu; *Appendix 3*). With the exception of estuarine spawners collected with 21.3-m seines (minimum density-weighted salinity of 7.9 psu), all life history stages had at least one pseudo-species where the density-weighted salinity was less than 5 psu. There were no over-arching trends between mainstem and tidal tributary habitats (*Appendix 3*). Pseudo-species in each habitat type had average density-weighted salinities ranging from freshwater (0.4 psu, tidal tributaries) and oligohaline (0.5 psu, mainstem) to euhaline (≥30 psu) and similar 10–90 percentile ranges (average range of 14.7 and 15.0 for mainstem and tidal tributaries, respectively).

Eight pseudo-species collected with 21.3-m seines, from *Appendix 3*, were selected for graphical presentation (*Figure 10*). The three tidal-river resident pseudo-species (bluegill, *L. macrochirus*; rainwater killifish, *L. parva*; largemouth bass, *M. salmoides*) presented here were associated with low salinity habitats (<10 psu; *Figure 10*). Bluegill in September were occasionally collected from salinities as high as 3 psu, but the density-weighted mean salinity values were <1 psu for both MS and TT habitats. Rainwater killifish collected in June had a density-weighted mean salinity <1 psu in MS habitats (10– 90 percentile range of 1psu), but a higher density-weighted mean salinity (5.6 psu) in TT habitats (10–90 percentile range of 4 psu). Largemouth bass collected in May had very similar density-weighted mean salinity values for both MS and TT habitats (5.8 and 3.9 psu, respectively). The four offshore-spawning, estuary-dependent pseudo-species presented here (pinfish, *L. rhomboides*; spot, *L. xanthurus*, striped mullet, *M. cephalus*; white shrimp, *L. setiferus*) were collected over a broad range of salinities in both MS and TT habitats (*Figure 10*). The density-weighted mean salinity values for each of these four pseudo-species were higher by ≥2.9 psu in the TTs than in the MS, indicating that these pseudo-species were using higher salinity, tidal tributary habitats that are closer to the river mouth and lower salinity, mainstem habitats that are further upstream (*Figure 8*, *Table 1*, *Table 2*). Pigfish (*O. chrysoptera*), an estuarine/nearshore spawner, also occurred over a broad range of salinities and had a density-weighted mean salinity that was higher (3.3 psu) in TT than in MS habitats (*Figure 10*).

The six pseudo-species collected with the 6.1-m otter trawl that were selected for graphical presentation occurred over a broad range of salinities (*Figure 11*). The majority of hogchoker (*T. maculatus*), a tidal-river resident, were collected at salinities of less than 6 psu in TT habitats and less than 1 psu in MS habitats. The four offshore-spawning, estuarine-dependent pseudo-species presented here (Atlantic croaker, *M. undulatus*; white shrimp, *L. setiferus*, spot, *L. xanthurus*; brown shrimp, *F. aztecus*) generally had broad ranges in salinity distribution (*Figure 11*). The density-weighted salinity values for Atlantic croaker were similar for MS and TT habitats (4.5 and 5.3, respectively). White shrimp and spot had slightly lower density-weighted mean salinity values (5.9 and 3.6 psu, respectively) in TT habitats than in MS habitats (*Figure 11*). Brown shrimp had a slightly higher density-weighted mean salinity in TT habitats than in MS habitats (2.7 psu). Bay anchovy (*A. mitchilli*), an estuarine spawner, occurred over a broad range of salinities within the LSJR study area, with the range being larger and the density-weighted mean being lower (3.1 psu) in TT habitats than in MS habitats (*Figure 11*).

Additional density-weighted salinity statistics for select pseudo-species can be found in the *Species Profiles* section of this report as well as in *Appendix 3*.

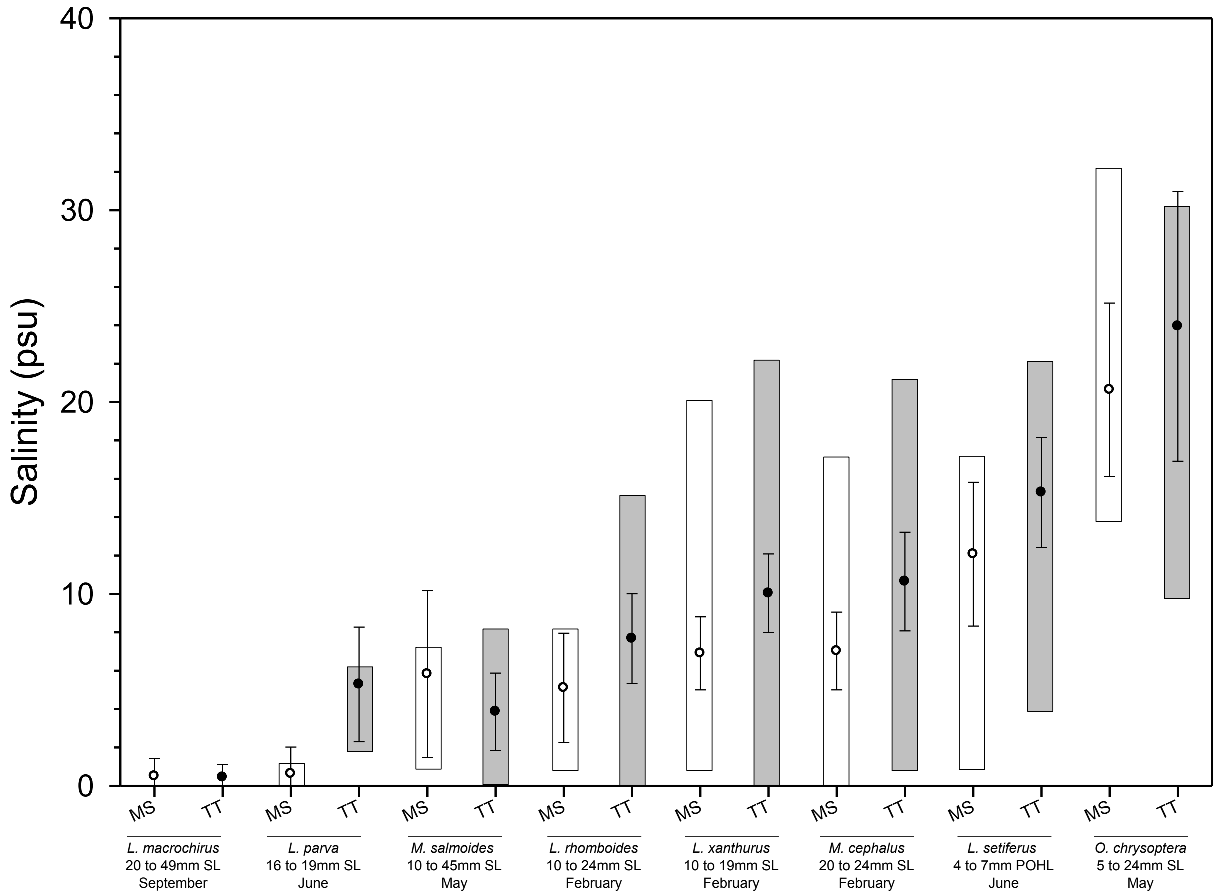

Figure 10. Density-weighted salinity statistics for eight pseudo-species collected with 21.3-m seines in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections. The absence of a 10th – 90th percentile boxes for *L. macrochirus* indicates that the 10th and 90th percentiles were the same value (0 psu).

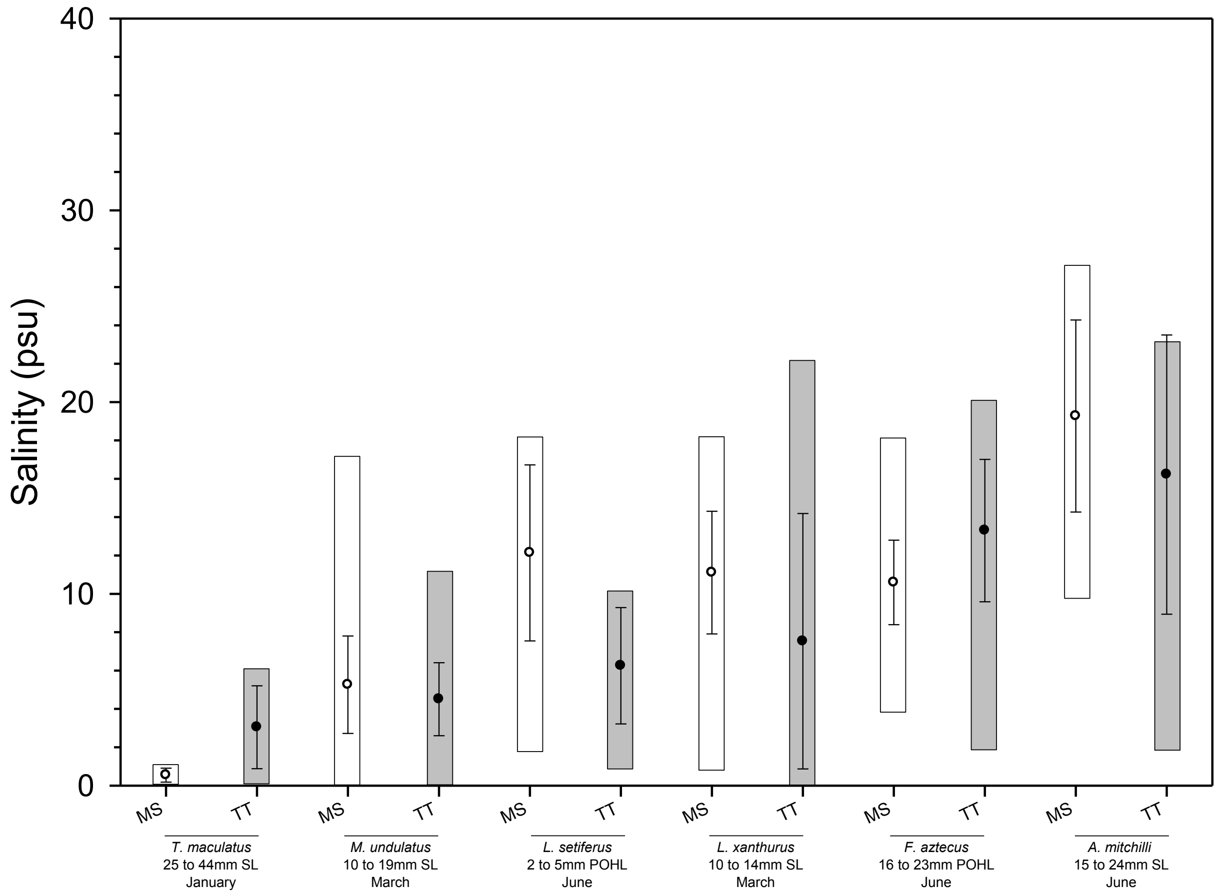

Figure 11. Density-weighted salinity statistics for six pseudo-species collected with 6.1-m otter trawls in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections

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Species Profiles

In the following section, we have summarized pseudo-species data for various abundant and frequently occurring species collected in the LSJR in terms of annual and seasonal abundance, spatial distribution, distribution in relation to salinity, and habitat associations (shoreline type, bottom type, and bottom vegetation type). Habitat associations were only summarized for 21.3-m and 183-m seines as these were shoreline-associated sampling gears where the shore and bottom habitat could be easily assessed. Water depth was included for summaries utilizing 6.1-m otter trawls where water depths tended to be greater and vary more widely than for shoreline-associated seine gears. Density-weighted salinity and distribution assessments for selected pseudo-species are also presented. All summaries and analyses included separate abundance calculations for mainstem (MS) and tidal tributary (TT) collections.

Most species included in these profiles are economically important (i.e., recreationally or commercially fished species, such as red drum and white shrimp). We also include a profile of bay anchovy which, because of its great abundance, is a key prey item for piscivorous species inhabiting the LSJR. Overview plots for additional taxa can be found by gear type in *Appendix 4* (21.3-m seines), *Appendix 5* (183-m seines), and *Appendix 6* (6.1-m otter trawls).

White shrimp, *Litopenaeus setiferus*

White shrimp range from New York to Saint Lucie Inlet, Florida on the Atlantic coast, and from the Ochlocknee River, Florida to Campeche, Mexico on the Gulf coast (Carpenter 2002). This species is of great economic importance to both the United States and Mexico. They spawn offshore and enter estuaries as postlarvae (Williams 1984). The different life stages of white shrimp all exhibit a broad range of salinity tolerance, although juvenile white shrimp have been reported to live in lower salinity waters than other commercially important penaeid shrimp (Perez-Farfante 1969).

Recruitment period

White shrimp [4-7 mm post-orbital head length (POHL)] were present throughout most of the year in the nearshore habitat sampled with 21.3-m seines, but were most abundant from June to October. During most months, abundances in TTs were greater than in MS habitats (*Figure 12*). White shrimp (2-5 mm POHL) were present from May to December in 6.1-m otter trawl collections, but were most abundant from June to October, with greatest abundances occurring in TTs (*Figure 13*). White shrimp (6-9 mm POHL) were present throughout most of the year in 6.1-m otter trawl collections, but again had highest abundances between June and October in TT habitats (*Figure 14*).

Habitat associations

White shrimp (4-7 mm POHL) sampled with 21.3-m seines were collected over the entire salinity gradient of the study area, but were more abundant in the higher salinity, downstream TT habitats of the study area (<35 km from river mouth; *Figure 12*). They were most abundant in collections along shorelines that were unvegetated or that had estuarine marshes (*Juncus* and *Spartina* spp.) lined shorelines and from substrates that were unvegetated (*Figure 12*). White shrimp (2-5 mm POH and 6-9 POHL) collected with 6.1-m otter trawls were typically more abundant in the TT habitats of the middle to upper reaches of the study area (22–70 km) within a salinity range of 4-18 psu (*Figure 13*, *Figure 14*).

Density-weighted distribution (river-kilometer)

White shrimp (4-7 mm POHL) sampled with 21.3-m seines tended to be collected further upstream in the study area in June than in July for both MS and TT habitats (*Figure 15*). White shrimp (2-5 mm POHL) sampled with 6.1-m otter trawls had similar mean distribution estimates in MS and TT collections during June, though there was a larger 10-90 percentile in MS habitats (*Figure 15*). There were distinct differences in the location of white shrimp (2-5 mm POHL) in August, with MS density-weighted mean distribution (river-km 50) occurring 15 km farther upstream than the TT density-weighted mean distribution (river-km 35; *Figure 15*). White shrimp (2-5 mm POHL) collected with 6.1-m otter trawls in September had similar mean distributions in both MS and TT habitats and were found in the middle reaches of the study area (20-45 km; *Figure 15*). Larger white shrimp (20-25 mm POHL) sampled with 6.1-m otter trawls had large 10-90 percentile ranges of distributions and, with the exception of October TTs, relatively similar density-weighted mean values in both MS and TT habitats during July, August, and October (*Figure 15*).

Additional density-weighted distribution statistics for white shrimp can be found in *Appendix 3*.

Density-weighted salinity

White shrimp (4-7 mm POHL) sampled with 21.3-m seines were collected from a broad range of salinities (1-37 psu; *Appendix 3*) during June and July with similar mean salinity estimates in both MS and TT habitats (*Figure 16*). White shrimp (2-5 mm POHL) sampled with 6.1-m otter trawls were generally collected from waters with relatively low salinity (<14 psu) during June, August, and September (*Figure 16*). The density-weighted mean salinities for white shrimp (2-5 mm POHL) in TT habitats were similar (6.3-7.6 psu) between June, August, and September (*Figure 16*) while the values for MS habitats varied considerably (2.3-12.1 psu). With the exception of TT habitats in July, larger white shrimp (20-25 mm POHL) collected in 6.1-m otter trawls tended to occur at salinities ≤10 psu during July, August, and October (*Figure 16*, *Appendix 3*).

Additional density-weighted salinity statistics for white shrimp can be found in *Appendix 3*.

Litopenaeus setiferus (White shrimp) in 21.3-m seines

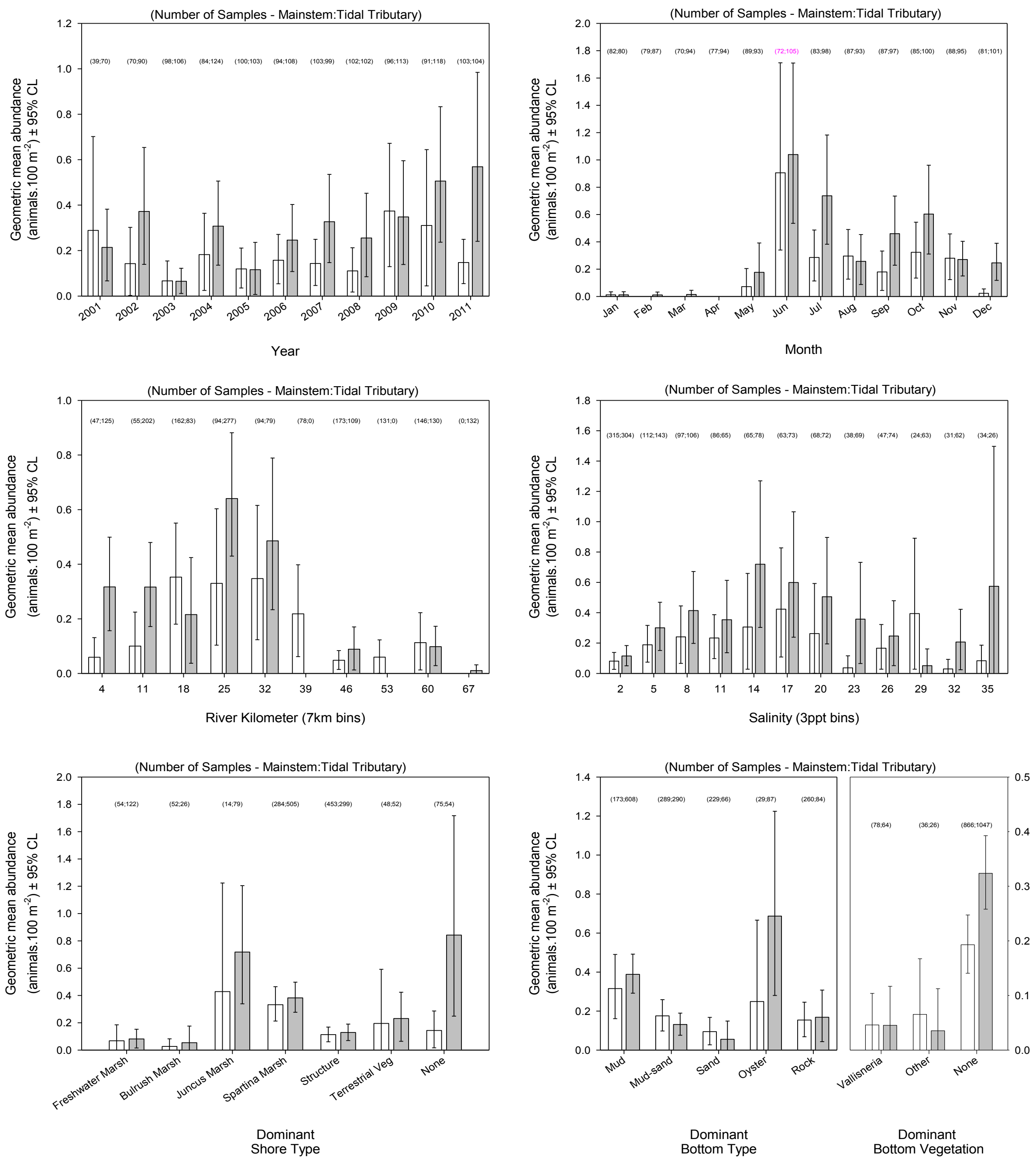

Figure 12. Relative abundance of *Litopenaeus setiferus* (white shrimp), 4 to 7 mm post-orbital head length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Litopenaeus setiferus (White shrimp) in 6.1-m trawls

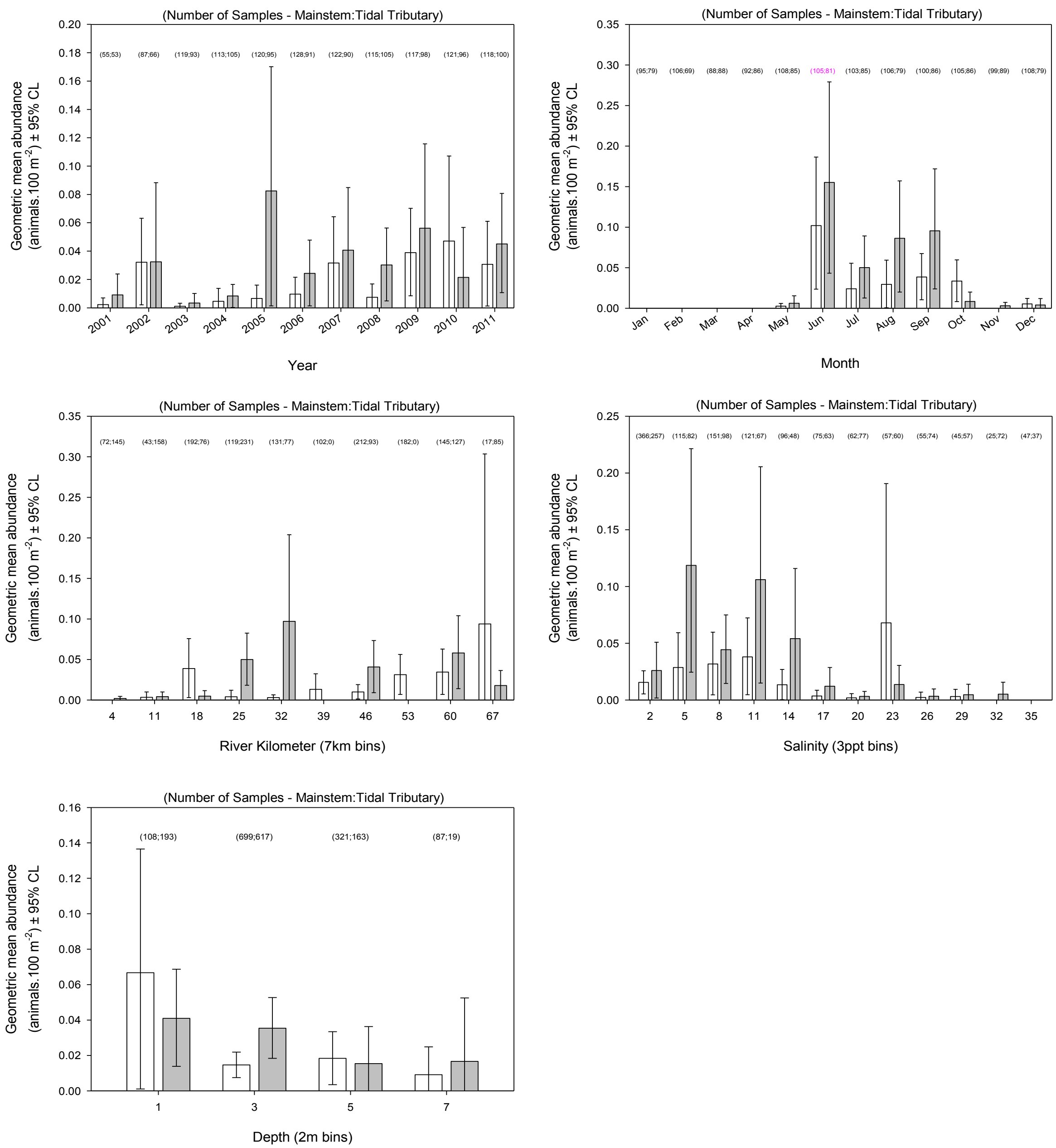

Figure 13. Relative abundance of *Litopenaeus setiferus* (white shrimp), 2 to 5 mm post-orbital head length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Litopenaeus setiferus **(White shrimp) in 6.1-m trawls**

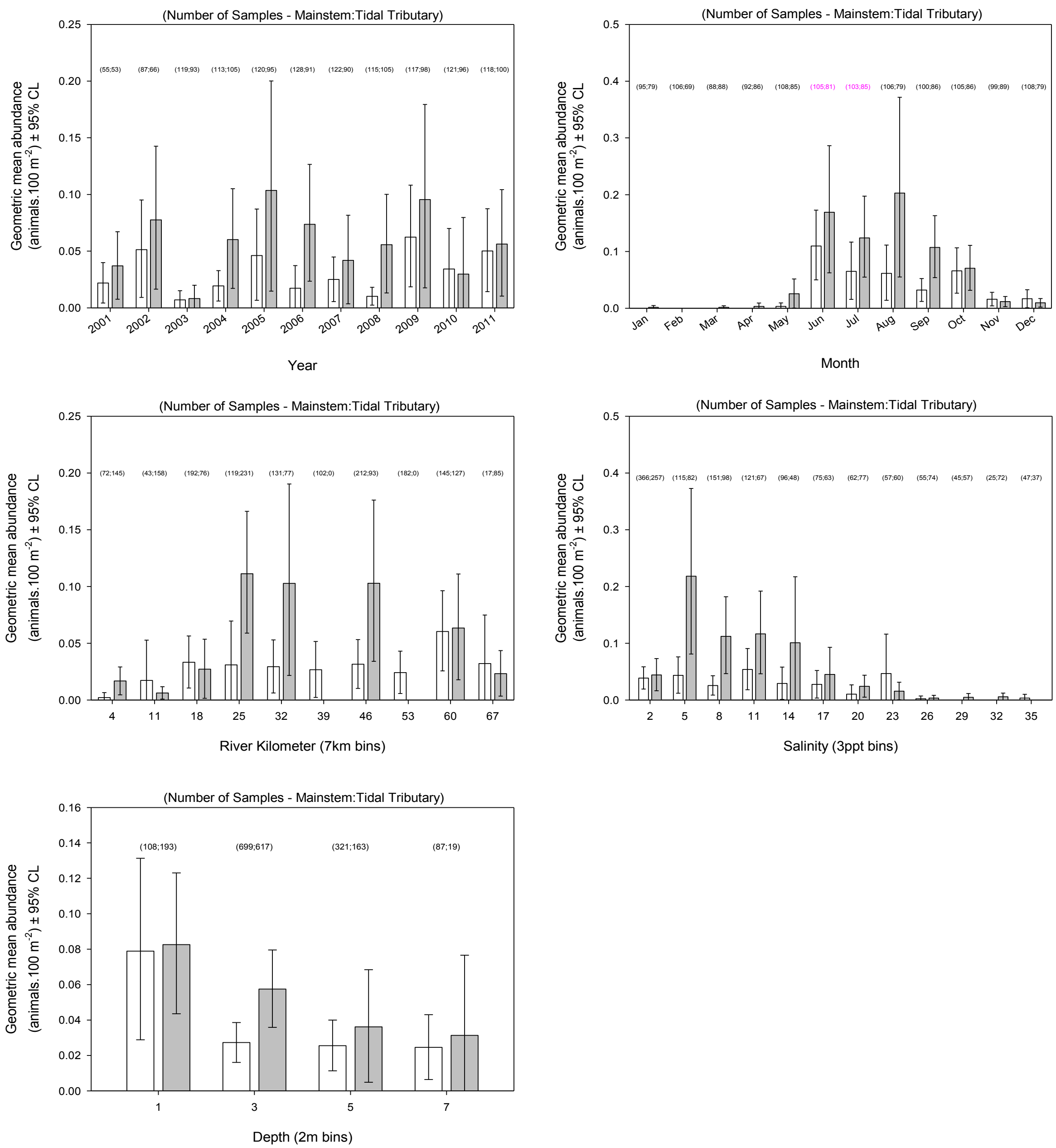

Figure 14. Relative abundance of *Litopenaeus setiferus* (white shrimp), 6 to 9 mm post-orbital head length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

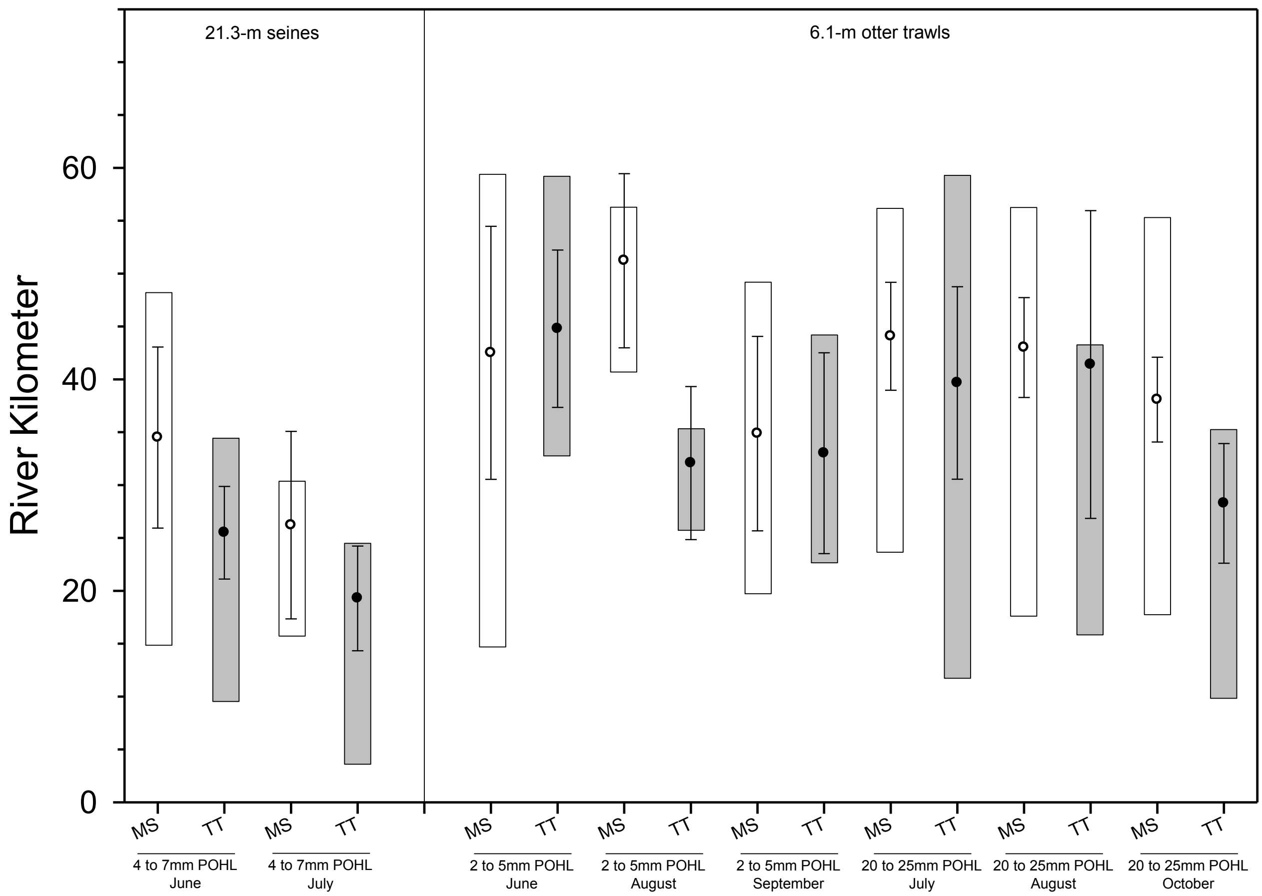

Figure 15. Density-weighted distribution (river-kilometer) statistics for *Litopenaeus setiferus* (white shrimp) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

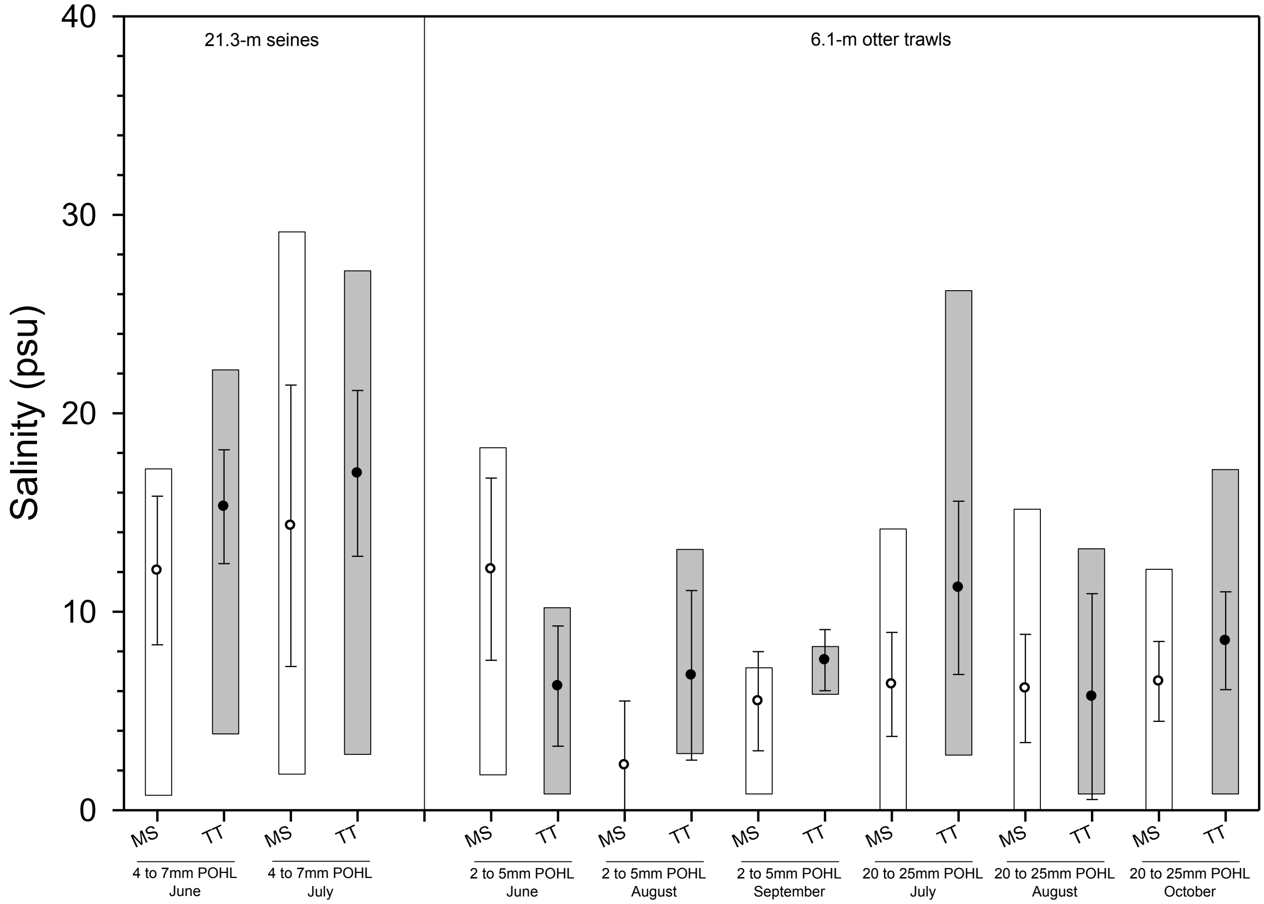

Figure 16. Density-weighted salinity statistics for *Litopenaeus setiferus* (white shrimp) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

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Blue crab, *Callinectes sapidus*

Blue crabs occur in the western Atlantic from Canada to Argentina, including Bermuda and the Antilles, and have been successfully introduced in Europe and Japan (Carpenter 2002). This species supports large commercial fisheries and is an important predator and prey species in inshore waters (Steele and Bert 1994). Blue crabs are transients in estuaries: spawning and larval development occurs in marine waters, but juveniles and adults spend most of their life history in estuaries (Steele and Bert 1994). Both larval blue crabs recruiting to the estuary and females leaving the estuary to spawn use selective tidal stream transport (STST; Olmi 1994; Tankersley *et al*. 1998) with odors emanating from estuarine and freshwater watersheds promoting settlement by triggering metamorphosis in larvae (Wolcott and De Vries 1994; Forward *et al*. 1994, 1997). Blue crabs tolerate salinities from freshwater to at least 50 psu, but optimal salinities vary among life-history stages: 12-36 psu for larvae, 2-21 psu for juveniles, less than 10 psu for adult males, and 23-33 psu for egg-bearing females (Pattillo *et al*. 1997).

Recruitment period

Blue crabs [10-119 mm carapace width (CW)] were present throughout the entire year in the nearshore habitat sampled with 21.3-m seines. During each month, the abundance in TTs was greater than in MS habitats (*Figure 17*). Blue crabs (10-59 mm CW and 50-99 mm CW) collected with 6.1-m otter trawls were also present during the entire year with higher abundance in TTs than in the MS habitats (*Figure 18*, *Figure 19*).

Habitat associations

Blue crabs (10-119 mm CW) sampled with 21.3-m seines were collected over the entire salinity gradient available (0-37 psu) and throughout most of the study area (2-67 km; *Figure 17*). No specific association with shore type, bottom type, or for the presence of bottom vegetation was evident (*Figure 17*). Blue crabs (10-59 mm CW and 50-99 mm CW) collected in 6.1-m otter trawls were found throughout the study area (2-68 km) but were most abundant in TT habitats in the middle reaches of the LSJR (22–49 km; *Figure 18*, *Figure 19*).

Density-weighted distribution (river-kilometer)

Blue crabs (10-30 mm CW) sampled with 21.3-m seines were collected throughout the study area in both MS and TT habitats, though they were not generally collected at the mouth of the LSJR. Density-weighted mean distributions were at river-km 24.2 and 31.2 for TT and MS habitats, respectively (*Figure 20*). Blue crabs (10-59 mm CW and 50-99 mm CW) sampled with 6.1-m otter trawls were also collected in both MS and TT habitats between river-km 2 and river-km 68 with centers of abundance between 30 and 40 km for both pseudo-species in both habitat types (*Figure 20*).

Additional density-weighted distribution statistics for blue crab can be found in *Appendix 3*.

Density-weighted salinity

Blue crabs (10-30 mm CW) sampled with 21.3-m seines utilized a broad range of salinities in both MS and TT habitats (*Figure 21*) and had very similar centers of abundance in both habitat types (13.4 and 13.7 psu, respectively; *Appendix 3*). Both pseudo-species (10-59 mm CW and 50-99 mm CW) analyzed from 6.1-m otter trawl collections also inhabited a broad range of salinities and had density-weighted mean salinity that ranged between 9.1 and 13.1 psu (*Figure 21*).

Additional density-weighted salinity statistics for blue crab can be found in *Appendix 3*.

Callinectes sapidus (Blue crab) in 21.3-m seines

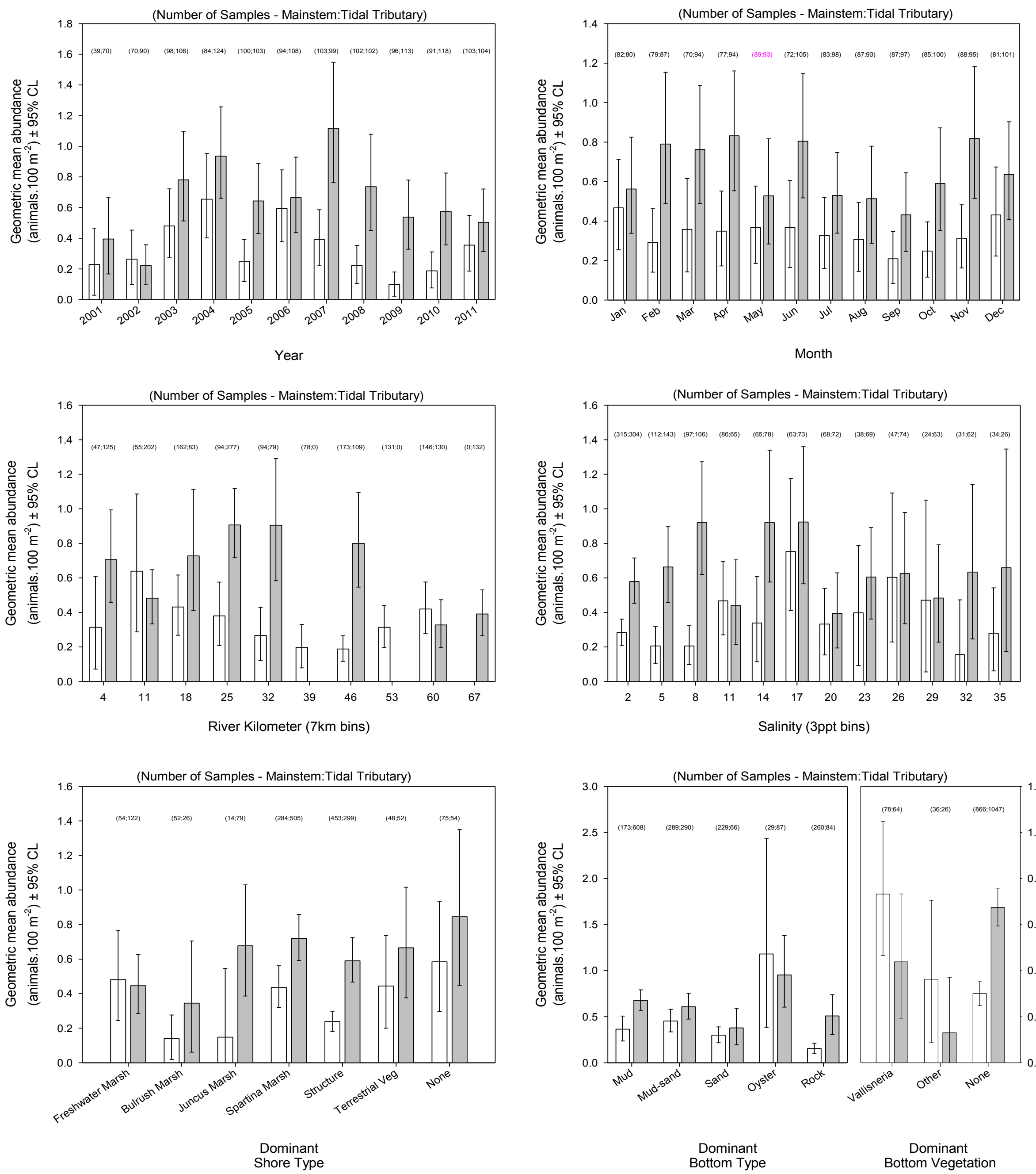

Figure 17. Relative abundance of *Callinectes sapidus* (blue crab), 10 to 119 mm carapace width, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Callinectes sapidus (Blue crab) in 6.1-m trawls

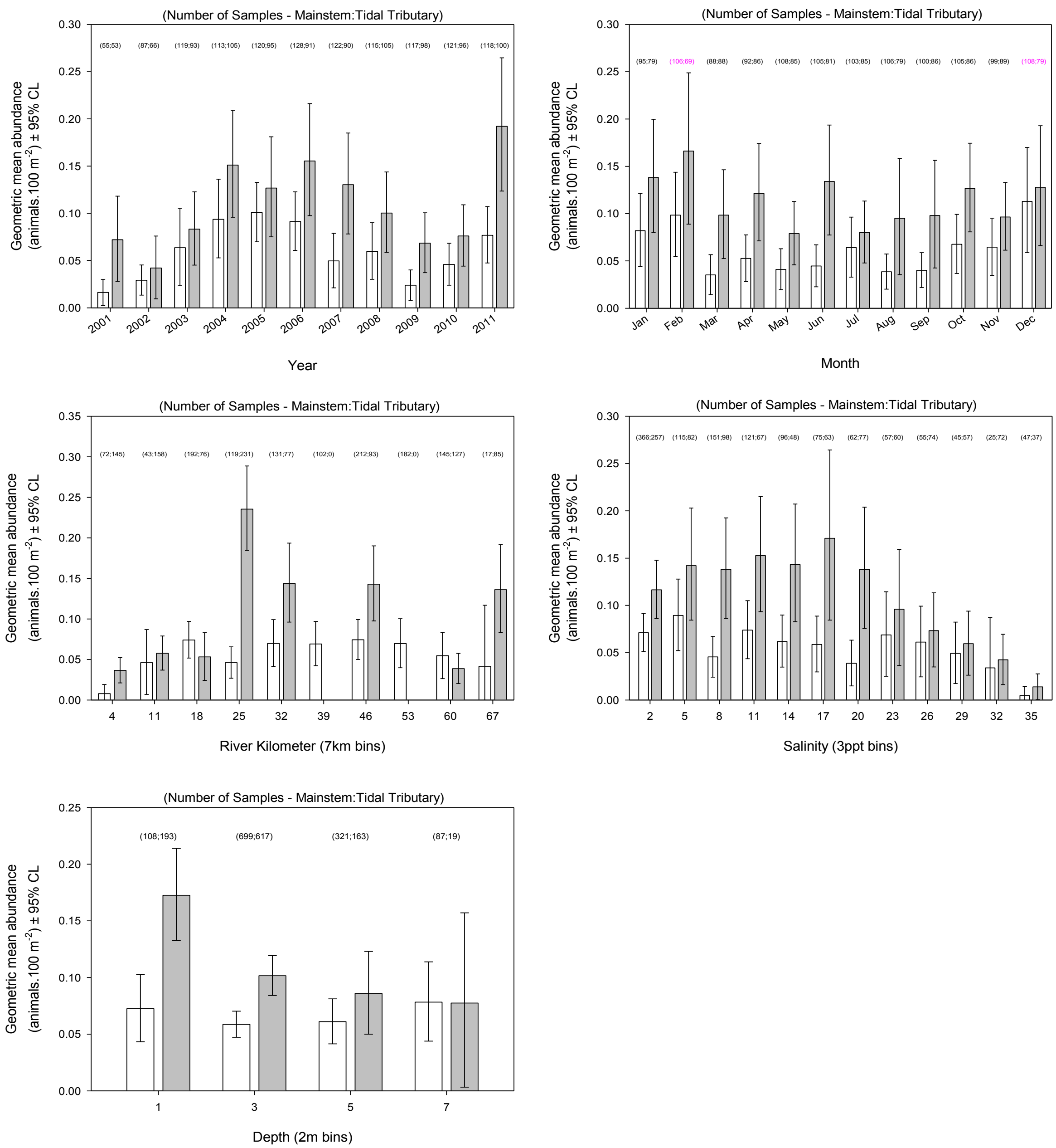

Figure 18. Relative abundance of *Callinectes sapidus* (blue crab), 10 to 59 mm carapace width, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Callinectes sapidus (Blue crab) in 6.1-m trawls

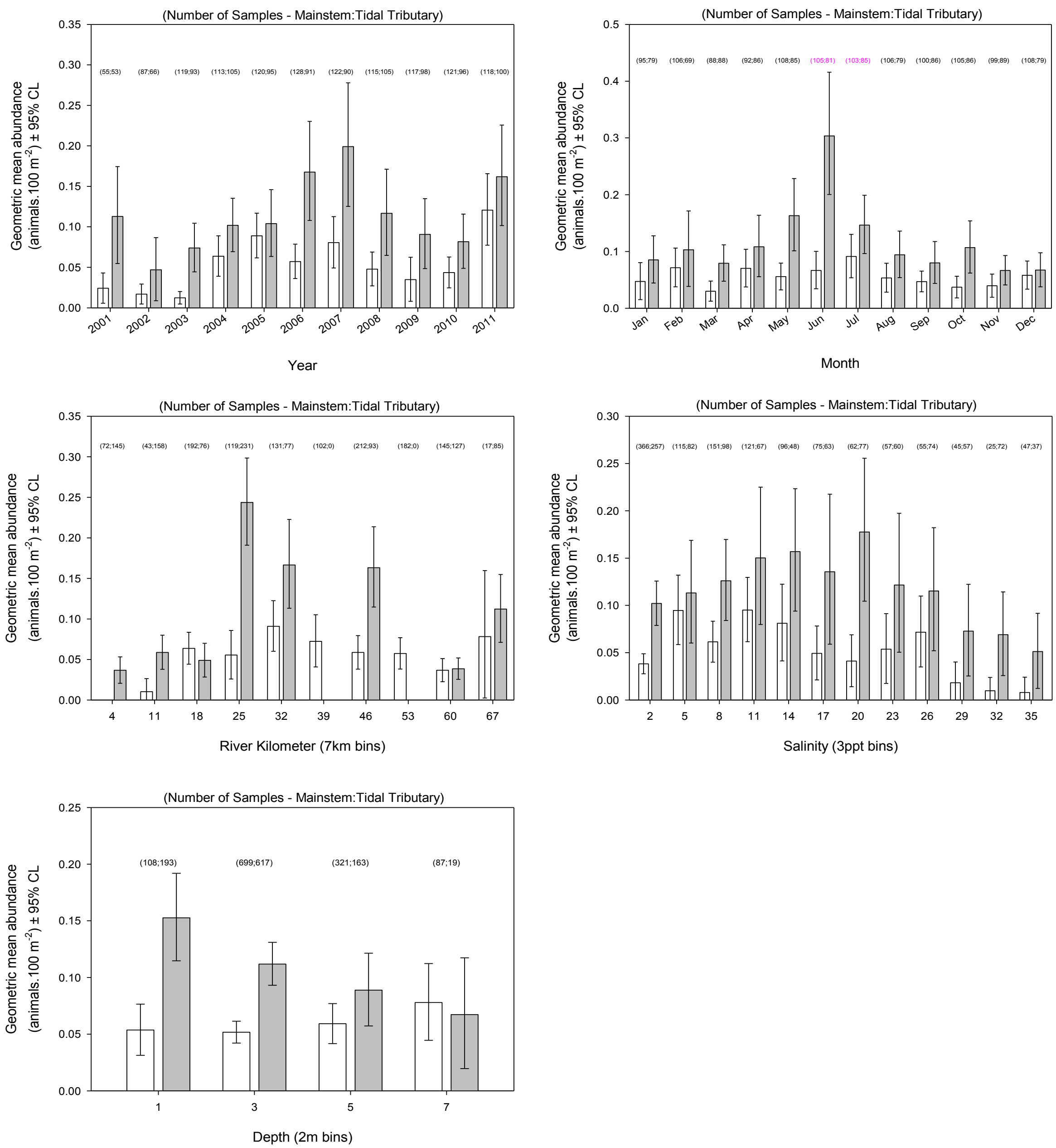

Figure 19. Relative abundance of *Callinectes sapidus* (blue crab), 50 to 99 mm carapace width, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

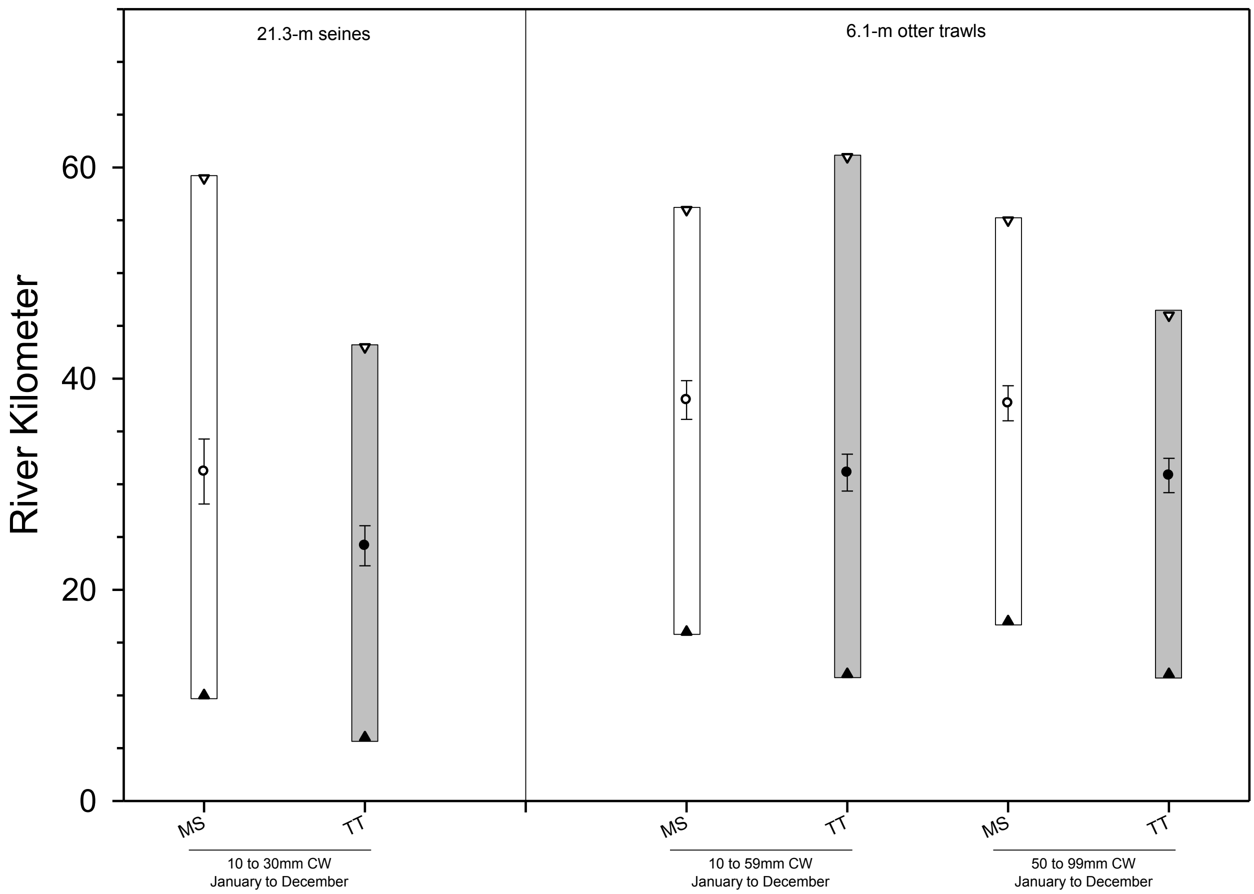

Figure 20. Density-weighted distribution (river-kilometer) statistics for *Callinectes sapidus* (blue crab) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

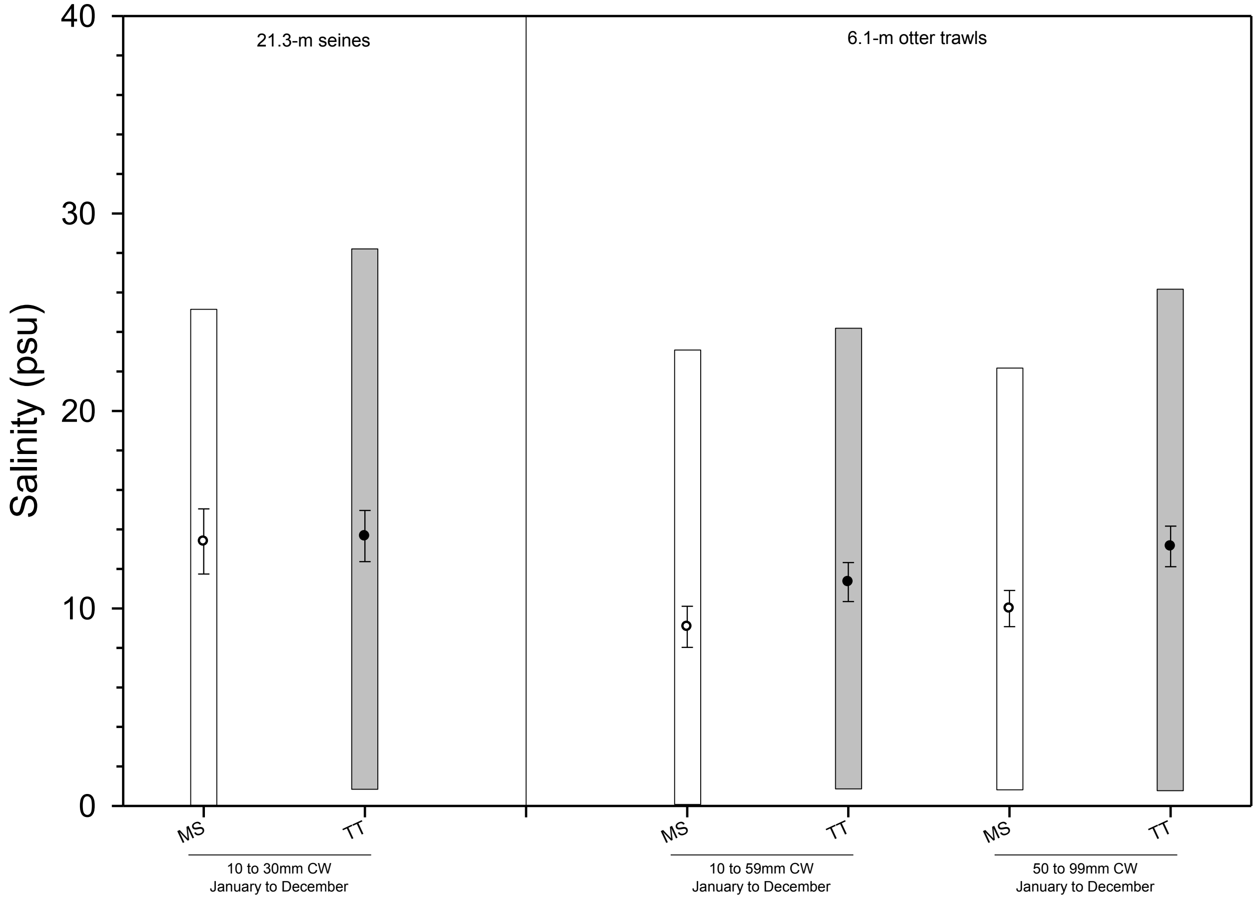

Figure 21. Density-weighted salinity statistics for *Callinectes sapidus* (blue crab) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

Bay anchovy, *Anchoa mitchilli*

Bay anchovies range from Maine to the Yucatan Peninsula and are of great importance in estuarine food chains due to their trophic position, small size, and extreme abundance (Pattillo *et al*. 1997; Carpenter 2002). They spawn in nearshore marine waters and estuaries. (Peebles *et al*. 1996; Pattillo *et al*. 1997). Larvae use selective tidal-stream transport to travel to upstream nursery areas (Schultz *et al*. 2003). All life history stages of bay anchovies exhibit a broad range of salinity tolerance (Pattillo *et al*. 1997), but have been shown to distribute differently in relation to salinity: spawning adults, eggs, and newly hatched larvae are generally found at higher salinities than later-stage larvae and juveniles (Peebles *et al*. 1991).

Recruitment period

Bay anchovies [20-29 mm standard length (SL)] were present throughout most of the year in the nearshore habitats sampled with 21.3-m seines, but were most abundant from September to December. During most months, abundance was very similar between TT and MS habitats (*Figure 22*). Bay anchovies (15-24 mm SL) collected in deeper water habitats sampled with 6.1-m otter trawls were also present throughout the entire year, but this smaller size class was more abundant earlier in the year, June to August. Abundance tended to be higher in TT habitats than in MS habitats, especially between November and March (*Figure 23*).

Habitat associations

Bay anchovies (20-29 mm SL) sampled with 21.3-m seines were collected over the entire salinity gradient of the study area, but were more abundant in the middle to upper reaches of the LSJR (22–49 km; *Figure 22*). They were not associated with any particular shoreline habitat; being collected along all shorelines sampled. Although collected from all bottom types, they tended to be associated with unvegetated bottom substrates that were not sandy (*Figure 22*). Bay anchovies (15-24 mm SL) collected in 6.1-m otter trawls were more abundant in TT habitats and in the middle to upper reaches of the study area (22–70 km; *Figure 23*).

Density-weighted distribution (river-kilometer)

Bay anchovies (20-29 mm SL) sampled with 21.3-m seines in October and November tended to occur further upstream in MS habitats than in TT habitats (*Figure 24*), with centers of abundance for MS habitats being approximately 10 km further upstream than those for TT habitats. The November centers of abundance for both MS and TT habitats was slightly upstream (~4 km) from the October centers of abundance (*Figure 24*). Bay anchovies (15-24 mm SL) collected in 6.1-m otter trawls from June to December were collected from river-km 1 to river-km 67 with centers of abundance ranging from 30.7 km (June MS habitat) to 60.2 km (December TT habitat; *Figure 24*, *Appendix 3*). There were no obvious trends in distribution, though the center of distribution in TT habitats was generally further upstream than in MS habitats between September and December (*Figure 24*). The center of distribution for TT habitats in December (60.2 km) was more than 23 km upstream of the center of distribution for MS habitats (*Figure 24*).

Additional density-weighted distribution statistics for bay anchovy can be found in *Appendix 3*.

Density-weighted salinity

Bay anchovies (20-29 mm SL) sampled with 21.3-m seines in October and November were collected over a broad range of salinities in both MS and TT habitats with density-weighted mean salinity values ranging from 7.9 to 12.2 psu (*Figure 25*, *Appendix 3*). There was a general decrease in density-weighted mean salinity for bay anchovies (15-24 mm SL) collected in 6.1-m otter trawls from June (16-20 psu) to August (4-9 psu) in both MS and TT habitats. From June to August, TT habitats had a slightly lower density-weighted mean salinity and larger 10-90 percentile ranges than did MS habitats (*Figure 25*). Density-weighted mean salinity between MS and TT habitats differed by more than 14 psu during October (*Figure 25*).

Additional density-weighted salinity statistics for bay anchovy can be found in *Appendix 3*.

Anchoa mitchilli (Bay anchovy) in 21.3-m seines

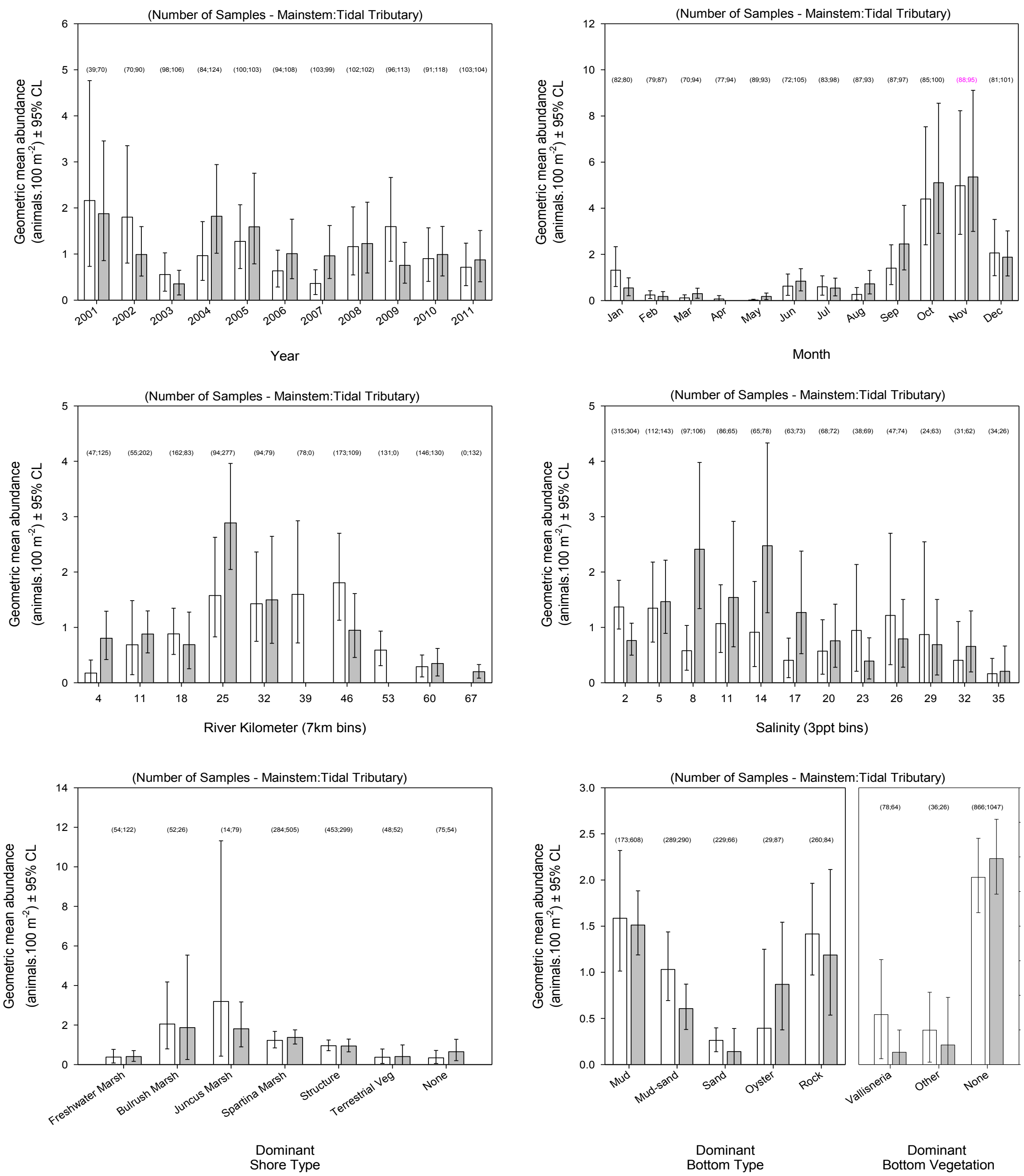

Figure 22. Relative abundance of *Anchoa mitchilli* (bay anchovy), 20 to 29 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Anchoa mitchilli (Bay anchovy) in 6.1-m trawls

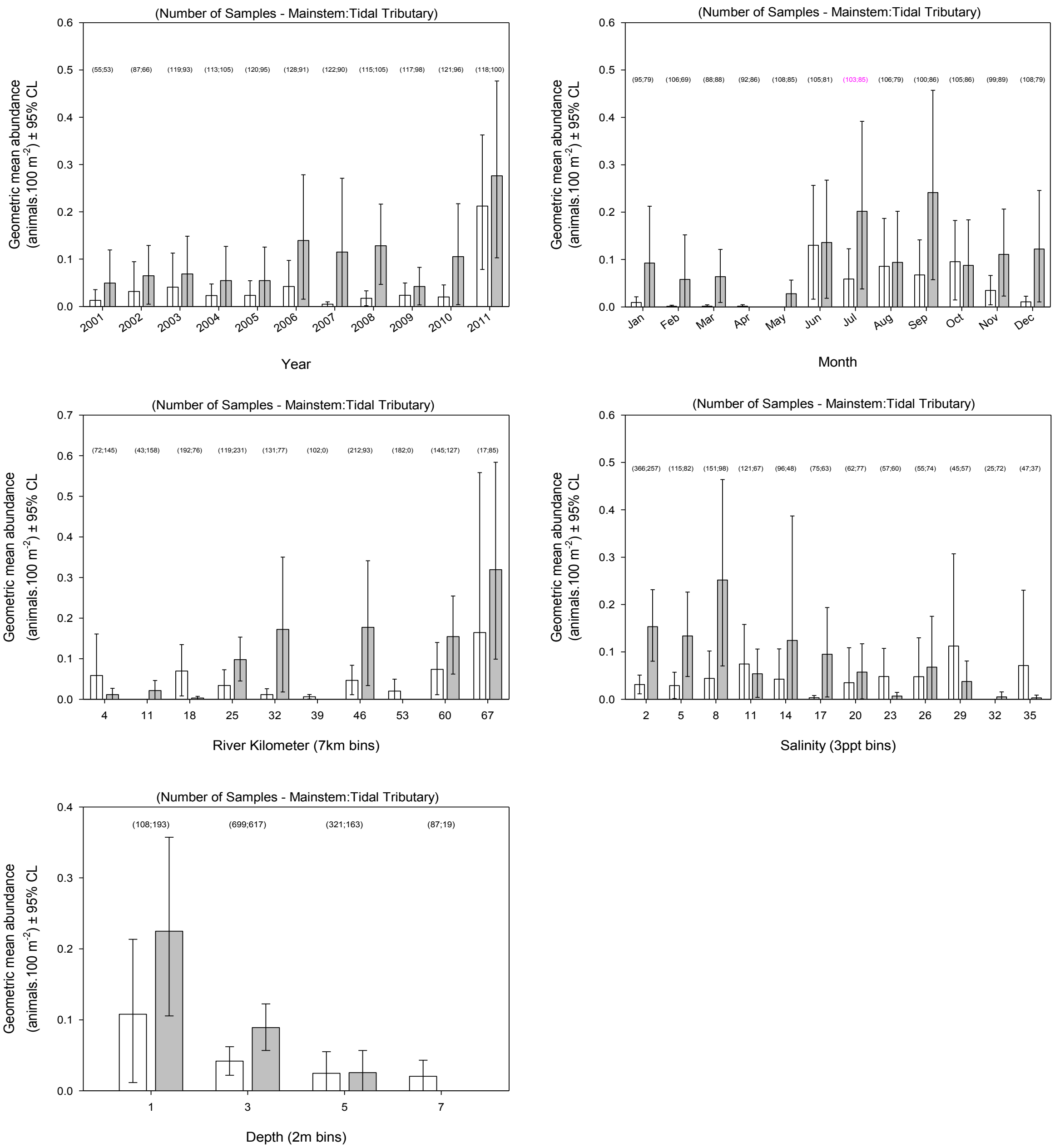

Figure 23. Relative abundance of *Anchoa mitchilli* (bay anchovy), 15 to 24 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

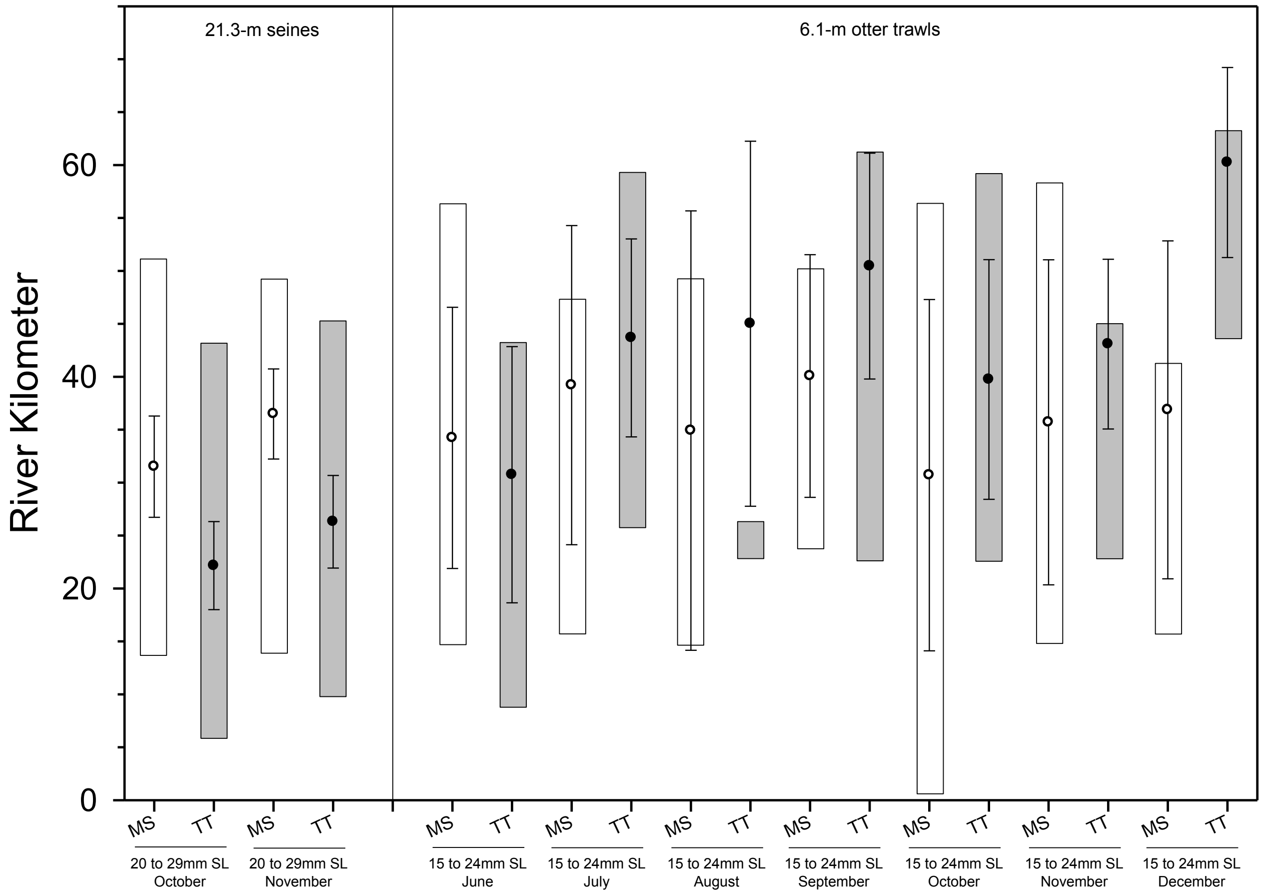

Figure 24. Density-weighted distribution (river-kilometer) statistics for *Anchoa mitchilli* (bay anchovy) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

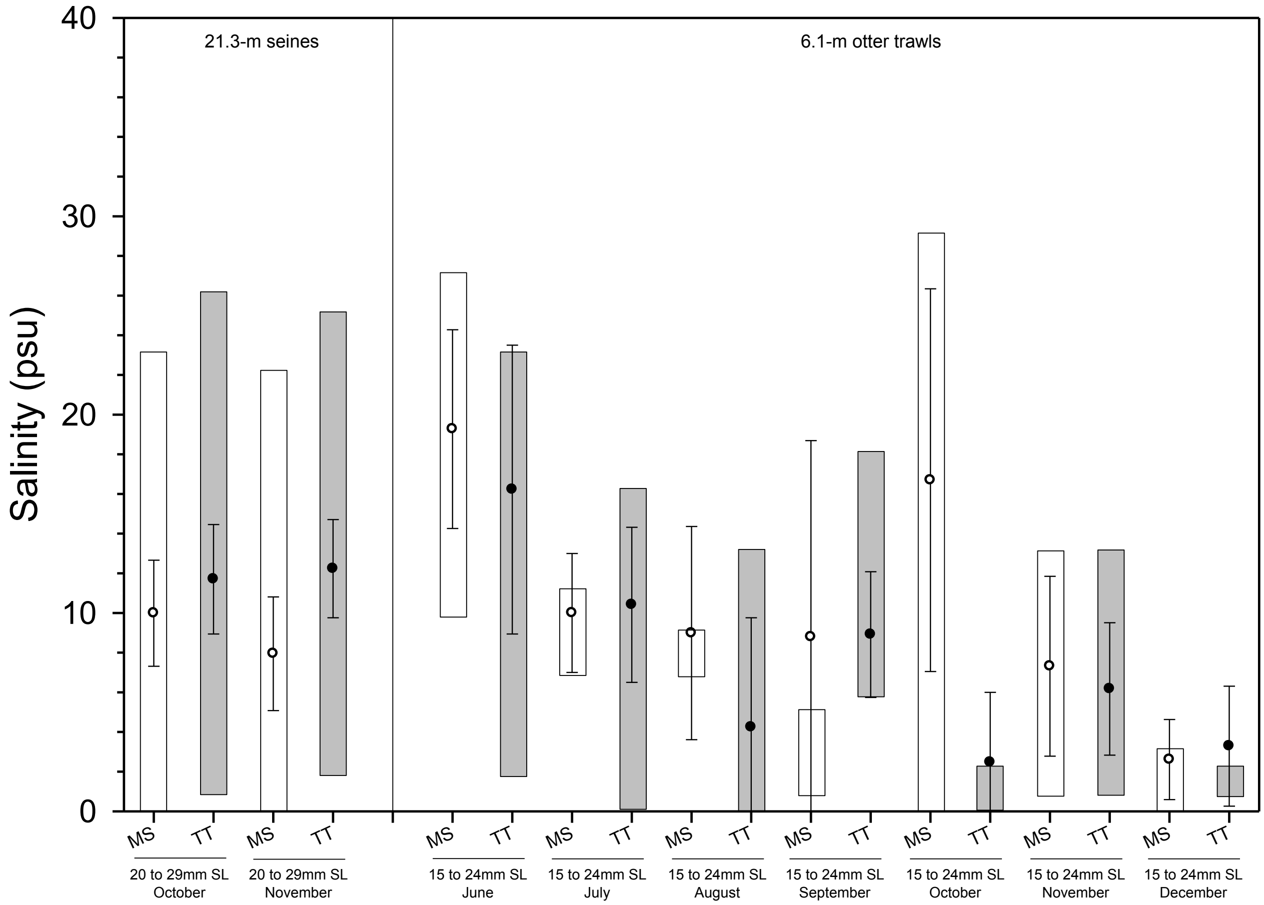

Figure 25. Density-weighted salinity statistics for *Anchoa mitchilli* (bay anchovy) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

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Largemouth bass, *Micropterus salmoides*

Largemouth bass are native to Atlantic drainages from North Carolina to Florida and in the Gulf of Mexico drainages from South Florida to Mexico (Page and Burr 1991). This species has been widely introduced throughout the U.S and Canada. Largemouth bass are among the most popular sport fish in the world. Spawning occurs entirely within freshwater.

Recruitment period

Largemouth bass (10-29 mm SL) were collected in the nearshore habitats sampled with 21.3-m seines from March to July, but were most abundant during April, May, and June in TT habitats (*Figure 26*).

Habitat associations

Largemouth bass (10-29 mm SL) were most abundant in nearshore TT habitats with salinities of 12.0 psu or less, upstream of river-km 29 in the study area (*Figure 26*). Largemouth bass (10-29 mm SL) abundance was associated with freshwater marsh shorelines and sandy or muddy substrates that had some submerged vegetation present (*Figure 26*).

Density-weighted distribution (river-kilometer)

Three pseudo-species of largemouth bass were analyzed from 21.3-m seine collections (*Figure 27*). Largemouth bass (10-35 mm SL) collected in April had centers of abundance located in the furthest upstream habitats of the study area (≥river-km 54; *Figure 27*). Very few animals (n=3) were collected in the MS habitat during this month (*Appendix 3*), accounting for the absence of a confidence interval (CI) and 10-90 percentile range (*Figure 27*). Largemouth bass (10-45 mm SL) collected in May and 10-65 mm SL largemouth bass collected in June had greater ranges of distribution than did the pseudo-species in April, but still had centers of distribution in the most upstream areas of the study area (>river-km 48; *Figure 27*).

Additional density-weighted distribution statistics for largemouth bass can be found in *Appendix 3*.

Density-weighted salinity

Density-weighted mean salinity values for largemouth bass (10-35 mm SL) collected in 21.3-m seines during April were ≤2.5 psu and 80% of the population occupied a very small salinity range (1-3 psu; *Figure 28*). Largemouth bass (10-45 mm SL) collected in May occupied a slightly greater 10-90 percentile salinity range (0-8 psu) in both MS and TT habitats with mean salinity estimates of 5.8 and 3.9 psu, respectively (*Figure 28*). Largemouth bass (10-65 mm SL) collected in TTs in June were distributed over a similar salinity range and had a density-weighted mean salinity of 3.3 or less (*Appendix 3*, *Figure 28*).

Additional density-weighted salinity statistics for largemouth bass can be found in *Appendix 3*.

Micropterus salmoides (Largemouth bass) in 21.3-m seines

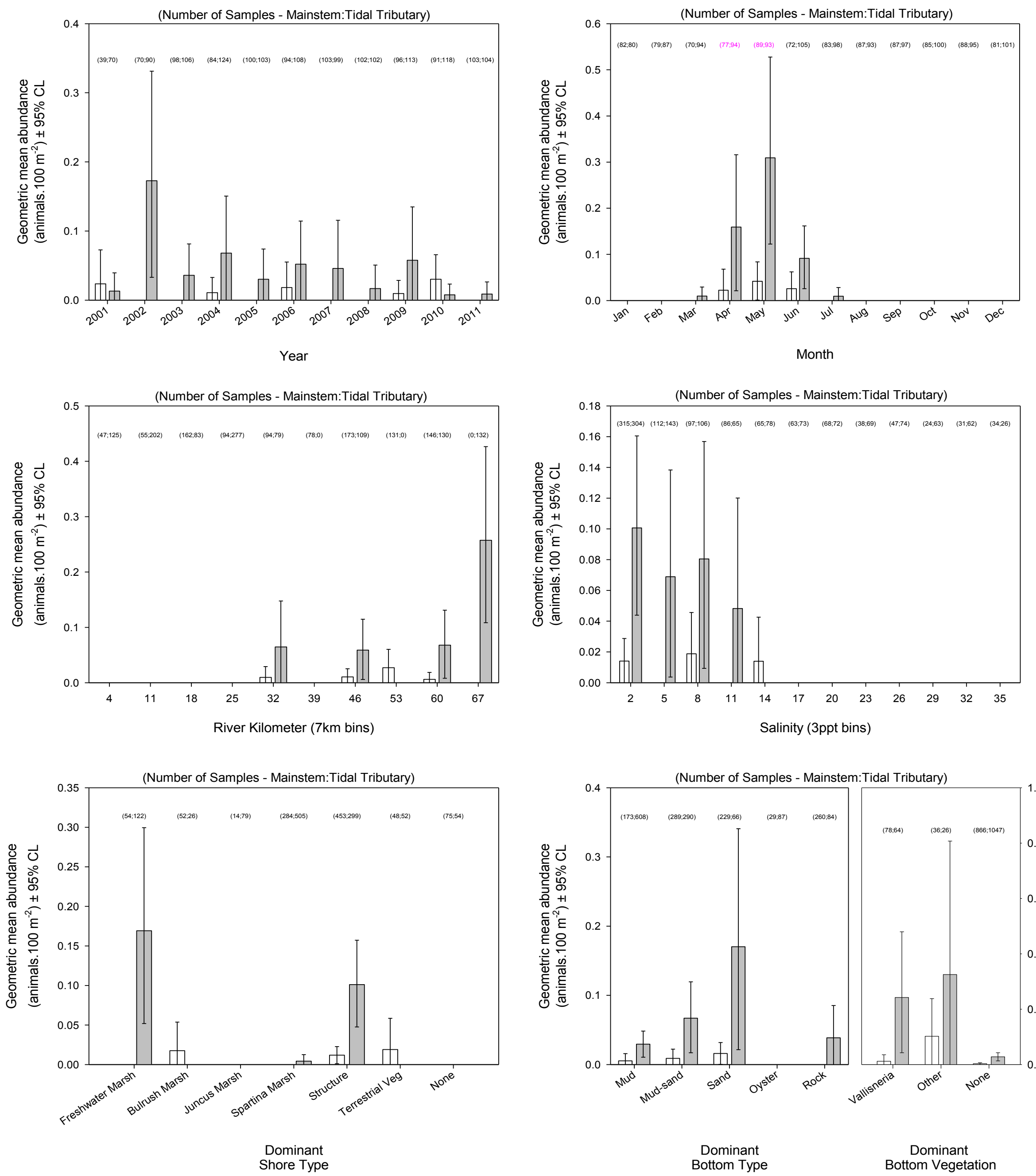

Figure 26. Relative abundance of *Micropterus salmoides* (largemouth bass), 10 to 29 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

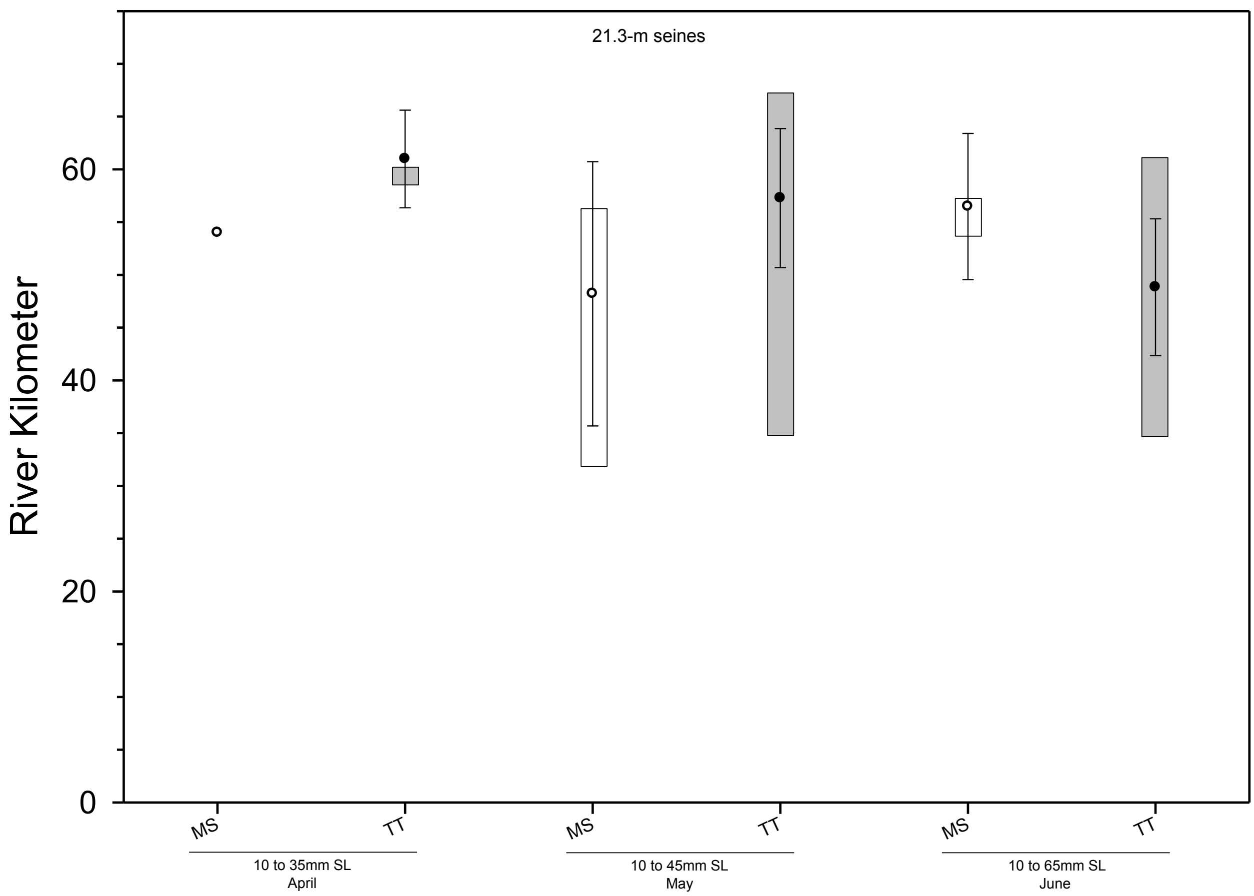

Figure 27. Density-weighted distribution (river-kilometer) statistics for *Micropterus salmoides* (largemouth bass) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

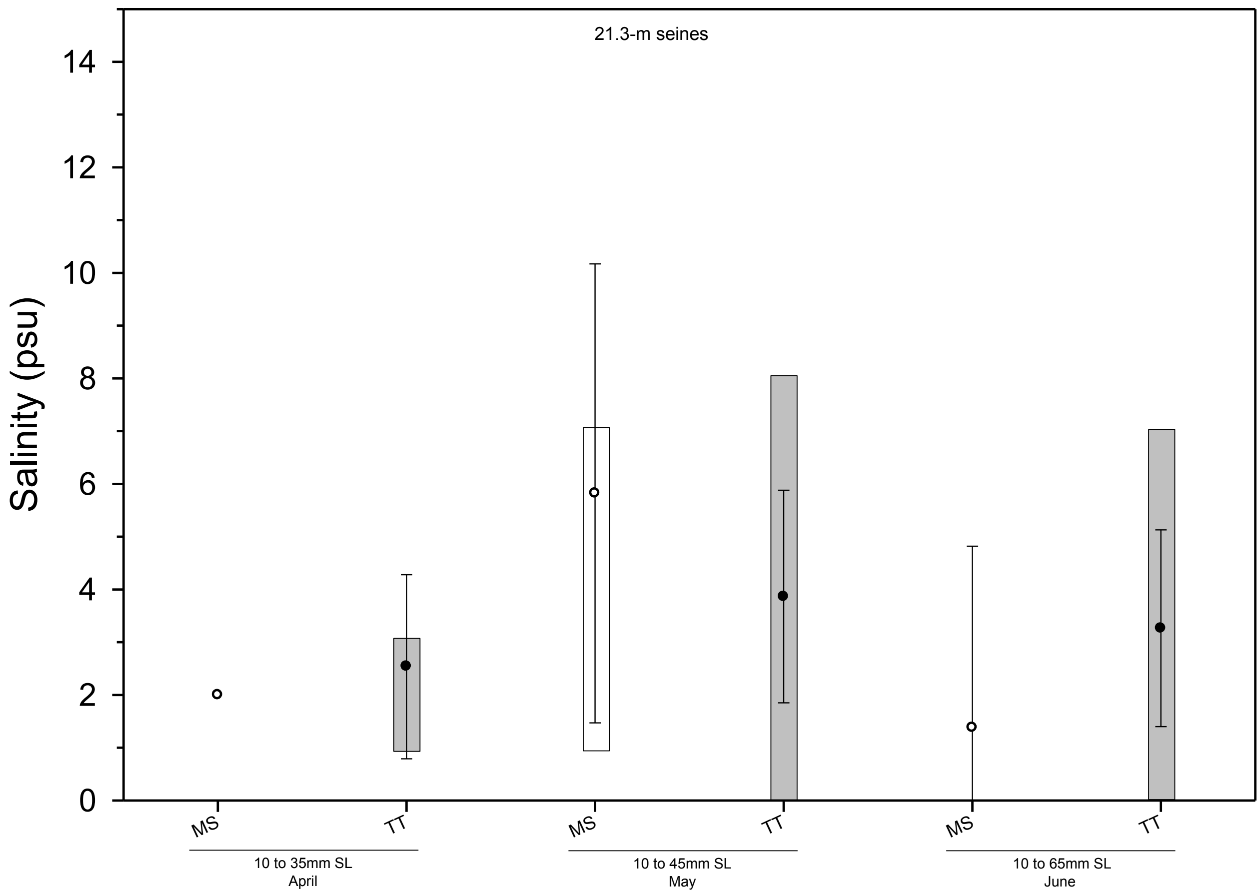

Figure 28. Density-weighted salinity statistics for *Micropterus salmoides* (largemouth bass) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

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Silver perch, *Bairdiella chrysoura*

Silver perch range from Cape Cod to Florida on the Atlantic coast and from west Florida to Rio Grande, Mexico in the Gulf of Mexico (Carpenter 2002). No directed fishery exists for silver perch, but they are often caught as bycatch in other fisheries and are commonly used for bait. Spawning for this species has been reported from within the estuaries as well as offshore (Able and Fahay 1998). Throughout its range, silver perch are often associated with estuarine marshes and seagrass beds (Able and Fahay 1998)

Recruitment period

Silver perch (10-19 mm SL) were present in nearshore habitats sampled with 21.3-m seines from April to August, but were most abundant during the month of May in both TT and MS habitats (*Figure 29*). Silver perch (20-29 mm SL) were present in nearshore habitats from May to August, with greatest abundances occurring during May and June in both TT and MS habitats (*Figure 30*).

Habitat associations

Silver perch were most abundant along shoreline habitats sampled with the 21.3-m seines. Both size classes analyzed (10-19 mm and 20-29 mm SL) were collected from waters with wide ranging salinity (*Appendix 3*, *Figure 29*, *Figure 30*). They were collected along all shoreline and bottom types sampled, with no obvious association with any particular habitat type (*Figure 29*, *Figure 30*).

Density-weighted distribution (river-kilometer)

Three pseudo-species of silver perch collected with 21.3-m seine collections were analyzed for centers of abundance (*Figure 31*). All three pseudo-species occupied relatively extensive portions of the LSJR, with 10-90 percentile ranges spanning from 25 km (June, 20-29 mm SL, TT) to 40 km (May, 20-29 mm SL, MS). The centers of abundance for silver perch in MS habitats were consistently upstream of the centers in TT habitats (9.7-16.1 km; *Figure 31*, *Appendix 3*). The larger pseudo-species of silver perch (20-29 mm SL) collected in May and June had similar mean distribution estimates and ranges for both months (*Figure 31*).

Additional density-weighted distribution statistics for silver perch can be found in *Appendix 3*.

Density-weighted salinity

Silver perch (10-19 mm SL) collected in May were collected from a broad range of salinities in both MS and TT habitats (*Appendix 3*, *Figure 32*). The density-weighted mean salinity for TTs (21.6 psu) was greater than for MS habitats (17.7 psu), but there was considerable overlap in confidence intervals and 10-90 percentile ranges. Similarly, silver perch (20-29 mm SL) collected in May and June were collected from most of the available salinity gradient (*Appendix 3*, *Figure 32*). Density-weighted mean salinities in TT habitats were greater than in MS habitats for all pseudo-species and months (*Figure 32*).

Additional density-weighted salinity statistics for silver perch can be found in *Appendix 3*.

Bairdiella chrysoura (Silver perch) in 21.3-m seines

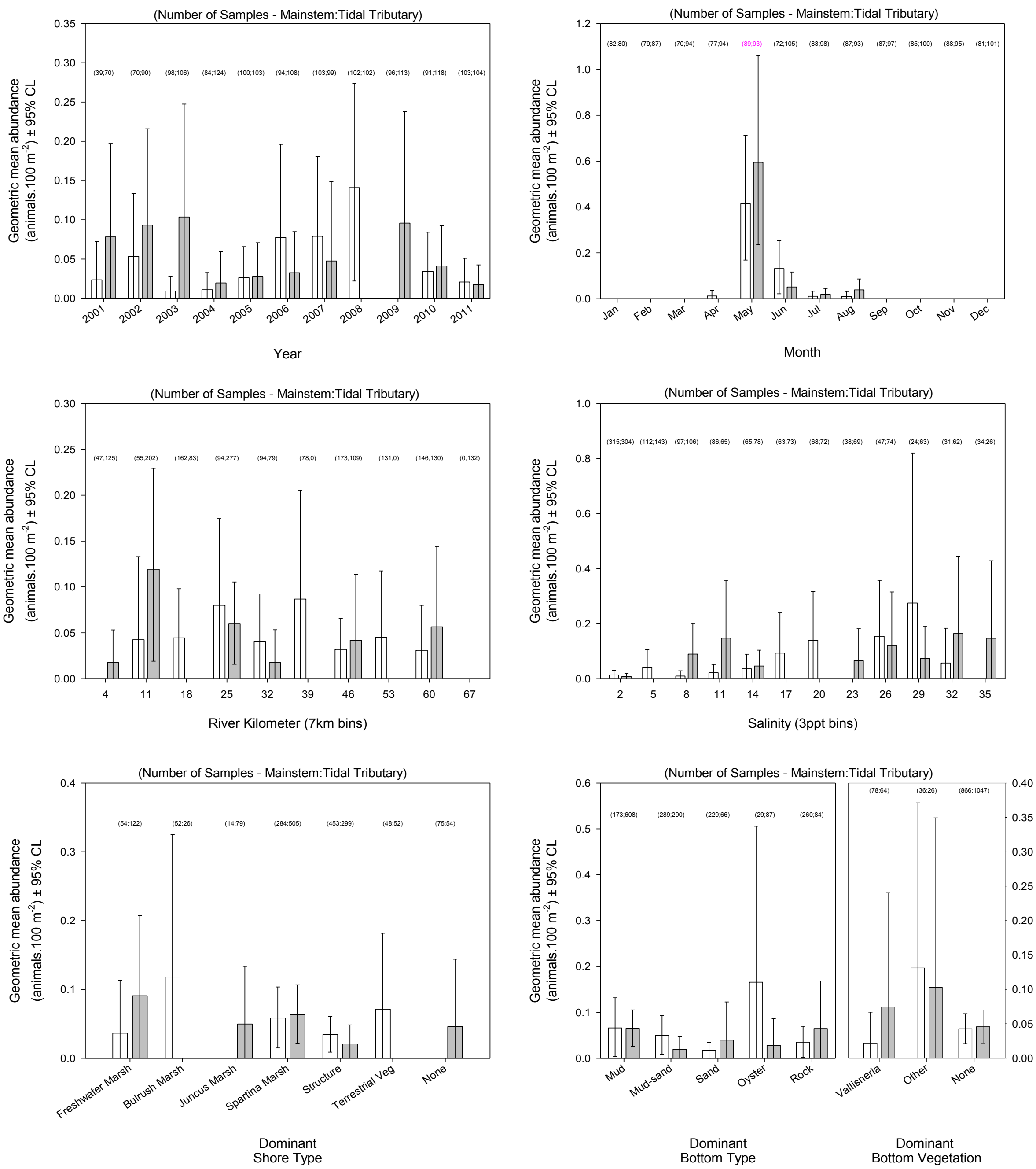

Figure 29. Relative abundance of *Bairdiella chrysoura* (silver perch), 10 to 19 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Bairdiella chrysoura (Silver perch) in 21.3-m seines

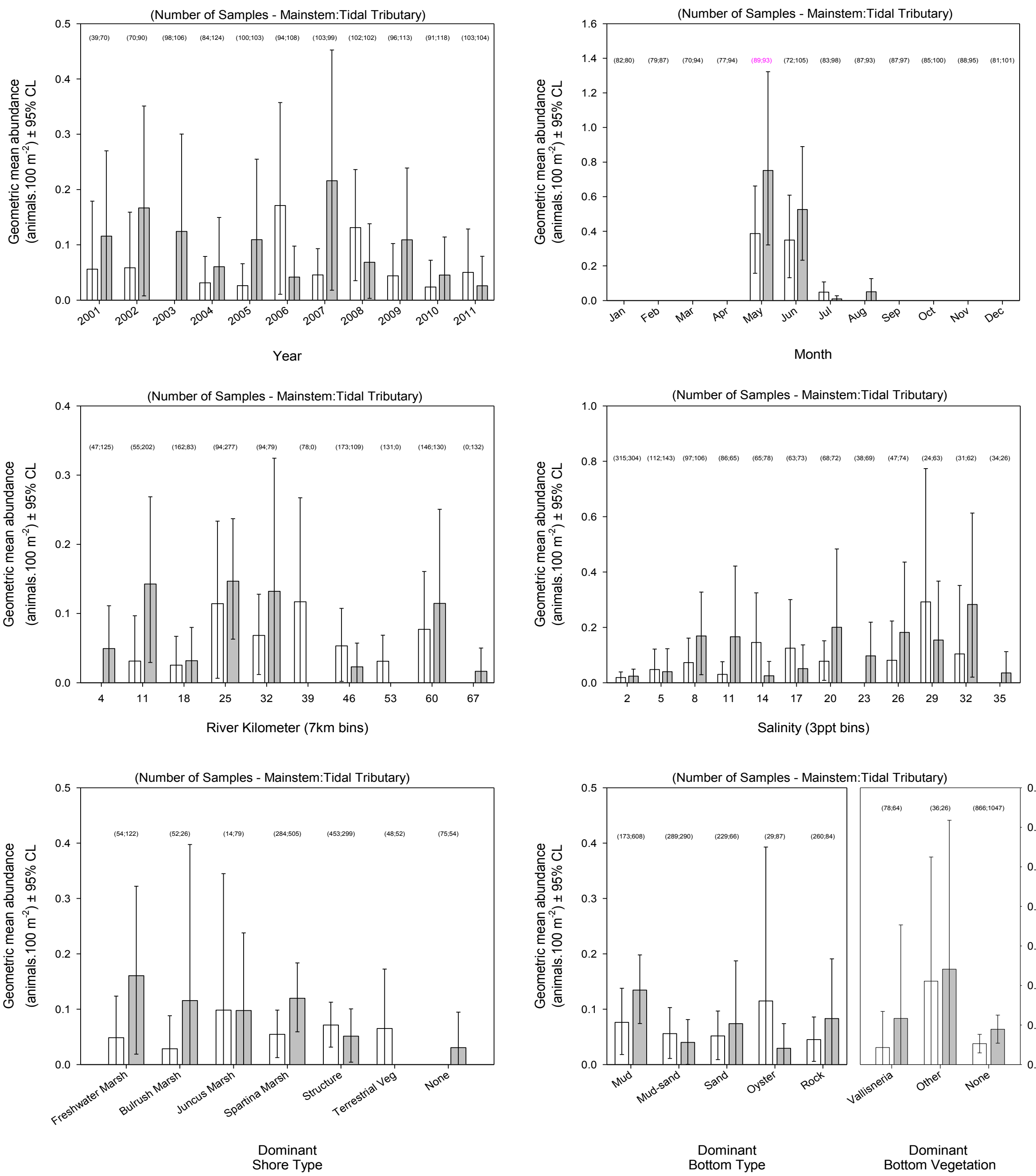

Figure 30. Relative abundance of *Bairdiella chrysoura* (silver perch), 20 to 29 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

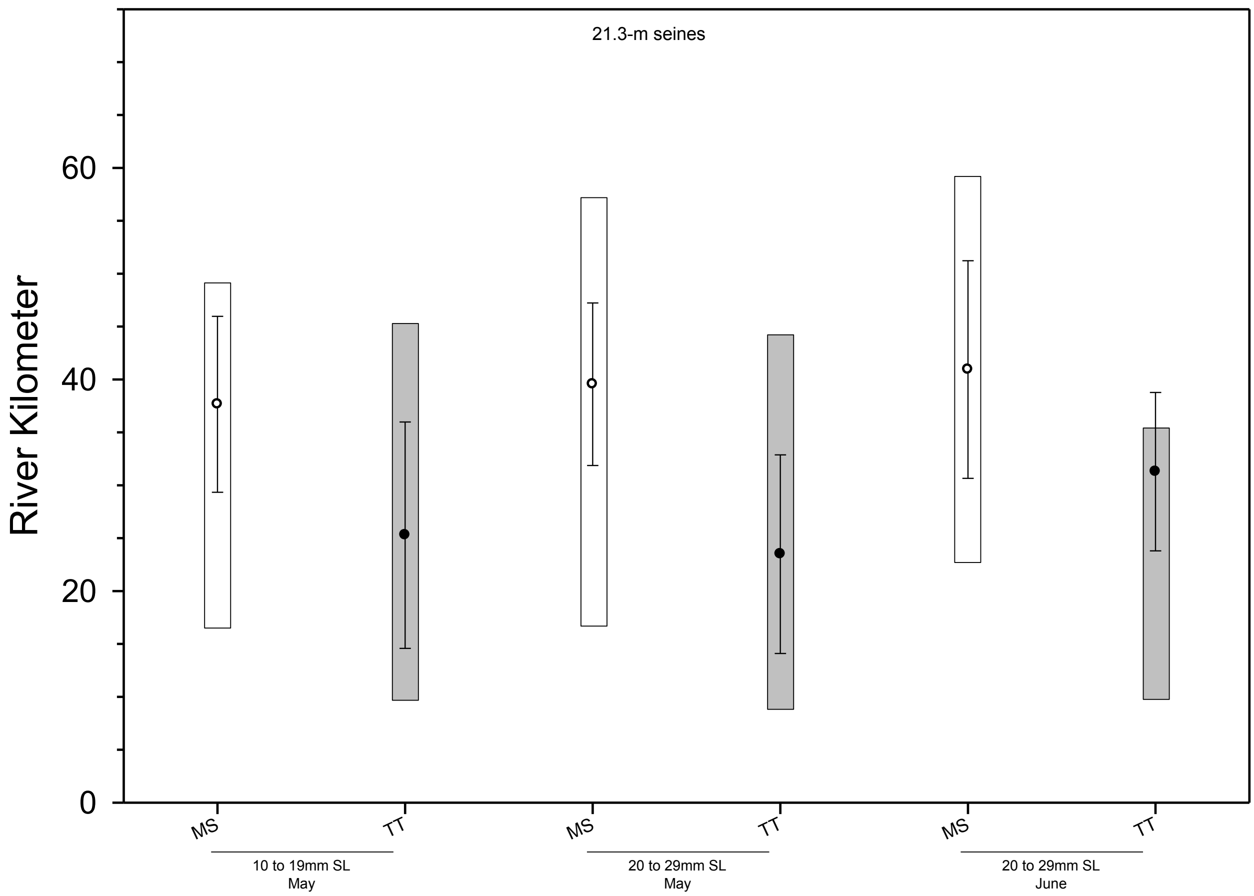

Figure 31. Density-weighted distribution (river-kilometer) statistics for *Bairdiella chrysoura* (silver perch) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

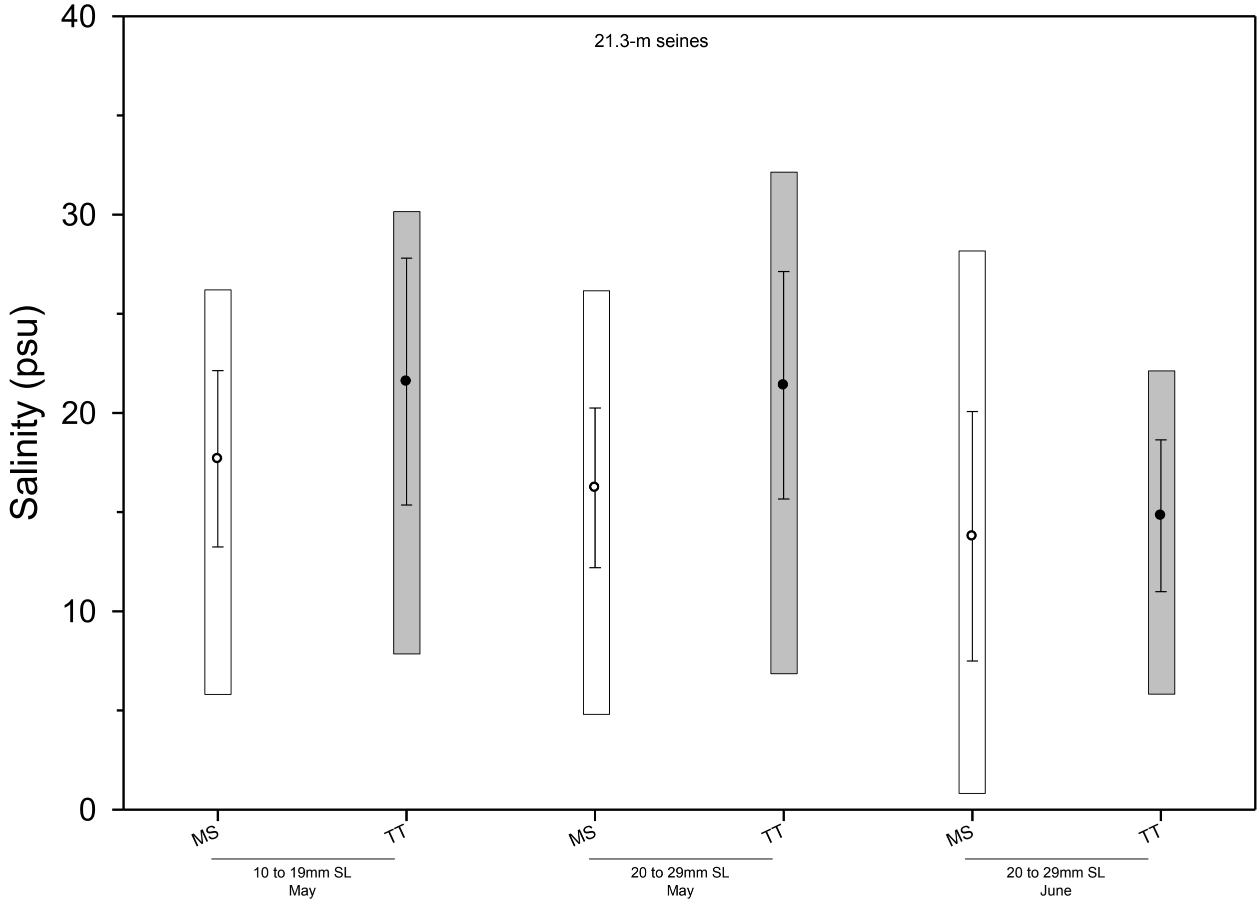

Figure 32. Density-weighted salinity statistics for *Bairdiella chrysoura* (silver perch) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

Spot, *Leiostomus xanthurus*

Spot are found from Cape Cod to the Gulf coast of Mexico (Murdy *et al*. 1997). This species is harvested in both commercial and recreational fisheries, and its abundance and habits make it a major factor in structuring estuarine demersal and benthic communities (Pattillo *et al*. 1997). Spot are estuarine transients that spawn on the continental shelf and use the estuaries as a nursery (Pattillo *et al*. 1997). Spot have been collected at salinities up to 60 psu, but are more common at salinities between 10-30 psu (Pattillo *et al*. 1997).

Recruitment period

Spot (10-19 mm SL and 20-29 mm SL) were present in nearshore habitats sampled with 21.3-m seines from January to May, but were most abundant during February and March in both MS and TT habitats (*Figure 33*, *Figure 34*). Spot (10-14 mm SL, 15-24 mm SL, and 20-29 mm SL) were present in 6.1-m otter trawls from January to May, with the highest abundance being collected in both TT and MS habitats during February and March for the 10-14 mm SL and 15-24 mm SL size classes (*Figure 35*, *Figure 36*). Spot (20-29 mm SL) collected in 6.1-m otter trawls were most abundant in TT habitats during March (*Figure 37*).

Habitat associations

Both pseudo-species of spot (10-19 mm and 20-29 mm SL) analyzed from nearshore habitats sampled with 21.3-m seines were collected from throughout the study area and over the entire salinity gradient (*Appendix 3*, *Figure 33*, *Figure 34*). They were collected along all shoreline and bottom types sampled, with no obvious association with any particular habitat type (*Figure 33*, *Figure 34*). The analyzed size classes of spot (10-14 mm SL, 15-24 mm SL, and 20-29 mm SL) sampled with 6.1-m otter trawls were also collected over the entire salinity range and throughout the LSJR study area (*Figure 35*, *Figure 36*, *Figure 37*).

Density-weighted distribution (river-kilometer)

Spot (10-19 mm SL) collected in 21.3-m seines from January to March were broadly distributed within the study area (10-90 percentile ranges ≥19 km), but tended to have relatively small confidence intervals around their centers of abundance (4.1-6.5 km; *Figure 38*). Centers of abundance in MS habitats were greater than TTs for all three months analyzed. The centers of abundance for MS and TT habitats during January were further downstream than in either February or March, suggesting the ingress of newly spawned spot during January from offshore waters (*Figure 38*). The centers of abundance in both MS and TT habitats were located further upstream for both size classes analyzed during subsequent months, but with the centers of abundance for TT habitats always occurring more downstream than those in MS habitats (*Figure 38*).

Spot (10-14 mm SL and 15-24 mm SL) collected with 6.1-m otter trawls during February and March had broad 10-90 percentile ranges of distribution (35-50 km; *Figure 38*). Centers of abundance for both pseudo-species in both MS and TT habitats were further downstream in February than in March (*Figure 38*), indicating a general upstream movement in abundance during these two months.

Additional density-weighted distribution statistics for spot can be found in *Appendix 3*.

Density-weighted salinity

Spot (10-19 mm SL) collected in 21.3-m seines during January, February, and March occupied a broad range of salinities in both MS and TT habitats (0-35 psu; *Appendix 3*, *Figure 39*). Density-weighted mean salinity estimates in TT habitats were greater than those in MS habitats during all three months analyzed. Density-weighted mean salinities for January (13.2 and 15.8 psu for MS and TT habitats, respectively; *Appendix 3*, *Figure 39*) were greater than either February (6.9 and 10.0, respectively) or March (9.9 and 11.7 psu, respectively) in both MS and TT habitats. Spot (20-29 mm SL) collected in 21.3-m seines during February, March, and April were also found over a broad salinity range in both MS and TT habitats (0-33 psu; *Appendix 3*, *Figure 39*). Density-weighted mean salinities for TT habitats were greater than those in MS habitats for all three months analyzed.

Spot (10-14 mm SL and 15-24 mm SL) sampled with 6.1-m otter trawls during February and March were also collected from a broad range of salinities in both MS and TT habitats (*Figure 39*). Density-weighted mean salinity estimates of spot (10-14 mm SL) were similar during February and March in MS habitats, while differing by nearly 11 psu between February and March in the TT habitats (*Figure 39*). Spot (15-24 mm SL) collected in February and March had similar mean salinity estimates for both MS and TT habitats (*Figure 39*).

Additional density-weighted salinity statistics for spot can be found in *Appendix 3*.

Leiostomus xanthurus (Spot) in 21.3-m seines

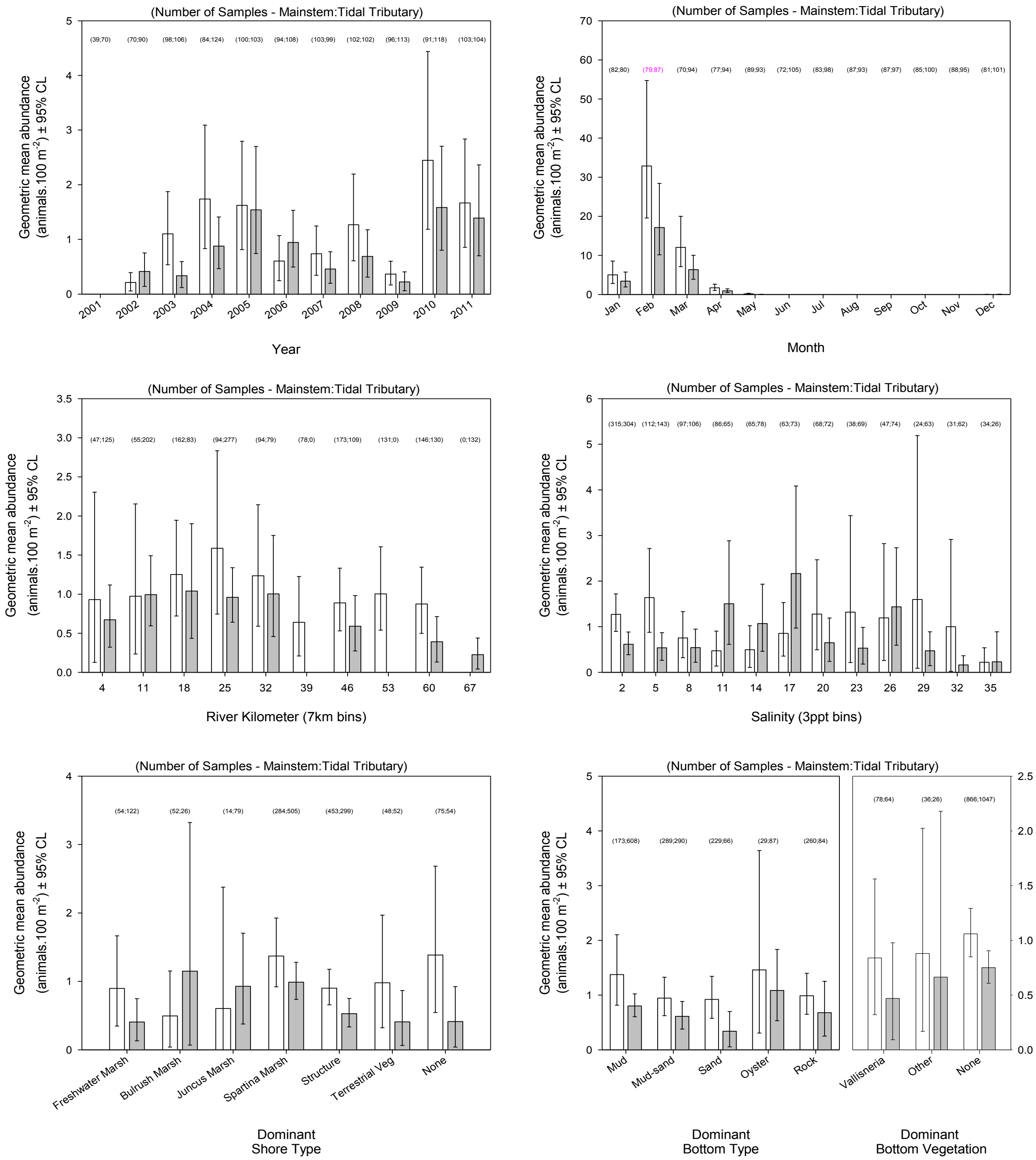

Figure 33. Relative abundance of *Leiostomus xanthurus* (spot), 10 to 19 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Leiostomus xanthurus (Spot) in 21.3-m seines

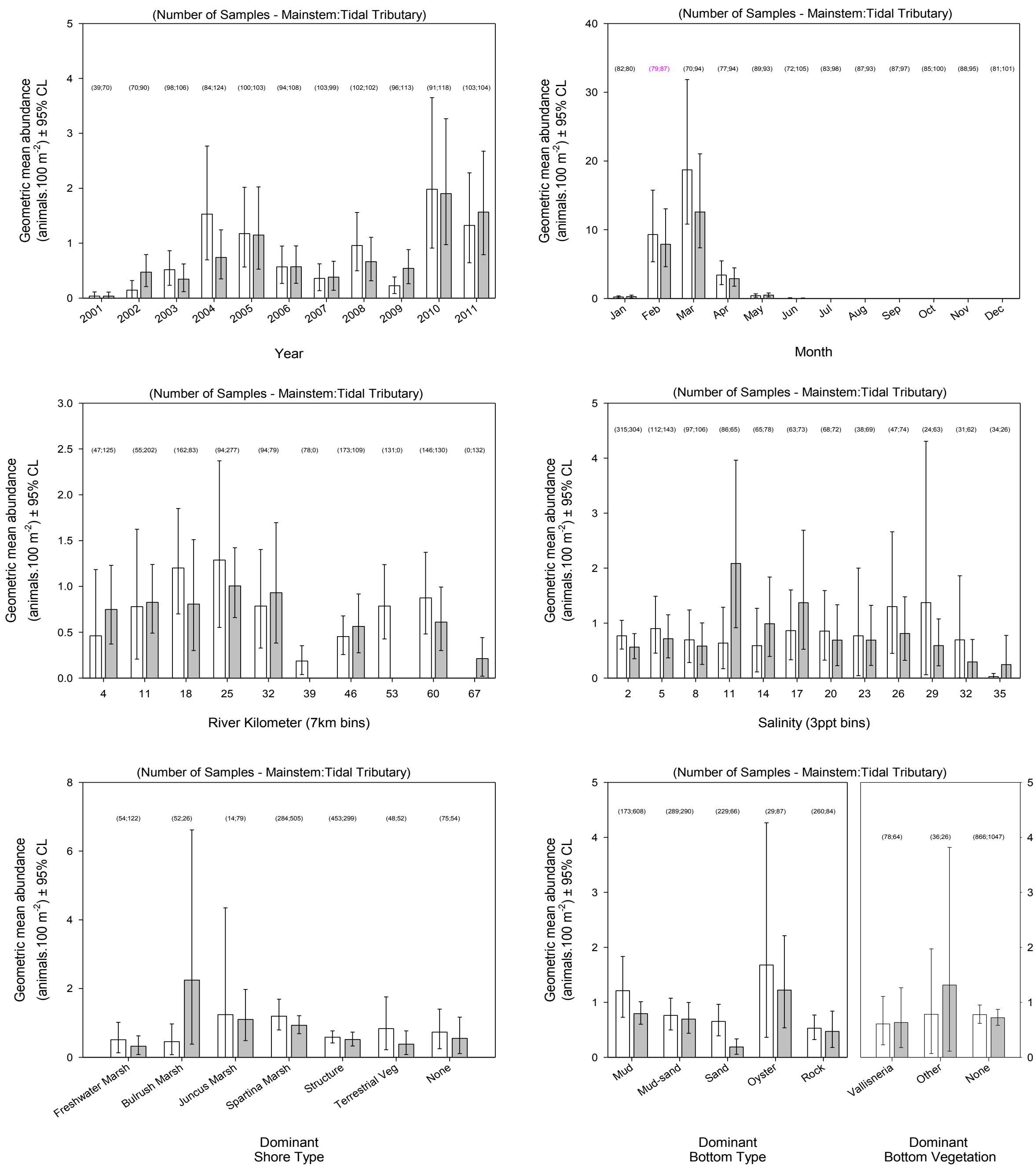

Figure 34. Relative abundance of *Leiostomus xanthurus* (spot), 20 to 29 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Leiostomus xanthurus (Spot) in 6.1-m trawls

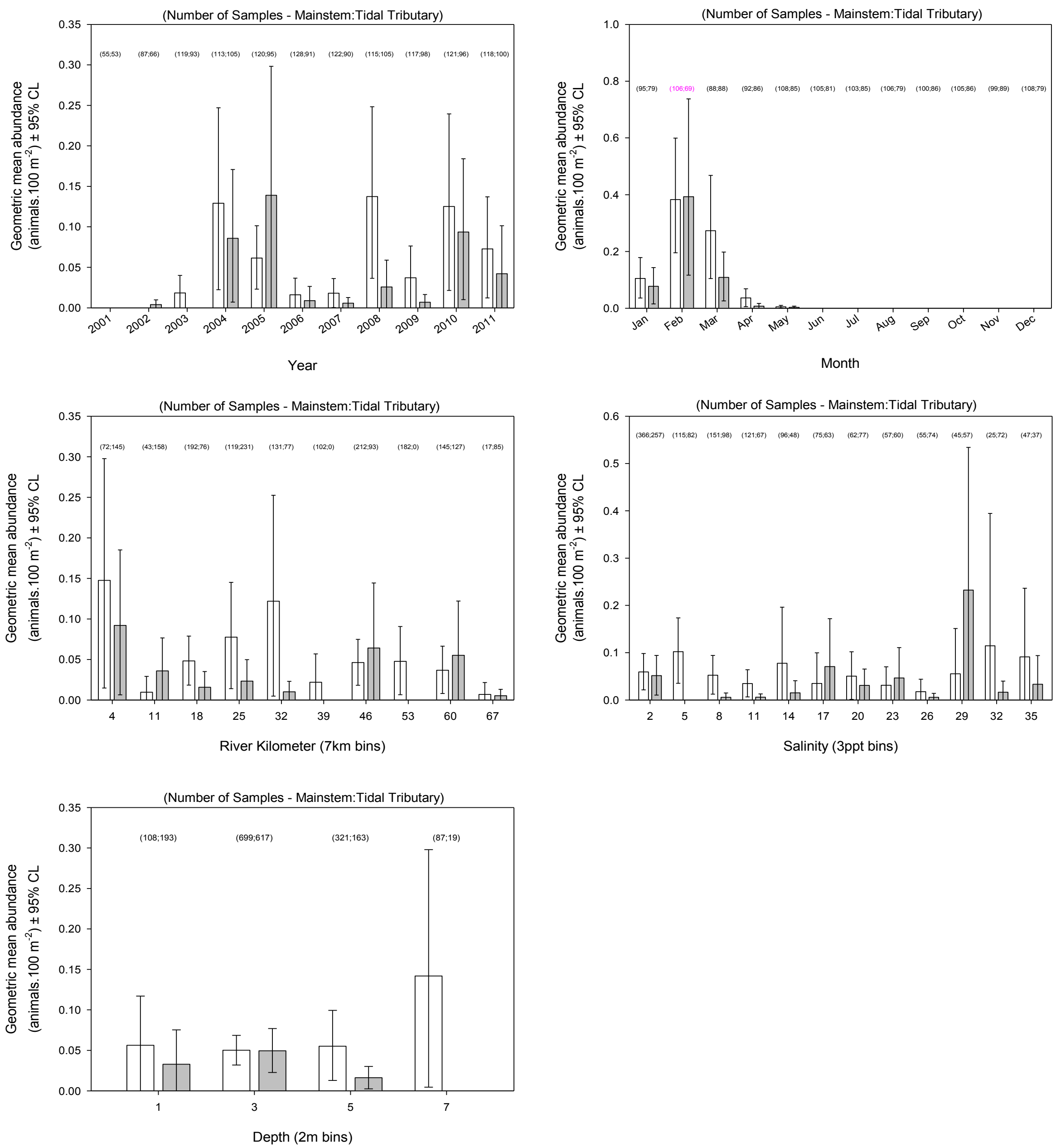

Figure 35. Relative abundance of *Leiostomus xanthurus* (spot), 10 to 14 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Leiostomus xanthurus (Spot) in 6.1-m trawls

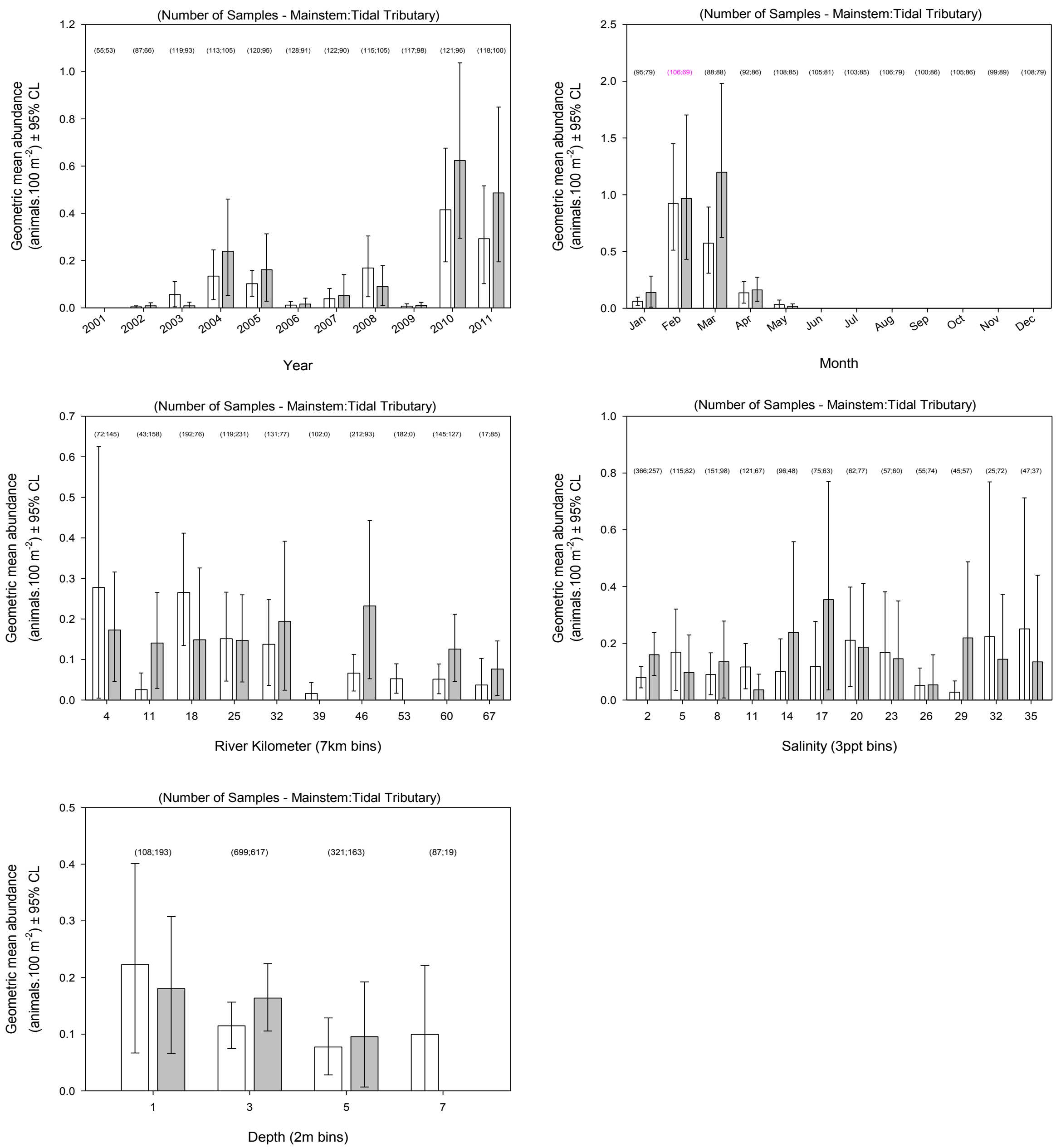

Figure 36. Relative abundance of *Leiostomus xanthurus* (spot), 15 to 24 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Leiostomus xanthurus (Spot) in 6.1-m trawls

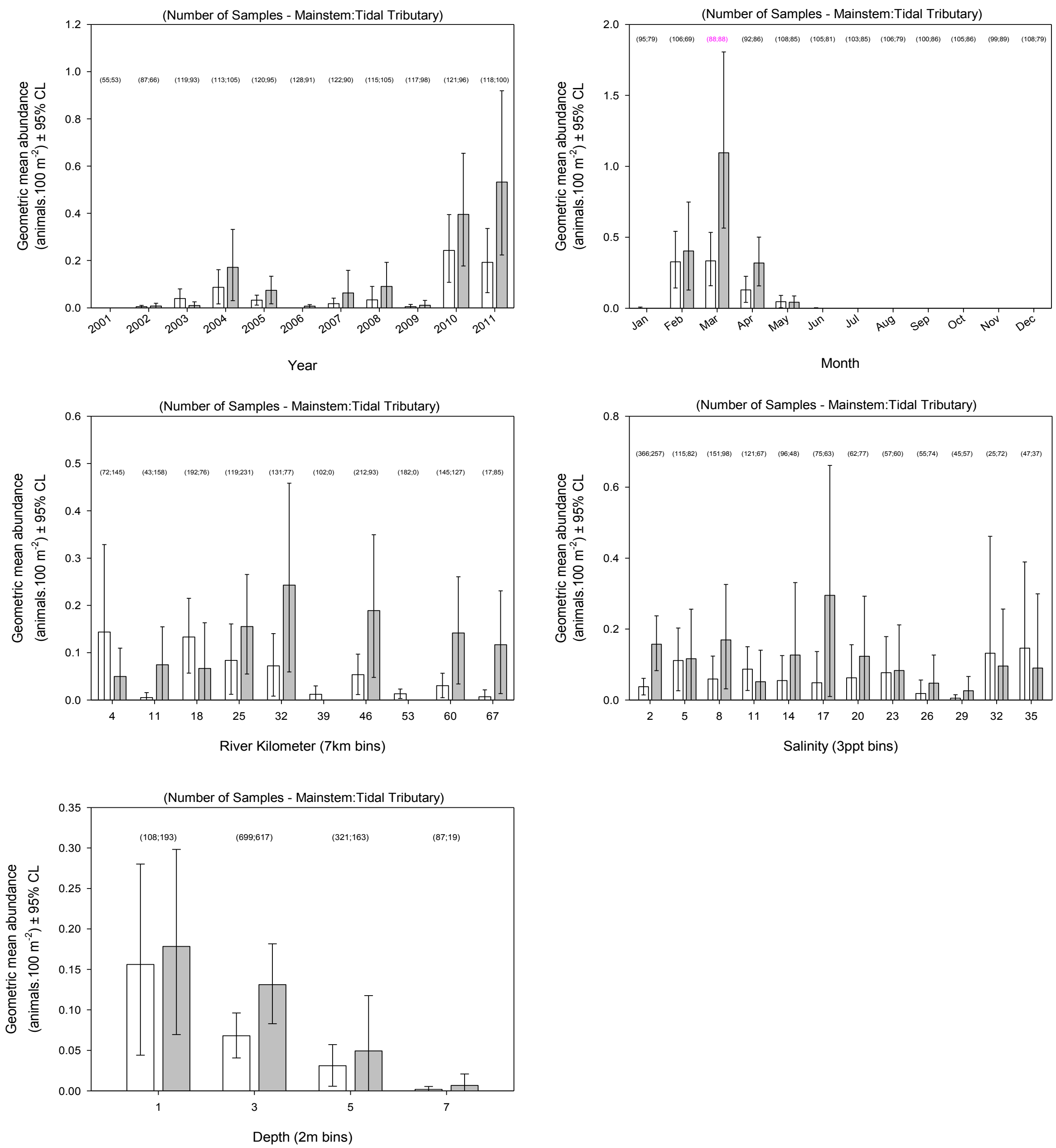

Figure 37. Relative abundance of *Leiostomus xanthurus* (spot), 20 to 29 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

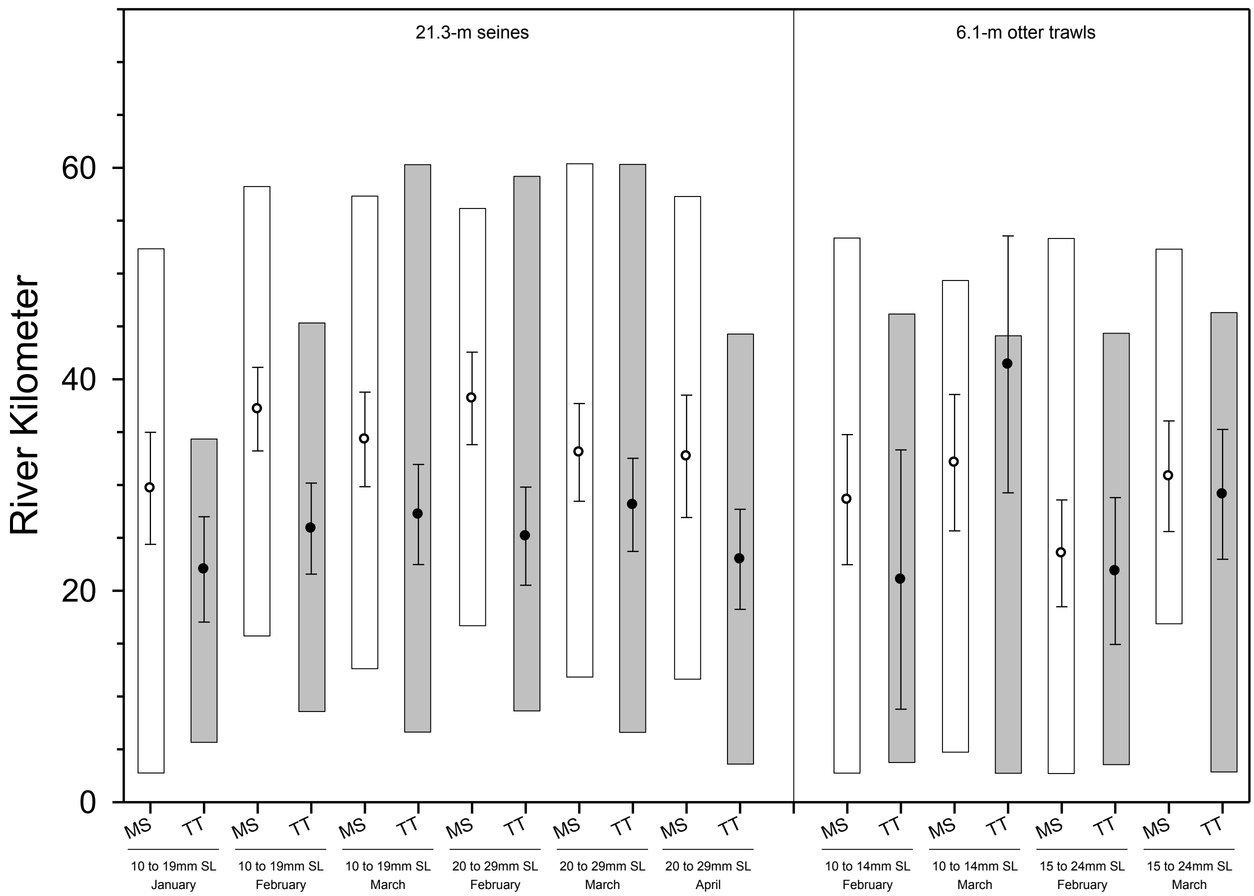

Figure 38. Density-weighted distribution (river-kilometer) statistics for *Leiostomus xanthurus* (spot) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

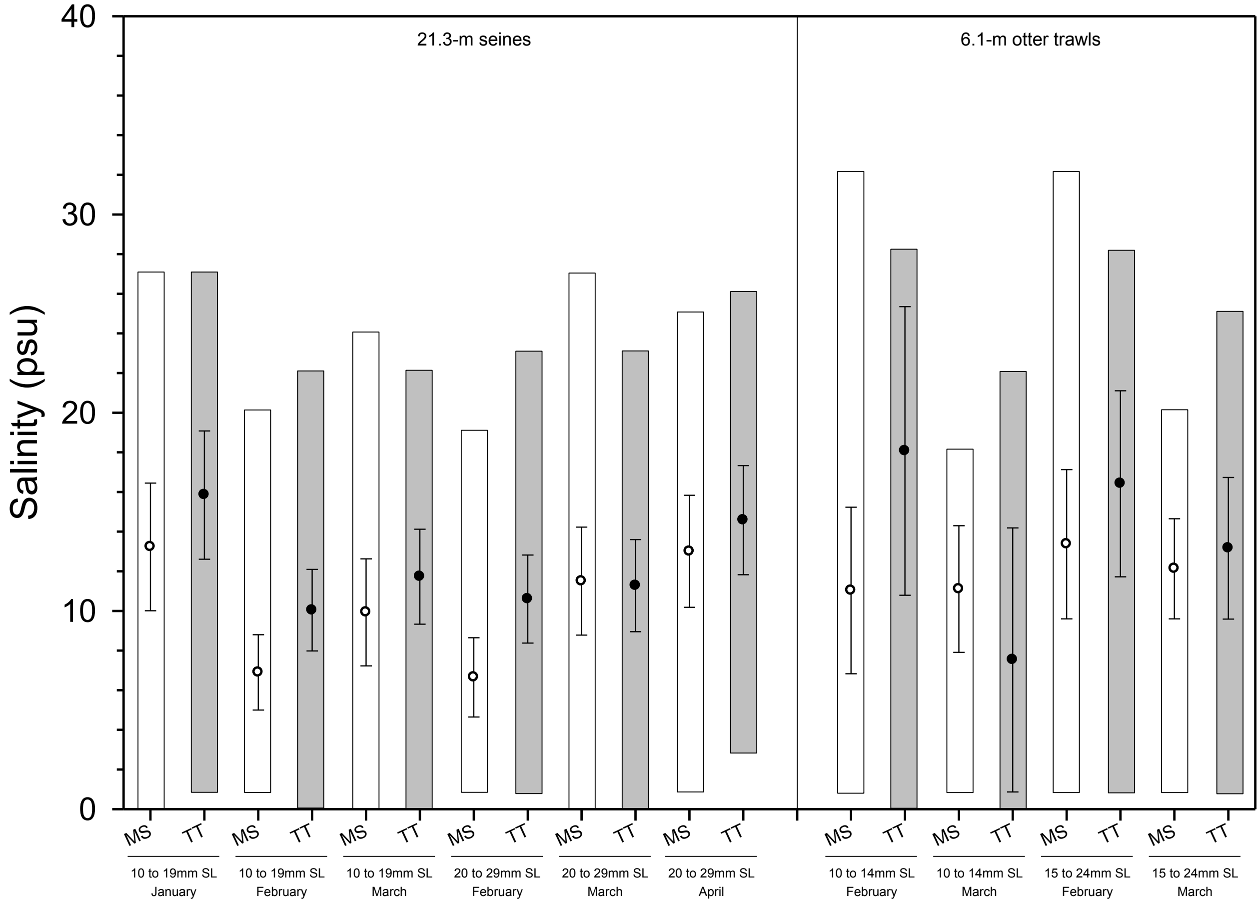

Figure 39. Density-weighted salinity statistics for *Leiostomus xanthurus* (spot) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

Atlantic croaker, *Micropogonias undulatus*

Atlantic croaker are distributed from Cape Cod to Florida on the Atlantic Coast and from Florida Bay to the Bay of Campeche in the Gulf of Mexico (Carpenter 2002). Atlantic croaker have some commercial and recreational value and have been described as a good food fish. Juveniles and young constitute 50% of the by-catch by shrimp trawlers in the Gulf of Mexico (Carpenter 2002). Spawning takes place primarily over the continental shelf and the spawning season can be protracted over many months (Able and Fahay 1998). Atlantic croaker YOY have been recorded to occur at salinities ranging from almost freshwater to seawater (Miglarese *et al*. 1982).

Recruitment period

Atlantic croaker (10-19 mm SL) were present in nearshore habitats sampled with 21.3-m seines from September to May, but were most abundant from December to February in both TT and MS habitats (*Figure 40*). Atlantic croaker (10-19 mm SL) sampled with 6.1-m otter trawls were present in collections made from September to June, with greatest abundances seen in both TT and MS habitats between December and March (*Figure 41*).

Habitat associations

Atlantic croaker (10-19 mm SL) in nearshore habitats sampled with 21.3-m seines were collected over the entire salinity gradient and found throughout the study area, with a peak in abundance in the middle reaches of the study area (22-49 km; *Figure 40*). This size class of Atlantic croaker was collected from all shoreline types sampled and occurred over all bottom types (*Figure 40*); although there were no clear shoreline habitat associations, higher abundance was clearly associated with unvegetated bottom types. Atlantic croaker (10-19 mm SL) sampled with 6.1-m otter trawls were also collected over the available salinity gradient and throughout the entire LSJR study area, but with greater abundance above river-km 29 and in salinities below 10 psu (*Figure 41*).

Density-weighted distribution (river-kilometer)

Atlantic croaker (10-19 mm SL) collected in 21.3-m seines during January and February were most abundant in the middle reaches of the study area within both MS and TT habitats (river-km 13-52; *Appendix 3*, *Figure 42*). Centers of abundance for Atlantic croaker were relatively similar for both months with abundance centers for MS habitats located further upstream than those for TT habitats (8.6 to 9.8 km; *Figure 42*). Atlantic croaker (10-19 mm SL) collected with 6.1-m otter trawls from December to March had broad 10-90 percentile ranges of distribution within the study area (33-51 km; *Appendix 3*, *Figure 42*) and the 10-90 percentile range in TT habitats was generally broader (37-51 km) than the MS habitats (33-45 km). The center of distribution in MS habitats was similar between months (river-km 40.8-44.3) while the center for TT habitats ranged from river-km 44.4 (December) to 32.9 (January; *Figure 42*).

Additional density-weighted distribution statistics for Atlantic croaker can be found in *Appendix 3*.

Density-weighted salinity

Atlantic croaker (10-19 mm SL) collected in 21.3-m seines in January and February generally occurred over a small 10-90 percentile range of salinities that were typically below 12 psu in both MS and TT habitats (*Appendix 3*, *Figure 43*). Density-weighted mean salinity ranged from 3.7-6.4 psu during these two months. Atlantic croaker (10-19 mm SL) collected in 6.1-m otter trawls from December to March were generally most abundant in salinities <20 psu (*Appendix 3*, *Figure 43*). Density-weighted mean salinities were similar for all months in both MS and TT habitats, ranging from 3.4 psu (February, MS) to 8.7 psu (January, TT; *Figure 43*). The small Atlantic croaker (10-19 mm SL) collected in both seines and trawls tended to occur in the lower salinity habitats during the months analyzed (*Figure 43*).

Additional density-weighted salinity statistics for Atlantic croaker can be found in *Appendix 3*.

Micropogonias undulatus (Atlantic croaker) in 21.3-m seines

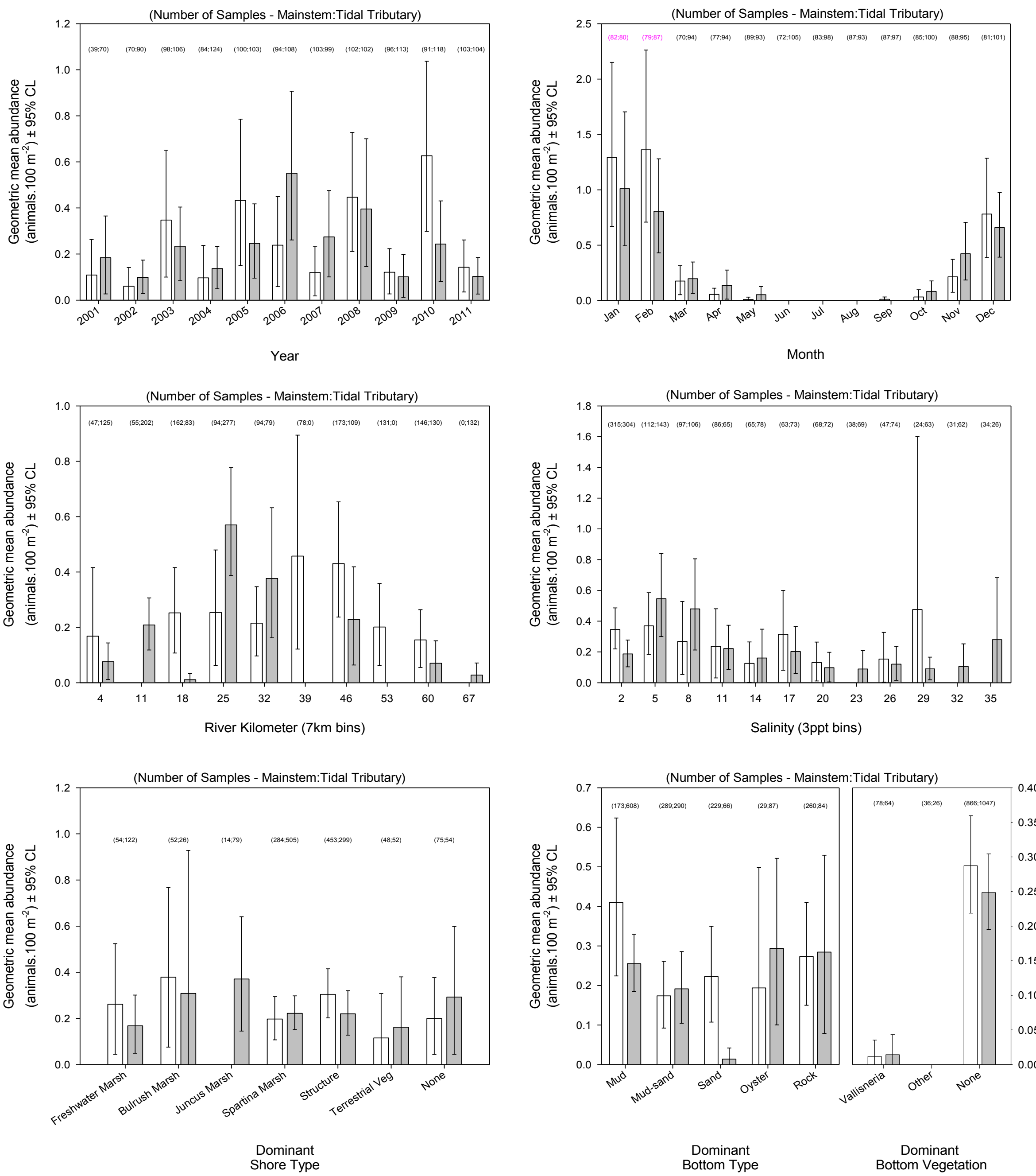

Figure 40. Relative abundance of *Micropogonias undulatus* (Atlantic croaker), 10 to 19 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Micropogonias undulatus (Atlantic croaker) in 6.1-m trawls

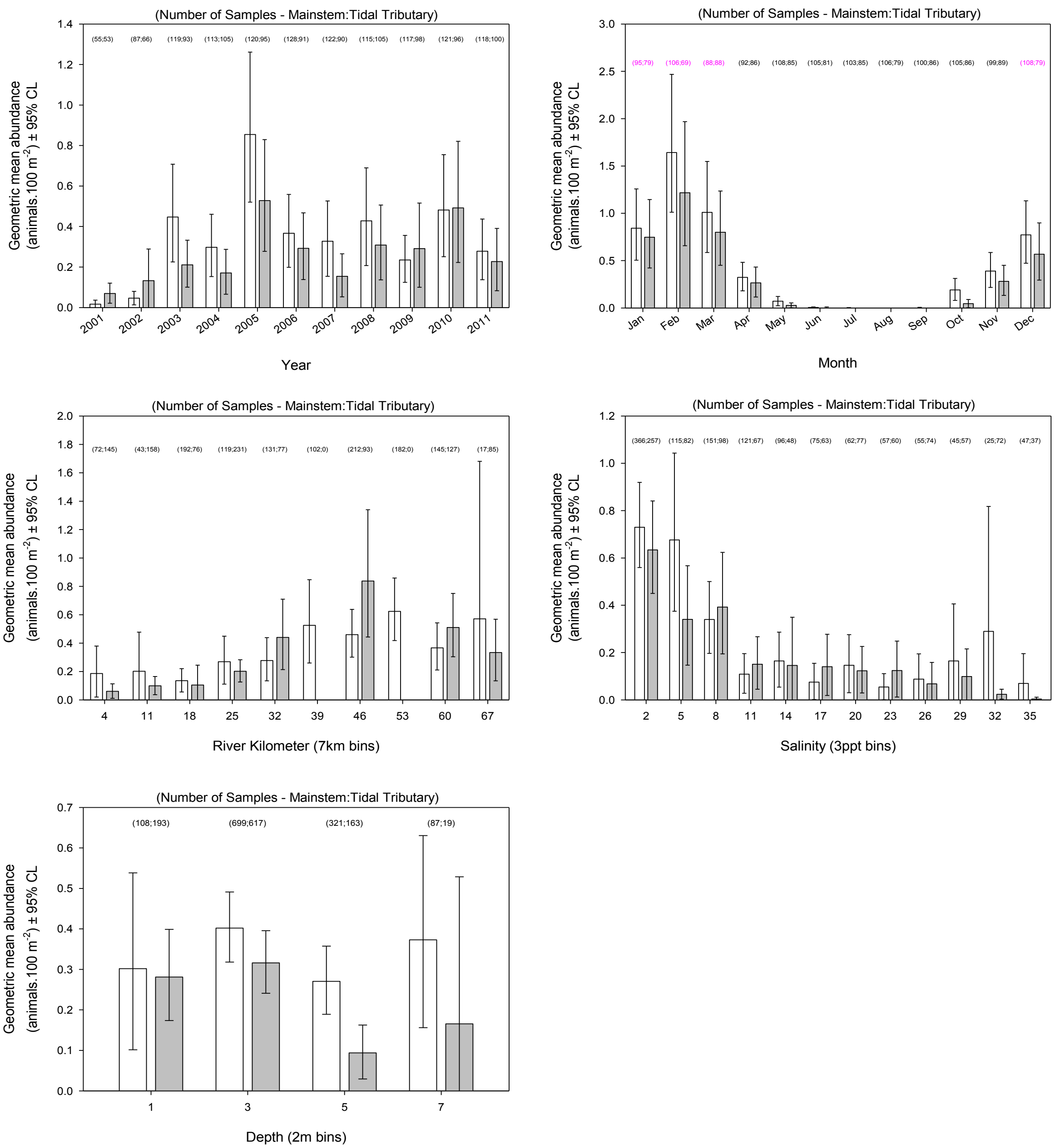

Figure 41. Relative abundance of *Micropogonias undulatus* (Atlantic croaker), 10 to 19 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

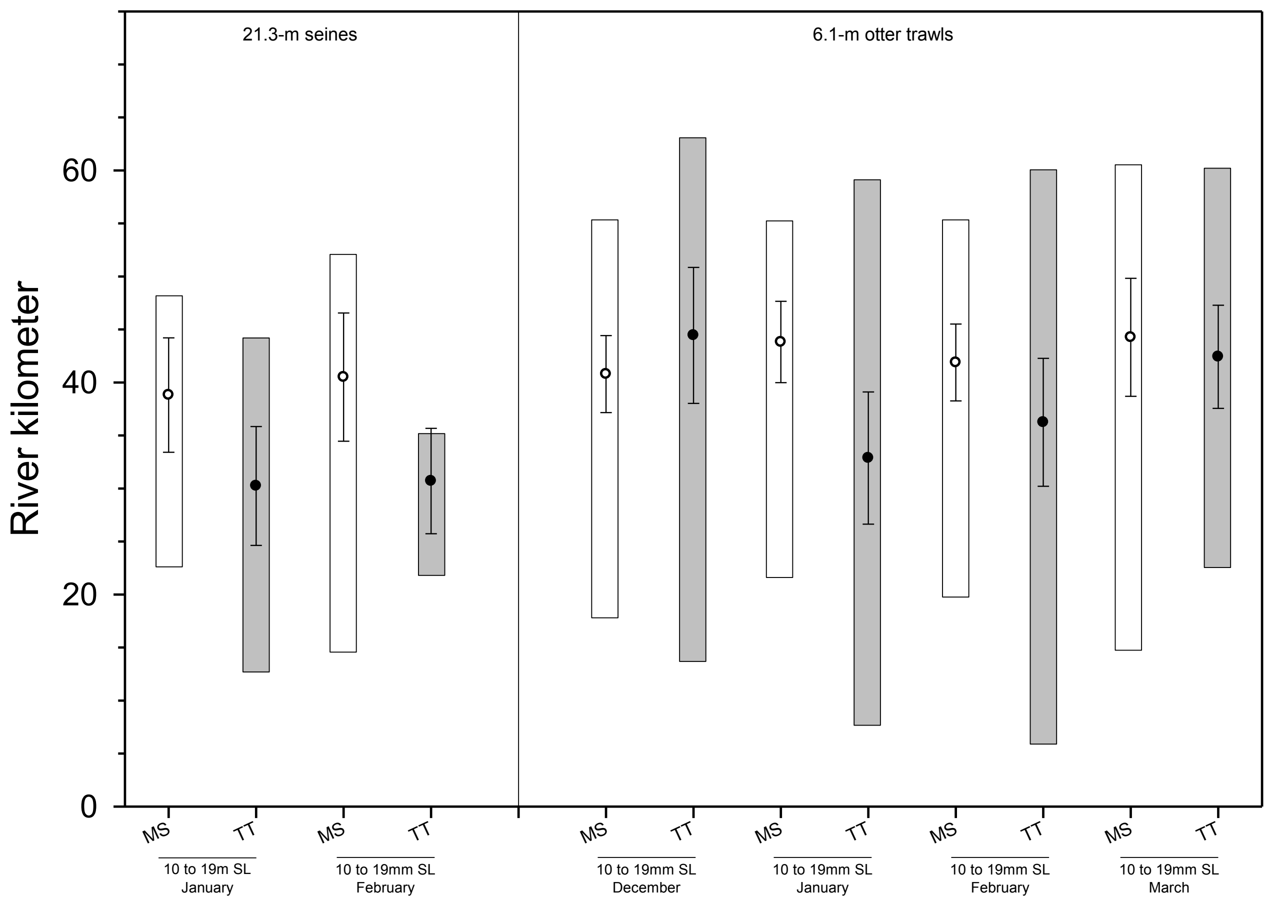

Figure 42. Density-weighted distribution (river-kilometer) statistics for *Micropogonias undulatus* (Atlantic croaker) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

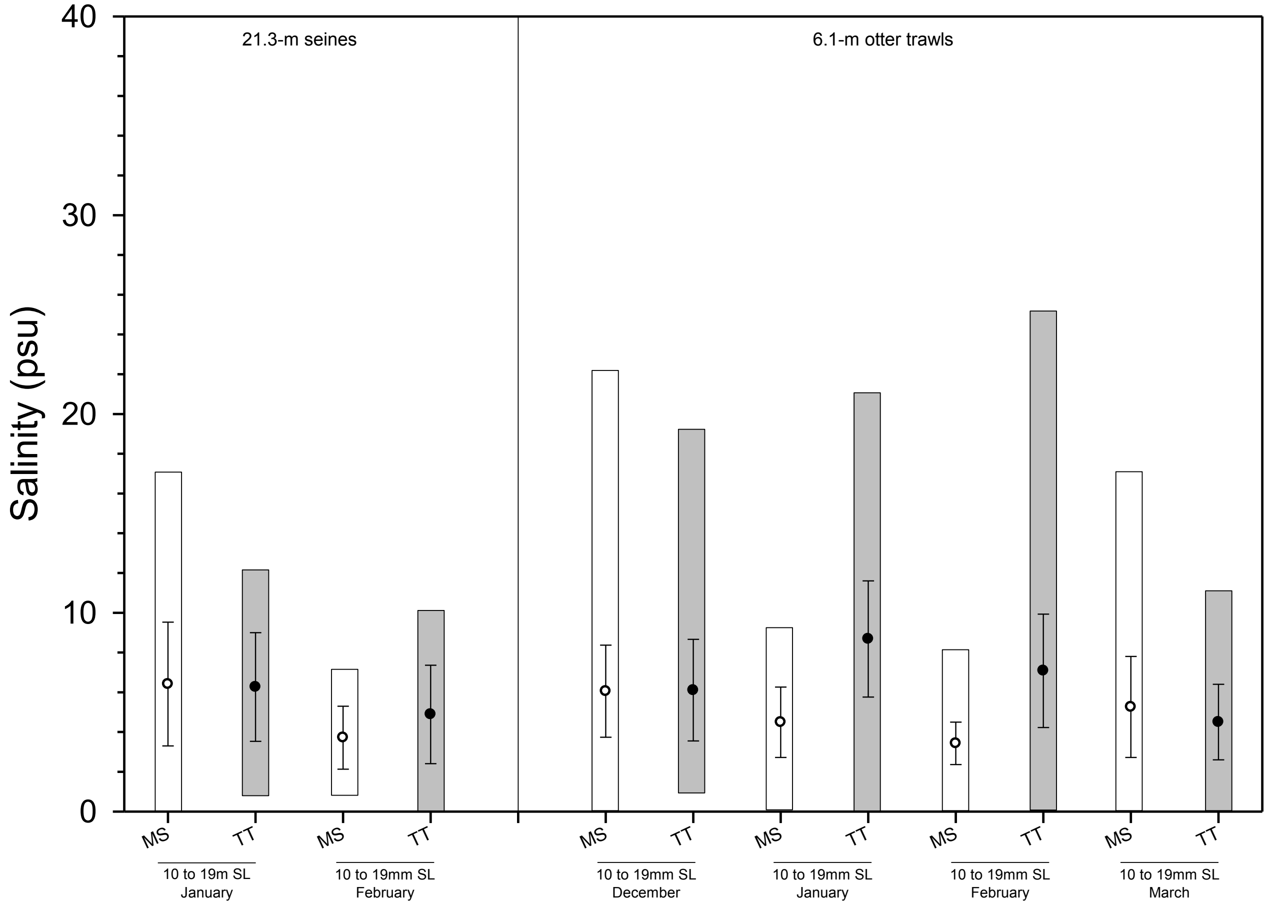

Figure 43. Density-weighted salinity statistics for *Micropogonias undulatus* (Atlantic croaker) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10^{th} to 90^{th} percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

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Red drum, *Sciaenops ocellatus*

Red drum occur from New York to the Gulf coast of Mexico (Carpenter 2002). This species represents valuable commercial and recreational fisheries in many parts of its range (Pattillo *et al*. 1997). Spawning generally occurs in nearshore marine waters but may also occur in higher salinity portions of estuaries (Pattillo *et al*. 1997). Larval settlement as demersal juveniles may occur prior to entry into tidal rivers (Peters and McMichael 1987; Holt *et al*. 1989; Peebles 2002). This species has been collected at salinities from 0 to more than 50 psu (Pattillo *et al*. 1997).

Recruitment period

Red drum (10-24 mm SL) were present in nearshore habitats sampled with 21.3-m seines from September to January, but were most abundant during October and November in both TT and MS habitats (*Figure 44*).

Habitat associations

Red drum (10-24 mm SL) in nearshore habitats sampled with 21.3-m seines were collected over the entire salinity range and from throughout the study area (*Figure 44*) with no obvious trends in abundance related to either location or salinity. Red drum were collected from all shore types and bottom types sampled (*Figure 44*).

Density-weighted distribution (river-kilometer)

Red drum (10-24 mm SL) collected in 21.3-m seines during October and November had relatively broad distribution in MS habitats (10-90 percentile range from 31 to 42 km), but generally occurred over a smaller area (10-90 percentile range of 16 to 19 km) in the TT habitats (*Appendix 3*, *Figure 45*). Within habitat type (MS and TT), the center of distribution was similar between months (18.0 and 19.7 km for TT; 36.0 and 32.2 for MS; *Figure 45*).

Additional density-weighted distribution statistics for red drum can be found in *Appendix 3*.

Density-weighted salinity

Red drum (10-24 mm SL) collected in 21.3-m seines during October and November inhabited a broad range of salinities (0-36 psu; *Appendix 3*, *Figure 46*). The 10-90 percentile range in salinity, among habitat type (MS and TT), was generally similar between months, but with MS habitats having lower 10th percentiles and TT habitats having higher 90th percentiles in each month (*Figure 46*). Density-weighted mean salinities were also similar between months within MS (8.7 and 10.3 psu) habitats, but increased from October (13.9 psu) to November (18.2 psu) in TT habitats (*Figure 46*).

Additional density-weighted salinity statistics for red drum can be found in *Appendix 3*.

Sciaenops ocellatus (Red drum) in 21.3-m seines

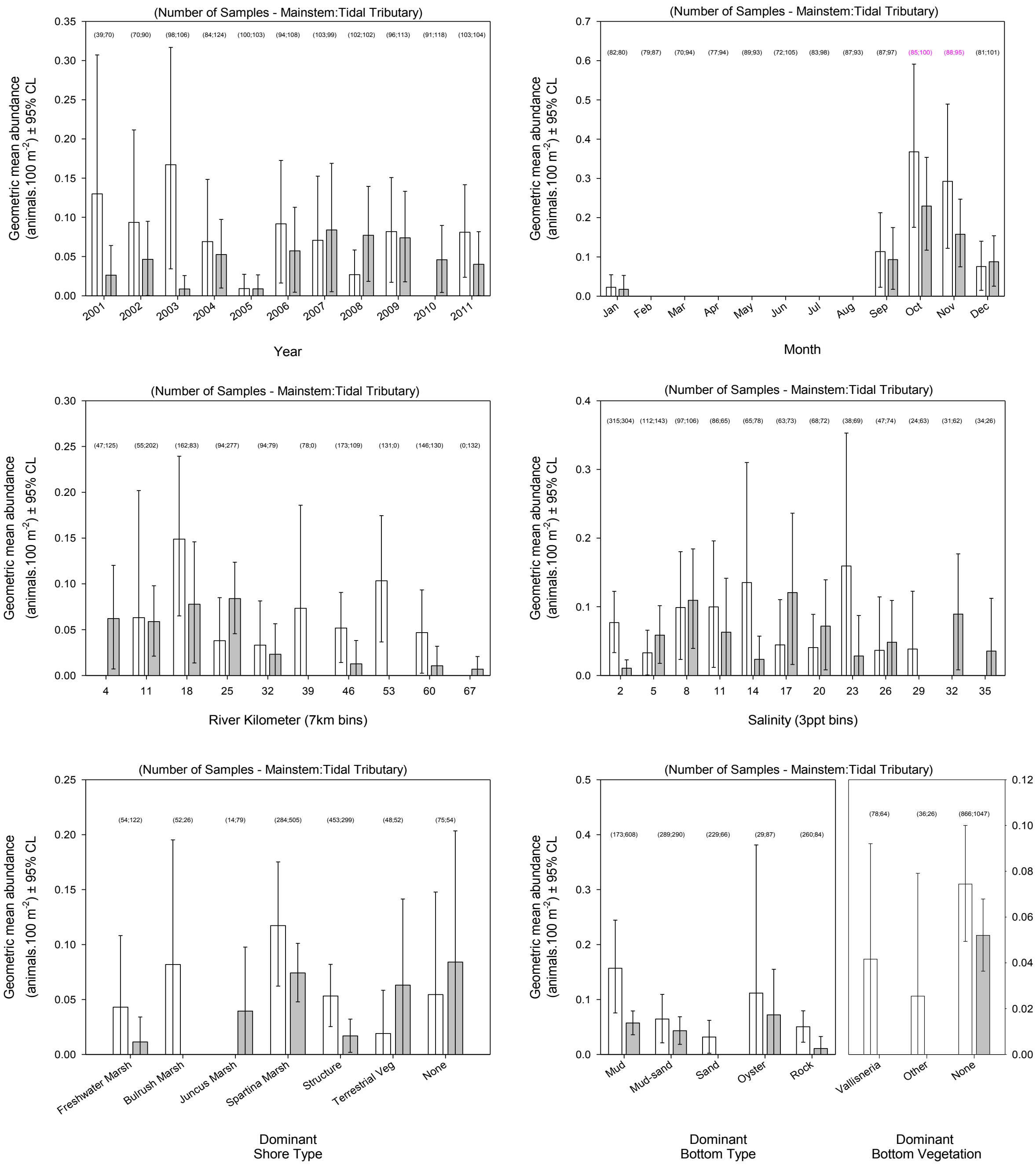

Figure 44. Relative abundance of *Sciaenops ocellatus* (red drum), 10 to 24 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

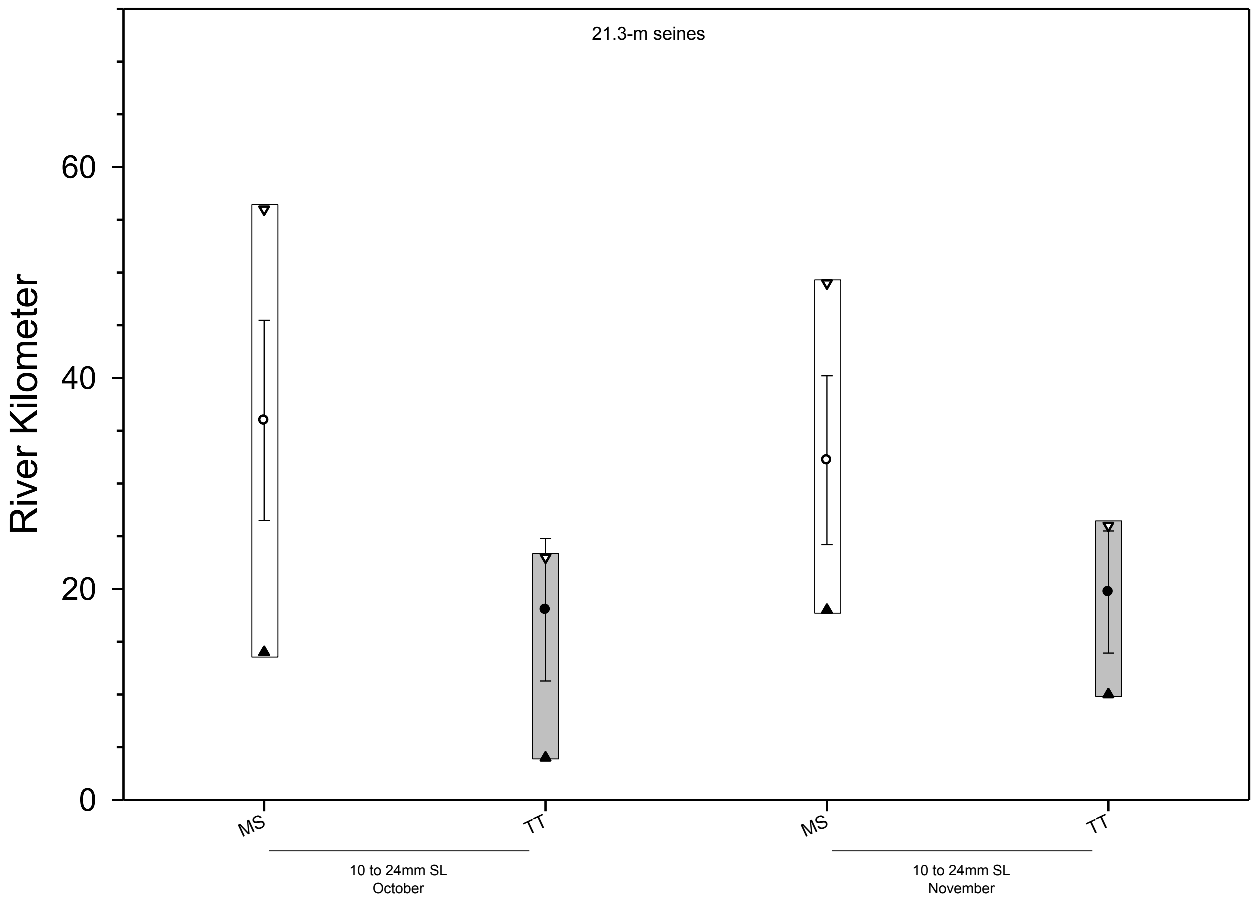

Figure 45. Density-weighted distribution (river-kilometer) statistics for *Sciaenops ocellatus* (red drum) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

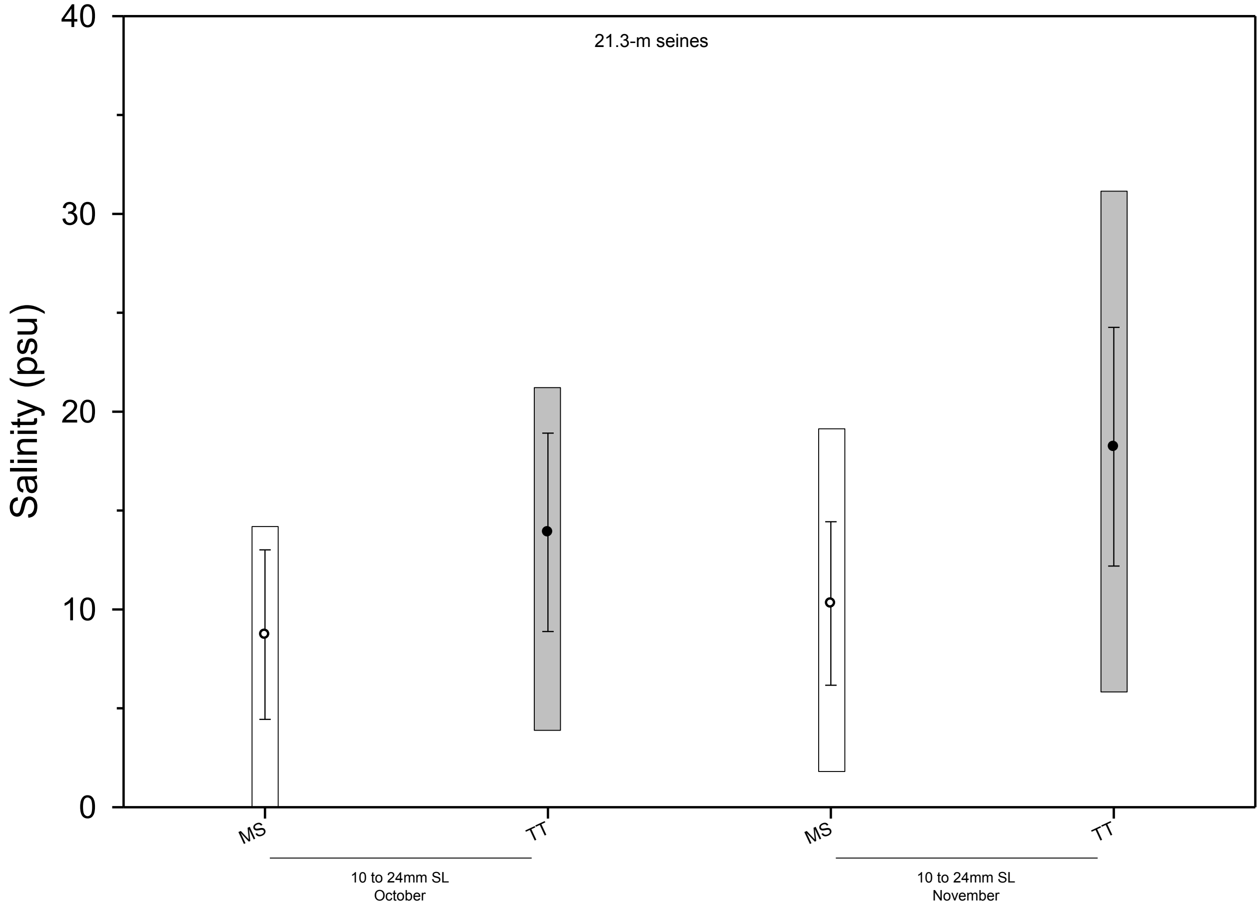

Figure 46. Density-weighted salinity statistics for *Sciaenops ocellatus* (red drum) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

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Freshwater goby, *Ctenogobius shufeldti*

Freshwater gobies range from North Carolina to south Florida and Texas (Carpenter 2002). Fishes in the Gobiidae family are often a dominant component of estuaries throughout the southeastern United States. The freshwater goby most likely spawns within the estuarine waters of the lower St. Johns River.

Recruitment period

Freshwater gobies (32-45 mm SL) were present in nearshore habitats sampled with 21.3-m seines year round, but were most abundant from January to March in both TT and MS habitats (*Figure 47*). Peak abundances of freshwater gobies occurred in the years 2003-2006 with abundance being much lower after 2006 (*Figure 47*).

Habitat associations

Freshwater gobies (32-45 mm SL) in nearshore habitats sampled with 21.3-m seines were collected in the mid- to lower salinity range (<24 psu) and had peaks of abundance below 6 psu. They occurred in the middle to upper reaches of the LSJR sampling area (>15 km) with a peak in abundance in TTs around river-km 32 (*Figure 47*). Freshwater gobies were collected from all shoreline and bottom types and were collected from bottoms both with and without submerged vegetation (*Figure 47*).

Density-weighted distribution (river-kilometer)

Freshwater gobies (32-45 mm SL) collected in 21.3-m seines were found in the middle to upper regions of the study area in both MS and TT habitats (river-km 15-62; *Appendix 3*, *Figure 48*). Centers of distribution in MS habitats were slightly upstream from those in TT habitats during both February and March and the 10-90 percentile range was greater in MS (≥26 km) than in TT (≤9 km) habitats. The centers of distribution were at 39.1 km (February) and 43.4 km (March) in MS habitats and at river-km 32.5 (February) and 35.0 (March) in TT habitats (*Figure 48*).

Additional density-weighted distribution statistics for freshwater gobies can be found in *Appendix 3*.

Density-weighted salinity

Freshwater gobies (32-45 mm SL) collected in 21.3-m seines during February and March were generally found in salinities of less than 12 psu (*Figure 49*). Little variation was seen in density-weighted mean salinities between MS and TT habitats for each month, but there were difference between months. Density-weighted mean salinities in February (<3 psu) were slightly lower in both habitat types than estimates in March (>6 psu; *Figure 49*). The 10-90 percentile range in salinity of MS (3 psu) and TT (1 psu) habitats in February were smaller than those values in March (13 and 10 psu, respectively; *Figure 49*).

Additional density-weighted salinity statistics for freshwater gobies can be found in *Appendix 3*.

Ctenogobius shufeldti (Freshwater goby) in 21.3-m seines

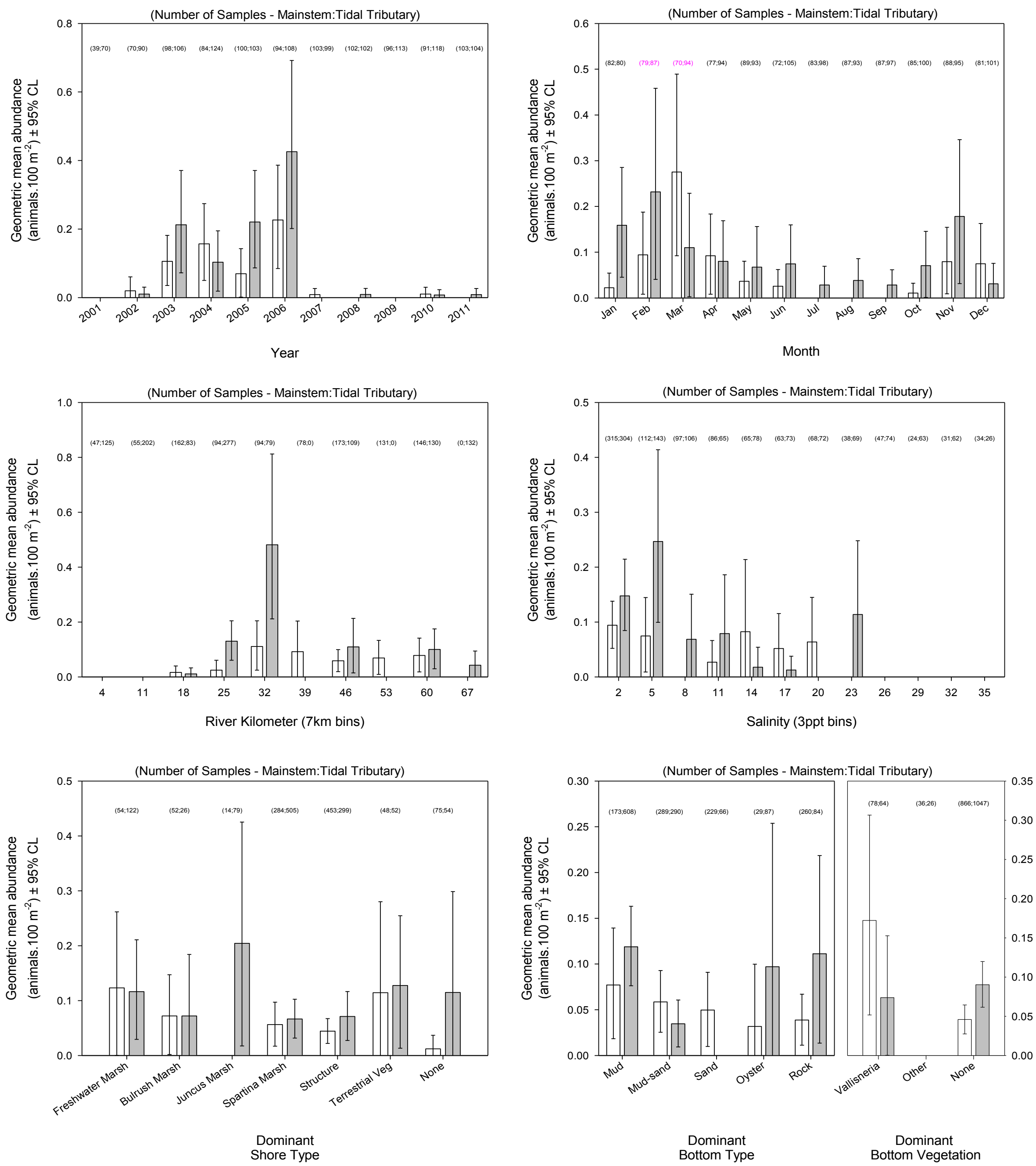

Figure 47. Relative abundance of *Ctenogobius shufeldti* (freshwater goby), 32 to 45 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

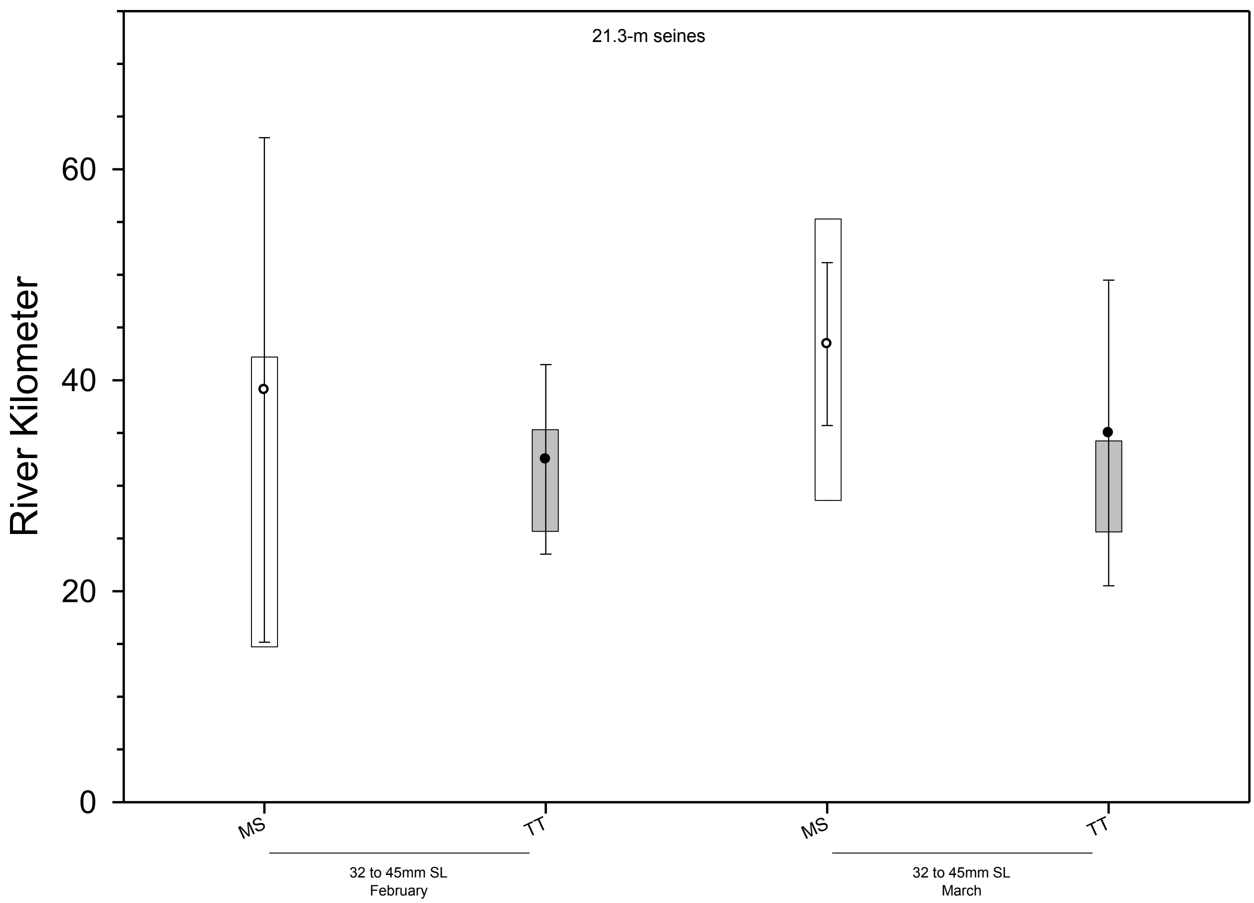

Figure 48. Density-weighted distribution (river-kilometer) statistics for *Ctenogobius shufeldti* (freshwater goby) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

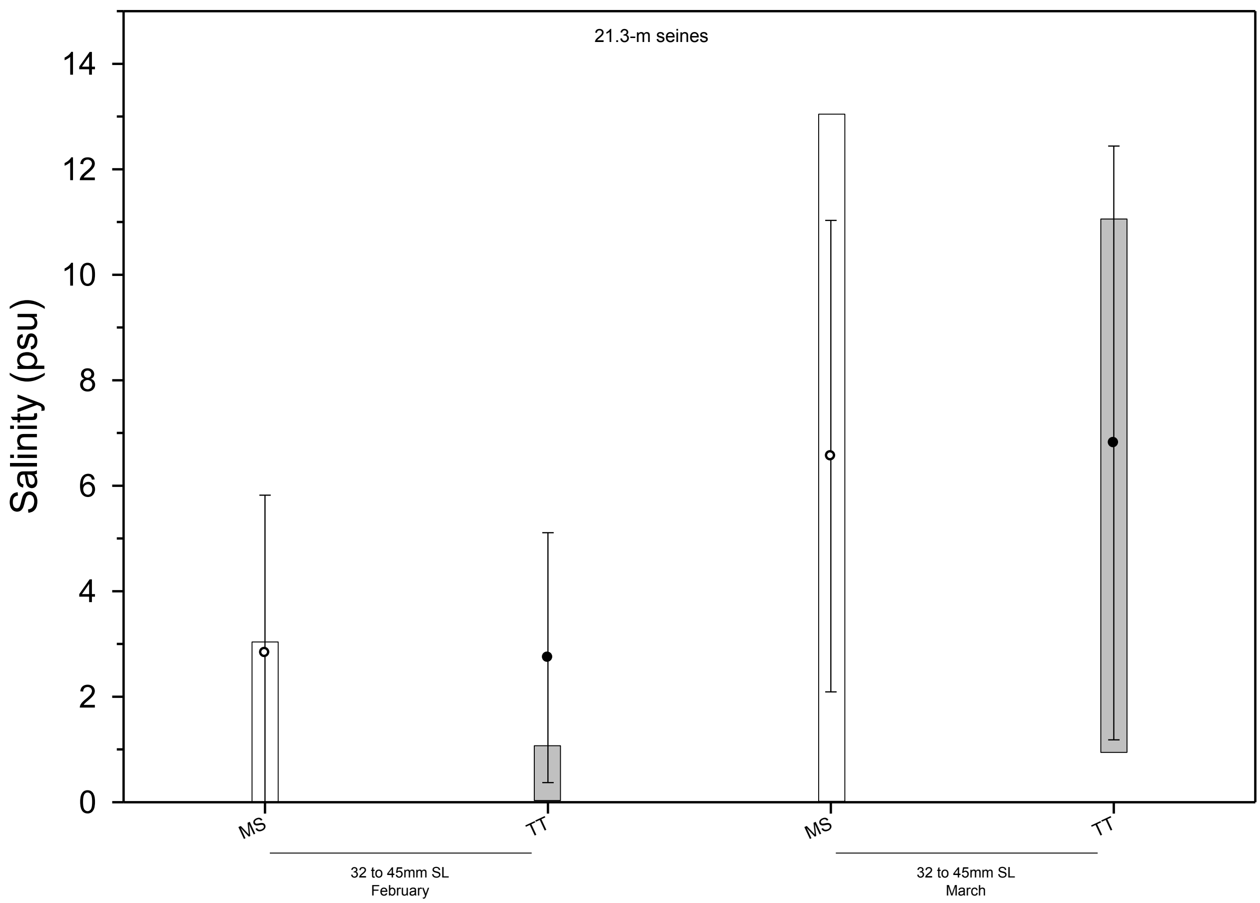

Figure 49. Density-weighted salinity statistics for *Ctenogobius shufeldti* (freshwater goby) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

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Hogchoker, *Trinectes maculatus*

Hogchokers range from Massachusetts to Panama (Carpenter 2002). This species is common in estuaries and is among the most abundant species in the upper estuarine portions of tidal rivers (Peebles and Flannery 1992; Wagner and Austin 1999). Hogchokers spawn in estuaries or the lower portions of tidal rivers and migrate to upstream areas as larvae (Dovel *et al*. 1969; Peterson 1996). Hogchokers are known to occur at salinities ranging from 0 to 50 psu (Simmons 1957; Tagatz 1968).

Recruitment period

Hogchokers (25-44 mm SL and 30-49 mm SL) sampled with 6.1-m trawls were collected year round, but were most abundant between October and April in both TT and MS habitats (*Figure 50*, *Figure 51*).

Habitat associations

Hogchokers (25-44 mm SL and 30-49 mm SL) sampled with 6.1-m trawls were collected over the entire salinity range, but were more abundant in salinities <15 psu than in more saline waters. Both size classes analyzed were generally found throughout the study area, except in areas directly around the river mouth (<7 km; *Figure 50*, *Figure 51*).

Density-weighted distribution (river-kilometer)

Hogchokers (25-44 mm SL) collected in 6.1-m otter trawls from December to April were generally found in MS and TT habitats in the middle to upper reaches (> river-km 25) of the study area (*Figure 52*). Centers of distribution were similar for MS habitats between December and March (river-km 49.1-53.4), but was much further downstream in April (river-km 30.6; *Figure 52*). There was also a much broader 10-90 percentile range of distribution in April than in other analyzed months (river-km 9-49; *Appendix 3*, *Figure 52*). Centers of distribution in TT habitats varied little between months analyzed (river-km 34.6-45.8). The 10-90 percentile range of distributions were generally similar between months for TT habitats (*Figure 52*).

Additional density-weighted distribution statistics for hogchokers can be found in *Appendix 3*.

Density-weighted salinity

Hogchokers (25-44 mm SL) collected in 6.1-m otter trawls from December to April generally occurred at higher abundance in relatively low salinity waters (<10 psu). With the exception of MS habitats in April, the 10^{th} percentile was at 0 psu and the 90^{th} below 11 psu during all months (*Appendix 3*, *Figure 53*). Density-weighted mean salinities for MS and TT habitats were less than 6 psu, with the exception of MS habitats in April (14.8 psu; *Figure 53*).

Additional density-weighted salinity statistics for hogchokers can be found in *Appendix 3*.

Trinectes maculatus (Hogchoker) in 6.1-m trawls

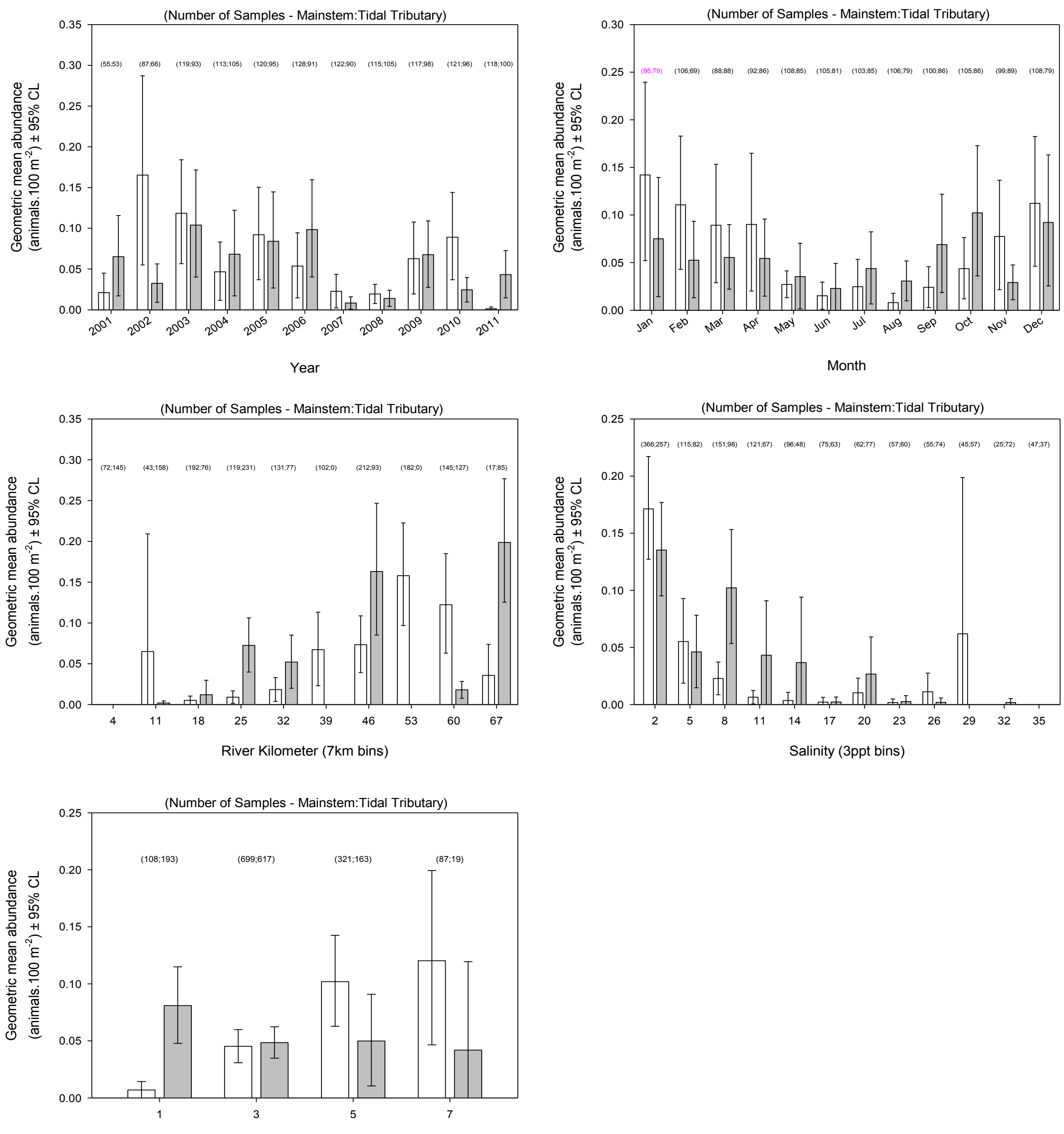

Figure 50. Relative abundance of *Trinectes maculatus* (hogchoker), 25 to 44 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Trinectes maculatus (Hogchoker) in 6.1-m trawls

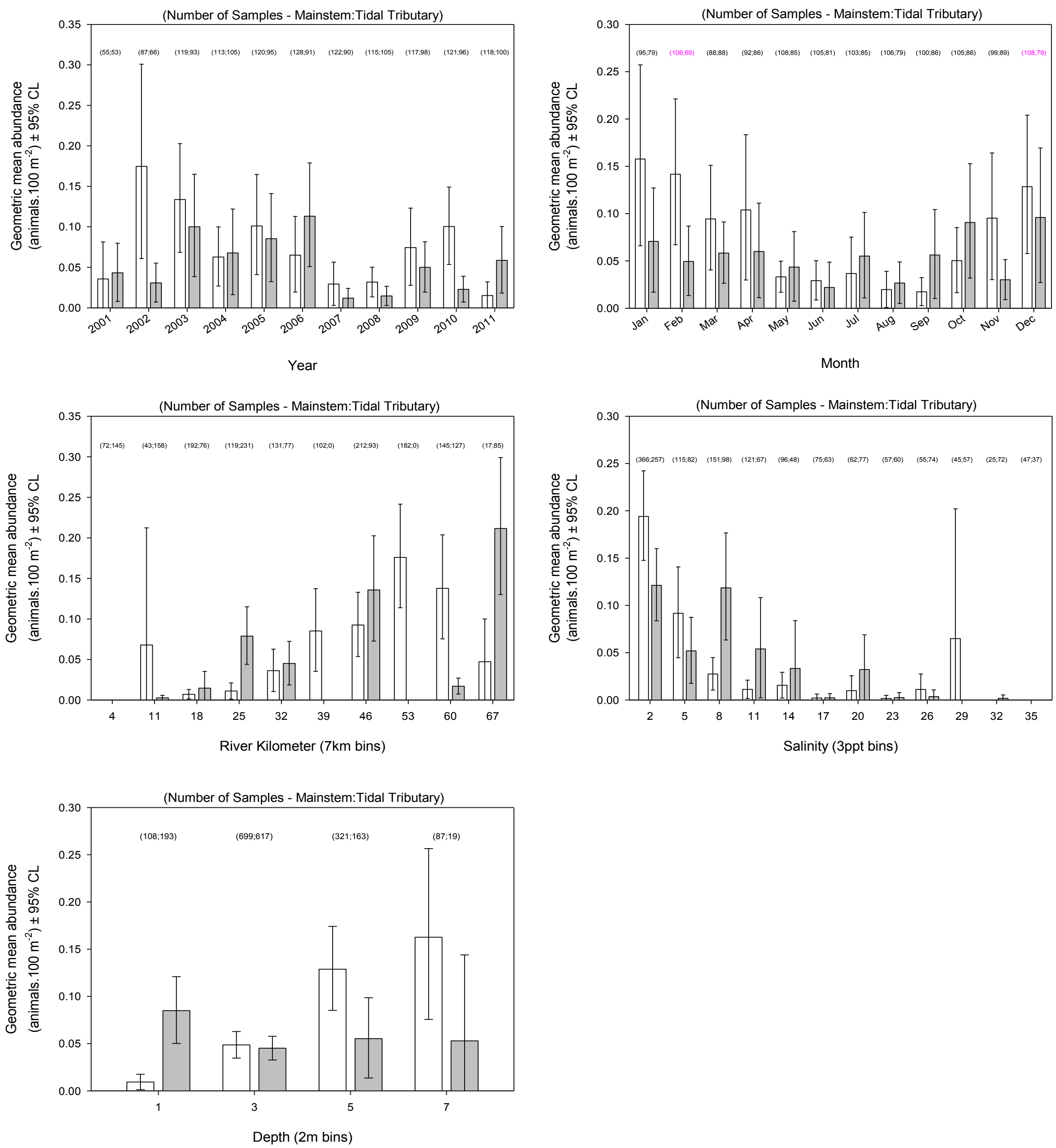

Figure 51. Relative abundance of *Trinectes maculatus* (hogchoker), 30 to 49 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

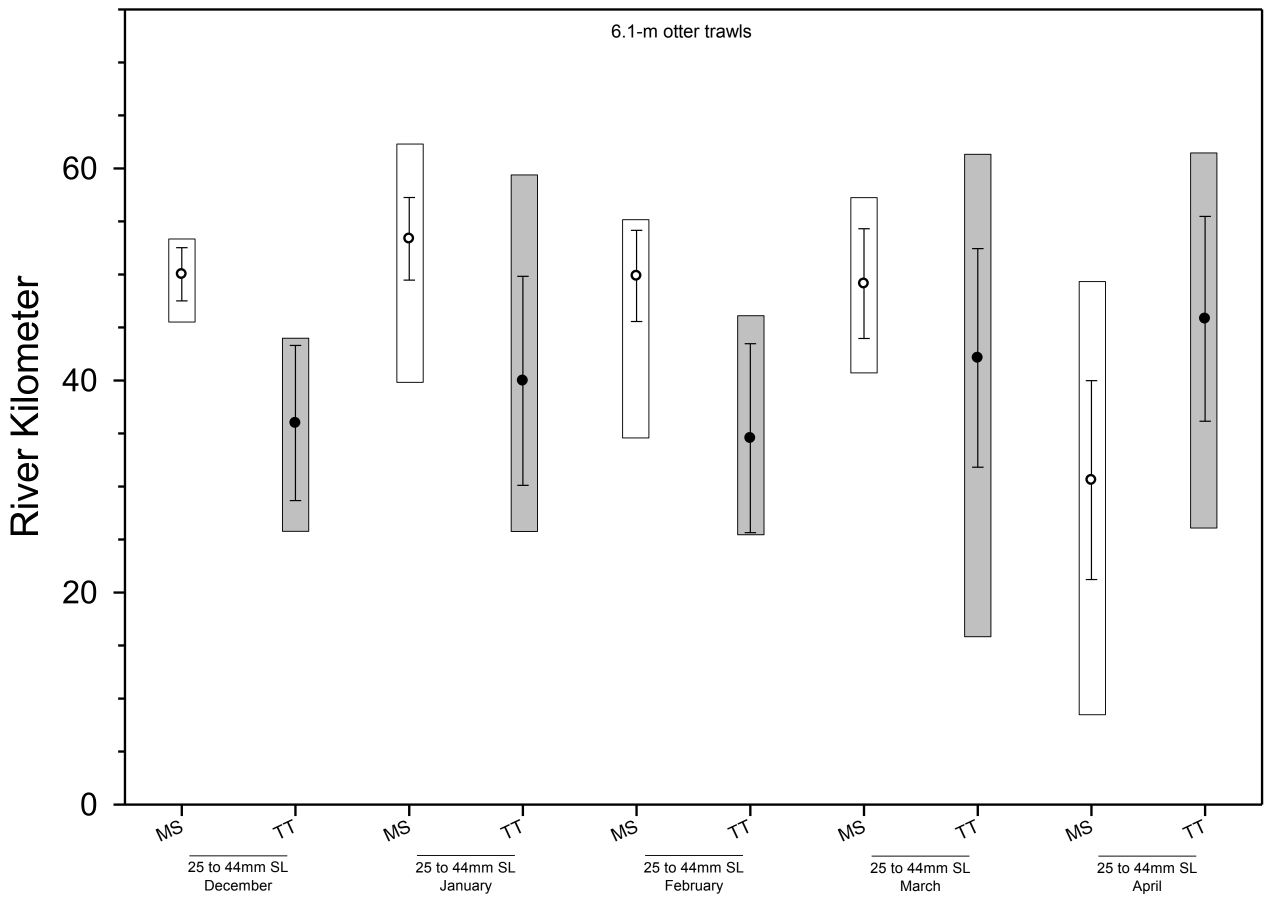

Figure 52. Density-weighted distribution (river-kilometer) statistics for *Trinectes maculatus* (hogchoker) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

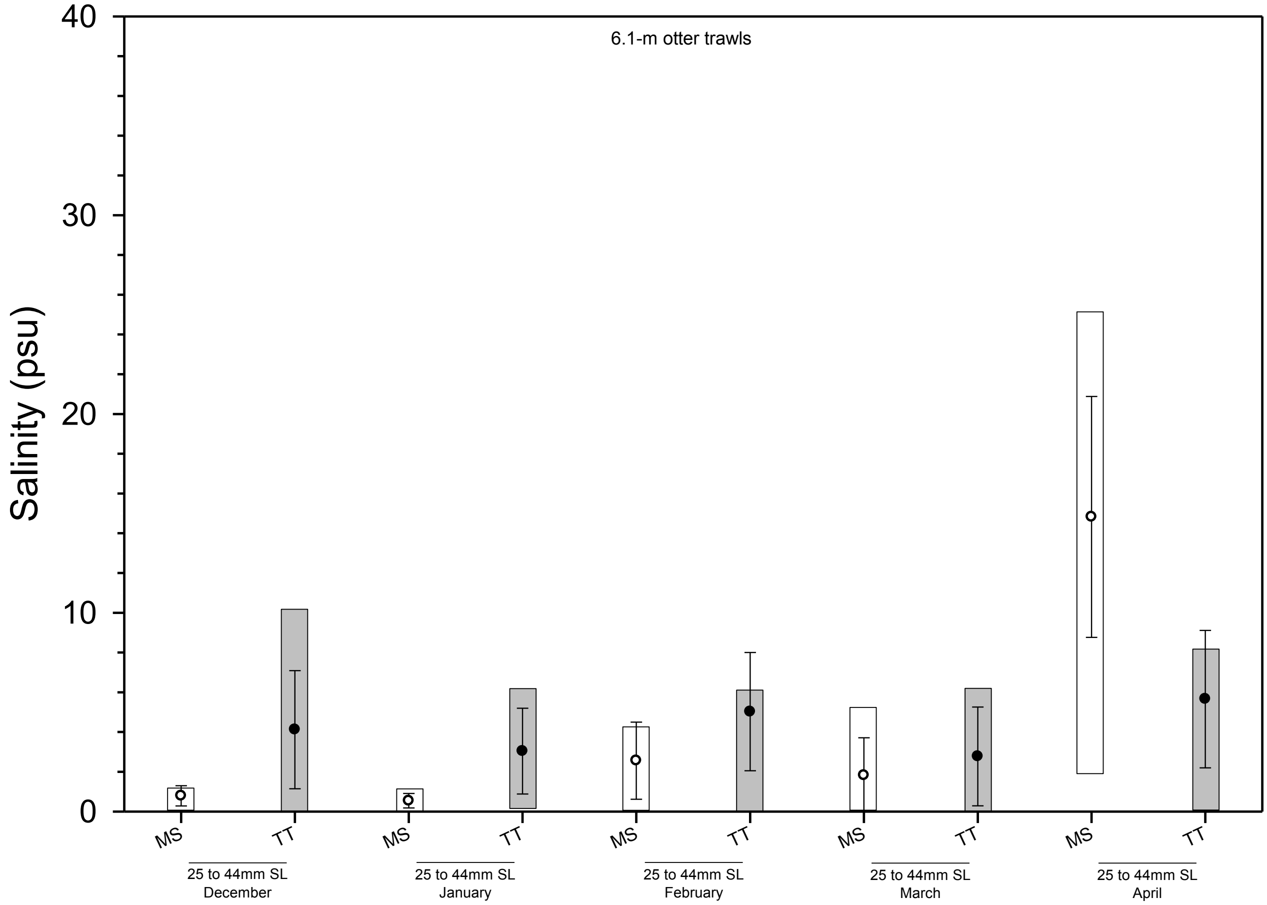

Figure 53. Density-weighted salinity statistics for *Trinectes maculatus* (hogchoker) pseudo-species collected in the lower St. Johns River. Points and error bars represent mean and 95% CI; boxes define the 10th to 90th percentile (10-90 percentile range). Open circles and boxes are for mainstem (MS) collections while the filled circles and boxes are for tidal tributary (TT) collections.

CONCLUSIONS

Composition of overall nekton community

The nekton community in the studied portion of the LSJR was generally typical of a Florida tidal river. Small schooling species such as bay anchovy and menidia silversides dominated the overall abundance of the collected nekton. We observed some interesting characteristics of the system, however, such as the relatively high prevalence of estuarine species well upriver at young-of-the-year, juvenile, and adult sizes (e.g., spotted seatrout) and the existence of freshwater species (e.g., largemouth bass, white catfish) well downstream in both the mainstem of the LSJR and its tidal tributaries. These biological features are likely a result of the physical and hydrodynamic characteristics of this river which provide for a long tidal reach.

Density-weighted distribution (river-kilometer) of nekton

Density-weighted distribution analyses were conducted on pseudo-species that were found throughout the LSJR, from multiple life history strategies (tidal-river resident, offshore spawners, near-shore spawners, and estuarine spawners), and from multiple seasons. Each of the life-history strategies assessed included taxa and pseudo-species that used all sections of the LSJR study area. Pseudo-species within the offshore and nearshore spawners tended to be distributed as far upstream as estuarine spawners and tidal river residents. Similarly, there were no overall trends between mainstem and tidal tributary habitats; there were pseudo-species with centers of abundance below 6.0 km and above 50 km for both mainstem and tidal tributary habitats.

In general, the distribution range of each pseudo-species was relatively broad, especially for the offshore, nearshore, and estuarine spawners. This is likely indicative of important habitats for each being distributed over a wide geographical area, which may allow for a greater dispersion of each pseudo-species within the LSJR. It is important to look at not only the mean distribution of these pseudo-species within the LSJR, but also the range over which they occur in order to determine habitats and areas that may be critical to their early life history stages.

Density-weighted salinity of nekton

Pseudo-species from each of the life history strategies were collected from a wide range of the available salinities in the LSRJ study area. Tidal river residents tended to have the smallest 10-90 percentile range (average range <8 psu) while the offshore and nearshore spawners had the largest (>16 psu). With the exception of estuarine spawners collected with 21.3-m seines, all life history stages had at least one pseudo-species where the density-weighted salinity was less than 5 psu. There were no overarching trends between mainstem and tidal tributary habitats. Pseudo-species in each habitat type had average density-weighted salinities ranging from freshwater (0.4 psu, tidal tributaries) and oligohaline (0.5 psu, mainstem) to euhaline (≥30 psu), and similar 10-90 percentile ranges (average range of 14.7 and 15.0 for mainstem and tidal tributaries, respectively). Over 63% of the pseudo-species assessed had density-weighted mean salinity values less than 12 psu, underscoring the critical importance of these lower salinity habitats in the LSJR study area.

The broad range of salinities that pseudo-species were collected from demonstrates the dynamic salinity environment that species encounter in the LSJR study area. These monitoring data were not designed to pinpoint critical habitats, but were instead designed to assess annual trends over the range of available habitats. The high abundance of a species and life history stage may indicate recruitment to that habitat or simply a transitioning through that habitat into another habitat. Additionally, high abundance at juvenile stages in a particular habitat may not directly equate to subsequent recruitment into the adult population. Higher survival, fitness, or growth in a habitat with lower juvenile abundance may result in that habitat contributing at a disproportionately higher rate to the adult population. Therefore, as with the river-km distribution analysis, it is more important to assess the range of salinity habitats from which a pseudo-species was collected rather than focusing on the center of salinity.

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APPENDIX 1: Gear-specific summary tables

Appendix 1 Table 1. Page 1 of 6.

21.3-m seine catch by month (May 2001 through December 2011).

Data are presented as total number collected.

Number of monthly samples is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	***Common Name***	***Jan (162)***	***Feb (166)***	***Mar (164)***	***Apr (171)***	***May (182)***	***Jun (177)***	***Jul (181)***	***Aug (180)***	***Sep (184)***	***Oct (185)***	***Nov (183)***	***Dec (182)***	***Total (2,117)***
Stomolophus meleagris	Cannonball jellyfish	3	9	1	3	.	1	.	.	.	.	.	6	23
Farfantepenaeus spp.	Commercial shrimps	15	7	19	390	1,740	432	131	67	135	362	129	67	3,494
Farfantepenaeus aztecus	Brown shrimp	.	.	.	8	280	304	7	4	1	1	.	2	607
Farfantepenaeus duorarum	Pink shrimp	.	.	1	109	188	106	42	16	14	43	9	13	541
Litopenaeus setiferus	White shrimp	21	6	3	3	599	8,187	5,609	3,646	1,526	2,390	2,676	930	25,596
Rimapenaeus constrictus	Roughneck shrimp	.	.	.	.	7	.	.	3	.	1	1	.	12
Sicyonia parri		.	.	.	.	1	.	.	.	.	.	.	.	1
Macrobrachium spp.	Prawns	.	.	.	.	1	.	.	.	.	.	1	.	2
Callinectes sp.		.	.	.	.	.	.	.	.	.	.	1	.	1
Callinectes sapidus	Blue crab	138	153	164	160	200	213	128	164	123	197	208	178	2,026
Callinectes similis	Lesser blue crab	1	.	2	36	178	20	21	78	23	16	40	15	430
Callinectes ornatus	Shelligs	.	.	.	.	.	.	10	1	.	.	.	.	11
Portunus spp.	Portunus crabs	.	.	.	1	7	2	7	3	.	.	.	.	20
Menippe sp.	Stone crab	.	.	.	1	.	.	.	.	.	.	.	.	1
Dasyatis sabina	Atlantic stingray	2	.	3	4	11	4	5	6	5	10	3	2	55
Dasyatis say	Bluntnose stingray	.	.	.	.	.	.	.	1	.	.	.	.	1
Lepisosteus osseus	Longnose gar	.	.	.	.	2	.	.	1	1	1	1	.	6
Lepisosteus platyrhincus	Florida gar	.	.	2	5	.	.	2	.	.	1	2	1	13
Amia calva	Bowfin	.	.	1	.	.	.	.	.	.	.	1	.	2
Elops saurus	Ladyfish	.	3	4	11	11	34	6	8	3	5	.	3	88
Albula vulpes	Bonefish	.	.	.	.	.	.	.	.	.	.	.	1	1
Anguilla rostrata	American eel	.	.	.	.	.	.	1	.	1	.	.	.	2

Appendix 1 Table 1 continued. Page 2 of 6.

Scientific Name	***Common Name***	***Jan (162)***	***Feb (166)***	***Mar (164)***	***Apr (171)***	***May (182)***	***Jun (177)***	***Jul (181)***	***Aug (180)***	***Sep (184)***	***Oct (185)***	***Nov (183)***	***Dec (182)***	***Total (2,117)***
Myrophis punctatus	Speckled worm eel	.	.	.	.	1	1	.	.	.	1	.	1	4
Clupeidae spp.	Herrings	1	.	.	.	.	.	.	.	3	3	.	.	7
Alosa sapidissima	American shad	.	.	.	7	.	9	.	.	.	.	.	2	18
Alosa aestivalis	Blueback herring	.	.	.	3	1	1	.	.	.	.	1	.	6
Alosa mediocris	Hickory shad	.	.	.	1	.	3	2	4	.	2	.	.	12
Brevoortia spp.	Menhadens	137	4,785	2,537	543	316	699	139	104	100	150	3	180	9,693
Dorosoma cepedianum	Gizzard shad	.	.	1	.	2	9	30	8	17	15	4	1	87
Dorosoma petenense	Threadfin shad	.	.	1	.	.	112	22	10	15	162	14	13	349
Opisthonema oglinum	Atlantic thread herring	.	1	.	.	119	221	706	155	19	34	1	1	1,257
Harengula jaguana	Scaled sardine	1	.	3	.	1	1,155	59	130	2	.	4	.	1,355
Sardinella aurita	Spanish sardine	.	.	.	1	.	8	.	1	2	.	.	.	12
Anchoa spp.	Anchovies	.	.	.	.	.	.	5	.	.	1	.	.	6
Anchoa hepsetus	Striped anchovy	.	18	11	160	2,193	2,510	3,450	617	2,010	842	6	4	11,821
Anchoa mitchilli	Bay anchovy	3,106	758	3,871	6,651	9,042	4,708	4,853	7,650	10,752	17,256	24,705	7,309	100,661
Anchoa lyolepis	Dusky anchovy	.	.	.	.	4	.	.	6	100	21	1	.	132
Esox niger	Chain pickerel	.	.	.	.	.	.	.	.	.	.	.	1	1
Synodus foetens	Inshore lizardfish	.	.	.	.	32	47	19	15	20	11	9	1	154
Notemigonus crysoleucas	Golden shiner	1	2	.	.	7	5	36	9	3	3	29	3	98
Notropis maculatus	Taillight shiner	.	.	.	138	13	1	.	.	.	.	.	.	152
Ictalurus punctatus	Channel catfish	.	.	1	1	.	1	.	.	5	.	2	.	10
Ameiurus catus	White catfish	.	3	1	4	1	11	3	1	2	4	1	1	32
Bagre marinus	Gafftopsail catfish	.	.	.	.	.	.	4	.	.	.	.	.	4
Ariopsis felis	Hardhead catfish	.	.	.	.	.	.	1	2	.	.	.	.	3
Pterygoplichthys sp.	Armoured catfishes	.	.	.	.	.	1	.	.	.	.	.	.	1
Opsanus tau	Oyster toadfish	.	.	1	.	1	.	2	4	1	1	.	1	11
Hyporhamphus spp.	Halfbeaks	.	.	.	.	6	.	.	.	.	.	.	.	6
Hyporhamphus meeki	False silver halfbeak	.	.	.	.	.	14	.	.	.	.	.	.	14
Strongylura spp.	Needlefishes	.	.	.	39	52	34	19	7	11	5	1	.	168
Strongylura marina	Atlantic needlefish	1	.	.	1	15	15	17	8	12	5	5	.	79
Strongylura notata	Redfin needlefish	.	.	.	.	.	1	.	4	.	.	.	.	5
Tylosurus crocodilus	Houndfish	.	.	.	.	.	.	2	.	.	.	.	.	2

Appendix 1 Table 1 continued. Page 3 of 6.

Scientific Name	Common Name	Jan (162)	Feb (166)	Mar (164)	Apr (171)	May (182)	Jun (177)	Jul (181)	Aug (180)	Sep (184)	Oct (185)	Nov (183)	Dec (182)	Total (2,117)
Cyprinodon variegatus	Sheepshead minnow	1	5	6	1	.	6	.	1	.	.	3	6	29
Fundulus sp.	Assorted killifish	.	.	.	.	.	1	.	.	.	.	.	.	1
Fundulus confluentus	Marsh killifish	.	.	1	.	.	3	1	.	2	.	.	.	7
Fundulus heteroclitus	Mummichog	670	290	241	273	645	569	516	108	51	403	278	437	4,481
Fundulus majalis	Striped killifish	47	14	10	33	7	74	65	105	23	23	42	39	482
Fundulus chrysotus	Golden topminnow	.	.	.	.	.	.	.	.	.	.	.	1	1
Fundulus seminolis	Seminole killifish	13	8	75	46	12	98	50	38	19	30	94	4	487
Lucania parva	Rainwater killifish	82	23	825	100	896	2,047	952	92	67	7	62	47	5,200
Lucania goodei	Bluefin killifish	7	.	2	9	4	1	1	.	.	1	1	3	29
Jordanella floridae	Flagfish	.	.	.	.	2	2	.	.	.	.	.	.	4
Gambusia holbrooki	Eastern mosquito fish	35	82	863	130	36	269	88	16	35	201	20	80	1,855
Poecilia latipinna	Sailfin molly	3	3	13	14	15	192	23	32	1	112	33	4	445
Heterandria formosa	Least killifish	4	1	2	6	.	1	.	.	4	1	.	.	19
Membras martinica	Rough silverside	9	.	.	7	1	64	414	575	48	46	35	.	1,199
Menidia spp.	Menidia silversides	952	2,179	930	1,107	2,519	2,061	1,451	1,589	1,034	1,730	1,321	1,475	18,348
Menidia menidia	Atlantic silverside	842	1,096	364	519	2,978	6,523	5,722	6,520	4,465	1,316	1,009	2,019	33,373
Labidesthes sicculus	Brook silverside	22	160	21	69	33	94	61	18	17	67	103	78	743
Hypoatherina harringtonensis	Reef silverside	.	.	.	.	.	.	.	.	.	1	.	.	1
Syngnathus floridae	Dusky pipefish	.	.	.	.	.	3	.	.	1	.	.	.	4
Syngnathus fuscus	Northern pipefish	1	.	.	.	1	.	.	.	.	1	.	.	3
Syngnathus louisianae	Chain pipefish	.	.	.	2	11	33	14	5	10	14	4	.	93
Syngnathus scovelli	Gulf pipefish	2	7	10	21	48	29	134	43	10	16	20	19	359
Microphis brachyurus	Opposum pipefish	.	.	.	.	.	.	1	.	.	1	5	2	9
Prionotus carolinus	Northern searobin	.	.	.	.	.	.	.	.	.	.	1	.	1
Prionotus scitulus	Leopard searobin	.	.	.	.	10	3	4	.	5	.	.	.	22
Prionotus tribulus	Bighead searobin	6	2	7	3	4	9	1	4	1	10	6	7	60
Centropomus undecimalis	Common snook	.	.	.	.	.	.	.	.	.	5	2	.	7
Centropristis philadelphica	Rock sea bass	.	.	2	3	1	.	.	.	1	.	.	.	7
Epinephelus itajara	Goliath grouper	.	.	.	.	.	.	.	.	.	2	.	.	2
Mycteroperca microlepis	Gag	.	.	.	1	1	.	.	.	1	1	.	.	4
Diplectrum formosum	Sand perch	.	.	.	.	.	.	.	1	.	.	.	.	1

Appendix 1 Table 1 continued. Page 4 of 6.

Scientific Name	***Common Name***	***Jan (162)***	***Feb (166)***	***Mar (164)***	***Apr (171)***	***May (182)***	***Jun (177)***	***Jul (181)***	***Aug (180)***	***Sep (184)***	***Oct (185)***	***Nov (183)***	***Dec (182)***	***Total (2,117)***
Centrarchidae sp.		.	.	.	1	.	.	.	.	.	.	.	.	1
Lepomis spp.	Sunfishes	2	10	10	.	.	2	9	71	74	44	15	22	259
Lepomis auritus	Redbreast sunfish	56	35	52	95	65	68	40	50	59	26	69	86	701
Lepomis macrochirus	Bluegill	36	129	170	244	116	151	81	70	202	91	192	242	1,723
Lepomis marginatus	Dollar sunfish	.	.	2	.	.	.	.	.	.	.	.	5	7
Lepomis microlophus	Redear sunfish	11	6	17	82	11	27	31	11	26	17	20	60	319
Lepomis punctatus	Spotted sunfish	.	.	.	18	3	.	5	1	2	1	2	4	36
Micropterus salmoides	Largemouth bass	5	6	8	92	146	92	51	22	12	7	20	11	472
Pomoxis nigromaculatus	Black crappie	.	.	5	.	.	.	4	.	1	1	1	.	12
Lepomis gulosus	Warmouth	5	.	.	1	.	.	.	.	.	1	.	1	8
Etheostoma fusiforme	Swamp darter	.	1	.	.	.	.	.	.	1	.	.	.	2
Pomatomus saltatrix	Bluefish	.	.	.	6	34	7	1	.	1	.	.	.	49
Carangidae spp.	Jacks	.	.	.	.	2	.	.	.	.	.	.	.	2
Caranx hippos	Crevalle jack	.	.	.	.	9	50	25	24	4	10	2	2	126
Caranx latus	Horse-eye jack	.	.	.	.	1	.	.	.	.	1	1	.	3
Chloroscombrus chrysurus	Atlantic bumper	.	.	.	.	1	7	36	36	24	24	31	.	159
Oligoplites saurus	Leatherjacket	.	.	.	.	.	12	25	45	82	87	34	2	287
Selene vomer	Lookdown	.	.	.	.	2	6	2	5	7	2	3	.	27
Trachinotus carolinus	Florida pompano	.	.	.	4	159	84	33	25	.	2	.	.	307
Trachinotus falcatus	Permit	.	.	.	.	7	49	14	67	65	97	324	9	632
Lutjanus griseus	Gray snapper	.	.	.	.	4	3	6	43	21	32	13	7	129
Lutjanus analis	Mutton snapper	.	.	.	.	.	.	.	.	1	3	.	.	4
Lutjanus synagris	Lane snapper	.	.	.	.	.	.	.	3	1	7	3	.	14
Lobotes surinamensis	Tripletail	.	.	.	.	.	1	.	.	.	.	.	.	1
Eucinostomus spp.	Eucinostomus	176	57	26	14	49	258	212	204	1,817	1,611	1,035	1,018	6,477
Eucinostomus gula	Silver jenny	12	2	.	6	.	8	102	145	70	79	97	145	666
Eucinostomus harengulus	Tidewater mojarra	75	23	46	30	37	123	616	440	431	546	435	524	3,326
Diapterus auratus	Irish pompano	2	.	.	.	1	2	28	89	49	112	192	43	518
Haemulidae spp.		.	.	.	3	.	.	.	.	.	.	.	.	3
Orthopristis chrysoptera	Pigfish	.	.	2	161	485	153	114	46	25	4	.	.	990
Lagodon rhomboides	Pinfish	101	798	964	1,165	1,534	1,246	776	420	337	218	84	19	7,662

Appendix 1 Table 1 continued. Page 5 of 6.

Scientific Name	***Common Name***	***Jan (162)***	***Feb (166)***	***Mar (164)***	***Apr (171)***	***May (182)***	***Jun (177)***	***Jul (181)***	***Aug (180)***	***Sep (184)***	***Oct (185)***	***Nov (183)***	***Dec (182)***	***Total (2,117)***
Archosargus probatocephalus	Sheepshead	.	1	3	2	16	22	7	19	2	7	4	2	85
Cynoscion nebulosus	Spotted seatrout	4	1	2	5	18	62	97	111	119	166	44	23	652
Cynoscion complex	*C. regalis* x *C. arenarius*	.	.	.	.	15	37	16	6	3	6	2	.	85
Bairdiella chrysoura	Silver perch	3	1	3	6	2,289	1,384	1,061	582	150	163	36	5	5,683
Leiostomus xanthurus	Spot	6,920	27,024	30,211	12,511	7,139	2,476	1,072	460	128	97	57	23	88,118
Menticirrhus americanus	Southern kingfish	5	.	.	5	15	64	43	48	4	15	5	3	207
Menticirrhus littoralis	Gulf kingfish	.	.	.	.	.	.	1	7	1	1	.	.	10
Menticirrhus saxatilis	Northern kingfish	2	.	.	3	9	.	5	.	.	.	.	.	19
Micropogonias undulatus	Atlantic croaker	1,971	1,721	805	907	1,613	531	255	41	2	53	305	765	8,969
Pogonias cromis	Black drum	.	.	.	.	5	6	6	3	2	3	1	.	26
Sciaenops ocellatus	Red drum	92	45	61	50	52	25	13	6	42	151	150	106	793
Stellifer lanceolatus	Star drum	.	.	.	.	.	.	.	1	.	.	.	.	1
Chaetodipterus faber	Atlantic spadefish	.	.	.	.	.	.	1	1	.	.	.	.	2
Oreochromis aureus	Blue tilapia	.	.	.	.	.	.	4	.	.	.	.	.	4
Oreochromis mossambicus	Mozambique tilapia	.	.	.	.	.	1	.	.	.	.	.	.	1
Oreochromis/Sarotherodon spp.	Tilapias	.	.	.	.	.	.	1	7	.	1	.	.	9
Elassoma okefenokee	Okefenokee pygmy sunfish	3	.	.	.	.	.	.	.	1	.	.	1	5
Mugil cephalus	Striped mullet	3,785	7,992	7,603	3,607	592	1,161	355	154	86	89	59	161	25,644
Mugil curema	White mullet	61	42	68	239	1,265	502	272	179	81	84	61	228	3,082
Agonostomus monticola	Mountain mullet	.	.	.	.	.	.	.	.	.	.	.	2	2
Sphyraena borealis	Northern sennet	.	.	1	1	1	.	.	.	.	.	.	.	3
Sphyraena guachancho	Guaguanche	.	.	.	.	.	.	.	1	.	.	.	.	1
Sphyraena barracuda	Great barracuda	.	.	.	.	.	.	.	.	.	.	2	.	2
Astroscopus y-graecum	Southern stargazer	2	.	2	4	2	.	.	.	.	.	1	1	12
Hypsoblennius ionthas	Freckled blenny	.	.	.	1	.	.	.	.	.	.	.	.	1
Chasmodes spp.		.	.	.	.	.	.	.	2	.	.	1	.	3
Chasmodes bosquianus	Striped blenny	.	.	1	1	.	.	1	1	.	1	2	3	10
Evorthodus lyricus	Lyre goby	1	.	.	.	.	1	.	1	.	6	.	.	9
Ctenogobius boleosoma	Darter goby	59	43	75	56	85	37	41	49	29	65	72	61	672
Gobionellus oceanicus	Highfin goby	.	2	.	6	.	9	2	.	4	9	4	3	39
Ctenogobius shufeldti	Freshwater goby	65	206	127	64	46	34	25	44	17	28	132	52	840

Appendix 1 Table 1 continued. Page 6 of 6.

Scientific Name	***Common Name***	***Jan (162)***	***Feb (166)***	***Mar (164)***	***Apr (171)***	***May (182)***	***Jun (177)***	***Jul (181)***	***Aug (180)***	***Sep (184)***	***Oct (185)***	***Nov (183)***	***Dec (182)***	***Total (2,117)***
Ctenogobius smaragdus	Emerald goby	4	3	1	2	4	1	7	.	5	32	9	5	73
Gobiosoma spp.	Gobiosoma gobies	19	34	14	4	3	12	11	86	34	54	56	50	377
Gobiosoma bosc	Naked goby	17	64	97	48	26	15	22	23	8	28	34	83	465
Gobiosoma robustum	Code goby	7	16	6	6	3	2	2	3	.	5	8	9	67
Microgobius gulosus	Clown goby	11	15	65	73	56	98	28	20	41	189	77	87	760
Microgobius thalassinus	Green goby	5	1	10	9	.	15	9	9	5	29	18	7	117
Bathygobius soporator	Frillfin goby	3	2	10	8	2	3	.	17	2	5	7	25	84
Dormitator maculatus	Fat sleeper	1	.	.	.	.	.	.	.	.	.	1	.	2
Scomberomorus maculatus	Spanish mackerel	.	.	.	.	.	1	.	.	5	.	1	.	7
Peprilus triacanthus	Butterfish	.	.	.	.	1	.	.	.	1	.	.	.	2
Citharichthys macrops	Spotted whiff	.	.	.	.	.	.	.	1	.	.	.	.	1
Citharichthys spilopterus	Bay whiff	21	6	14	50	191	123	67	25	24	10	3	2	536
Etropus crossotus	Fringed flounder	.	.	2	3	.	17	31	13	9	11	3	2	91
Paralichthys dentatus	Summer flounder	.	3	3	6	6	2	1	.	.	.	.	.	21
Paralichthys albigutta	Gulf flounder	9	18	15	19	22	8	9	4	2	1	.	.	107
Paralichthys lethostigma	Southern flounder	14	42	51	40	47	60	27	25	13	20	22	7	368
Paralichthys squamilentus	Broad flounder	.	.	.	2	1	1	.	.	.	.	.	.	4
Ancylopsetta quadrocellata	Ocellated flounder	1	1	.	.	.	.	.	.	.	.	.	.	2
Symphurus plagiusa	Blackcheek tonguefish	13	3	20	8	48	57	33	34	46	62	213	24	561
Trinectes maculatus	Hogchoker	34	53	8	32	32	28	55	47	39	14	28	24	394
Achirus lineatus	Lined sole	3	3	3	4	5	2	10	38	17	26	7	6	124
Stephanolepis hispidus	Planehead filefish	.	.	.	.	8	8	.	1	2	2	4	1	26
Sphoeroides nephelus	Southern puffer	2	.	.	5	51	35	18	8	6	6	10	.	141
Sphoeroides spengleri	Bandtail puffer	.	.	.	.	.	1	.	.	.	.	.	.	1
Chilomycterus schoepfii	Striped burrfish	.	.	.	.	3	12	11	8	13	6	1	.	54
Totals		***19,741***	***48,024***	***50,582***	***30,333***	***38,594***	***40,153***	***30,666***	***25,784***	***24,956***	***30,001***	***34,910***	***16,927***	***390,671***

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Appendix 1 Table 2. Page 1 of 5.

183-m seine catch by month (May 2001 through December 2011).

Data are presented as total number collected

Number of monthly samples is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	***Common Name***	***Jan (91)***	***Feb (91)***	***Mar (91)***	***Apr (91)***	***May (100)***	***Jun (101)***	***Jul (101)***	***Aug (97)***	***Sep (93)***	***Oct (94)***	***Nov (95)***	***Dec (98)***	***Tot (1,143)***
Stomolophus meleagris	Cannonball jellyfish	111	223	192	13	9	2	.	.	.	1,260	224	61	2,095
Limulus polyphemus	Horseshoe crab	.	.	.	.	.	.	.	.	.	.	2	1	3
Farfantepenaeus spp.	Commercial shrimps	.	1	.	2	28	9	8	.	.	4	1	.	53
Farfantepenaeus aztecus	Brown shrimp	.	.	.	.	93	43	7	.	.	.	.	.	143
Farfantepenaeus duorarum	Pink shrimp	1	.	1	1	21	18	1	3	1	12	.	1	60
Litopenaeus setiferus	White shrimp	12	5	6	3	.	3	229	90	519	78	145	10	1,100
Callinectes sapidus	Blue crab	65	34	69	76	160	217	105	143	158	67	33	24	1,151
Callinectes similis	Lesser blue crab	1	.	1	1	15	19	19	3	1	1	5	.	66
Callinectes ornatus	Shelligs	.	.	.	.	.	1	.	1	.	.	.	.	2
Portunus sp.	Portunus crabs	.	.	.	.	.	.	.	.	.	.	1	.	1
Menippe spp.	Stone crab	.	.	.	.	2	.	.	.	.	.	.	.	2
Dasyatis sabina	Atlantic stingray	144	82	199	325	398	409	479	327	306	179	218	166	3,232
Dasyatis say	Bluntnose stingray	.	.	1	18	6	3	3	1	.	.	1	1	34
Gymnura micrura	Smooth butterfly ray	.	.	.	4	1	1	1	.	2	.	.	.	9
Aetobatus narinari	Spotted eagle ray	.	.	.	.	.	2	.	.	.	.	.	.	2
Rhinoptera bonasus	Cownose ray	.	.	.	.	.	3	.	1	.	.	.	.	4
Lepisosteus osseus	Longnose gar	1	5	49	25	33	15	9	15	45	19	8	17	241
Lepisosteus platyrhincus	Florida gar	3	46	20	15	9	90	29	17	5	8	5	19	266
Amia calva	Bowfin	1	2	.	1	.	1	.	.	.	.	1	.	6
Elops saurus	Ladyfish	16	8	8	13	74	63	66	375	630	254	79	31	1,617
Megalops atlanticus	Tarpon	.	.	.	.	.	.	.	.	.	1	.	1	2
Albula vulpes	Bonefish	.	.	.	.	2	.	.	2	1	.	.	.	5
Anguilla rostrata	American eel	.	1	.	1	.	.	1	.	2	.	.	1	6

Appendix 1 Table 2 continued. Page 2 of 5.

Scientific Name	*Common Name*	*Jan (91)*	*Feb (91)*	*Mar (91)*	*Apr (91)*	*May (100)*	*Jun (101)*	*Jul (101)*	*Aug (97)*	*Sep (93)*	*Oct (94)*	*Nov (95)*	*Dec (98)*	*Tot (1,143)*
Alosa sapidissima	American shad	2	3	.	.	.	.	.	.	.	1	.	.	6
Alosa aestivalis	Blueback herring	.	.	.	.	.	.	.	.	.	.	.	7	7
Alosa mediocris	Hickory shad	1	.	.	.	.	.	.	.	.	.	4	4	9
Brevoortia spp.	Menhadens	20	178	137	460	130	1,177	9,313	4,518	224	2,244	433	189	19,023
Dorosoma cepedianum	Gizzard shad	117	28	4	47	216	925	349	158	445	495	134	81	2,999
Dorosoma petenense	Threadfin shad	14	40	8	19	1	2	91	9	25	107	136	30	482
Opisthonema oglinum	Atlantic thread herring	13	125	23	163	144	330	29	63	284	65	23	48	1,310
Harengula jaguana	Scaled sardine	.	.	.	5	2	4	.	1	36	88	5	2	143
Anchoa hepsetus	Striped anchovy	8	.	8	.	.	.	.	.	.	.	.	.	16
Anchoa mitchilli	Bay anchovy	.	.	.	1	1	.	.	.	.	.	.	.	2
Anchoa cubana	Cuban anchovy	.	.	.	.	.	.	1	.	.	.	.	.	1
Esox niger	Chain pickerel	.	.	.	.	.	.	1	.	3	.	.	.	4
Synodus foetens	Inshore lizardfish	.	4	11	1	.	7	.	6	10	9	11	7	66
Notemigonus crysoleucas	Golden shiner	36	4	4	.	17	.	.	8	4	1	30	10	114
Ictalurus punctatus	Channel catfish	17	24	43	13	46	22	39	10	84	25	13	41	377
Ameiurus catus	White catfish	28	33	56	41	112	26	227	14	405	40	27	30	1,039
Ameiurus nebulosus	Brown bullhead	.	1	.	2	1	.	1	.	15	.	2	.	22
Bagre marinus	Gafftopsail catfish	.	.	.	2	1	.	1	.	1	1	.	1	7
Ariopsis felis	Hardhead catfish	.	.	1	2	2	3	8	4	4	1	.	.	25
Loricariidae sp.	Suckermouth catfish	.	1	.	.	.	.	.	.	.	.	.	.	1
Pterygoplichthys spp.	Armoured catfishes	2	.	.	1	.	.	.	.	.	.	.	.	3
Opsanus tau	Oyster toadfish	.	.	.	.	1	.	.	1	3	.	1	1	7
Ogcocephalus sp.	Batfishes	.	.	.	.	.	1	.	.	.	.	.	.	1
Ogcocephalus cubifrons	Polka-dot batfish	.	.	.	.	.	.	.	1	.	.	1	.	2
Strongylura marina	Atlantic needlefish	24	41	38	18	38	29	27	64	81	40	109	66	575
Strongylura notata	Redfin needlefish	.	.	.	.	1	.	.	3	.	.	.	.	4
Tylosurus crocodilus	Houndfish	.	.	.	.	.	.	1	.	1	4	1	.	7
Fundulus heteroclitus	Mummichog	6	.	.	.	.	.	.	.	.	.	.	1	7

Appendix 1 Table 2 continued. Page 3 of 5.

Scientific Name	*Common Name*	*Jan (91)*	*Feb (91)*	*Mar (91)*	*Apr (91)*	*May (100)*	*Jun (101)*	*Jul (101)*	*Aug (97)*	*Sep (93)*	*Oct (94)*	*Nov (95)*	*Dec (98)*	*Tot (1,143)*
Fundulus majalis	Striped killifish	.	.	.	5	2	1	.	.	.	1	.	.	9
Fundulus seminolis	Seminole killifish	7	14	1	7	3	13	1	3	9	1	4	4	67
Menidia menidia	Atlantic silverside	2	1	.	.	.	.	.	.	.	.	.	.	3
Prionotus evolans	Striped searobin	.	.	.	.	.	.	.	2	.	2	.	.	4
Prionotus scitulus	Leopard searobin	.	.	.	.	1	1	.	.	2	2	3	.	9
Prionotus tribulus	Bighead searobin	3	1	2	13	12	17	4	.	.	2	5	2	61
Centropomus undecimalis	Common snook	37	.	.	1	.	1	1	.	.	3	4	.	47
Centropristis philadelphica	Rock sea bass	.	.	.	.	.	.	1	2	1	6	3	.	13
Lepomis auritus	Redbreast sunfish	65	44	36	55	23	25	18	21	61	66	30	41	485
Lepomis macrochirus	Bluegill	205	112	104	108	52	189	190	66	74	55	77	206	1,438
Lepomis marginatus	Dollar sunfish	1	.	.	.	.	.	.	.	.	.	.	.	1
Lepomis microlophus	Redear sunfish	117	73	75	65	60	79	57	34	99	42	37	100	838
Lepomis punctatus	Spotted sunfish	1	.	.	1	7	1	.	3	.	.	.	.	13
Micropterus salmoides	Largemouth bass	39	45	16	9	27	31	31	31	40	25	68	30	392
Pomoxis nigromaculatus	Black crappie	5	4	1	.	4	.	.	3	3	6	12	3	41
Lepomis gulosus	Warmouth	.	1	.	.	6	.	1	.	.	1	.	.	9
Pomatomus saltatrix	Bluefish	5	5	7	15	13	14	10	4	2	3	5	13	96
Rachycentron canadum	Cobia	.	.	.	.	.	.	.	3	2	.	.	.	5
Caranx hippos	Crevalle jack	.	.	.	5	28	66	97	99	57	19	21	25	417
Caranx latus	Horse-eye jack	.	.	.	.	.	.	1	.	4	3	9	12	29
Caranx crysos	Blue runner	.	.	.	.	.	.	.	3	4	4	.	.	11
Chloroscombrus chrysurus	Atlantic bumper	.	.	.	41	12	16	569	496	1,046	971	256	45	3,452
Oligoplites saurus	Leatherjacket	.	.	.	1	4	3	.	5	3	8	1	.	25
Selene vomer	Lookdown	.	.	.	.	3	19	35	23	107	24	34	9	254
Selene setapinnis	Atlantic moonfish	.	.	.	.	.	.	.	.	.	.	12	.	12
Trachinotus carolinus	Florida pompano	.	.	1	.	12	6	11	37	.	.	.	.	67
Trachinotus falcatus	Permit	.	2	.	.	.	1	7	32	13	9	19	21	104
Lutjanus griseus	Gray snapper	1	.	1	.	3	1	1	13	6	17	6	2	51

Appendix 1 Table 2 continued. Page 4 of 5.

Scientific Name	***Common Name***	***Jan (91)***	***Feb (91)***	***Mar (91)***	***Apr (91)***	***May (100)***	***Jun (101)***	***Jul (101)***	***Aug (97)***	***Sep (93)***	***Oct (94)***	***Nov (95)***	***Dec (98)***	***Tot (1,143)***
Lutjanus synagris	Lane snapper	.	.	.	.	.	.	.	.	.	4	.	3	7
Lobotes surinamensis	Tripletail	.	.	1	.	.	.	.	.	.	.	.	.	1
Eucinostomus sp.	Eucinostomus	.	.	.	.	.	.	.	1	.	.	.	.	1
Eucinostomus gula	Silver jenny	23	8	8	4	25	44	31	63	81	37	84	105	513
Eucinostomus harengulus	Tidewater mojarra	71	17	85	30	1,061	214	52	213	203	414	50	151	2,561
Diapterus auratus	Irish pompano	8	4	8	7	6	6	5	22	112	133	146	186	643
Orthopristis chrysoptera	Pigfish	.	.	.	.	2	2	62	157	116	34	8	.	381
Lagodon rhomboides	Pinfish	76	56	258	150	295	3,875	3,417	2,518	3,047	1,661	1,353	641	17,347
Archosargus probatocephalus	Sheepshead	48	38	86	50	75	75	77	36	75	47	44	64	715
Cynoscion nebulosus	Spotted seatrout	54	61	135	49	74	24	40	30	55	61	55	62	700
Cynoscion complex	*C. regalis* x *C. arenarius*	1	21	27	5	1	.	1	48	1	4	8	19	136
Bairdiella chrysoura	Silver perch	87	264	102	60	6	3	6	186	519	190	167	80	1,670
Leiostomus xanthurus	Spot	208	415	307	795	1,292	2,861	963	684	1,735	865	750	417	11,292
Menticirrhus americanus	Southern kingfish	8	1	1	11	7	9	7	15	9	11	7	8	94
Menticirrhus littoralis	Gulf kingfish	.	.	.	.	.	.	1	.	.	.	.	.	1
Menticirrhus saxatilis	Northern kingfish	1	1	.	.	1	.	.	5	.	.	.	1	9
Micropogonias undulatus	Atlantic croaker	1	10	118	184	224	1,732	531	362	219	109	22	2	3,514
Pogonias cromis	Black drum	11	.	8	49	13	11	46	9	21	31	13	9	221
Sciaenops ocellatus	Red drum	69	121	82	202	163	106	89	84	76	44	161	43	1,240
Stellifer lanceolatus	Star drum	.	.	.	.	.	.	.	.	.	.	.	1	1
Chaetodipterus faber	Atlantic spadefish	.	.	.	1	44	9	2	3	2	.	.	.	61
Oreochromis aureus	Blue tilapia	.	.	.	.	.	.	.	.	1	.	.	.	1
Oreochromis/Sarotherodon spp.	Tilapias	.	.	.	.	.	.	.	.	.	1	1	.	2
Morone saxatilis	Striped bass	.	.	.	1	.	.	.	1	.	.	.	1	3
Mugil cephalus	Striped mullet	922	989	802	976	1,594	1,054	975	835	908	607	1,097	1,996	12,755
Mugil curema	White mullet	1,100	334	222	745	457	270	133	193	236	564	1,252	1,872	7,378
Sphyraena barracuda	Great barracuda	.	.	.	.	.	.	1	.	1	1	1	.	4
Astroscopus y-graecum	Southern stargazer	1	2	3	4	1	.	1	.	1	.	2	1	16

Appendix 1 Table 2 continued. Page 5 of 5.

Scientific Name	***Common Name***	***Jan (91)***	***Feb (91)***	***Mar (91)***	***Apr (91)***	***May (100)***	***Jun (101)***	***Jul (101)***	***Aug (97)***	***Sep (93)***	***Oct (94)***	***Nov (95)***	***Dec (98)***	***Tot (1,143)***
Chasmodes sp.		.	.	.	.	.	.	.	.	.	.	.	1	1
Microgobius gulosus	Clown goby	.	.	.	.	.	.	.	.	.	1	.	.	1
Gobioides broussonetii	Violet goby	.	.	.	.	.	.	1	.	.	.	.	.	1
Dormitator maculatus	Fat sleeper	.	.	.	.	.	.	.	.	3	.	.	.	3
Scomberomorus cavalla	King mackerel	.	.	.	.	.	.	.	.	.	.	.	1	1
Scomberomorus maculatus	Spanish mackerel	.	.	1	12	16	12	23	5	2	14	11	10	106
Peprilus triacanthus	Butterfish	.	.	.	.	.	.	.	.	.	.	.	1	1
Peprilus paru	Harvestfish	.	.	40	5	.	.	.	5	.	5	2	.	57
Citharichthys macrops	Spotted whiff	.	.	1	.	.	.	.	1	.	2	7	.	11
Citharichthys spilopterus	Bay whiff	.	1	4	7	16	139	229	136	101	93	3	1	730
Etropus crossotus	Fringed flounder	2	.	7	17	3	27	15	21	31	60	68	29	280
Paralichthys dentatus	Summer flounder	1	.	.	15	8	2	3	2	4	7	2	.	44
Paralichthys albigutta	Gulf flounder	10	3	13	15	38	46	22	17	17	1	10	12	204
Paralichthys lethostigma	Southern flounder	29	11	19	31	69	92	68	48	51	37	31	14	500
Paralichthys squamilentus	Broad flounder	.	.	.	6	.	.	.	.	.	.	.	.	6
Ancylopsetta quadrocellata	Ocellated flounder	.	3	7	24	13	1	.	.	.	.	.	.	48
Trinectes maculatus	Hogchoker	.	.	1	1	3	10	.	2	2	2	3	4	28
Achirus lineatus	Lined sole	2	3	1	9	12	11	5	6	19	13	6	4	91
Aluterus monoceros	Unicorn filefish	.	.	.	.	.	.	.	.	.	1	.	.	1
Stephanolepis hispidus	Planehead filefish	.	.	.	.	1	.	.	1	.	.	.	.	2
Sphoeroides maculatus	Northern puffer	.	.	.	1	1	.	.	.	.	.	.	.	2
Sphoeroides nephelus	Southern puffer	5	9	4	19	11	19	17	35	42	35	35	11	242
Chilomycterus schoepfii	Striped burrfish	4	.	5	15	13	23	29	35	23	8	5	7	167
Totals		***3,875***	***3,586***	***3,496***	***5,113***	***7,402***	***14,608***	***18,975***	***12,517***	***12,558***	***11,387***	***7,677***	***7,131***	***108,325***

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Appendix 1 Table 3. Page 1 of 7.

6.1-m otter trawl catch by month (May 2001 through December 2011).

Data are presented as total number collected

Number of monthly samples is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	***Common Name***	***Jan (174)***	***Feb (175)***	***Mar (176)***	***Apr (178)***	***May (193)***	***Jun (186)***	***Jul (188)***	***Aug (185)***	***Sep (186)***	***Oct (191)***	***Nov (188)***	***Dec (187)***	***Tot (2,207)***
Stomolophus meleagris	Cannonball jellyfish	53	37	44	6	2	4	1	.	.	17	25	126	315
Limulus polyphemus	Horseshoe crab	1	.	1	1	.	.	.	.	.	.	2	.	5
Penaeidae spp.	Penaeid shrimps	.	.	.	.	.	.	.	.	.	2	104	.	106
Farfantepenaeus spp.	Commercial shrimps	30	35	24	160	617	613	216	209	390	355	190	65	2,904
Farfantepenaeus aztecus	Brown shrimp	2	2	1	34	155	311	29	15	7	13	8	3	580
Farfantepenaeus duorarum	Pink shrimp	6	9	12	67	120	192	50	50	89	127	65	22	809
Litopenaeus setiferus	White shrimp	329	143	82	128	57	1,141	2,047	2,270	1,369	1,671	778	817	10,832
Penaeus monodon	Giant tiger prawn	.	.	.	.	.	.	.	.	.	1	.	.	1
Rimapenaeus constrictus	Roughneck shrimp	.	.	.	3	1	6	61	4	18	2	29	6	130
Xiphopenaeus kroyeri	Atlantic seabob	.	.	.	.	.	.	.	.	.	.	1	1	2
Sicyonia brevirostris	Rock Shrimp	.	.	.	1	.	.	.	.	.	.	1	.	2
Sicyonia parri		.	.	1	.	.	.	.	.	.	.	.	.	1
Macrobrachium spp.	Prawns	15	9	.	19	2	5	1	2	.	1	8	16	78
Alpheidae sp.	Snapping shrimp	.	.	.	.	.	1	.	.	.	.	.	.	1
Callinectes sapidus	Blue crab	377	600	325	475	446	726	637	496	428	541	438	556	6,045
Callinectes similis	Lesser blue crab	3	8	6	46	46	101	120	22	28	30	25	5	440
Callinectes ornatus	Shelligs	.	.	.	.	.	6	2	.	.	.	.	.	8
Portunus spp.	Portunus crabs	.	.	5	.	2	6	7	.	1	.	17	1	39
Charybdis hellerii	Spiny hands	.	.	.	.	.	.	.	.	.	1	.	.	1
Menippe spp.	Stone crab	.	1	4	1	2	.	2	1	.	1	2	1	15
Dasyatis sabina	Atlantic stingray	107	56	54	38	20	20	21	35	20	38	39	46	494
Dasyatis say	Bluntnose stingray	.	.	.	1	.	1	7	1	1	.	1	.	12
Gymnura micrura	Smooth butterfly ray	.	.	.	3	.	1	.	1	.	.	.	.	5

Appendix 1 Table 3 continued. Page 2 of 7.

Scientific Name	***Common Name***	***Jan (174)***	***Feb (175)***	***Mar (176)***	***Apr (178)***	***May (193)***	***Jun (186)***	***Jul (188)***	***Aug (185)***	***Sep (186)***	***Oct (191)***	***Nov (188)***	***Dec (187)***	***Tot (2,207)***
Lepisosteus osseus	Longnose gar	.	.	2	1	.	.	.	.	.	.	.	.	3
Elops saurus	Ladyfish	14	13	141	184	32	2	.	.	.	.	.	15	401
Anguilla rostrata	American eel	.	1	.	1	1	.	.	.	1	2	2	3	11
Ophichthidae sp.		.	.	.	.	.	.	.	.	.	.	1	.	1
Myrophis punctatus	Speckled worm eel	5	7	1	1	1	3	1	.	1	2	1	.	23
Ophichthus gomesii	Shrimp eel	.	.	.	.	.	1	.	.	.	1	.	.	2
Alosa sapidissima	American shad	3	.	.	.	.	.	.	.	.	.	.	.	3
Alosa aestivalis	Blueback herring	.	.	.	.	.	.	.	.	.	.	.	3	3
Alosa mediocris	Hickory shad	.	.	.	.	.	.	1	1	.	.	.	.	2
Brevoortia spp.	Menhadens	1	5	56	3	11	6	2	5	5	6	4	12	116
Dorosoma cepedianum	Gizzard shad	2	.	.	1	.	2	1	1	1	1	1	3	13
Dorosoma petenense	Threadfin shad	4	3	.	1	.	1	16	2	.	3	6	14	50
Opisthonema oglinum	Atlantic thread herring	2	13	.	.	.	5	.	2	3	.	.	.	25
Harengula jaguana	Scaled sardine	.	.	.	.	.	1	.	.	.	15	.	.	16
Anchoa spp.	Anchovies	.	.	.	.	2	.	.	.	.	.	.	.	2
Anchoa hepsetus	Striped anchovy	4	3	4	25	461	661	31	533	12	1	9	.	1,744
Anchoa mitchilli	Bay anchovy	2,457	1,581	2,680	2,421	2,607	7,411	4,779	3,820	6,462	5,372	2,222	1,734	43,546
Anchoa lyolepis	Dusky anchovy	.	.	.	.	.	21	4	1	.	1	.	.	27
Synodus foetens	Inshore lizardfish	7	4	5	2	33	38	26	12	9	12	10	2	160
Ictaluridae sp.	Bullhead catfishes	.	.	.	.	.	.	1	.	.	.	.	.	1
Ictalurus punctatus	Channel catfish	25	12	9	14	5	11	.	5	15	38	53	28	215
Noturus gyrinus	Tadpole madtom	1	.	.	.	.	.	.	.	.	.	.	.	1
Ameiurus catus	White catfish	272	201	134	110	44	79	69	55	96	182	172	157	1,571
Ameiurus natalis	Yellow bullhead	.	.	.	.	.	.	.	1	.	.	.	.	1
Ameiurus nebulosus	Brown bullhead	.	2	.	.	.	.	1	.	1	2	.	1	7
Bagre marinus	Gafftopsail catfish	.	.	.	.	.	.	5	4	2	.	.	7	18
Ariopsis felis	Hardhead catfish	1	97	3	4	6	3	112	51	24	19	11	8	339
Loricariidae sp.	Suckermouth catfish	1	.	.	.	.	.	.	.	.	.	.	.	1

Appendix 1 Table 3 continued. Page 3 of 7.

Scientific Name	Common Name	Jan (174)	Feb (175)	Mar (176)	Apr (178)	May (193)	Jun (186)	Jul (188)	Aug (185)	Sep (186)	Oct (191)	Nov (188)	Dec (187)	Tot (2,207)
Opsanus tau	Oyster toadfish	15	9	15	21	20	18	39	11	20	48	18	16	250
Gobiesox strumosus	Skilletfish	1	2	2	.	1	1	1	.	.	2	6	4	20
Ogcocephalus sp.	Batfishes	.	.	.	.	1	.	.	.	.	.	.	.	1
Ogcocephalus cubifrons	Polka-dot batfish	1	.	1	1	.	.	.	.	.	.	1	1	5
Urophycis regia	Spotted hake	2	8	12	2	.	.	.	.	.	.	.	.	24
Urophycis floridana	Southern hake	1	1	2	.	.	.	.	.	.	.	.	.	4
Ophidiidae sp.		.	.	.	.	.	1	.	.	.	.	.	.	1
Lepophidium brevibarbe		.	5	16	.	1	.	.	.	.	.	.	1	23
Ophidion sp.		.	.	.	1	.	.	.	.	.	.	.	.	1
Ophidion holbrookii	Bank cusk-eel	.	.	1	1	2	.	.	.	.	.	.	.	4
Ophidion josephi	Crested cusk-eel	.	.	.	.	.	.	3	.	.	.	.	.	3
Fundulus heteroclitus	Mummichog	.	1	.	.	.	.	.	.	.	.	.	.	1
Lucania parva	Rainwater killifish	.	.	.	1	.	1	.	.	.	.	.	1	3
Gambusia holbrooki	Eastern mosquito fish	.	.	.	.	.	.	.	.	.	.	.	1	1
Membras martinica	Rough silverside	1	.	.	.	.	.	.	.	1	.	.	.	2
Menidia spp.	Menidia silversides	.	.	.	.	.	.	.	.	.	.	2	1	3
Menidia menidia	Atlantic silverside	.	.	.	.	1	.	.	.	.	.	1	.	2
Labidesthes sicculus	Brook silverside	.	1	.	.	.	.	.	.	.	.	.	.	1
Syngnathus floridae	Dusky pipefish	.	.	1	.	.	.	.	.	.	.	.	.	1
Syngnathus fuscus	Northern pipefish	.	.	1	2	1	.	.	.	.	.	.	.	4
Syngnathus louisianae	Chain pipefish	4	4	5	6	9	9	6	2	1	8	9	4	67
Syngnathus scovelli	Gulf pipefish	5	9	11	10	3	7	5	2	.	1	5	1	59
Hippocampus erectus	Lined seahorse	.	.	1	.	1	1	.	.	.	.	1	1	5
Scorpaena brasiliensis	Barbfish	.	.	.	.	.	1	.	.	.	.	.	.	1
Prionotus carolinus	Northern searobin	.	.	3	7	2	1	.	.	.	.	3	.	16
Prionotus evolans	Striped searobin	.	.	.	6	.	.	.	.	.	.	.	.	6
Prionotus scitulus	Leopard searobin	2	1	7	8	14	16	38	15	5	18	4	5	133
Prionotus tribulus	Bighead searobin	39	53	116	90	39	8	3	3	9	10	17	26	413

Appendix 1 Table 3 continued. Page 4 of 7.

Scientific Name	***Common Name***	***Jan (174)***	***Feb (175)***	***Mar (176)***	***Apr (178)***	***May (193)***	***Jun (186)***	***Jul (188)***	***Aug (185)***	***Sep (186)***	***Oct (191)***	***Nov (188)***	***Dec (187)***	***Tot (2,207)***
Prionotus rubio	Blackfin searobin	.	.	.	.	.	1	.	.	1	3	.	.	5
Centropomus undecimalis	Common snook	2	.	.	.	.	.	.	.	.	.	1	.	3
Centropristis striata	Black sea bass	.	.	.	.	.	1	.	5	.	.	1	.	7
Centropristis philadelphica	Rock sea bass	4	3	4	13	5	11	4	7	11	9	10	6	87
Epinephelus itajara	Goliath grouper	.	.	.	.	.	.	.	.	.	.	.	1	1
Mycteroperca microlepis	Gag	.	.	.	.	.	.	.	.	.	1	.	.	1
Lepomis spp.	Sunfishes	.	.	.	.	.	.	.	8	2	7	.	6	23
Lepomis auritus	Redbreast sunfish	1	4	.	4	.	.	.	12	26	5	.	5	57
Lepomis macrochirus	Bluegill	19	4	16	4	1	.	1	8	4	178	7	5	247
Lepomis marginatus	Dollar sunfish	.	.	1	.	.	.	.	.	.	.	.	.	1
Lepomis microlophus	Redear sunfish	7	5	2	5	3	1	1	1	3	15	3	1	47
Micropterus salmoides	Largemouth bass	1	1	1	1	1	1	.	.	.	1	.	.	7
Pomoxis nigromaculatus	Black crappie	2	6	6	2	.	.	3	11	2	10	23	7	72
Lepomis gulosus	Warmouth	.	1	.	1	.	.	.	.	1	.	1	.	4
Pomatomus saltatrix	Bluefish	.	.	.	.	1	.	.	.	.	.	.	.	1
Rachycentron canadum	Cobia	.	.	.	.	.	.	2	.	.	.	.	.	2
Caranx hippos	Crevalle jack	.	.	.	.	1	1	1	.	2	.	.	.	5
Chloroscombrus chrysurus	Atlantic bumper	.	.	.	1	8	43	65	766	41	41	182	84	1,231
Oligoplites saurus	Leatherjacket	.	.	.	.	.	.	.	.	2	.	2	.	4
Selene vomer	Lookdown	1	.	.	.	.	9	4	3	3	10	4	5	39
Selene setapinnis	Atlantic moonfish	.	.	.	.	.	.	.	.	2	6	116	.	124
Trachinotus falcatus	Permit	.	.	.	.	.	.	.	.	.	2	.	1	3
Lutjanus griseus	Gray snapper	4	1	4	1	1	.	1	2	.	8	4	3	29
Lutjanus synagris	Lane snapper	.	.	.	.	.	.	.	1	1	4	2	8	16
Eucinostomus spp.	Eucinostomus	1	.	.	1	1	177	20	20	48	126	44	67	505
Eucinostomus gula	Silver jenny	12	.	1	.	1	2	3	2	18	27	25	31	122
Eucinostomus harengulus	Tidewater mojarra	14	4	3	.	1	50	37	21	83	68	53	79	413
Diapterus auratus	Irish pompano	4	4	2	1	.	.	5	24	29	79	64	75	287

Appendix 1 Table 3 continued. Page 5 of 7.

Scientific Name	***Common Name***	***Jan (174)***	***Feb (175)***	***Mar (176)***	***Apr (178)***	***May (193)***	***Jun (186)***	***Jul (188)***	***Aug (185)***	***Sep (186)***	***Oct (191)***	***Nov (188)***	***Dec (187)***	***Tot (2,207)***
Orthopristis chrysoptera	Pigfish	.	.	.	2	348	69	14	11	6	21	13	1	485
Lagodon rhomboides	Pinfish	49	32	58	28	23	69	47	61	42	67	70	88	634
Archosargus probatocephalus	Sheepshead	15	22	20	14	26	8	6	5	7	11	11	14	159
Sciaenidae spp.	Drums	.	.	.	.	.	.	.	.	.	.	.	3	3
Cynoscion nebulosus	Spotted seatrout	8	8	8	1	1	6	11	5	14	6	5	7	80
Cynoscion nothus	Silver seatrout	.	.	.	.	.	.	.	.	3	.	1	.	4
Cynoscion complex	*C. regalis* x *C. arenarius*	27	35	6	9	855	603	261	259	441	206	92	46	2,840
Bairdiella chrysoura	Silver perch	84	77	57	66	99	182	73	41	71	90	83	148	1,071
Leiostomus xanthurus	Spot	764	12,940	13,290	5,435	2,287	1,325	515	619	368	305	259	282	38,389
Larimus fasciatus	Banded drum	.	.	.	.	.	.	.	.	.	1	23	.	24
Menticirrhus americanus	Southern kingfish	12	1	2	2	44	104	78	48	124	51	25	10	501
Menticirrhus saxatilis	Northern kingfish	.	.	.	.	11	4	2	.	.	.	.	.	17
Micropogonias undulatus	Atlantic croaker	4,798	18,851	13,371	9,320	3,352	1,972	779	372	125	797	2,436	7,342	63,515
Pogonias cromis	Black drum	4	8	1	.	.	2	2	4	.	2	10	9	42
Sciaenops ocellatus	Red drum	11	3	5	2	1	2	2	2	4	24	15	2	73
Stellifer lanceolatus	Star drum	24	46	21	15	146	53	156	333	256	490	127	100	1,767
Chaetodipterus faber	Atlantic spadefish	.	1	.	1	8	10	14	24	12	14	5	3	92
Oreochromis niloticus		.	.	.	.	.	.	.	.	.	.	.	1	1
Mugil cephalus	Striped mullet	5	8	1	.	.	.	1	.	1	1	2	3	22
Mugil curema	White mullet	12	5	.	.	.	.	.	.	.	2	.	14	33
Sphyraena borealis	Northern sennet	.	.	.	.	.	.	.	.	1	.	.	.	1
Sphyraena guachancho	Guaguanche	.	.	.	.	.	.	.	1	.	.	1	.	2
Astroscopus y-graecum	Southern stargazer	5	25	9	9	3	2	8	.	1	1	3	1	67
Hypsoblennius hentz	Feather blenny	1	.	.	2	.	.	1	.	.	.	.	.	4
Chasmodes bosquianus	Striped blenny	.	1	.	.	.	.	.	.	.	.	1	.	2
Chasmodes saburrae	Florida blenny	.	.	1	.	.	.	.	.	.	.	.	.	1
Hypleurochilus geminatus	Crested blenny	.	.	.	.	.	.	.	.	.	1	.	.	1
Gobiidae sp.	Gobies	.	.	.	.	.	1	.	.	.	.	.	.	1

Appendix 1 Table 3 continued. Page 6 of 7.

Scientific Name	**Common Name**	**Jan (174)**	**Feb (175)**	**Mar (176)**	**Apr (178)**	**May (193)**	**Jun (186)**	**Jul (188)**	**Aug (185)**	**Sep (186)**	**Oct (191)**	**Nov (188)**	**Dec (187)**	**Tot (2,207)**
Ctenogobius boleosoma	Darter goby	7	26	5	11	9	.	8	25	3	15	5	9	123
Gobionellus oceanicus	Highfin goby	2	6	3	15	13	9	7	3	22	7	6	17	110
Ctenogobius shufeldti	Freshwater goby	129	182	103	28	4	3	8	13	20	26	28	52	596
Ctenogobius stigmaticus	Marked goby	1	.	.	.	.	.	2	.	.	2	.	.	5
Ctenogobius smaragdus	Emerald goby	3	1	.	3	.	.	1	4	.	31	3	1	47
Gobiosoma spp.	Gobiosoma gobies	4	7	1	7	1	1	7	6	4	13	22	11	84
Gobiosoma bosc	Naked goby	12	12	13	12	6	7	15	6	10	4	11	9	117
Gobiosoma robustum	Code goby	2	8	4	11	4	.	2	2	1	1	2	1	38
Microgobius gulosus	Clown goby	9	29	39	44	10	15	25	89	52	64	39	86	501
Microgobius thalassinus	Green goby	29	29	20	31	8	25	82	49	39	123	96	37	568
Bathygobius soporator	Frillfin goby	.	.	2	.	.	1	1	.	.	1	.	3	8
Gobioides broussonetii	Violet goby	.	3	2	6	8	12	25	6	8	5	5	2	82
Erotelis smaragdus	Emerald sleeper	.	.	.	.	.	.	.	.	.	1	.	.	1
Dormitator maculatus	Fat sleeper	.	.	.	.	.	.	.	.	2	1	.	.	3
Ctenogobius spp.		.	.	.	5	.	.	.	.	.	.	.	.	5
Eleotris amblyopsis		.	.	.	.	.	.	.	1	1	.	.	.	2
Trichiurus lepturus	Atlantic cutlassfish	.	2	2	11	5	7	1	.	.	3	6	11	48
Scomberomorus cavalla	King mackerel	.	.	.	.	.	.	.	.	.	.	1	.	1
Peprilus spp.		.	.	.	.	.	.	.	.	.	.	.	2	2
Peprilus triacanthus	Butterfish	.	4	3	2	.	.	.	.	1	.	.	.	10
Peprilus paru	Harvestfish	.	.	3	.	2	.	.	.	.	.	4	2	11
Bothidae sp.	Sand flounders	1	.	.	.	.	.	.	.	.	.	.	.	1
Citharichthys macrops	Spotted whiff	.	.	.	.	.	.	.	2	.	1	2	.	5
Citharichthys spilopterus	Bay whiff	1	34	14	80	119	212	270	242	174	71	14	7	1,238
Etropus crossotus	Fringed flounder	20	31	31	22	5	17	76	79	84	134	94	73	666
Paralichthys sp.		.	.	1	.	.	.	.	.	.	.	.	.	1
Paralichthys dentatus	Summer flounder	.	67	18	16	12	6	3	4	5	1	1	1	134
Paralichthys albigutta	Gulf flounder	7	7	9	15	14	20	10	9	8	13	1	5	118

Appendix 1 Table 3 continued. Page 7 of 7.

Scientific Name	***Common Name***	***Jan (174)***	***Feb (175)***	***Mar (176)***	***Apr (178)***	***May (193)***	***Jun (186)***	***Jul (188)***	***Aug (185)***	***Sep (186)***	***Oct (191)***	***Nov (188)***	***Dec (187)***	***Tot (2,207)***
Paralichthys lethostigma	Southern flounder	46	189	109	108	88	61	64	46	31	47	54	52	895
Paralichthys squamilentus	Broad flounder	.	.	.	1	.	1	.	.	.	.	.	.	2
Scophthalmus aquosus	Windowpane	.	.	1	1	.	.	.	.	.	.	.	.	2
Ancylopsetta quadrocellata	Ocellated flounder	4	14	16	20	10	.	.	1	.	.	.	.	65
Symphurus plagiusa	Blackcheek tonguefish	38	38	22	24	15	44	82	68	90	95	48	72	636
Symphurus civitatium	Offshore tonguefish	.	.	.	.	3	2	.	.	.	.	.	2	7
Trinectes maculatus	Hogchoker	605	581	316	269	126	156	300	245	325	409	289	531	4,152
Achirus lineatus	Lined sole	30	30	30	40	21	30	60	15	45	119	36	56	512
Aluterus schoepfii	Orange filefish	.	.	.	.	.	1	.	.	.	.	.	.	1
Stephanolepis hispidus	Planehead filefish	.	.	1	10	10	7	1	1	3	2	12	3	50
Sphoeroides nephelus	Southern puffer	8	4	13	12	21	34	31	17	23	22	22	14	221
Sphoeroides spengleri	Bandtail puffer	.	.	1	.	.	.	.	1	.	1	.	.	3
Chilomycterus schoepfii	Striped burrfish	1	.	.	4	1	8	5	17	5	10	13	4	68
Totals		***10,645***	***36,336***	***31,460***	***19,658***	***12,512***	***16,831***	***11,548***	***11,259***	***11,730***	***12,456***	***8,831***	***13,235***	***196,501***

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Appendix 1 Table 4, page 1 of 7.

21.3-m seine catch by year.

Data are presented as total number collected.

Number of samples collected by year is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	Common Name	2001 (109)	2002 (160)	2003 (204)	2004 (208)	2005 (203)	2006 (202)	2007 (202)	2008 (204)	2009 (209)	2010 (209)	2011 (207)	Total (2,117)
Stomolophus meleagris	Cannonball jellyfish	.	5	1	.	.	.	9	.	1	.	7	23
Farfantepenaeus spp.	Commercial shrimps	.	4	196	220	149	183	169	437	1,293	467	376	3494
Farfantepenaeus aztecus	Brown shrimp	.	32	.	34	66	190	11	66	10	170	28	607
Farfantepenaeus duorarum	Pink shrimp	206	187	37	35	19	16	17	10	6	2	6	541
Litopenaeus setiferus	White shrimp	804	1,154	220	2,979	2,446	1,048	1,574	1,591	3,849	5586	4345	25596
Rimapenaeus constrictus	Roughneck shrimp	.	.	.	.	.	1	1	.	7	3	.	12
Sicyonia parri		.	.	.	.	.	.	1	.	.	.	.	1
Macrobrachium spp.	Prawns	.	.	.	.	.	.	.	1	.	.	1	2
Callinectes sp.		.	.	.	.	1	.	.	.	.	.	.	1
Callinectes sapidus	Blue crab	96	66	232	278	153	211	275	194	145	178	198	2026
Callinectes similis	Lesser blue crab	44	11	3	6	9	59	32	72	88	67	39	430
Callinectes ornatus	Shelligs	.	.	.	.	.	.	1	.	.	.	10	11
Portunus spp.	Portunus crabs	.	.	.	.	.	.	20	.	.	.	.	20
Menippe sp.	Stone crab	.	.	.	1	.	.	.	.	.	.	.	1
Dasyatis sabina	Atlantic stingray	4	.	7	5	3	11	8	2	6	7	2	55
Dasyatis say	Bluntnose stingray	.	.	.	.	.	.	.	.	.	1	.	1
Lepisosteus osseus	Longnose gar	.	.	1	.	2	.	1	1	.	.	1	6
Lepisosteus platyrhincus	Florida gar	1	1	3	4	1	2	.	1	.	.	.	13
Amia calva	Bowfin	.	.	1	.	.	.	.	.	1	.	.	2
Elops saurus	Ladyfish	.	14	1	4	4	9	3	25	5	5	18	88
Albula vulpes	Bonefish	1	.	.	.	.	.	.	.	.	.	.	1
Anguilla rostrata	American eel	.	.	.	.	1	1	.	.	.	.	.	2

Appendix 1 Table 4 continued, page 2 of 7.

Scientific Name	Common Name	2001 (109)	2002 (160)	2003 (204)	2004 (208)	2005 (203)	2006 (202)	2007 (202)	2008 (204)	2009 (209)	2010 (209)	2011 (207)	Total (2,117)
Myrophis punctatus	Speckled worm eel	1	.	.	.	.	.	1	.	.	1	1	4
Clupeidae spp.	Herrings	5	.	.	.	1	.	.	.	.	.	1	7
Alosa sapidissima	American shad	.	.	.	.	18	.	.	.	.	.	.	18
Alosa aestivalis	Blueback herring	.	.	.	.	2	4	.	.	.	.	.	6
Alosa mediocris	Hickory shad	.	.	.	2	8	1	.	.	1	.	.	12
Brevoortia spp.	Menhadens	45	24	640	2,133	4,112	190	98	56	308	1309	778	9693
Dorosoma cepedianum	Gizzard shad	2	1	7	.	19	13	2	2	.	28	13	87
Dorosoma petenense	Threadfin shad	.	.	84	94	73	52	26	3	1	15	1	349
Opisthonema oglinum	Atlantic thread herring	5	108	10	364	79	102	385	18	24	161	1	1257
Harengula jaguana	Scaled sardine	1	1	2	1,245	.	84	5	5	7	5	.	1355
Sardinella aurita	Spanish sardine	.	.	.	1	.	.	2	.	1	8	.	12
Anchoa spp.	Anchovies	.	6	.	.	.	.	.	.	.	.	.	6
Anchoa hepsetus	Striped anchovy	265	2,303	146	421	607	2,345	3,399	325	925	636	449	11821
Anchoa mitchilli	Bay anchovy	9,625	5,518	5,364	10,277	9,270	11,955	6,317	13,143	9,611	9308	10273	100661
Anchoa lyolepis	Dusky anchovy	.	.	15	.	.	.	102	3	.	10	2	132
Esox niger	Chain pickerel	.	.	.	.	.	1	.	.	.	.	.	1
Synodus foetens	Inshore lizardfish	25	8	15	21	5	17	20	8	3	17	15	154
Notemigonus crysoleucas	Golden shiner	.	1	35	10	17	1	.	21	10	3	.	98
Notropis maculatus	Taillight shiner	.	.	.	54	1	84	.	.	13	.	.	152
Ictalurus punctatus	Channel catfish	.	.	3	3	2	2	.	.	.	.	.	10
Ameiurus catus	White catfish	.	1	6	6	9	.	4	1	5	.	.	32
Bagre marinus	Gafftopsail catfish	.	.	.	4	.	.	.	.	.	.	.	4
Ariopsis felis	Hardhead catfish	2	.	.	.	.	.	1	.	.	.	.	3
Pterygoplichthys sp.	Armoured catfishes	.	.	.	.	.	.	.	.	1	.	.	1
Opsanus tau	Oyster toadfish	3	1	.	.	.	.	2	3	.	2	.	11

Appendix 1 Table 4 continued, page 3 of 7.

Scientific Name	***Common Name***	***2001 (109)***	***2002 (160)***	***2003 (204)***	***2004 (208)***	***2005 (203)***	***2006 (202)***	***2007 (202)***	***2008 (204)***	***2009 (209)***	***2010 (209)***	***2011 (207)***	***Total (2,117)***
Hyporhamphus spp.	Halfbeaks	.	.	.	.	.	.	.	.	6	.	.	6
Hyporhamphus meeki	False silver halfbeak	.	.	.	.	.	.	.	14	.	.	.	14
Strongylura spp.	Needlefishes	5	18	13	10	18	17	19	19	22	5	22	168
Strongylura marina	Atlantic needlefish	5	9	6	10	16	3	3	4	5	4	14	79
Strongylura notata	Redfin needlefish	1	4	.	.	.	.	.	.	.	.	.	5
Tylosurus crocodilus	Houndfish	.	.	1	.	.	.	1	.	.	.	.	2
Cyprinodon variegatus	Sheepshead minnow	.	9	5	.	3	.	1	3	.	8	.	29
Fundulus sp.	Assorted killifish	.	.	.	.	1	.	.	.	.	.	.	1
Fundulus confluentus	Marsh killifish	.	.	2	5	.	.	.	.	.	.	.	7
Fundulus heteroclitus	Mummichog	183	227	507	167	87	158	655	189	514	807	987	4481
Fundulus majalis	Striped killifish	56	83	33	77	57	8	69	37	5	27	30	482
Fundulus chrysotus	Golden topminnow	.	.	1	.	.	.	.	.	.	.	.	1
Fundulus seminolis	Seminole killifish	.	5	48	98	169	62	23	3	29	34	16	487
Lucania parva	Rainwater killifish	.	38	235	3,428	263	33	595	357	38	66	147	5200
Lucania goodei	Bluefin killifish	2	.	7	6	1	2	9	.	1	.	1	29
Jordanella floridae	Flagfish	.	.	.	2	.	.	.	.	.	.	2	4
Gambusia holbrooki	Eastern mosquito fish	271	12	262	151	219	28	69	547	157	112	27	1855
Poecilia latipinna	Sailfin molly	111	3	53	31	133	17	3	9	13	56	16	445
Heterandria formosa	Least killifish	.	.	1	5	4	4	3	1	.	1	.	19
Membras martinica	Rough silverside	18	102	.	9	1	38	394	569	12	1	55	1199
Menidia spp.	Menidia silversides	2,641	2,465	1,557	3,325	634	2,372	791	827	1,962	955	819	18348
Menidia menidia	Atlantic silverside	.	1,463	4,485	1,920	1,192	2,823	4,351	3,050	5,367	5761	2961	33373
Labidesthes sicculus	Brook silverside	119	41	160	99	24	36	6	17	36	176	29	743
Hypoatherina harringtonensis	Reef silverside	.	.	.	.	.	.	.	.	.	.	1	1
Syngnathus floridae	Dusky pipefish	.	3	.	1	.	.	.	.	.	.	.	4

Appendix 1 Table 4 continued, page 4 of 7.

Scientific Name	***Common Name***	***2001 (109)***	***2002 (160)***	***2003 (204)***	***2004 (208)***	***2005 (203)***	***2006 (202)***	***2007 (202)***	***2008 (204)***	***2009 (209)***	***2010 (209)***	***2011 (207)***	***Total (2,117)***
Syngnathus fuscus	Northern pipefish	.	.	.	1	.	1	.	.	.	1	.	3
Syngnathus louisianae	Chain pipefish	7	21	4	13	3	18	7	4	4	3	9	93
Syngnathus scovelli	Gulf pipefish	15	34	15	50	10	29	18	14	27	17	130	359
Microphis brachyurus	Opposum pipefish	.	.	.	.	5	.	1	.	.	1	2	9
Prionotus carolinus	Northern searobin	.	.	.	.	.	.	.	.	.	.	1	1
Prionotus scitulus	Leopard searobin	11	1	2	1	.	.	4	3	.	.	.	22
Prionotus tribulus	Bighead searobin	1	1	5	4	6	6	10	5	4	9	9	60
Centropomus undecimalis	Common snook	2	.	2	.	2	.	.	.	.	1	.	7
Centropristis philadelphica	Rock sea bass	.	.	.	.	.	.	2	.	.	5	.	7
Epinephelus itajara	Goliath grouper	.	.	.	.	.	.	.	.	.	.	2	2
Mycteroperca microlepis	Gag	.	1	.	.	2	.	1	.	.	.	.	4
Diplectrum formosum	Sand perch	.	.	1	.	.	.	.	.	.	.	.	1
Centrarchidae sp.		.	.	.	.	.	1	.	.	.	.	.	1
Lepomis spp.	Sunfishes	7	24	66	24	75	12	1	10	38	2	1	259
Lepomis auritus	Redbreast sunfish	21	27	76	140	102	187	18	4	81	30	15	701
Lepomis macrochirus	Bluegill	32	65	300	375	352	241	5	69	176	102	6	1723
Lepomis marginatus	Dollar sunfish	.	.	5	2	.	.	.	.	.	.	.	7
Lepomis microlophus	Redear sunfish	15	11	35	76	62	24	3	7	50	29	7	319
Lepomis punctatus	Spotted sunfish	.	21	6	2	6	.	.	.	.	.	1	36
Micropterus salmoides	Largemouth bass	4	99	28	80	65	33	17	8	58	57	23	472
Pomoxis nigromaculatus	Black crappie	.	.	6	2	1	.	.	.	.	3	.	12
Lepomis gulosus	Warmouth	.	.	5	2	.	.	1	.	.	.	.	8
Etheostoma fusiforme	Swamp darter	.	.	.	.	.	.	.	.	1	1	.	2
Pomatomus saltatrix	Bluefish	1	1	2	30	2	.	4	6	2	1	.	49
Carangidae spp.	Jacks	2	.	.	.	.	.	.	.	.	.	.	2

Appendix 1 Table 4 continued, page 5 of 7.

Scientific Name	***Common Name***	***2001 (109)***	***2002 (160)***	***2003 (204)***	***2004 (208)***	***2005 (203)***	***2006 (202)***	***2007 (202)***	***2008 (204)***	***2009 (209)***	***2010 (209)***	***2011 (207)***	***Total (2,117)***
Caranx hippos	Crevalle jack	8	5	4	6	10	6	4	40	13	13	17	126
Caranx latus	Horse-eye jack	.	1	.	.	.	1	.	.	.	1	.	3
Chloroscombrus chrysurus	Atlantic bumper	23	9	2	2	12	49	5	6	36	3	12	159
Oligoplites saurus	Leatherjacket	18	37	29	16	23	56	29	11	7	29	32	287
Selene vomer	Lookdown	6	2	1	5	2	3	.	2	2	1	3	27
Trachinotus carolinus	Florida pompano	6	54	31	102	24	31	17	2	21	.	19	307
Trachinotus falcatus	Permit	10	4	50	27	27	53	106	270	21	21	43	632
Lutjanus griseus	Gray snapper	26	3	5	6	14	18	12	6	1	22	16	129
Lutjanus analis	Mutton snapper	1	.	.	.	.	.	.	.	.	2	1	4
Lutjanus synagris	Lane snapper	.	2	1	.	.	1	.	2	.	4	4	14
Lobotes surinamensis	Tripletail	.	.	.	1	.	.	.	.	.	.	.	1
Eucinostomus spp.	Eucinostomus	658	702	500	230	186	239	719	689	870	1481	203	6477
Eucinostomus gula	Silver jenny	53	22	15	73	21	85	15	43	120	98	121	666
Eucinostomus harengulus	Tidewater mojarra	300	452	442	282	178	363	420	208	309	255	117	3326
Diapterus auratus	Irish pompano	65	2	183	17	80	27	43	54	11	19	17	518
Haemulidae spp.		.	.	.	.	.	3	.	.	.	.	.	3
Orthopristis chrysoptera	Pigfish	2	232	4	39	39	93	220	21	188	13	139	990
Lagodon rhomboides	Pinfish	241	202	327	335	430	79	430	673	458	1924	2563	7662
Archosargus probatocephalus	Sheepshead	12	4	1	12	6	7	12	4	17	7	3	85
Cynoscion nebulosus	Spotted seatrout	72	41	16	48	8	86	175	29	24	28	125	652
Cynoscion complex	*C. regalis* x *C. arenarius*	2	8	3	31	3	7	5	4	21	1	.	85
Bairdiella chrysoura	Silver perch	185	224	787	493	568	813	825	250	1,154	238	146	5683
Leiostomus xanthurus	Spot	869	1,020	3,391	12,383	11,266	4,184	3,058	7,013	2,856	27921	14157	88118
Menticirrhus americanus	Southern kingfish	9	28	12	26	10	17	22	14	13	52	4	207
Menticirrhus littoralis	Gulf kingfish	1	2	.	.	7	.	.	.	.	.	.	10

Appendix 1 Table 4 continued, page 6 of 7.

Scientific Name	***Common Name***	***2001 (109)***	***2002 (160)***	***2003 (204)***	***2004 (208)***	***2005 (203)***	***2006 (202)***	***2007 (202)***	***2008 (204)***	***2009 (209)***	***2010 (209)***	***2011 (207)***	***Total (2,117)***
Menticirrhus saxatilis	Northern kingfish	4	.	.	3	.	3	3	1	3	2	.	19
Micropogonias undulatus	Atlantic croaker	828	161	1,111	670	814	1,353	611	1,820	484	913	204	8969
Pogonias cromis	Black drum	2	6	.	2	.	6	2	1	5	.	2	26
Sciaenops ocellatus	Red drum	23	70	164	83	31	32	89	67	107	86	41	793
Stellifer lanceolatus	Star drum	.	.	.	1	.	.	.	.	.	.	.	1
Chaetodipterus faber	Atlantic spadefish	2	.	.	.	.	.	.	.	.	.	.	2
Oreochromis aureus	Blue tilapia	.	.	.	.	.	4	.	.	.	.	.	4
Oreochromis mossambicus	Mozambique tilapia	.	.	.	.	.	.	.	1	.	.	.	1
Oreochromis/Sarotherodon spp.	Tilapias	.	.	1	.	7	.	.	.	.	.	1	9
Elassoma okefenokee	Okefenokee pygmy sunfish	1	.	.	.	1	3	.	.	.	.	.	5
Mugil cephalus	Striped mullet	139	1,726	1,620	1,321	2,270	2,362	1,092	2,510	1,421	7261	3922	25644
Mugil curema	White mullet	291	85	1,649	287	25	117	101	103	35	152	237	3082
Agonostomus monticola	Mountain mullet	.	.	.	.	.	2	.	.	.	.	.	2
Sphyraena borealis	Northern sennet	.	.	.	1	.	.	1	.	1	.	.	3
Sphyraena guachancho	Guaguanche	.	.	.	.	.	1	.	.	.	.	.	1
Sphyraena barracuda	Great barracuda	.	.	.	.	.	.	.	.	.	2	.	2
Astroscopus y-graecum	Southern stargazer	.	.	1	1	1	.	5	.	2	.	2	12
Hypsoblennius ionthas	Freckled blenny	.	.	1	.	.	.	.	.	.	.	.	1
Chasmodes spp.		3	.	.	.	.	.	.	.	.	.	.	3
Chasmodes bosquianus	Striped blenny	.	.	1	2	.	.	4	.	1	2	.	10
Evorthodus lyricus	Lyre goby	5	.	.	.	1	1	1	.	1	.	.	9
Ctenogobius boleosoma	Darter goby	34	66	48	119	95	67	51	65	14	102	11	672
Gobionellus oceanicus	Highfin goby	2	.	1	5	9	2	4	6	3	4	3	39
Ctenogobius shufeldti	Freshwater goby	.	5	180	102	165	349	12	9	1	11	6	840
Ctenogobius smaragdus	Emerald goby	.	5	1	4	7	8	20	16	8	4	.	73

Appendix 1 Table 4 continued, page 7 of 7.

Scientific Name	***Common Name***	***2001 (109)***	***2002 (160)***	***2003 (204)***	***2004 (208)***	***2005 (203)***	***2006 (202)***	***2007 (202)***	***2008 (204)***	***2009 (209)***	***2010 (209)***	***2011 (207)***	***Total (2,117)***
Gobiosoma spp.	Gobiosoma gobies	24	34	11	96	33	24	26	38	10	12	69	377
Gobiosoma bosc	Naked goby	14	32	44	47	23	80	66	43	25	44	47	465
Gobiosoma robustum	Code goby	4	2	.	.	5	8	10	14	5	8	11	67
Microgobius gulosus	Clown goby	30	137	112	32	81	64	47	49	79	36	93	760
Microgobius thalassinus	Green goby	14	2	4	1	1	.	24	15	4	12	40	117
Bathygobius soporator	Frillfin goby	1	2	23	20	4	19	5	2	2	6	.	84
Dormitator maculatus	Fat sleeper	.	.	1	.	.	.	.	.	.	1	.	2
Scomberomorus maculatus	Spanish mackerel	.	.	1	.	.	1	3	1	.	1	.	7
Peprilus triacanthus	Butterfish	1	.	.	.	.	.	.	.	.	1	.	2
Citharichthys macrops	Spotted whiff	.	.	.	.	.	.	.	.	.	1	.	1
Citharichthys spilopterus	Bay whiff	40	29	78	27	51	19	46	68	136	23	19	536
Etropus crossotus	Fringed flounder	2	7	3	5	4	13	6	13	17	15	6	91
Paralichthys dentatus	Summer flounder	1	.	.	1	.	2	5	.	1	6	5	21
Paralichthys albigutta	Gulf flounder	7	9	8	18	3	5	14	8	15	3	17	107
Paralichthys lethostigma	Southern flounder	7	4	42	21	56	27	32	13	20	103	43	368
Paralichthys squamilentus	Broad flounder	1	.	.	1	.	.	1	.	1	.	.	4
Ancylopsetta quadrocellata	Ocellated flounder	.	.	.	.	1	.	.	.	.	.	1	2
Symphurus plagiusa	Blackcheek tonguefish	29	9	33	20	16	20	68	36	15	254	61	561
Trinectes maculatus	Hogchoker	18	25	117	32	24	52	11	12	49	42	12	394
Achirus lineatus	Lined sole	22	3	3	4	8	17	24	29	8	1	5	124
Stephanolepis hispidus	Planehead filefish	1	.	1	1	4	2	8	3	.	4	2	26
Sphoeroides nephelus	Southern puffer	18	3	6	14	11	17	28	7	11	13	13	141
Sphoeroides spengleri	Bandtail puffer	.	.	.	.	1	.	.	.	.	.	.	1
Chilomycterus schoepfii	Striped burrfish	9	.	3	3	4	2	8	1	3	12	9	54
Totals		***18,808***	***19,712***	***26,036***	***45,427***	***37,263***	***33,638***	***28,116***	***36,057***	***33,558***	***67,534***	***44,522***	***390,671***

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Appendix 1 Table 5, page 1 of 6.

183-m seine catch by year.

Data are presented as total number collected.

Number of samples collected by year is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	***Common Name***	***2001 (57)***	***2002 (79)***	***2003 (113)***	***2004 (108)***	***2005 (112)***	***2006 (111)***	***2007 (109)***	***2008 (112)***	***2009 (116)***	***2010 (112)***	***2011 (114)***	***Total (1,143)***
Stomolophus meleagris	Cannonball jellyfish	251	1,310	144	66	3	18	252	4	5	3	39	2,095
Limulus polyphemus	Horseshoe crab	.	1	2	.	.	.	.	.	.	.	.	3
Farfantepenaeus spp.	Commercial shrimps	.	.	.	.	.	5	.	13	7	27	1	53
Farfantepenaeus aztecus	Brown shrimp	.	.	.	.	.	1	.	4	5	53	80	143
Farfantepenaeus duorarum	Pink shrimp	.	.	.	3	.	25	11	11	2	.	8	60
Litopenaeus setiferus	White shrimp	12	5	3	103	57	12	141	410	22	263	72	1,100
Callinectes sapidus	Blue crab	46	33	60	166	39	169	258	147	49	45	139	1,151
Callinectes similis	Lesser blue crab	3	.	.	.	.	1	36	11	1	7	7	66
Callinectes ornatus	Shelligs	.	.	.	.	.	.	.	1	.	.	1	2
Portunus sp.	Portunus crabs	.	.	.	.	.	.	.	.	.	.	1	1
Menippe spp.	Stone crab	.	1	.	.	.	.	1	.	.	.	.	2
Dasyatis sabina	Atlantic stingray	189	240	486	332	255	317	415	382	343	149	124	3,232
Dasyatis say	Bluntnose stingray	4	4	.	4	3	7	3	1	1	5	2	34
Gymnura micrura	Smooth butterfly ray	3	.	.	.	.	1	1	.	.	4	.	9
Aetobatus narinari	Spotted eagle ray	.	1	.	1	.	.	.	.	.	.	.	2
Rhinoptera bonasus	Cownose ray	.	1	.	.	1	.	.	.	.	.	2	4
Lepisosteus osseus	Longnose gar	6	8	41	31	24	22	30	27	14	23	15	241
Lepisosteus platyrhincus	Florida gar	25	19	20	50	5	11	4	50	29	1	52	266
Amia calva	Bowfin	.	.	2	2	.	1	.	.	.	1	.	6
Elops saurus	Ladyfish	51	90	64	105	186	226	440	98	190	12	155	1,617
Megalops atlanticus	Tarpon	.	.	.	.	.	.	.	1	1	.	.	2
Albula vulpes	Bonefish	.	.	.	.	.	3	2	.	.	.	.	5

Appendix 1 Table 5 continued, page 2 of 6.

Scientific Name	Common Name	2001 (57)	2002 (79)	2003 (113)	2004 (108)	2005 (112)	2006 (111)	2007 (109)	2008 (112)	2009 (116)	2010 (112)	2011 (114)	Total (1,143)
Anguilla rostrata	American eel	1	.	1	2	.	1	.	1	.	.	.	6
Alosa sapidissima	American shad	.	.	.	.	.	3	.	1	.	1	1	6
Alosa aestivalis	Blueback herring	.	.	4	.	2	.	1	.	.	.	.	7
Alosa mediocris	Hickory shad	.	1	.	.	8	.	.	.	.	.	.	9
Brevoortia spp.	Menhadens	133	3,984	38	2,660	44	1,216	435	114	8,463	1284	652	19,023
Dorosoma cepedianum	Gizzard shad	49	29	21	30	674	262	128	1,011	73	187	535	2,999
Dorosoma petenense	Threadfin shad	21	10	15	5	89	25	153	82	37	13	32	482
Opisthonema oglinum	Atlantic thread herring	13	335	12	99	18	435	34	202	27	85	50	1,310
Harengula jaguana	Scaled sardine	1	.	.	4	.	94	5	.	4	19	16	143
Anchoa hepsetus	Striped anchovy	.	.	.	.	.	.	.	10	6	.	.	16
Anchoa mitchilli	Bay anchovy	.	.	.	.	.	.	.	2	.	.	.	2
Anchoa cubana	Cuban anchovy	.	.	.	.	.	.	.	1	.	.	.	1
Esox niger	Chain pickerel	.	.	.	4	.	.	.	.	.	.	.	4
Synodus foetens	Inshore lizardfish	1	.	.	1	.	5	10	4	2	14	29	66
Notemigonus crysoleucas	Golden shiner	.	.	8	31	18	55	.	1	.	.	1	114
Ictalurus punctatus	Channel catfish	27	42	62	25	61	102	5	19	21	13	.	377
Ameiurus catus	White catfish	7	7	104	202	55	481	25	82	23	47	6	1,039
Ameiurus nebulosus	Brown bullhead	2	.	.	1	1	17	.	1	.	.	.	22
Bagre marinus	Gafftopsail catfish	.	1	1	.	.	.	.	.	2	1	2	7
Ariopsis felis	Hardhead catfish	1	2	3	1	4	2	9	1	2	.	.	25
Loricariidae sp.	Suckermouth catfish	.	.	.	.	.	.	.	1	.	.	.	1
Pterygoplichthys spp.	Armoured catfishes	.	.	.	.	1	2	.	.	.	.	.	3
Opsanus tau	Oyster toadfish	5	.	.	.	.	.	.	.	.	2	.	7
Ogcocephalus sp.	Batfishes	1	.	.	.	.	.	.	.	.	.	.	1
Ogcocephalus cubifrons	Polka-dot batfish	.	.	.	.	.	.	1	.	.	.	1	2

Appendix 1 Table 5 continued, page 3 of 6.

Scientific Name	*Common Name*	*2001 (57)*	*2002 (79)*	*2003 (113)*	*2004 (108)*	*2005 (112)*	*2006 (111)*	*2007 (109)*	*2008 (112)*	*2009 (116)*	*2010 (112)*	*2011 (114)*	*Total (1,143)*
Strongylura marina	Atlantic needlefish	45	15	11	10	66	58	109	129	43	54	35	575
Strongylura notata	Redfin needlefish	.	.	.	.	2	.	1	1	.	.	.	4
Tylosurus crocodilus	Houndfish	.	.	.	.	.	4	1	.	.	.	2	7
Fundulus heteroclitus	Mummichog	.	.	.	.	.	.	.	.	.	6	1	7
Fundulus majalis	Striped killifish	.	.	.	.	.	.	1	1	6	1	.	9
Fundulus seminolis	Seminole killifish	.	.	.	34	4	12	7	2	1	1	6	67
Menidia menidia	Atlantic silverside	.	.	.	.	.	.	.	1	.	.	2	3
Prionotus evolans	Striped searobin	.	.	.	.	.	1	.	.	.	.	3	4
Prionotus scitulus	Leopard searobin	.	1	.	.	.	1	.	1	.	1	5	9
Prionotus tribulus	Bighead searobin	1	.	.	2	3	1	13	9	2	14	16	61
Centropomus undecimalis	Common snook	.	2	1	.	1	2	38	1	1	.	1	47
Centropristis philadelphica	Rock sea bass	1	.	.	4	.	3	.	1	.	2	2	13
Lepomis auritus	Redbreast sunfish	12	14	11	53	59	91	96	67	24	51	7	485
Lepomis macrochirus	Bluegill	78	41	156	414	154	168	168	145	55	51	8	1,438
Lepomis marginatus	Dollar sunfish	.	.	.	1	.	.	.	.	.	.	.	1
Lepomis microlophus	Redear sunfish	19	43	38	180	137	207	74	79	44	9	8	838
Lepomis punctatus	Spotted sunfish	.	.	.	1	7	5	.	.	.	.	.	13
Micropterus salmoides	Largemouth bass	1	2	28	121	93	51	15	19	16	23	23	392
Pomoxis nigromaculatus	Black crappie	.	.	3	7	23	4	.	3	.	1	.	41
Lepomis gulosus	Warmouth	.	.	.	1	6	.	.	1	.	1	.	9
Pomatomus saltatrix	Bluefish	15	3	.	3	2	4	32	13	7	8	9	96
Rachycentron canadum	Cobia	1	.	.	.	2	1	1	.	.	.	.	5
Caranx hippos	Crevalle jack	44	23	29	17	20	26	69	94	51	16	28	417
Caranx latus	Horse-eye jack	2	1	.	.	.	3	11	2	1	2	7	29
Caranx crysos	Blue runner	.	.	.	.	.	1	2	1	.	.	7	11

Appendix 1 Table 5 continued, page 4 of 6.

Scientific Name	***Common Name***	***2001 (57)***	***2002 (79)***	***2003 (113)***	***2004 (108)***	***2005 (112)***	***2006 (111)***	***2007 (109)***	***2008 (112)***	***2009 (116)***	***2010 (112)***	***2011 (114)***	***Total (1,143)***
Chloroscombrus chrysurus	Atlantic bumper	163	196	40	2	126	243	755	624	507	167	629	3,452
Oligoplites saurus	Leatherjacket	1	1	1	.	2	8	4	.	.	2	6	25
Selene vomer	Lookdown	20	2	11	84	13	35	15	14	3	16	41	254
Selene setapinnis	Atlantic moonfish	2	.	.	.	1	.	.	.	.	.	9	12
Trachinotus carolinus	Florida pompano	2	6	1	2	.	17	7	.	5	.	27	67
Trachinotus falcatus	Permit	22	.	1	5	9	7	16	.	.	16	28	104
Lutjanus griseus	Gray snapper	2	5	1	1	3	4	13	17	3	2	.	51
Lutjanus synagris	Lane snapper	.	.	2	.	.	4	1	.	.	.	.	7
Lobotes surinamensis	Tripletail	.	.	1	.	.	.	.	.	.	.	.	1
Eucinostomus sp.	Eucinostomus	1	.	.	.	.	.	.	.	.	.	.	1
Eucinostomus gula	Silver jenny	27	4	12	27	14	155	64	70	53	37	50	513
Eucinostomus harengulus	Tidewater mojarra	24	.	90	65	19	593	1,481	133	52	47	57	2,561
Diapterus auratus	Irish pompano	5	24	60	46	190	115	59	41	43	29	31	643
Orthopristis chrysoptera	Pigfish	2	15	.	5	5	145	53	2	1	10	143	381
Lagodon rhomboides	Pinfish	896	422	840	1,477	669	550	1,668	2,983	491	2018	5333	17,347
Archosargus probatocephalus	Sheepshead	26	92	105	121	61	30	33	53	63	95	36	715
Cynoscion nebulosus	Spotted seatrout	34	80	18	43	130	66	88	62	35	71	73	700
Cynoscion complex	*C. regalis* x *C. arenarius*	.	3	7	2	19	22	2	4	51	23	3	136
Bairdiella chrysoura	Silver perch	15	25	166	37	108	822	121	55	54	37	230	1,670
Leiostomus xanthurus	Spot	913	226	326	868	579	1,635	979	1,263	1,316	1042	2145	11,292
Menticirrhus americanus	Southern kingfish	6	4	10	2	7	16	26	6	1	5	11	94
Menticirrhus littoralis	Gulf kingfish	1	.	.	.	.	.	.	.	.	.	.	1
Menticirrhus saxatilis	Northern kingfish	6	1	.	.	1	.	.	.	1	.	.	9
Micropogonias undulatus	Atlantic croaker	89	24	41	265	119	351	353	1,567	159	117	429	3,514
Pogonias cromis	Black drum	5	21	33	13	27	25	5	7	8	26	51	221

Appendix 1 Table 5 continued, page 5 of 6.

Scientific Name	***Common Name***	***2001 (57)***	***2002 (79)***	***2003 (113)***	***2004 (108)***	***2005 (112)***	***2006 (111)***	***2007 (109)***	***2008 (112)***	***2009 (116)***	***2010 (112)***	***2011 (114)***	***Total (1,143)***
Sciaenops ocellatus	Red drum	38	77	74	201	84	106	67	79	240	181	93	1,240
Stellifer lanceolatus	Star drum	.	.	.	.	1	.	.	.	.	.	.	1
Chaetodipterus faber	Atlantic spadefish	1	9	34	.	.	7	5	.	.	.	5	61
Oreochromis aureus	Blue tilapia	.	.	.	.	.	.	.	.	1	.	.	1
Oreochromis/Sarotherodon spp.	Tilapias	.	.	.	1	.	1	.	.	.	.	.	2
Morone saxatilis	Striped bass	.	.	.	.	1	1	.	.	.	1	.	3
Mugil cephalus	Striped mullet	372	723	1,176	1,726	938	1,110	853	1,140	1,067	2114	1536	12,755
Mugil curema	White mullet	167	221	225	241	425	858	2,090	597	199	1500	855	7,378
Sphyraena barracuda	Great barracuda	.	3	.	.	.	1	.	.	.	.	.	4
Astroscopus y-graecum	Southern stargazer	.	2	.	.	1	.	2	2	6	1	2	16
Chasmodes sp.		1	.	.	.	.	.	.	.	.	.	.	1
Microgobius gulosus	Clown goby	.	.	.	.	.	1	.	.	.	.	.	1
Gobioides broussonetii	Violet goby	.	.	.	.	.	.	.	.	.	1	.	1
Dormitator maculatus	Fat sleeper	.	.	.	3	.	.	.	.	.	.	.	3
Scomberomorus cavalla	King mackerel	.	.	.	.	.	.	.	.	1	.	.	1
Scomberomorus maculatus	Spanish mackerel	12	33	14	5	10	10	8	2	4	4	4	106
Peprilus triacanthus	Butterfish	.	.	.	.	.	.	.	.	1	.	.	1
Peprilus paru	Harvestfish	.	.	2	.	5	.	5	6	39	.	.	57
Citharichthys macrops	Spotted whiff	1	1	4	.	.	.	.	.	.	.	5	11
Citharichthys spilopterus	Bay whiff	50	21	16	36	32	74	189	93	34	26	159	730
Etropus crossotus	Fringed flounder	6	5	3	1	1	39	25	31	8	85	76	280
Paralichthys dentatus	Summer flounder	.	1	.	2	.	3	.	1	.	24	13	44
Paralichthys albigutta	Gulf flounder	10	9	11	15	2	5	74	26	10	10	32	204
Paralichthys lethostigma	Southern flounder	60	18	35	47	22	54	54	47	30	43	90	500
Paralichthys squamilentus	Broad flounder	.	.	.	.	.	.	1	.	.	5	.	6

Appendix 1 Table 5 continued, page 6 of 6.

Scientific Name	***Common Name***	***2001 (57)***	***2002 (79)***	***2003 (113)***	***2004 (108)***	***2005 (112)***	***2006 (111)***	***2007 (109)***	***2008 (112)***	***2009 (116)***	***2010 (112)***	***2011 (114)***	***Total (1,143)***
Ancylopsetta quadrocellata	Ocellated flounder	1	.	.	6	5	.	7	1	2	10	16	48
Trinectes maculatus	Hogchoker	2	1	4	4	.	3	2	2	5	5	.	28
Achirus lineatus	Lined sole	5	8	7	17	1	9	12	13	4	6	9	91
Aluterus monoceros	Unicorn filefish	.	1	.	.	.	.	.	.	.	.	.	1
Stephanolepis hispidus	Planehead filefish	.	.	.	.	.	.	2	.	.	.	.	2
Sphoeroides maculatus	Northern puffer	.	2	.	.	.	.	.	.	.	.	.	2
Sphoeroides nephelus	Southern puffer	24	18	8	19	3	16	59	39	11	9	36	242
Chilomycterus schoepfii	Striped burrfish	33	17	7	18	3	16	39	4	4	5	21	167
Totals		***4,116***	***8,598***	***4,782***	***10,199***	***5,781***	***11,343***	***12,289***	***12,281***	***14,117***	***10,307***	***14,512***	***108,325***

Appendix 1 Table 6, page 1 of 8.

6.1-m otter trawl catch by year.

Data are presented as total number collected.

Number of samples collected by year is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	Common Name	2001 (108)	2002 (153)	2003 (212)	2004 (218)	2005 (215)	2006 (219)	2007 (212)	2008 (220)	2009 (215)	2010 (217)	2011 (218)	Total (2,207)
Stomolophus meleagris	Cannonball jellyfish	22	120	57	35	4	16	22	.	6	.	33	315
Limulus polyphemus	Horseshoe crab	.	.	.	1	.	.	2	.	.	.	2	5
Penaeidae spp.	Penaeid shrimps	105	1	.	.	.	.	.	.	.	.	.	106
Farfantepenaeus spp.	Commercial shrimps	.	44	225	476	351	176	150	355	519	324	284	2,904
Farfantepenaeus aztecus	Brown shrimp	.	27	8	50	28	21	14	37	37	123	235	580
Farfantepenaeus duorarum	Pink shrimp	277	144	49	79	34	61	45	37	14	29	40	809
Litopenaeus setiferus	White shrimp	227	746	166	868	1,908	743	481	470	986	2,460	1,777	10,832
Penaeus monodon	Giant tiger prawn	.	.	.	.	.	.	.	.	1	.	.	1
Rimapenaeus constrictus	Roughneck shrimp	.	.	.	.	10	2	12	71	19	1	15	130
Xiphopenaeus kroyeri	Atlantic seabob	.	.	.	.	.	.	.	.	1	1	.	2
Sicyonia brevirostris	Rock Shrimp	.	.	.	.	.	1	1	.	.	.	.	2
Sicyonia parri		.	.	.	.	.	.	1	.	.	.	.	1
Macrobrachium spp.	Prawns	.	.	.	.	3	52	7	3	5	8	.	78
Alpheidae sp.	Snapping shrimp	.	.	.	.	.	.	.	.	1	.	.	1
Callinectes sapidus	Blue crab	182	147	353	765	572	819	900	627	379	350	951	6,045
Callinectes similis	Lesser blue crab	50	5	1	12	3	53	86	66	50	51	63	440
Callinectes ornatus	Shelligs	.	.	.	.	.	.	.	3	.	.	5	8
Portunus spp.	Portunus crabs	10	.	.	.	.	1	8	5	.	6	9	39
Charybdis hellerii	Spiny hands	.	.	.	.	.	.	.	.	.	1	.	1
Menippe spp.	Stone crab	1	3	.	.	.	.	2	3	.	2	4	15
Dasyatis sabina	Atlantic stingray	14	37	101	34	37	28	51	66	59	41	26	494
Dasyatis say	Bluntnose stingray	.	1	2	2	.	2	2	.	.	1	2	12

Appendix 1 Table 6 continued, page 2 of 8.

Scientific Name	***Common Name***	***2001 (108)***	***2002 (153)***	***2003 (212)***	***2004 (218)***	***2005 (215)***	***2006 (219)***	***2007 (212)***	***2008 (220)***	***2009 (215)***	***2010 (217)***	***2011 (218)***	***Total (2,207)***
Gymnura micrura	Smooth butterfly ray	.	.	1	.	.	.	.	.	1	3	.	5
Lepisosteus osseus	Longnose gar	.	.	.	.	1	2	.	.	.	.	.	3
Elops saurus	Ladyfish	1	13	8	13	42	33	15	139	6	20	111	401
Anguilla rostrata	American eel	4	.	1	1	.	.	2	1	.	1	1	11
Ophichthidae sp.		.	.	.	1	.	.	.	.	.	.	.	1
Myrophis punctatus	Speckled worm eel	1	6	2	2	2	1	1	1	.	.	7	23
Ophichthus gomesii	Shrimp eel	.	.	.	.	.	.	1	.	1	.	.	2
Alosa sapidissima	American shad	.	.	.	.	.	.	.	.	.	.	3	3
Alosa aestivalis	Blueback herring	.	.	1	.	1	.	.	.	.	1	.	3
Alosa mediocris	Hickory shad	.	.	.	.	2	.	.	.	.	.	.	2
Brevoortia spp.	Menhadens	2	1	4	11	6	2	3	5	.	53	29	116
Dorosoma cepedianum	Gizzard shad	.	1	.	3	1	.	.	2	.	5	1	13
Dorosoma petenense	Threadfin shad	.	.	3	12	2	16	3	1	.	4	9	50
Opisthonema oglinum	Atlantic thread herring	2	1	13	1	.	1	.	.	3	2	2	25
Harengula jaguana	Scaled sardine	.	.	1	.	.	.	.	.	.	.	15	16
Anchoa spp.	Anchovies	.	.	2	.	.	.	.	.	.	.	.	2
Anchoa hepsetus	Striped anchovy	395	99	117	182	7	9	14	65	8	276	572	1,744
Anchoa mitchilli	Bay anchovy	3,372	2,611	2,906	2,069	840	2,187	5,090	2,650	1,476	2,894	17,451	43,546
Anchoa lyolepis	Dusky anchovy	.	4	.	.	.	.	.	1	.	1	21	27
Synodus foetens	Inshore lizardfish	14	12	20	11	9	13	30	8	3	33	7	160
Ictaluridae sp.	Bullhead catfishes	.	.	1	.	.	.	.	.	.	.	.	1
Ictalurus punctatus	Channel catfish	1	6	32	23	109	39	.	.	3	2	.	215
Noturus gyrinus	Tadpole madtom	.	1	.	.	.	.	.	.	.	.	.	1
Ameiurus catus	White catfish	23	56	294	184	319	372	28	72	110	88	25	1,571
Ameiurus natalis	Yellow bullhead	.	.	.	.	.	.	.	1	.	.	.	1

Appendix 1 Table 6 continued, page 3 of 8.

Scientific Name	Common Name	2001 (108)	2002 (153)	2003 (212)	2004 (218)	2005 (215)	2006 (219)	2007 (212)	2008 (220)	2009 (215)	2010 (217)	2011 (218)	Total (2,207)
Ameiurus nebulosus	Brown bullhead	1	.	1	1	1	.	.	.	.	2	1	7
Bagre marinus	Gafftopsail catfish	.	.	.	.	.	.	.	.	10	1	7	18
Ariopsis felis	Hardhead catfish	5	7	39	7	7	100	39	6	62	9	58	339
Loricariidae sp.	Suckermouth catfish	.	.	.	.	.	.	.	.	.	1	.	1
Opsanus tau	Oyster toadfish	57	15	16	5	10	15	14	58	31	11	18	250
Gobiesox strumosus	Skilletfish	8	1	2	.	1	.	.	7	.	1	.	20
Ogcocephalus sp.	Batfishes	.	1	.	.	.	.	.	.	.	.	.	1
Ogcocephalus cubifrons	Polka-dot batfish	1	.	.	.	.	.	3	.	.	.	1	5
Urophycis regia	Spotted hake	.	.	.	7	2	2	.	.	.	6	7	24
Urophycis floridana	Southern hake	.	.	1	3	.	.	.	.	.	.	.	4
Ophidiidae sp.		.	.	.	.	.	.	.	1	.	.	.	1
Lepophidium brevibarbe		1	3	1	18	.	.	.	.	.	.	.	23
Ophidion sp.		.	.	.	1	.	.	.	.	.	.	.	1
Ophidion holbrookii	Bank cusk-eel	.	.	.	.	2	.	.	1	.	1	.	4
Ophidion josephi	Crested cusk-eel	.	.	.	.	.	.	.	3	.	.	.	3
Fundulus heteroclitus	Mummichog	.	.	.	.	.	.	.	.	.	.	1	1
Lucania parva	Rainwater killifish	.	.	.	1	.	.	.	.	1	1	.	3
Gambusia holbrooki	Eastern mosquito fish	.	.	.	.	.	.	.	.	1	.	.	1
Membras martinica	Rough silverside	.	1	.	.	.	1	.	.	.	.	.	2
Menidia spp.	Menidia silversides	1	.	1	.	.	.	1	.	.	.	.	3
Menidia menidia	Atlantic silverside	.	.	.	1	.	.	.	.	.	.	1	2
Labidesthes sicculus	Brook silverside	.	1	.	.	.	.	.	.	.	.	.	1
Syngnathus floridae	Dusky pipefish	.	.	.	.	.	.	.	.	1	.	.	1
Syngnathus fuscus	Northern pipefish	.	.	.	1	.	1	2	.	.	.	.	4
Syngnathus louisianae	Chain pipefish	3	5	12	4	2	11	9	7	.	5	9	67

Appendix 1 Table 6 continued, page 4 of 8.

Scientific Name	***Common Name***	***2001 (108)***	***2002 (153)***	***2003 (212)***	***2004 (218)***	***2005 (215)***	***2006 (219)***	***2007 (212)***	***2008 (220)***	***2009 (215)***	***2010 (217)***	***2011 (218)***	***Total (2,207)***
Syngnathus scovelli	Gulf pipefish	.	5	5	14	4	3	3	1	8	5	11	59
Hippocampus erectus	Lined seahorse	1	.	.	1	.	2	1	.	.	.	.	5
Scorpaena brasiliensis	Barbfish	.	.	.	1	.	.	.	.	.	.	.	1
Prionotus carolinus	Northern searobin	.	.	.	.	.	.	.	.	.	11	5	16
Prionotus evolans	Striped searobin	.	.	.	.	.	5	.	.	.	.	1	6
Prionotus scitulus	Leopard searobin	10	10	6	11	1	7	15	20	3	18	32	133
Prionotus tribulus	Bighead searobin	3	13	31	49	43	35	37	28	27	71	76	413
Prionotus rubio	Blackfin searobin	1	.	.	.	.	.	.	.	.	4	.	5
Centropomus undecimalis	Common snook	.	.	.	.	1	.	.	.	.	2	.	3
Centropristis striata	Black sea bass	1	.	.	1	.	.	1	3	.	.	1	7
Centropristis philadelphica	Rock sea bass	1	2	5	15	5	8	8	17	9	7	10	87
Epinephelus itajara	Goliath grouper	.	.	.	.	.	.	.	.	.	.	1	1
Mycteroperca microlepis	Gag	.	.	.	.	.	.	1	.	.	.	.	1
Lepomis spp.	Sunfishes	12	.	.	.	8	.	.	.	3	.	.	23
Lepomis auritus	Redbreast sunfish	1	.	.	4	.	3	8	.	39	2	.	57
Lepomis macrochirus	Bluegill	137	17	7	10	19	5	36	3	5	7	1	247
Lepomis marginatus	Dollar sunfish	.	.	1	.	.	.	.	.	.	.	.	1
Lepomis microlophus	Redear sunfish	4	3	1	9	7	3	8	6	2	4	.	47
Micropterus salmoides	Largemouth bass	.	.	.	.	2	.	2	.	1	1	1	7
Pomoxis nigromaculatus	Black crappie	3	1	21	22	12	2	1	1	4	5	.	72
Lepomis gulosus	Warmouth	.	.	.	1	1	.	.	1	1	.	.	4
Pomatomus saltatrix	Bluefish	.	.	.	.	.	.	.	.	1	.	.	1
Rachycentron canadum	Cobia	.	.	.	.	.	1	.	.	.	.	1	2
Caranx hippos	Crevalle jack	.	.	.	.	.	2	1	1	.	.	1	5
Chloroscombrus chrysurus	Atlantic bumper	711	19	9	10	17	13	112	19	64	21	236	1,231

Appendix 1 Table 6 continued, page 5 of 8.

Scientific Name	***Common Name***	***2001 (108)***	***2002 (153)***	***2003 (212)***	***2004 (218)***	***2005 (215)***	***2006 (219)***	***2007 (212)***	***2008 (220)***	***2009 (215)***	***2010 (217)***	***2011 (218)***	***Total (2,207)***
Oligoplites saurus	Leatherjacket	.	.	.	.	1	.	1	.	.	2	.	4
Selene vomer	Lookdown	3	1	4	2	2	4	3	4	1	7	8	39
Selene setapinnis	Atlantic moonfish	.	.	.	.	1	2	2	.	.	1	118	124
Trachinotus falcatus	Permit	1	.	.	.	.	.	.	.	2	.	.	3
Lutjanus griseus	Gray snapper	1	4	2	.	2	1	4	7	1	6	1	29
Lutjanus synagris	Lane snapper	2	1	.	.	1	7	2	.	.	3	.	16
Eucinostomus spp.	Eucinostomus	7	114	114	87	9	9	15	28	74	41	7	505
Eucinostomus gula	Silver jenny	4	12	7	5	.	5	10	1	22	13	43	122
Eucinostomus harengulus	Tidewater mojarra	18	90	31	15	26	22	38	30	61	50	32	413
Diapterus auratus	Irish pompano	16	7	134	7	52	5	9	50	5	1	1	287
Orthopristis chrysoptera	Pigfish	18	32	.	34	3	196	31	3	6	7	155	485
Lagodon rhomboides	Pinfish	11	39	46	34	53	14	87	32	27	104	187	634
Archosargus probatocephalus	Sheepshead	11	12	23	11	9	17	14	20	11	22	9	159
Sciaenidae spp.	Drums	.	3	.	.	.	.	.	.	.	.	.	3
Cynoscion nebulosus	Spotted seatrout	8	10	9	3	5	16	13	5	.	6	5	80
Cynoscion nothus	Silver seatrout	.	.	.	.	.	3	.	.	.	.	1	4
Cynoscion complex	*C. regalis* x *C. arenarius*	93	87	666	402	254	175	194	361	454	83	71	2,840
Bairdiella chrysoura	Silver perch	121	96	99	186	133	78	62	106	97	22	71	1,071
Leiostomus xanthurus	Spot	285	117	969	8,086	2,669	316	1,362	2,991	466	9,479	11,649	38,389
Larimus fasciatus	Banded drum	15	.	.	1	.	.	.	.	.	.	8	24
Menticirrhus americanus	Southern kingfish	25	36	32	54	62	36	27	117	72	21	19	501
Menticirrhus saxatilis	Northern kingfish	2	5	.	2	.	3	1	4	.	.	.	17
Micropogonias undulatus	Atlantic croaker	646	1,969	5,534	5,359	6,852	5,105	5,240	8,362	5,051	14,255	5,142	63,515
Pogonias cromis	Black drum	3	8	8	2	1	3	4	7	5	1	.	42
Sciaenops ocellatus	Red drum	.	3	9	38	.	1	1	12	6	3	.	73

Appendix 1 Table 6 continued, page 6 of 8.

Scientific Name	Common Name	2001 (108)	2002 (153)	2003 (212)	2004 (218)	2005 (215)	2006 (219)	2007 (212)	2008 (220)	2009 (215)	2010 (217)	2011 (218)	Total (2,207)
Stellifer lanceolatus	Star drum	109	62	8	452	435	187	21	328	150	1	14	1,767
Chaetodipterus faber	Atlantic spadefish	8	3	.	4	23	10	14	3	5	12	10	92
Oreochromis niloticus		.	.	.	.	.	.	.	.	.	1	.	1
Mugil cephalus	Striped mullet	.	2	9	1	.	1	1	1	2	1	4	22
Mugil curema	White mullet	.	.	.	.	.	.	.	.	7	24	2	33
Sphyraena borealis	Northern sennet	.	.	.	.	.	.	.	.	.	.	1	1
Sphyraena guachancho	Guaguanche	.	.	.	.	.	.	.	.	.	2	.	2
Astroscopus y-graecum	Southern stargazer	.	.	1	1	5	3	3	7	7	13	27	67
Hypsoblennius hentz	Feather blenny	.	.	1	1	.	.	.	.	1	.	1	4
Chasmodes bosquianus	Striped blenny	.	1	1	.	.	.	.	.	.	.	.	2
Chasmodes saburrae	Florida blenny	.	.	.	.	.	.	.	.	.	.	1	1
Hypleurochilus geminatus	Crested blenny	.	.	.	.	.	.	.	.	.	1	.	1
Gobiidae sp.	Gobies	.	.	.	.	.	.	1	.	.	.	.	1
Ctenogobius boleosoma	Darter goby	.	14	10	8	43	3	7	7	8	18	5	123
Gobionellus oceanicus	Highfin goby	1	6	4	19	18	12	8	2	16	20	4	110
Ctenogobius shufeldti	Freshwater goby	1	1	78	246	86	162	5	6	5	4	2	596
Ctenogobius stigmaticus	Marked goby	.	1	.	.	.	.	.	3	1	.	.	5
Ctenogobius smaragdus	Emerald goby	.	28	1	.	1	.	1	9	7	.	.	47
Gobiosoma spp.	Gobiosoma gobies	1	6	5	1	2	15	23	16	6	2	7	84
Gobiosoma bosc	Naked goby	5	16	5	9	3	4	13	21	23	7	11	117
Gobiosoma robustum	Code goby	.	2	.	1	1	3	5	8	4	4	10	38
Microgobius gulosus	Clown goby	3	16	73	65	28	67	14	27	163	26	19	501
Microgobius thalassinus	Green goby	49	60	15	2	3	13	131	100	17	9	169	568
Bathygobius soporator	Frillfin goby	.	.	2	2	4	.	.	.	.	.	.	8
Gobioides broussonetii	Violet goby	.	1	.	7	15	4	15	16	6	1	17	82

Appendix 1 Table 6 continued, page 7 of 8.

Scientific Name	Common Name	2001 (108)	2002 (153)	2003 (212)	2004 (218)	2005 (215)	2006 (219)	2007 (212)	2008 (220)	2009 (215)	2010 (217)	2011 (218)	Total (2,207)
Erotelis smaragdus	Emerald sleeper	.	.	.	.	1	.	.	.	.	.	.	1
Dormitator maculatus	Fat sleeper	.	.	.	2	.	1	.	.	.	.	.	3
Ctenogobius spp.		.	.	.	.	.	5	.	.	.	.	.	5
Eleotris amblyopsis		.	.	.	1	.	1	.	.	.	.	.	2
Trichiurus lepturus	Atlantic cutlassfish	2	2	2	7	.	3	10	3	.	6	13	48
Scomberomorus cavalla	King mackerel	.	.	.	.	.	.	.	.	.	1	.	1
Peprilus spp.		.	2	.	.	.	.	.	.	.	.	.	2
Peprilus triacanthus	Butterfish	.	.	2	1	4	.	.	.	.	1	2	10
Peprilus paru	Harvestfish	.	.	.	2	1	1	.	1	2	1	3	11
Bothidae sp.	Sand flounders	.	.	.	.	1	.	.	.	.	.	.	1
Citharichthys macrops	Spotted whiff	.	.	.	.	.	.	.	2	.	3	.	5
Citharichthys spilopterus	Bay whiff	48	68	56	76	113	113	145	179	116	70	254	1,238
Etropus crossotus	Fringed flounder	7	35	16	39	28	82	41	84	36	136	162	666
Paralichthys sp.		.	1	.	.	.	.	.	.	.	.	.	1
Paralichthys dentatus	Summer flounder	.	.	.	3	8	3	4	2	4	32	78	134
Paralichthys albigutta	Gulf flounder	3	8	5	12	4	4	28	10	20	8	16	118
Paralichthys lethostigma	Southern flounder	21	28	54	80	98	76	33	34	25	201	245	895
Paralichthys squamilentus	Broad flounder	.	.	.	.	.	.	.	1	.	1	.	2
Scophthalmus aquosus	Windowpane	.	.	.	1	1	.	.	.	.	.	.	2
Ancylopsetta quadrocellata	Ocellated flounder	.	3	1	7	13	4	6	2	4	6	19	65
Symphurus plagiusa	Blackcheek tonguefish	34	69	46	51	106	69	40	71	29	66	55	636
Symphurus civitatium	Offshore tonguefish	.	.	.	.	5	2	.	.	.	.	.	7
Trinectes maculatus	Hogchoker	170	419	550	427	650	475	191	174	408	343	345	4,152
Achirus lineatus	Lined sole	32	19	31	48	52	26	24	175	62	19	24	512
Aluterus schoepfii	Orange filefish	.	.	.	.	1	.	.	.	.	.	.	1

Appendix 1 Table 6 continued, page 8 of 8.

Scientific Name	Common Name	2001 (108)	2002 (153)	2003 (212)	2004 (218)	2005 (215)	2006 (219)	2007 (212)	2008 (220)	2009 (215)	2010 (217)	2011 (218)	Total (2,207)
Stephanolepis hispidus	Planehead filefish	3	11	1	5	.	4	4	1	2	2	17	50
Sphoeroides nephelus	Southern puffer	24	27	13	21	6	10	26	50	20	6	18	221
Sphoeroides spengleri	Bandtail puffer	.	.	.	.	.	.	2	.	.	1	.	3
Chilomycterus schoepfii	Striped burrfish	14	9	3	1	.	3	13	8	1	8	8	68
Totals		***7,490***	***7,756***	***13,208***	***20,964***	***16,330***	***12,255***	***15,223***	***18,363***	***11,479***	***32,162***	***41,271***	***196,501***

Appendix 1 Table 7, page 1 of 7.

21.3-m seine catch by FIM sampling zone.

Data are presented as total number collected.

Number of samples collected by zone is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	***Common Name***	***1 (527)***	***2 (501)***	***3 (490)***	***4 (599)***	***Total (2,117)***
Stomolophus meleagris	Cannonball jellyfish	18	5	.	.	23
Farfantepenaeus spp.	Commercial shrimps	1,037	1,716	343	398	3,494
Farfantepenaeus aztecus	Brown shrimp	32	457	69	49	607
Farfantepenaeus duorarum	Pink shrimp	182	221	84	54	541
Litopenaeus setiferus	White shrimp	5,296	16,394	2,374	1,532	25,596
Rimapenaeus constrictus	Roughneck shrimp	4	1	6	1	12
Sicyonia parri		1	.	.	.	1
Macrobrachium spp.	Prawns	.	1	1	.	2
Callinectes sp.		1	.	.	.	1
Callinectes sapidus	Blue crab	688	646	371	321	2,026
Callinectes similis	Lesser blue crab	347	79	4	.	430
Callinectes ornatus	Shelligs	10	.	1	.	11
Portunus spp.	Portunus crabs	19	1	.	.	20
Menippe sp.	Stone crab	1	.	.	.	1
Dasyatis sabina	Atlantic stingray	10	11	9	25	55
Dasyatis say	Bluntnose stingray	1	.	.	.	1
Lepisosteus osseus	Longnose gar	.	1	4	1	6
Lepisosteus platyrhincus	Florida gar	.	.	2	11	13
Amia calva	Bowfin	.	.	1	1	2
Elops saurus	Ladyfish	8	39	13	28	88
Albula vulpes	Bonefish	.	1	.	.	1
Anguilla rostrata	American eel	.	.	1	1	2
Myrophis punctatus	Speckled worm eel	2	2	.	.	4
Clupeidae spp.	Herrings	4	2	.	1	7

Appendix 1 Table 7 continued, page 2 of 7.

Scientific Name	Common Name	1 (527)	2 (501)	3 (490)	4 (599)	Total (2,117)
Alosa sapidissima	American shad	.	.	17	1	18
Alosa aestivalis	Blueback herring	1	.	1	4	6
Alosa mediocris	Hickory shad	.	6	3	3	12
Brevoortia spp.	Menhadens	2,883	3,436	2,399	975	9,693
Dorosoma cepedianum	Gizzard shad	.	4	41	42	87
Dorosoma petenense	Threadfin shad	6	117	104	122	349
Opisthonema oglinum	Atlantic thread herring	874	228	146	9	1,257
Harengula jaguana	Scaled sardine	984	368	2	1	1,355
Sardinella aurita	Spanish sardine	11	1	.	.	12
Anchoa spp.	Anchovies	6	.	.	.	6
Anchoa hepsetus	Striped anchovy	9,177	846	863	935	11,821
Anchoa mitchilli	Bay anchovy	22,770	38,481	29,655	9,755	100,661
Anchoa lyolepis	Dusky anchovy	119	13	.	.	132
Esox niger	Chain pickerel	.	.	.	1	1
Synodus foetens	Inshore lizardfish	97	22	32	3	154
Notemigonus crysoleucas	Golden shiner	.	5	16	77	98
Notropis maculatus	Taillight shiner	.	.	13	139	152
Ictalurus punctatus	Channel catfish	.	.	5	5	10
Ameiurus catus	White catfish	.	3	17	12	32
Bagre marinus	Gafftopsail catfish	.	.	4	.	4
Ariopsis felis	Hardhead catfish	.	1	2	.	3
Pterygoplichthys sp.	Armoured catfishes	.	.	1	.	1
Opsanus tau	Oyster toadfish	7	4	.	.	11
Hyporhamphus spp.	Halfbeaks	5	1	.	.	6
Hyporhamphus meeki	False silver halfbeak	14	.	.	.	14
Strongylura spp.	Needlefishes	22	20	47	79	168
Strongylura marina	Atlantic needlefish	11	14	24	30	79
Strongylura notata	Redfin needlefish	.	.	.	5	5
Tylosurus crocodilus	Houndfish	2	.	.	.	2

Appendix 1 Table 7 continued, page 3 of 7.

Scientific Name	Common Name	1 (527)	2 (501)	3 (490)	4 (599)	Total (2,117)
Cyprinodon variegatus	Sheepshead minnow	18	5	6	.	29
Fundulus sp.	Assorted killifish	.	.	1	.	1
Fundulus confluentus	Marsh killifish	1	1	.	5	7
Fundulus heteroclitus	Mummichog	2,217	2,098	164	2	4,481
Fundulus majalis	Striped killifish	371	110	.	1	482
Fundulus chrysotus	Golden topminnow	.	.	.	1	1
Fundulus seminolis	Seminole killifish	.	.	29	458	487
Lucania parva	Rainwater killifish	.	3	56	5,141	5,200
Lucania goodei	Bluefin killifish	.	.	8	21	29
Jordanella floridae	Flagfish	.	.	.	4	4
Gambusia holbrooki	Eastern mosquito fish	19	416	565	855	1,855
Poecilia latipinna	Sailfin molly	35	152	214	44	445
Heterandria formosa	Least killifish	.	.	2	17	19
Membras martinica	Rough silverside	428	153	591	27	1,199
Menidia spp.	Menidia silversides	2,990	3,341	4,423	7,594	18,348
Menidia menidia	Atlantic silverside	24,353	7,889	1,038	93	33,373
Labidesthes sicculus	Brook silverside	.	1	195	547	743
Hypoatherina harringtonensis	Reef silverside	.	1	.	.	1
Syngnathus floridae	Dusky pipefish	.	.	1	3	4
Syngnathus fuscus	Northern pipefish	1	.	.	2	3
Syngnathus louisianae	Chain pipefish	29	25	10	29	93
Syngnathus scovelli	Gulf pipefish	6	24	52	277	359
Microphis brachyurus	Opposum pipefish	.	6	2	1	9
Prionotus carolinus	Northern searobin	1	.	.	.	1
Prionotus scitulus	Leopard searobin	15	6	1	.	22
Prionotus tribulus	Bighead searobin	47	6	5	2	60
Centropomus undecimalis	Common snook	1	1	3	2	7
Centropristis philadelphica	Rock sea bass	7	.	.	.	7
Epinephelus itajara	Goliath grouper	1	1	.	.	2

Appendix 1 Table 7 continued, page 4 of 7.

Scientific Name	Common Name	1 (527)	2 (501)	3 (490)	4 (599)	Total (2,117)
Mycteroperca microlepis	Gag	2	2	.	.	4
Diplectrum formosum	Sand perch	1	.	.	.	1
Centrarchidae sp.		.	.	.	1	1
Lepomis spp.	Sunfishes	.	3	27	229	259
Lepomis auritus	Redbreast sunfish	.	2	168	531	701
Lepomis macrochirus	Bluegill	.	16	298	1,409	1,723
Lepomis marginatus	Dollar sunfish	.	.	.	7	7
Lepomis microlophus	Redear sunfish	.	.	82	237	319
Lepomis punctatus	Spotted sunfish	.	.	21	15	36
Micropterus salmoides	Largemouth bass	.	4	77	391	472
Pomoxis nigromaculatus	Black crappie	.	.	.	12	12
Lepomis gulosus	Warmouth	.	1	5	2	8
Etheostoma fusiforme	Swamp darter	.	.	.	2	2
Pomatomus saltatrix	Bluefish	36	5	8	.	49
Carangidae spp.	Jacks	2	.	.	.	2
Caranx hippos	Crevalle jack	41	40	28	17	126
Caranx latus	Horse-eye jack	.	2	1	.	3
Chloroscombrus chrysurus	Atlantic bumper	111	7	35	6	159
Oligoplites saurus	Leatherjacket	63	140	44	40	287
Selene vomer	Lookdown	15	4	4	4	27
Trachinotus carolinus	Florida pompano	269	15	23	.	307
Trachinotus falcatus	Permit	538	26	66	2	632
Lutjanus griseus	Gray snapper	51	38	18	22	129
Lutjanus analis	Mutton snapper	4	.	.	.	4
Lutjanus synagris	Lane snapper	13	1	.	.	14
Lobotes surinamensis	Tripletail	1	.	.	.	1
Eucinostomus spp.	Eucinostomus	3,088	1,466	1,051	872	6,477
Eucinostomus gula	Silver jenny	421	170	49	26	666
Eucinostomus harengulus	Tidewater mojarra	1,206	692	569	859	3,326

Appendix 1 Table 7 continued, page 5 of 7.

Scientific Name	Common Name	1 (527)	2 (501)	3 (490)	4 (599)	Total (2,117)
Diapterus auratus	Irish pompano	108	254	81	75	518
Haemulidae spp.		3	.	.	.	3
Orthopristis chrysoptera	Pigfish	432	179	138	241	990
Lagodon rhomboides	Pinfish	1,073	2,745	1,094	2,750	7,662
Archosargus probatocephalus	Sheepshead	13	28	19	25	85
Cynoscion nebulosus	Spotted seatrout	142	344	86	80	652
Cynoscion complex	*C. regalis* x *C. arenarius*	13	29	33	10	85
Bairdiella chrysoura	Silver perch	1,821	1,492	754	1,616	5,683
Leiostomus xanthurus	Spot	24,982	35,046	12,489	15,601	88,118
Menticirrhus americanus	Southern kingfish	80	76	31	20	207
Menticirrhus littoralis	Gulf kingfish	9	1	.	.	10
Menticirrhus saxatilis	Northern kingfish	13	4	2	.	19
Micropogonias undulatus	Atlantic croaker	405	3,226	3,798	1,540	8,969
Pogonias cromis	Black drum	10	11	2	3	26
Sciaenops ocellatus	Red drum	209	301	159	124	793
Stellifer lanceolatus	Star drum	1	.	.	.	1
Chaetodipterus faber	Atlantic spadefish	1	1	.	.	2
Oreochromis aureus	Blue tilapia	.	.	4	.	4
Oreochromis mossambicus	Mozambique tilapia	.	.	.	1	1
Oreochromis/Sarotherodon spp.	Tilapias	.	1	.	8	9
Elassoma okefenokee	Okefenokee pygmy sunfish	.	.	.	5	5
Mugil cephalus	Striped mullet	2,954	9,130	9,172	4,388	25,644
Mugil curema	White mullet	2,007	452	414	209	3,082
Agonostomus monticola	Mountain mullet	.	2	.	.	2
Sphyraena borealis	Northern sennet	3	.	.	.	3
Sphyraena guachancho	Guaguanche	1	.	.	.	1
Sphyraena barracuda	Great barracuda	.	2	.	.	2
Astroscopus y-graecum	Southern stargazer	8	1	3	.	12
Hypsoblennius ionthas	Freckled blenny	1	.	.	.	1

Appendix 1 Table 7 continued, page 6 of 7.

Scientific Name	Common Name	1 (527)	2 (501)	3 (490)	4 (599)	Total (2,117)
Chasmodes spp.		.	3	.	.	3
Chasmodes bosquianus	Striped blenny	4	4	.	2	10
Evorthodus lyricus	Lyre goby	1	6	1	1	9
Ctenogobius boleosoma	Darter goby	315	153	193	11	672
Gobionellus oceanicus	Highfin goby	2	18	18	1	39
Ctenogobius shufeldti	Freshwater goby	31	264	360	185	840
Ctenogobius smaragdus	Emerald goby	70	3	.	.	73
Gobiosoma spp.	Gobiosoma gobies	32	98	43	204	377
Gobiosoma bosc	Naked goby	106	209	60	90	465
Gobiosoma robustum	Code goby	29	16	11	11	67
Microgobius gulosus	Clown goby	8	34	130	588	760
Microgobius thalassinus	Green goby	30	75	8	4	117
Bathygobius soporator	Frillfin goby	37	42	5	.	84
Dormitator maculatus	Fat sleeper	.	.	2	.	2
Scomberomorus maculatus	Spanish mackerel	5	1	.	1	7
Peprilus triacanthus	Butterfish	2	.	.	.	2
Citharichthys macrops	Spotted whiff	1	.	.	.	1
Citharichthys spilopterus	Bay whiff	272	196	50	18	536
Etropus crossotus	Fringed flounder	78	7	6	.	91
Paralichthys dentatus	Summer flounder	14	5	1	1	21
Paralichthys albigutta	Gulf flounder	59	34	12	2	107
Paralichthys lethostigma	Southern flounder	68	177	57	66	368
Paralichthys squamilentus	Broad flounder	4	.	.	.	4
Ancylopsetta quadrocellata	Ocellated flounder	2	.	.	.	2
Symphurus plagiusa	Blackcheek tonguefish	384	144	31	2	561
Trinectes maculatus	Hogchoker	3	17	174	200	394
Achirus lineatus	Lined sole	41	60	18	5	124
Stephanolepis hispidus	Planehead filefish	23	2	1	.	26
Sphoeroides nephelus	Southern puffer	71	48	19	3	141

Appendix 1 Table 7 continued, page 7 of 7.

Scientific Name	Common Name	1 (527)	2 (501)	3 (490)	4 (599)	Total (2,117)
Sphoeroides spengleri	Bandtail puffer	1	.	.	.	1
Chilomycterus schoepfii	Striped burrfish	33	15	5	1	54
Totals		***117,069***	***134,977***	***76,099***	***62,526***	***390,671***

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Appendix 1 Table 8, page 1 of 5.

183-m seine catch by FIM sampling zone.

Data are presented as total number collected.

Number of samples collected by zone is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	***Common Name***	***1 (290)***	***2 (253)***	***3 (241)***	***4 (359)***	***Total (1,143)***
Stomolophus meleagris	Cannonball jellyfish	1,593	498	4	.	2,095
Limulus polyphemus	Horseshoe crab	3	.	.	.	3
Farfantepenaeus spp.	Commercial shrimps	7	10	30	6	53
Farfantepenaeus aztecus	Brown shrimp	.	8	104	31	143
Farfantepenaeus duorarum	Pink shrimp	8	3	27	22	60
Litopenaeus setiferus	White shrimp	233	97	731	39	1,100
Callinectes sapidus	Blue crab	265	133	210	543	1,151
Callinectes similis	Lesser blue crab	39	4	22	1	66
Callinectes ornatus	Shelligs	1	1	.	.	2
Portunus sp.	Portunus crabs	1	.	.	.	1
Menippe spp.	Stone crab	2	.	.	.	2
Dasyatis sabina	Atlantic stingray	1,015	876	404	937	3,232
Dasyatis say	Bluntnose stingray	22	7	1	4	34
Gymnura micrura	Smooth butterfly ray	7	2	.	.	9
Aetobatus narinari	Spotted eagle ray	2	.	.	.	2
Rhinoptera bonasus	Cownose ray	1	3	.	.	4
Lepisosteus osseus	Longnose gar	11	4	58	168	241
Lepisosteus platyrhincus	Florida gar	.	2	7	257	266
Amia calva	Bowfin	.	.	.	6	6
Elops saurus	Ladyfish	415	452	150	600	1,617
Megalops atlanticus	Tarpon	.	.	1	1	2
Albula vulpes	Bonefish	4	.	1	.	5
Anguilla rostrata	American eel	1	.	2	3	6
Alosa sapidissima	American shad	.	1	2	3	6

Appendix 1 Table 8 continued, page 2 of 5.

Scientific Name	Common Name	1 (290)	2 (253)	3 (241)	4 (359)	Total (1,143)
Alosa aestivalis	Blueback herring	.	3	.	4	7
Alosa mediocris	Hickory shad	2	.	5	2	9
Brevoortia spp.	Menhadens	377	14,185	3,676	785	19,023
Dorosoma cepedianum	Gizzard shad	16	340	579	2,064	2,999
Dorosoma petenense	Threadfin shad	13	33	102	334	482
Opisthonema oglinum	Atlantic thread herring	594	602	30	84	1,310
Harengula jaguana	Scaled sardine	24	101	17	1	143
Anchoa hepsetus	Striped anchovy	3	12	1	.	16
Anchoa mitchilli	Bay anchovy	.	.	1	1	2
Anchoa cubana	Cuban anchovy	1	.	.	.	1
Esox niger	Chain pickerel	.	.	.	4	4
Synodus foetens	Inshore lizardfish	49	9	6	2	66
Notemigonus crysoleucas	Golden shiner	.	.	1	113	114
Ictalurus punctatus	Channel catfish	.	.	66	311	377
Ameiurus catus	White catfish	1	8	90	940	1,039
Ameiurus nebulosus	Brown bullhead	.	.	3	19	22
Bagre marinus	Gafftopsail catfish	3	1	3	.	7
Ariopsis felis	Hardhead catfish	5	13	1	6	25
Loricariidae sp.	Suckermouth catfish	.	.	.	1	1
Pterygoplichthys spp.	Armoured catfishes	.	.	.	3	3
Opsanus tau	Oyster toadfish	2	1	4	.	7
Ogcocephalus sp.	Batfishes	1	.	.	.	1
Ogcocephalus cubifrons	Polka-dot batfish	2	.	.	.	2
Strongylura marina	Atlantic needlefish	148	254	31	142	575
Strongylura notata	Redfin needlefish	1	3	.	.	4
Tylosurus crocodilus	Houndfish	3	4	.	.	7
Fundulus heteroclitus	Mummichog	6	.	.	1	7
Fundulus majalis	Striped killifish	7	1	.	1	9
Fundulus seminolis	Seminole killifish	.	.	.	67	67

Appendix 1 Table 8 continued, page 3 of 5.

Scientific Name	*Common Name*	*1 (290)*	*2 (253)*	*3 (241)*	*4 (359)*	*Total (1,143)*
Menidia menidia	Atlantic silverside	2	1	.	.	3
Prionotus evolans	Striped searobin	3	.	.	1	4
Prionotus scitulus	Leopard searobin	7	1	1	.	9
Prionotus tribulus	Bighead searobin	41	11	7	2	61
Centropomus undecimalis	Common snook	3	2	3	39	47
Centropristis philadelphica	Rock sea bass	12	1	.	.	13
Lepomis auritus	Redbreast sunfish	.	.	61	424	485
Lepomis macrochirus	Bluegill	.	.	68	1,370	1,438
Lepomis marginatus	Dollar sunfish	.	.	.	1	1
Lepomis microlophus	Redear sunfish	.	.	53	785	838
Lepomis punctatus	Spotted sunfish	.	.	.	13	13
Micropterus salmoides	Largemouth bass	.	.	9	383	392
Pomoxis nigromaculatus	Black crappie	.	.	.	41	41
Lepomis gulosus	Warmouth	.	.	.	9	9
Pomatomus saltatrix	Bluefish	55	35	6	.	96
Rachycentron canadum	Cobia	3	2	.	.	5
Caranx hippos	Crevalle jack	137	117	69	94	417
Caranx latus	Horse-eye jack	17	8	3	1	29
Caranx crysos	Blue runner	2	4	5	.	11
Chloroscombrus chrysurus	Atlantic bumper	1,300	1,315	727	110	3,452
Oligoplites saurus	Leatherjacket	9	11	4	1	25
Selene vomer	Lookdown	132	76	38	8	254
Selene setapinnis	Atlantic moonfish	10	2	.	.	12
Trachinotus carolinus	Florida pompano	39	25	.	3	67
Trachinotus falcatus	Permit	31	60	10	3	104
Lutjanus griseus	Gray snapper	13	14	13	11	51
Lutjanus synagris	Lane snapper	7	.	.	.	7
Lobotes surinamensis	Tripletail	1	.	.	.	1
Eucinostomus sp.	Eucinostomus	.	1	.	.	1

Appendix 1 Table 8 continued, page 4 of 5.

Scientific Name	*Common Name*	*1 (290)*	*2 (253)*	*3 (241)*	*4 (359)*	*Total (1,143)*
Eucinostomus gula	Silver jenny	295	110	18	90	513
Eucinostomus harengulus	Tidewater mojarra	422	203	182	1,754	2,561
Diapterus auratus	Irish pompano	101	138	253	151	643
Orthopristis chrysoptera	Pigfish	60	41	59	221	381
Lagodon rhomboides	Pinfish	2,741	2,216	1,559	10,831	17,347
Archosargus probatocephalus	Sheepshead	288	275	73	79	715
Cynoscion nebulosus	Spotted seatrout	238	334	60	68	700
Cynoscion complex	*C. regalis* x *C. arenarius*	29	31	71	5	136
Bairdiella chrysoura	Silver perch	282	491	72	825	1,670
Leiostomus xanthurus	Spot	1,145	2,459	1,843	5,845	11,292
Menticirrhus americanus	Southern kingfish	35	49	3	7	94
Menticirrhus littoralis	Gulf kingfish	1	.	.	.	1
Menticirrhus saxatilis	Northern kingfish	6	.	1	2	9
Micropogonias undulatus	Atlantic croaker	106	685	418	2,305	3,514
Pogonias cromis	Black drum	18	172	19	12	221
Sciaenops ocellatus	Red drum	234	517	139	350	1,240
Stellifer lanceolatus	Star drum	1	.	.	.	1
Chaetodipterus faber	Atlantic spadefish	50	9	2	.	61
Oreochromis aureus	Blue tilapia	.	.	1	.	1
Oreochromis/Sarotherodon spp.	Tilapias	.	.	.	2	2
Morone saxatilis	Striped bass	.	.	1	2	3
Mugil cephalus	Striped mullet	2,907	3,730	1,873	4,245	12,755
Mugil curema	White mullet	1,735	1,523	1,746	2,374	7,378
Sphyraena barracuda	Great barracuda	1	3	.	.	4
Astroscopus y-graecum	Southern stargazer	8	3	5	.	16
Chasmodes sp.		.	1	.	.	1
Microgobius gulosus	Clown goby	.	.	.	1	1
Gobioides broussonetii	Violet goby	.	1	.	.	1
Dormitator maculatus	Fat sleeper	.	.	.	3	3

Appendix 1 Table 8 continued, page 5 of 5.

Scientific Name	***Common Name***	***1 (290)***	***2 (253)***	***3 (241)***	***4 (359)***	***Total (1,143)***
Scomberomorus cavalla	King mackerel	1	.	.	.	1
Scomberomorus maculatus	Spanish mackerel	64	35	7	.	106
Peprilus triacanthus	Butterfish	1	.	.	.	1
Peprilus paru	Harvestfish	13	5	39	.	57
Citharichthys macrops	Spotted whiff	11	.	.	.	11
Citharichthys spilopterus	Bay whiff	129	249	264	88	730
Etropus crossotus	Fringed flounder	123	59	94	4	280
Paralichthys dentatus	Summer flounder	36	6	1	1	44
Paralichthys albigutta	Gulf flounder	114	50	39	1	204
Paralichthys lethostigma	Southern flounder	114	170	118	98	500
Paralichthys squamilentus	Broad flounder	6	.	.	.	6
Ancylopsetta quadrocellata	Ocellated flounder	45	3	.	.	48
Trinectes maculatus	Hogchoker	6	6	8	8	28
Achirus lineatus	Lined sole	52	16	15	8	91
Aluterus monoceros	Unicorn filefish	1	.	.	.	1
Stephanolepis hispidus	Planehead filefish	1	1	.	.	2
Sphoeroides maculatus	Northern puffer	1	1	.	.	2
Sphoeroides nephelus	Southern puffer	95	104	36	7	242
Chilomycterus schoepfii	Striped burrfish	115	38	14	.	167
Totals		***18,353***	***33,185***	***16,482***	***40,305***	***108,325***

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Appendix 1 Table 9, page 1 of 7.

6.1-m otter trawl catch by FIM sampling zone.

Data are presented as total number collected.

Number of samples collected by zone is indicated in parentheses. Organisms are listed in phylogenetic order.

Scientific Name	***Common Name***	***1 (517)***	***2 (509)***	***3 (583)***	***4 (598)***	***Total (2,207)***
Stomolophus meleagris	Cannonball jellyfish	264	40	11	.	315
Limulus polyphemus	Horseshoe crab	5	.	.	.	5
Penaeidae spp.	Penaeid shrimps	105	.	.	1	106
Farfantepenaeus spp.	Commercial shrimps	576	945	687	696	2,904
Farfantepenaeus aztecus	Brown shrimp	26	147	207	200	580
Farfantepenaeus duorarum	Pink shrimp	104	381	179	145	809
Litopenaeus setiferus	White shrimp	542	2,890	3,777	3,623	10,832
Penaeus monodon	Giant tiger prawn	.	1	.	.	1
Rimapenaeus constrictus	Roughneck shrimp	44	29	56	1	130
Xiphopenaeus kroyeri	Atlantic seabob	1	.	1	.	2
Sicyonia brevirostris	Rock Shrimp	2	.	.	.	2
Sicyonia parri		1	.	.	.	1
Macrobrachium spp.	Prawns	.	13	34	31	78
Alpheidae sp.	Snapping shrimp	1	.	.	.	1
Callinectes sapidus	Blue crab	740	1,979	1,915	1,411	6,045
Callinectes similis	Lesser blue crab	174	164	98	4	440
Callinectes ornatus	Shelligs	4	4	.	.	8
Portunus spp.	Portunus crabs	36	1	2	.	39
Charybdis hellerii	Spiny hands	1	.	.	.	1
Menippe spp.	Stone crab	13	1	1	.	15
Dasyatis sabina	Atlantic stingray	192	119	74	109	494
Dasyatis say	Bluntnose stingray	8	1	2	1	12
Gymnura micrura	Smooth butterfly ray	5	.	.	.	5
Lepisosteus osseus	Longnose gar	.	1	2	.	3

Appendix 1 Table 9 continued, page 2 of 7.

Scientific Name	Common Name	1 (517)	2 (509)	3 (583)	4 (598)	Total (2,207)
Elops saurus	Ladyfish	119	89	58	135	401
Anguilla rostrata	American eel	.	2	7	2	11
Ophichthidae sp.		1	.	.	.	1
Myrophis punctatus	Speckled worm eel	7	4	8	4	23
Ophichthus gomesii	Shrimp eel	1	.	1	.	2
Alosa sapidissima	American shad	.	1	2	.	3
Alosa aestivalis	Blueback herring	.	2	1	.	3
Alosa mediocris	Hickory shad	.	1	1	.	2
Brevoortia spp.	Menhadens	20	18	46	32	116
Dorosoma cepedianum	Gizzard shad	.	1	6	6	13
Dorosoma petenense	Threadfin shad	.	.	6	44	50
Opisthonema oglinum	Atlantic thread herring	5	17	1	2	25
Harengula jaguana	Scaled sardine	15	1	.	.	16
Anchoa spp.	Anchovies	2	.	.	.	2
Anchoa hepsetus	Striped anchovy	1,594	92	26	32	1,744
Anchoa mitchilli	Bay anchovy	7,622	15,011	12,772	8,141	43,546
Anchoa lyolepis	Dusky anchovy	27	.	.	.	27
Synodus foetens	Inshore lizardfish	100	39	20	1	160
Ictaluridae sp.	Bullhead catfishes	.	.	.	1	1
Ictalurus punctatus	Channel catfish	.	1	52	162	215
Noturus gyrinus	Tadpole madtom	.	.	.	1	1
Ameiurus catus	White catfish	2	179	473	917	1,571
Ameiurus natalis	Yellow bullhead	.	.	1	.	1
Ameiurus nebulosus	Brown bullhead	.	.	1	6	7
Bagre marinus	Gafftopsail catfish	.	2	14	2	18
Ariopsis felis	Hardhead catfish	115	78	144	2	339
Loricariidae sp.	Suckermouth catfish	.	.	1	.	1
Opsanus tau	Oyster toadfish	58	148	44	.	250
Gobiesox strumosus	Skilletfish	6	6	7	1	20

Appendix 1 Table 9 continued, page 3 of 7.

Scientific Name	Common Name	1 (517)	2 (509)	3 (583)	4 (598)	Total (2,207)
Ogcocephalus sp.	Batfishes	1	.	.	.	1
Ogcocephalus cubifrons	Polka-dot batfish	5	.	.	.	5
Urophycis regia	Spotted hake	11	1	12	.	24
Urophycis floridana	Southern hake	4	.	.	.	4
Ophidiidae sp.		.	.	1	.	1
Lepophidium brevibarbe		2	3	18	.	23
Ophidion sp.		.	.	1	.	1
Ophidion holbrookii	Bank cusk-eel	2	2	.	.	4
Ophidion josephi	Crested cusk-eel	.	.	3	.	3
Fundulus heteroclitus	Mummichog	.	1	.	.	1
Lucania parva	Rainwater killifish	.	.	1	2	3
Gambusia holbrooki	Eastern mosquito fish	.	.	1	.	1
Membras martinica	Rough silverside	.	1	.	1	2
Menidia spp.	Menidia silversides	.	1	.	2	3
Menidia menidia	Atlantic silverside	.	.	2	.	2
Labidesthes sicculus	Brook silverside	.	.	.	1	1
Syngnathus floridae	Dusky pipefish	.	1	.	.	1
Syngnathus fuscus	Northern pipefish	3	.	1	.	4
Syngnathus louisianae	Chain pipefish	37	12	11	7	67
Syngnathus scovelli	Gulf pipefish	12	17	25	5	59
Hippocampus erectus	Lined seahorse	5	.	.	.	5
Scorpaena brasiliensis	Barbfish	1	.	.	.	1
Prionotus carolinus	Northern searobin	15	1	.	.	16
Prionotus evolans	Striped searobin	2	3	1	.	6
Prionotus scitulus	Leopard searobin	108	18	5	2	133
Prionotus tribulus	Bighead searobin	176	146	90	1	413
Prionotus rubio	Blackfin searobin	2	3	.	.	5
Centropomus undecimalis	Common snook	.	1	2	.	3
Centropristis striata	Black sea bass	7	.	.	.	7

Appendix 1 Table 9 continued, page 4 of 7.

Scientific Name	Common Name	1 (517)	2 (509)	3 (583)	4 (598)	Total (2,207)
Centropristis philadelphica	Rock sea bass	72	11	4	.	87
Epinephelus itajara	Goliath grouper	1	.	.	.	1
Mycteroperca microlepis	Gag	1	.	.	.	1
Lepomis spp.	Sunfishes	.	.	9	14	23
Lepomis auritus	Redbreast sunfish	.	.	45	12	57
Lepomis macrochirus	Bluegill	.	3	168	76	247
Lepomis marginatus	Dollar sunfish	.	.	1	.	1
Lepomis microlophus	Redear sunfish	.	.	10	37	47
Micropterus salmoides	Largemouth bass	.	.	2	5	7
Pomoxis nigromaculatus	Black crappie	.	1	8	63	72
Lepomis gulosus	Warmouth	.	.	.	4	4
Pomatomus saltatrix	Bluefish	.	.	1	.	1
Rachycentron canadum	Cobia	.	2	.	.	2
Caranx hippos	Crevalle jack	.	3	1	1	5
Chloroscombrus chrysurus	Atlantic bumper	1,021	102	101	7	1,231
Oligoplites saurus	Leatherjacket	1	2	1	.	4
Selene vomer	Lookdown	11	15	9	4	39
Selene setapinnis	Atlantic moonfish	11	4	108	1	124
Trachinotus falcatus	Permit	2	1	.	.	3
Lutjanus griseus	Gray snapper	8	4	16	1	29
Lutjanus synagris	Lane snapper	15	1	.	.	16
Eucinostomus spp.	Eucinostomus	291	77	117	20	505
Eucinostomus gula	Silver jenny	67	54	1	.	122
Eucinostomus harengulus	Tidewater mojarra	218	100	39	56	413
Diapterus auratus	Irish pompano	80	119	71	17	287
Orthopristis chrysoptera	Pigfish	241	231	11	2	485
Lagodon rhomboides	Pinfish	333	126	151	24	634
Archosargus probatocephalus	Sheepshead	79	43	24	13	159
Sciaenidae spp.	Drums	3	.	.	.	3

Appendix 1 Table 9 continued, page 5 of 7.

Scientific Name	Common Name	1 (517)	2 (509)	3 (583)	4 (598)	Total (2,207)
Cynoscion nebulosus	Spotted seatrout	22	22	21	15	80
Cynoscion nothus	Silver seatrout	3	1	.	.	4
Cynoscion complex	*C. regalis* x *C. arenarius*	399	930	920	591	2,840
Bairdiella chrysoura	Silver perch	357	361	236	117	1,071
Leiostomus xanthurus	Spot	10,460	11,248	10,113	6,568	38,389
Larimus fasciatus	Banded drum	24	.	.	.	24
Menticirrhus americanus	Southern kingfish	288	99	76	38	501
Menticirrhus saxatilis	Northern kingfish	11	1	2	3	17
Micropogonias undulatus	Atlantic croaker	2,935	9,725	24,578	26,277	63,515
Pogonias cromis	Black drum	.	20	18	4	42
Sciaenops ocellatus	Red drum	6	24	29	14	73
Stellifer lanceolatus	Star drum	713	297	746	11	1,767
Chaetodipterus faber	Atlantic spadefish	57	21	12	2	92
Oreochromis niloticus		.	.	.	1	1
Mugil cephalus	Striped mullet	2	9	6	5	22
Mugil curema	White mullet	2	7	10	14	33
Sphyraena borealis	Northern sennet	1	.	.	.	1
Sphyraena guachancho	Guaguanche	.	1	1	.	2
Astroscopus y-graecum	Southern stargazer	50	14	3	.	67
Hypsoblennius hentz	Feather blenny	3	1	.	.	4
Chasmodes bosquianus	Striped blenny	.	2	.	.	2
Chasmodes saburrae	Florida blenny	1	.	.	.	1
Hypleurochilus geminatus	Crested blenny	1	.	.	.	1
Gobiidae sp.	Gobies	.	1	.	.	1
Ctenogobius boleosoma	Darter goby	43	54	21	5	123
Gobionellus oceanicus	Highfin goby	6	65	19	20	110
Ctenogobius shufeldti	Freshwater goby	9	21	155	411	596
Ctenogobius stigmaticus	Marked goby	3	2	.	.	5
Ctenogobius smaragdus	Emerald goby	36	10	1	.	47

Appendix 1 Table 9 continued, page 6 of 7.

Scientific Name	Common Name	1 (517)	2 (509)	3 (583)	4 (598)	Total (2,207)
Gobiosoma spp.	Gobiosoma gobies	5	21	29	29	84
Gobiosoma bosc	Naked goby	8	70	27	12	117
Gobiosoma robustum	Code goby	17	8	8	5	38
Microgobius gulosus	Clown goby	21	27	56	397	501
Microgobius thalassinus	Green goby	49	245	128	146	568
Bathygobius soporator	Frillfin goby	2	5	.	1	8
Gobioides broussonetii	Violet goby	1	9	21	51	82
Erotelis smaragdus	Emerald sleeper	1	.	.	.	1
Dormitator maculatus	Fat sleeper	.	1	1	1	3
Ctenogobius spp.		.	5	.	.	5
Eleotris amblyopsis		.	1	1	.	2
Trichiurus lepturus	Atlantic cutlassfish	19	12	14	3	48
Scomberomorus cavalla	King mackerel	.	1	.	.	1
Peprilus spp.		2	.	.	.	2
Peprilus triacanthus	Butterfish	10	.	.	.	10
Peprilus paru	Harvestfish	4	4	3	.	11
Bothidae sp.	Sand flounders	.	1	.	.	1
Citharichthys macrops	Spotted whiff	5	.	.	.	5
Citharichthys spilopterus	Bay whiff	204	510	284	240	1,238
Etropus crossotus	Fringed flounder	312	256	79	19	666
Paralichthys sp.		1	.	.	.	1
Paralichthys dentatus	Summer flounder	31	85	18	.	134
Paralichthys albigutta	Gulf flounder	58	49	9	2	118
Paralichthys lethostigma	Southern flounder	73	376	197	249	895
Paralichthys squamilentus	Broad flounder	2	.	.	.	2
Scophthalmus aquosus	Windowpane	2	.	.	.	2
Ancylopsetta quadrocellata	Ocellated flounder	55	6	4	.	65
Symphurus plagiusa	Blackcheek tonguefish	115	234	228	59	636
Symphurus civitatium	Offshore tonguefish	3	1	3	.	7

Appendix 1 Table 9 continued, page 7 of 7.

Scientific Name	***Common Name***	***1 (517)***	***2 (509)***	***3 (583)***	***4 (598)***	***Total (2,207)***
Trinectes maculatus	Hogchoker	144	498	1,460	2,050	4,152
Achirus lineatus	Lined sole	267	132	74	39	512
Aluterus schoepfii	Orange filefish	1	.	.	.	1
Stephanolepis hispidus	Planehead filefish	46	3	1	.	50
Sphoeroides nephelus	Southern puffer	117	59	35	10	221
Sphoeroides spengleri	Bandtail puffer	3	.	.	.	3
Chilomycterus schoepfii	Striped burrfish	55	5	7	1	68
Totals		***32,454***	***49,079***	***61,465***	***53,503***	***196,501***

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APPENDIX 2: Pseudo-species selected for density-weighted salinity and river-kilometer abundance analysis.

Appendix 2, Table 1. Species, gear type, size ranges, and months selected for assessing the relationship between density-weighted relative abundance and salinity/location distributions of abundant nekton in the lower St. Johns River (2001-2011). Species are sorted in phylogenetic order. Life history style indicates probable spawning location: offshore spawners (OS), nearshore spawners (NS), estuarine spawners (ES), and tidal-river residents (TRR).

Species	***Gear***	***Size Range (mm)***	***Month(s)***	***Life History Style***	***Initial Recruit***	***Forced***	***Notes***
Stomolophus meleagris	183-m Seine	50 to 59 BW	Oct.	OS	X		
Stomolophus meleagris	183-m Seine	60 to 79 BW	Oct.	OS			
Stomolophus meleagris	183-m Seine	60 to 79 BW	Nov.	OS			
Farfantepenaeus spp.	21.3-m Seine	4 to 7 POHL	May	OS	X	X	Forced - mix of species
Farfantepenaeus spp.	21.3-m Seine	8 to 11 POHL	May	OS		X	Forced - mix of species
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	May	OS	X	X	Forced - mix of species
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Jun.	OS	X	X	Forced - mix of species
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Sep.	OS	X	X	Forced - mix of species
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Oct.	OS	X	X	Forced - mix of species
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	May	OS			
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	Jun.	OS			
Farfantepenaeus duorarum	6.1-m Otter Trawl	0 to 25 POHL	May	OS		X	Forced - large size range
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jun.	OS	X		
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jul.	OS	X		
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Jun.	OS	X		Bi-modal length-frequency distribution - first peak
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Aug.	OS	X		Bi-modal length-frequency distribution - first peak
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Sep.	OS	X		Bi-modal length-frequency distribution - first peak
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Jul.	OS			Bi-modal length-frequency distribution - second peak
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Aug.	OS			Bi-modal length-frequency distribution - second peak
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Oct.	OS			Bi-modal length-frequency distribution - second peak
Callinectes sapidus	21.3-m Seine	10 to 30 CW	Jan. to Dec.	NS	X	X	Forced - multiple months
Callinectes sapidus	6.1-m Otter Trawl	10 to 59 CW	Jan. to Dec.	NS	X	X	Forced - multiple months
Callinectes sapidus	6.1-m Otter Trawl	50 to 99 CW	Jan. to Dec.	NS			Forced - multiple months
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Feb.	OS	X	X	Forced - mix of species
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Mar.	OS	X	X	Forced - mix of species

Species	Gear	Size Range (mm)	Month(s)	Life History Style	Initial Recruit	Forced	Notes
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Oct.	ES			
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Nov.	ES			
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jun.	ES	X		
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jul.	ES	X		
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Aug.	ES	X		
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Sep.	ES	X		
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Oct.	ES	X		
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Nov.	ES	X		
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Dec.	ES	X		
Lucania parva	21.3-m Seine	16 to 19 SL	Jun.	TRR	X		
Lucania parva	21.3-m Seine	16 to 19 SL	May	TRR	X		
Gambusia holbrooki	21.3-m Seine	18 to 21 SL	Mar.	TRR	X		
Menidia menidia	21.3-m Seine	25 to 39 SL	Jun.	TRR			
Menidia menidia	21.3-m Seine	25 to 39 SL	Jul.	TRR			
Menidia menidia	21.3-m Seine	25 to 39 SL	Aug.	TRR			
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Mar.	TRR	X	X	Forced - too few animals
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Apr.	TRR	X	X	Forced - too few animals
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Sep.	TRR	X	X	Forced - too few animals
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Nov.	TRR	X	X	Forced - too few animals
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Dec.	TRR	X	X	Forced - too few animals
Micropterus salmoides	21.3-m Seine	10 to 35 SL	Apr.	TRR	X	X	Forced - too few animals
Micropterus salmoides	21.3-m Seine	10 to 45 SL	May	TRR	X	X	Forced - too few animals
Micropterus salmoides	21.3-m Seine	10 to 65 SL	Jun.	TRR	X	X	Forced - too few animals
Orthopristis chrysoptera	21.3-m Seine	15 to 24 SL	May	ES	X		
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Feb.	OS	X		
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Mar.	OS	X		
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Apr.	OS	X		
Lagodon rhomboides	21.3-m Seine	30 to 54 SL	May	OS			
Lagodon rhomboides	21.3-m Seine	55 to 64 SL	Jul.	OS			
Cynoscion complex	6.1-m Otter Trawl	10 to 19 SL	May	ES	X	X	Forced - mix of species
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Jun.	ES		X	Forced - mix of species

Species	***Gear***	***Size Range (mm)***	***Month(s)***	***Life History Style***	***Initial Recruit***	***Forced***	***Notes***
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Sep.	ES		X	Forced - mix of species
Cynoscion complex	6.1-m Otter Trawl	20 to 29 SL	Jun.	ES		X	Forced - mix of species
Bairdiella chrysoura	21.3-m Seine	10 to 19 SL	May	ES	X		
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	May	ES			
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	Jun.	ES			
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Jan.	OS	X		
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Feb.	OS	X		
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Mar.	OS	X		
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Feb.	OS			
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Mar.	OS			
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Apr.	OS			
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Feb.	OS	X		
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Mar.	OS	X		
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Feb.	OS	X		
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Mar.	OS	X		
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Jan.	OS	X		
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Feb.	OS	X		
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Jan.	OS	X		
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Feb.	OS	X		
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Mar.	OS	X		
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Dec.	OS	X		
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Oct.	OS	X	X	Forced - too few animals
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Nov.	OS	X	X	Forced - too few animals
Mugil cephalus	21.3-m Seine	20 to 24 SL	Jan.	OS	X		
Mugil cephalus	21.3-m Seine	20 to 24 SL	Feb.	OS	X		
Mugil cephalus	21.3-m Seine	20 to 24 SL	Mar.	OS	X		
Mugil curema	21.3-m Seine	20 to 29 SL	Apr.	OS	X		
Mugil curema	21.3-m Seine	20 to 29 SL	May	OS	X		
Mugil curema	21.3-m Seine	20 to 29 SL	Jun.	OS	X		
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Feb.	TRR		X	Forced - too few animals
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Mar.	TRR		X	Forced - too few animals

Species	*Gear*	*Size Range (mm)*	*Month(s)*	*Life History Style*	*Initial Recruit*	*Forced*	*Notes*
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Jun.	TRR	X	X	Forced - too few animals
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Nov.	TRR	X	X	Forced - too few animals
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Jan.	TRR	X		
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Feb.	TRR	X		
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Mar.	TRR	X		
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Apr.	TRR	X		
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Dec.	TRR	X		

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APPENDIX 3: Density-weighted salinity and distribution statistics for select pseudo-species in the LSJR during FIM sampling (2001-2011).

Appendix 3, Table 1. Density-weighted salinity statistics for select pseudo-species collected during FIM sampling in the lower St. Johns River (2001-2011). Gear type, size range, month(s), and water type are given for each species analyzed. Results are shown as the mean density-weighted salinity for the select pseudo-species. Other statistics shown are the 95% confidence interval (CI), minimum (Min) and maximum (Max) values recorded, and the 10th, 25th, 75th, and 90th percentiles. Life history indicates probable spawning location: offshore spawners (OS), nearshore spawners (NS), estuarine spawners (ES), and tidal-river residents (TRR). Species are sorted in phylogenetic order.

								Density-weighted summary statistics (Salinity)									
Scientific Name	***Gear***	***Sizes (mm)***	***Month(s)***	***Water Type***	***Number of Hauls***	***Number of Animals***	***% Occur***	***Mean***	***Lower 95% CI***	***Upper 95% CI***	***Min***	***10th***	***25th***	***75th***	***90th***	***Max***	***Life History***
Stomolophus meleagris	183-m Seine	50 to 59 BW	Oct.	Tidal Trib.	32	0	.	.	.	.	.	.	.	.	.	.	OS
Stomolophus meleagris	183-m Seine	50 to 59 BW	Oct.	Mainstem	62	435	1.6	32.0	.	.	32	.	.	.	.	32	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Oct.	Tidal Trib.	32	1	3.1	35.0	.	.	35	.	.	.	.	35	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Oct.	Mainstem	62	808	1.6	32.0	.	.	32	.	.	.	.	32	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Nov.	Tidal Trib.	27	0	.	.	.	.	.	.	.	.	.	.	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Nov.	Mainstem	68	110	7.4	22.5	19.9	25.1	21	21	.	.	22	34	OS
Farfantepenaeus spp.	21.3-m Seine	4 to 7 POHL	May	Tidal Trib.	93	321	28.0	18.5	14.1	22.9	4	4	9	27	32	36	OS
Farfantepenaeus spp.	21.3-m Seine	4 to 7 POHL	May	Mainstem	89	124	20.2	15.6	11.2	19.9	4	5	6	21	23	36	OS
Farfantepenaeus spp.	21.3-m Seine	8 to 11 POHL	May	Tidal Trib.	93	398	44.1	20.4	17.2	23.5	2	7	10	28	32	36	OS
Farfantepenaeus spp.	21.3-m Seine	8 to 11 POHL	May	Mainstem	89	538	30.3	16.0	12.8	19.3	4	5	9	21	24	36	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	May	Tidal Trib.	85	110	24.7	11.6	7.9	15.2	1	3	6	11	21	31	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	May	Mainstem	108	162	23.1	11.1	8.2	13.9	4	4	6	11	17	28	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Jun.	Tidal Trib.	81	51	19.8	13.8	9.5	18.1	1	1	9	17	23	33	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Jun.	Mainstem	105	123	21.9	4.8	2.2	7.3	1	1	1	4	11	23	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Sep.	Tidal Trib.	86	146	30.2	13.2	10.3	16.1	4	6	8	18	20	35	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Sep.	Mainstem	100	35	17.0	10.6	6.7	14.5	1	1	5	14	17	26	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Oct.	Tidal Trib.	86	100	23.3	11.5	8.4	14.5	1	3	5	17	18	20	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Oct.	Mainstem	105	69	21.9	9.3	5.5	13.1	1	1	3	11	14	29	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	May	Tidal Trib.	85	70	10.6	10.1	3.5	16.8	3	3	3	7	19	25	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	May	Mainstem	108	50	12.0	15.8	10.2	21.5	4	4	10	23	25	33	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	Jun.	Tidal Trib.	81	78	24.7	13.3	9.6	17.0	1	2	6	19	20	27	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	Jun.	Mainstem	105	139	33.3	10.6	8.4	12.8	1	4	6	15	18	29	OS
Farfantepenaeus duorarum	6.1-m Otter Trawl	0 to 25 POHL	May	Tidal Trib.	85	51	15.3	19.7	15.8	23.5	6	11	13	22	23	34	OS
Farfantepenaeus duorarum	6.1-m Otter Trawl	0 to 25 POHL	May	Mainstem	108	67	18.5	15.8	12.3	19.3	3	6	8	15	22	28	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jun.	Tidal Trib.	105	1,114	25.7	15.3	12.4	18.2	1	4	11	20	22	33	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jun.	Mainstem	72	1,429	25.0	12.1	8.3	15.8	1	1	6	16	17	29	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jul.	Tidal Trib.	98	314	24.5	17.0	12.8	21.2	1	3	13	22	27	37	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jul.	Mainstem	83	55	15.7	14.3	7.2	21.4	1	2	3	18	29	35	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Jun.	Tidal Trib.	81	235	18.5	6.3	3.2	9.3	1	1	2	10	10	26	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Jun.	Mainstem	105	243	12.4	12.1	7.5	16.7	2	2	4	18	18	22	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Aug.	Tidal Trib.	79	92	15.2	6.8	2.5	11.1	0	3	3	8	13	29	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Aug.	Mainstem	106	33	5.7	2.3	-1.0	5.5	1	1	.	.	1	13	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Sep.	Tidal Trib.	86	130	17.4	7.6	6.0	9.1	1	6	6	8	8	18	OS

Scientific Name	Gear	Sizes (mm)	Month(s)	Water Type	Number of Hauls	Number of Animals	% Occur	Density-weighted summary statistics (Salinity) Mean	Lower 95% CI	Upper 95% CI	Min	10th	25th	75th	90th	Max	Life History
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Sep.	Mainstem	100	34	13.0	5.5	3.0	8.0	1	1	1	7	7	15	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Jul.	Tidal Trib.	85	453	22.4	11.2	6.8	15.6	0	3	7	16	26	37	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Jul.	Mainstem	103	464	30.1	6.3	3.7	9.0	0	0	1	10	14	26	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Aug.	Tidal Trib.	79	101	12.7	5.7	0.5	10.9	0	1	1	6	13	29	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Aug.	Mainstem	106	669	37.7	6.1	3.4	8.9	0	0	0	9	15	34	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Oct.	Tidal Trib.	86	224	33.7	8.5	6.1	11.0	0	1	5	10	17	29	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Oct.	Mainstem	105	630	49.5	6.5	4.5	8.5	0	0	1	9	12	29	OS
Callinectes sapidus	21.3-m Seine	10 to 30 CW	Jan. to Dec.	Tidal Trib.	1,137	818	22.2	13.7	12.4	15.0	0	1	5	22	28	37	NS
Callinectes sapidus	21.3-m Seine	10 to 30 CW	Jan. to Dec.	Mainstem	980	344	14.0	13.4	11.7	15.0	0	0	4	20	25	35	NS
Callinectes sapidus	6.1-m Otter Trawl	10 to 59 CW	Jan. to Dec.	Tidal Trib.	992	1,031	33.6	11.3	10.4	12.3	0	1	3	18	24	37	NS
Callinectes sapidus	6.1-m Otter Trawl	10 to 59 CW	Jan. to Dec.	Mainstem	1,215	697	22.7	9.1	8.0	10.1	0	0	1	13	23	33	NS
Callinectes sapidus	6.1-m Otter Trawl	50 to 99 CW	Jan. to Dec.	Tidal Trib.	992	1,061	35.9	13.1	12.1	14.2	0	1	3	19	26	37	NS
Callinectes sapidus	6.1-m Otter Trawl	50 to 99 CW	Jan. to Dec.	Mainstem	1,215	595	23.0	10.0	9.1	10.9	0	1	4	12	22	35	NS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Feb.	Tidal Trib.	87	2,946	28.7	9.3	6.3	12.4	0	1	1	15	16	24	OS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Feb.	Mainstem	79	1,839	40.5	5.4	3.3	7.4	0	0	1	7	10	24	OS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Mar.	Tidal Trib.	94	2,266	13.8	6.9	2.4	11.4	1	1	2	10	12	33	OS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Mar.	Mainstem	70	262	32.9	12.8	8.0	17.6	0	0	3	21	26	31	OS
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Oct.	Tidal Trib.	100	6,711	49.0	11.7	8.9	14.5	0	1	4	15	26	36	ES
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Oct.	Mainstem	85	3,298	49.4	10.0	7.3	12.7	0	0	2	13	23	30	ES
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Nov.	Tidal Trib.	95	8,039	52.6	12.2	9.8	14.7	0	2	6	17	25	32	ES
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Nov.	Mainstem	88	2,713	51.1	7.9	5.1	10.8	0	0	1	13	22	34	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jun.	Tidal Trib.	81	256	12.3	16.2	8.9	23.5	2	2	5	23	23	25	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jun.	Mainstem	105	594	11.4	19.3	14.3	24.3	8	10	10	27	27	29	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jul.	Tidal Trib.	85	1,505	12.9	10.4	6.5	14.3	0	0	9	10	16	18	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jul.	Mainstem	103	130	6.8	10.0	7.0	13.0	0	7	9	11	11	12	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Aug.	Tidal Trib.	79	205	8.9	4.2	-1.3	9.8	0	0	0	3	13	18	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Aug.	Mainstem	106	415	6.6	9.0	3.6	14.4	3	7	7	8	9	30	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Sep.	Tidal Trib.	86	1,220	19.8	8.9	5.7	12.1	0	6	6	7	18	30	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Sep.	Mainstem	100	145	8.0	8.8	-1.1	18.7	0	1	1	5	5	25	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Oct.	Tidal Trib.	86	248	12.8	2.5	-1.1	6.0	0	0	0	2	2	29	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Oct.	Mainstem	105	251	12.4	16.7	7.0	26.3	0	0	3	29	29	35	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Nov.	Tidal Trib.	89	189	13.5	6.2	2.8	9.5	1	1	2	8	13	18	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Nov.	Mainstem	99	36	9.1	7.3	2.8	11.8	1	1	2	13	13	14	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Dec.	Tidal Trib.	79	233	10.1	3.3	0.3	6.3	1	1	1	2	2	15	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Dec.	Mainstem	108	10	4.6	2.6	0.6	4.6	0	0	2	2	3	5	ES
Lucania parva	21.3-m Seine	16 to 19 SL	Jun.	Tidal Trib.	105	494	8.6	5.3	2.3	8.3	1	2	2	6	6	11	TRR
Lucania parva	21.3-m Seine	16 to 19 SL	Jun.	Mainstem	72	58	5.6	0.6	-0.8	2.0	0	0	0	0	1	2	TRR
Lucania parva	21.3-m Seine	16 to 19 SL	May	Tidal Trib.	93	55	4.3	3.5	0.2	6.7	2	2	2	2	4	7	TRR
Lucania parva	21.3-m Seine	16 to 19 SL	May	Mainstem	89	120	3.4	5.6	4.2	7.1	5	5	5	5	5	6	TRR
Gambusia holbrooki	21.3-m Seine	18 to 21 SL	Mar.	Tidal Trib.	94	337	10.6	2.1	-0.5	4.8	0	0	0	1	4	12	TRR
Gambusia holbrooki	21.3-m Seine	18 to 21 SL	Mar.	Mainstem	70	18	5.7	12.5	-6.3	31.3	5	5	6	6	24	31	TRR

Scientific Name	Gear	Sizes (mm)	Month(s)	Water Type	Number of Hauls	Number of Animals	% Occur	Density-weighted summary statistics (Salinity) Mean	Lower 95% CI	Upper 95% CI	Min	10th	25th	75th	90th	Max	Life History
Menidia menidia	21.3-m Seine	25 to 39 SL	Jun.	Tidal Trib.	105	2,708	29.5	22.7	19.8	25.7	11	13	14	31	31	35	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Jun.	Mainstem	72	847	20.8	20.4	16.4	24.4	11	12	14	27	29	31	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Jul.	Tidal Trib.	98	1,961	33.7	20.5	17.8	23.1	3	12	15	26	30	37	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Jul.	Mainstem	83	330	22.9	15.5	10.6	20.4	0	4	10	15	33	35	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Aug.	Tidal Trib.	93	1,873	23.7	25.2	21.8	28.7	4	17	18	29	33	36	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Aug.	Mainstem	87	136	12.6	18.0	12.0	24.0	2	5	10	25	25	26	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Mar.	Tidal Trib.	94	95	17.0	0.6	-0.1	1.3	0	0	0	0	0	7	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Mar.	Mainstem	70	7	5.7	1.0	-0.1	2.1	0	0	.	.	1	2	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Apr.	Tidal Trib.	94	179	7.4	2.2	0.2	4.3	0	1	1	1	2	6	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Apr.	Mainstem	77	1	1.3	2.0	.	.	2	.	.	.	.	2	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Sep.	Tidal Trib.	97	124	9.3	0.4	-0.2	1.1	0	0	0	0	0	3	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Sep.	Mainstem	87	6	4.6	0.5	-0.4	1.4	0	0	0	0	0	1	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Nov.	Tidal Trib.	95	145	12.6	0.5	-0.3	1.2	0	0	0	0	0	6	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Nov.	Mainstem	88	1	1.1	1.0	.	.	1	.	.	.	.	1	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Dec.	Tidal Trib.	101	87	5.9	0.6	-0.8	2.0	0	0	0	0	1	4	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Dec.	Mainstem	81	29	6.2	0.5	-0.2	1.2	0	0	0	0	0	1	TRR
Micropterus salmoides	21.3-m Seine	10 to 35 SL	Apr.	Tidal Trib.	94	88	7.4	2.5	0.8	4.3	0	1	2	2	3	8	TRR
Micropterus salmoides	21.3-m Seine	10 to 35 SL	Apr.	Mainstem	77	3	1.3	2.0	.	.	2	.	.	.	.	2	TRR
Micropterus salmoides	21.3-m Seine	10 to 45 SL	May	Tidal Trib.	93	122	15.1	3.9	1.8	5.9	0	0	0	6	8	10	TRR
Micropterus salmoides	21.3-m Seine	10 to 45 SL	May	Mainstem	89	10	6.7	5.8	1.5	10.2	1	1	2	5	7	14	TRR
Micropterus salmoides	21.3-m Seine	10 to 65 SL	Jun.	Tidal Trib.	105	45	19.0	3.3	1.4	5.1	0	0	1	2	7	12	TRR
Micropterus salmoides	21.3-m Seine	10 to 65 SL	Jun.	Mainstem	72	37	6.9	1.4	-2.0	4.8	0	0	0	0	0	9	TRR
Orthopristis chrysoptera	21.3-m Seine	15 to 24 SL	May	Tidal Trib.	93	123	12.9	23.9	16.9	31.0	4	10	10	30	30	34	ES
Orthopristis chrysoptera	21.3-m Seine	15 to 24 SL	May	Mainstem	89	150	15.7	20.6	16.1	25.2	6	14	15	20	32	36	ES
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Feb.	Tidal Trib.	87	606	37.9	7.7	5.3	10.0	0	0	2	11	15	24	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Feb.	Mainstem	79	168	29.1	5.1	2.2	8.0	0	1	1	5	8	24	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Mar.	Tidal Trib.	94	552	31.9	10.5	7.1	14.0	0	0	2	16	21	29	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Mar.	Mainstem	70	198	28.6	9.6	5.5	13.6	0	0	1	16	18	27	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Apr.	Tidal Trib.	94	117	36.2	8.3	5.2	11.3	0	1	1	9	20	30	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Apr.	Mainstem	77	263	26.0	11.0	6.9	15.1	1	2	3	17	21	31	OS
Lagodon rhomboides	21.3-m Seine	30 to 54 SL	May	Tidal Trib.	93	903	49.5	14.1	11.1	17.1	0	4	6	19	26	36	OS
Lagodon rhomboides	21.3-m Seine	30 to 54 SL	May	Mainstem	89	332	24.7	13.5	9.8	17.2	5	5	6	18	23	36	OS
Lagodon rhomboides	21.3-m Seine	55 to 64 SL	Jul.	Tidal Trib.	98	130	30.6	13.1	9.9	16.3	1	3	8	17	22	32	OS
Lagodon rhomboides	21.3-m Seine	55 to 64 SL	Jul.	Mainstem	83	29	15.7	9.0	3.2	14.7	0	0	2	11	14	34	OS
Cynoscion complex	6.1-m Otter Trawl	10 to 19 SL	May	Tidal Trib.	85	20	7.1	22.0	14.4	29.6	6	8	23	23	23	29	ES
Cynoscion complex	6.1-m Otter Trawl	10 to 19 SL	May	Mainstem	108	360	18.5	10.3	8.9	11.7	4	7	10	10	10	26	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Jun.	Tidal Trib.	81	84	28.4	12.9	9.0	16.9	0	1	2	15	25	31	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Jun.	Mainstem	105	120	30.5	9.5	7.1	12.0	0	2	3	12	15	27	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Sep.	Tidal Trib.	86	133	20.9	8.9	6.2	11.6	0	1	7	9	14	30	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Sep.	Mainstem	100	44	24.0	3.9	1.2	6.6	0	0	1	4	11	29	ES
Cynoscion complex	6.1-m Otter Trawl	20 to 29 SL	Jun.	Tidal Trib.	81	63	22.2	11.3	7.1	15.5	0	1	2	15	19	31	ES

Scientific Name	Gear	Sizes (mm)	Month(s)	Water Type	Number of Hauls	Number of Animals	% Occur	Density-weighted summary statistics (Salinity) Mean	Lower 95% CI	Upper 95% CI	Min	10th	25th	75th	90th	Max	Life History
Cynoscion complex	6.1-m Otter Trawl	20 to 29 SL	Jun.	Mainstem	105	96	26.7	9.5	6.9	12.0	0	2	3	12	15	27	ES
Bairdiella chrysoura	21.3-m Seine	10 to 19 SL	May	Tidal Trib.	93	725	16.1	21.6	15.4	27.8	0	8	10	30	30	36	ES
Bairdiella chrysoura	21.3-m Seine	10 to 19 SL	May	Mainstem	89	146	16.9	17.7	13.2	22.1	2	6	15	21	26	27	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	May	Tidal Trib.	93	992	19.4	21.4	15.7	27.1	0	7	9	29	32	33	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	May	Mainstem	89	132	18.0	16.2	12.2	20.2	5	5	14	20	26	27	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	Jun.	Tidal Trib.	105	470	18.1	14.8	11.0	18.6	0	6	7	18	22	31	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	Jun.	Mainstem	72	61	16.7	13.8	7.5	20.1	1	1	8	13	28	31	ES
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Jan.	Tidal Trib.	80	2,587	50.0	15.8	12.6	19.1	0	1	6	24	27	31	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Jan.	Mainstem	82	4,171	57.3	13.2	10.0	16.4	0	0	2	19	27	35	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Feb.	Tidal Trib.	87	7,971	73.6	10.0	8.0	12.1	0	0	2	15	22	28	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Feb.	Mainstem	79	9,185	84.8	6.9	5.0	8.8	0	1	1	8	20	25	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Mar.	Tidal Trib.	94	3,595	63.8	11.7	9.3	14.1	0	0	3	17	22	33	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Mar.	Mainstem	70	3,552	77.1	9.9	7.2	12.6	0	0	1	16	24	31	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Feb.	Tidal Trib.	87	4,738	66.7	10.6	8.4	12.8	0	1	3	15	23	30	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Feb.	Mainstem	79	4,902	69.6	6.7	4.7	8.7	0	1	1	8	19	25	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Mar.	Tidal Trib.	94	12,363	70.2	11.3	8.9	13.6	0	0	2	16	23	33	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Mar.	Mainstem	70	6,704	84.3	11.5	8.8	14.2	0	0	2	18	27	31	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Apr.	Tidal Trib.	94	1,665	53.2	14.6	11.8	17.3	0	3	8	22	26	31	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Apr.	Mainstem	77	2,176	59.7	13.0	10.2	15.8	0	1	3	20	25	31	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Feb.	Tidal Trib.	69	1,325	20.3	18.1	10.8	25.4	0	0	1	27	28	31	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Feb.	Mainstem	106	1,439	34.0	11.0	6.8	15.2	0	1	2	20	32	33	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Mar.	Tidal Trib.	88	179	17.0	7.5	0.9	14.2	0	0	0	14	22	33	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Mar.	Mainstem	88	1,219	29.5	11.1	7.9	14.3	0	1	5	14	18	28	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Feb.	Tidal Trib.	69	4,097	36.2	16.4	11.7	21.1	0	1	5	26	28	31	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Feb.	Mainstem	106	5,823	41.5	13.4	9.6	17.1	0	1	3	22	32	33	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Mar.	Tidal Trib.	88	7,435	40.9	13.2	9.6	16.7	0	1	3	18	25	33	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Mar.	Mainstem	88	1,474	39.8	12.1	9.6	14.7	0	1	6	17	20	25	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Jan.	Tidal Trib.	80	616	30.0	6.3	3.5	9.0	0	1	3	6	12	27	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Jan.	Mainstem	82	877	35.4	6.4	3.3	9.5	0	0	0	9	17	28	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Feb.	Tidal Trib.	87	225	28.7	4.9	2.4	7.4	0	0	1	4	10	29	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Feb.	Mainstem	79	773	32.9	3.7	2.1	5.3	0	1	1	5	7	17	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Jan.	Tidal Trib.	79	1,272	45.6	8.7	5.8	11.6	0	0	1	13	21	29	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Jan.	Mainstem	95	1,947	44.2	4.5	2.7	6.3	0	0	0	6	9	32	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Feb.	Tidal Trib.	69	5,967	60.9	7.1	4.2	9.9	0	0	0	8	25	31	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Feb.	Mainstem	106	7,536	52.8	3.4	2.4	4.5	0	0	0	4	8	20	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Mar.	Tidal Trib.	88	2,297	43.2	4.5	2.6	6.4	0	0	0	6	11	23	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Mar.	Mainstem	88	2,622	46.6	5.3	2.7	7.8	0	0	0	6	17	28	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Dec.	Tidal Trib.	79	2,140	48.1	6.1	3.5	8.7	0	1	1	8	19	31	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Dec.	Mainstem	108	2,528	55.6	6.1	3.7	8.4	0	0	1	6	22	31	OS
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Oct.	Tidal Trib.	100	32	18.0	13.9	8.9	18.9	2	4	5	17	21	36	OS
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Oct.	Mainstem	85	62	20.0	8.7	4.4	13.0	0	0	0	9	14	26	OS

Scientific Name	Gear	Sizes (mm)	Month(s)	Water Type	Number of Hauls	Number of Animals	% Occur	Density-weighted summary statistics (Salinity) Mean	Lower 95% CI	Upper 95% CI	Min	10th	25th	75th	90th	Max	Life History
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Nov.	Tidal Trib.	95	17	14.7	18.2	12.2	24.3	5	6	7	25	31	32	OS
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Nov.	Mainstem	88	65	17.0	10.3	6.2	14.4	1	2	3	12	19	24	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Jan.	Tidal Trib.	80	1,502	26.3	10.1	6.7	13.4	0	1	3	15	17	24	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Jan.	Mainstem	82	1,462	51.2	12.1	9.0	15.3	0	0	3	17	24	35	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Feb.	Tidal Trib.	87	1,152	49.4	10.6	8.1	13.2	0	1	3	15	21	27	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Feb.	Mainstem	79	5,159	60.8	7.0	5.0	9.0	0	0	1	8	17	25	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Mar.	Tidal Trib.	94	475	36.2	10.6	7.6	13.5	0	1	2	16	22	29	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Mar.	Mainstem	70	4,229	55.7	11.2	8.2	14.2	0	1	3	16	25	30	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Apr.	Tidal Trib.	94	201	4.3	23.5	20.1	26.8	22	22	22	24	24	26	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Apr.	Mainstem	77	27	3.9	23.6	-6.0	53.2	12	12	12	13	13	32	OS
Mugil curema	21.3-m Seine	20 to 29 SL	May	Tidal Trib.	93	123	3.2	28.7	21.5	36.0	27	27	27	27	28	33	OS
Mugil curema	21.3-m Seine	20 to 29 SL	May	Mainstem	89	1,133	7.9	20.7	13.3	28.0	10	10	13	24	25	35	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Jun.	Tidal Trib.	105	37	3.8	9.2	-7.8	26.2	2	2	2	13	21	25	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Jun.	Mainstem	72	261	12.5	20.0	10.7	29.3	1	1	13	28	28	33	OS
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Feb.	Tidal Trib.	87	147	8.0	2.7	0.4	5.1	0	0	0	1	1	5	TRR
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Feb.	Mainstem	79	12	6.3	2.8	-0.2	5.8	0	0	1	3	3	6	TRR
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Mar.	Tidal Trib.	94	36	5.3	6.8	1.2	12.4	1	1	4	11	11	12	TRR
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Mar.	Mainstem	70	44	15.7	6.6	2.1	11.0	0	0	0	13	13	17	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Jun.	Tidal Trib.	105	40	10.5	23.6	17.2	29.9	4	12	14	29	32	34	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Jun.	Mainstem	72	6	1.4	17.0	.	.	17	.	.	.	.	17	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Nov.	Tidal Trib.	95	187	5.3	27.5	17.5	37.4	13	17	18	18	18	32	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Nov.	Mainstem	88	1	1.1	24.0	.	.	24	.	.	.	.	24	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Jan.	Tidal Trib.	79	78	15.2	3.0	0.9	5.2	0	0	0	4	6	9	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Jan.	Mainstem	95	223	18.9	0.5	0.2	0.9	0	0	0	0	1	2	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Feb.	Tidal Trib.	69	36	20.3	5.0	2.0	8.0	0	0	1	6	6	24	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Feb.	Mainstem	106	173	17.9	2.6	0.6	4.5	0	0	0	2	4	24	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Mar.	Tidal Trib.	88	46	17.0	2.8	0.3	5.3	0	0	0	2	6	13	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Mar.	Mainstem	88	106	18.2	1.8	-0.1	3.7	0	0	0	1	5	14	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Apr.	Tidal Trib.	86	49	20.9	5.7	2.2	9.1	0	0	1	8	8	31	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Apr.	Mainstem	92	103	19.6	14.8	8.8	20.9	0	2	2	25	25	29	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Dec.	Tidal Trib.	79	102	19.0	4.1	1.1	7.1	0	0	1	3	10	19	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Dec.	Mainstem	108	168	22.2	0.8	0.3	1.3	0	0	0	0	1	5	TRR

Appendix 3, Table 2. Density-weighted distribution (river-kilometer) statistics for select pseudo-species collected during FIM sampling in the lower St. Johns River (2001-2011). Gear type, size range, month(s), and water type are given for each species analyzed. Results are shown as the mean density-weighted salinity for the select pseudo-species. Other statistics shown are the 95% confidence interval (CI), minimum (Min) and maximum (Max) values recorded, and the 10th, 25th, 75th, and 90th percentiles. Life history indicates probable spawning location: offshore spawners (OS), nearshore spawners (NS), estuarine spawners (ES), and tidal-river residents (TRR). Species are sorted in phylogenetic order.

								Density-weighted summary statistics (River-kilometer)									
Scientific Name	***Gear***	***Sizes (mm)***	***Month(s)***	***Water Type***	***Number of Hauls***	***Number of Animals***	***% Occur***	***Mean***	***Lower 95% CI***	***Upper 95% CI***	***Min***	***10th***	***25th***	***75th***	***90th***	***Max***	***Life History***
Stomolophus meleagris	183-m Seine	50 to 59 BW	Oct.	Tidal Trib.	32	0	.	.	.	.	.	.	.	.	.	.	OS
Stomolophus meleagris	183-m Seine	50 to 59 BW	Oct.	Mainstem	62	435	1.6	2.0	.	.	2	.	.	.	.	2	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Oct.	Tidal Trib.	32	1	3.1	6.0	.	.	6	.	.	.	.	6	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Oct.	Mainstem	62	808	1.6	2.0	.	.	2	.	.	.	.	2	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Nov.	Tidal Trib.	27	0	.	.	.	.	.	.	.	.	.	.	OS
Stomolophus meleagris	183-m Seine	60 to 79 BW	Nov.	Mainstem	68	110	7.4	16.7	10.9	22.4	2	16	16	16	17	22	OS
Farfantepenaeus spp.	21.3-m Seine	4 to 7 POHL	May	Tidal Trib.	93	321	28.0	27.3	19.1	35.5	6	8	12	26	59	68	OS
Farfantepenaeus spp.	21.3-m Seine	4 to 7 POHL	May	Mainstem	89	124	20.2	30.7	22.1	39.3	8	15	17	48	54	61	OS
Farfantepenaeus spp.	21.3-m Seine	8 to 11 POHL	May	Tidal Trib.	93	398	44.1	21.8	17.3	26.3	4	7	12	23	34	63	OS
Farfantepenaeus spp.	21.3-m Seine	8 to 11 POHL	May	Mainstem	89	538	30.3	29.6	23.5	35.7	8	15	16	36	50	61	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	May	Tidal Trib.	85	110	24.7	28.3	21.5	35.0	4	8	16	34	43	59	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	May	Mainstem	108	162	23.1	39.0	32.5	45.4	17	19	24	54	56	62	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Jun.	Tidal Trib.	81	51	19.8	27.2	19.9	34.5	3	16	21	33	35	59	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Jun.	Mainstem	105	123	21.9	44.0	38.1	49.8	14	18	43	48	54	60	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Sep.	Tidal Trib.	86	146	30.2	19.3	12.4	26.2	3	6	7	24	26	63	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Sep.	Mainstem	100	35	17.0	32.0	23.9	40.1	12	16	18	46	49	58	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Oct.	Tidal Trib.	86	100	23.3	18.5	13.3	23.7	8	8	9	23	26	59	OS
Farfantepenaeus spp.	6.1-m Otter Trawl	6 to 9 POHL	Oct.	Mainstem	105	69	21.9	26.0	18.2	33.8	3	15	15	34	53	61	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	May	Tidal Trib.	85	70	10.6	47.8	32.4	63.1	7	26	26	59	59	63	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	May	Mainstem	108	50	12.0	40.2	28.7	51.7	12	17	18	43	61	62	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	Jun.	Tidal Trib.	81	78	24.7	36.6	30.3	42.9	12	26	26	35	43	63	OS
Farfantepenaeus aztecus	6.1-m Otter Trawl	16 to 23 POHL	Jun.	Mainstem	105	139	33.3	40.3	36.3	44.4	10	18	40	45	51	63	OS
Farfantepenaeus duorarum	6.1-m Otter Trawl	0 to 25 POHL	May	Tidal Trib.	85	51	15.3	28.6	22.0	35.2	6	16	26	26	43	59	OS
Farfantepenaeus duorarum	6.1-m Otter Trawl	0 to 25 POHL	May	Mainstem	108	67	18.5	35.7	30.3	41.1	17	18	24	41	47	55	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jun.	Tidal Trib.	105	1,114	25.7	25.5	21.1	29.9	3	10	21	24	34	61	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jun.	Mainstem	72	1,429	25.0	34.5	25.9	43.1	10	15	18	45	48	63	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jul.	Tidal Trib.	98	314	24.5	19.3	14.3	24.2	3	4	10	24	24	59	OS
Litopenaeus setiferus	21.3-m Seine	4 to 7 POHL	Jul.	Mainstem	83	55	15.7	26.2	17.3	35.1	3	16	19	26	30	60	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Jun.	Tidal Trib.	81	235	18.5	44.8	37.3	52.2	23	33	34	43	59	63	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Jun.	Mainstem	105	243	12.4	42.5	30.5	54.5	15	15	15	58	59	63	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Aug.	Tidal Trib.	79	92	15.2	32.1	24.8	39.3	21	26	26	26	35	63	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Aug.	Mainstem	106	33	5.7	51.2	43.0	59.5	41	41	41	55	56	61	OS
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Sep.	Tidal Trib.	86	130	17.4	33.0	23.5	42.5	6	23	23	43	44	63	OS

								Density-weighted summary statistics (River-kilometer)									
Scientific Name	***Gear***	***Sizes (mm)***	***Month(s)***	***Water Type***	***Number of Hauls***	***Number of Animals***	***% Occur***	***Mean***	***Lower 95% CI***	***Upper 95% CI***	***Min***	***10th***	***25th***	***75th***	***90th***	***Max***	***Life History***
Litopenaeus setiferus	6.1-m Otter Trawl	2 to 5 POHL	Sep.	Mainstem	100	34	13.0	34.9	25.7	44.1	19	20	20	49	49	60	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Jul.	Tidal Trib.	85	453	22.4	39.7	30.6	48.8	6	12	26	45	59	63	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Jul.	Mainstem	103	464	30.1	44.1	39.0	49.2	15	24	31	55	56	62	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Aug.	Tidal Trib.	79	101	12.7	41.4	26.8	56.0	6	16	26	43	43	63	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Aug.	Mainstem	106	669	37.7	43.0	38.3	47.7	3	18	35	53	56	63	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Oct.	Tidal Trib.	86	224	33.7	28.3	22.6	33.9	6	10	13	35	35	68	OS
Litopenaeus setiferus	6.1-m Otter Trawl	20 to 25 POHL	Oct.	Mainstem	105	630	49.5	38.1	34.1	42.1	3	18	28	47	55	63	OS
Callinectes sapidus	21.3-m Seine	10 to 30 CW	Jan. to Dec.	Tidal Trib.	1,137	818	22.2	24.2	22.3	26.1	3	6	13	28	43	67	NS
Callinectes sapidus	21.3-m Seine	10 to 30 CW	Jan. to Dec.	Mainstem	980	344	14.0	31.2	28.1	34.3	2	10	16	46	59	63	NS
Callinectes sapidus	6.1-m Otter Trawl	10 to 59 CW	Jan. to Dec.	Tidal Trib.	992	1,031	33.6	31.1	29.4	32.8	3	12	23	35	61	68	NS
Callinectes sapidus	6.1-m Otter Trawl	10 to 59 CW	Jan. to Dec.	Mainstem	1,215	697	22.7	38.0	36.1	39.8	2	16	24	50	56	63	NS
Callinectes sapidus	6.1-m Otter Trawl	50 to 99 CW	Jan. to Dec.	Tidal Trib.	992	1,061	35.9	30.8	29.2	32.5	3	12	23	35	46	68	NS
Callinectes sapidus	6.1-m Otter Trawl	50 to 99 CW	Jan. to Dec.	Mainstem	1,215	595	23.0	37.7	36.0	39.3	10	17	26	48	55	63	NS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Feb.	Tidal Trib.	87	2,946	28.7	26.4	19.3	33.4	10	12	13	24	44	67	OS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Feb.	Mainstem	79	1,839	40.5	39.2	33.9	44.4	2	19	25	50	56	61	OS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Mar.	Tidal Trib.	94	2,266	13.8	29.3	21.7	37.0	6	13	26	26	43	59	OS
Brevoortia spp.	21.3-m Seine	20 to 34 SL	Mar.	Mainstem	70	262	32.9	29.1	23.1	35.0	8	8	20	36	45	52	OS
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Oct.	Tidal Trib.	100	6,711	49.0	22.2	18.0	26.3	3	6	12	25	43	63	ES
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Oct.	Mainstem	85	3,298	49.4	31.5	26.7	36.3	10	14	17	44	51	62	ES
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Nov.	Tidal Trib.	95	8,039	52.6	26.3	21.9	30.7	3	10	16	24	45	67	ES
Anchoa mitchilli	21.3-m Seine	20 to 29 SL	Nov.	Mainstem	88	2,713	51.1	36.5	32.2	40.7	3	14	27	46	49	61	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jun.	Tidal Trib.	81	256	12.3	30.7	18.6	42.8	9	9	23	26	43	63	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jun.	Mainstem	105	594	11.4	34.2	21.9	46.6	15	15	15	56	56	58	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jul.	Tidal Trib.	85	1,505	12.9	43.7	34.3	53.0	26	26	34	44	59	63	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Jul.	Mainstem	103	130	6.8	39.2	24.1	54.3	14	16	16	45	47	59	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Aug.	Tidal Trib.	79	205	8.9	45.0	27.8	62.3	16	23	26	26	26	59	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Aug.	Mainstem	106	415	6.6	34.9	14.2	55.7	15	15	15	49	49	63	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Sep.	Tidal Trib.	86	1,220	19.8	50.5	39.8	61.1	3	23	26	61	61	63	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Sep.	Mainstem	100	145	8.0	40.1	28.6	51.5	24	24	24	47	50	57	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Oct.	Tidal Trib.	86	248	12.8	39.7	28.4	51.1	8	23	34	45	59	63	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Oct.	Mainstem	105	251	12.4	30.7	14.1	47.3	1	1	1	53	56	63	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Nov.	Tidal Trib.	89	189	13.5	43.1	35.1	51.1	21	23	35	44	45	60	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Nov.	Mainstem	99	36	9.1	35.7	20.3	51.0	15	15	15	42	58	63	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Dec.	Tidal Trib.	79	233	10.1	60.2	51.3	69.2	26	44	59	63	63	67	ES
Anchoa mitchilli	6.1-m Otter Trawl	15 to 24 SL	Dec.	Mainstem	108	10	4.6	36.9	20.9	52.8	16	16	32	41	41	46	ES
Lucania parva	21.3-m Seine	16 to 19 SL	Jun.	Tidal Trib.	105	494	8.6	60.4	58.9	61.9	59	59	59	60	61	68	TRR
Lucania parva	21.3-m Seine	16 to 19 SL	Jun.	Mainstem	72	58	5.6	56.0	50.0	62.0	54	54	54	55	56	63	TRR
Lucania parva	21.3-m Seine	16 to 19 SL	May	Tidal Trib.	93	55	4.3	61.6	58.1	65.1	59	59	59	59	59	63	TRR
Lucania parva	21.3-m Seine	16 to 19 SL	May	Mainstem	89	120	3.4	54.9	37.5	72.3	48	48	48	53	53	62	TRR
Gambusia holbrooki	21.3-m Seine	18 to 21 SL	Mar.	Tidal Trib.	94	337	10.6	50.4	40.2	60.6	14	22	44	59	60	63	TRR
Gambusia holbrooki	21.3-m Seine	18 to 21 SL	Mar.	Mainstem	70	18	5.7	20.7	10.5	30.9	12	12	13	22	22	25	TRR

Scientific Name	Gear	Sizes (mm)	Month(s)	Water Type	Number of Hauls	Number of Animals	% Occur	Density-weighted summary statistics (River-kilometer) Mean	Lower 95% CI	Upper 95% CI	Min	10th	25th	75th	90th	Max	Life History
Menidia menidia	21.3-m Seine	25 to 39 SL	Jun.	Tidal Trib.	105	2,708	29.5	15.0	11.5	18.4	3	4	7	19	23	44	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Jun.	Mainstem	72	847	20.8	21.1	14.3	27.9	10	12	14	20	32	57	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Jul.	Tidal Trib.	98	1,961	33.7	13.2	10.2	16.3	3	4	7	16	24	44	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Jul.	Mainstem	83	330	22.9	17.0	13.4	20.6	3	8	14	19	25	35	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Aug.	Tidal Trib.	93	1,873	23.7	11.6	9.0	14.1	3	6	9	10	16	34	TRR
Menidia menidia	21.3-m Seine	25 to 39 SL	Aug.	Mainstem	87	136	12.6	19.1	13.7	24.6	3	14	16	19	24	36	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Mar.	Tidal Trib.	94	95	17.0	55.8	49.8	61.9	26	44	45	61	63	68	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Mar.	Mainstem	70	7	5.7	50.9	31.1	70.7	30	30	52	52	55	62	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Apr.	Tidal Trib.	94	179	7.4	59.3	49.1	69.5	43	44	44	63	63	68	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Apr.	Mainstem	77	1	1.3	43.0	.	.	43	.	.	.	.	43	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Sep.	Tidal Trib.	97	124	9.3	52.3	42.7	62.0	24	44	44	60	60	63	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Sep.	Mainstem	87	6	4.6	53.4	45.2	61.6	49	49	50	52	52	60	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Nov.	Tidal Trib.	95	145	12.6	60.1	56.3	63.9	44	59	59	60	63	67	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Nov.	Mainstem	88	1	1.1	43.0	.	.	43	.	.	.	.	43	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Dec.	Tidal Trib.	101	87	5.9	61.6	55.6	67.6	43	59	59	59	63	67	TRR
Lepomis macrochirus	21.3-m Seine	20 to 49 SL	Dec.	Mainstem	81	29	6.2	56.7	51.8	61.6	54	54	54	54	61	63	TRR
Micropterus salmoides	21.3-m Seine	10 to 35 SL	Apr.	Tidal Trib.	94	88	7.4	61.0	56.4	65.6	44	59	60	60	60	63	TRR
Micropterus salmoides	21.3-m Seine	10 to 35 SL	Apr.	Mainstem	77	3	1.3	54.0	.	.	54	.	.	.	.	54	TRR
Micropterus salmoides	21.3-m Seine	10 to 45 SL	May	Tidal Trib.	93	122	15.1	57.3	50.7	63.9	35	35	44	59	67	68	TRR
Micropterus salmoides	21.3-m Seine	10 to 45 SL	May	Mainstem	89	10	6.7	48.2	35.7	60.7	32	32	32	53	56	61	TRR
Micropterus salmoides	21.3-m Seine	10 to 65 SL	Jun.	Tidal Trib.	105	45	19.0	48.8	42.4	55.3	23	35	35	61	61	63	TRR
Micropterus salmoides	21.3-m Seine	10 to 65 SL	Jun.	Mainstem	72	37	6.9	56.5	49.6	63.4	46	54	54	57	57	63	TRR
Orthopristis chrysoptera	21.3-m Seine	15 to 24 SL	May	Tidal Trib.	93	123	12.9	22.0	6.6	37.5	3	3	4	34	34	63	ES
Orthopristis chrysoptera	21.3-m Seine	15 to 24 SL	May	Mainstem	89	150	15.7	34.1	25.6	42.7	8	15	20	44	49	50	ES
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Feb.	Tidal Trib.	87	606	37.9	27.5	21.4	33.5	4	10	12	34	45	68	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Feb.	Mainstem	79	168	29.1	41.6	34.7	48.4	16	18	23	52	57	61	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Mar.	Tidal Trib.	94	552	31.9	31.6	24.3	38.8	3	9	21	44	60	63	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Mar.	Mainstem	70	198	28.6	34.5	26.1	42.8	8	18	18	48	60	63	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Apr.	Tidal Trib.	94	117	36.2	36.1	29.5	42.6	4	10	22	46	46	61	OS
Lagodon rhomboides	21.3-m Seine	10 to 24 SL	Apr.	Mainstem	77	263	26.0	37.9	28.4	47.5	15	16	17	58	58	60	OS
Lagodon rhomboides	21.3-m Seine	30 to 54 SL	May	Tidal Trib.	93	903	49.5	34.0	28.3	39.8	6	12	15	44	60	68	OS
Lagodon rhomboides	21.3-m Seine	30 to 54 SL	May	Mainstem	89	332	24.7	37.7	30.0	45.5	8	15	23	51	57	62	OS
Lagodon rhomboides	21.3-m Seine	55 to 64 SL	Jul.	Tidal Trib.	98	130	30.6	32.4	24.3	40.5	6	6	12	46	63	68	OS
Lagodon rhomboides	21.3-m Seine	55 to 64 SL	Jul.	Mainstem	83	29	15.7	40.5	26.9	54.2	6	9	15	54	61	63	OS
Cynoscion complex	6.1-m Otter Trawl	10 to 19 SL	May	Tidal Trib.	85	20	7.1	13.1	0.0	26.3	4	4	4	15	15	35	ES
Cynoscion complex	6.1-m Otter Trawl	10 to 19 SL	May	Mainstem	108	360	18.5	33.1	26.5	39.7	17	17	18	44	44	62	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Jun.	Tidal Trib.	81	84	28.4	28.1	20.7	35.5	6	12	16	35	43	63	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Jun.	Mainstem	105	120	30.5	37.5	31.8	43.3	10	15	26	47	59	62	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Sep.	Tidal Trib.	86	133	20.9	23.6	13.6	33.7	3	3	3	26	44	63	ES
Cynoscion complex	6.1-m Otter Trawl	15 to 29 SL	Sep.	Mainstem	100	44	24.0	43.0	38.2	47.8	18	27	35	48	58	61	ES
Cynoscion complex	6.1-m Otter Trawl	20 to 29 SL	Jun.	Tidal Trib.	81	63	22.2	30.8	22.3	39.3	9	16	16	35	43	63	ES

Scientific Name	Gear	Sizes (mm)	Month(s)	Water Type	Number of Hauls	Number of Animals	% Occur	Density-weighted summary statistics (River-kilometer) Mean	Lower 95% CI	Upper 95% CI	Min	10th	25th	75th	90th	Max	Life History
Cynoscion complex	6.1-m Otter Trawl	20 to 29 SL	Jun.	Mainstem	105	96	26.7	37.7	31.6	43.8	10	17	26	47	61	62	ES
Bairdiella chrysoura	21.3-m Seine	10 to 19 SL	May	Tidal Trib.	93	725	16.1	25.3	14.6	36.0	3	10	12	35	45	59	ES
Bairdiella chrysoura	21.3-m Seine	10 to 19 SL	May	Mainstem	89	146	16.9	37.7	29.3	46.0	16	17	23	48	49	61	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	May	Tidal Trib.	93	992	19.4	23.5	14.1	32.9	3	9	12	16	44	59	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	May	Mainstem	89	132	18.0	39.5	31.9	47.2	16	17	27	48	57	61	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	Jun.	Tidal Trib.	105	470	18.1	31.3	23.8	38.8	6	10	23	26	35	63	ES
Bairdiella chrysoura	21.3-m Seine	20 to 29 SL	Jun.	Mainstem	72	61	16.7	40.9	30.7	51.2	14	23	25	54	59	61	ES
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Jan.	Tidal Trib.	80	2,587	50.0	22.0	17.0	27.0	3	6	13	23	34	63	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Jan.	Mainstem	82	4,171	57.3	29.7	24.4	35.0	0	3	18	44	52	62	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Feb.	Tidal Trib.	87	7,971	73.6	25.9	21.6	30.2	4	9	12	34	45	68	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Feb.	Mainstem	79	9,185	84.8	37.2	33.2	41.1	10	16	20	50	58	62	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Mar.	Tidal Trib.	94	3,595	63.8	27.2	22.5	31.9	3	7	13	34	60	63	OS
Leiostomus xanthurus	21.3-m Seine	10 to 19 SL	Mar.	Mainstem	70	3,552	77.1	34.3	29.8	38.8	5	13	20	46	57	63	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Feb.	Tidal Trib.	87	4,738	66.7	25.2	20.5	29.8	4	9	12	26	59	68	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Feb.	Mainstem	79	4,902	69.6	38.2	33.8	42.6	12	17	22	51	56	62	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Mar.	Tidal Trib.	94	12,363	70.2	28.1	23.7	32.5	3	7	13	34	60	63	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Mar.	Mainstem	70	6,704	84.3	33.1	28.5	37.7	5	12	19	46	60	63	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Apr.	Tidal Trib.	94	1,665	53.2	23.0	18.2	27.7	3	4	7	26	44	60	OS
Leiostomus xanthurus	21.3-m Seine	20 to 29 SL	Apr.	Mainstem	77	2,176	59.7	32.7	26.9	38.5	3	12	17	52	57	62	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Feb.	Tidal Trib.	69	1,325	20.3	21.1	8.8	33.3	4	4	4	44	46	59	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Feb.	Mainstem	106	1,439	34.0	28.6	22.5	34.8	3	3	18	45	53	61	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Mar.	Tidal Trib.	88	179	17.0	41.4	29.2	53.6	3	3	23	44	44	63	OS
Leiostomus xanthurus	6.1-m Otter Trawl	10 to 14 SL	Mar.	Mainstem	88	1,219	29.5	32.1	25.7	38.6	3	5	24	43	49	62	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Feb.	Tidal Trib.	69	4,097	36.2	21.9	14.9	28.8	4	4	9	26	44	63	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Feb.	Mainstem	106	5,823	41.5	23.5	18.5	28.6	3	3	16	26	53	63	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Mar.	Tidal Trib.	88	7,435	40.9	29.1	23.0	35.2	3	3	14	43	46	63	OS
Leiostomus xanthurus	6.1-m Otter Trawl	15 to 24 SL	Mar.	Mainstem	88	1,474	39.8	30.8	25.6	36.1	5	17	19	44	52	62	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Jan.	Tidal Trib.	80	616	30.0	30.2	24.6	35.8	9	13	23	34	44	59	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Jan.	Mainstem	82	877	35.4	38.8	33.4	44.2	0	23	36	44	48	62	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Feb.	Tidal Trib.	87	225	28.7	30.7	25.7	35.7	10	22	26	34	35	68	OS
Micropogonias undulatus	21.3-m Seine	10 to 19 SL	Feb.	Mainstem	79	773	32.9	40.5	34.5	46.5	2	15	30	50	52	62	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Jan.	Tidal Trib.	79	1,272	45.6	32.9	26.6	39.1	3	8	16	43	59	67	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Jan.	Mainstem	95	1,947	44.2	43.8	40.0	47.6	16	22	40	53	55	63	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Feb.	Tidal Trib.	69	5,967	60.9	36.2	30.2	42.3	4	6	21	46	60	63	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Feb.	Mainstem	106	7,536	52.8	41.9	38.3	45.5	6	20	31	51	55	63	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Mar.	Tidal Trib.	88	2,297	43.2	42.4	37.6	47.3	7	23	34	46	60	63	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Mar.	Mainstem	88	2,622	46.6	44.3	38.7	49.8	3	15	43	55	60	63	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Dec.	Tidal Trib.	79	2,140	48.1	44.4	38.0	50.9	6	14	26	60	63	68	OS
Micropogonias undulatus	6.1-m Otter Trawl	10 to 19 SL	Dec.	Mainstem	108	2,528	55.6	40.8	37.2	44.4	3	18	31	51	55	63	OS
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Oct.	Tidal Trib.	100	32	18.0	18.0	11.3	24.8	3	4	9	23	23	63	OS
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Oct.	Mainstem	85	62	20.0	36.0	26.5	45.5	14	14	18	49	56	61	OS

Scientific Name	Gear	Sizes (mm)	Month(s)	Water Type	Number of Hauls	Number of Animals	% Occur	Density-weighted summary statistics (River-kilometer) Mean	Lower 95% CI	Upper 95% CI	Min	10th	25th	75th	90th	Max	Life History
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Nov.	Tidal Trib.	95	17	14.7	19.7	13.9	25.5	6	10	13	23	26	43	OS
Sciaenops ocellatus	21.3-m Seine	10 to 24 SL	Nov.	Mainstem	88	65	17.0	32.2	24.2	40.2	14	18	18	43	49	52	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Jan.	Tidal Trib.	80	1,502	26.3	24.3	16.5	32.2	3	6	9	26	44	63	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Jan.	Mainstem	82	1,462	51.2	32.4	27.3	37.6	2	9	21	45	53	62	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Feb.	Tidal Trib.	87	1,152	49.4	25.4	20.2	30.7	4	9	12	26	45	61	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Feb.	Mainstem	79	5,159	60.8	36.5	32.2	40.9	10	18	22	50	54	61	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Mar.	Tidal Trib.	94	475	36.2	29.9	23.8	36.0	3	9	21	34	44	61	OS
Mugil cephalus	21.3-m Seine	20 to 24 SL	Mar.	Mainstem	70	4,229	55.7	33.9	28.9	39.0	8	16	25	45	52	63	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Apr.	Tidal Trib.	94	201	4.3	15.6	11.3	20.0	10	13	13	13	13	17	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Apr.	Mainstem	77	27	3.9	14.0	-24.7	52.7	3	3	3	3	28	30	OS
Mugil curema	21.3-m Seine	20 to 29 SL	May	Tidal Trib.	93	123	3.2	11.3	-3.6	26.2	3	3	12	12	12	16	OS
Mugil curema	21.3-m Seine	20 to 29 SL	May	Mainstem	89	1,133	7.9	19.1	9.5	28.7	11	11	11	17	33	36	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Jun.	Tidal Trib.	105	37	3.8	24.7	2.0	47.5	3	3	8	23	23	34	OS
Mugil curema	21.3-m Seine	20 to 29 SL	Jun.	Mainstem	72	261	12.5	19.5	5.4	33.6	1	1	1	19	48	52	OS
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Feb.	Tidal Trib.	87	147	8.0	32.5	23.5	41.5	24	26	26	33	35	59	TRR
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Feb.	Mainstem	79	12	6.3	39.1	15.2	63.0	15	15	32	42	42	59	TRR
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Mar.	Tidal Trib.	94	36	5.3	35.0	20.5	49.5	22	26	33	33	34	59	TRR
Ctenogobius shufeldti	21.3-m Seine	32 to 45 SL	Mar.	Mainstem	70	44	15.7	43.4	35.7	51.2	29	29	36	46	55	62	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Jun.	Tidal Trib.	105	40	10.5	12.3	5.5	19.0	3	3	4	19	24	33	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Jun.	Mainstem	72	6	1.4	18.0	.	.	18	.	.	.	.	18	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Nov.	Tidal Trib.	95	187	5.3	13.6	7.9	19.3	6	10	13	13	13	26	TRR
Symphurus plagiusa	21.3-m Seine	20 to 34 SL	Nov.	Mainstem	88	1	1.1	18.0	.	.	18	.	.	.	.	18	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Jan.	Tidal Trib.	79	78	15.2	40.0	30.1	49.8	10	26	26	43	59	63	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Jan.	Mainstem	95	223	18.9	53.4	49.5	57.3	40	40	53	56	62	63	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Feb.	Tidal Trib.	69	36	20.3	34.6	25.7	43.5	16	26	26	34	46	63	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Feb.	Mainstem	106	173	17.9	49.9	45.6	54.2	20	35	46	53	55	63	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Mar.	Tidal Trib.	88	46	17.0	42.1	31.8	52.4	16	16	26	59	61	63	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Mar.	Mainstem	88	106	18.2	49.1	44.0	54.3	19	41	46	52	57	61	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Apr.	Tidal Trib.	86	49	20.9	45.8	36.2	55.5	12	26	26	61	61	67	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Apr.	Mainstem	92	103	19.6	30.6	21.2	40.0	9	9	9	48	49	63	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Dec.	Tidal Trib.	79	102	19.0	36.0	28.7	43.3	26	26	26	35	44	68	TRR
Trinectes maculatus	6.1-m Otter Trawl	25 to 44 SL	Dec.	Mainstem	108	168	22.2	50.0	47.5	52.5	24	46	48	53	53	63	TRR

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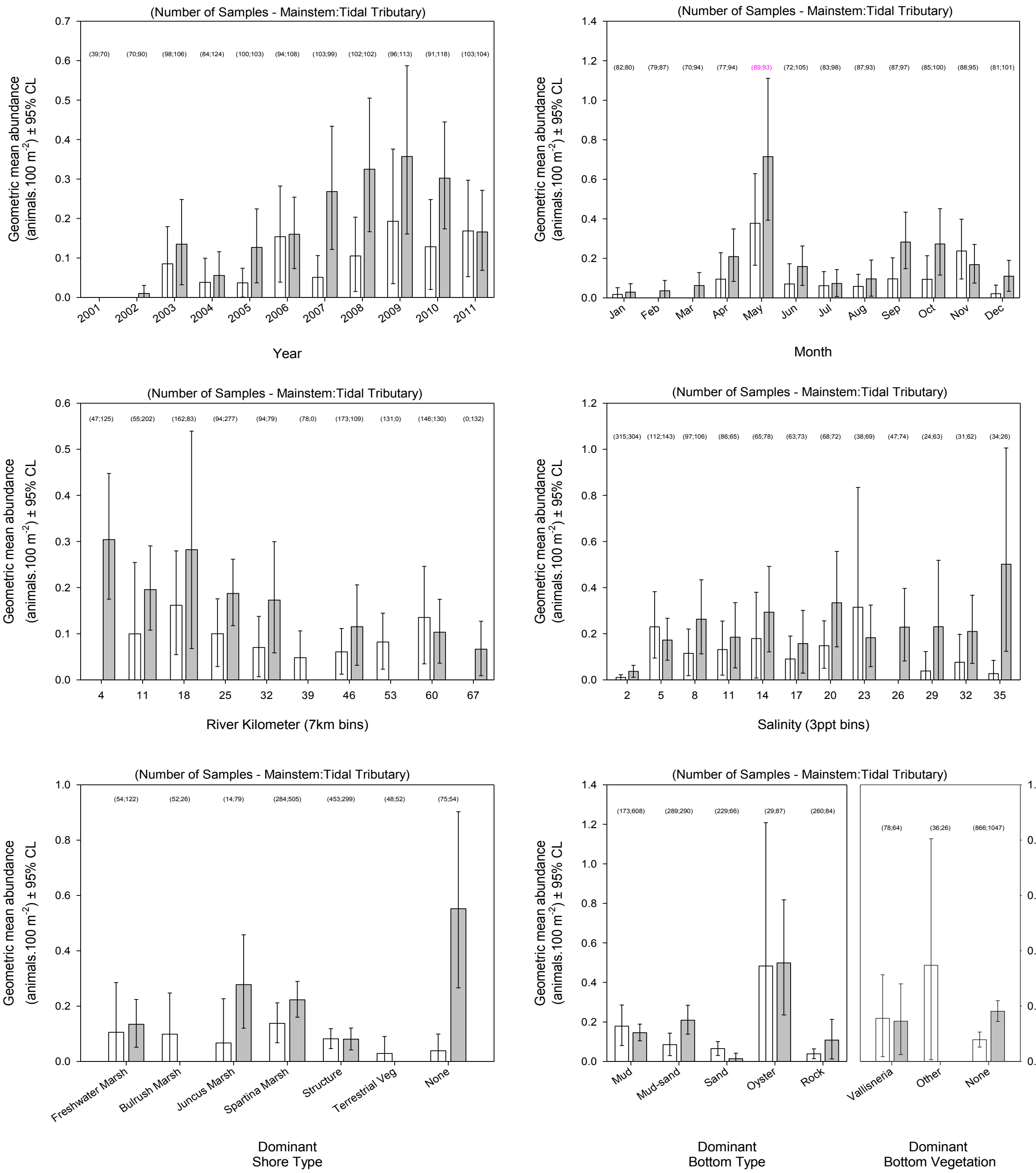
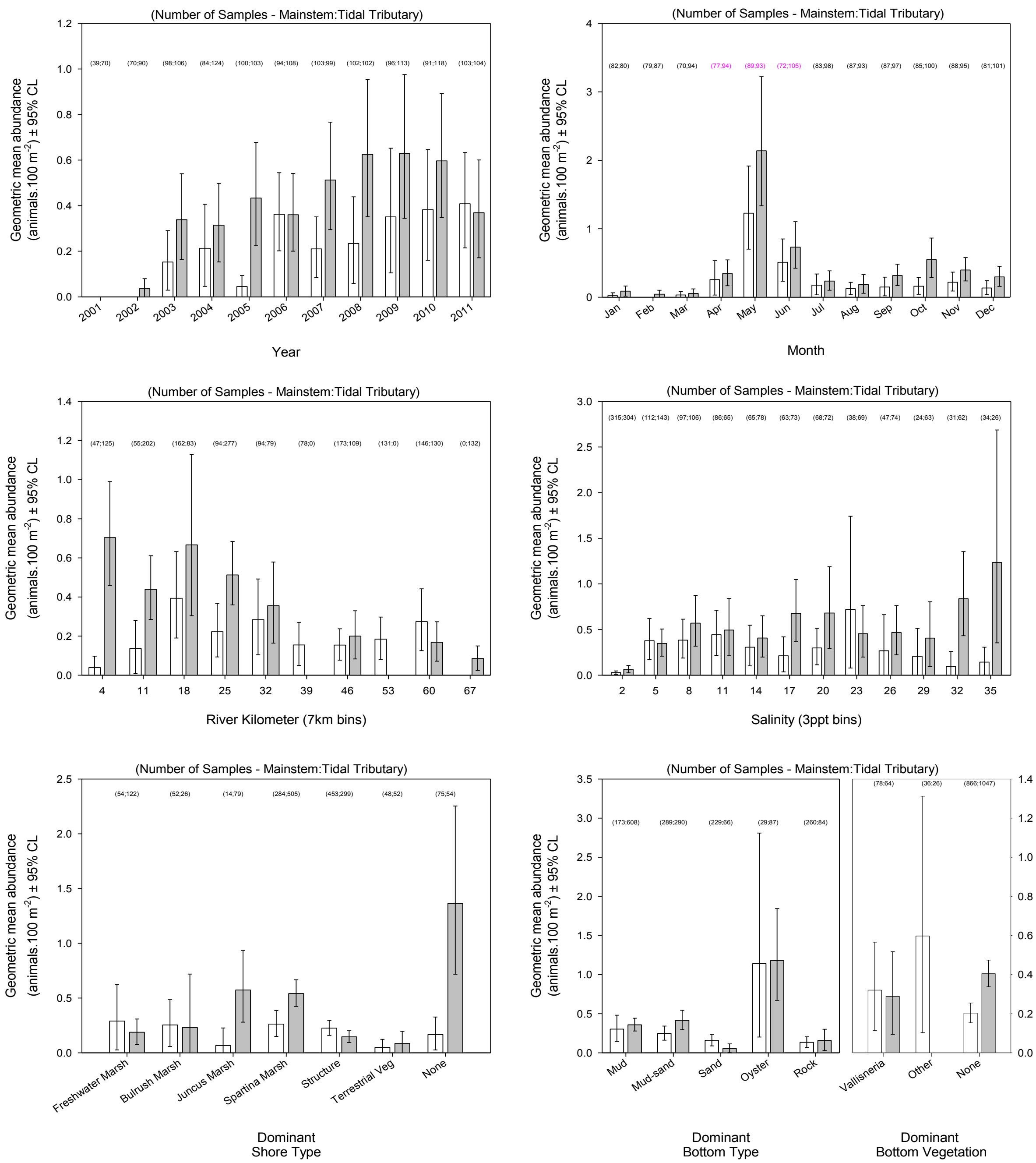
APPENDIX 4: Catch overview plots for 21.3-m seines

Farfantepenaeus spp. (Commercial shrimp) in 21.3-m seines



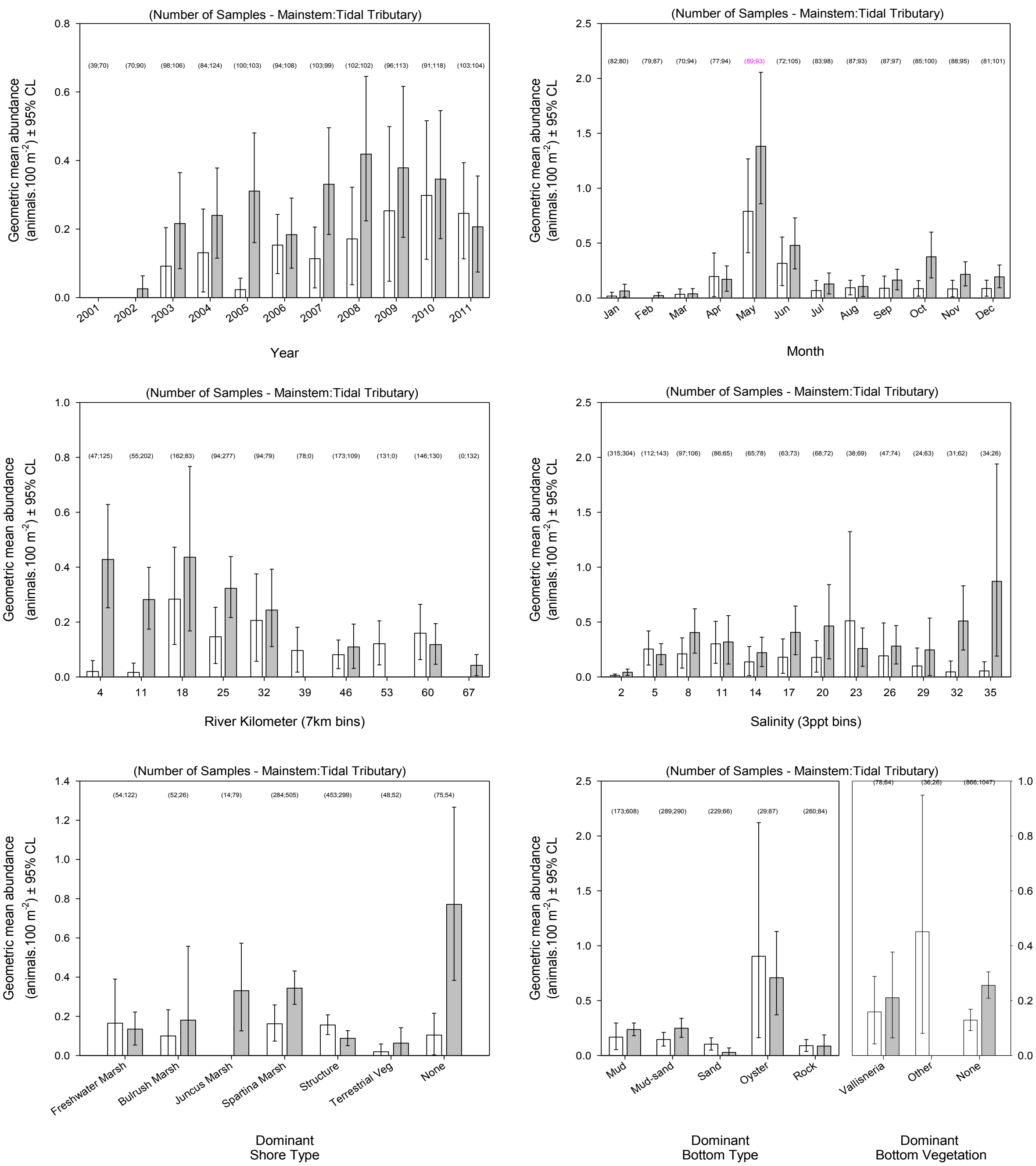
Appendix 4, Figure 1. Relative abundance of *Farfantepenaeus* spp. (commercial shrimp), 4 to 7 mm post-orbital head length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Farfantepenaeus spp. (Commercial shrimp) in 21.3-m seines



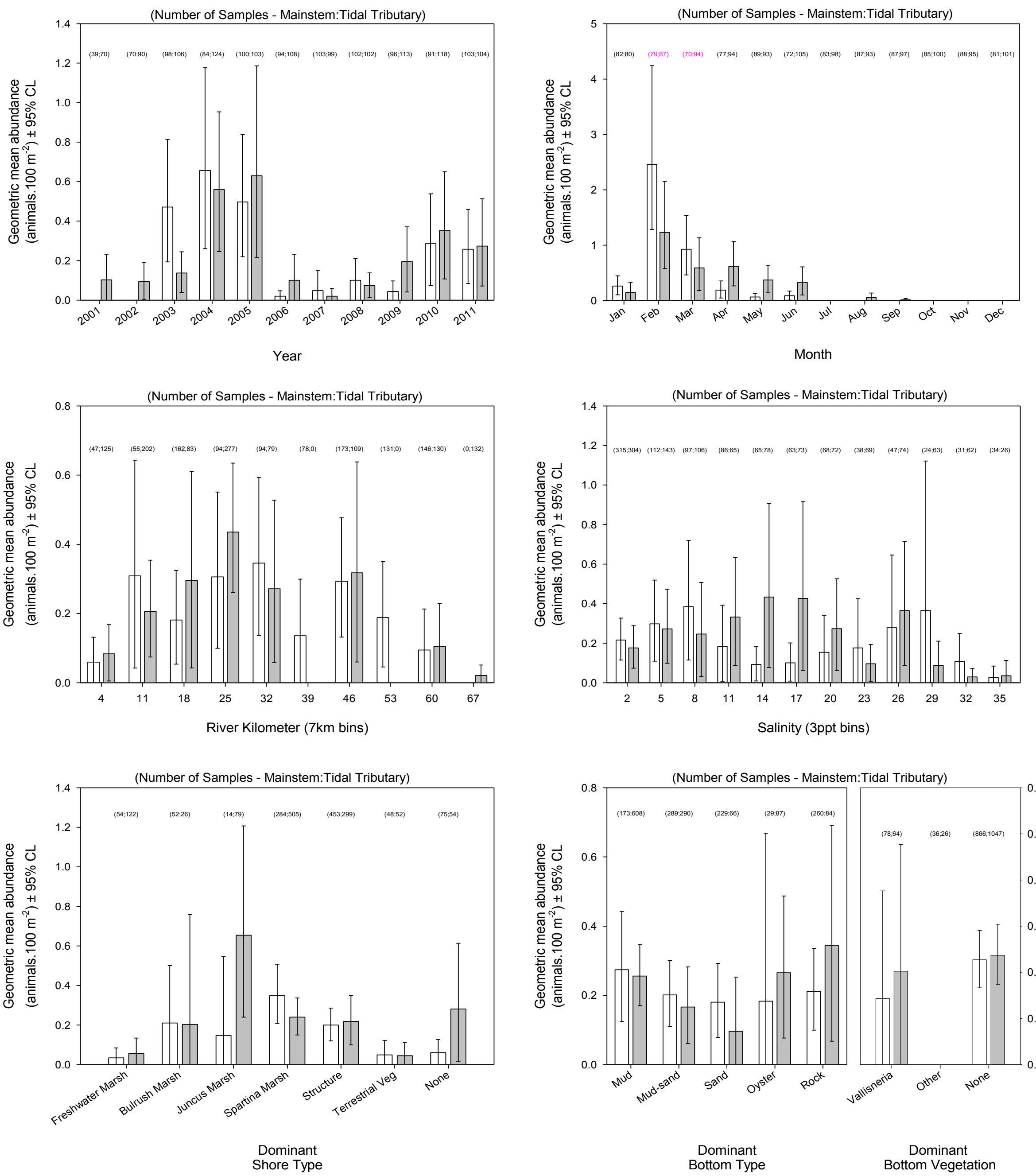
Appendix 4, Figure 2. Relative abundance of *Farfantepenaeus* spp. (commercial shrimp), 6 to 13 mm post-orbital head length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Farfantepenaeus spp. (Commercial shrimp) in 21.3-m seines



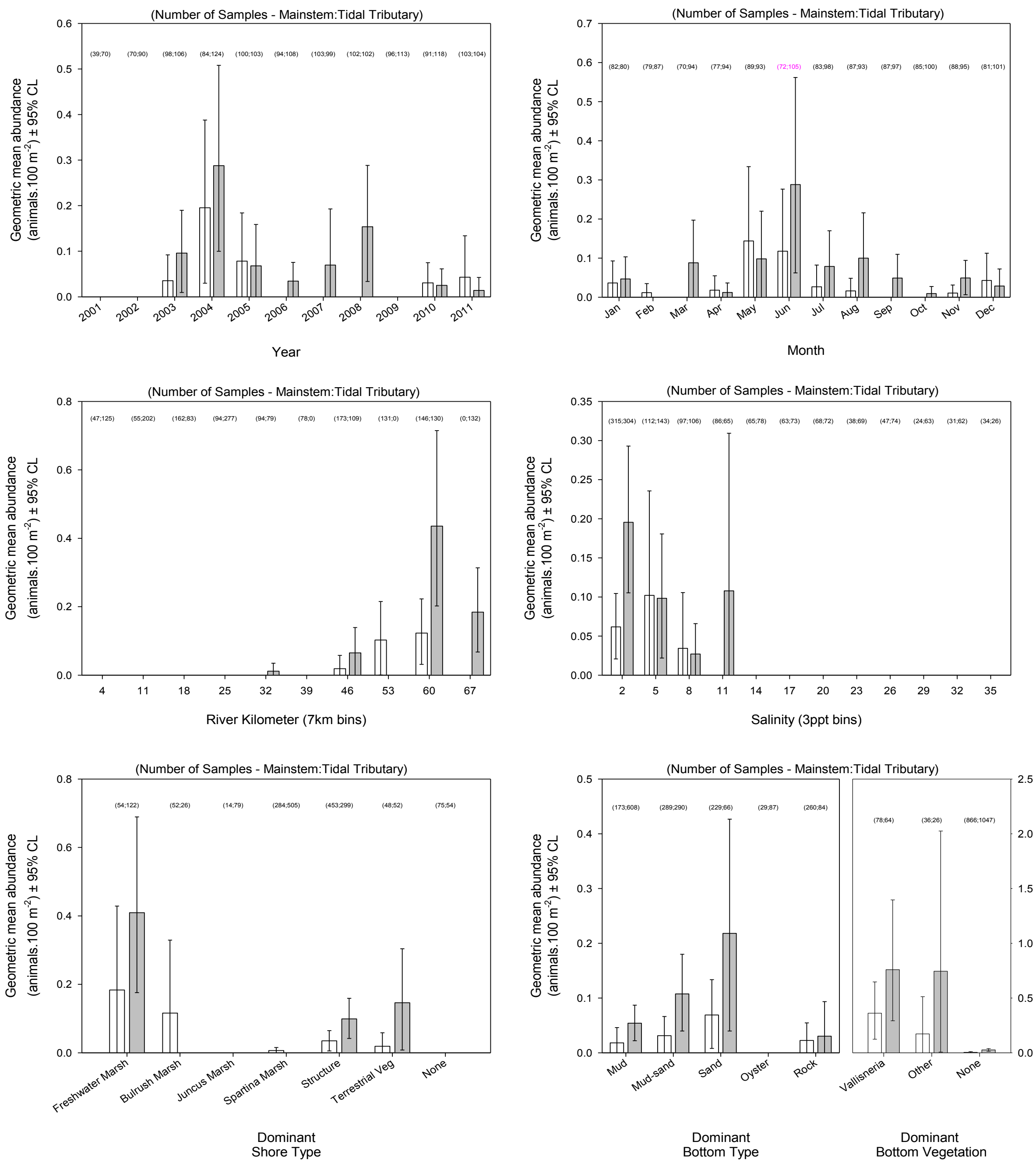
Appendix 4, Figure 3. Relative abundance of *Farfantepenaeus* spp. (commercial shrimp), 8 to 11 mm post-orbital head length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Brevoortia spp. (Menhaden) in 21.3-m seines



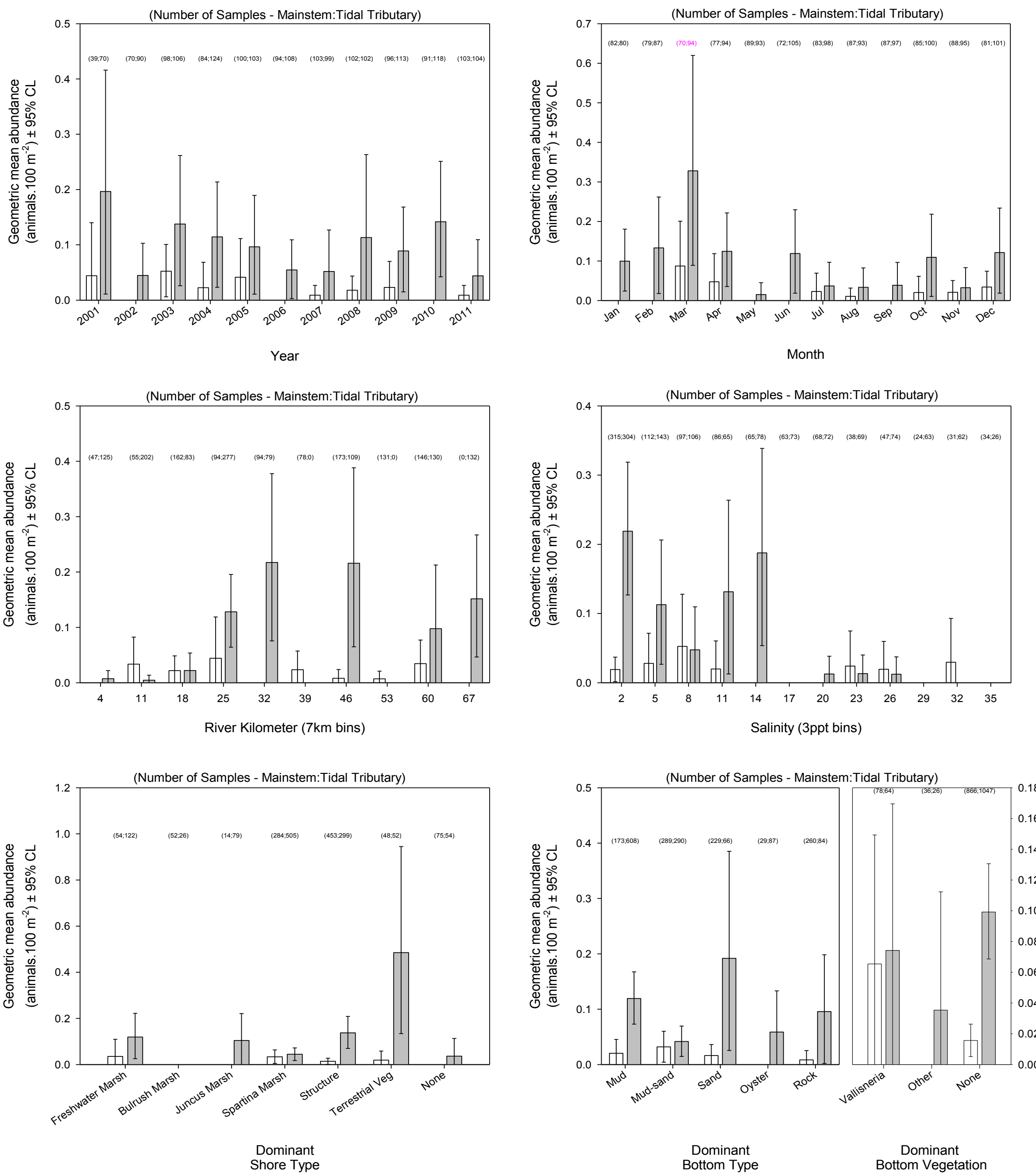
Appendix 4, Figure 4. Relative abundance of *Brevoortia* spp. (menhaden), 20 to 34 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Lucania parva (Rainwater killifish) in 21.3-m seines



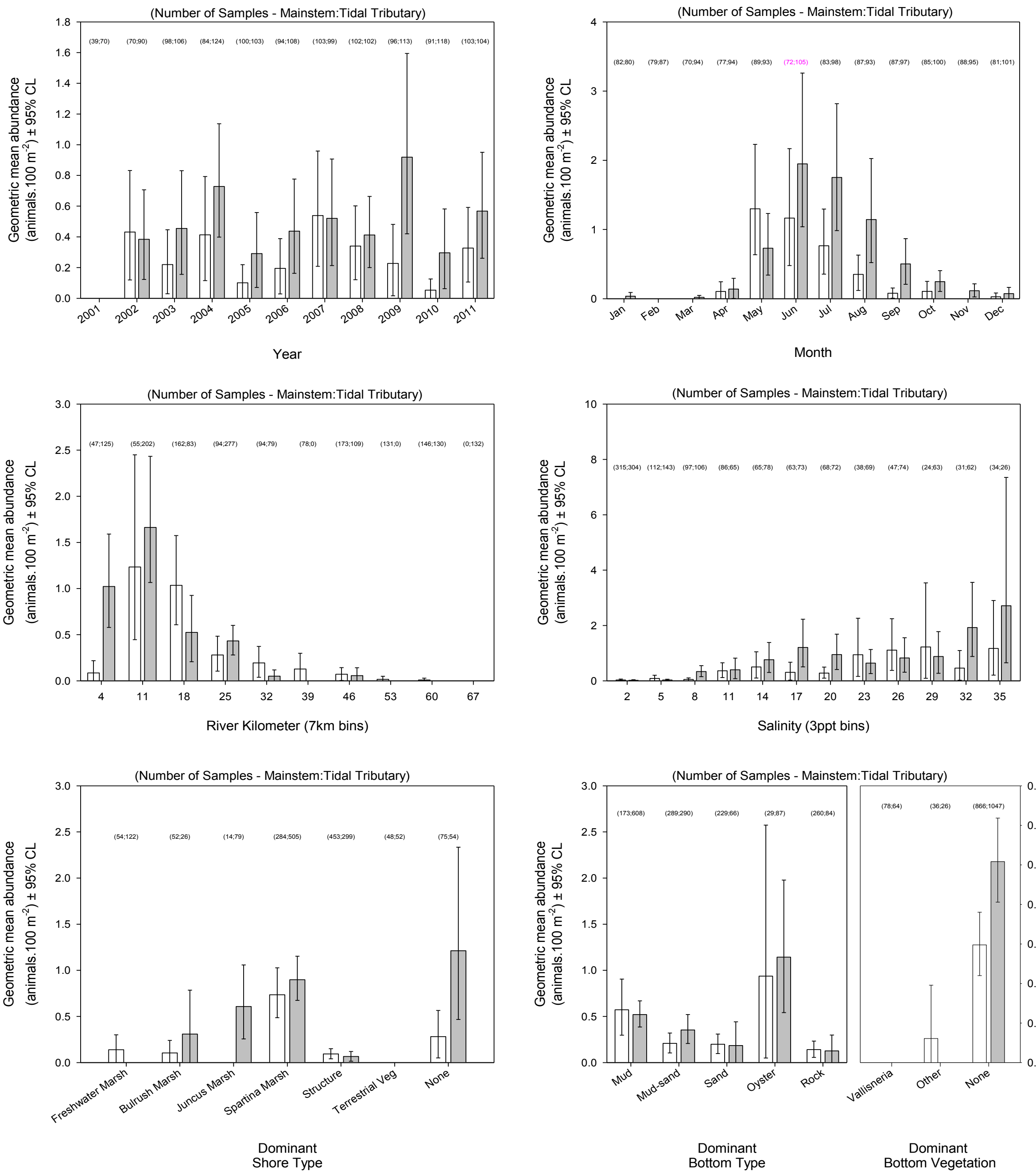
Appendix 4, Figure 5. Relative abundance of *Lucania parva* (rainwater killifish), 16 to 19 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Gambusia holbrooki (Eastern mosquito fish) in 21.3-m seines



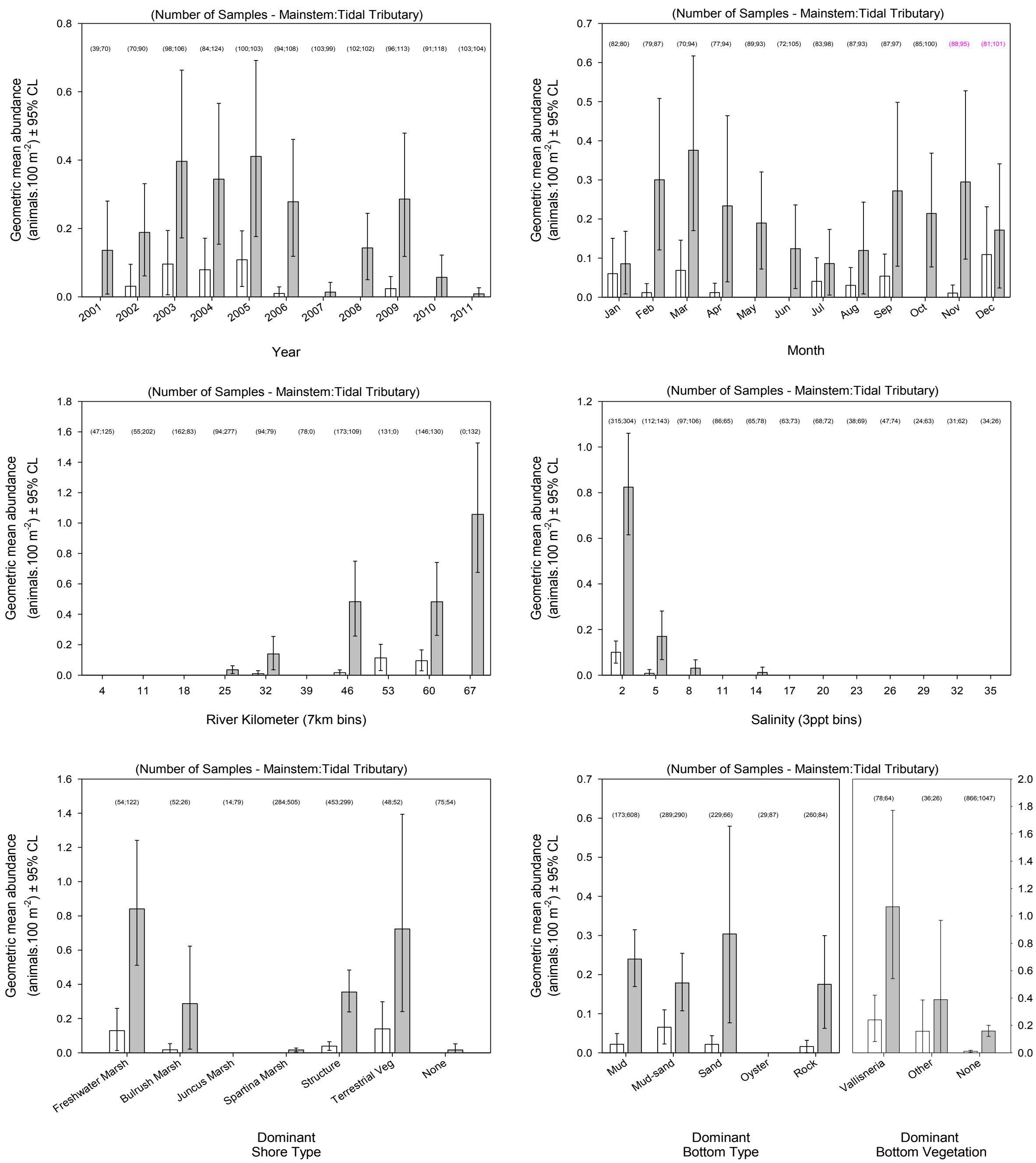
Appendix 4, Figure 6. Relative abundance of *Gambusia holbrooki* (Eastern mosquito fish), 18 to 21 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Menidia menidia (Atlantic silverside) in 21.3-m seines



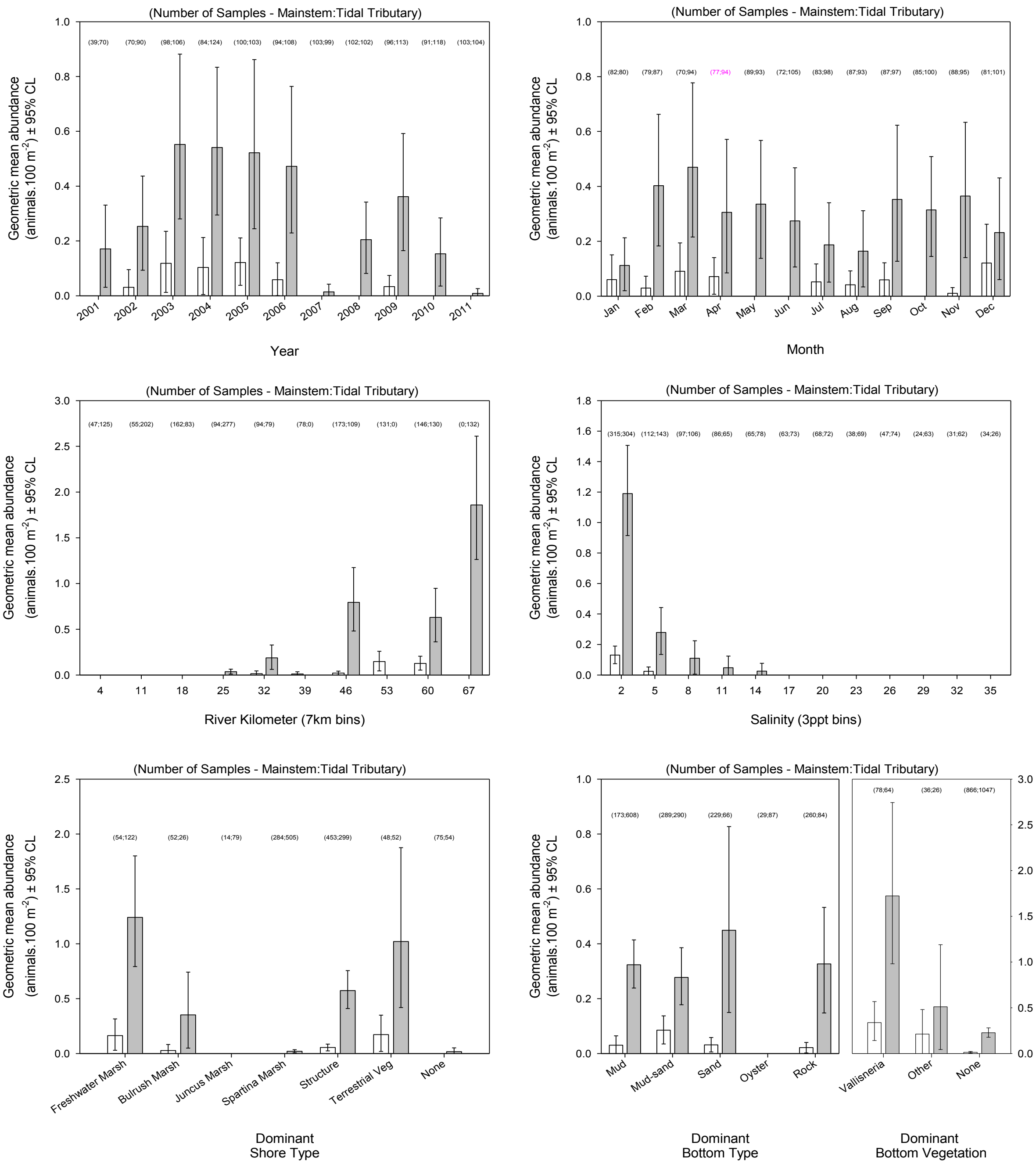
Appendix 4, Figure 7. Relative abundance of *Menidia menidia* (Atlantic silverside), 25 to 39 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Lepomis macrochirus (Bluegill) in 21.3-m seines



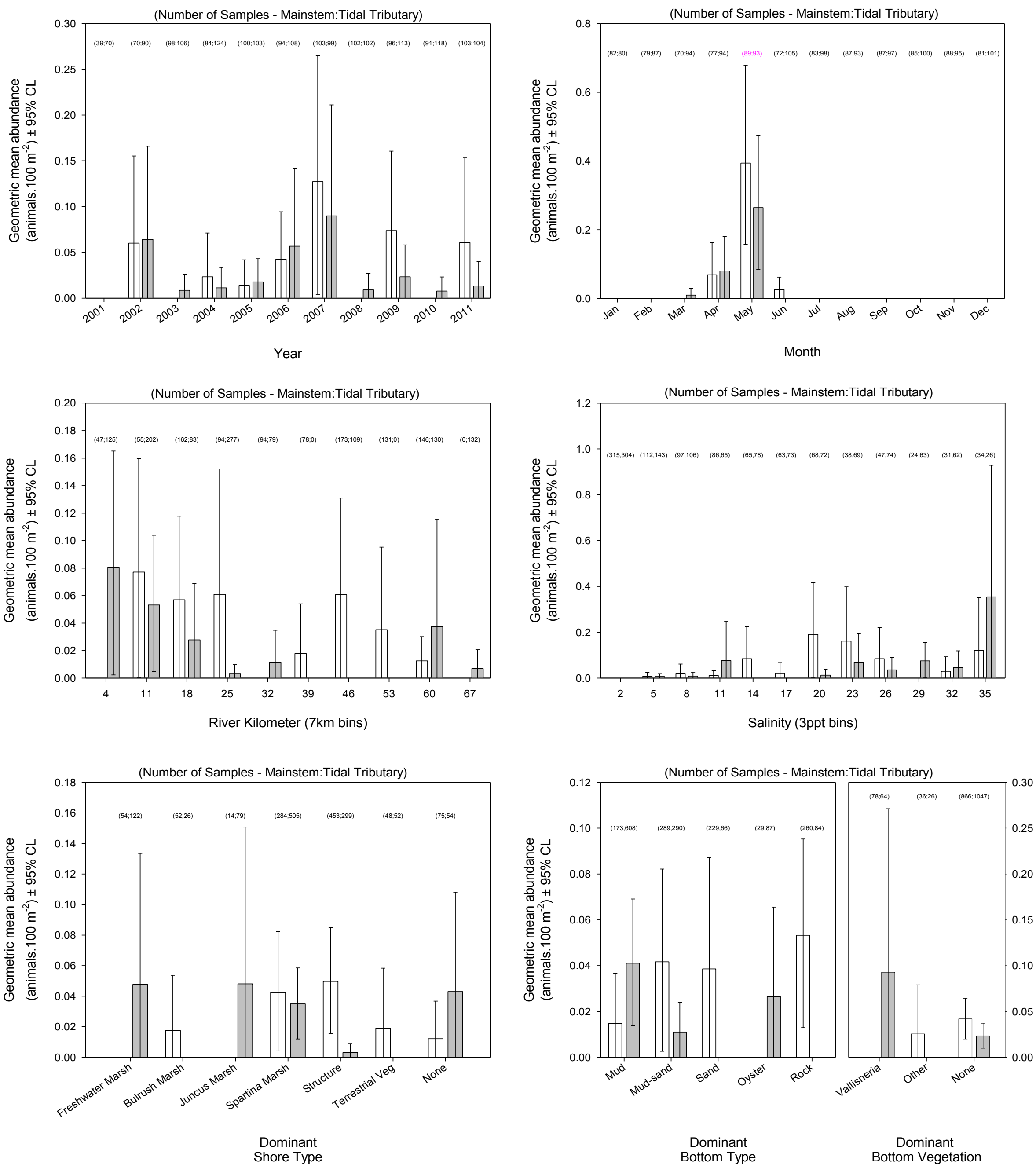
Appendix 4, Figure 8. Relative abundance of *Lepomis macrochirus* (bluegill), 20 to 49 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Lepomis macrochirus (Bluegill) in 21.3-m seines



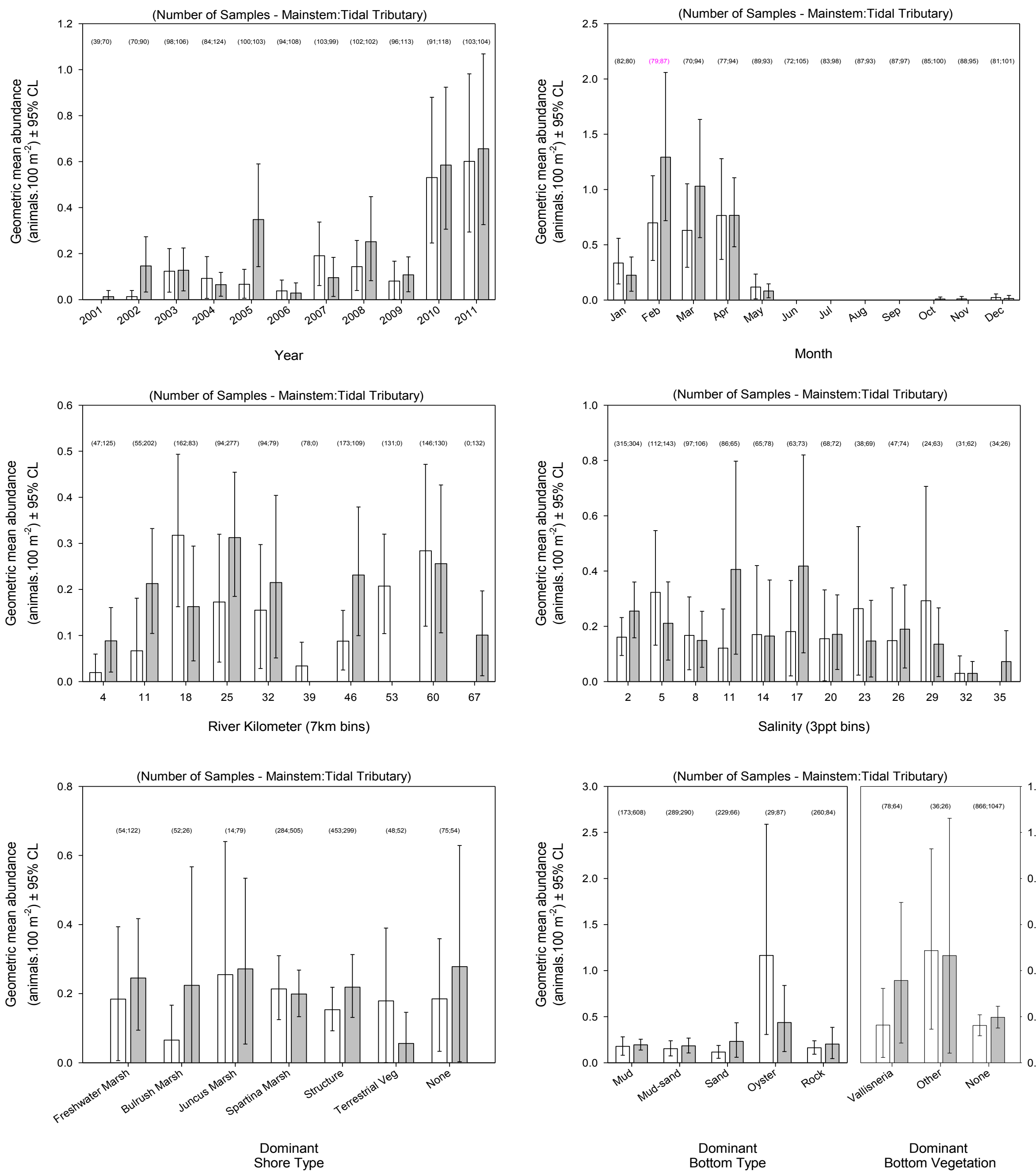
Appendix 4, Figure 9. Relative abundance of *Lepomis macrochirus* (bluegill), 20 to 69 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Orthopristis chrysoptera (Pigfish) in 21.3-m seines



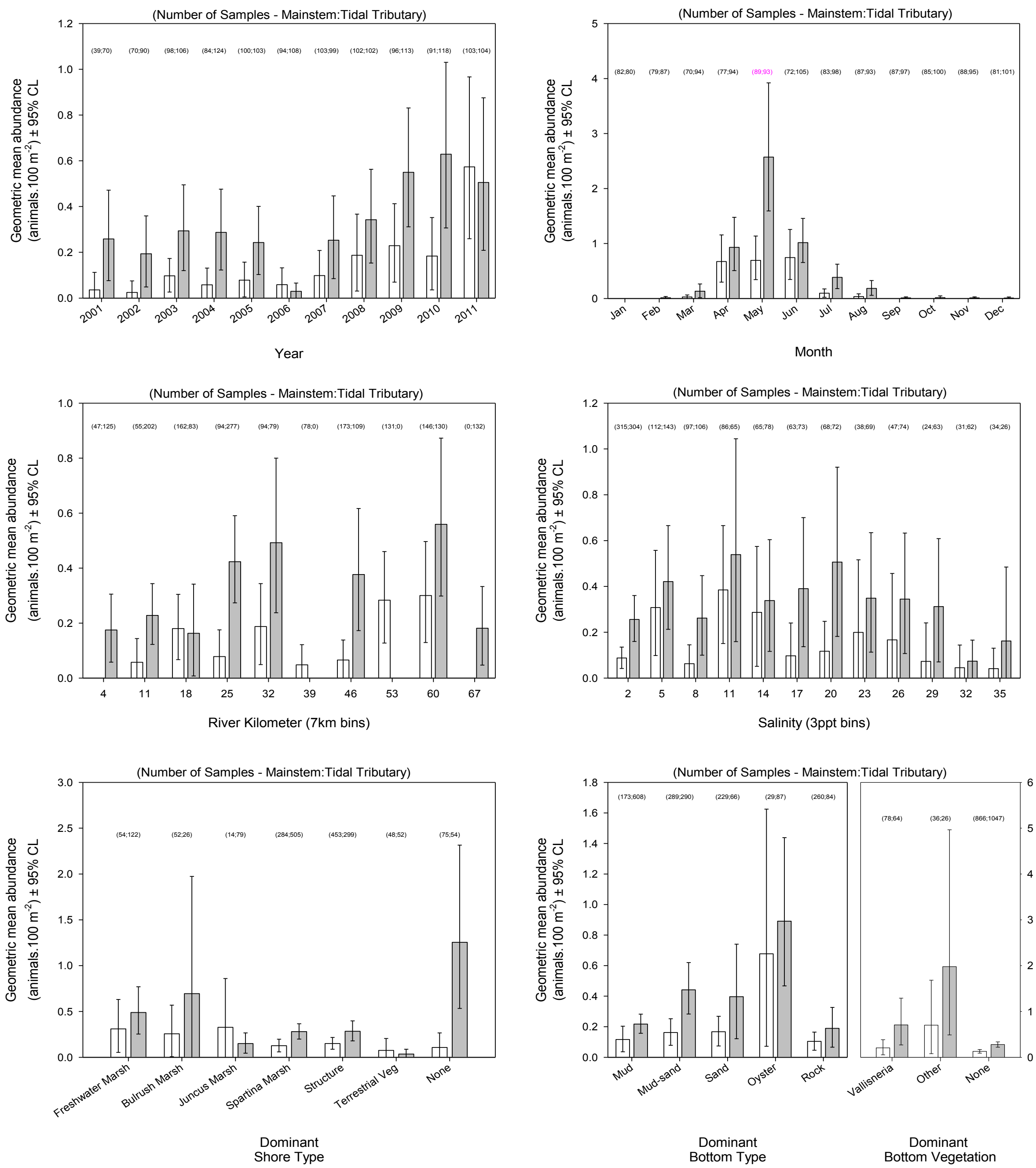
Appendix 4, Figure 10. Relative abundance of *Orthopristis chrysoptera* (pigfish), 15 to 24 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Lagodon rhomboides (Pinfish) in 21.3-m seines



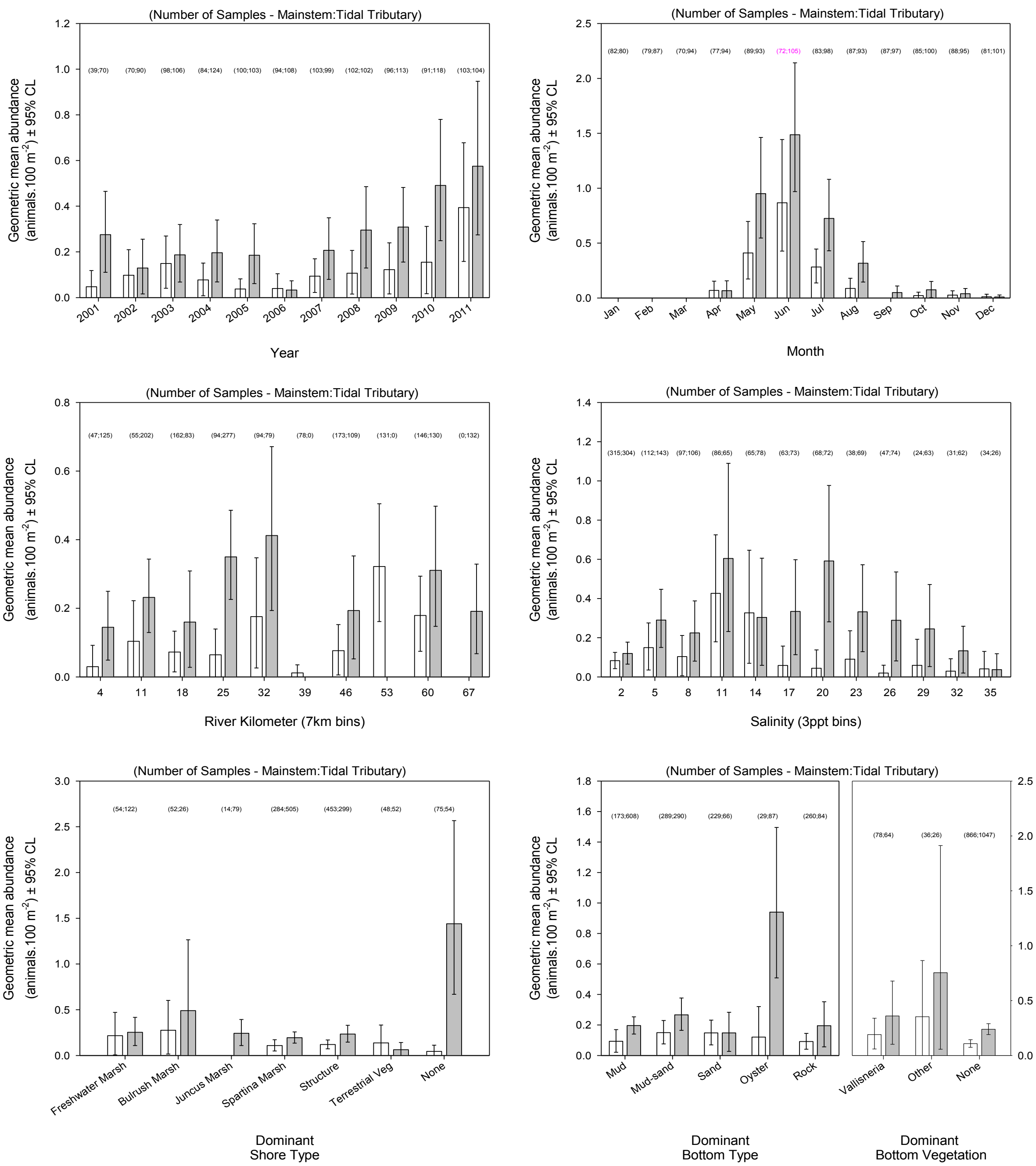
Appendix 4, Figure 11. Relative abundance of *Lagodon rhomboides* (pinfish), 10 to 24 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Lagodon rhomboides (Pinfish) in 21.3-m seines



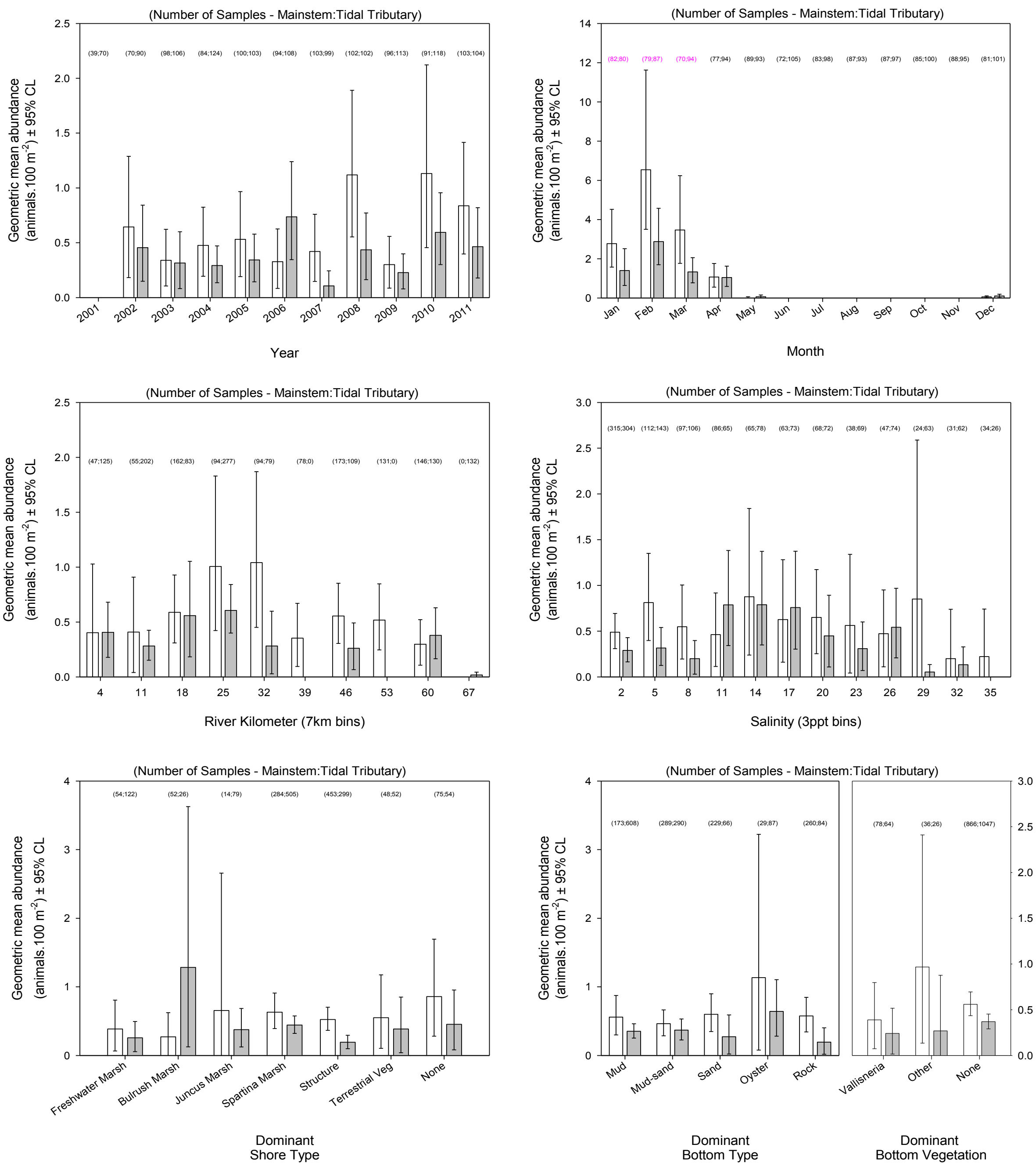
Appendix 4, Figure 12. Relative abundance of *Lagodon rhomboides* (pinfish), 30 to 54 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Lagodon rhomboides (Pinfish) in 21.3-m seines



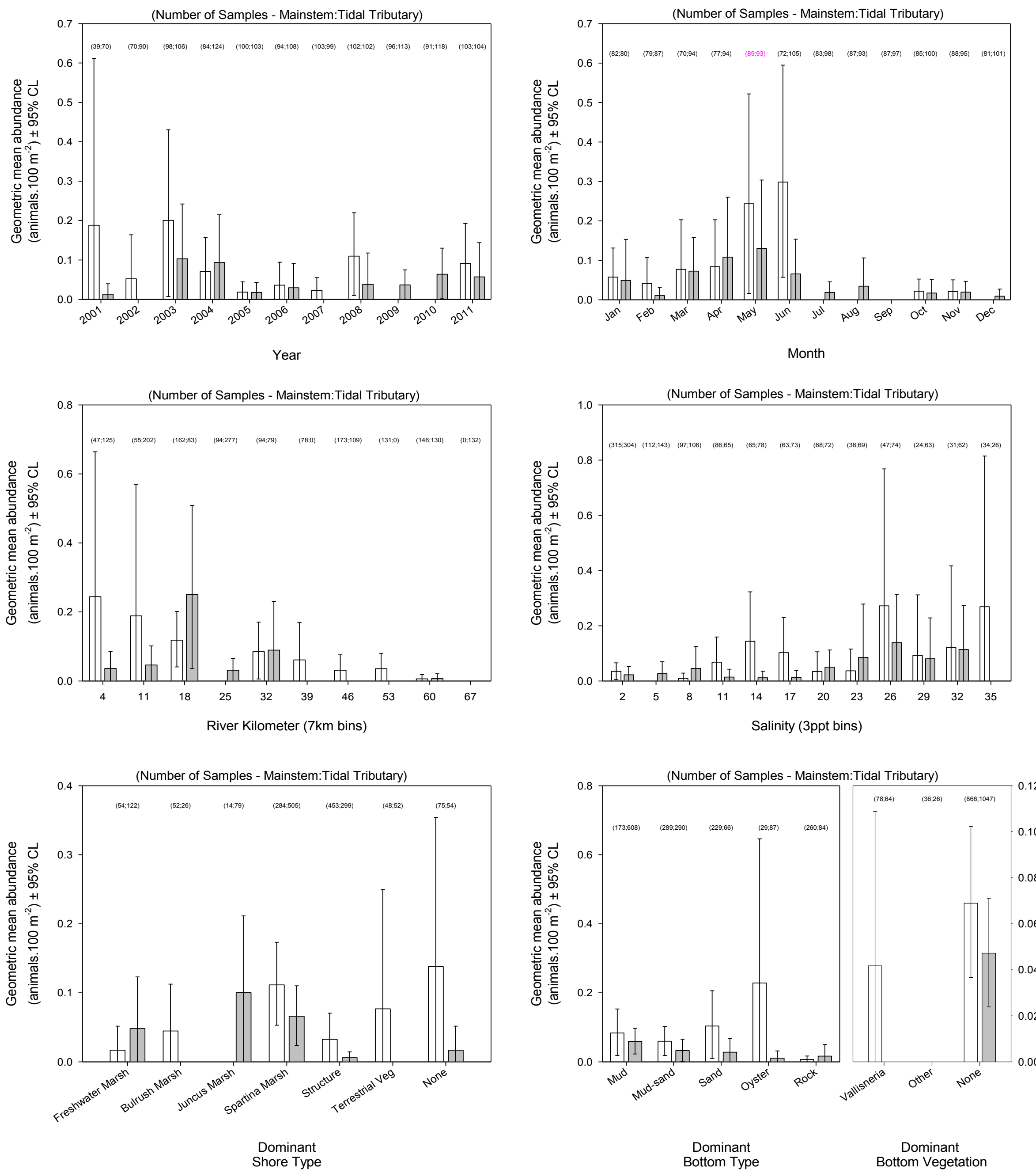
Appendix 4, Figure 13. Relative abundance of *Lagodon rhomboides* (pinfish), 50 to 64 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Mugil cephalus (Striped mullet) in 21.3-m seines



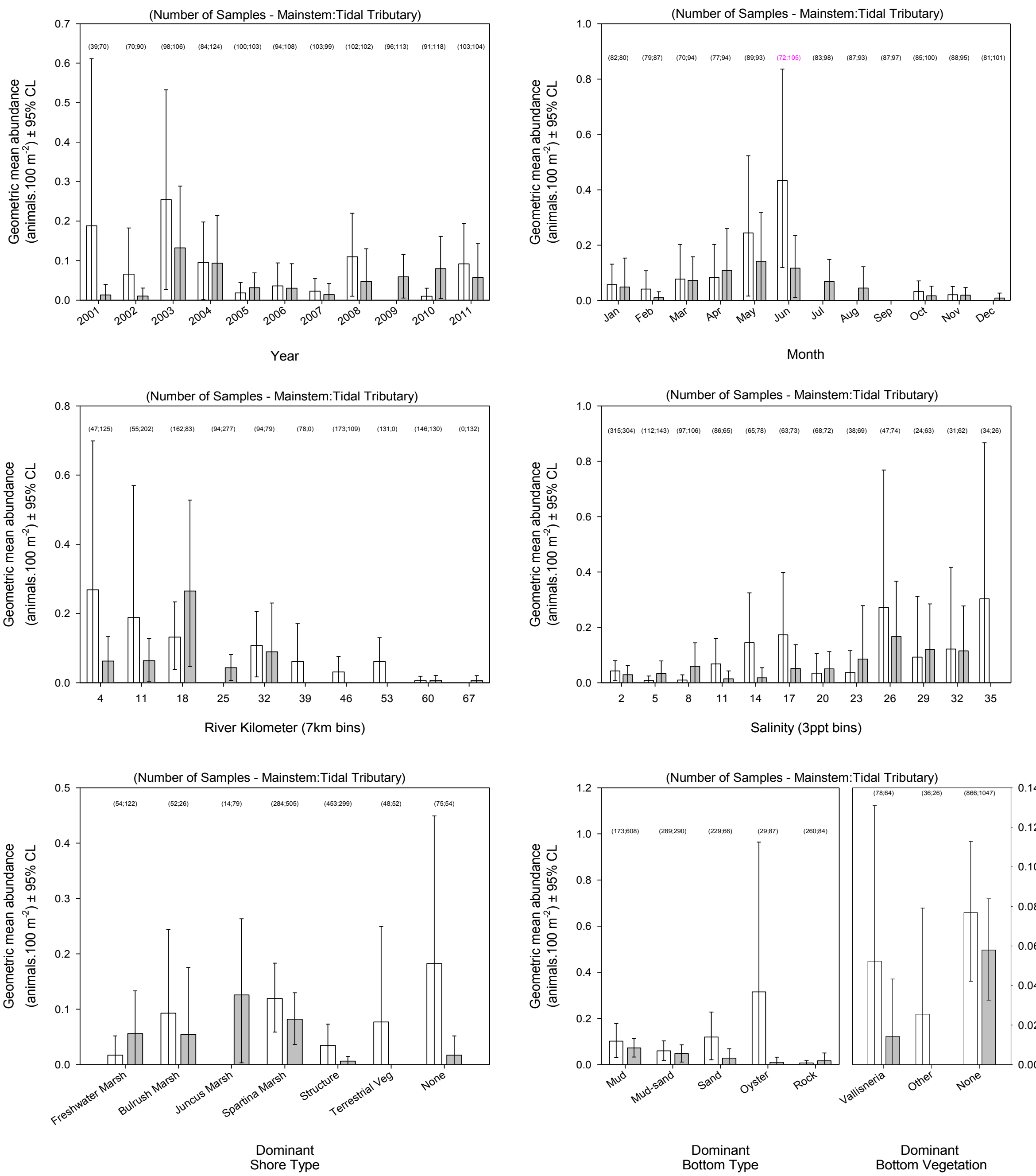
Appendix 4, Figure 14. Relative abundance of *Mugil cephalus* (striped mullet), 20 to 24 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Mugil curema (White mullet) in 21.3-m seines



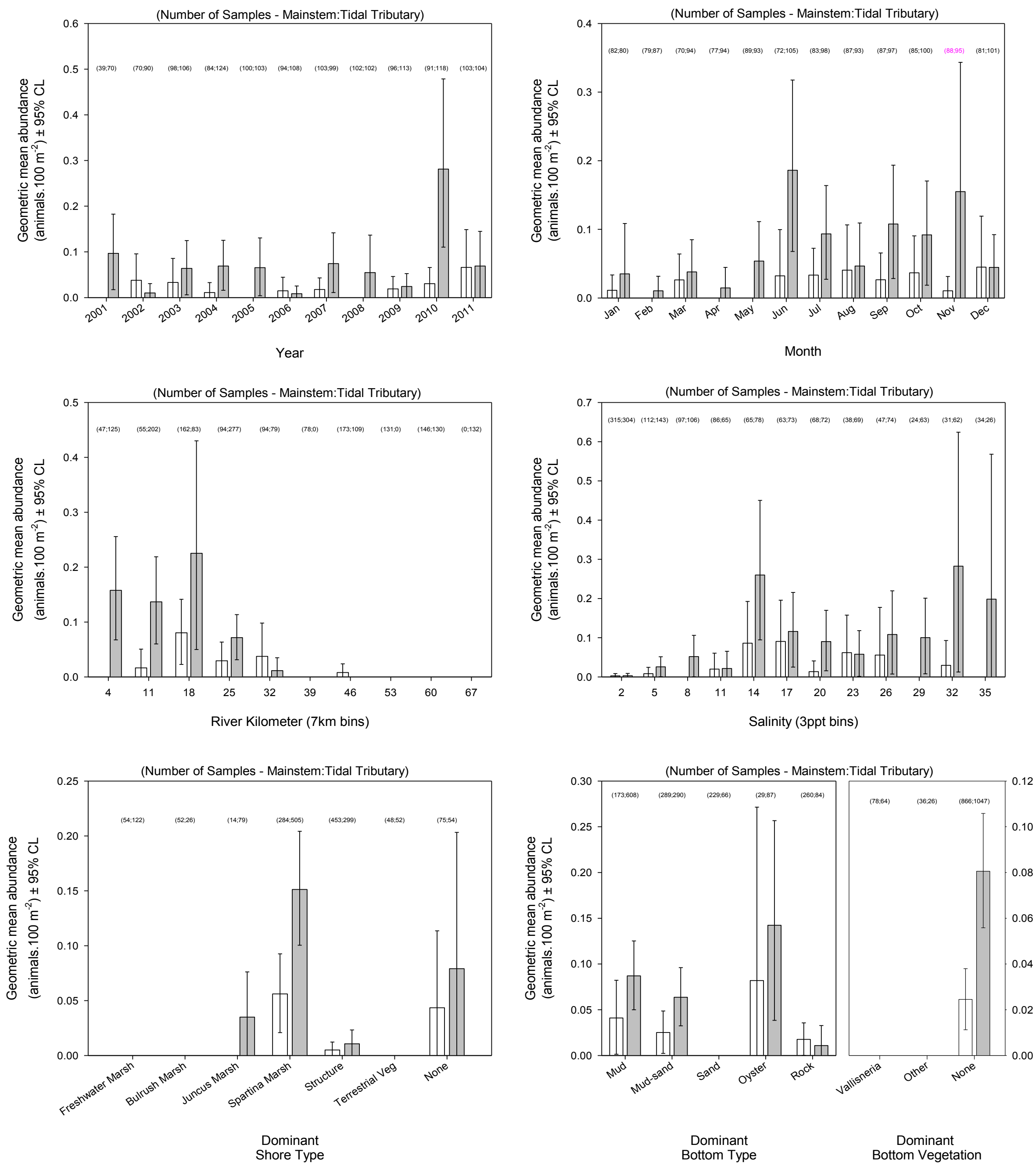
Appendix 4, Figure 15. Relative abundance of *Mugil curema* (white mullet), 20 to 29 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Mugil curema (White mullet) in 21.3-m seines



Appendix 4, Figure 16. Relative abundance of *Mugil curema* (white mullet), 20 to 39 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

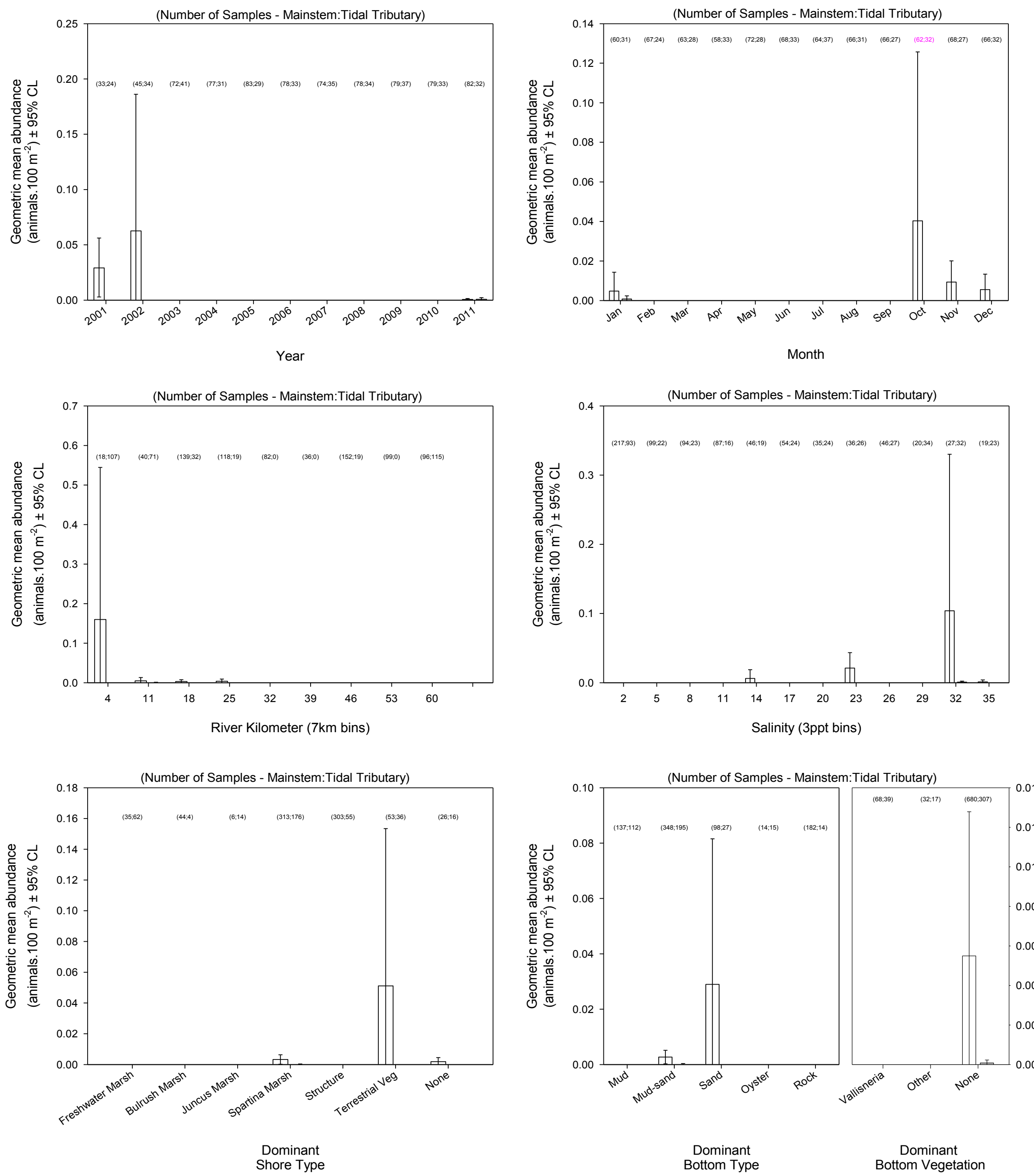
Symphurus plagiusa (Blackcheek tonguefish) in 21.3-m seines



Appendix 4, Figure 17. Relative abundance of *Symphurus plagiusa* (blackcheek tonguefish), 20 to 34 mm standard length, collected with 21.3-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

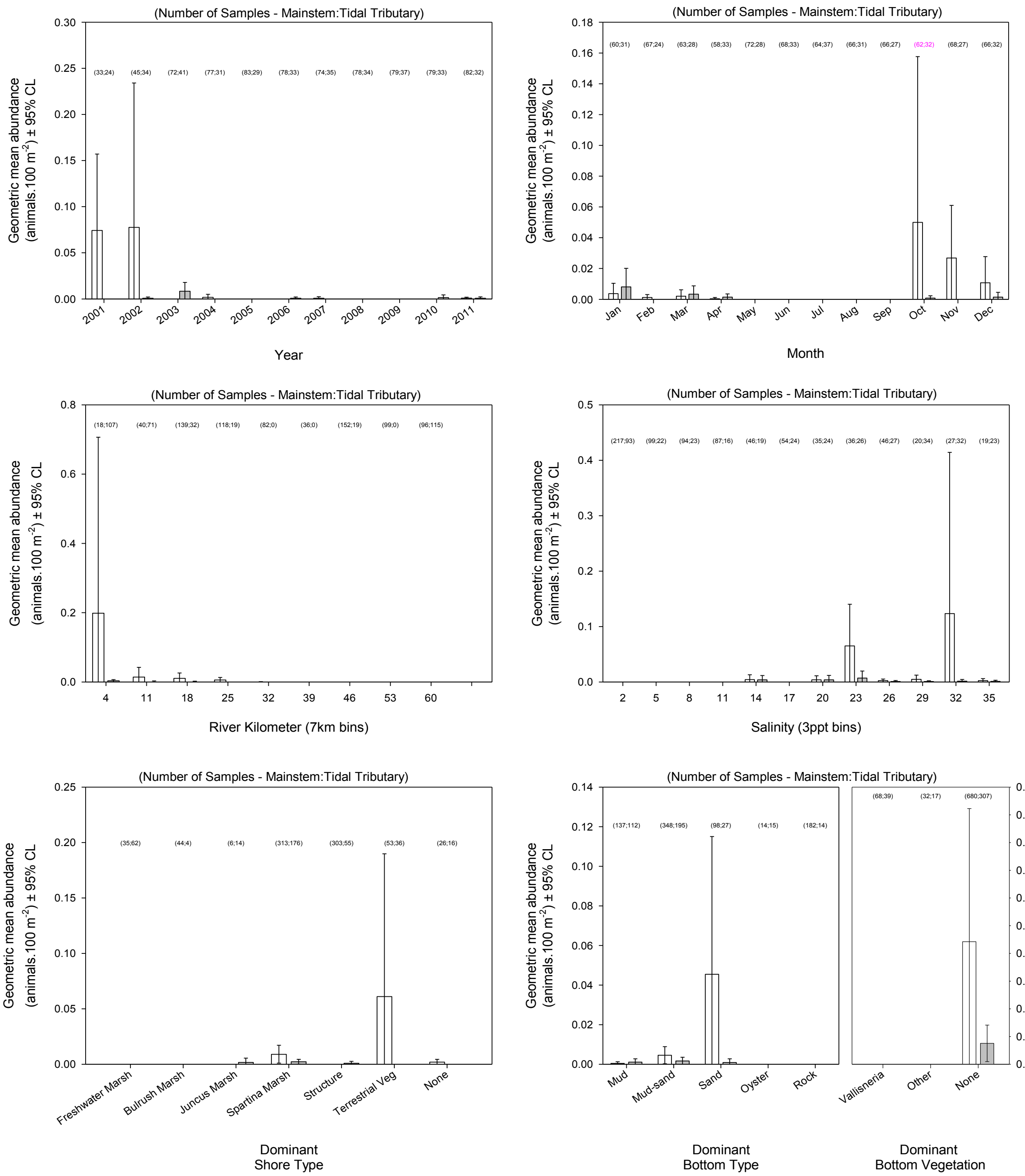
APPENDIX 5: Catch overview plots for 183-m seines

Stomolophus meleagris (Cannonball jellyfish) in 183-m seines



Appendix 5, Figure 1. Relative abundance of *Stomolophus meleagris* (cannonball jellyfish), 50 to 59 mm bell diameter, collected with 183-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Stomolophus meleagris (Cannonball jellyfish) in 183-m seines



Appendix 5, Figure 2. Relative abundance of *Stomolophus meleagris* (cannonball jellyfish), 60 to 79 mm bell diameter, collected with 183-m seines in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

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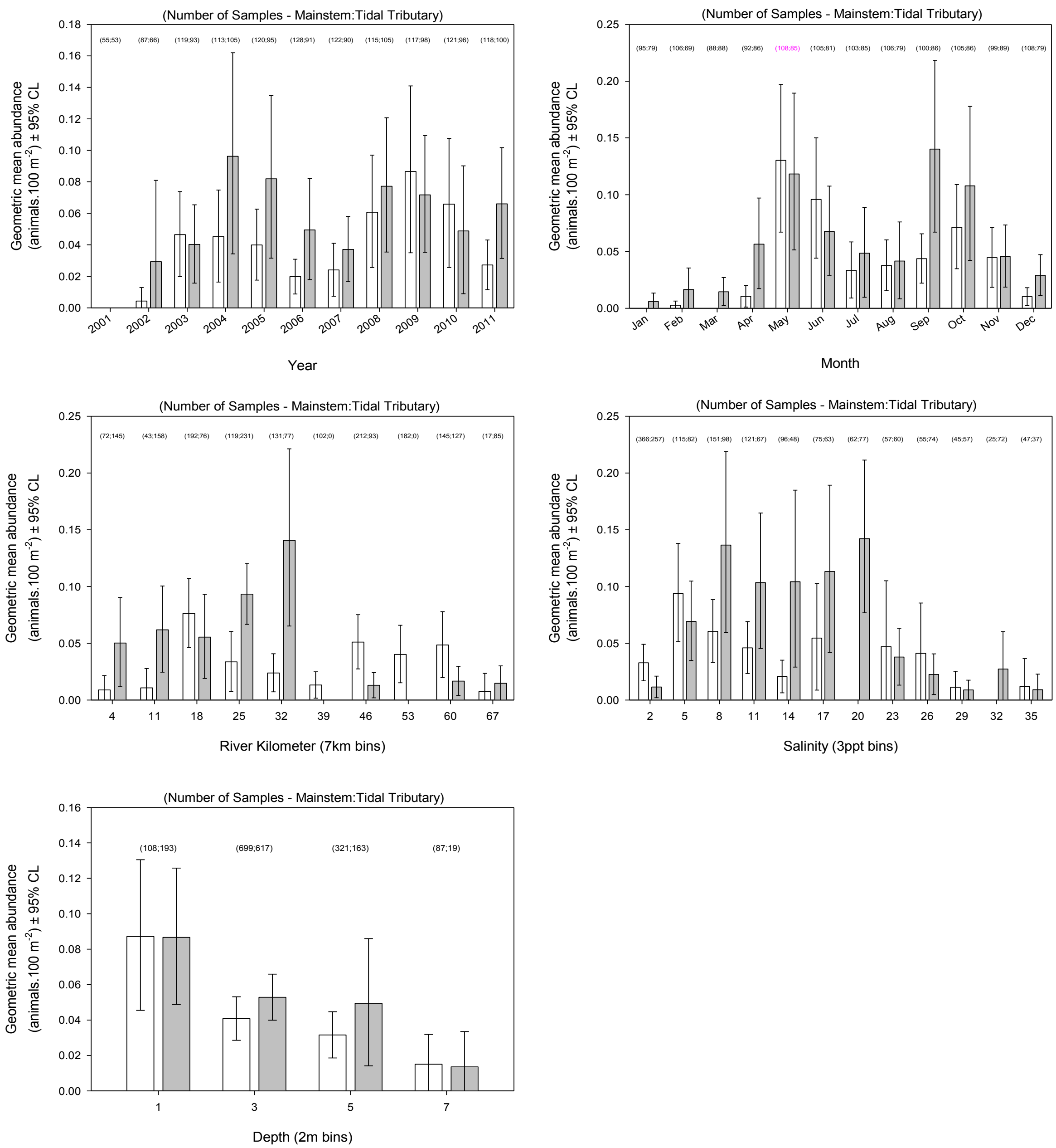
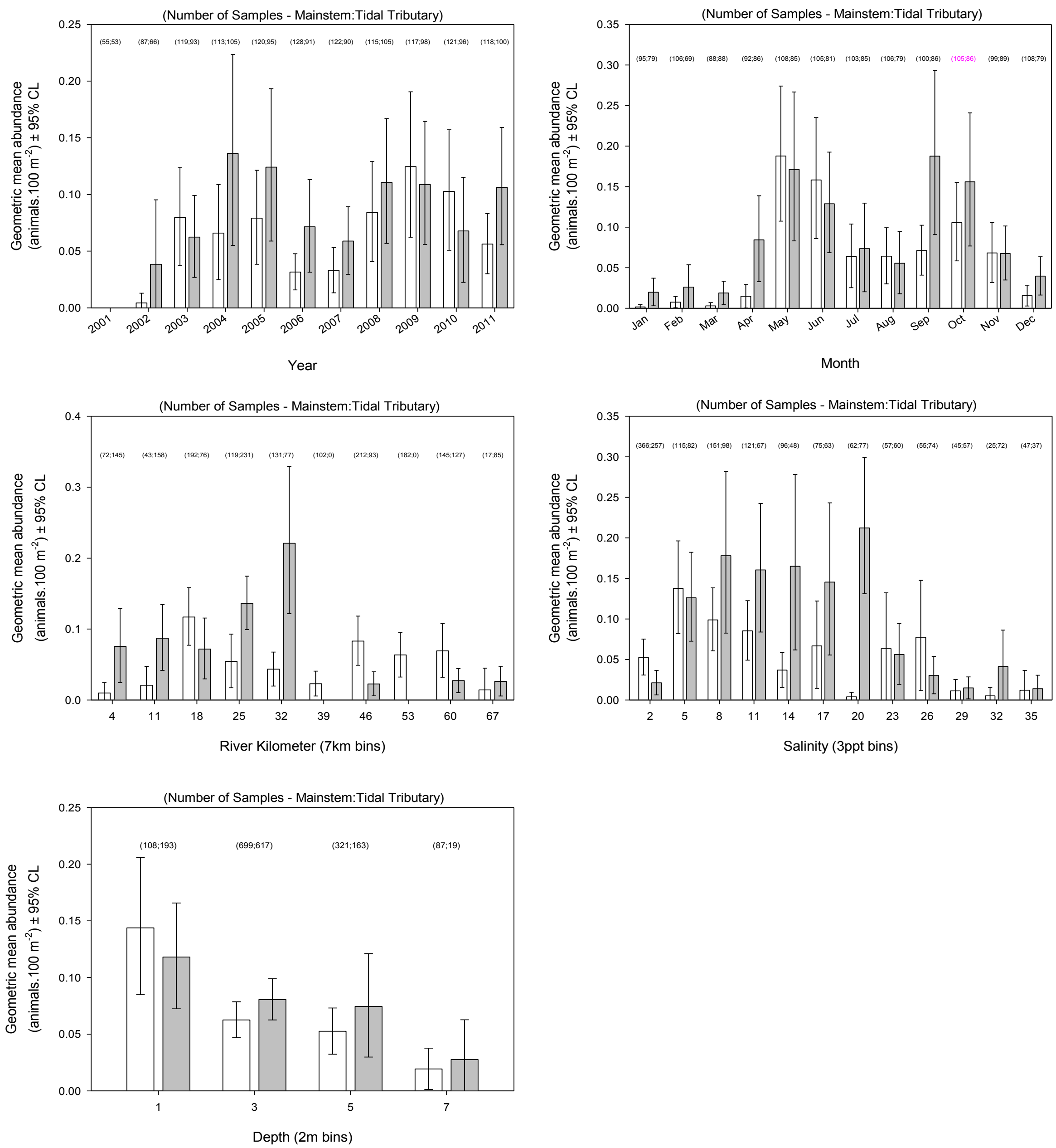
APPENDIX 6: Catch overview plots for 6.1-m otter trawls

Farfantepenaeus spp. (Commercial shrimp) in 6.1-m trawls



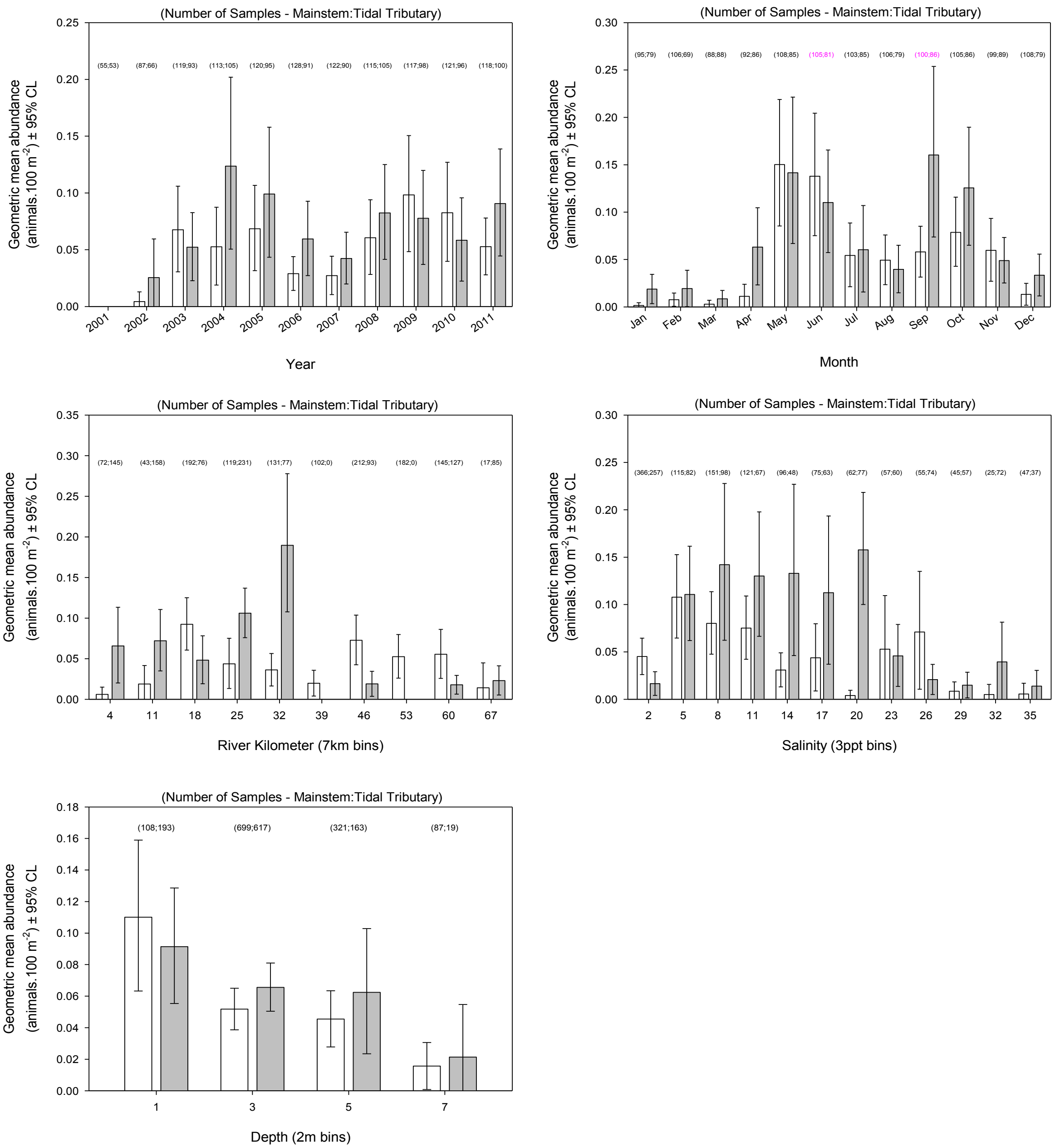
Appendix 6, Figure 1. Relative abundance of *Farfantepenaeus* spp. (commercial shrimp), 6 to 9 mm post-orbital head length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Farfantepenaeus spp. (Commercial shrimp) in 6.1-m trawls



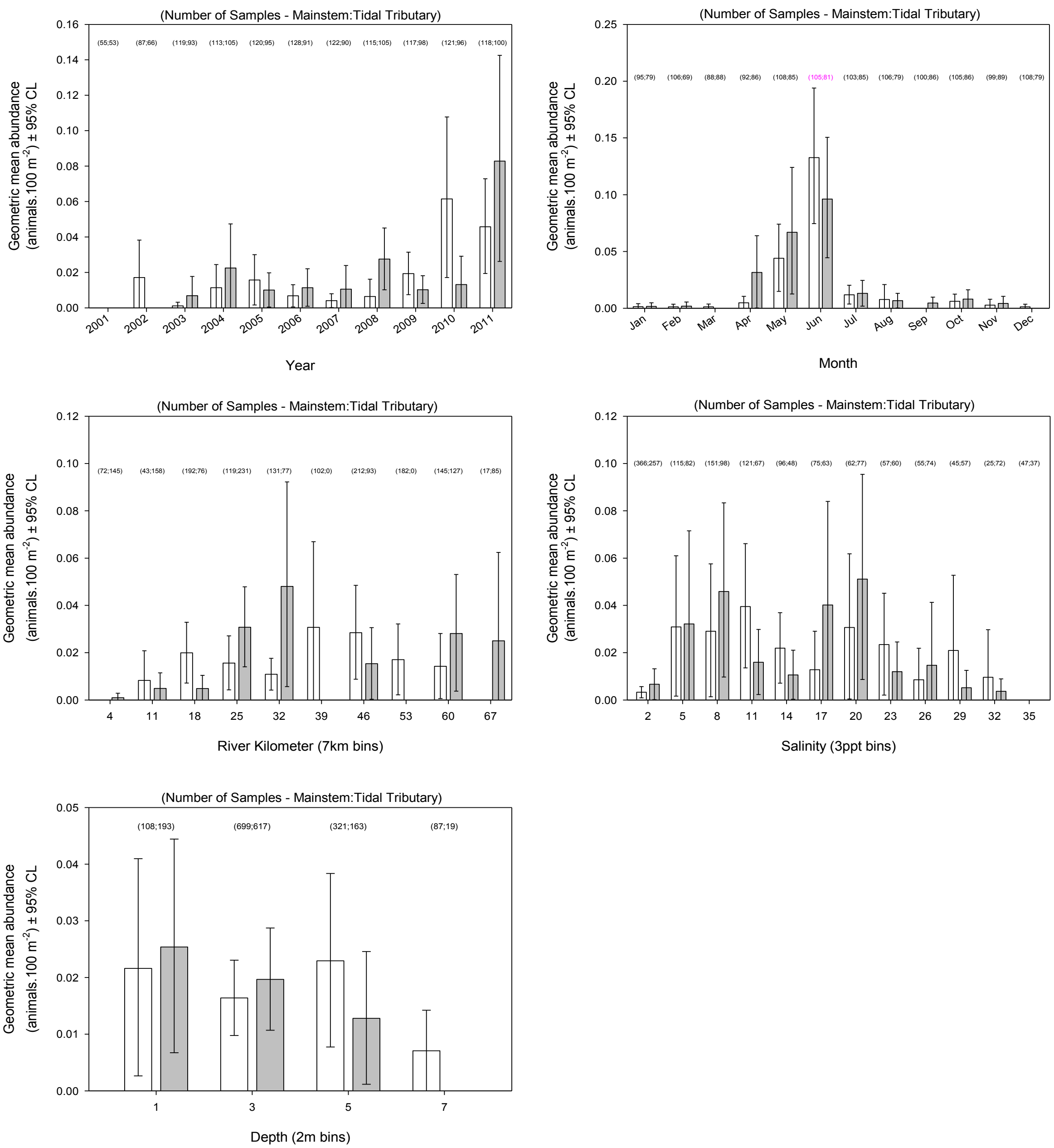
Appendix 6, Figure 2. Relative abundance of *Farfantepenaeus* spp. (commercial shrimp), 6 to 11 mm post-orbital head length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Farfantepenaeus spp. (Commercial shrimp) in 6.1-m trawls



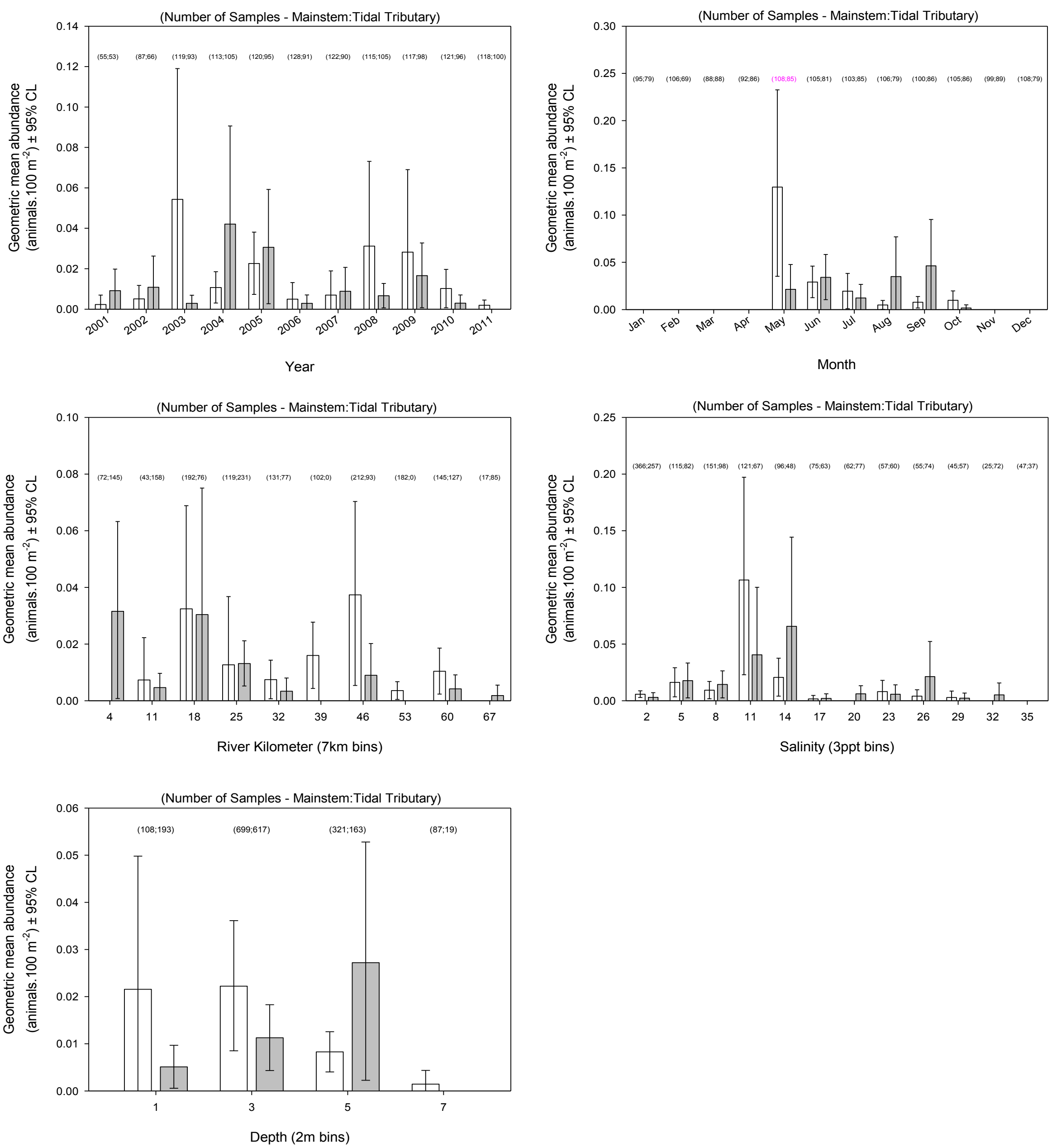
Appendix 6, Figure 3. Relative abundance of *Farfantepenaeus* spp. (commercial shrimp), 8 to 11 mm post-orbital head length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Farfantepenaeus aztecus (Brown shrimp) in 6.1-m trawls



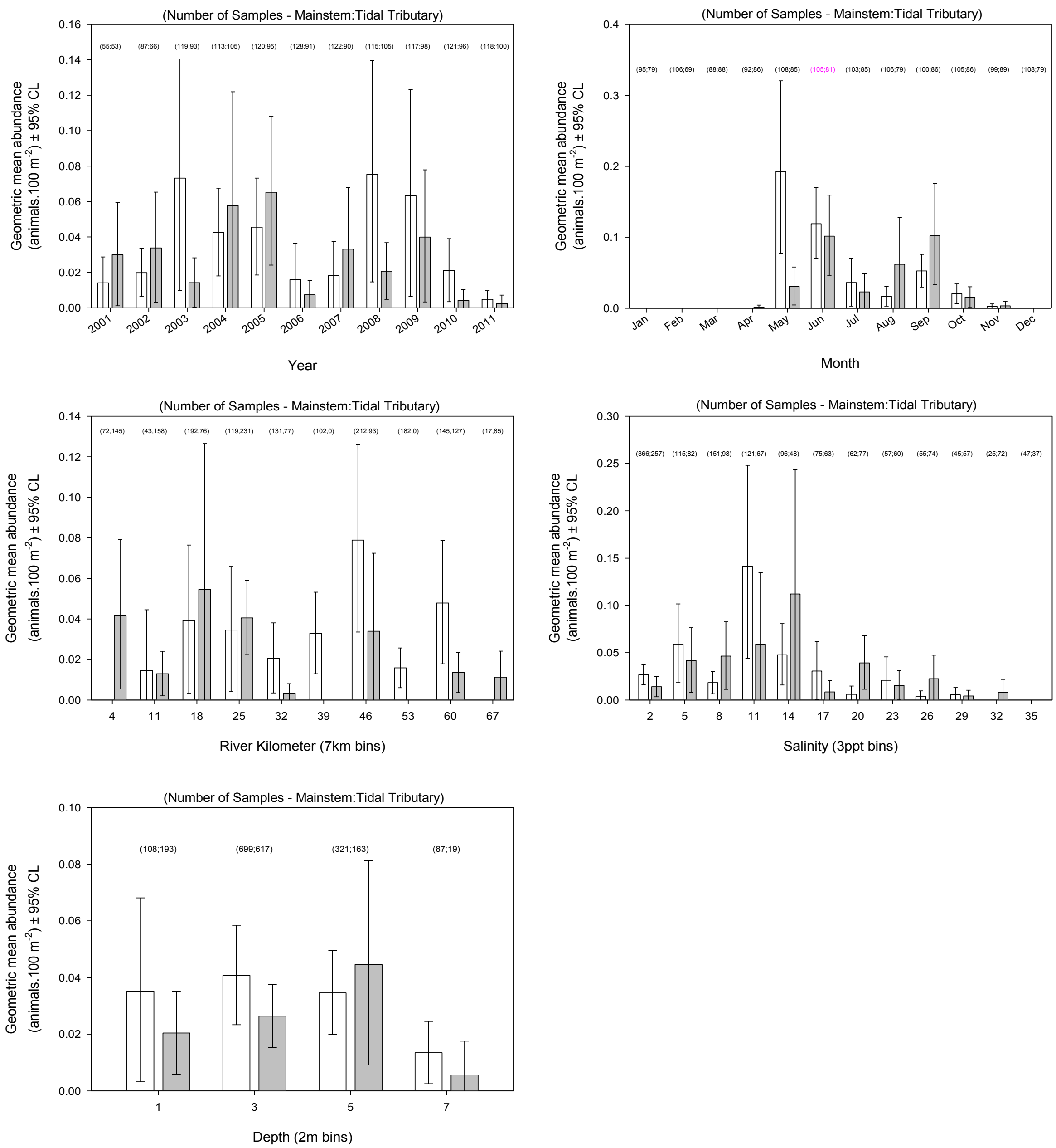
Appendix 6, Figure 4. Relative abundance of *Farfantepenaeu*s *aztecus* (brown shrimp), 16 to 23 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Cynoscion complex (Cynoscion hybrid) in 6.1-m trawls



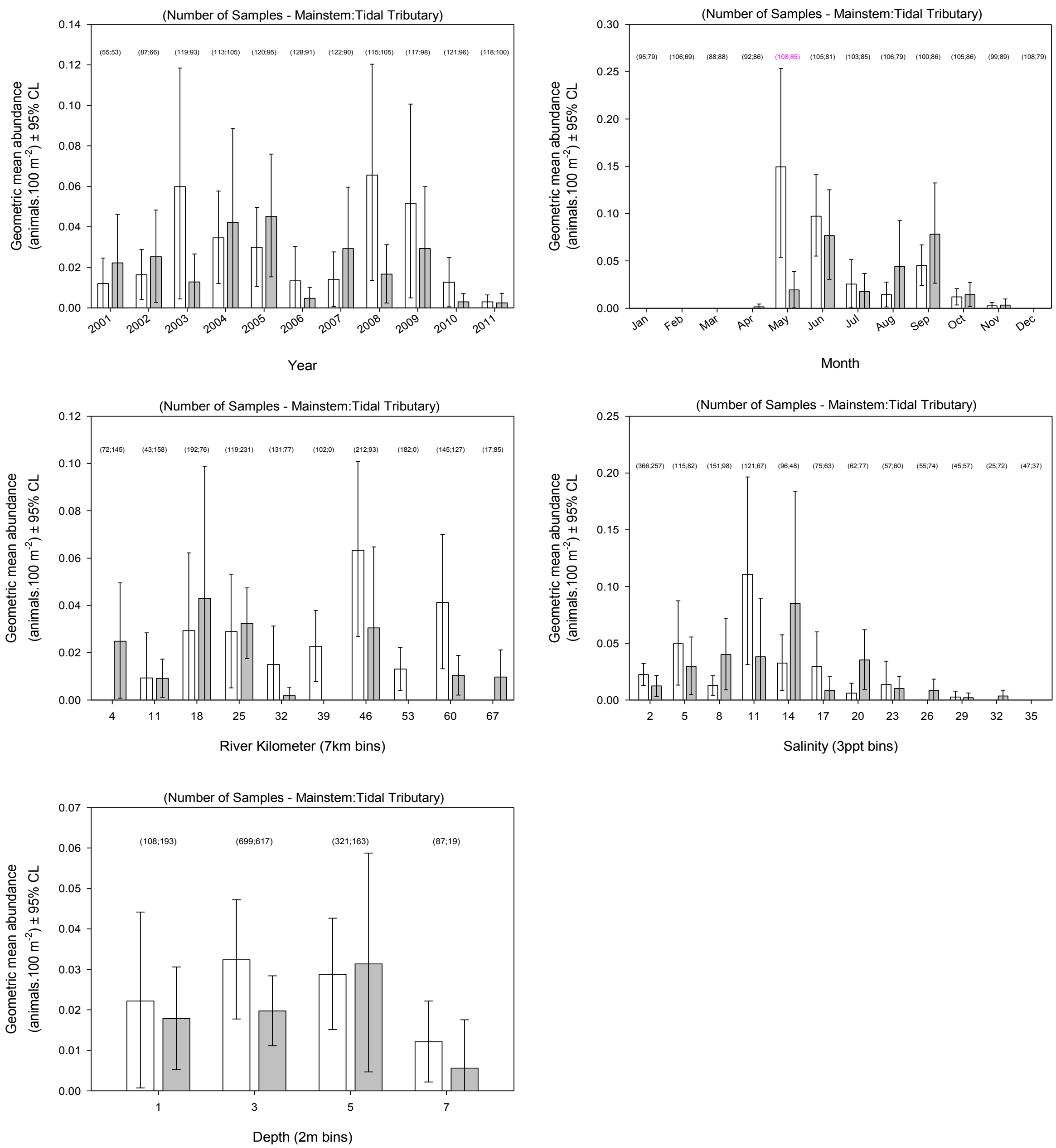
Appendix 6, Figure 5. Relative abundance of *Cynoscion* complex (*Cynoscion* hybrid), 10 to 19 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

Cynoscion complex (Cynoscion hybrid) in 6.1-m trawls



Appendix 6, Figure 6. Relative abundance of *Cynoscion* complex (*Cynoscion* hybrid), 15 to 29 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

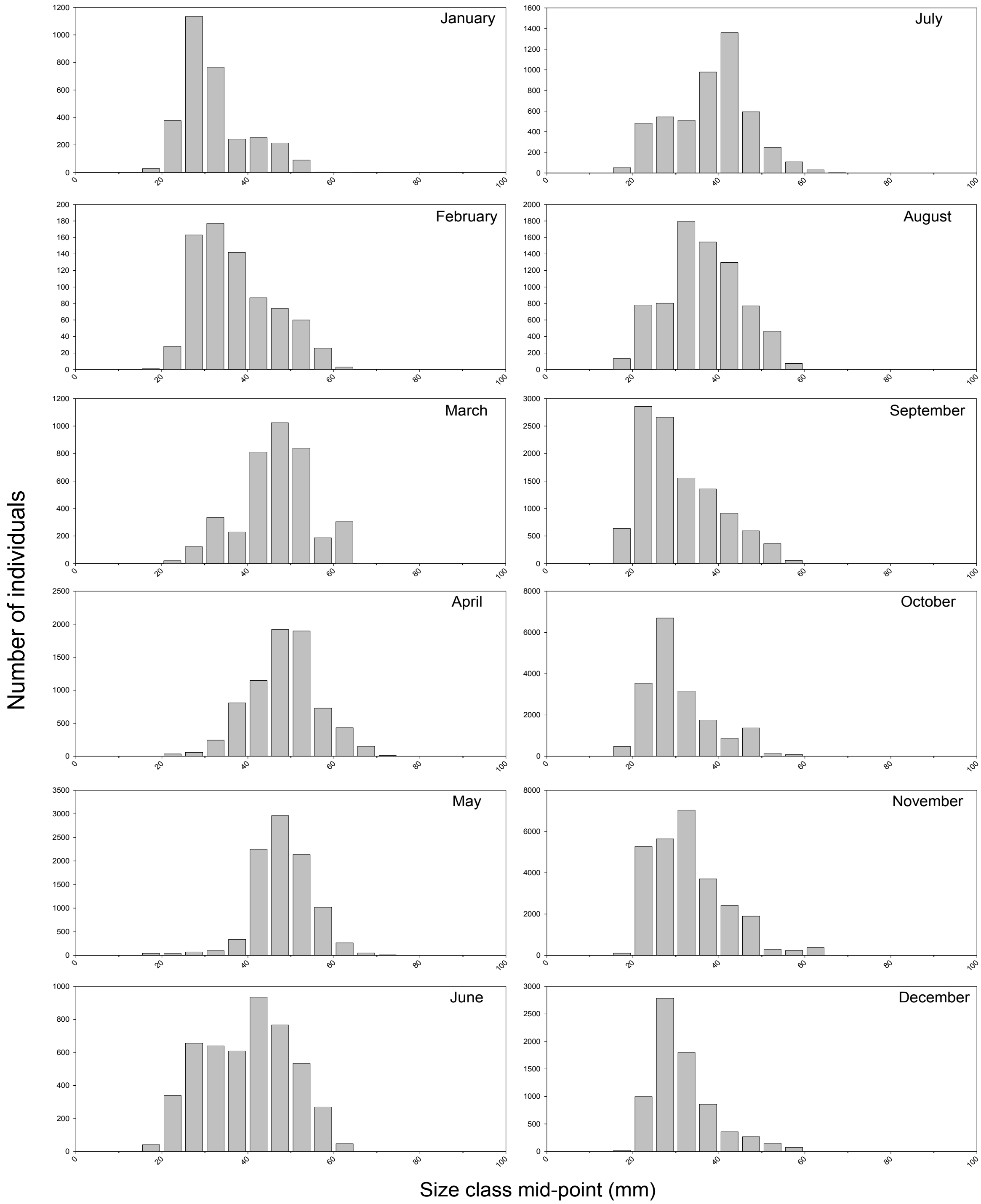
Cynoscion complex (Cynoscion hybrid) in 6.1-m trawls



Appendix 6, Figure 7. Relative abundance of *Cynoscion* complex (*Cynoscion* hybrid), 20 to 29 mm standard length, collected with 6.1-m trawls in the lower St. Johns River. Box: geometric mean relative abundance; error bars: 95% CI. White boxes represent mainstem (MS) collections while the gray boxes are tidal tributary (TT) collections.

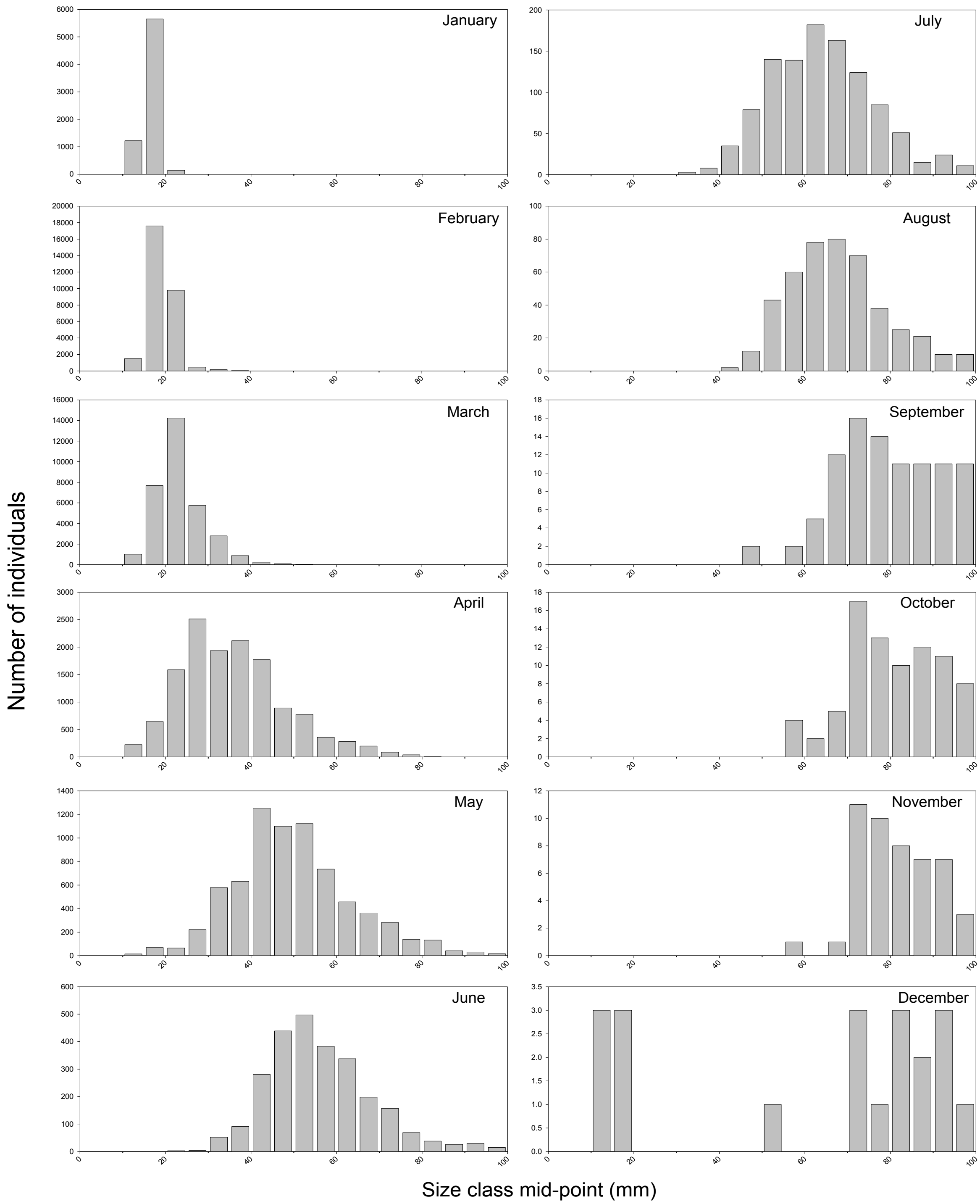
APPENDIX 7: Monthly length-frequency plots for 21.3-m seines

Anchoa mitchilli (Bay anchovy) in 21.3-m seines



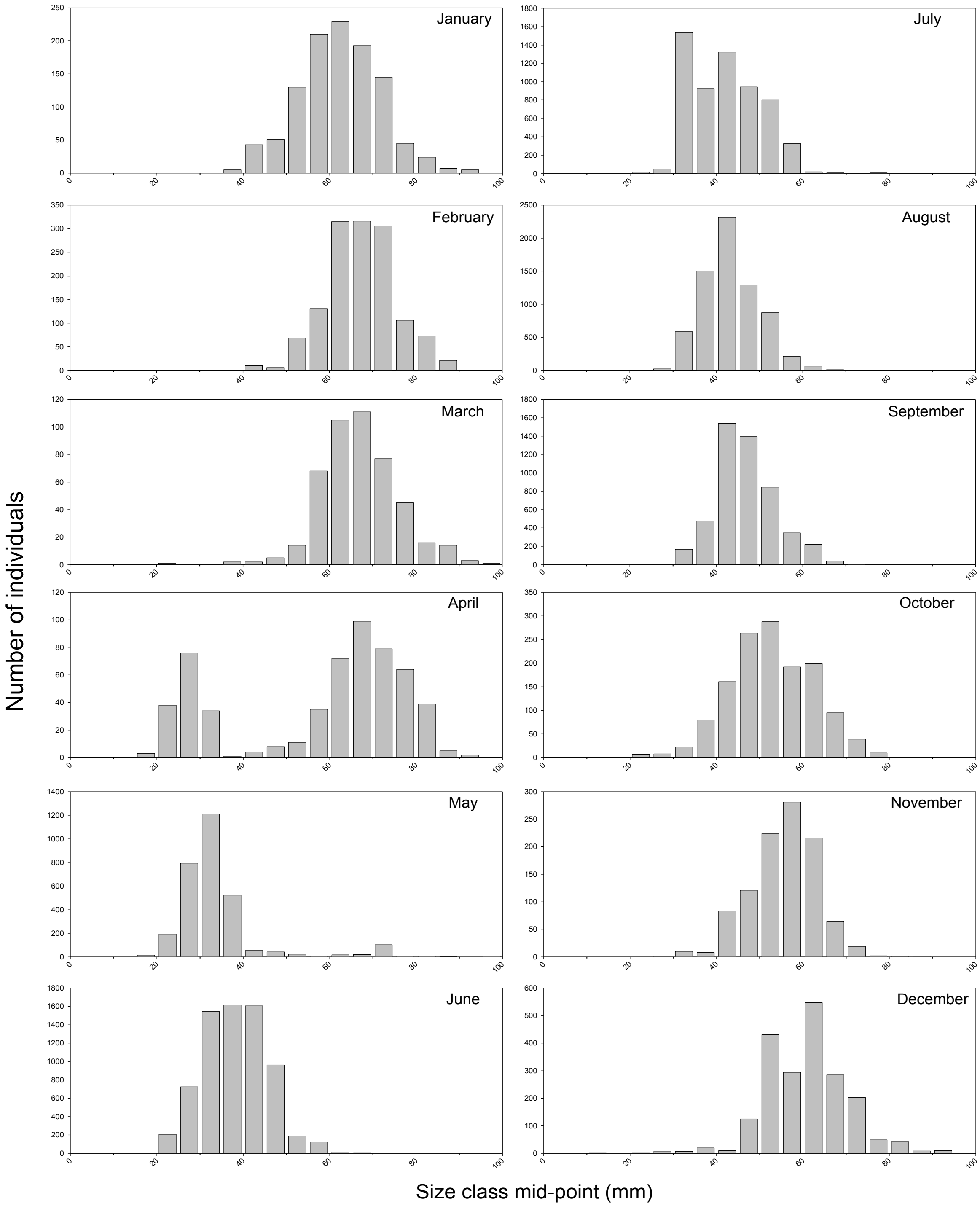
Appendix 7, Figure 1. Length frequencies of bay anchovy by month collected with 21.3-m seines in the lower St. Johns River.

Leiostomus xanthurus (Spot) in 21.3-m seines



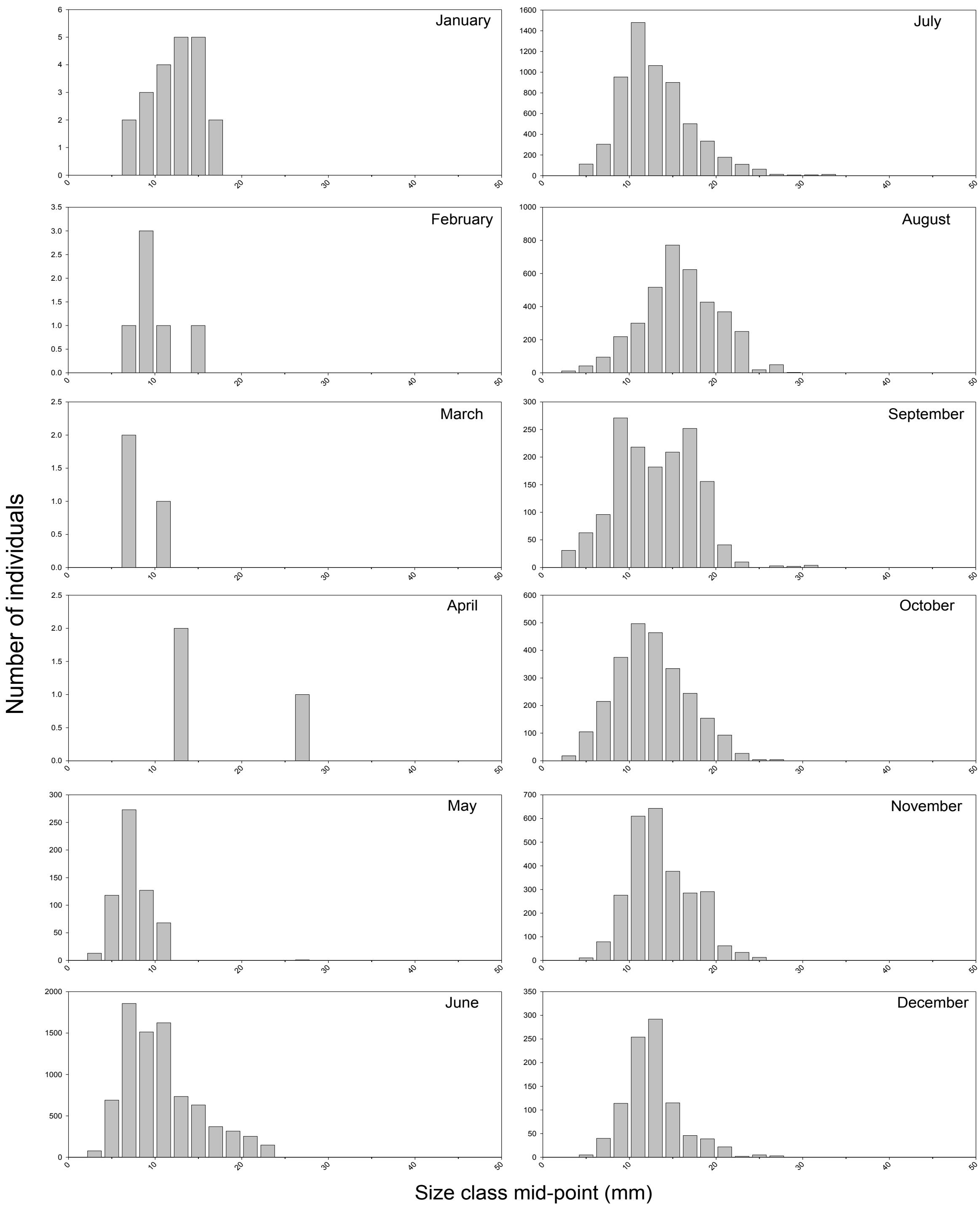
Appendix 7, Figure 2. Length frequencies of spot by month collected with 21.3-m seines in the lower St. Johns River.

Menidia menidia (Atlantic silverside) in 21.3-m seines



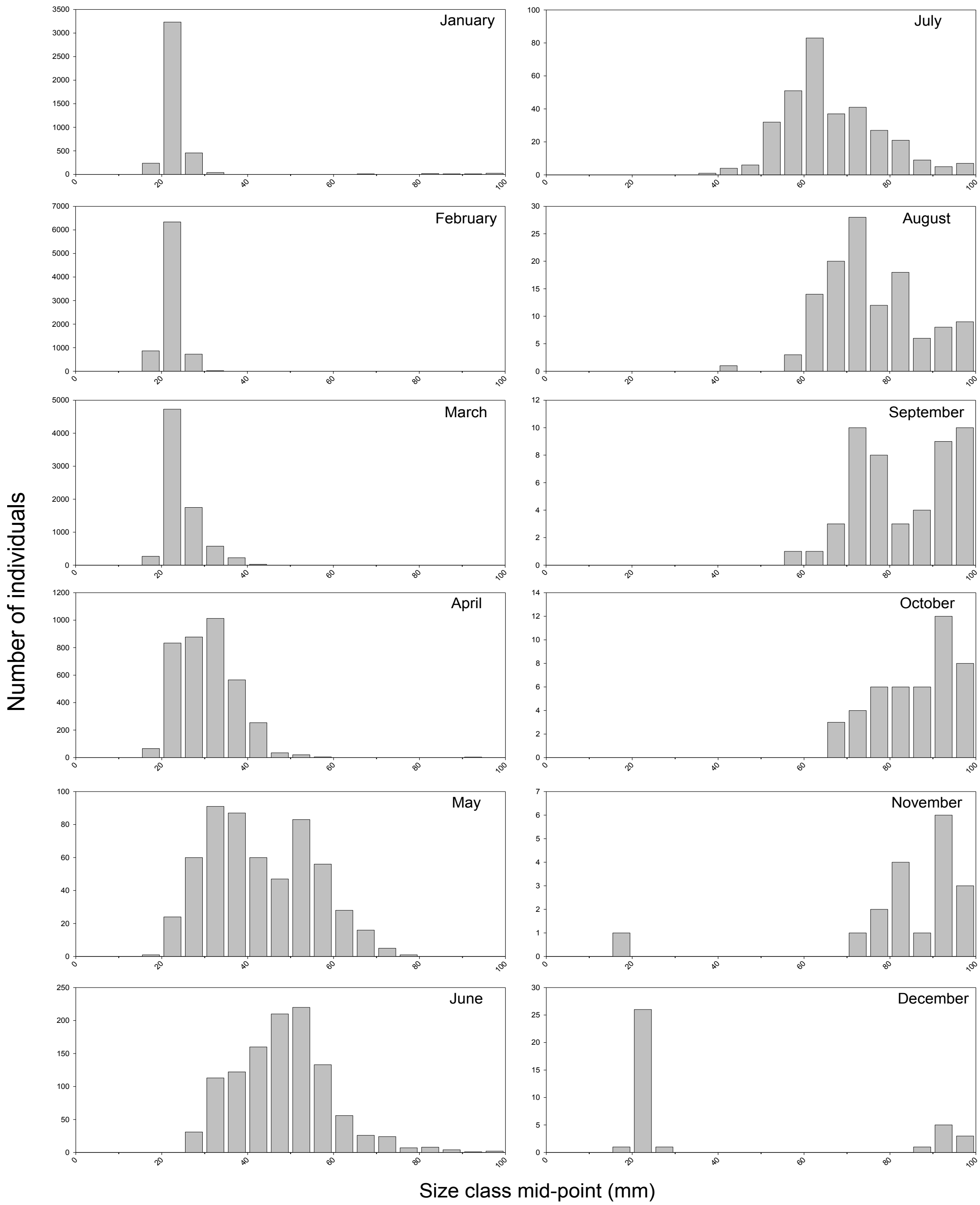
Appendix 7, Figure 3. Length frequencies of Atlantic silverside by month collected with 21.3-m seines in the lower St. Johns River.

Litopenaeus setiferus (White shrimp) in 21.3-m seines



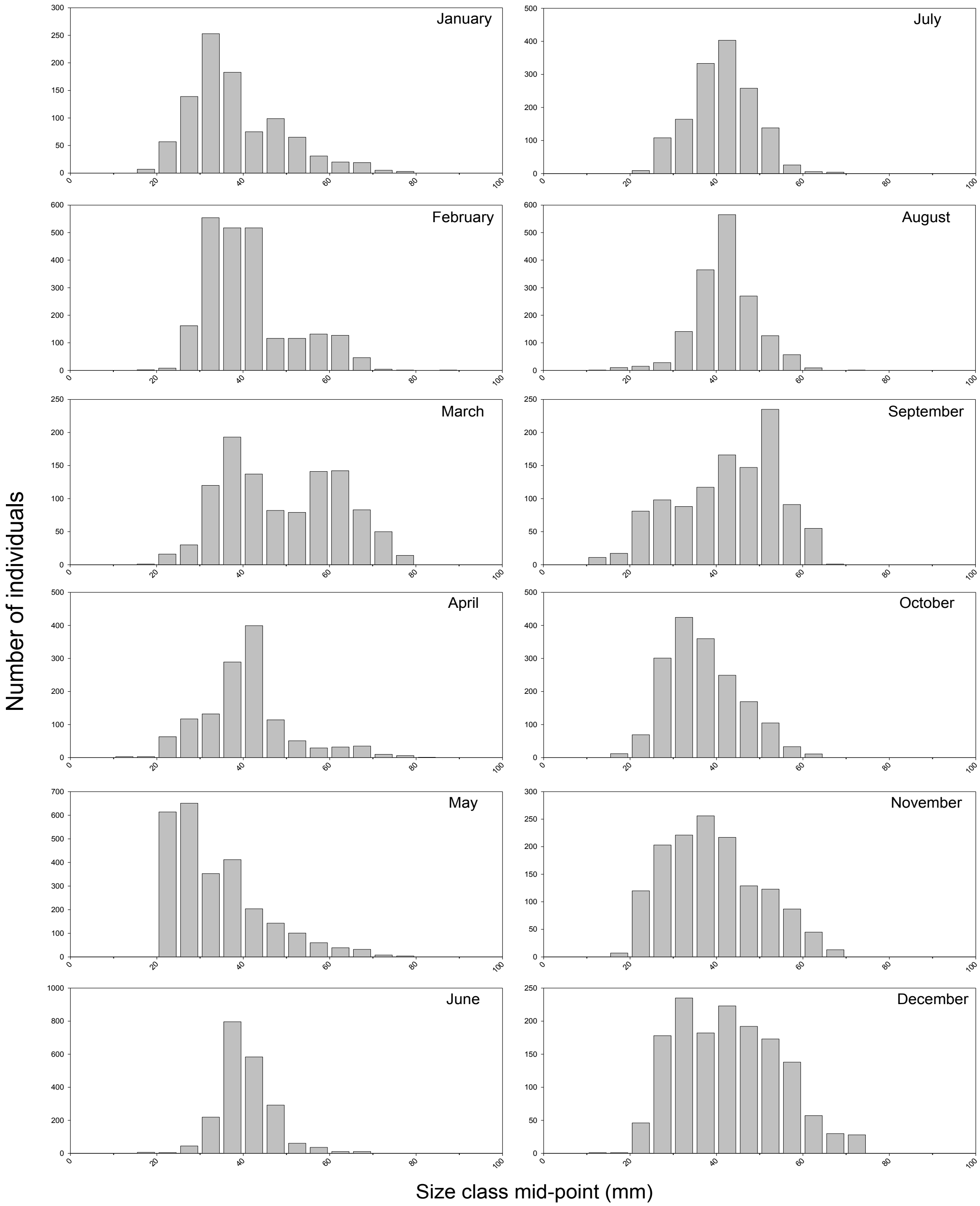
Appendix 7, Figure 4. Length frequencies of white shrimp by month collected with 21.3-m seines in the lower St. Johns River.

Mugil cephalus (Striped mullet) in 21.3-m seines



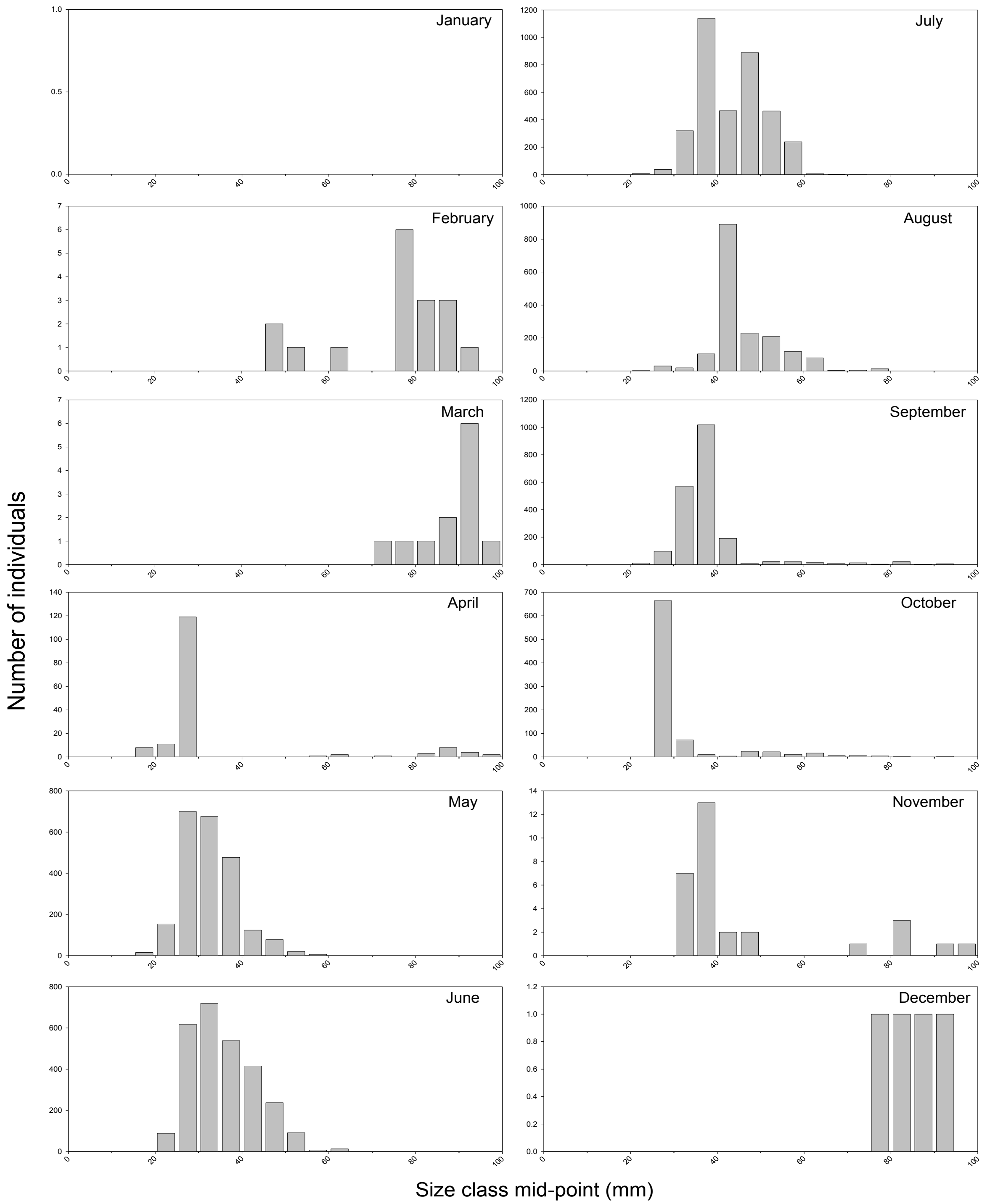
Appendix 7, Figure 5. Length frequencies of striped mullet by month collected with 21.3-m seines in the lower St. Johns River.

Menidia spp. (Menidia silversides) in 21.3-m seines



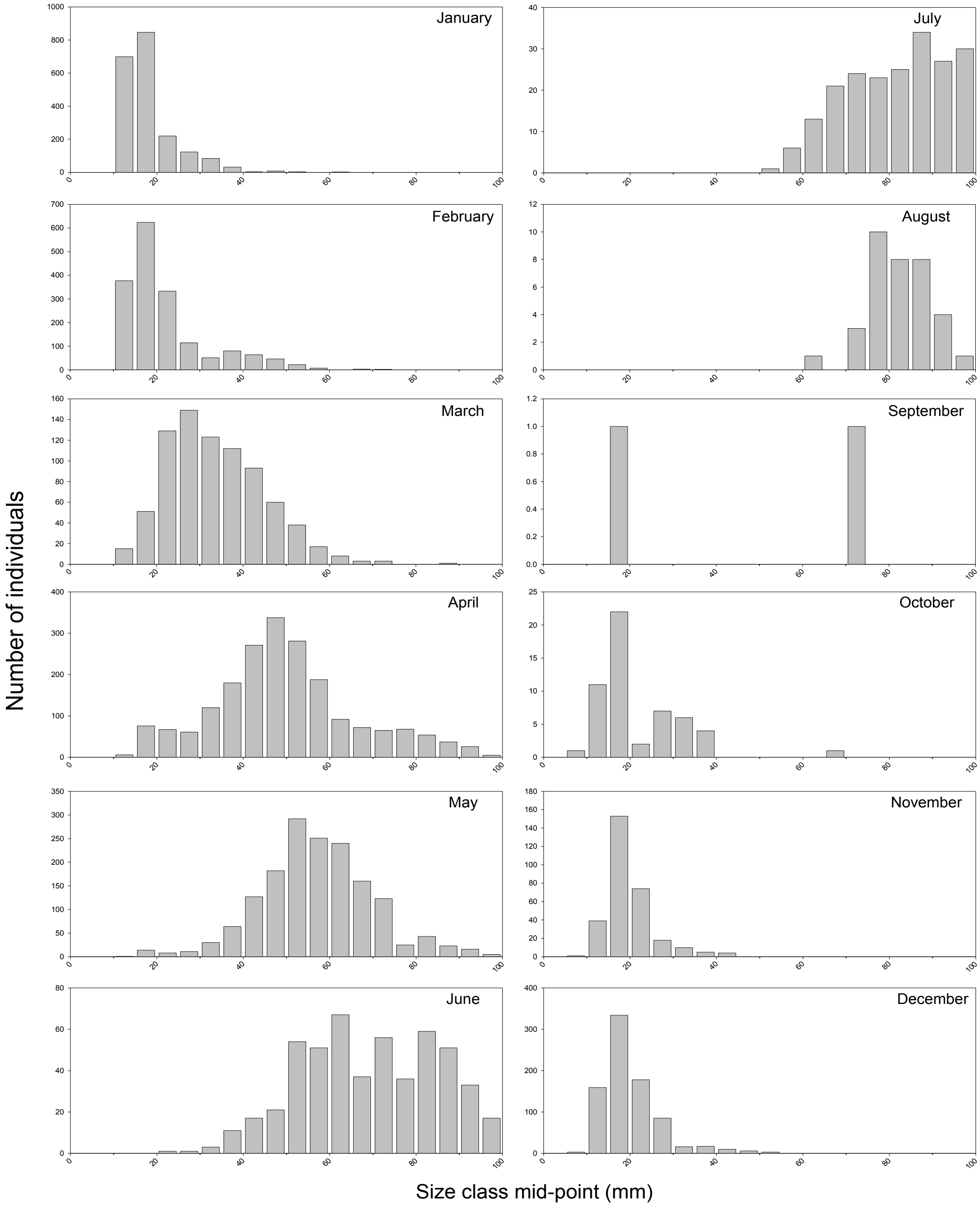
Appendix 7, Figure 6. Length frequencies of menidia silversides by month collected with 21.3-m seines in the lower St. Johns River.

Anchoa hepsetus (Striped anchovy) in 21.3-m seines



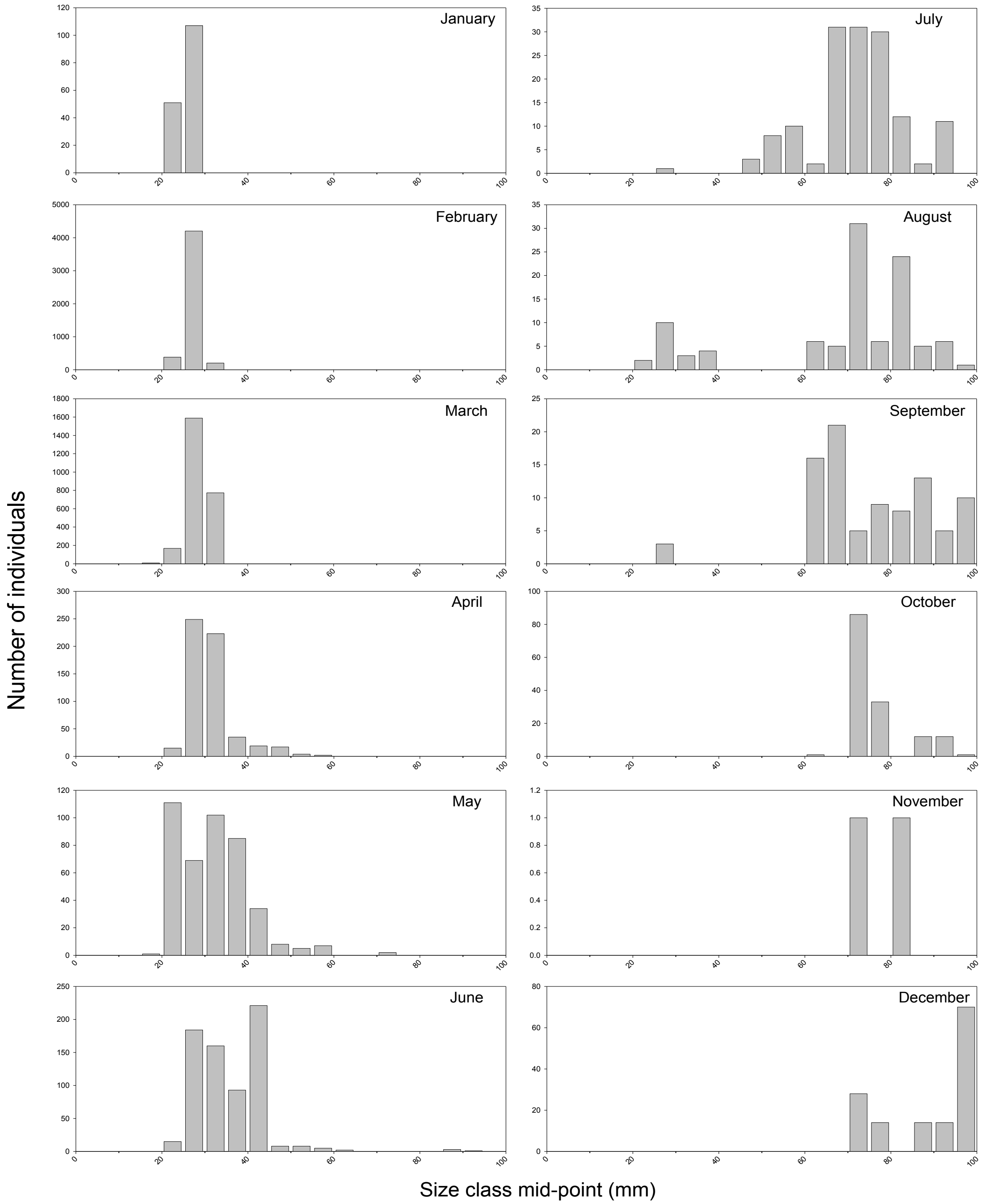
Appendix 7, Figure 7. Length frequencies of striped anchovy by month collected with 21.3-m seines in the lower St. Johns River.

Micropogonias undulatus (Atlantic croaker) in 21.3-m seines



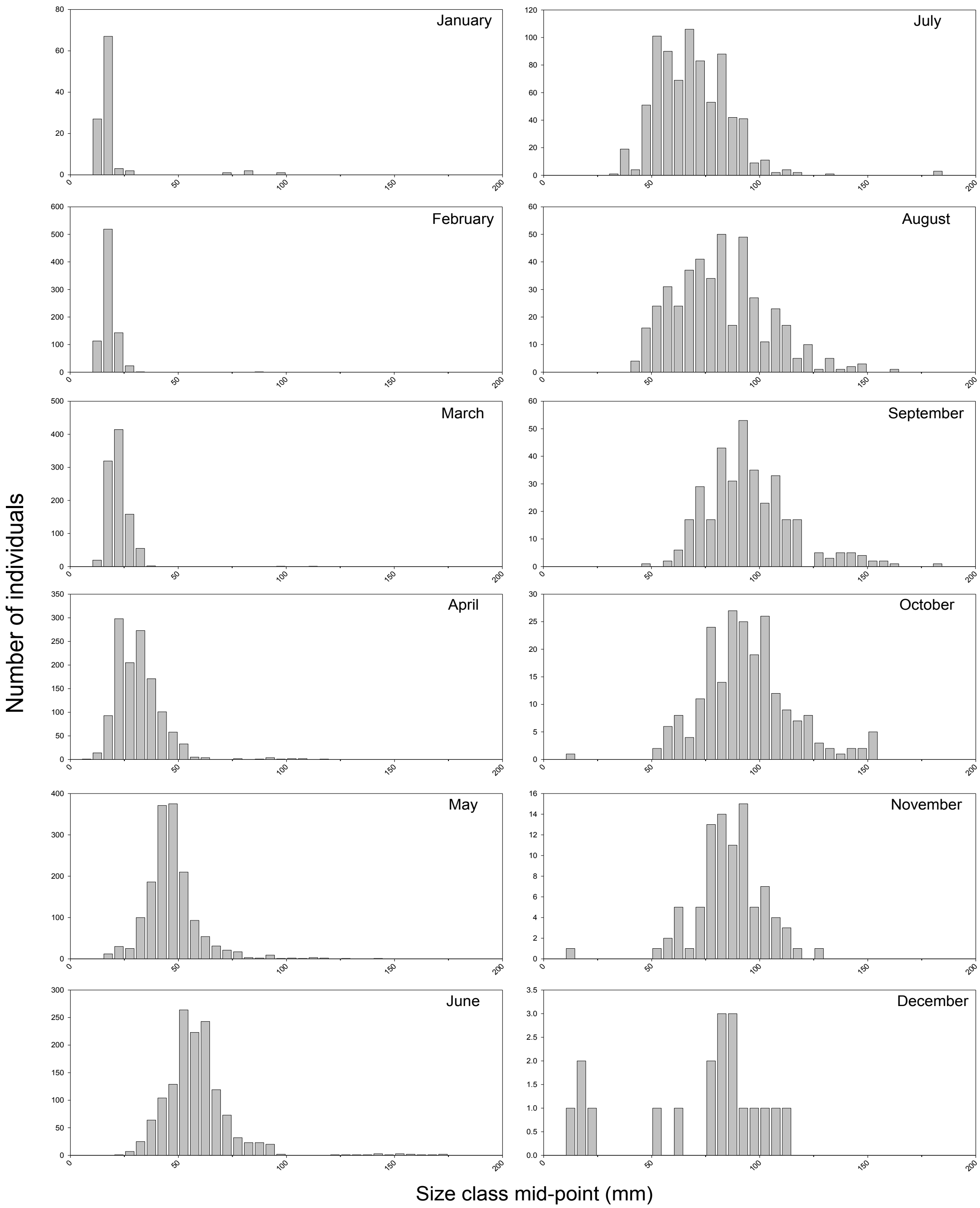
Appendix 7, Figure 8. Length frequencies of Atlantic croaker by month collected with 21.3-m seines in the lower St. Johns River.

Brevoortia spp. (Menhaden) in 21.3-m seines



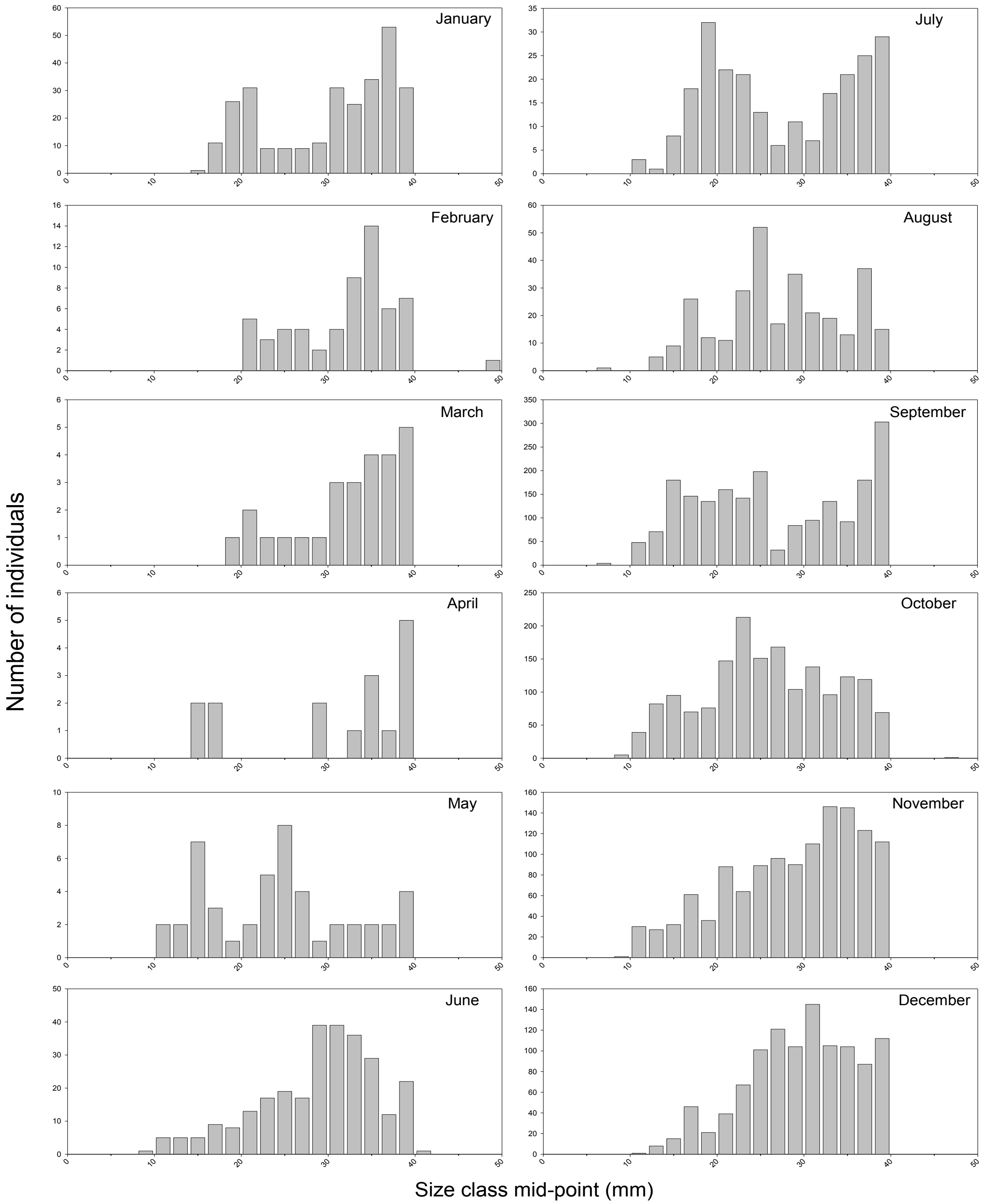
Appendix 7, Figure 9. Length frequencies of menhaden by month collected with 21.3-m seines in the lower St. Johns River.

Lagodon rhomboides (Pinfish) in 21.3-m seines



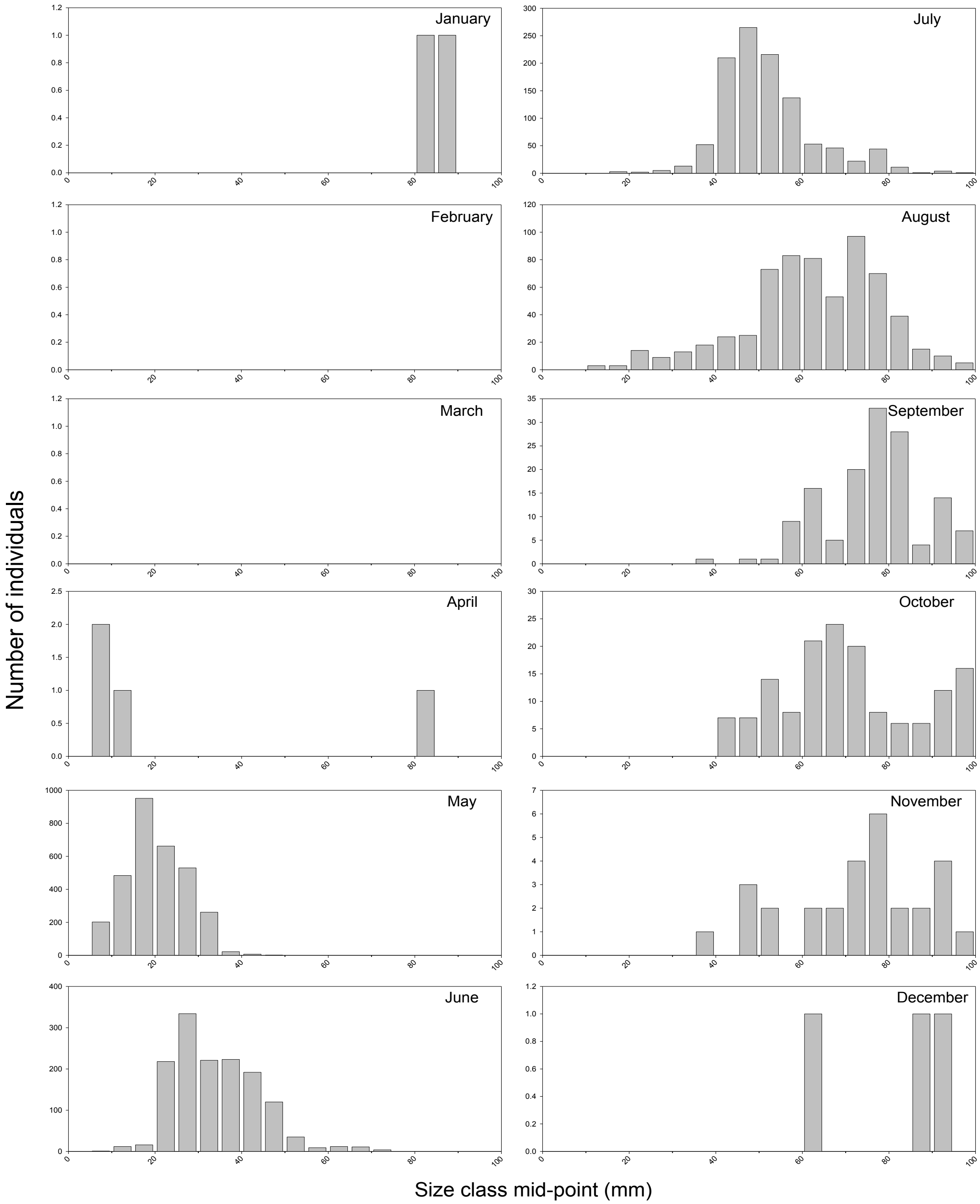
Appendix 7, Figure 10. Length frequencies of pinfish by month collected with 21.3-m seines in the lower St. Johns River.

Eucinostomus spp. (Eucinostomus mojarras) in 21.3-m seines



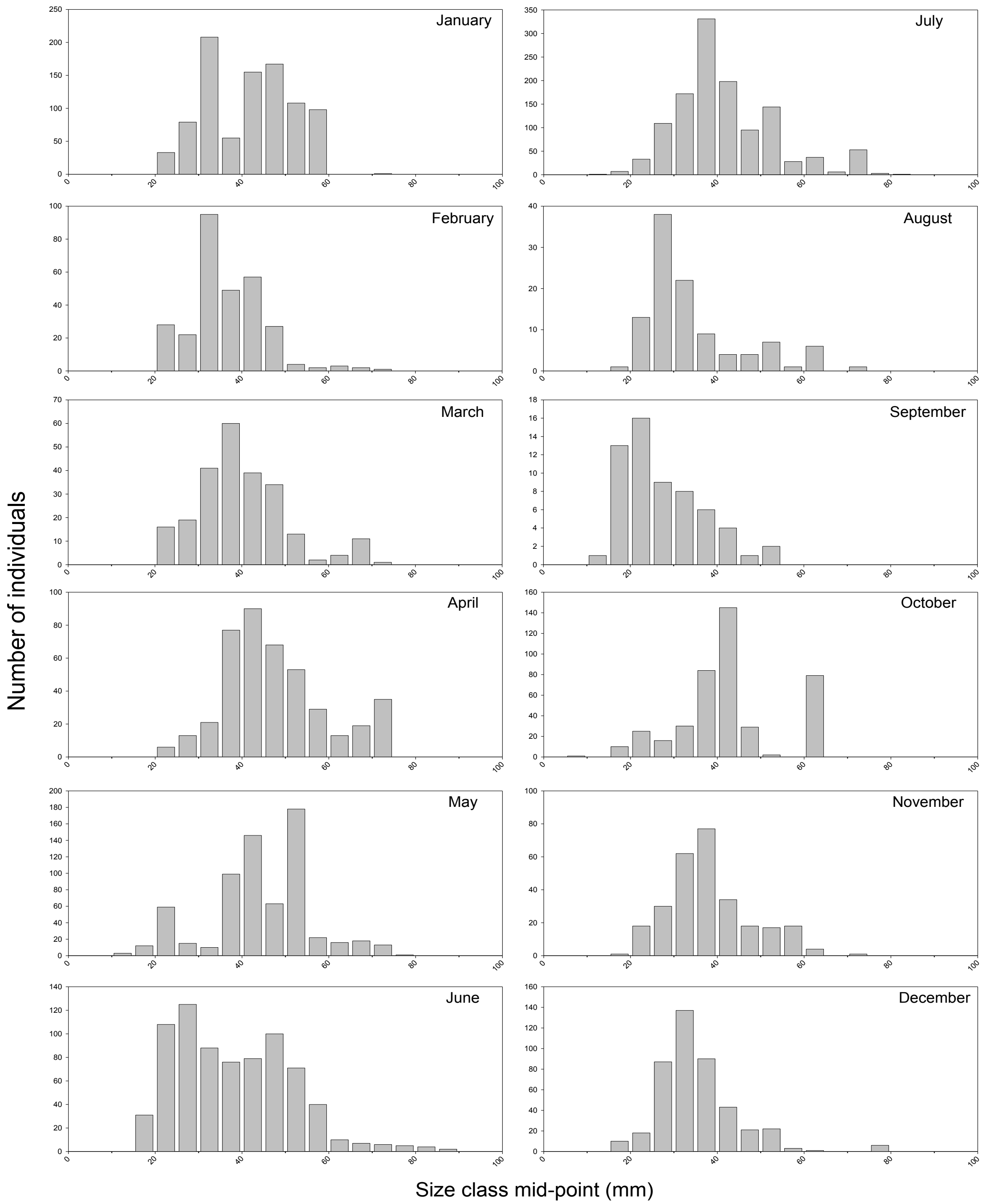
Appendix 7, Figure 11. Length frequencies of eucinostomus mojarras by month collected with 21.3-m seines in the lower St. Johns River.

Bairdiella chrysoura (Silver perch) in 21.3-m seines



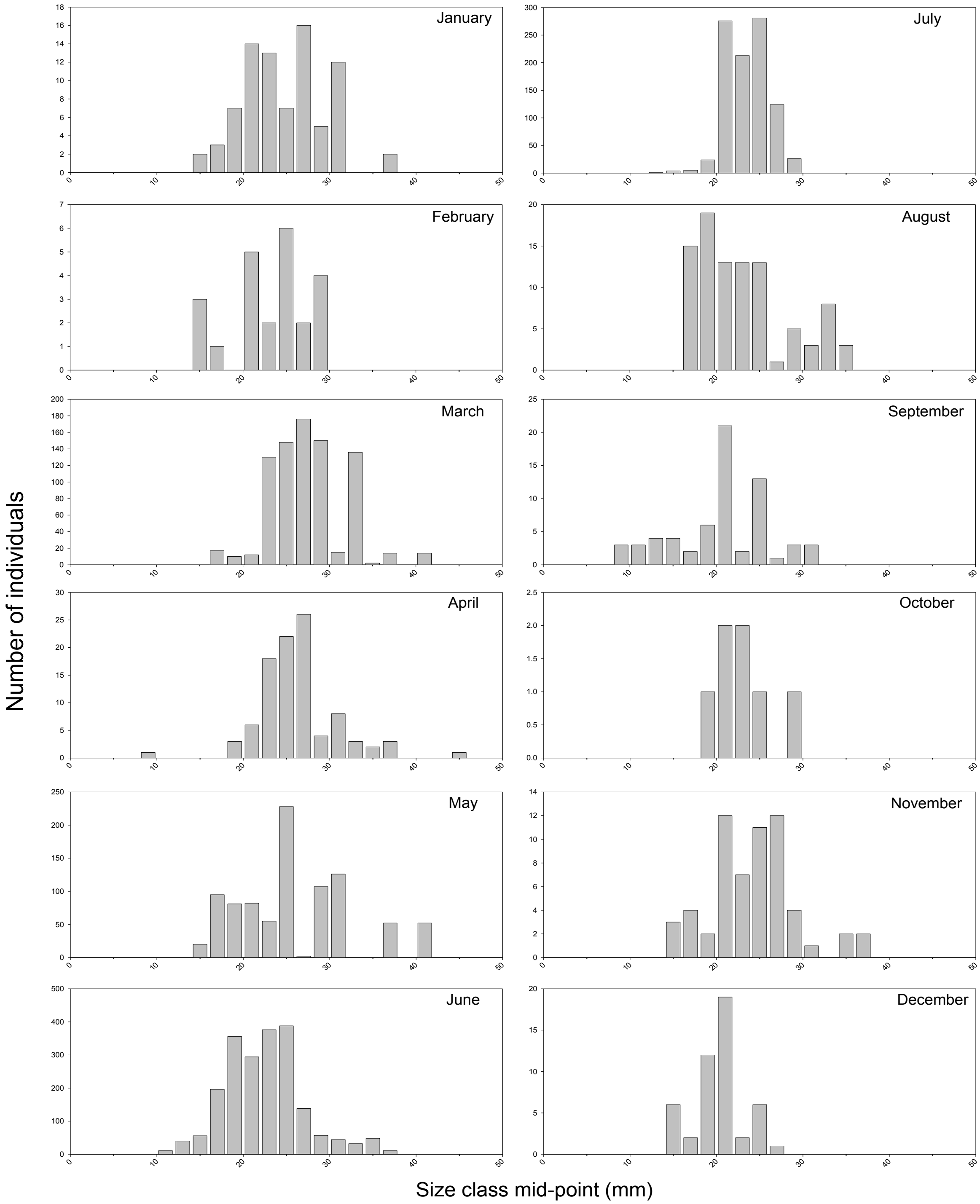
Appendix 7, Figure 12. Length frequencies of silver perch by month collected with 21.3-m seines in the lower St. Johns River.

Fundulus heteroclitus (Mummichog) in 21.3-m seines



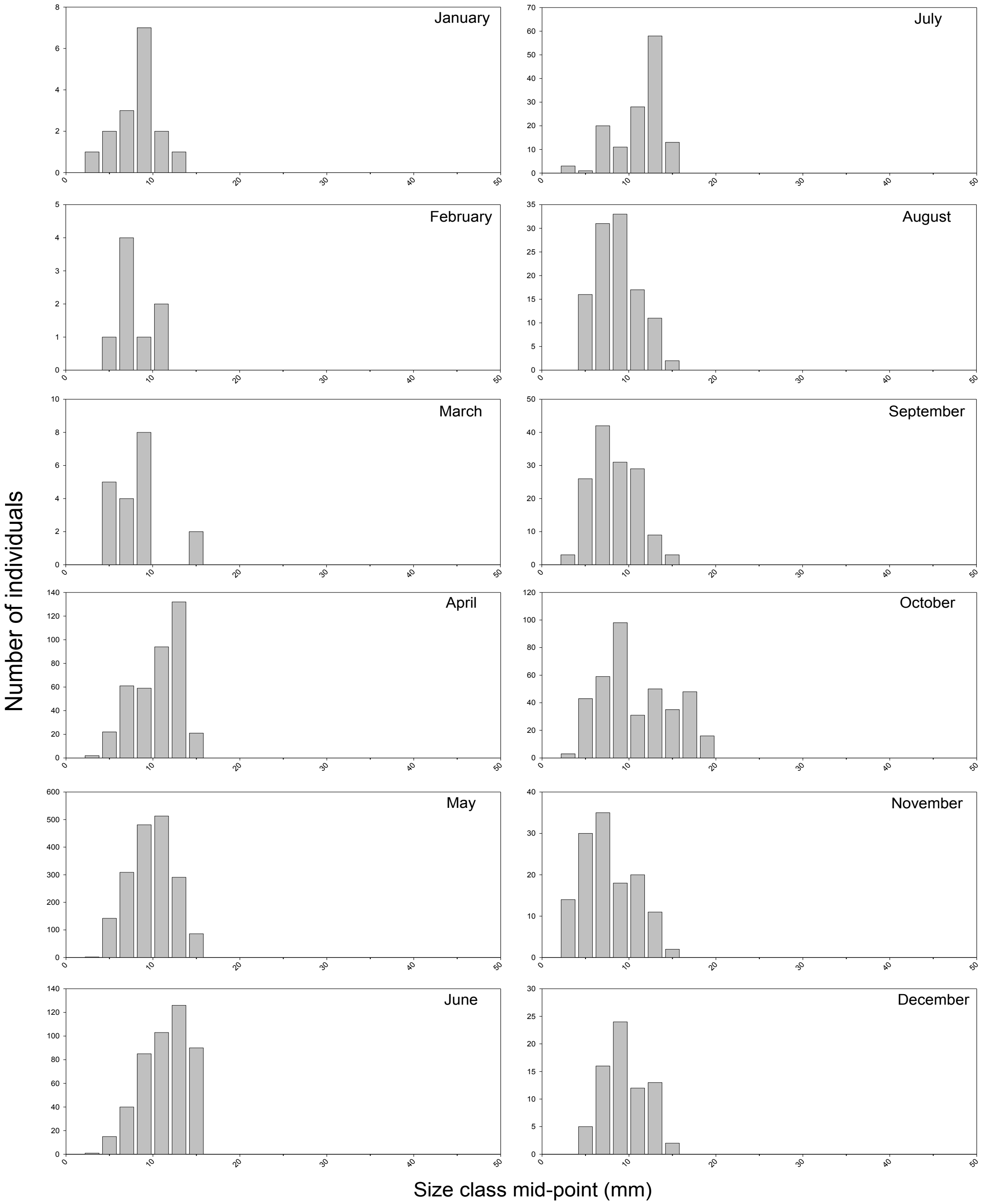
Appendix 7, Figure 13. Length frequencies of mummichog by month collected with 21.3-m seines in the lower St. Johns River.

Lucania parva (Rainwater killifish) in 21.3-m seines



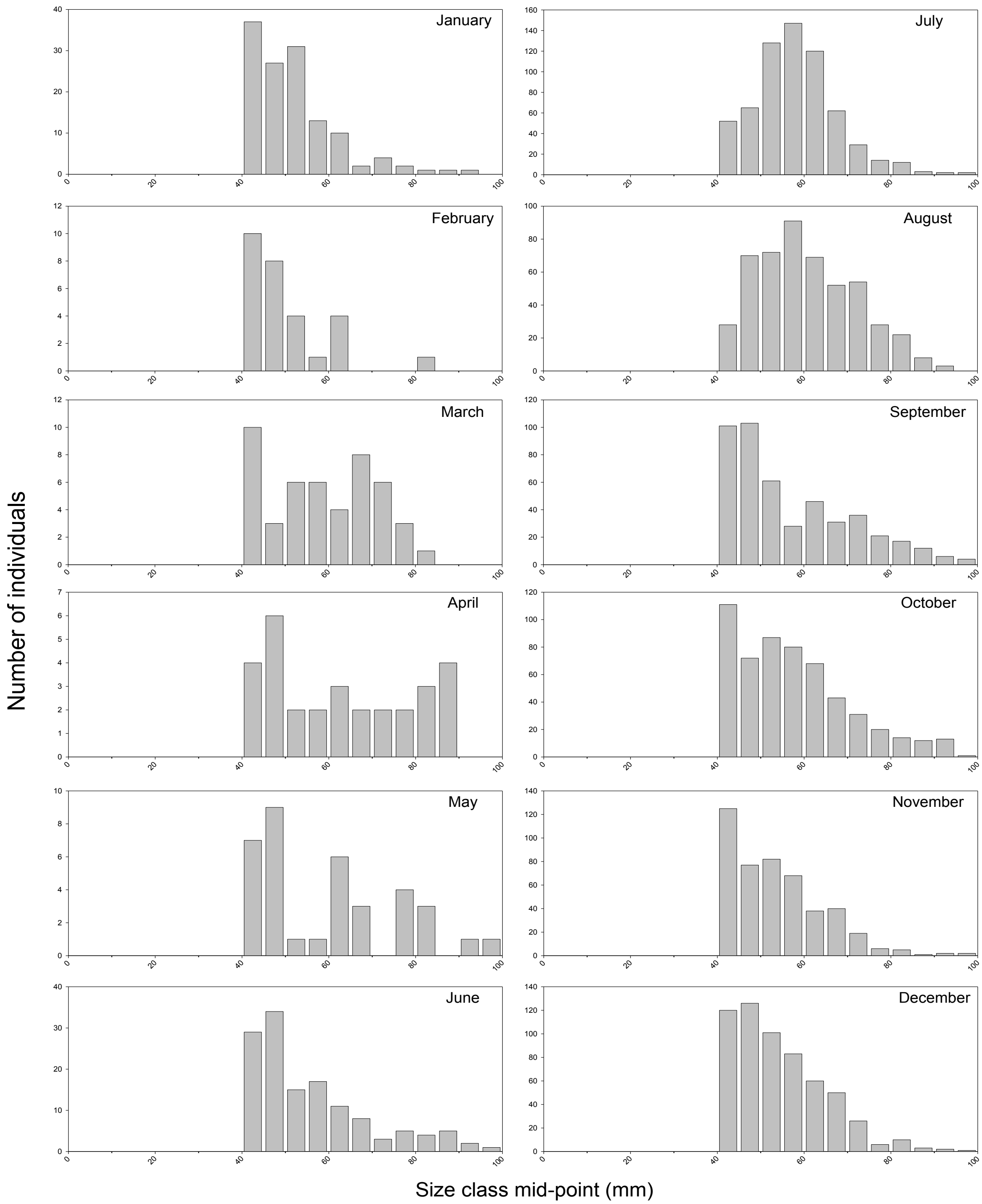
Appendix 7, Figure 14. Length frequencies of rainwater killifish by month collected with 21.3-m seines in the lower St. Johns River.

Farfantepenaeus spp. (Commercial shrimp) in 21.3-m seines



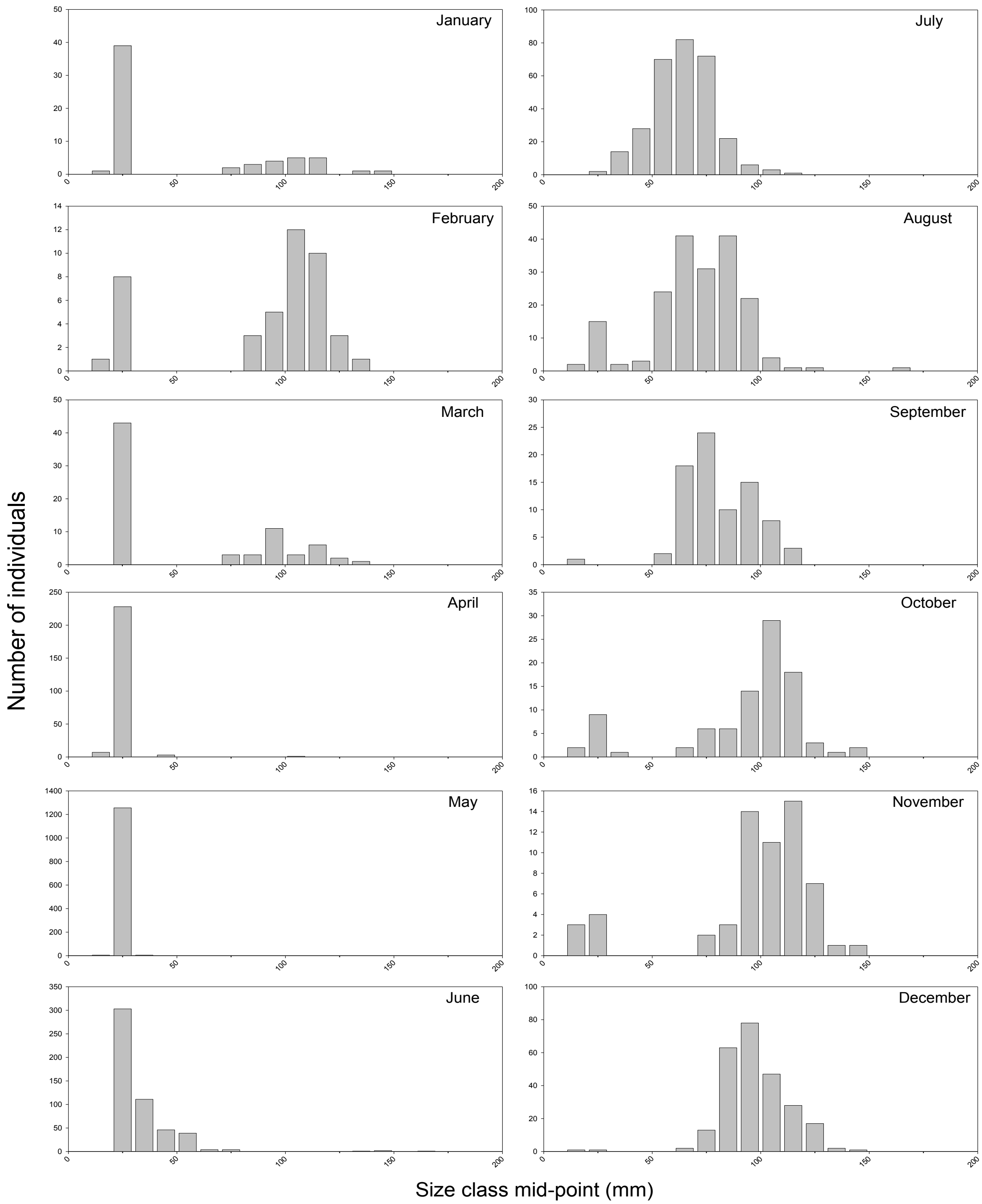
Appendix 7, Figure 15. Length frequencies of commercial shrimp by month collected with 21.3-m seines in the lower St. Johns River.

Eucinostomus harengulus (Tidewater mojarra) in 21.3-m seines



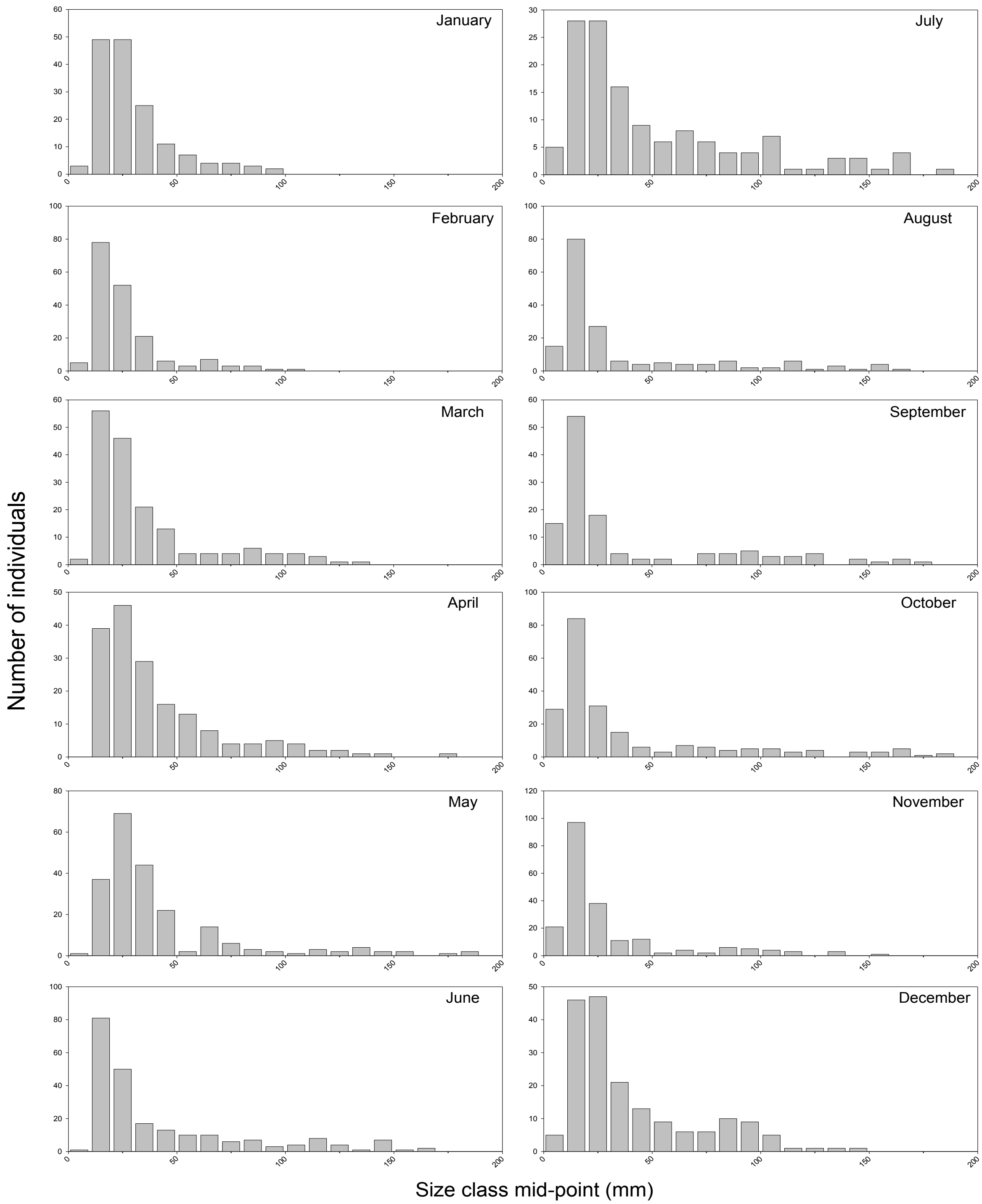
Appendix 7, Figure 16. Length frequencies of tidewater mojarra by month collected with 21.3-m seines in the lower St. Johns River.

Mugil curema (White mullet) in 21.3-m seines



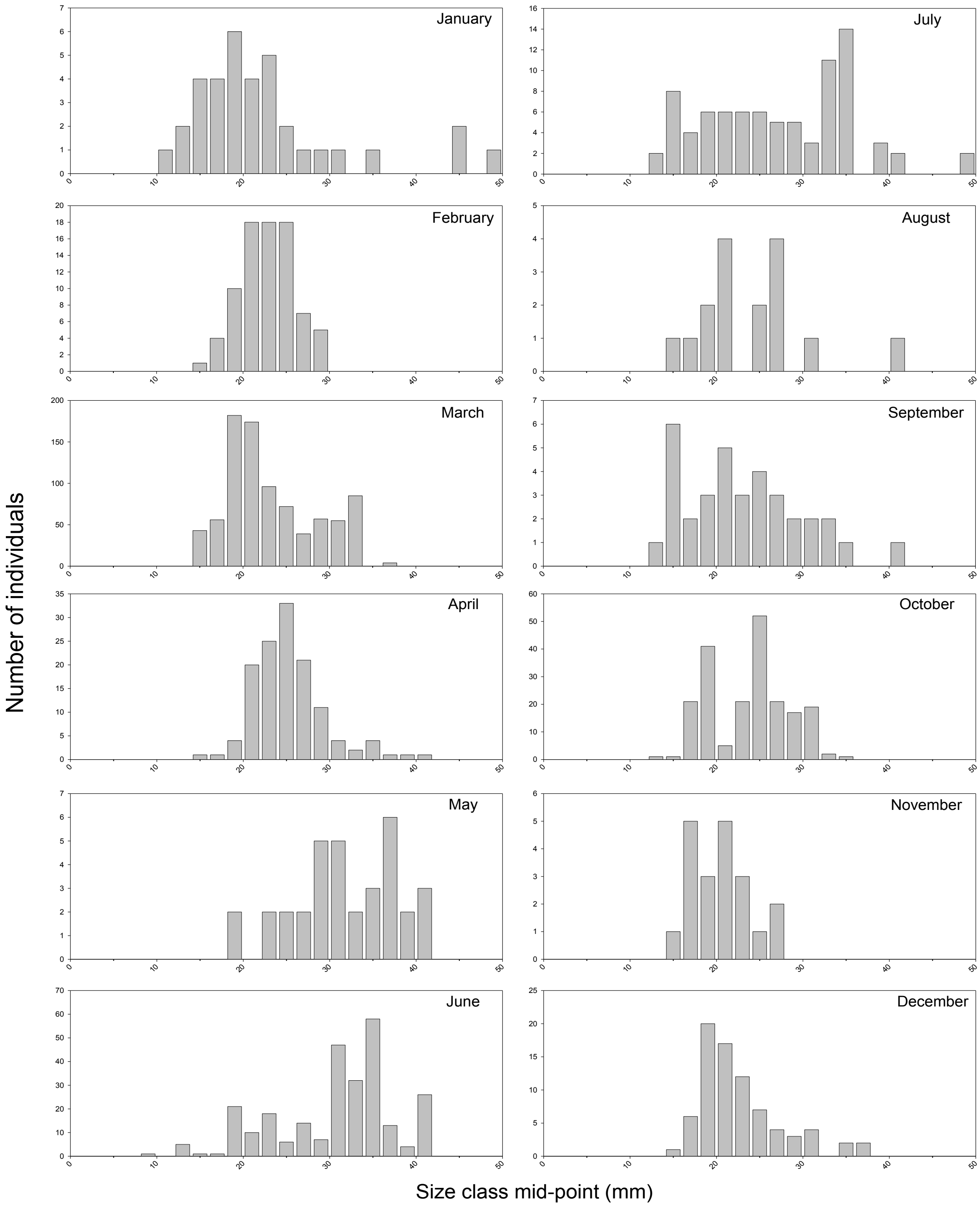
Appendix 7, Figure 17. Length frequencies of white mullet by month collected with 21.3-m seines in the lower St. Johns River.

Callinectes sapidus (Blue crab) in 21.3-m seines



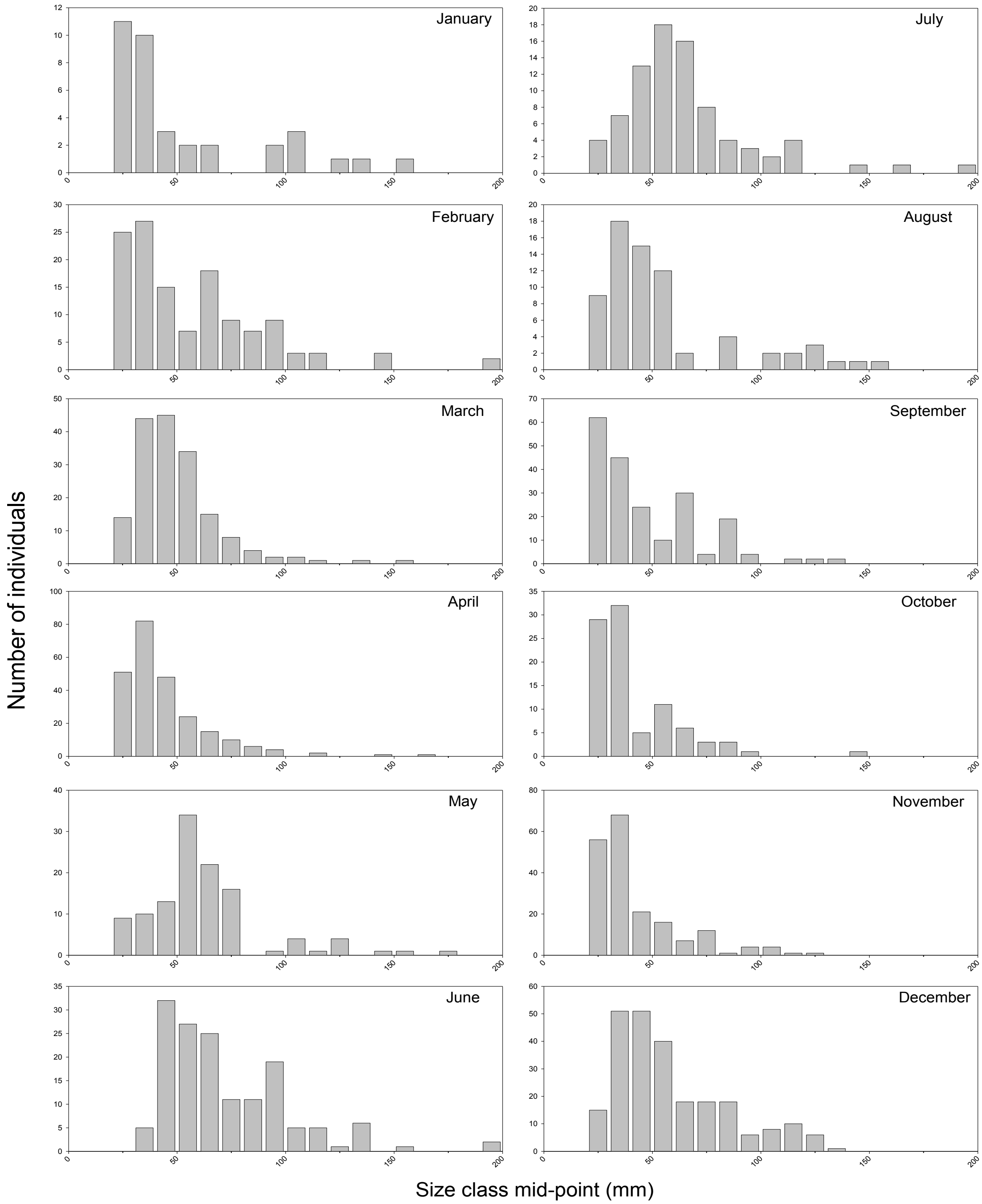
Appendix 7, Figure 18. Length frequencies of blue crab by month collected with 21.3-m seines in the lower St. Johns River.

Gambusia holbrooki (Eastern mosquito fish) in 21.3-m seines



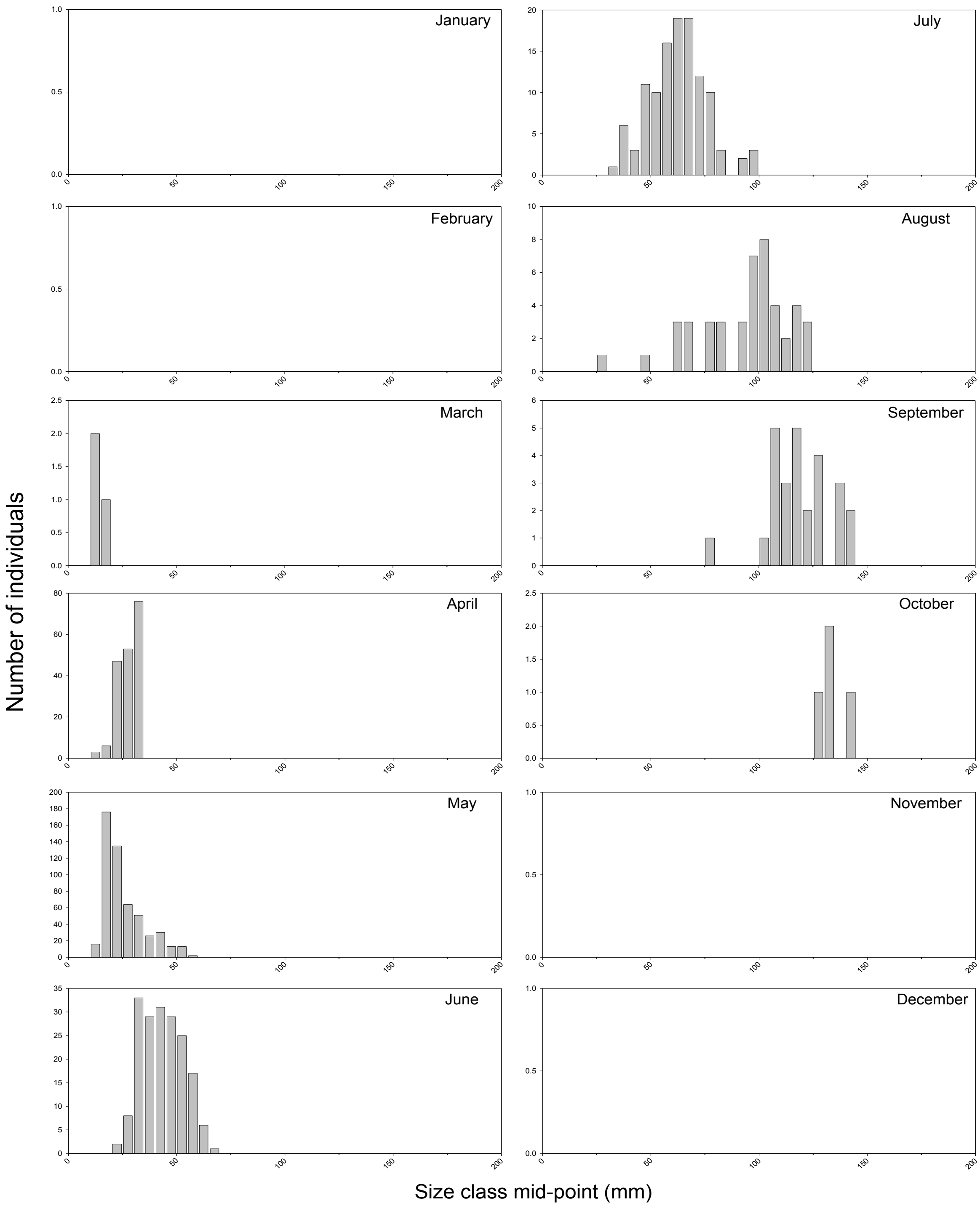
Appendix 7, Figure 19. Length frequencies of eastern mosquito fish by month collected with 21.3-m seines in the lower St. Johns River.

Lepomis macrochirus (Bluegill) in 21.3-m seines



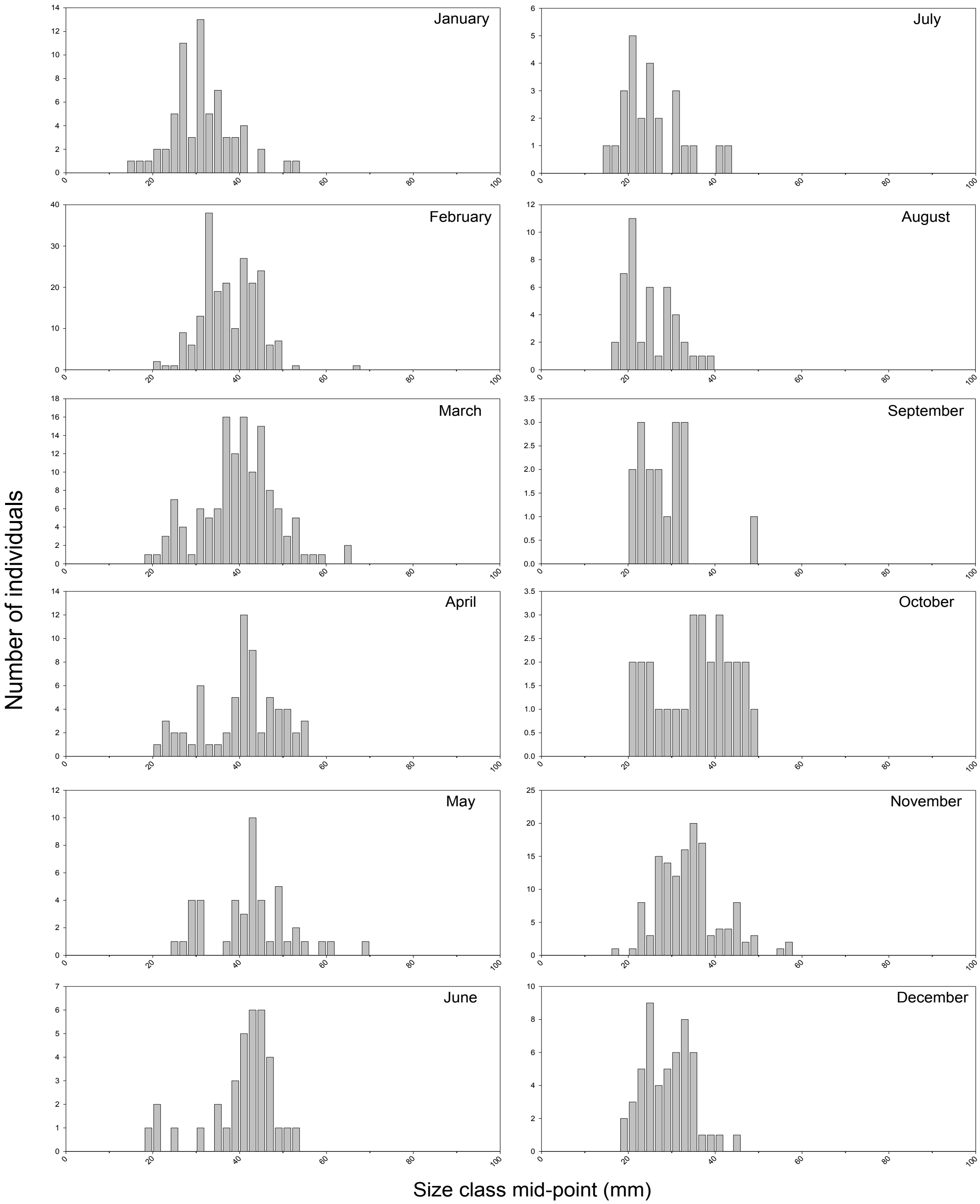
Appendix 7, Figure 20. Length frequencies of bluegill by month collected with 21.3-m seines in the lower St. Johns River.

Orthopristis chrysoptera (Pigfish) in 21.3-m seines



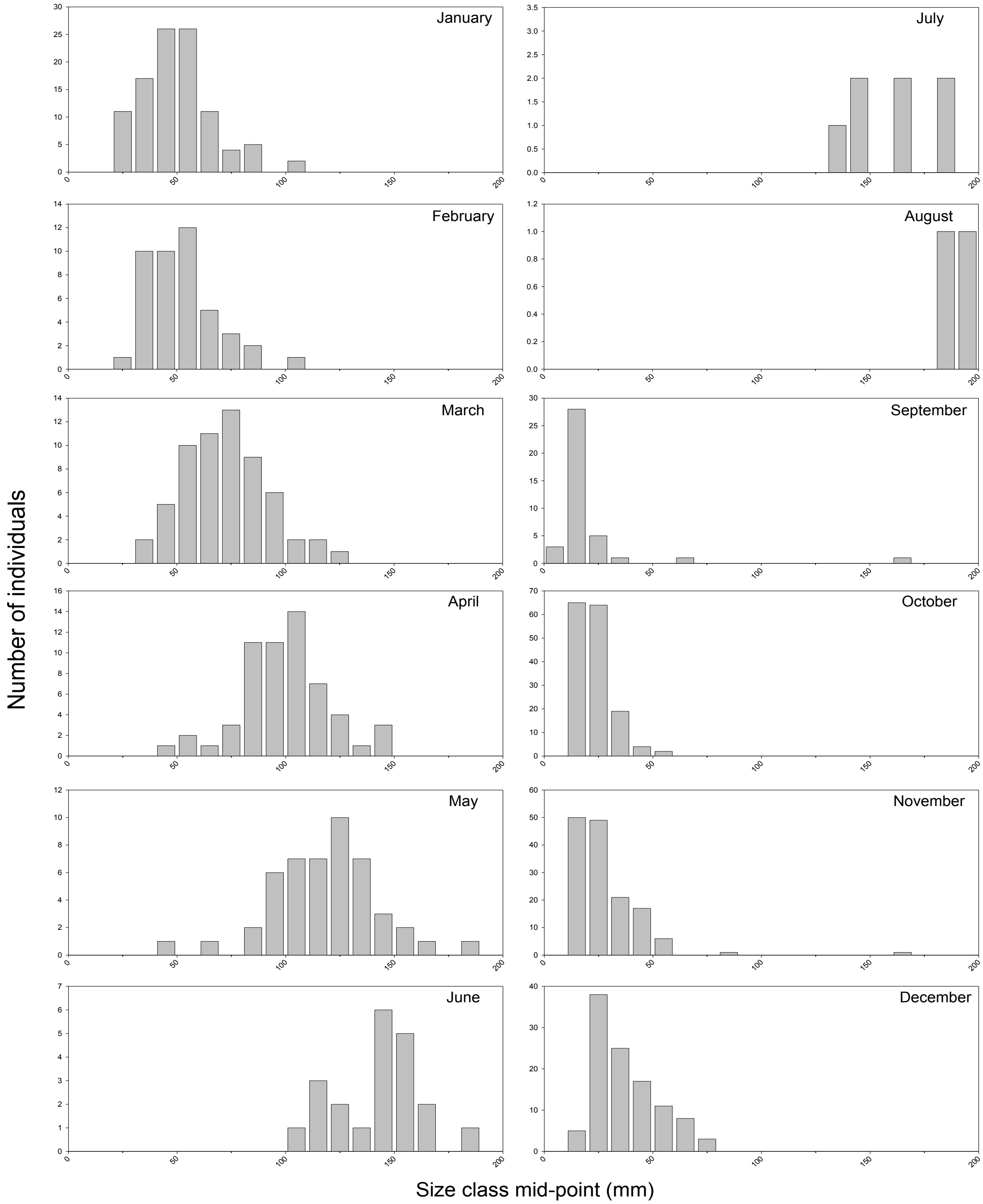
Appendix 7, Figure 21. Length frequencies of pigfish by month collected with 21.3-m seines in the lower St. Johns River.

Ctenogobius shufeldti (Freshwater goby) in 21.3-m seines



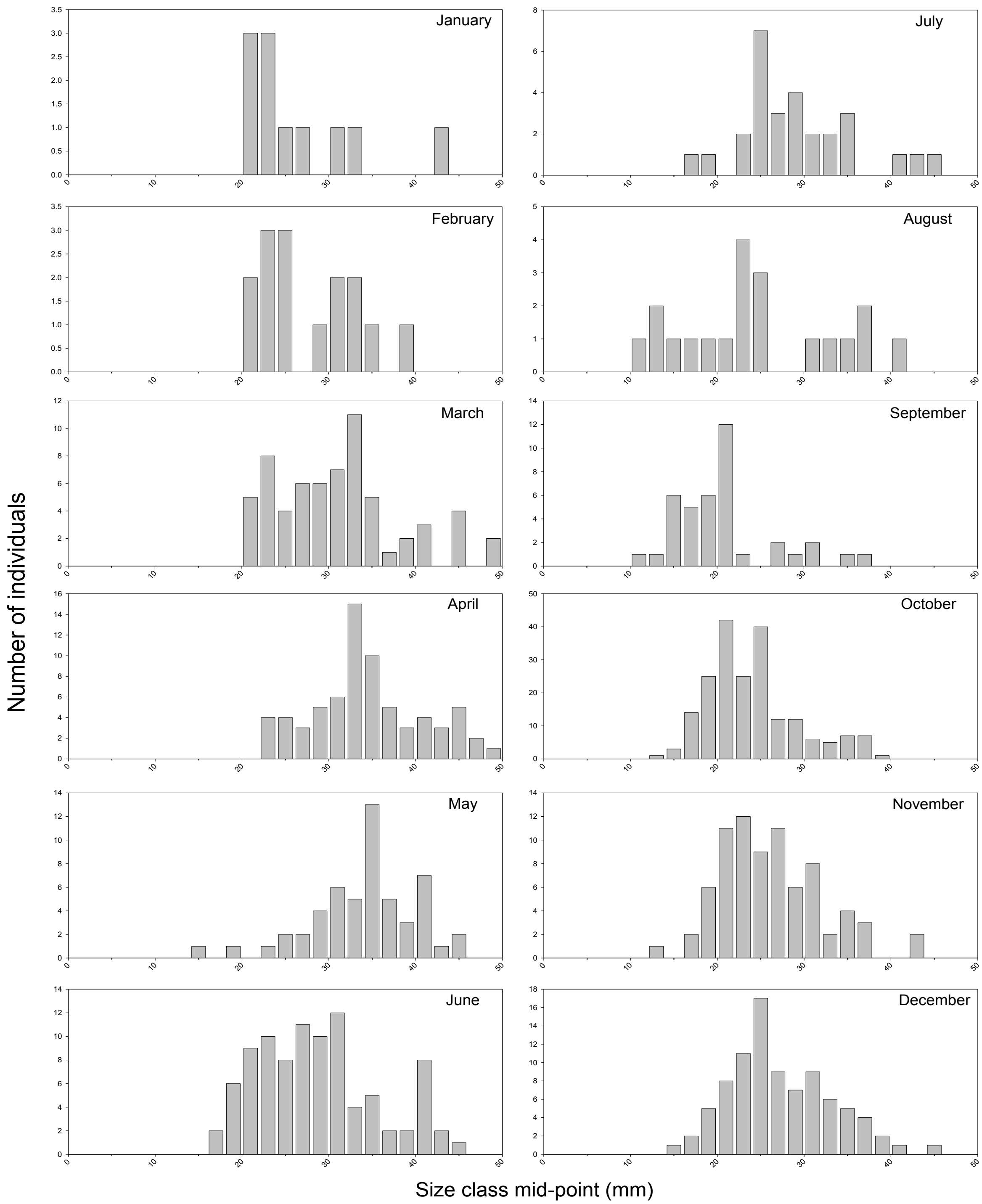
Appendix 7, Figure 22. Length frequencies of freshwater goby by month collected with 21.3-m seines in the lower St. Johns River.

Sciaenops ocellatus (Red drum) in 21.3-m seines



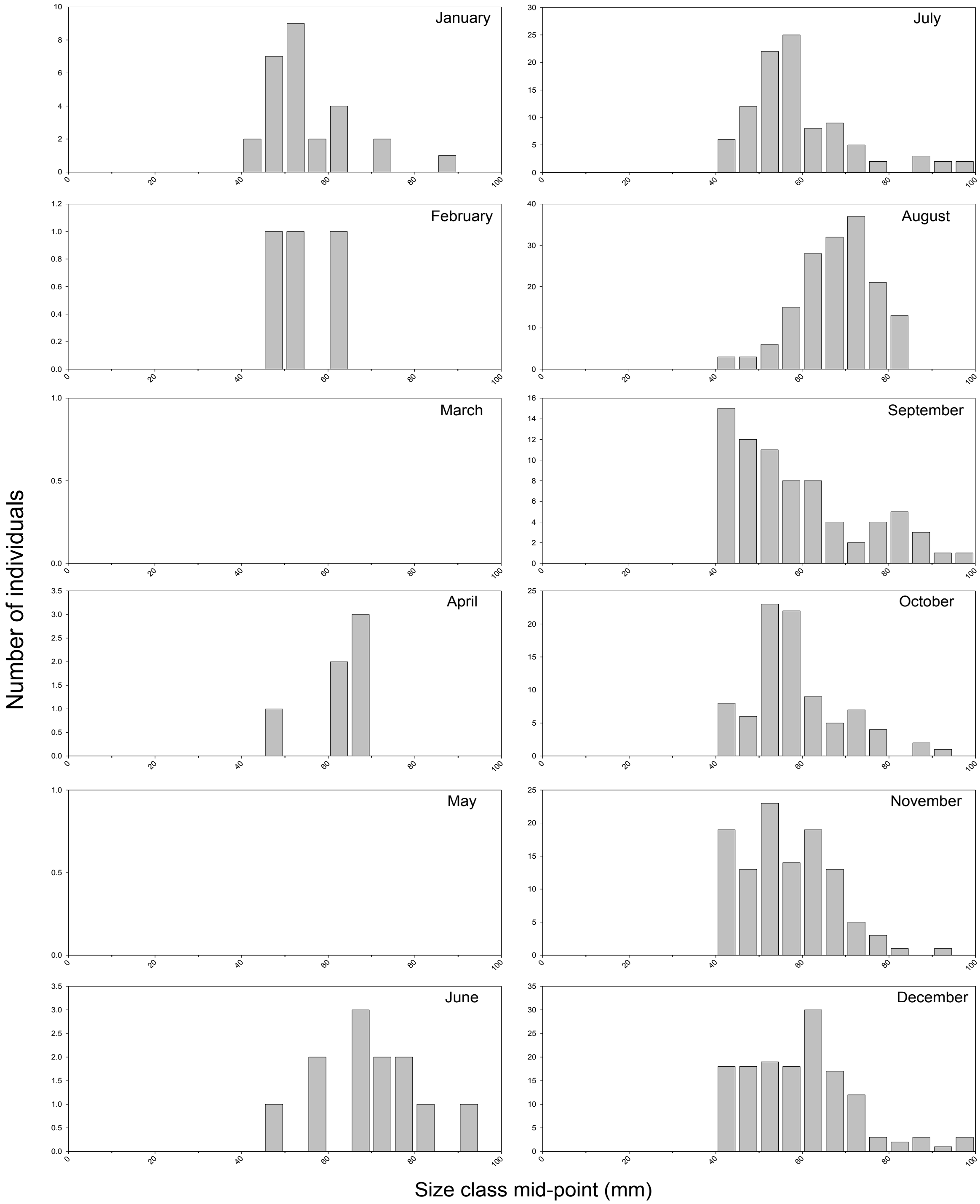
Appendix 7, Figure 23. Length frequencies of red drum by month collected with 21.3-m seines in the lower St. Johns River.

Microgobius gulosus (Clown goby) in 21.3-m seines



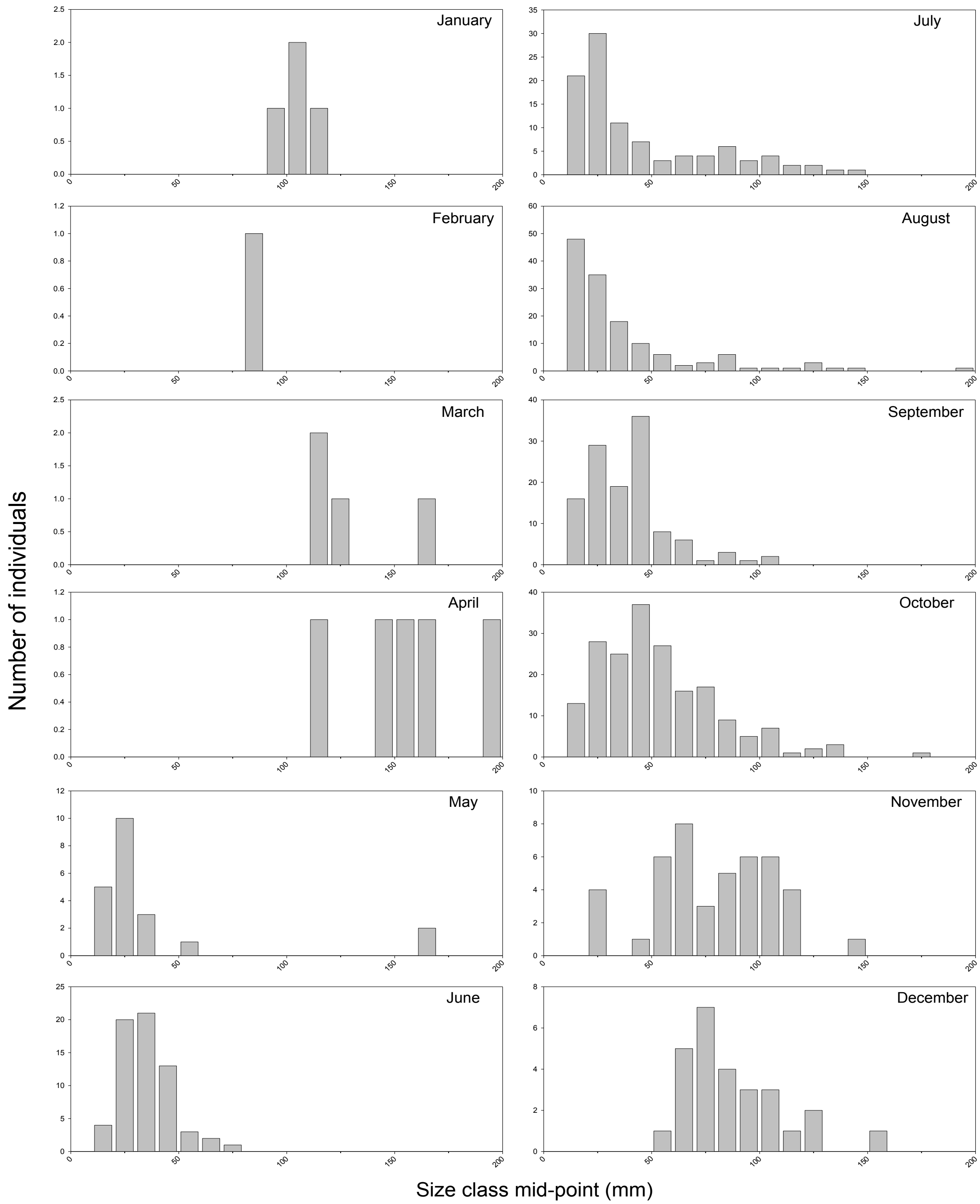
Appendix 7, Figure 24. Length frequencies of clown goby by month collected with 21.3-m seines in the lower St. Johns River.

Eucinostomus gula (Silver jenny) in 21.3-m seines



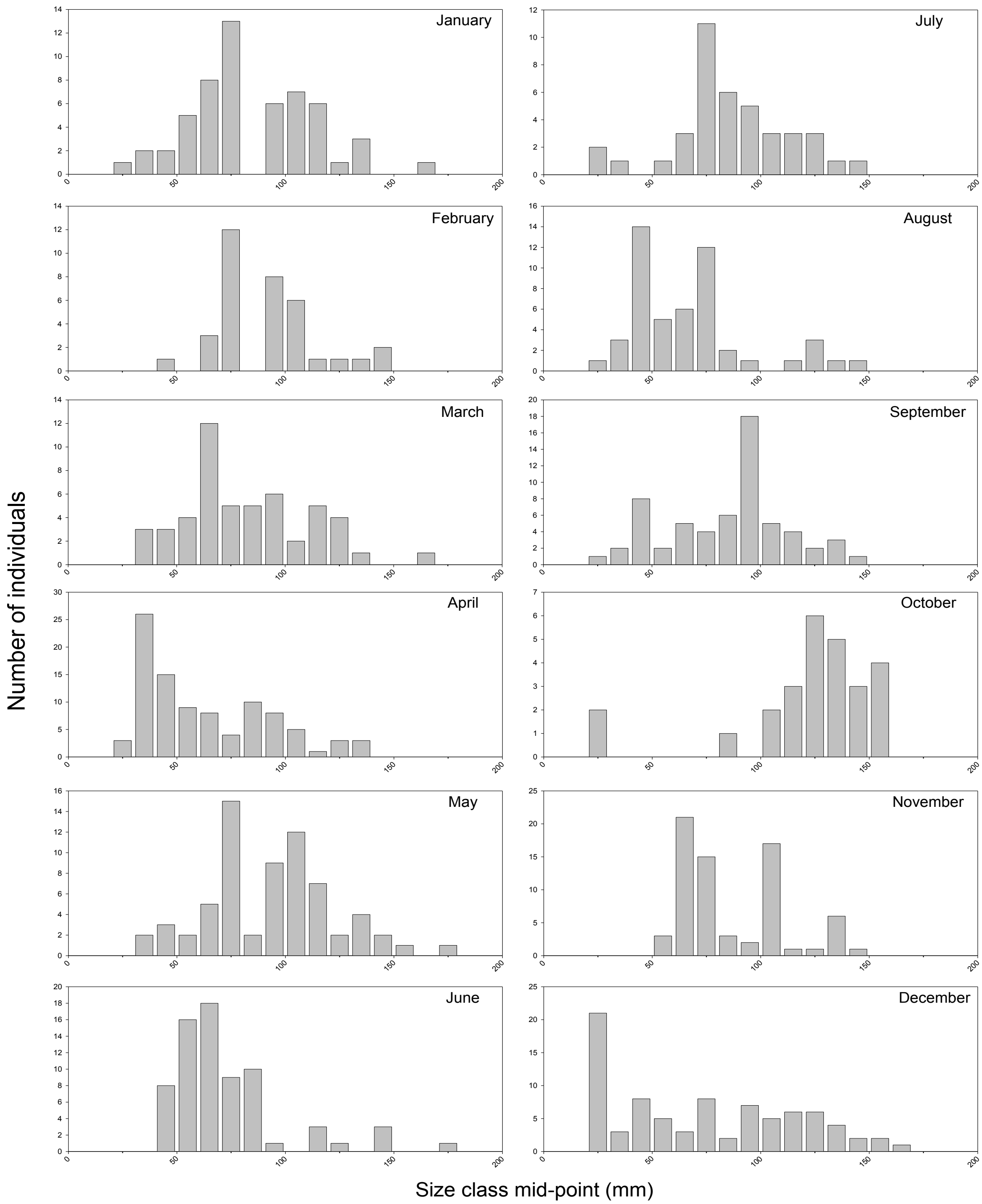
Appendix 7, Figure 25. Length frequencies of silver jenny by month collected with 21.3-m seines in the lower St. Johns River.

Cynoscion nebulosus (Spotted seatrout) in 21.3-m seines



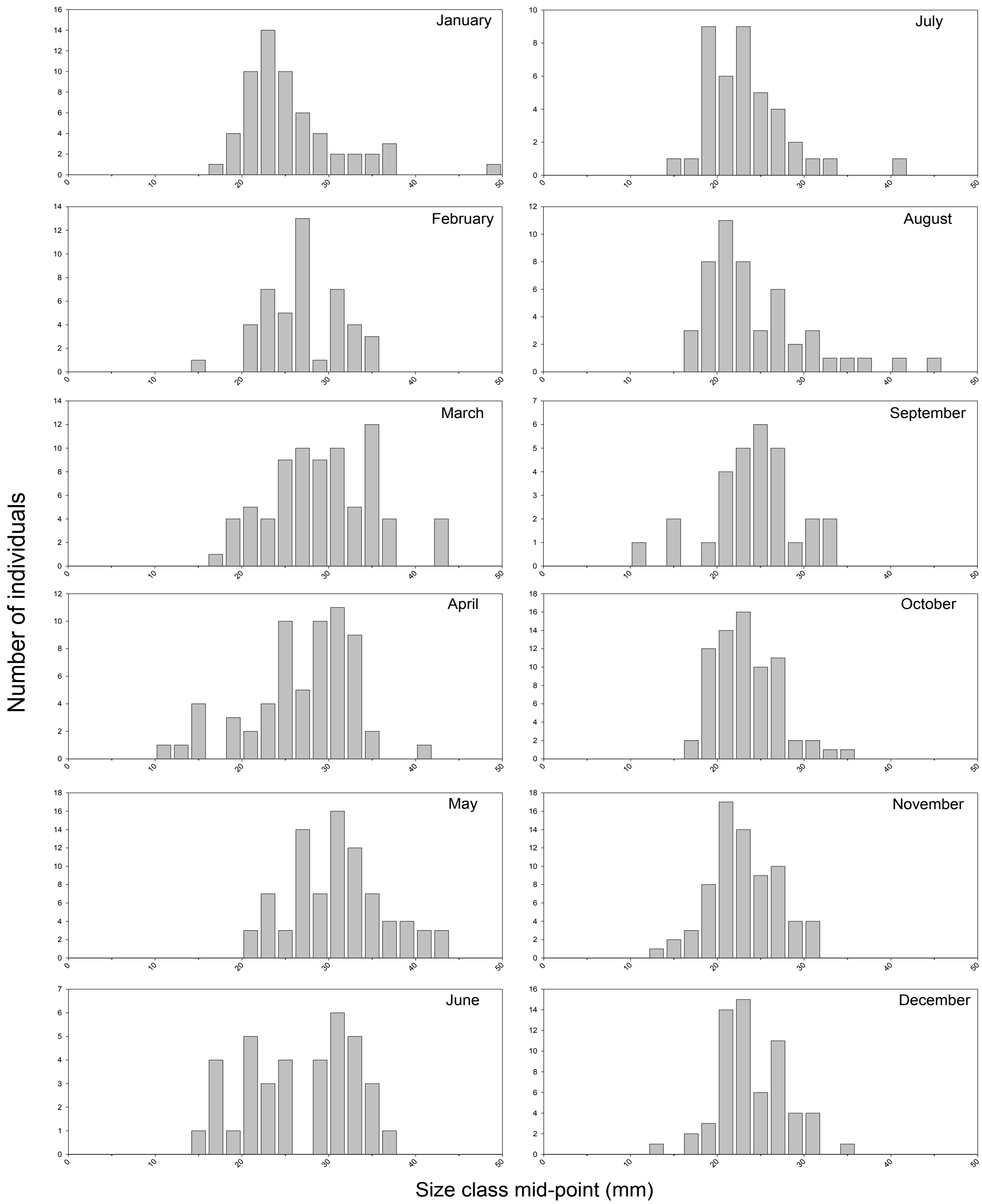
Appendix 7, Figure 26. Length frequencies of spotted seatrout by month collected with 21.3-m seines in the lower St. Johns River.

Lepomis auritus (Redbreast sunfish) in 21.3-m seines



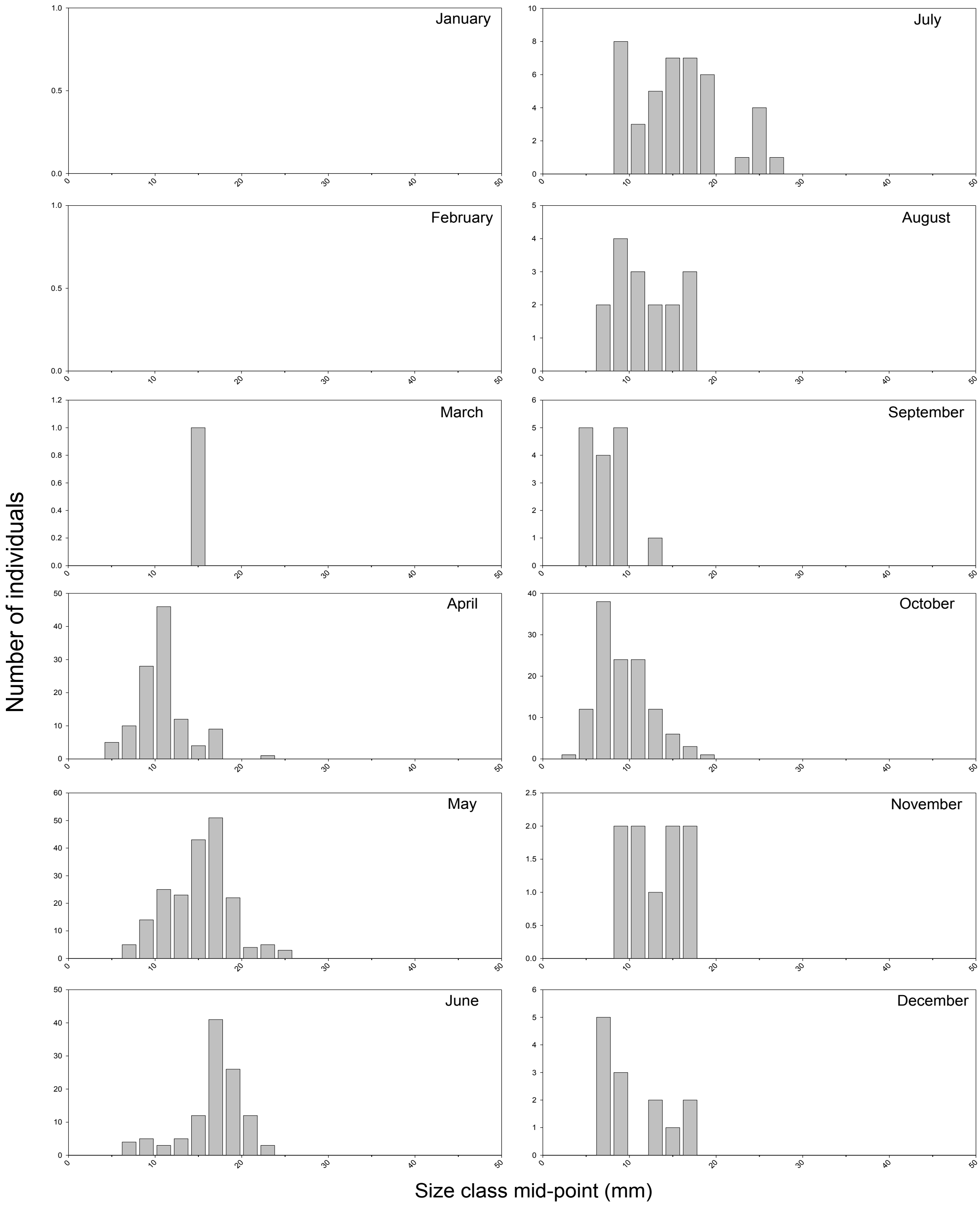
Appendix 7, Figure 27. Length frequencies of redbreast sunfish by month collected with 21.3-m seines in the lower St. Johns River.

Ctenogobius boleosoma (Darter goby) in 21.3-m seines



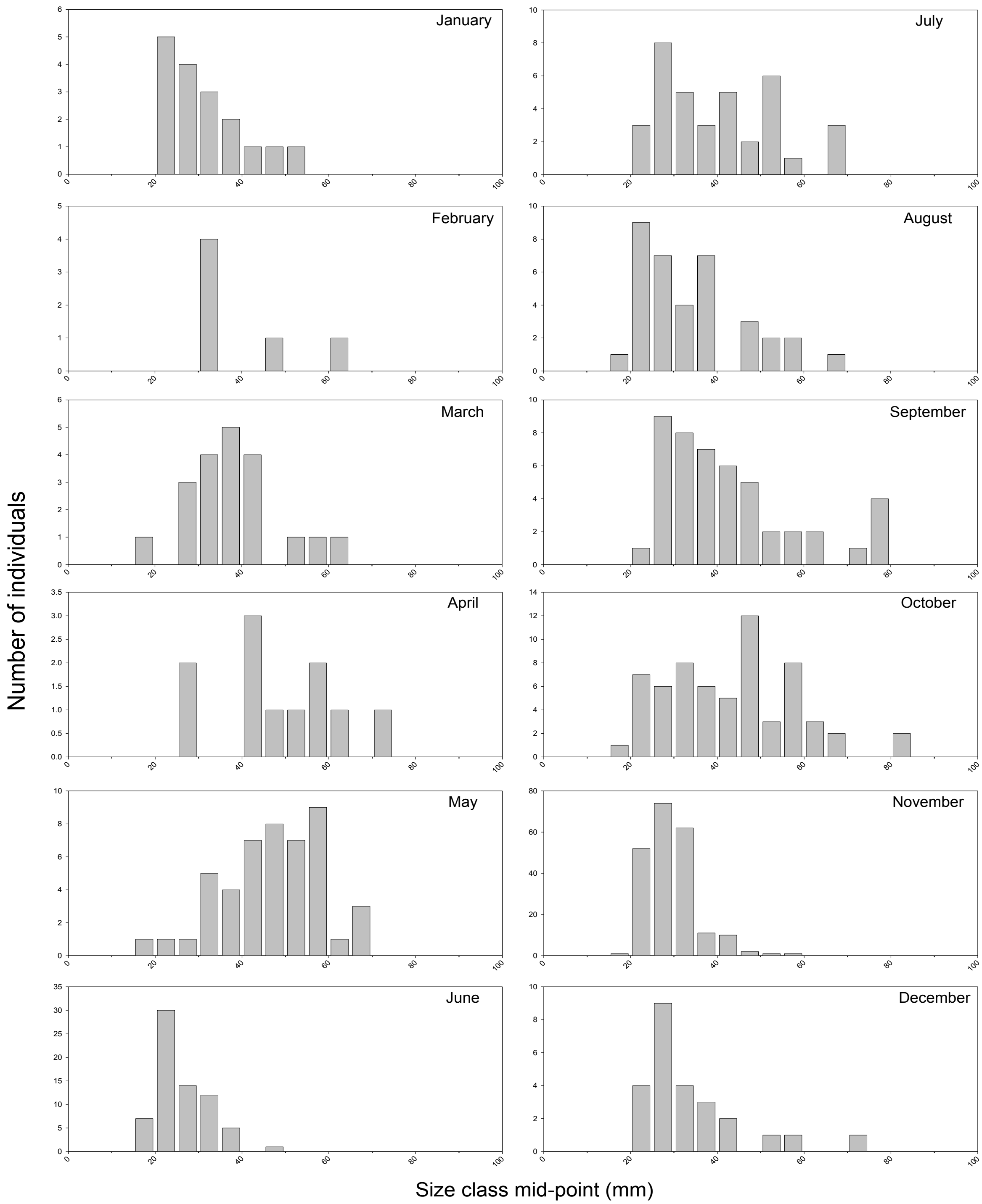
Appendix 7, Figure 28. Length frequencies of darter goby by month collected with 21.3-m seines in the lower St. Johns River.

Farfantepenaeus duorarum (Pink shrimp) in 21.3-m seines



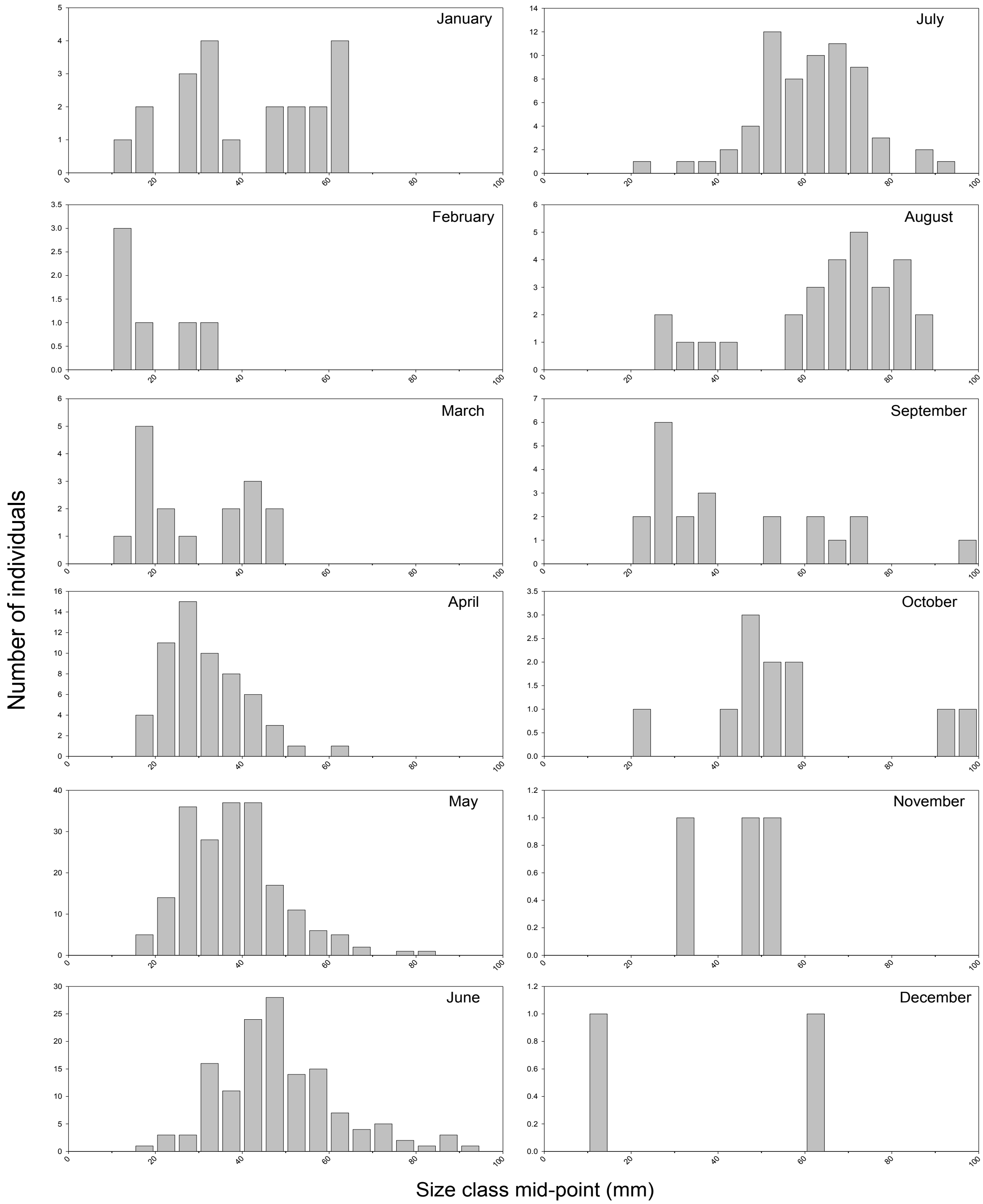
Appendix 7, Figure 29. Length frequencies of pink shrimp by month collected with 21.3-m seines in the lower St. Johns River.

Symphurus plagiusa (Blackcheek tonguefish) in 21.3-m seines



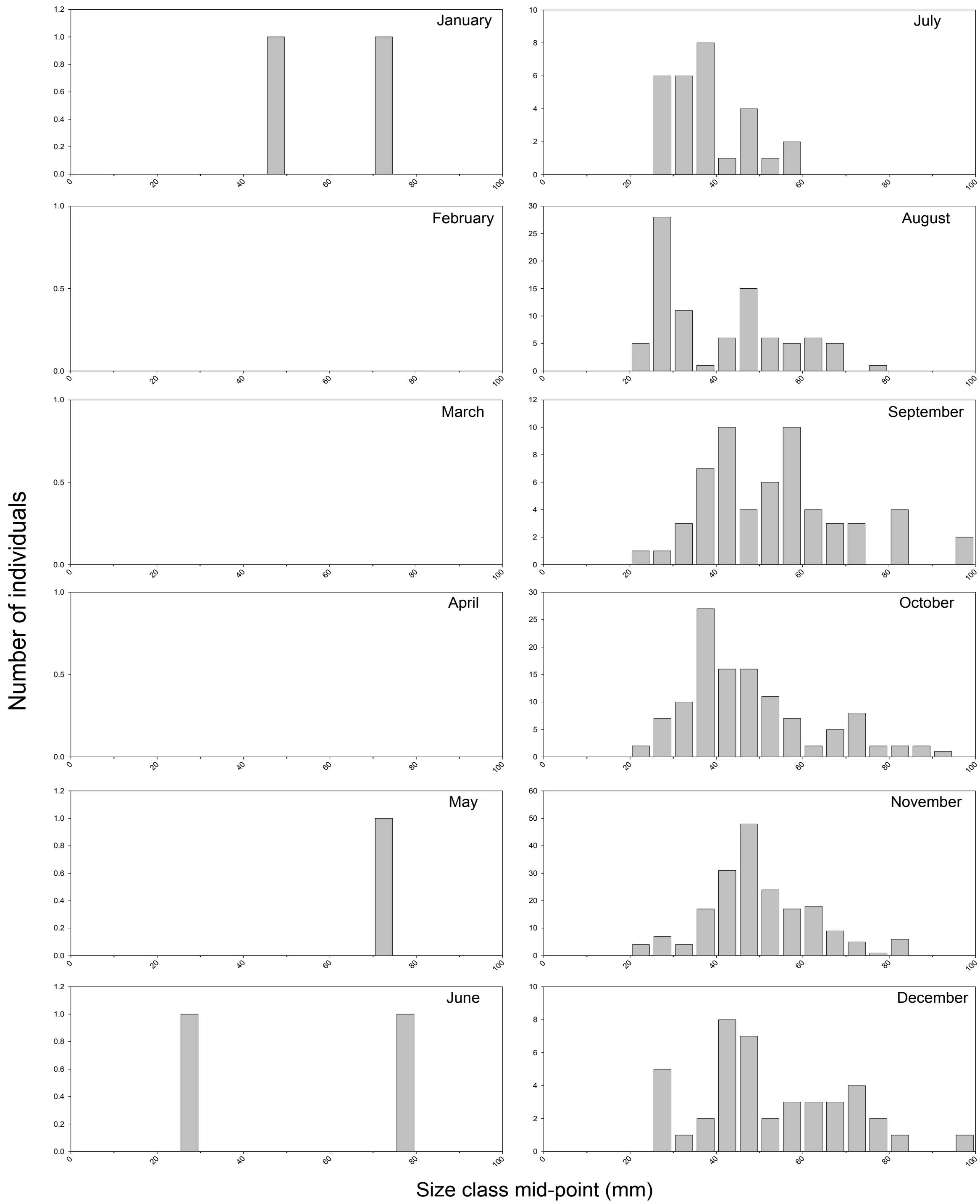
Appendix 7, Figure 30. Length frequencies of blackcheek tonguefish by month collected with 21.3-m seines in the lower St. Johns River.

Citharichthys spilopterus (Bay whiff) in 21.3-m seines



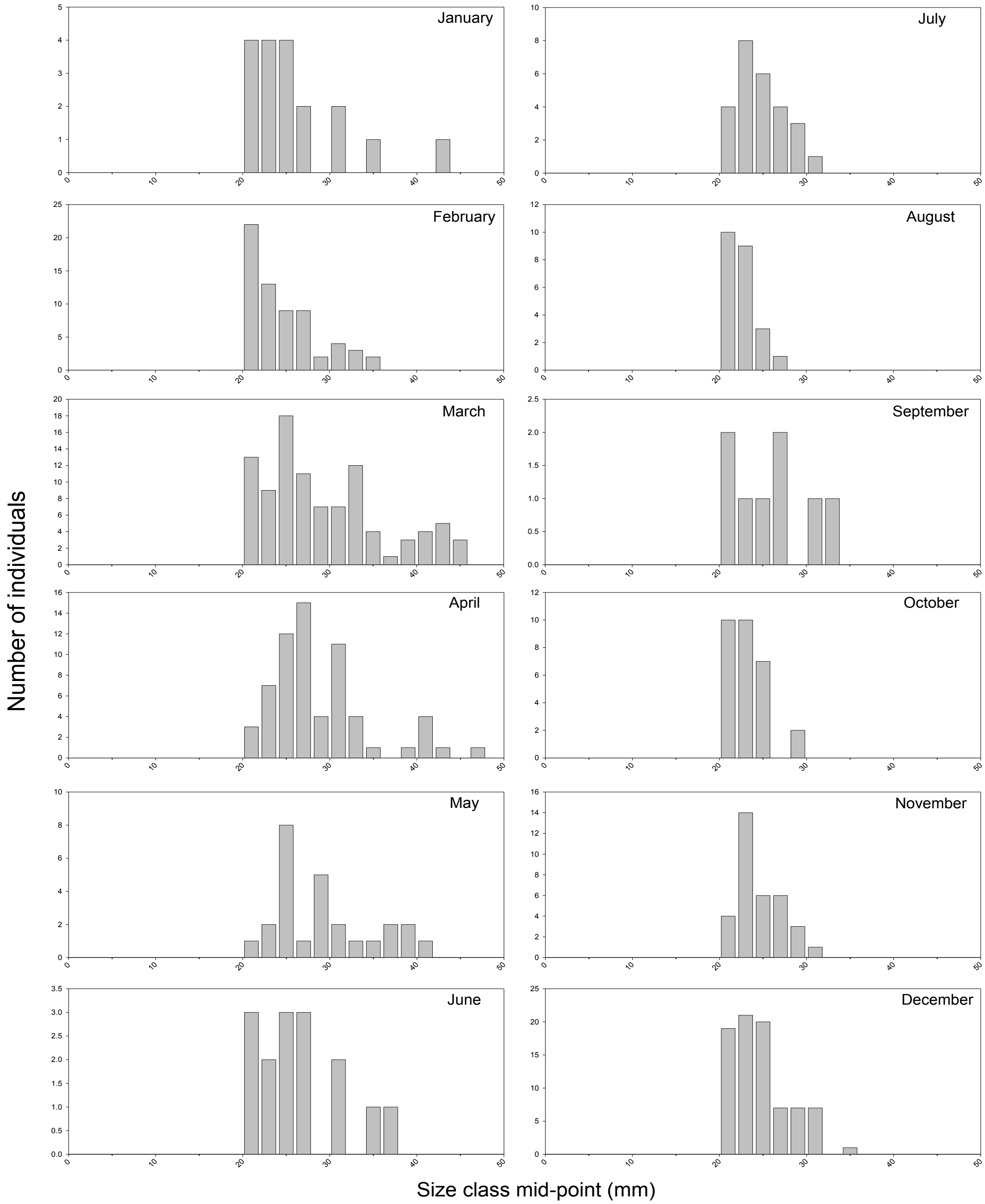
Appendix 7, Figure 31. Length frequencies of bay whiff by month collected with 21.3-m seines in the lower St. Johns River.

Diapterus auratus (Irish pompano) in 21.3-m seines



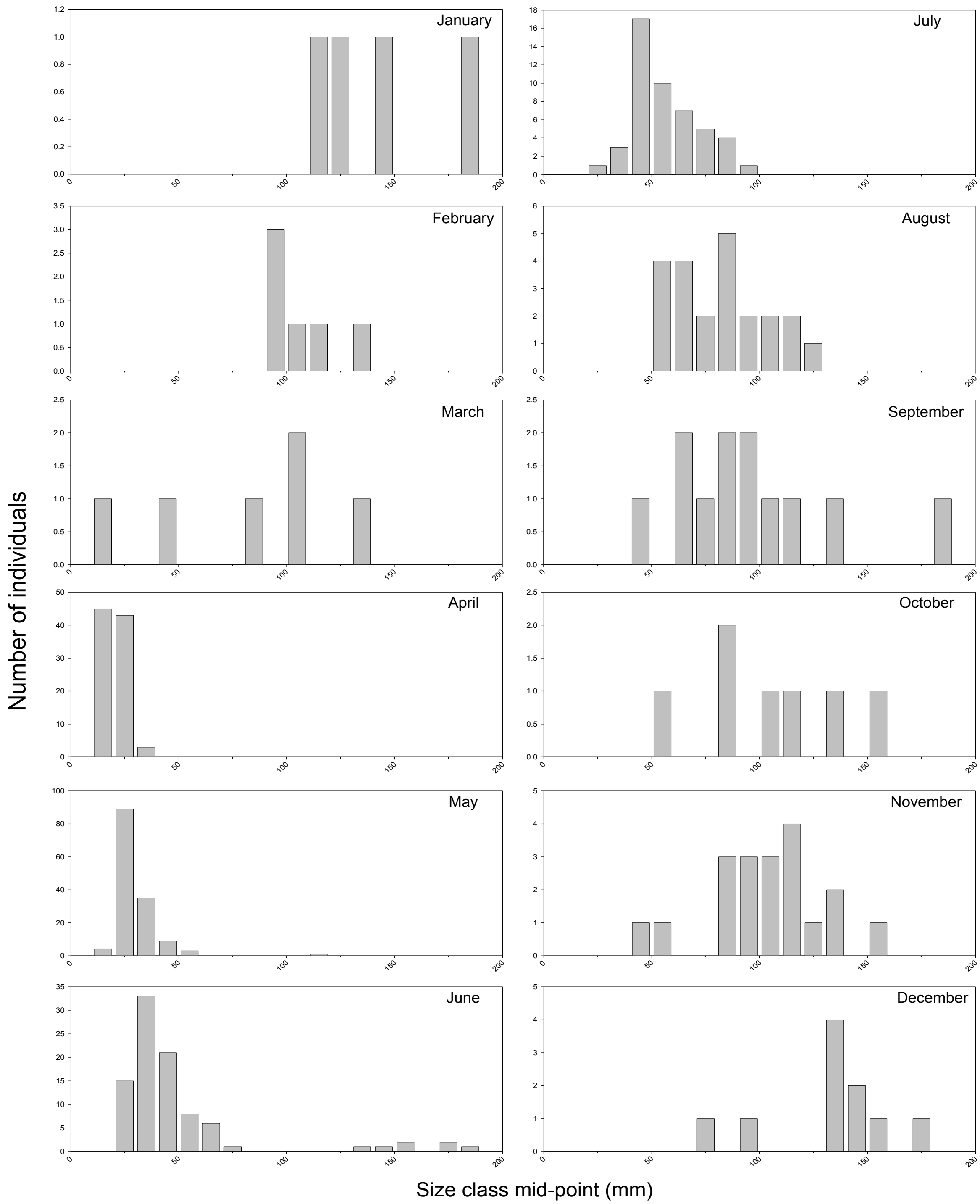
Appendix 7, Figure 32. Length frequencies of irish pompano by month collected with 21.3-m seines in the lower St. Johns River.

Gobiosoma bosc (Naked goby) in 21.3-m seines



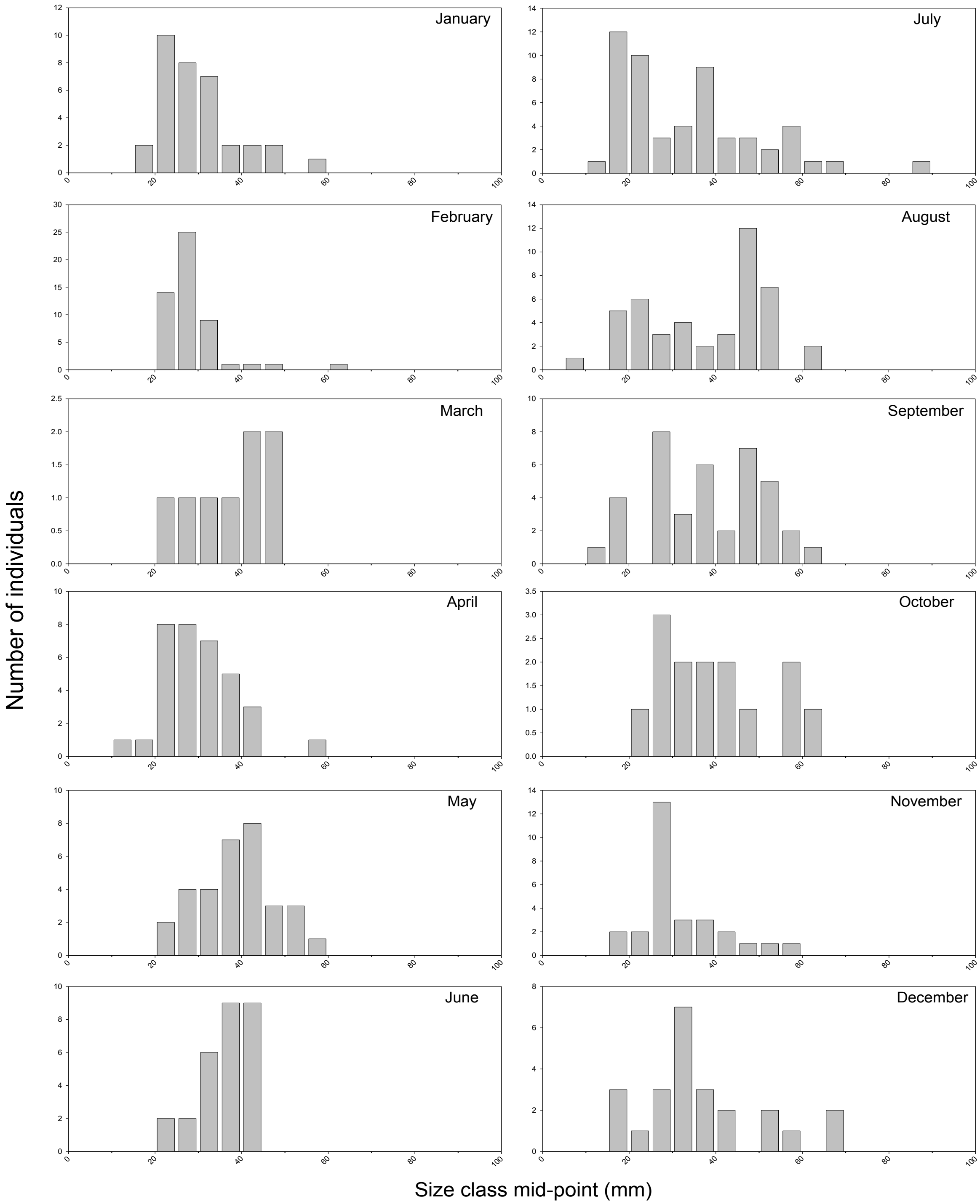
Appendix 7, Figure 33. Length frequencies of naked goby by month collected with 21.3-m seines in the lower St. Johns River.

Micropterus salmoides (Largemouth bass) in 21.3-m seines

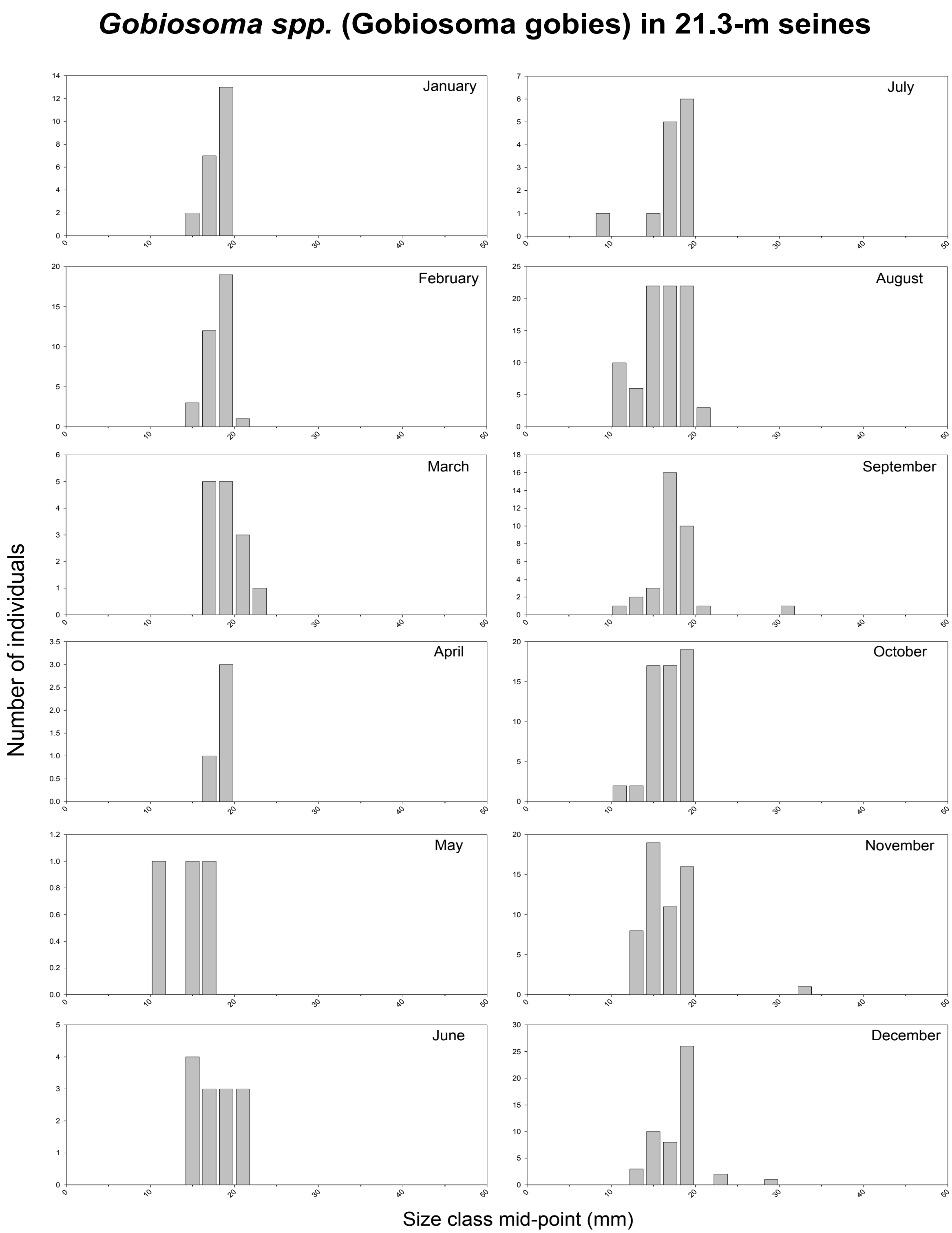


Appendix 7, Figure 34. Length frequencies of largemouth bass by month collected with 21.3-m seines in the lower St. Johns River.

Trinectes maculatus (Hogchoker) in 21.3-m seines

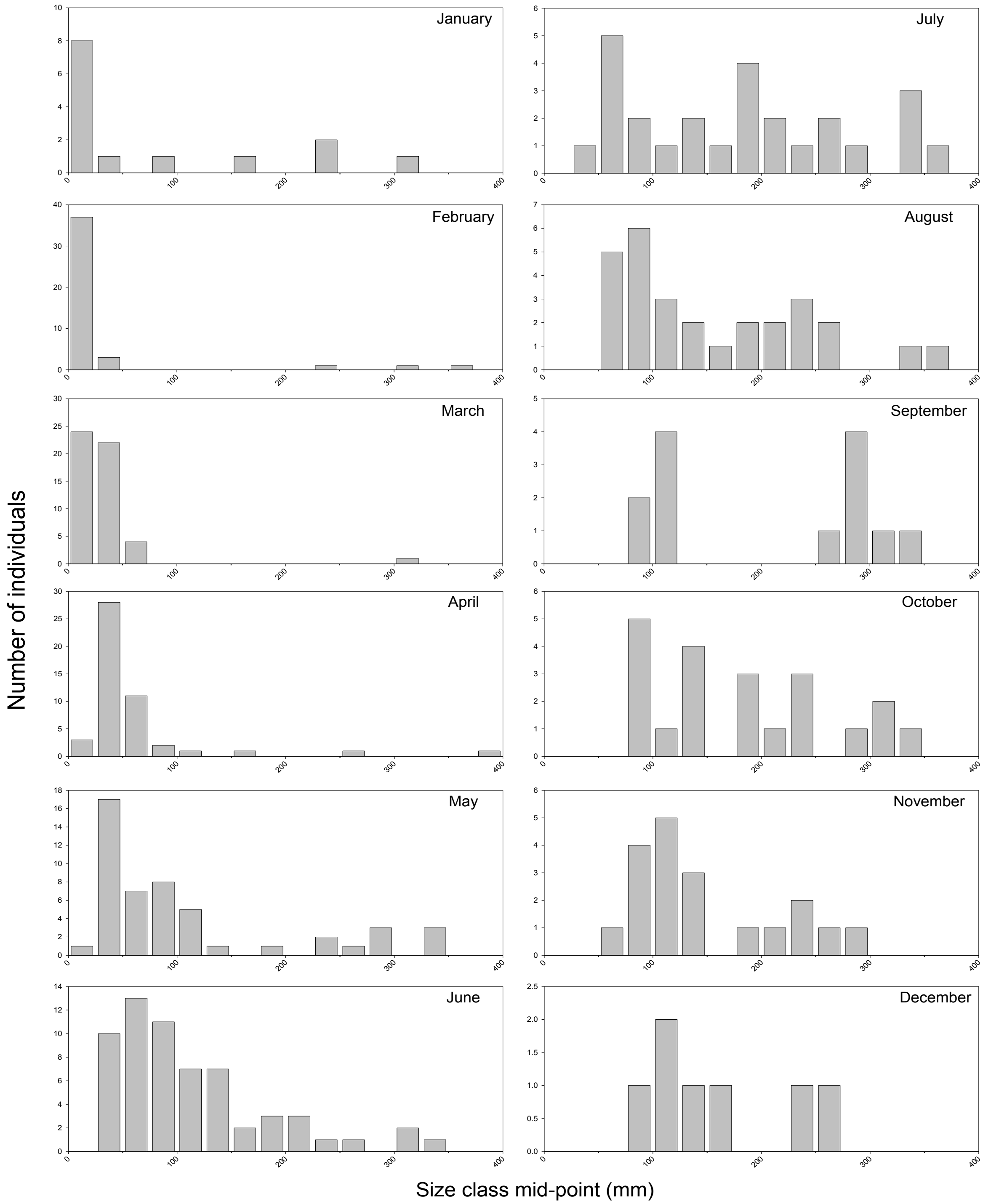


Appendix 7, Figure 35. Length frequencies of hogchoker by month collected with 21.3-m seines in the lower St. Johns River.



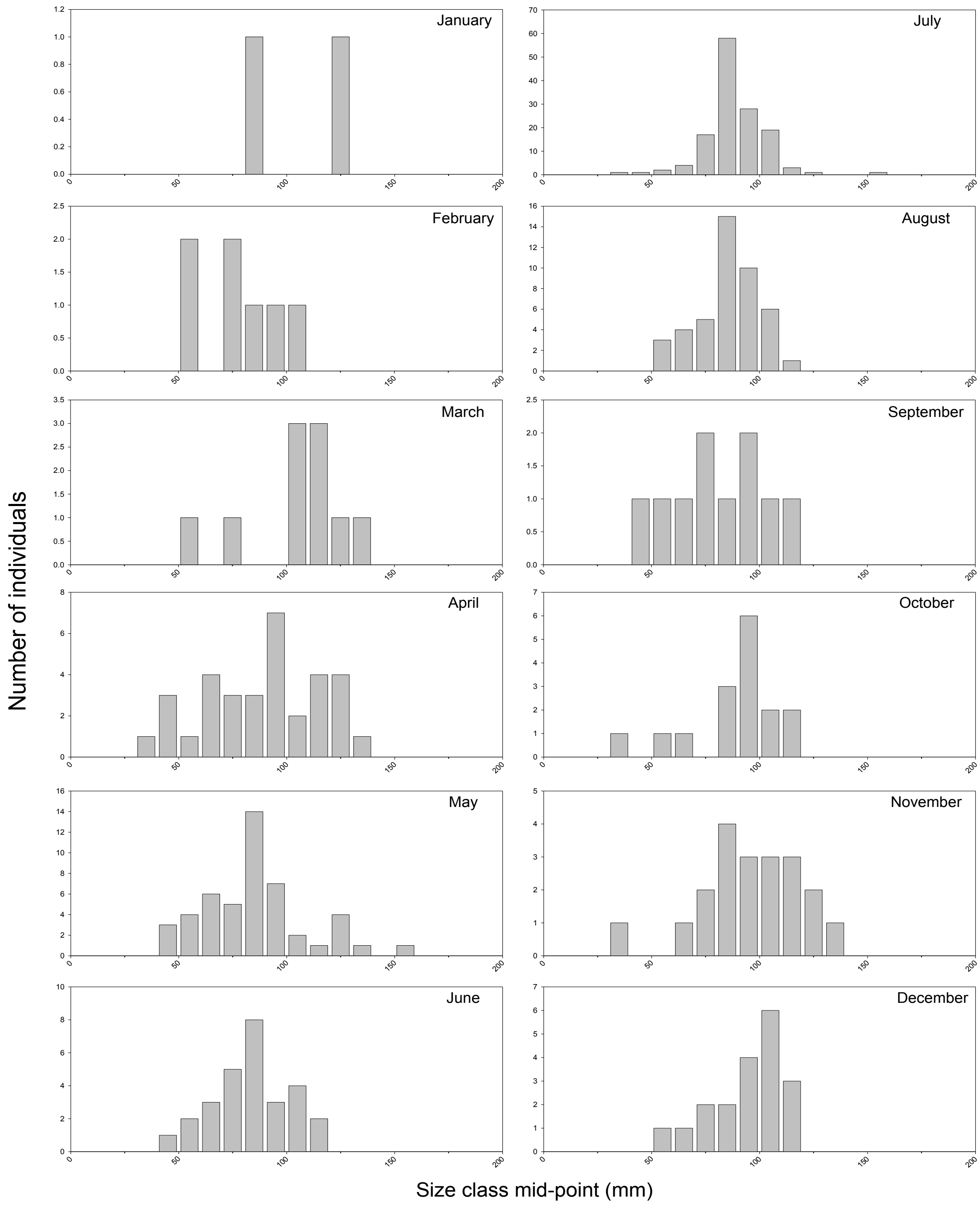
Appendix 7, Figure 36. Length frequencies of gobiosoma gobies by month collected with 21.3-m seines in the lower St. Johns River.

Paralichthys lethostigma (Southern flounder) in 21.3-m seines



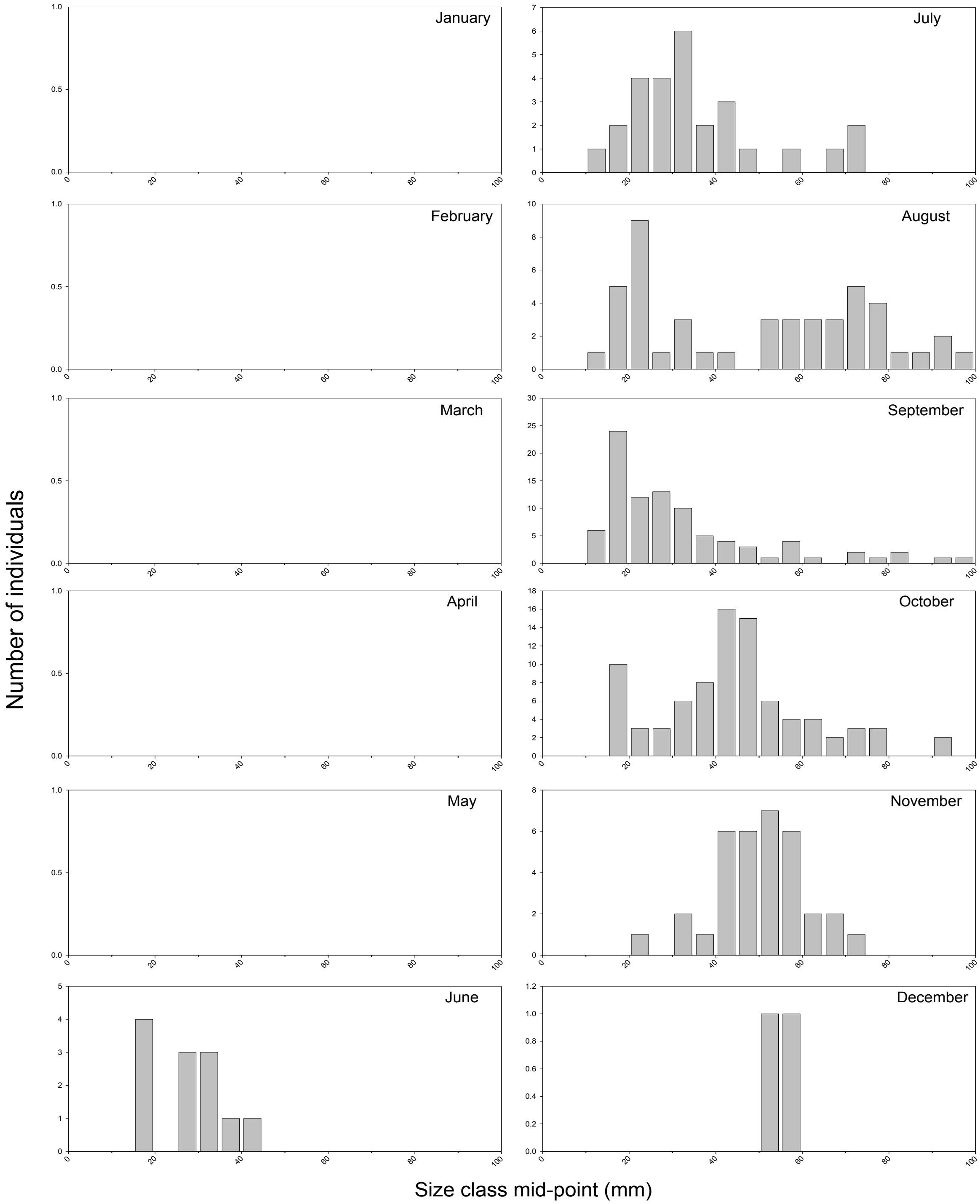
Appendix 7, Figure 37. Length frequencies of southern flounder by month collected with 21.3-m seines in the lower St. Johns River.

Syngnathus scovelli (Gulf pipefish) in 21.3-m seines



Appendix 7, Figure 38. Length frequencies of gulf pipefish by month collected with 21.3-m seines in the lower St. Johns River.

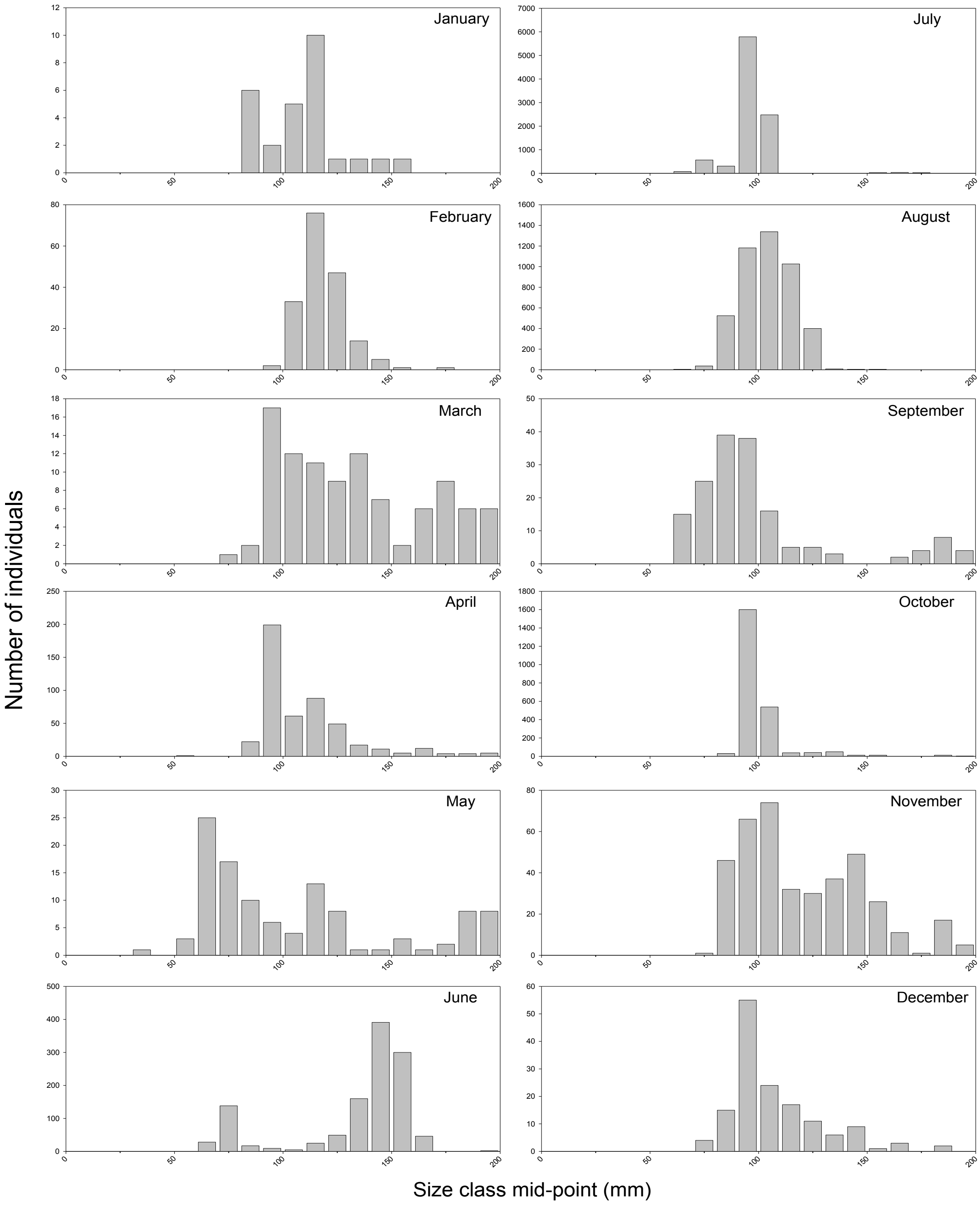
Oligoplites saurus (Leatherjacket) in 21.3-m seines



Appendix 7, Figure 39. Length frequencies of leatherjacket by month collected with 21.3-m seines in the lower St. Johns River.

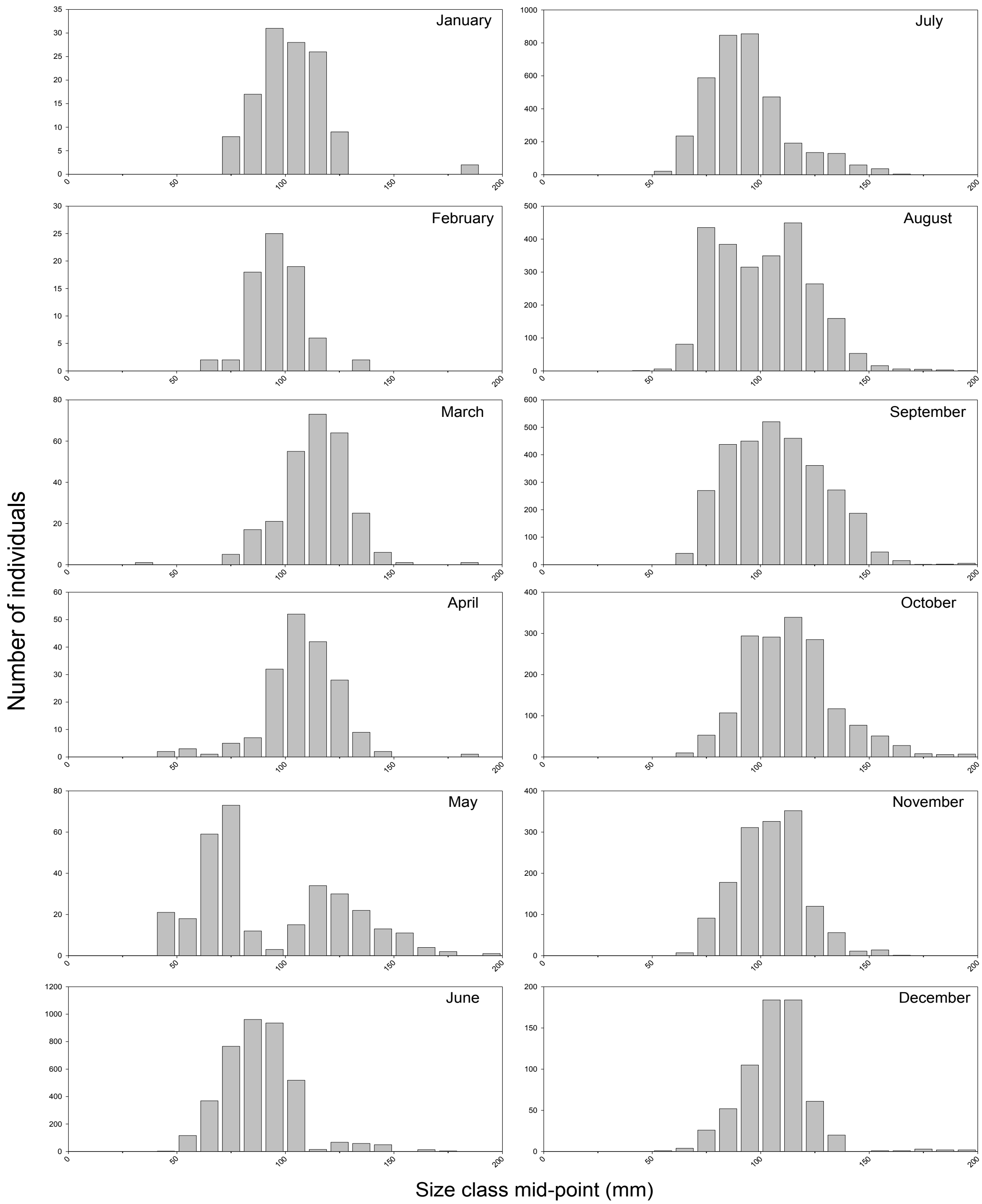
APPENDIX 8: Monthly length-frequency plots for 183-m seines

Brevoortia spp. (Menhaden) in 183-m seines



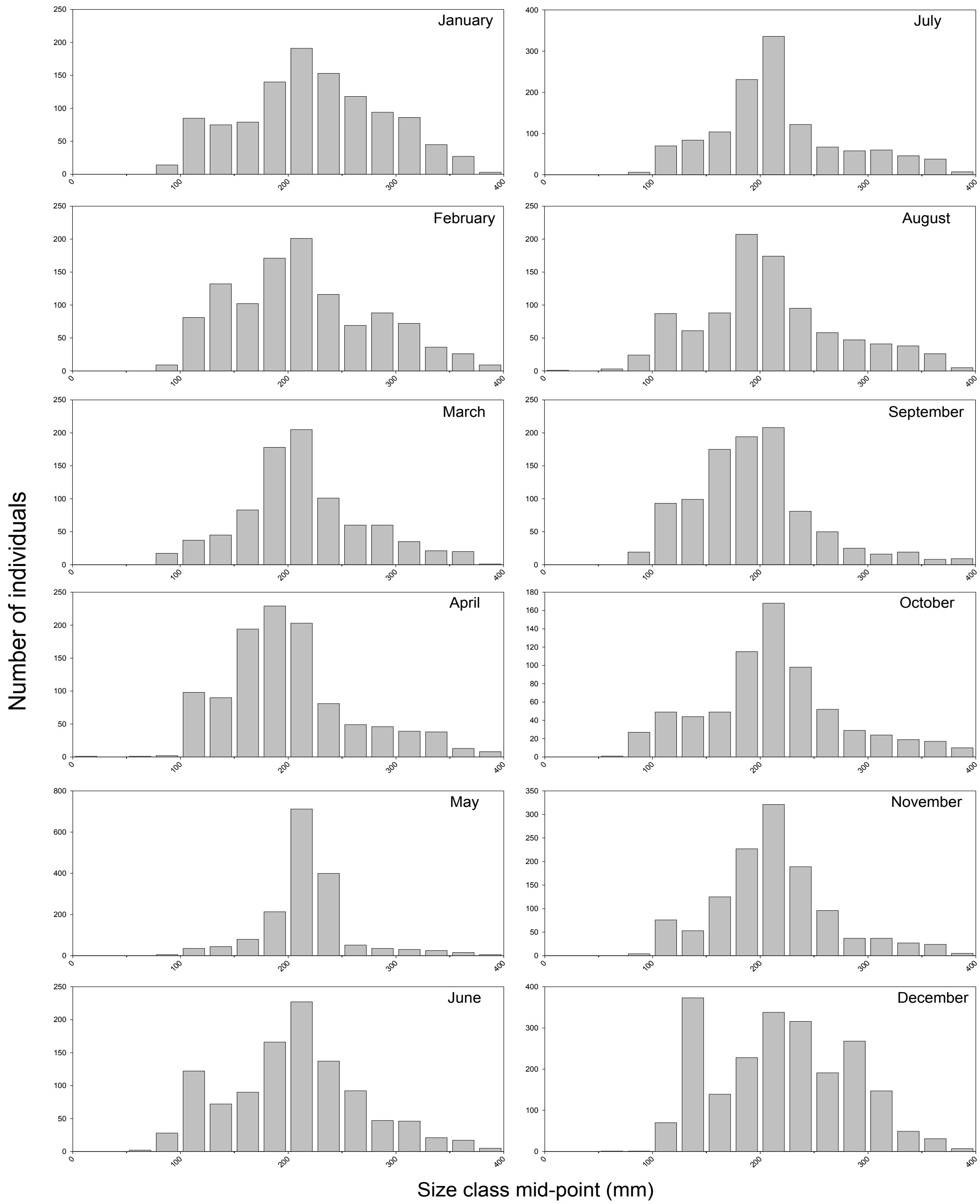
Appendix 8, Figure 1. Length frequencies of menhaden by month collected with 183-m seines in the lower St. Johns River.

Lagodon rhomboides (Pinfish) in 183-m seines



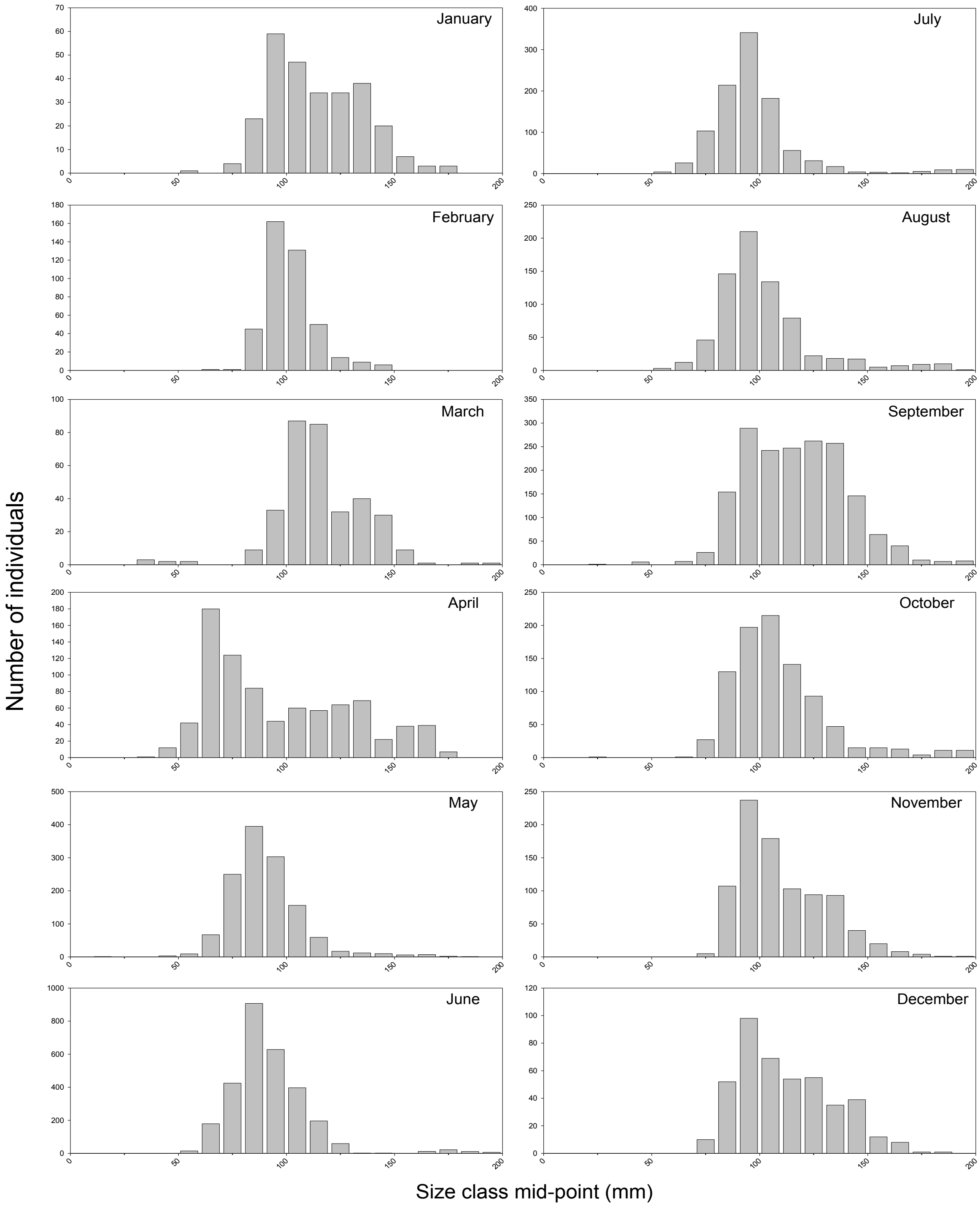
Appendix 8, Figure 2. Length frequencies of pinfish by month collected with 183-m seines in the lower St. Johns River.

Mugil cephalus (Striped mullet) in 183-m seines



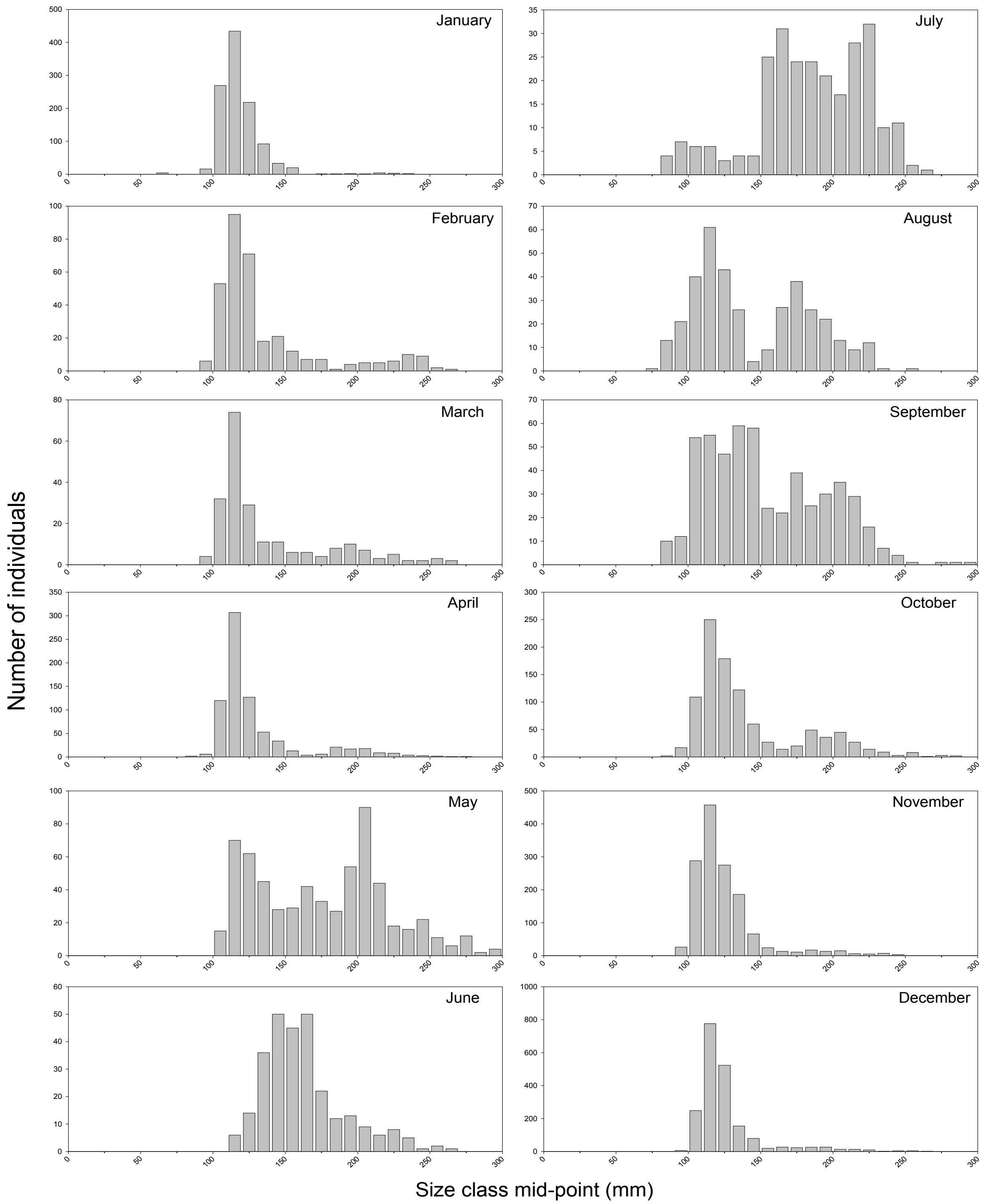
Appendix 8, Figure 3. Length frequencies of striped mullet by month collected with 183-m seines in the lower St. Johns River.

Leiostomus xanthurus (Spot) in 183-m seines



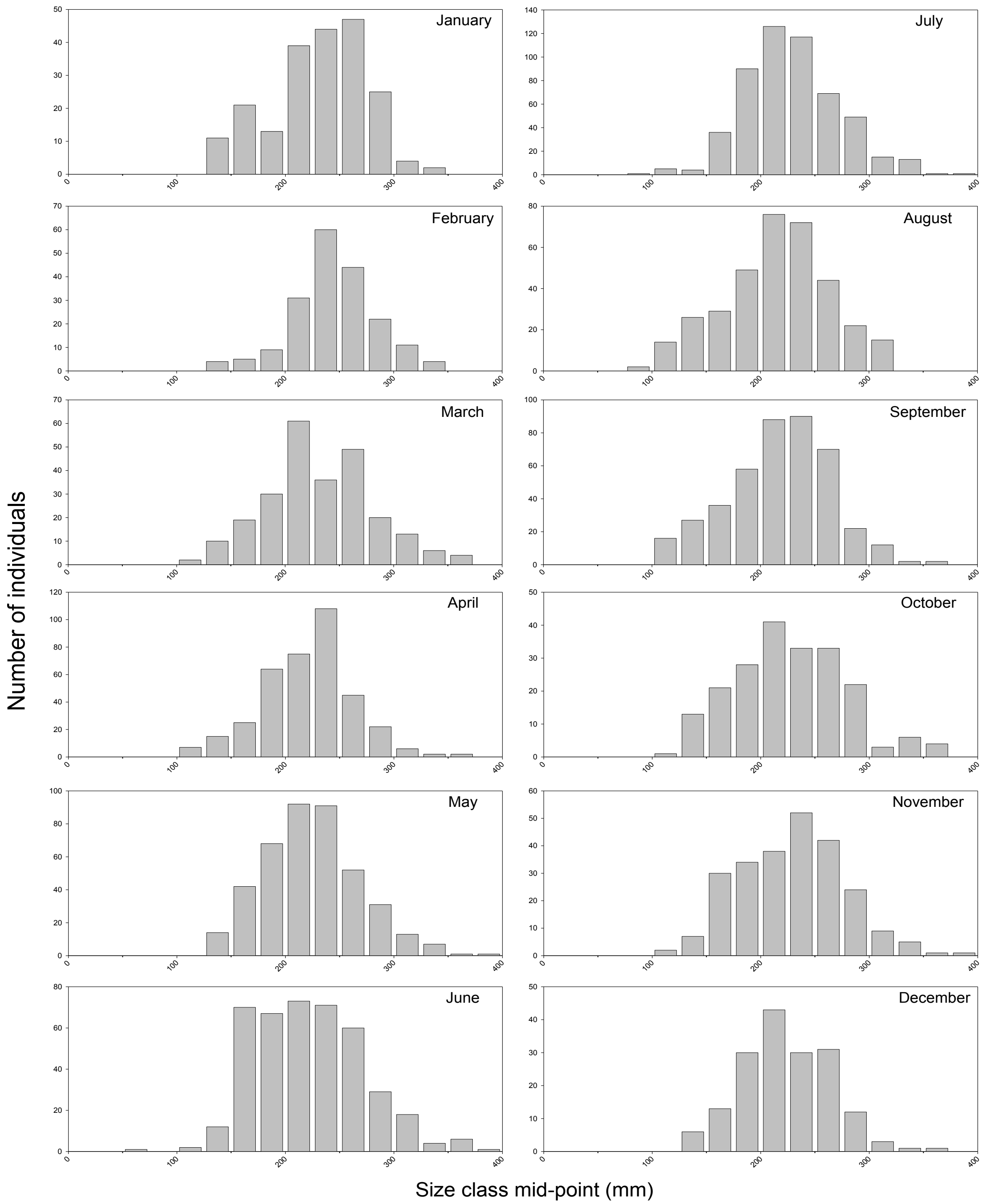
Appendix 8, Figure 4. Length frequencies of spot by month collected with 183-m seines in the lower St. Johns River.

Mugil curema (White mullet) in 183-m seines



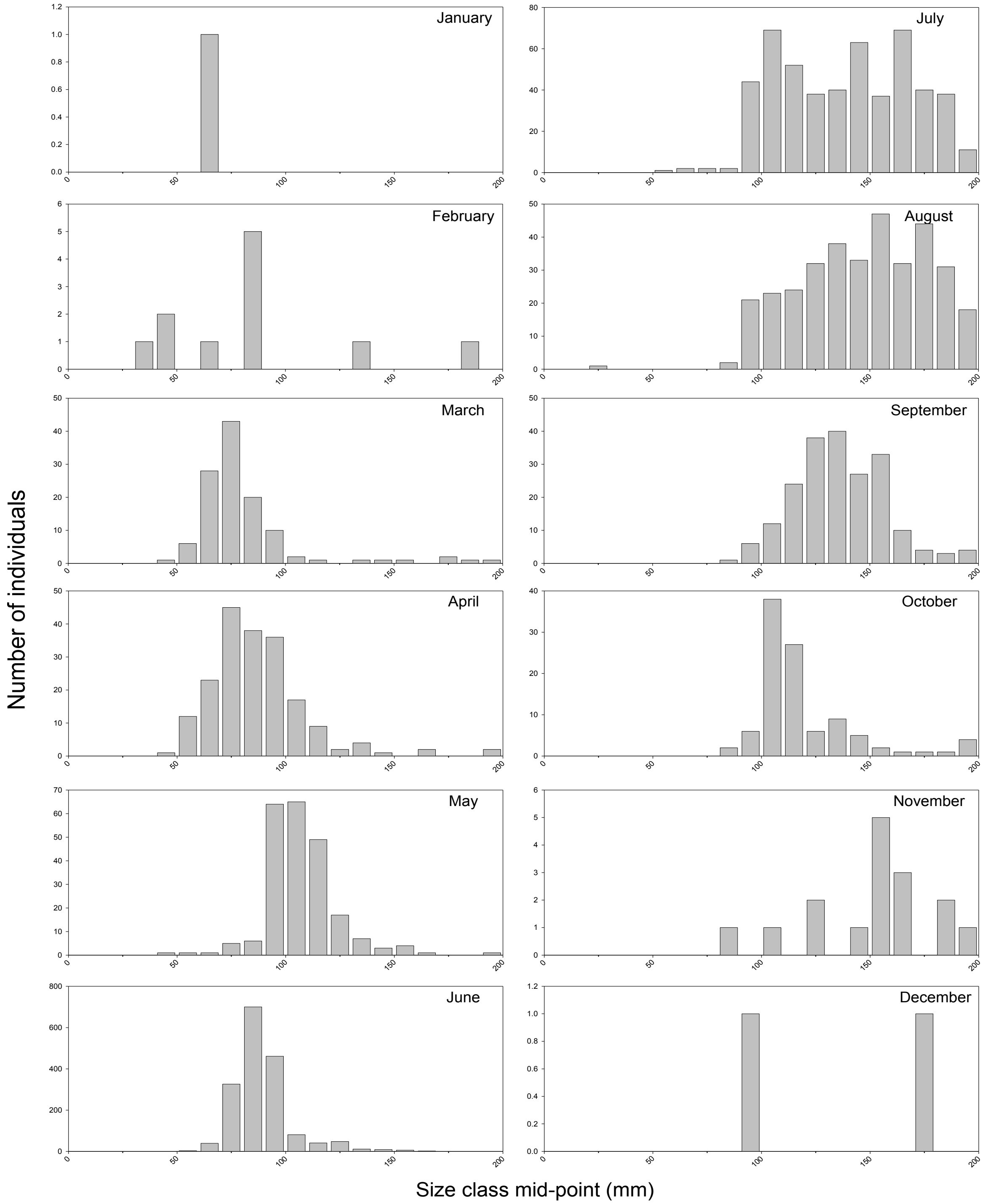
Appendix 8, Figure 5. Length frequencies of white mullet by month collected with 183-m seines in the lower St. Johns River.

Dasyatis sabina (Atlantic stingray) in 183-m seines



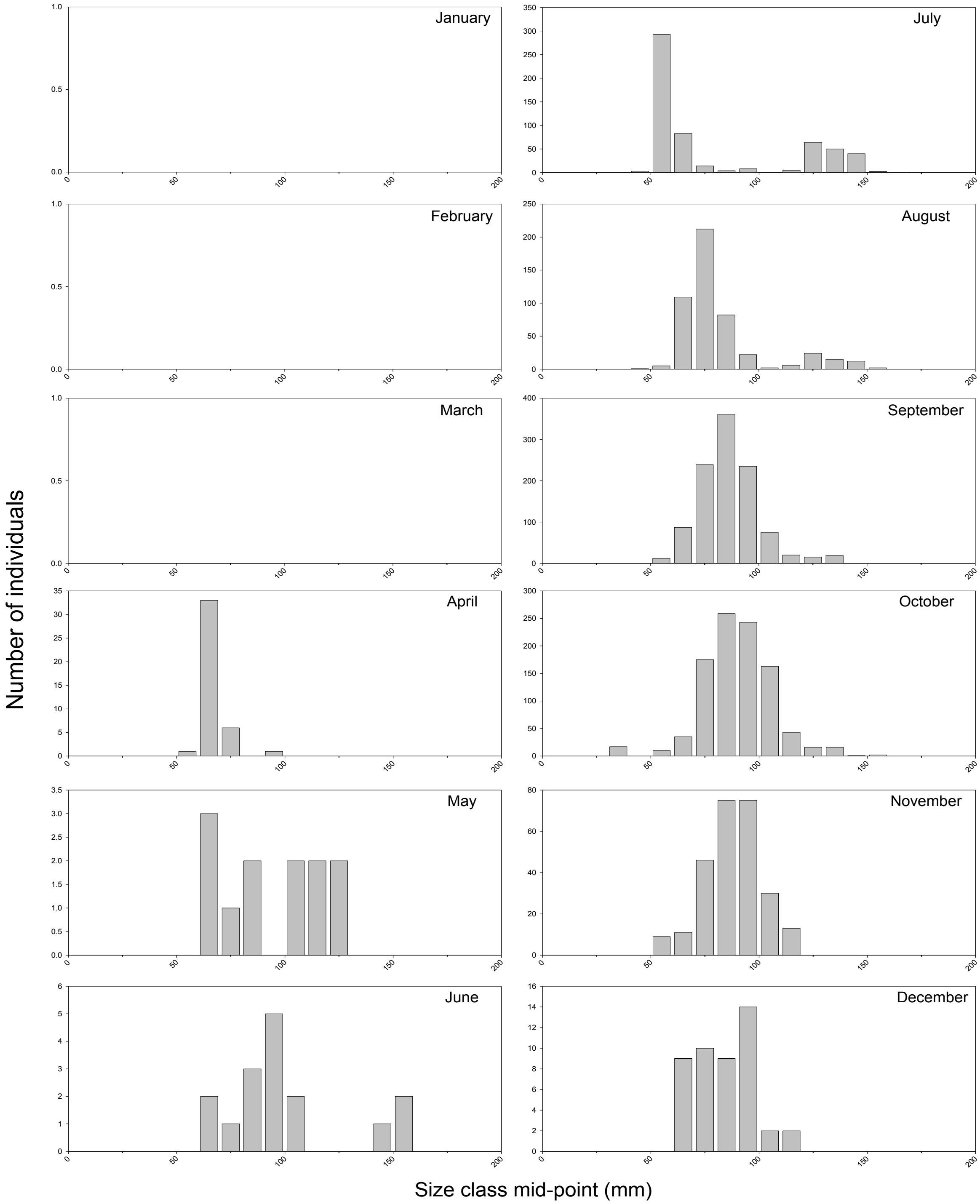
Appendix 8, Figure 6. Length frequencies of Atlantic stingray by month collected with 183-m seines in the lower St. Johns River.

Micropogonias undulatus (Atlantic croaker) in 183-m seines



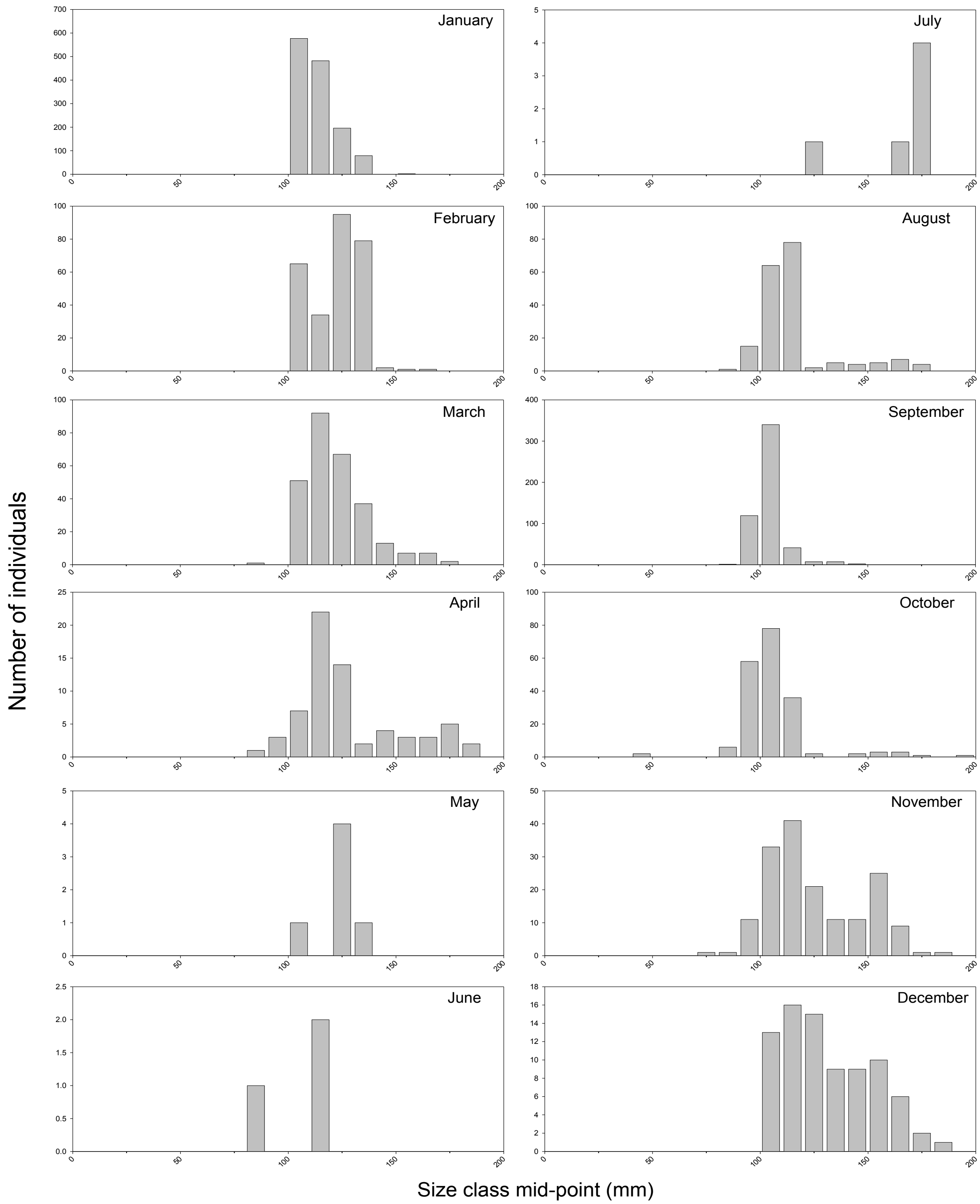
Appendix 8, Figure 7. Length frequencies of Atlantic croaker by month collected with 183-m seines in the lower St. Johns River.

Chloroscombrus chrysurus (Atlantic bumper) in 183-m seines

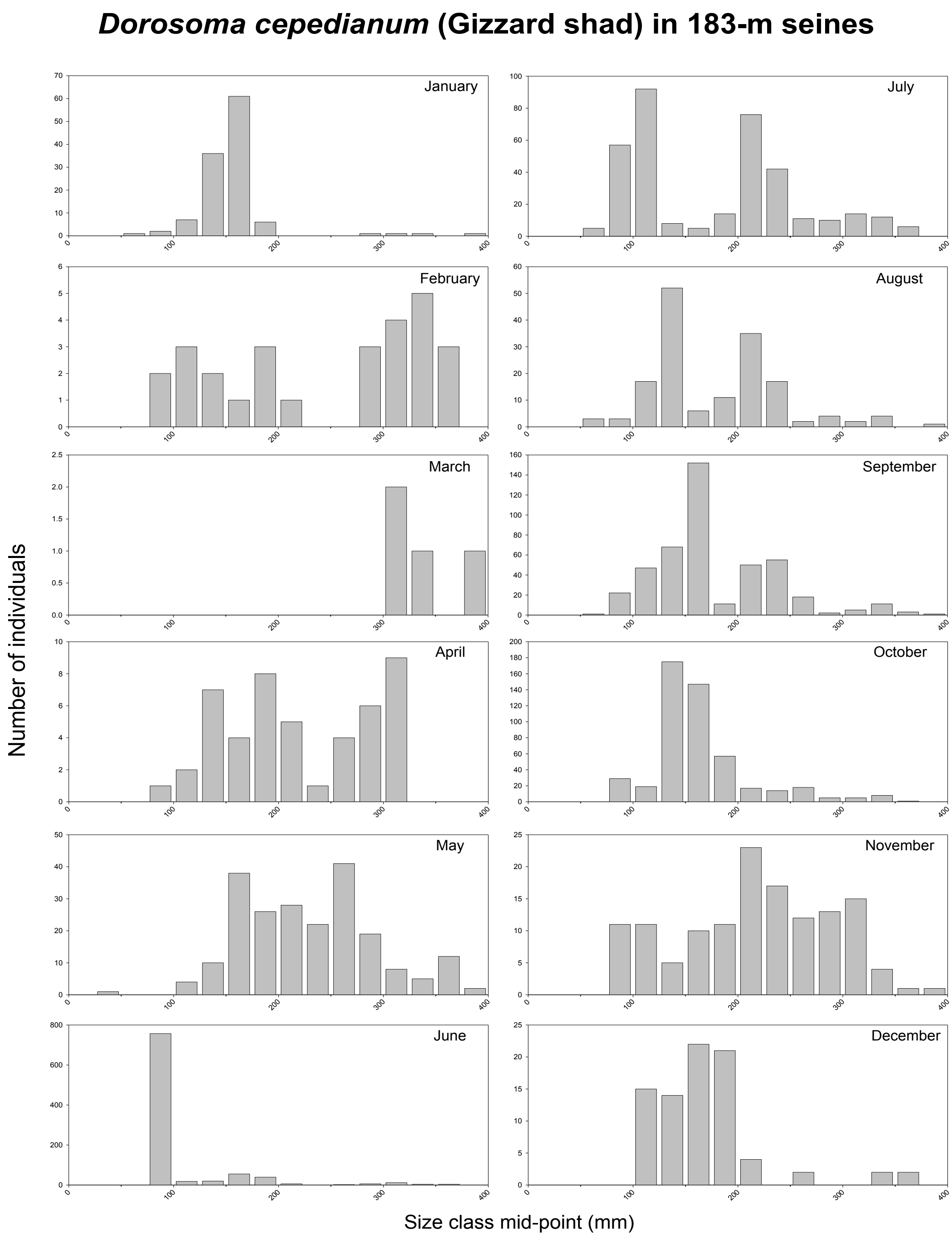


Appendix 8, Figure 8. Length frequencies of Atlantic bumper by month collected with 183-m seines in the lower St. Johns River.

Bairdiella chrysoura (Silver perch) in 183-m seines

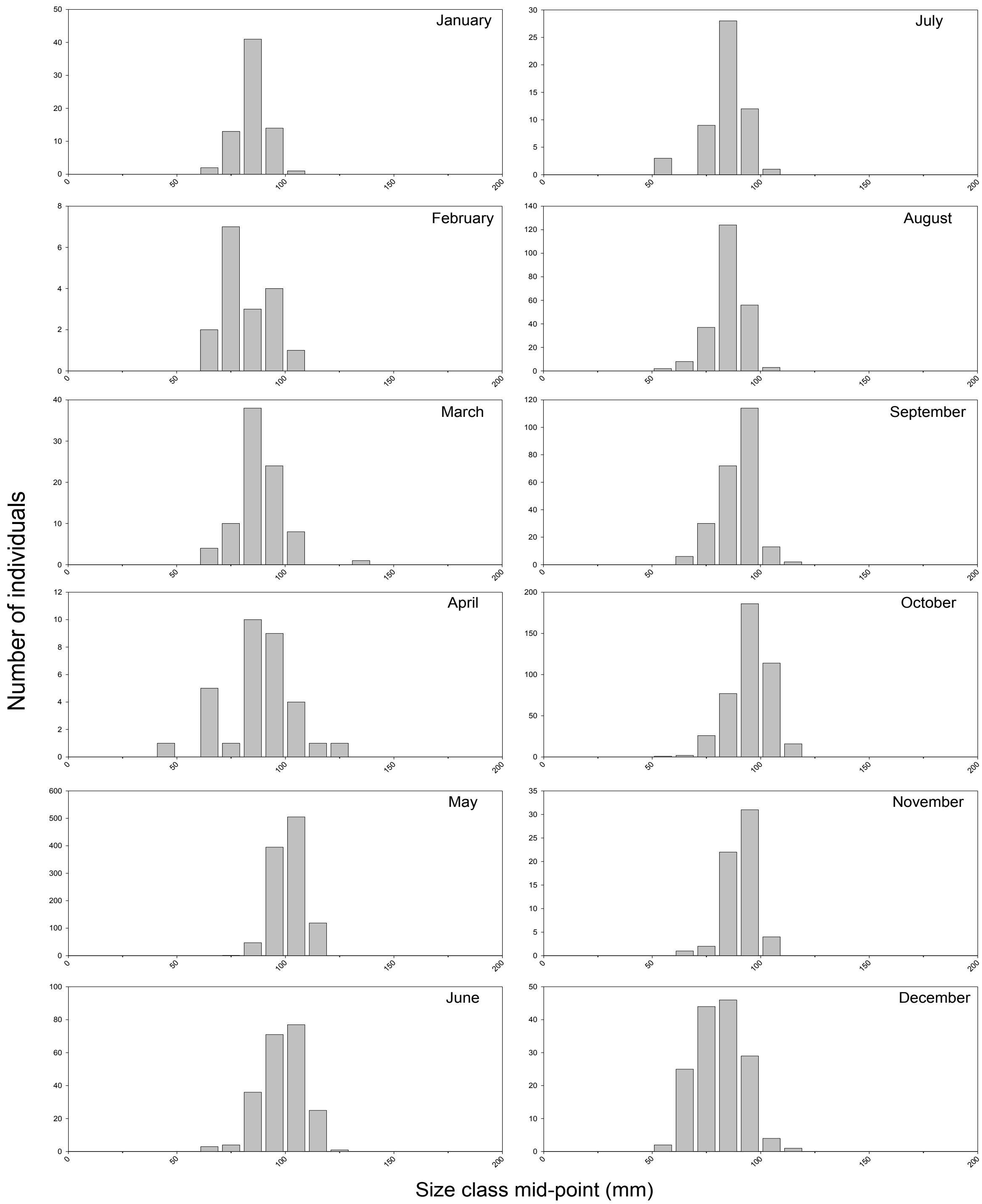


Appendix 8, Figure 9. Length frequencies of silver perch by month collected with 183-m seines in the lower St. Johns River.



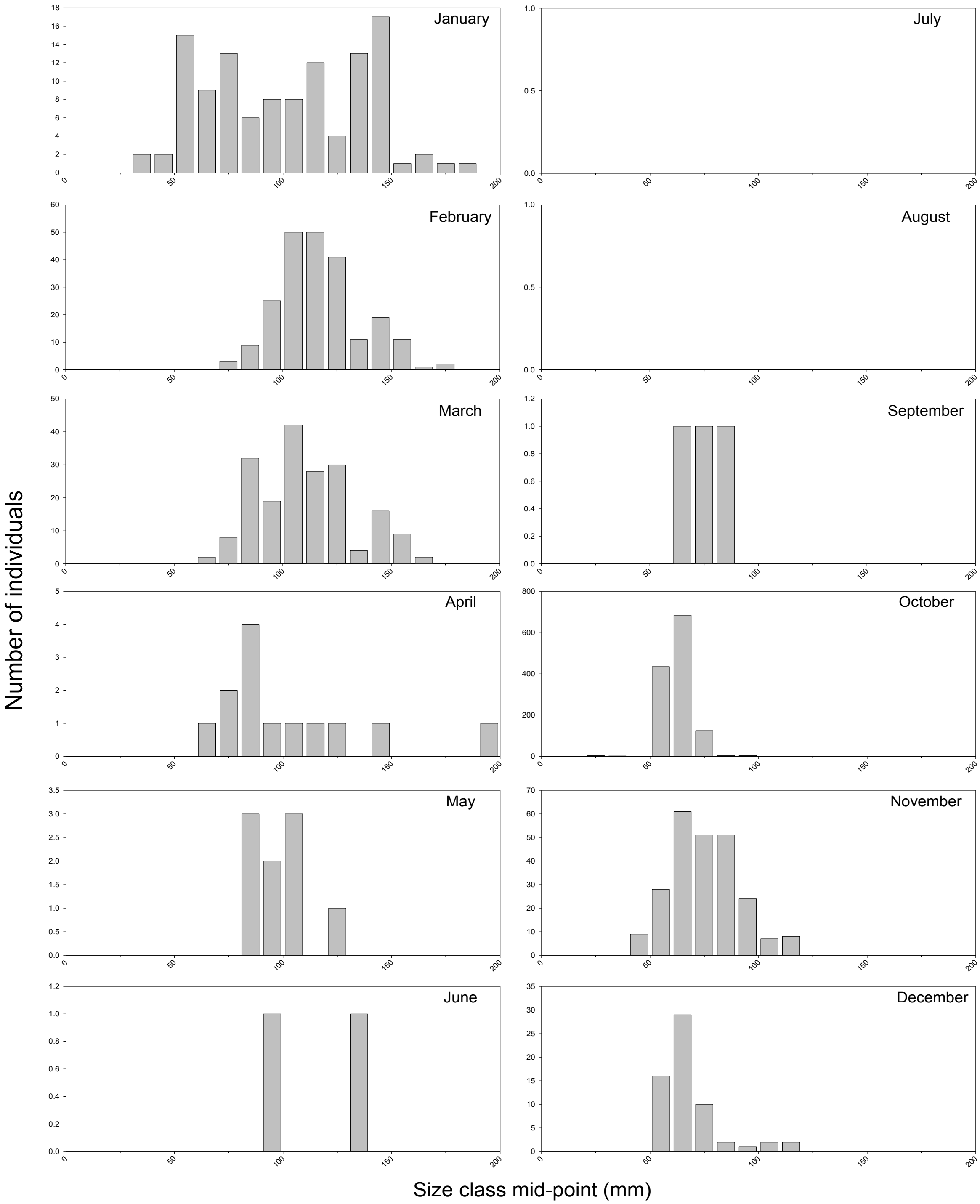
Appendix 8, Figure 10. Length frequencies of gizzard shad by month collected with 183-m seines in the lower St. Johns River.

Eucinostomus harengulus (Tidewater mojarra) in 183-m seines



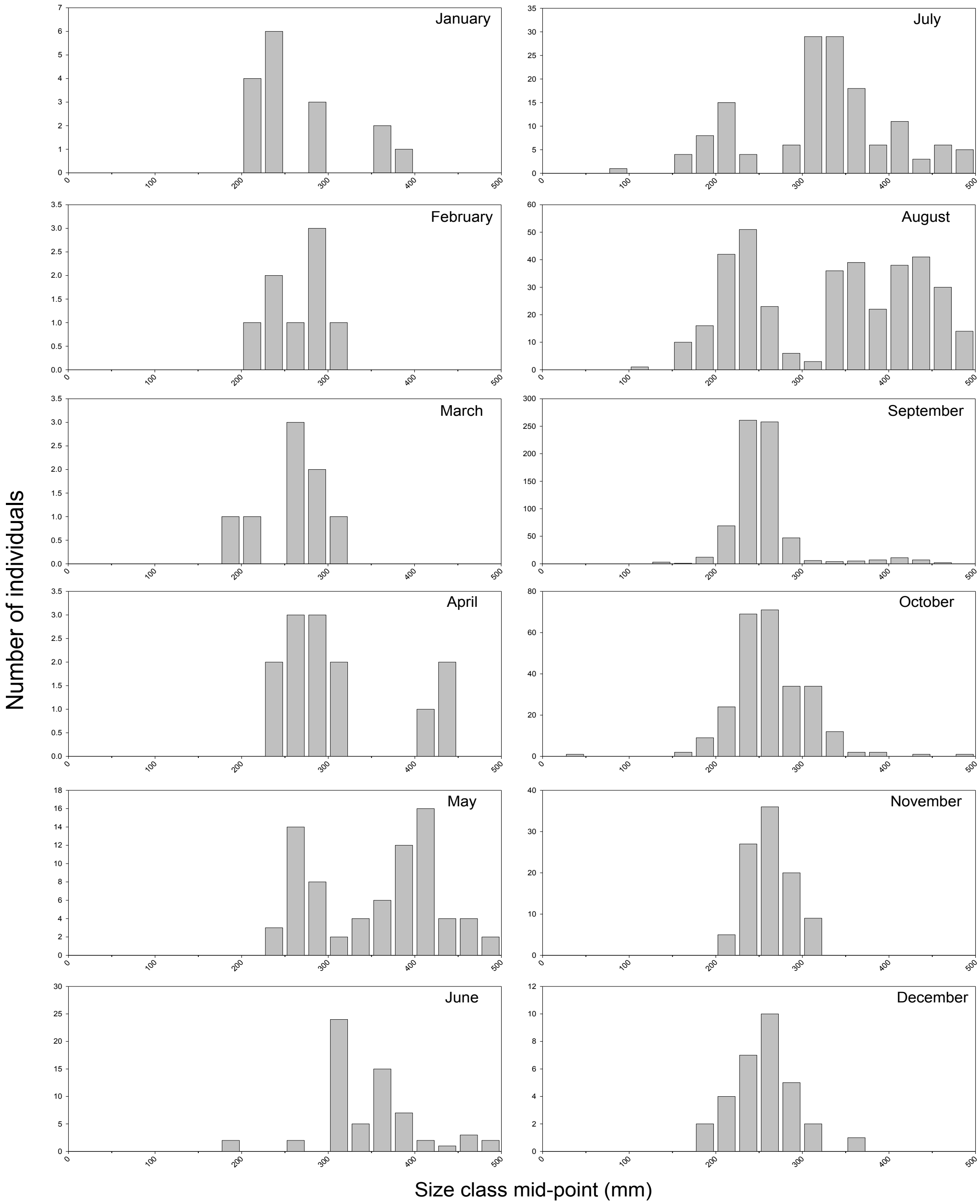
Appendix 8, Figure 11. Length frequencies of tidewater mojarra by month collected with 183-m seines in the lower St. Johns River.

Stomolophus meleagris (Cannonball jellyfish) in 183-m seines



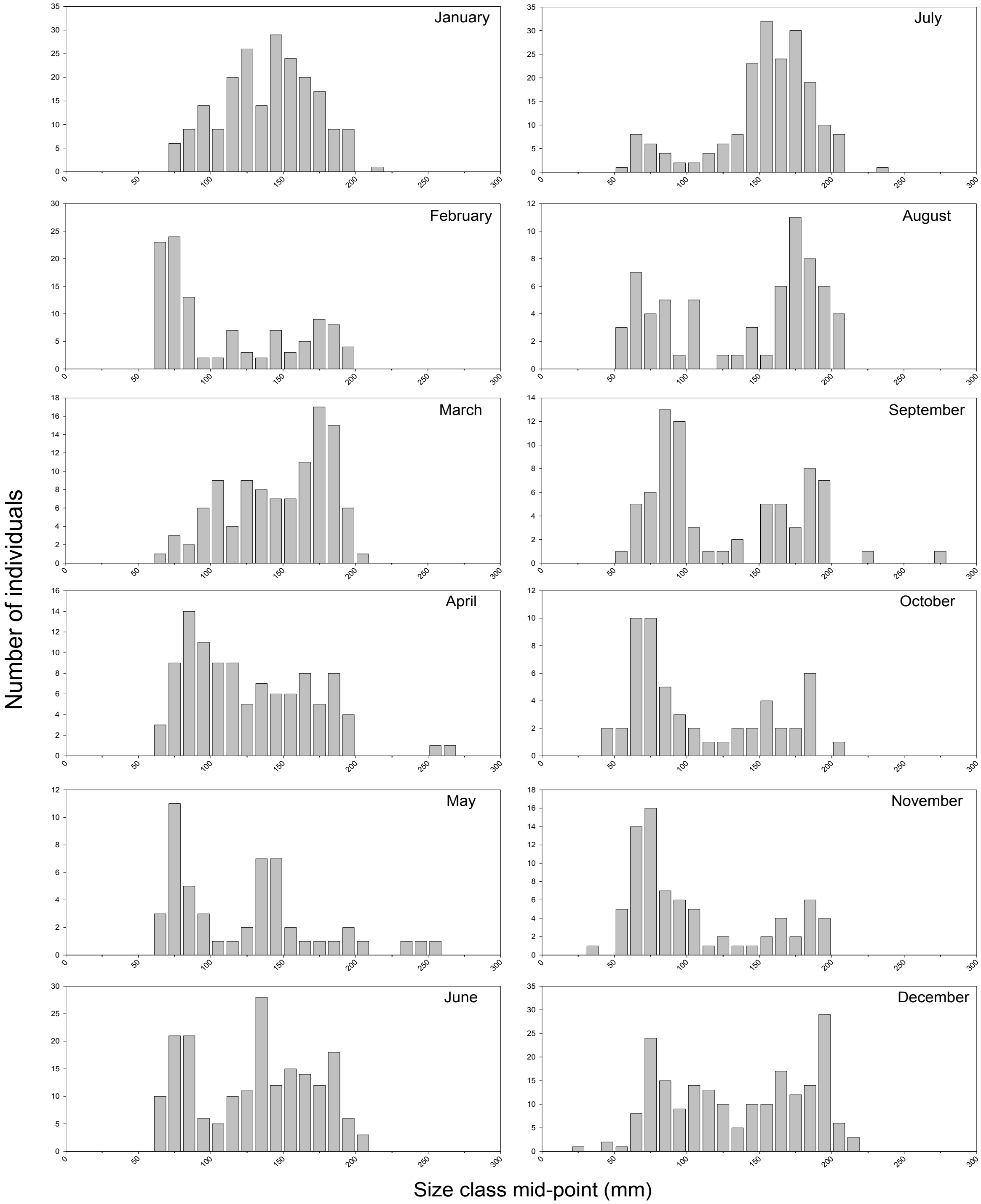
Appendix 8, Figure 12. Length frequencies of cannonball jellyfish by month collected with 183-m seines in the lower St. Johns River.

Elops saurus (Ladyfish) in 183-m seines



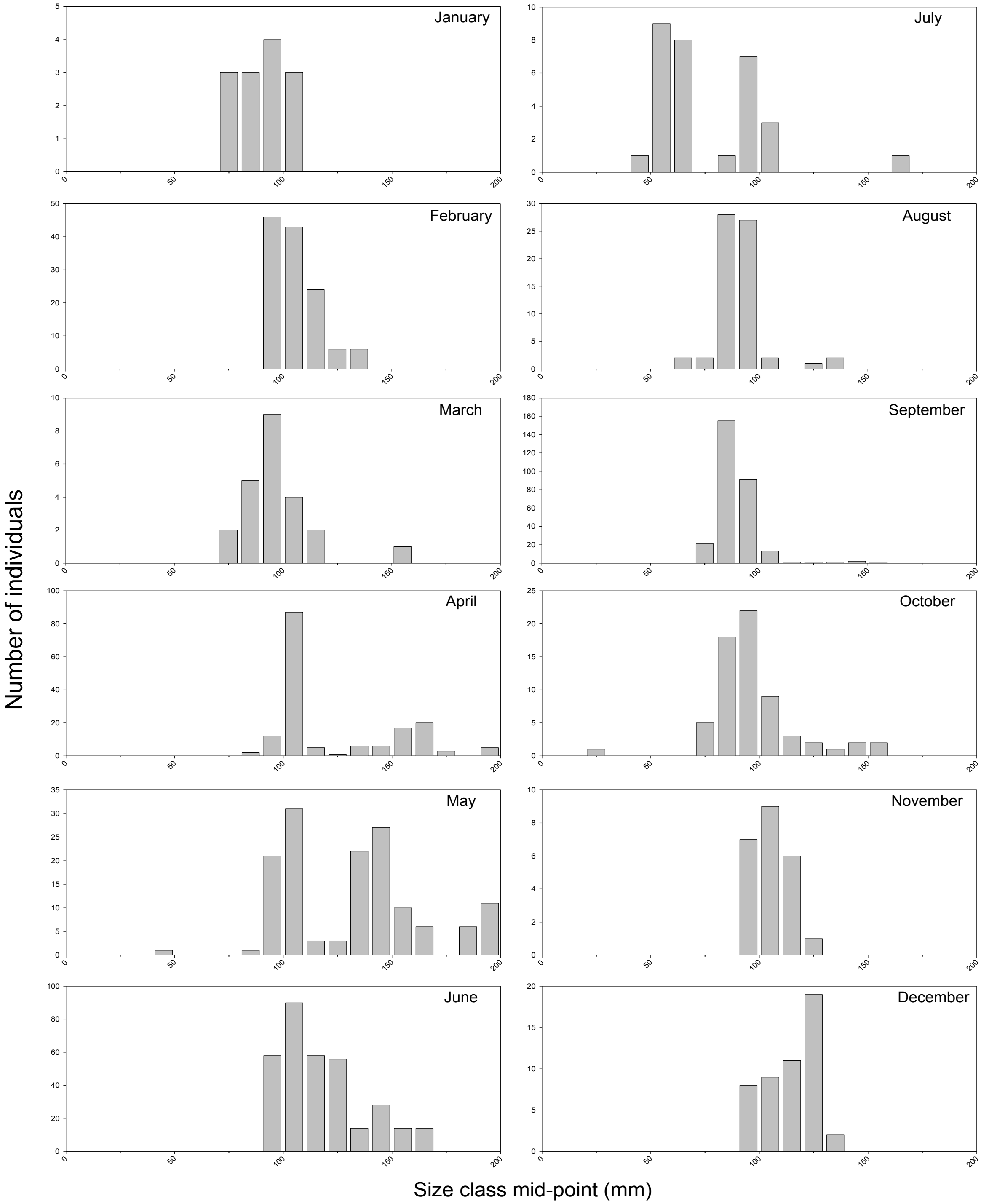
Appendix 8, Figure 13. Length frequencies of ladyfish by month collected with 183-m seines in the lower St. Johns River.

Lepomis macrochirus (Bluegill) in 183-m seines



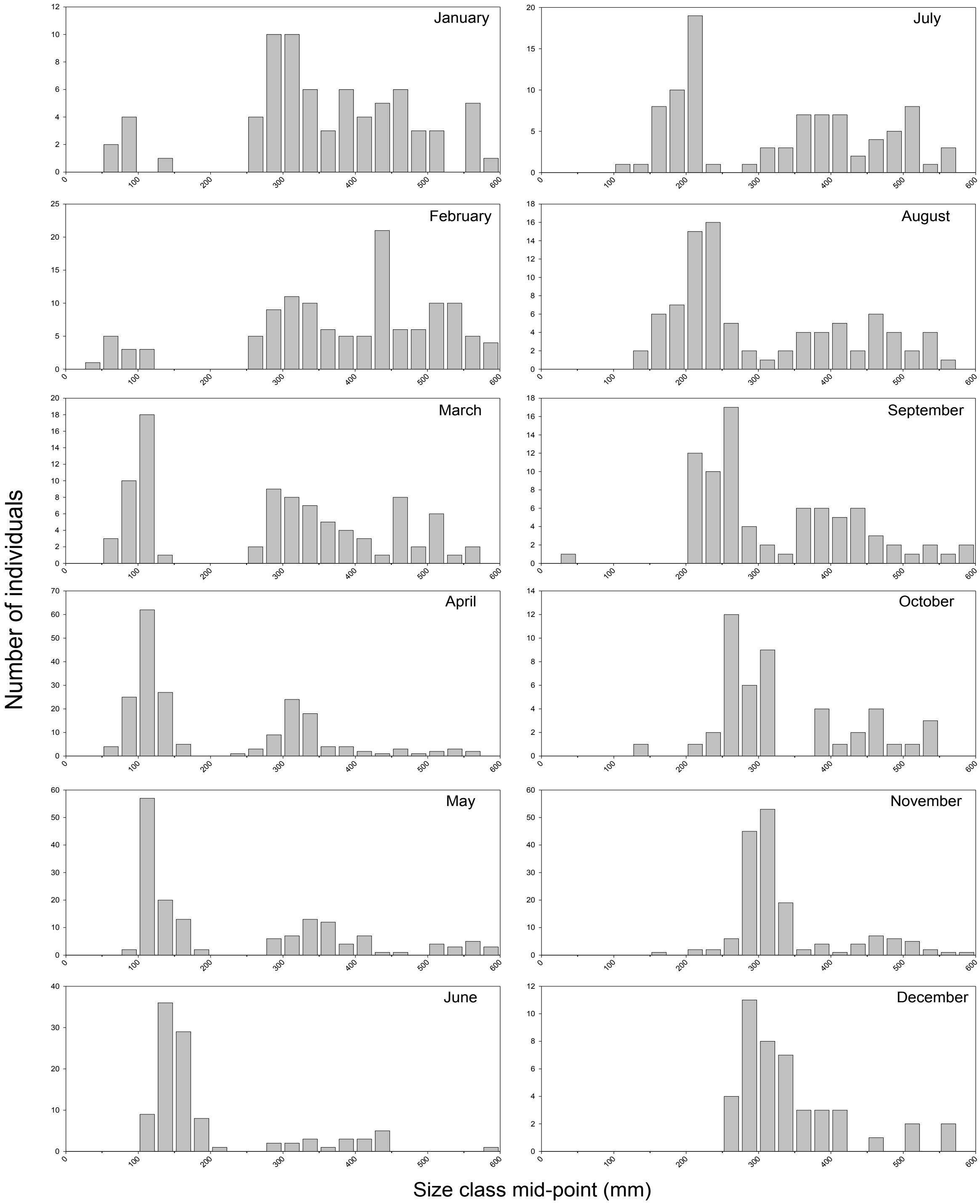
Appendix 8, Figure 14. Length frequencies of bluegill by month collected with 183-m seines in the lower St. Johns River.

Opisthonema oglinum (Atlantic thread herring) in 183-m seines

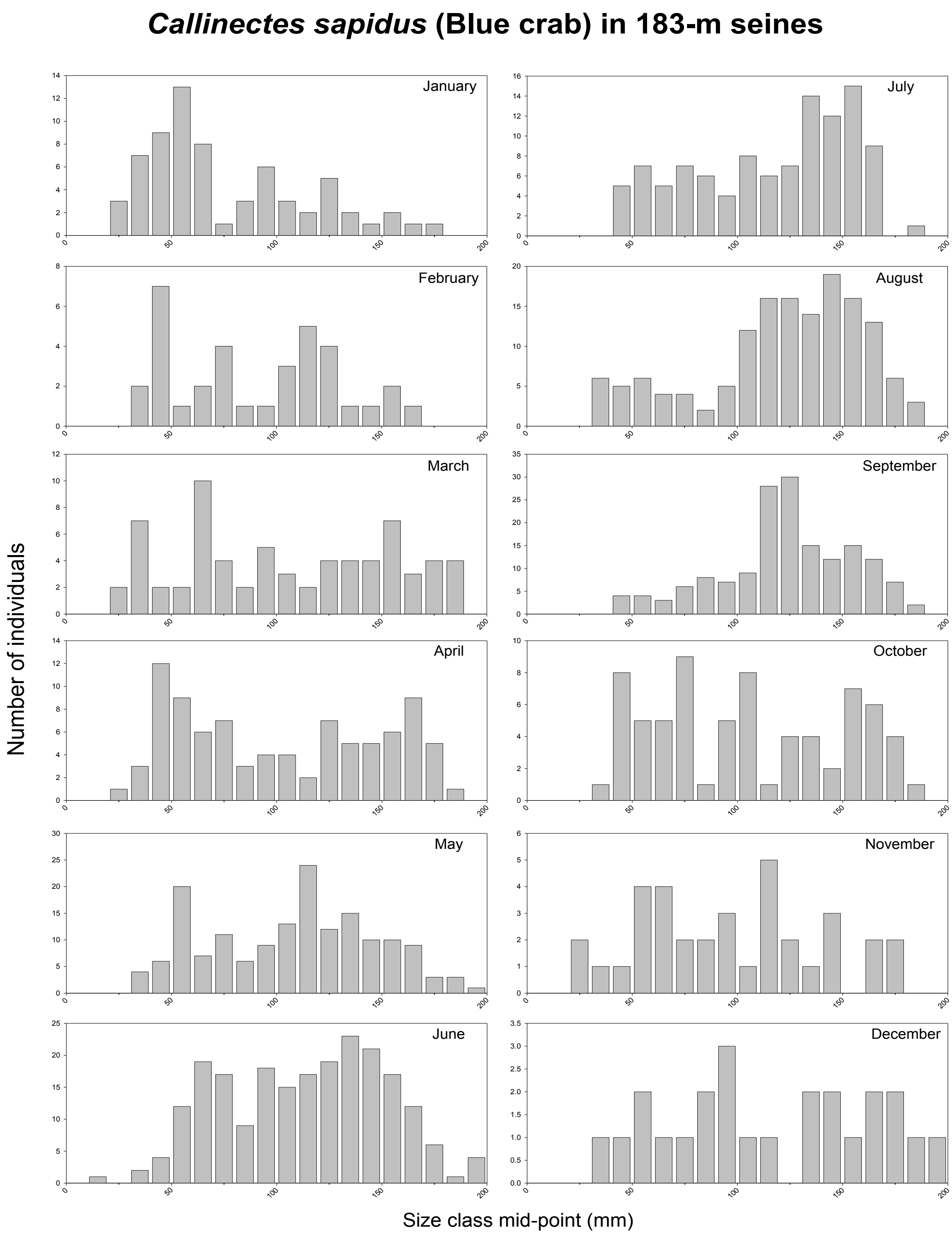


Appendix 8, Figure 15. Length frequencies of Atlantic thread herring by month collected with 183-m seines in the lower St. Johns River.

Sciaenops ocellatus (Red drum) in 183-m seines

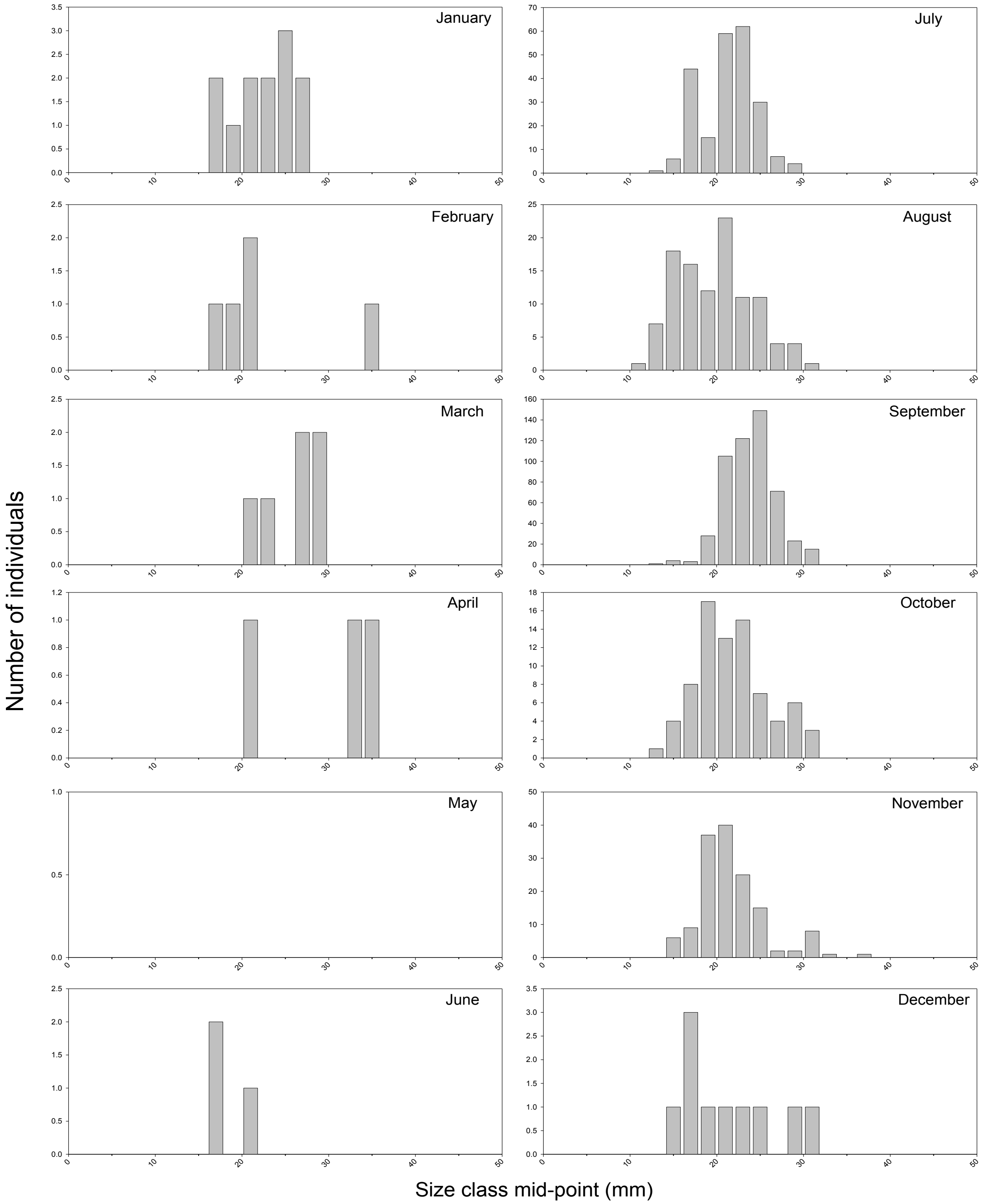


Appendix 8, Figure 16. Length frequencies of red drum by month collected with 183-m seines in the lower St. Johns River.



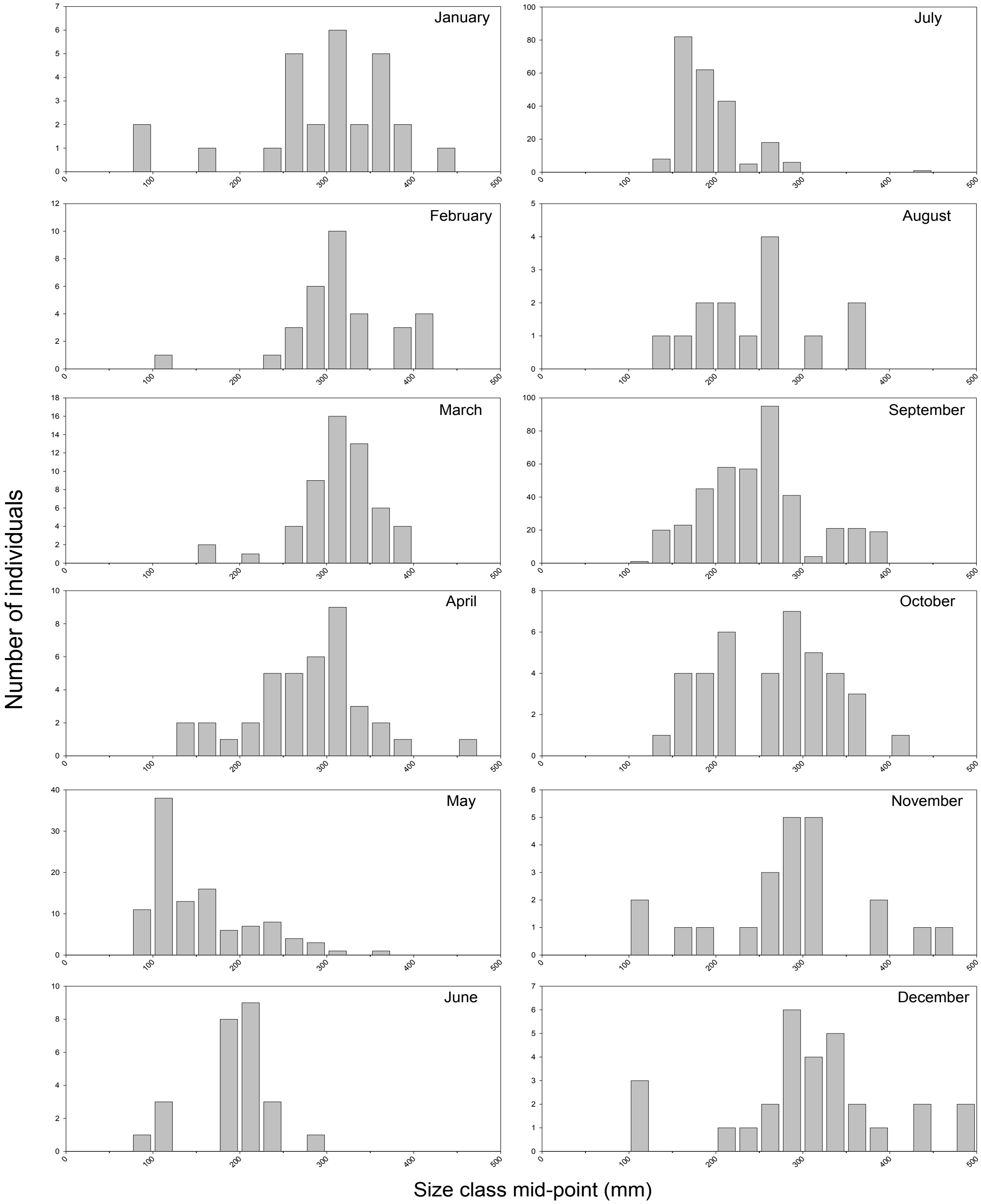
Appendix 8, Figure 17. Length frequencies of blue crab by month collected with 183-m seines in the lower St. Johns River.

Litopenaeus setiferus (White shrimp) in 183-m seines



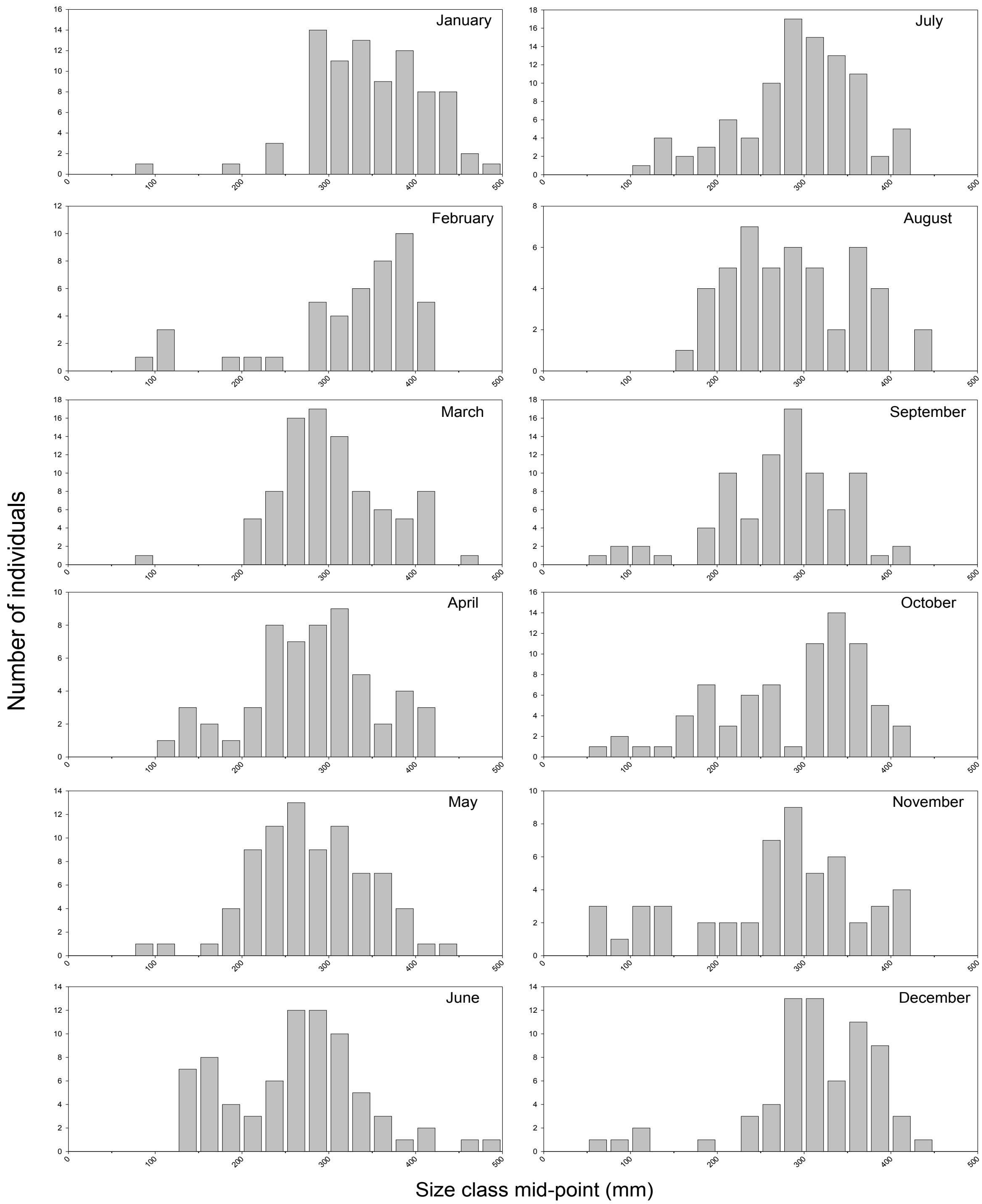
Appendix 8, Figure 18. Length frequencies of white shrimp by month collected with 183-m seines in the lower St. Johns River.

Ameiurus catus (White catfish) in 183-m seines

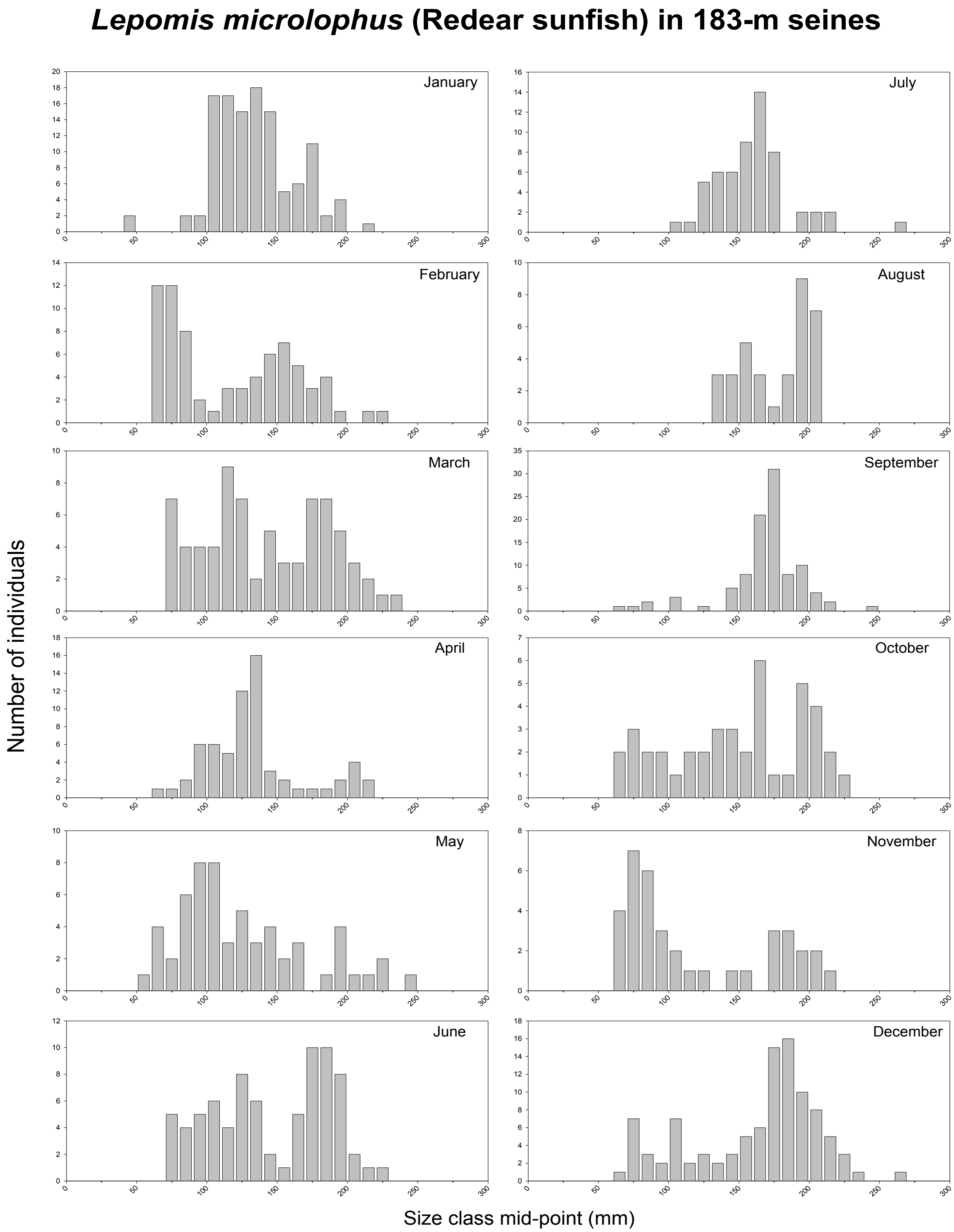


Appendix 8, Figure 19. Length frequencies of white catfish by month collected with 183-m seines in the lower St. Johns River.

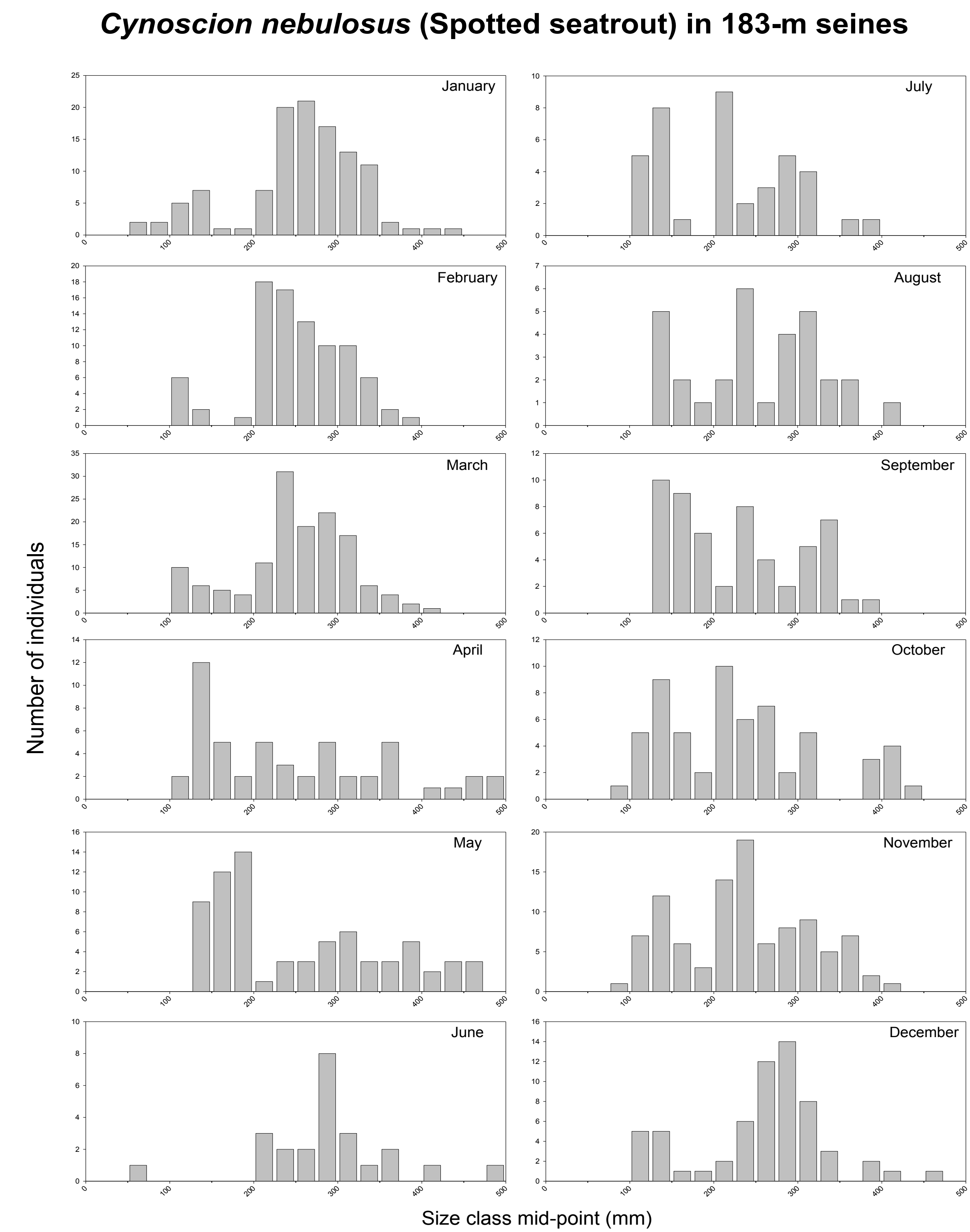
Archosargus probatocephalus (Sheepshead) in 183-m seines



Appendix 8, Figure 20. Length frequencies of sheepshead by month collected with 183-m seines in the lower St. Johns River.

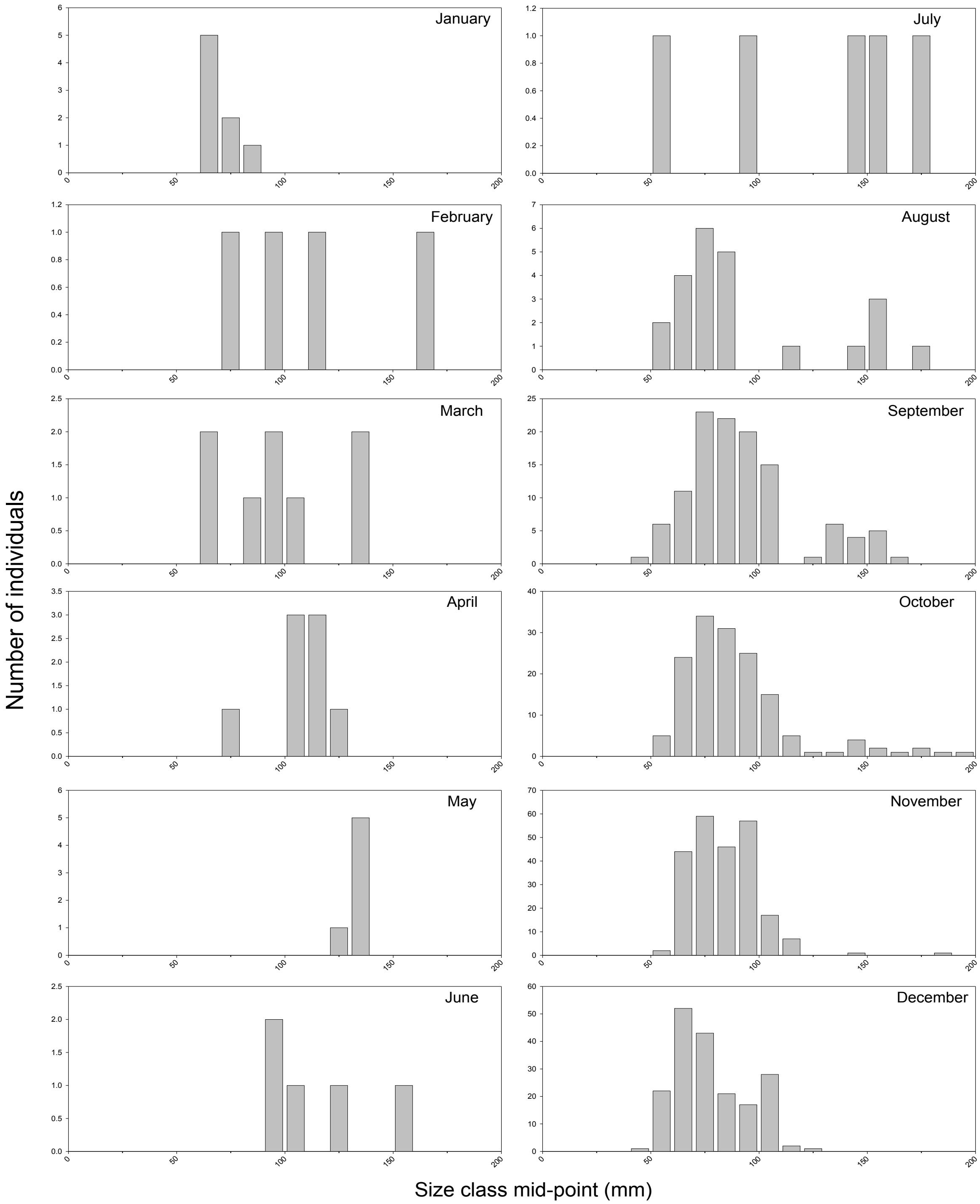


Appendix 8, Figure 21. Length frequencies of redear sunfish by month collected with 183-m seines in the lower St. Johns River.



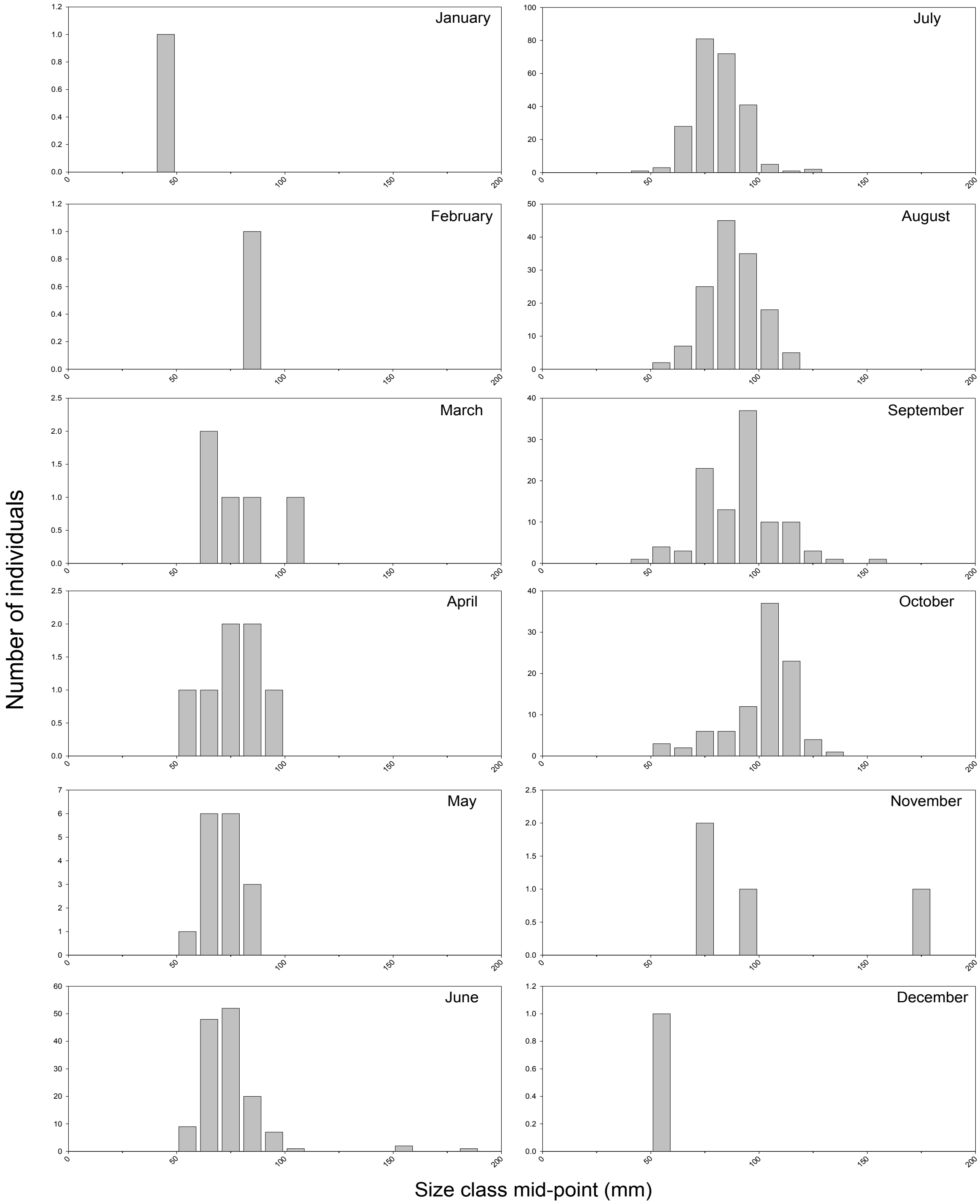
Appendix 8, Figure 22. Length frequencies of spotted seatrout by month collected with 183-m seines in the lower St. Johns River.

Diapterus auratus (Irish pompano) in 183-m seines



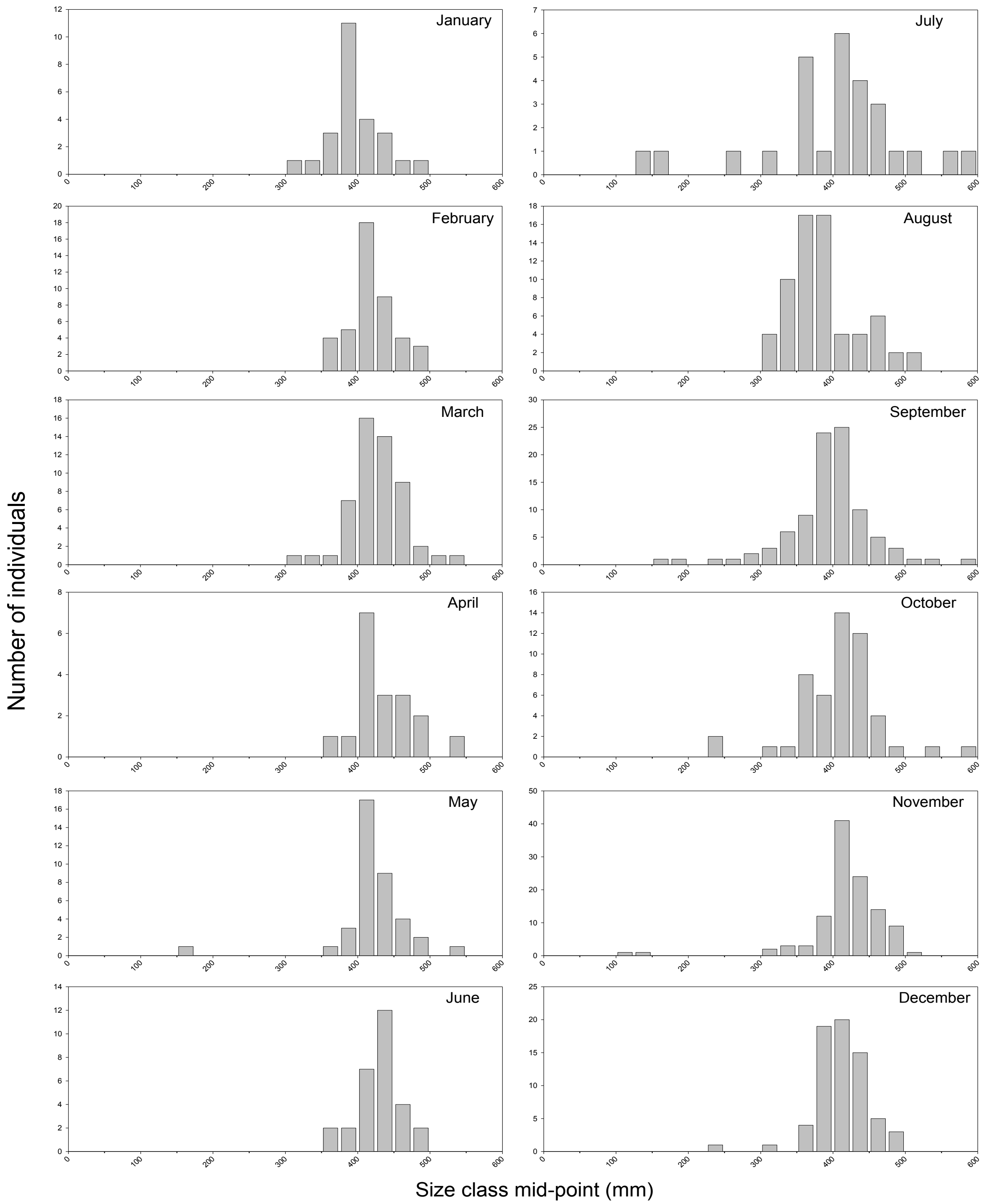
Appendix 8, Figure 23. Length frequencies of Irish pompano by month collected with 183-m seines in the lower St. Johns River.

Citharichthys spilopterus (Bay whiff) in 183-m seines



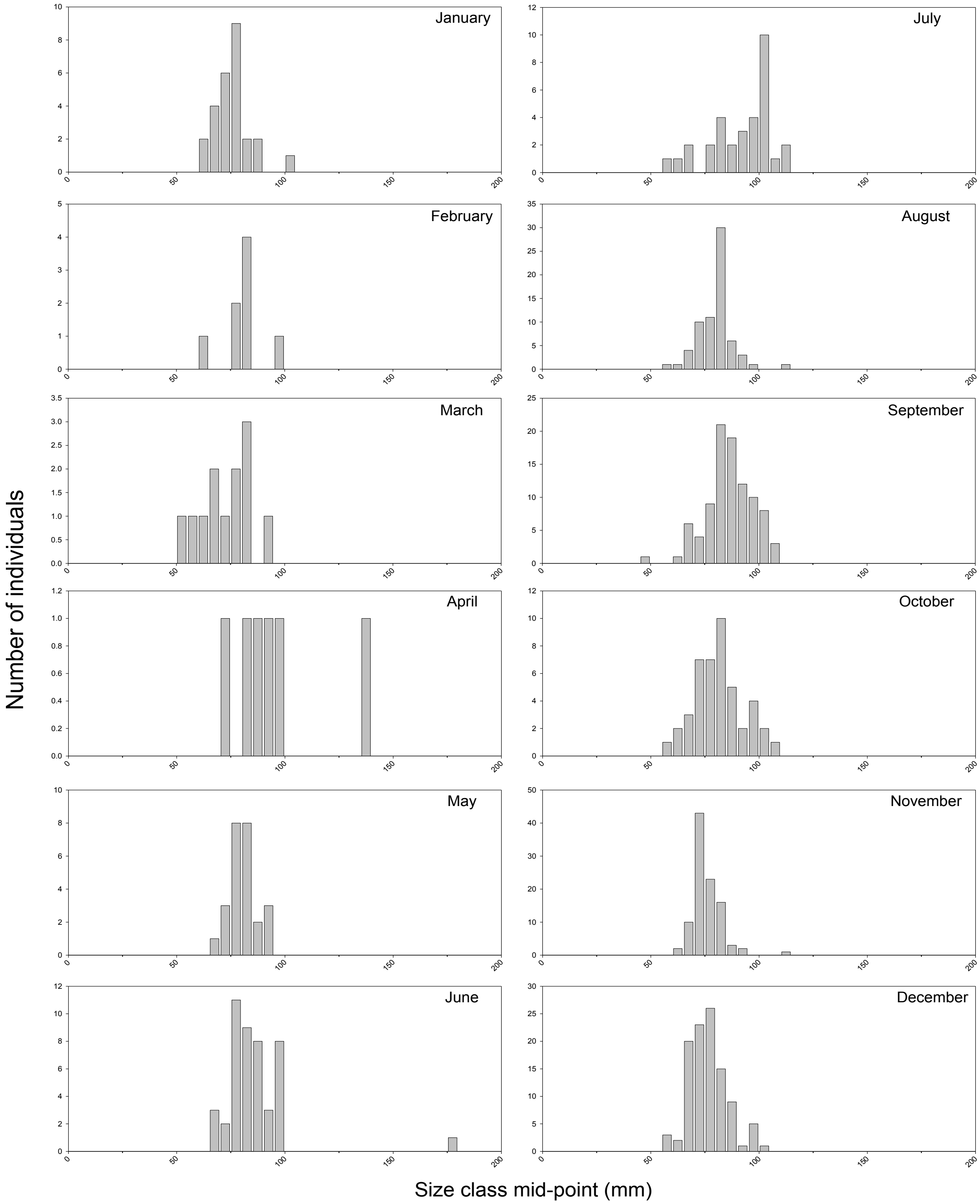
Appendix 8, Figure 24. Length frequencies of bay whiff by month collected with 183-m seines in the lower St. Johns River.

Strongylura marina (Atlantic needlefish) in 183-m seines



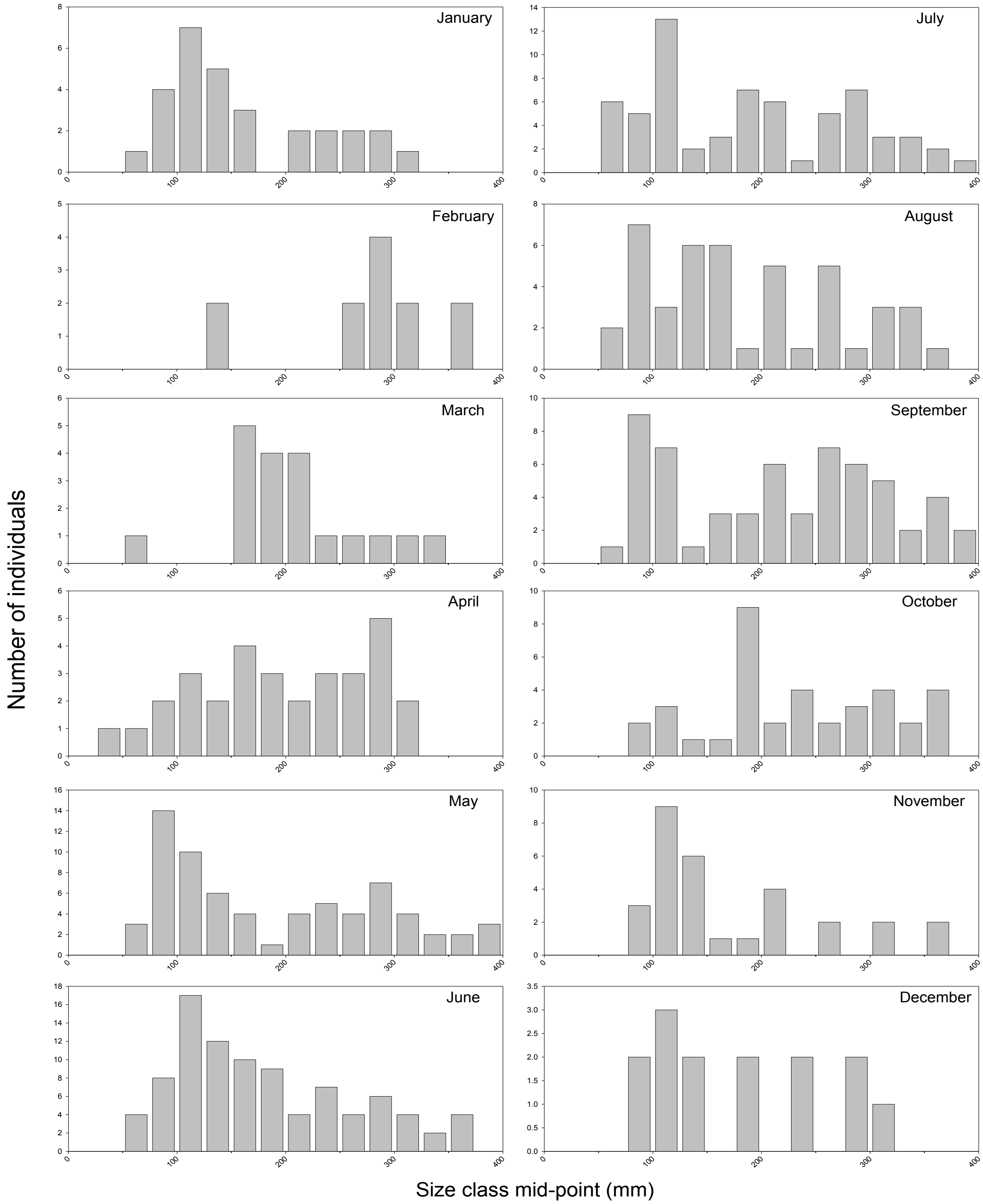
Appendix 8, Figure 25. Length frequencies of Atlantic needlefish by month collected with 183-m seines in the lower St. Johns River.

Eucinostomus gula (Silver jenny) in 183-m seines



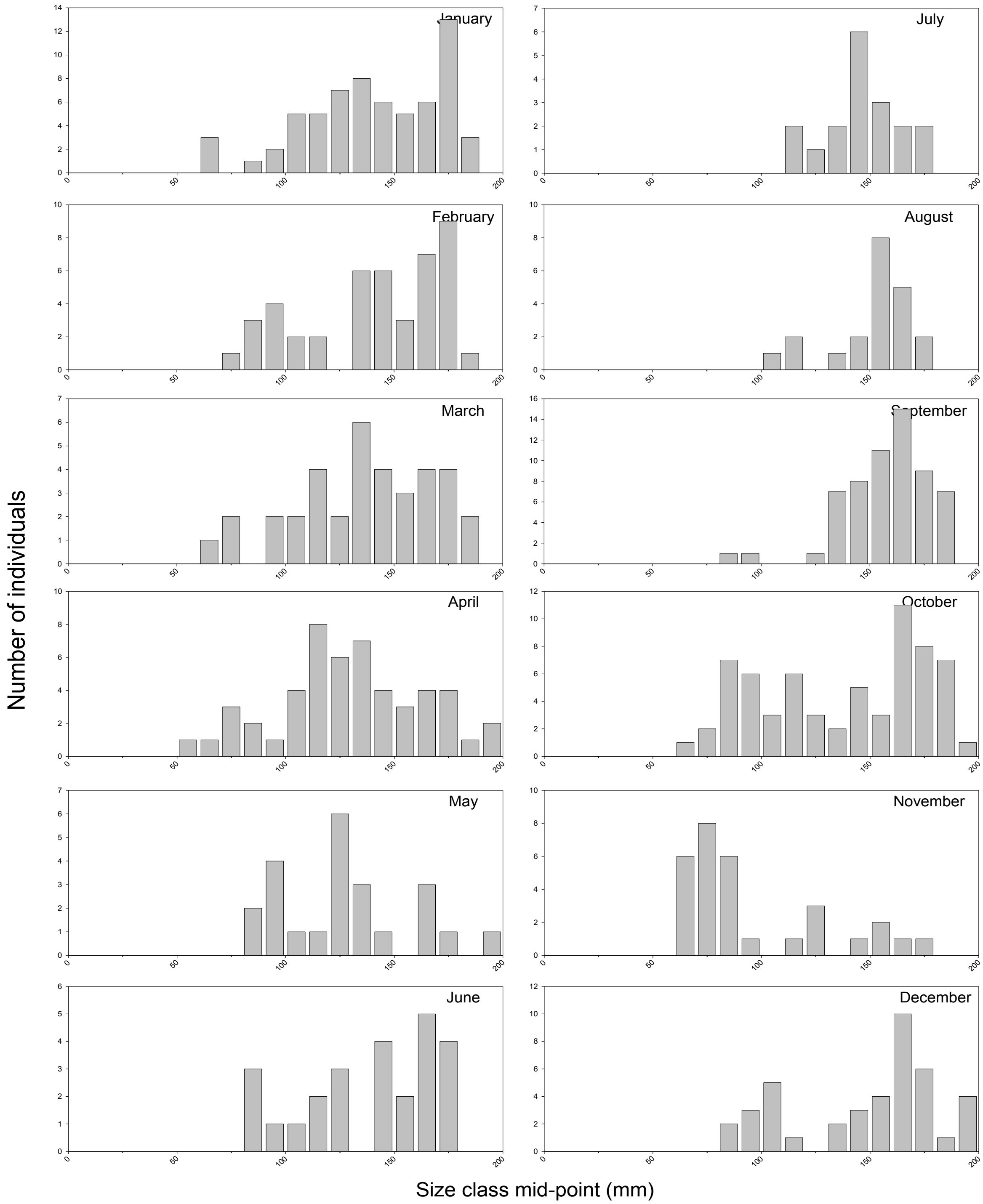
Appendix 8, Figure 26. Length frequencies of silver jenny by month collected with 183-m seines in the lower St. Johns River.

Paralichthys lethostigma (Southern flounder) in 183-m seines

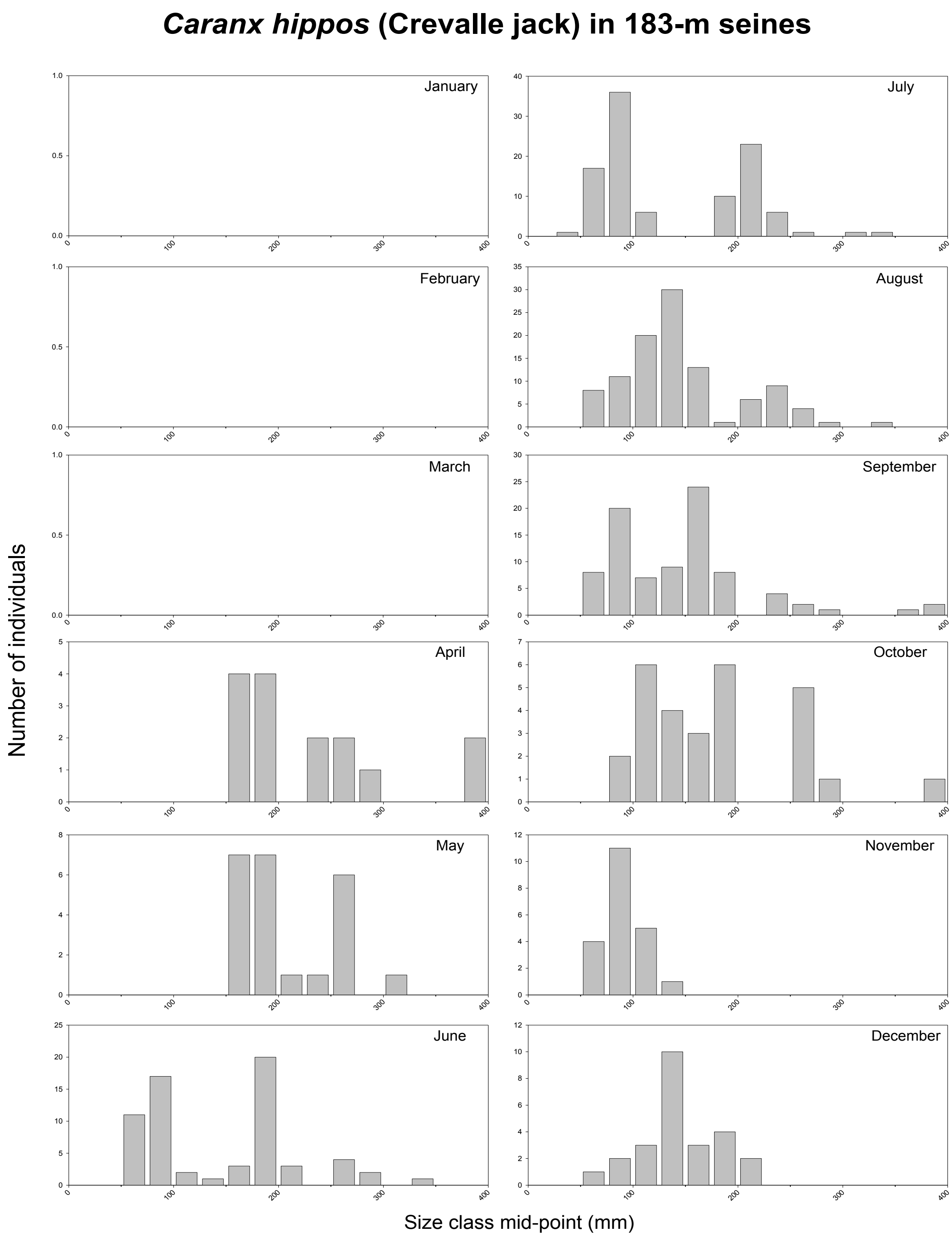


Appendix 8, Figure 27. Length frequencies of southern flounder by month collected with 183-m seines in the lower St. Johns River.

Lepomis auritus (Redbreast sunfish) in 183-m seines

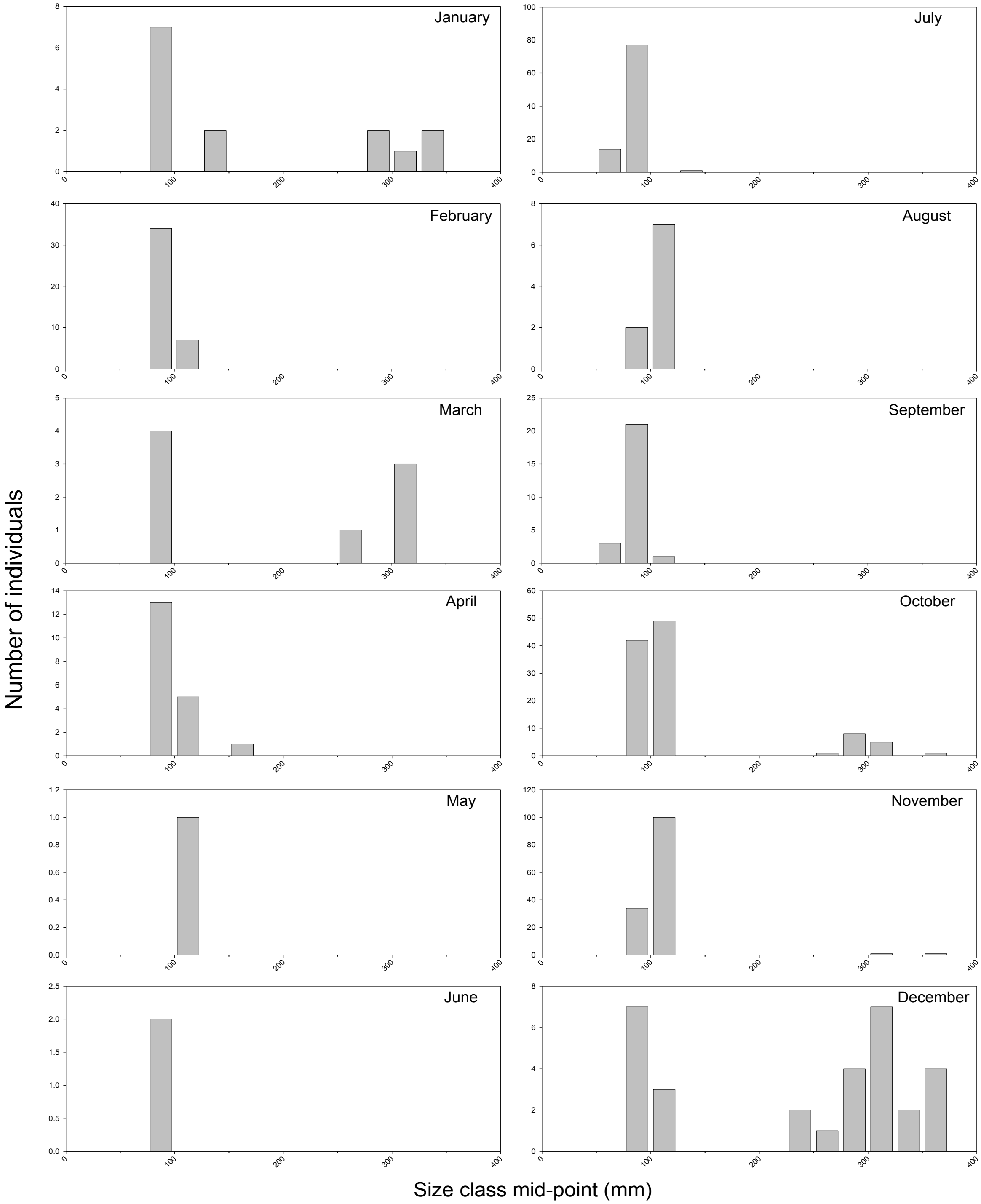


Appendix 8, Figure 28. Length frequencies of redbreast sunfish by month collected with 183-m seines in the lower St. Johns River.



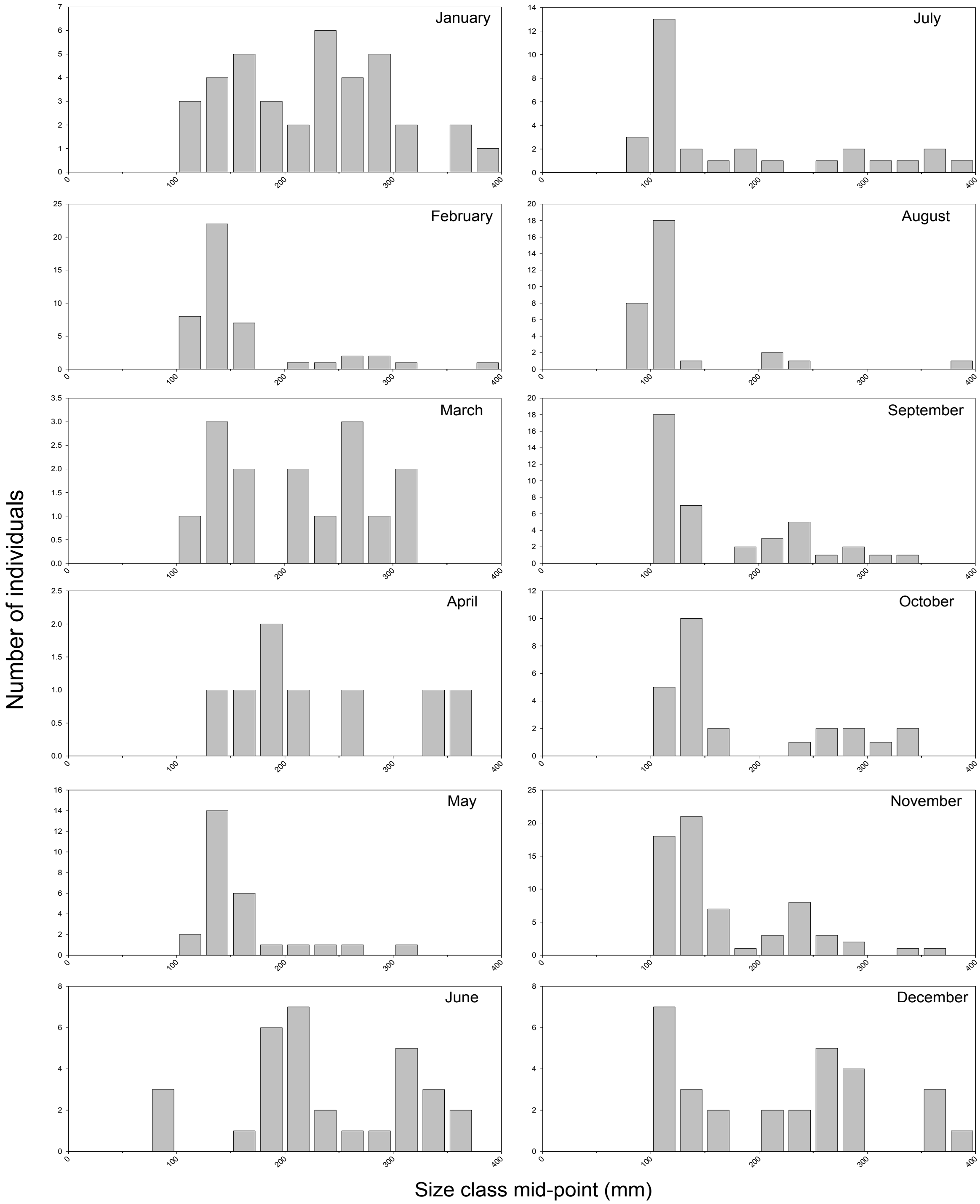
Appendix 8, Figure 29. Length frequencies of crevalle jack by month collected with 183-m seines in the lower St. Johns River.

Dorosoma petenense (Threadfin shad) in 183-m seines



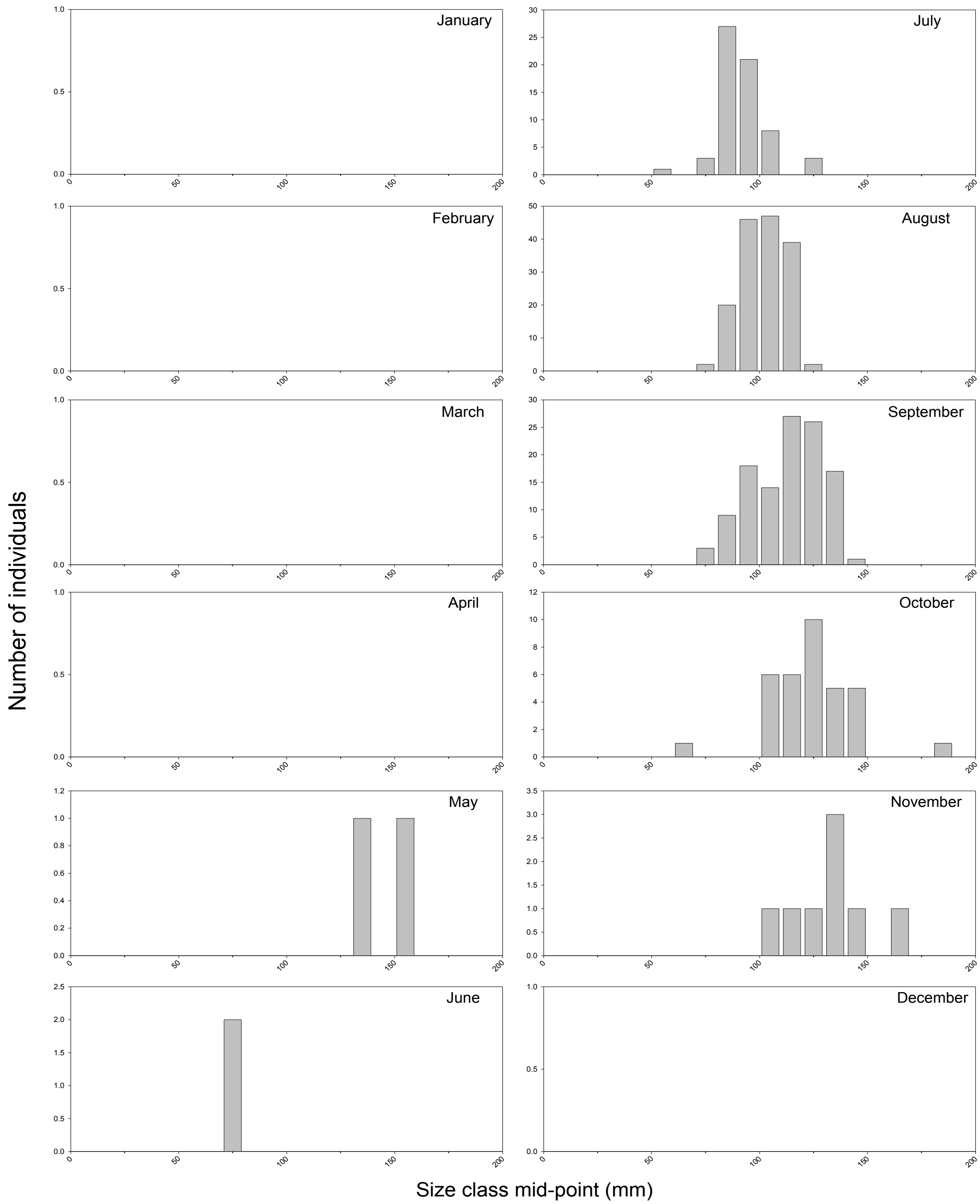
Appendix 8, Figure 30. Length frequencies of threadfin shad by month collected with 183-m seines in the lower St. Johns River.

Micropterus salmoides (Largemouth bass) in 183-m seines



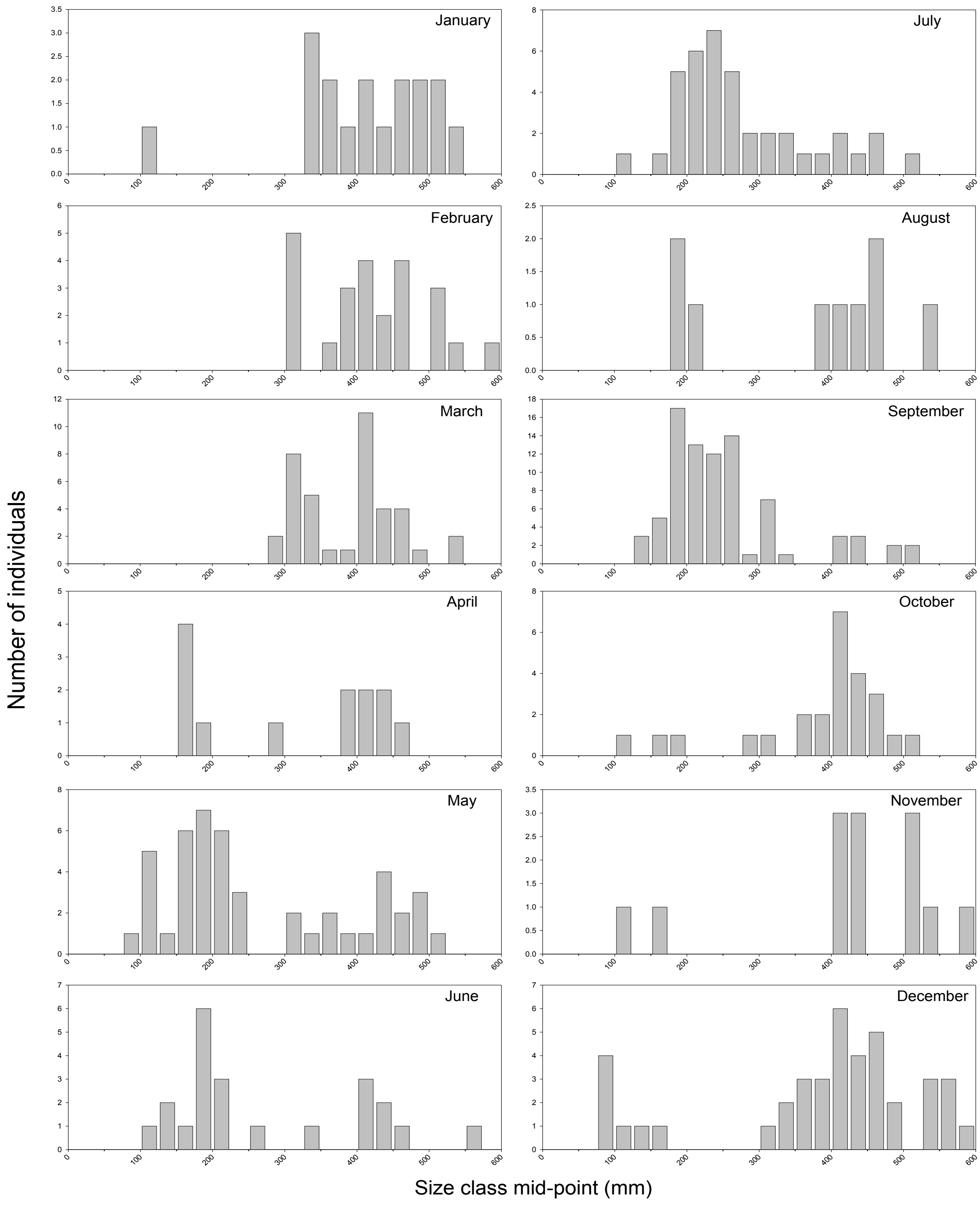
Appendix 8, Figure 31. Length frequencies of largemouth bass by month collected with 183-m seines in the lower St. Johns River.

Orthopristis chrysoptera (Pigfish) in 183-m seines



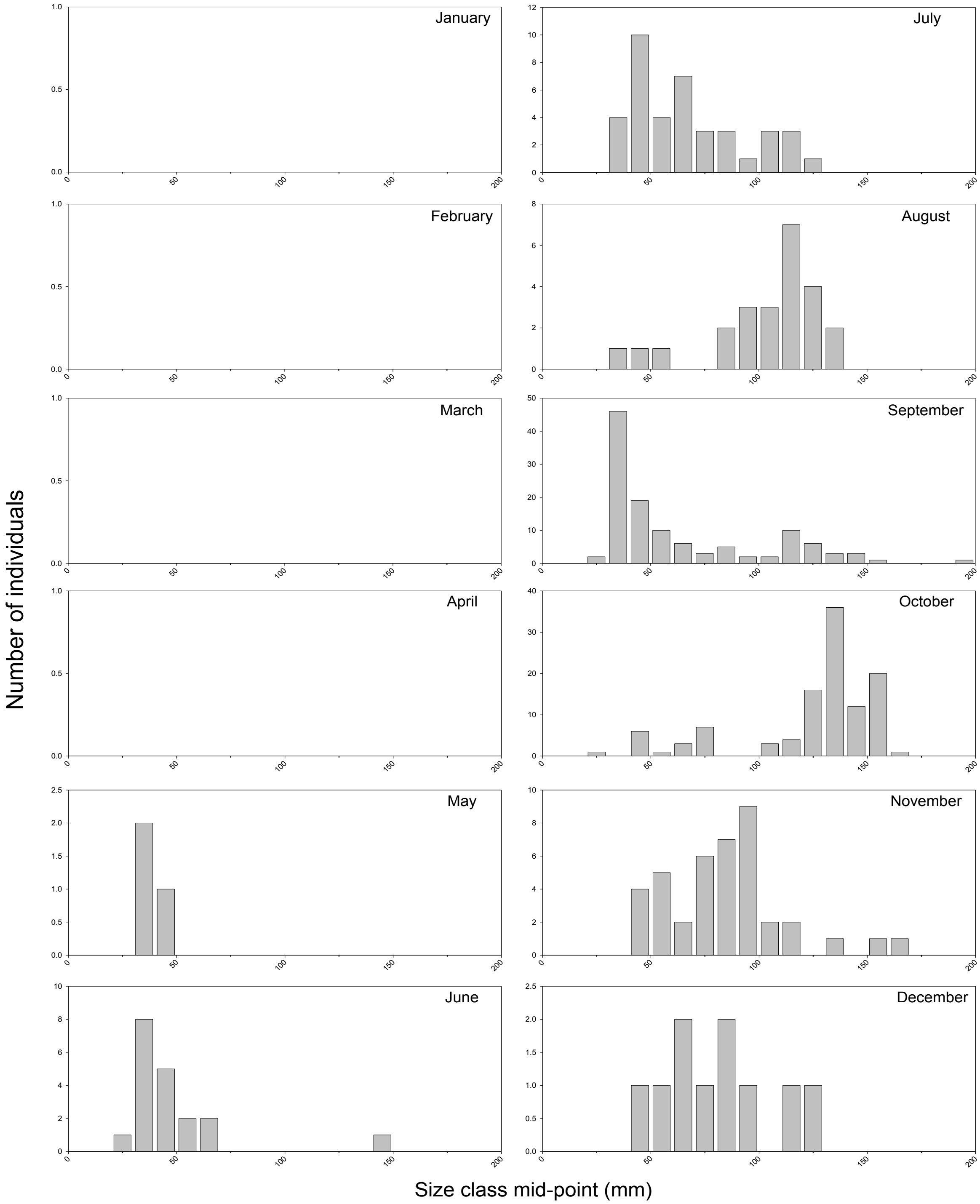
Appendix 8, Figure 32. Length frequencies of pigfish by month collected with 183-m seines in the lower St. Johns River.

Ictalurus punctatus (Channel catfish) in 183-m seines



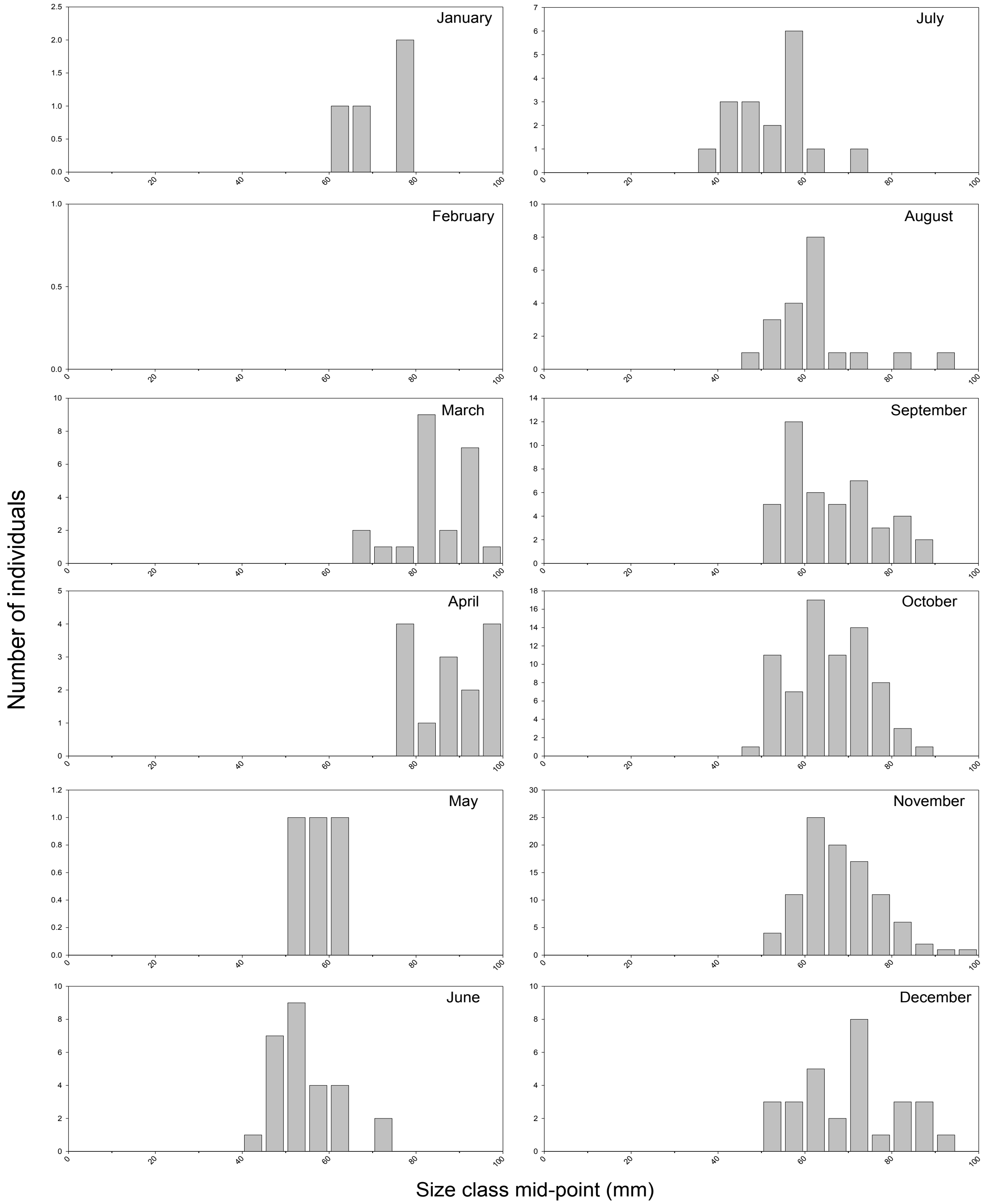
Appendix 8, Figure 33. Length frequencies of channel catfish by month collected with 183-m seines in the lower St. Johns River.

Selene vomer (Lookdown) in 183-m seines



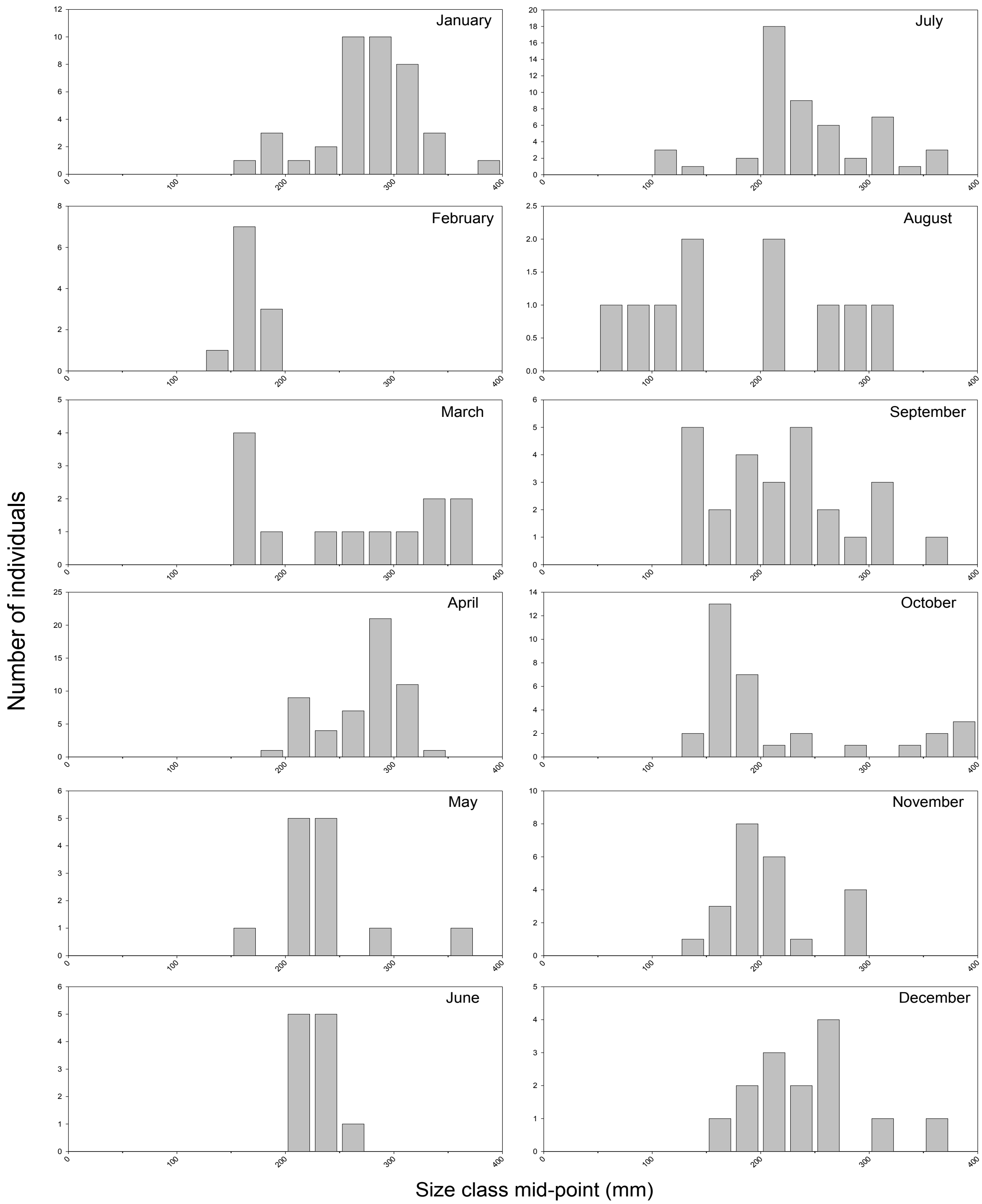
Appendix 8, Figure 34. Length frequencies of lookdown by month collected with 183-m seines in the lower St. Johns River.

Etropus crossotus (Fringed flounder) in 183-m seines



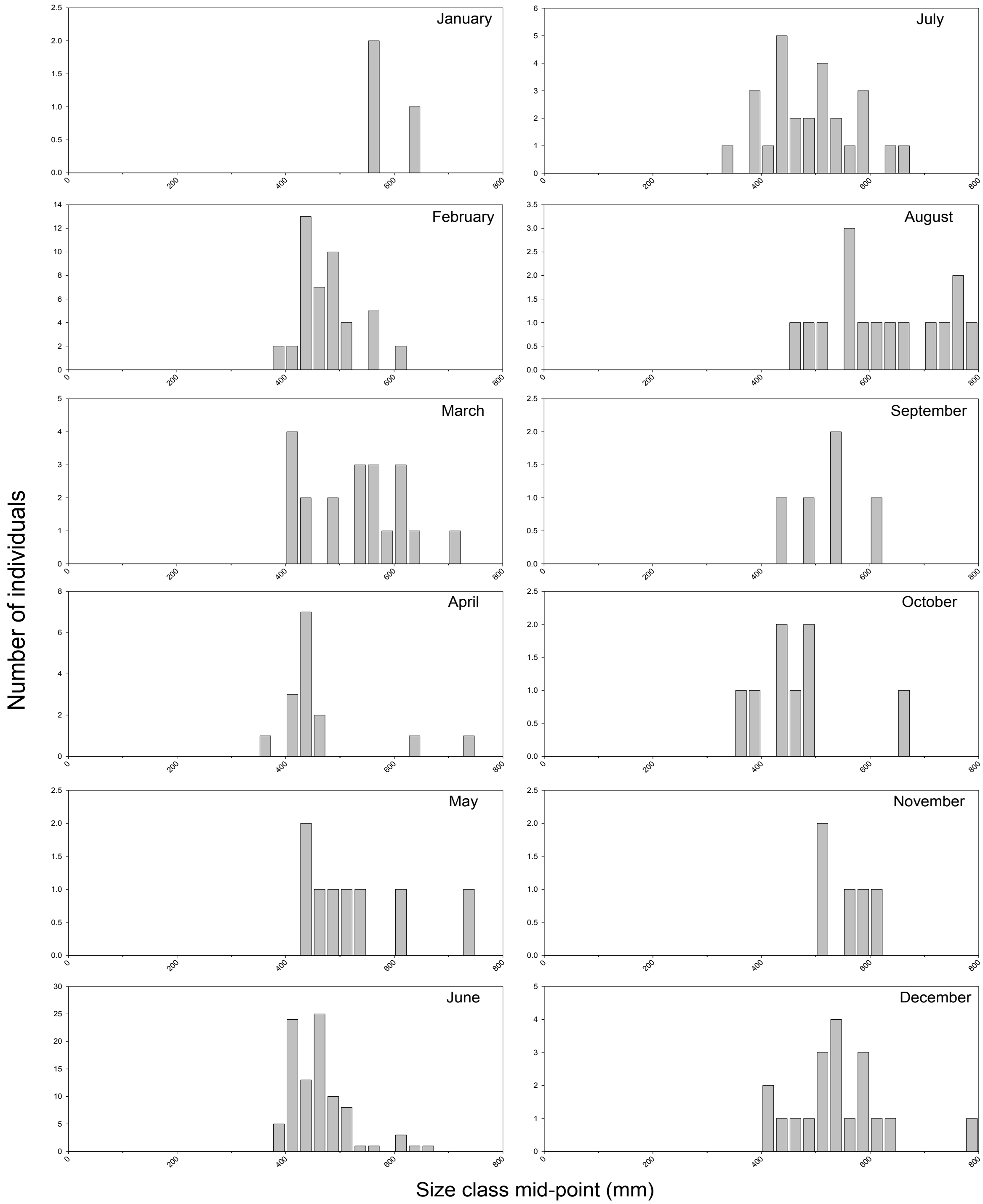
Appendix 8, Figure 35. Length frequencies of fringed flounder by month collected with 183-m seines in the lower St. Johns River.

Pogonias cromis (Black drum) in 183-m seines



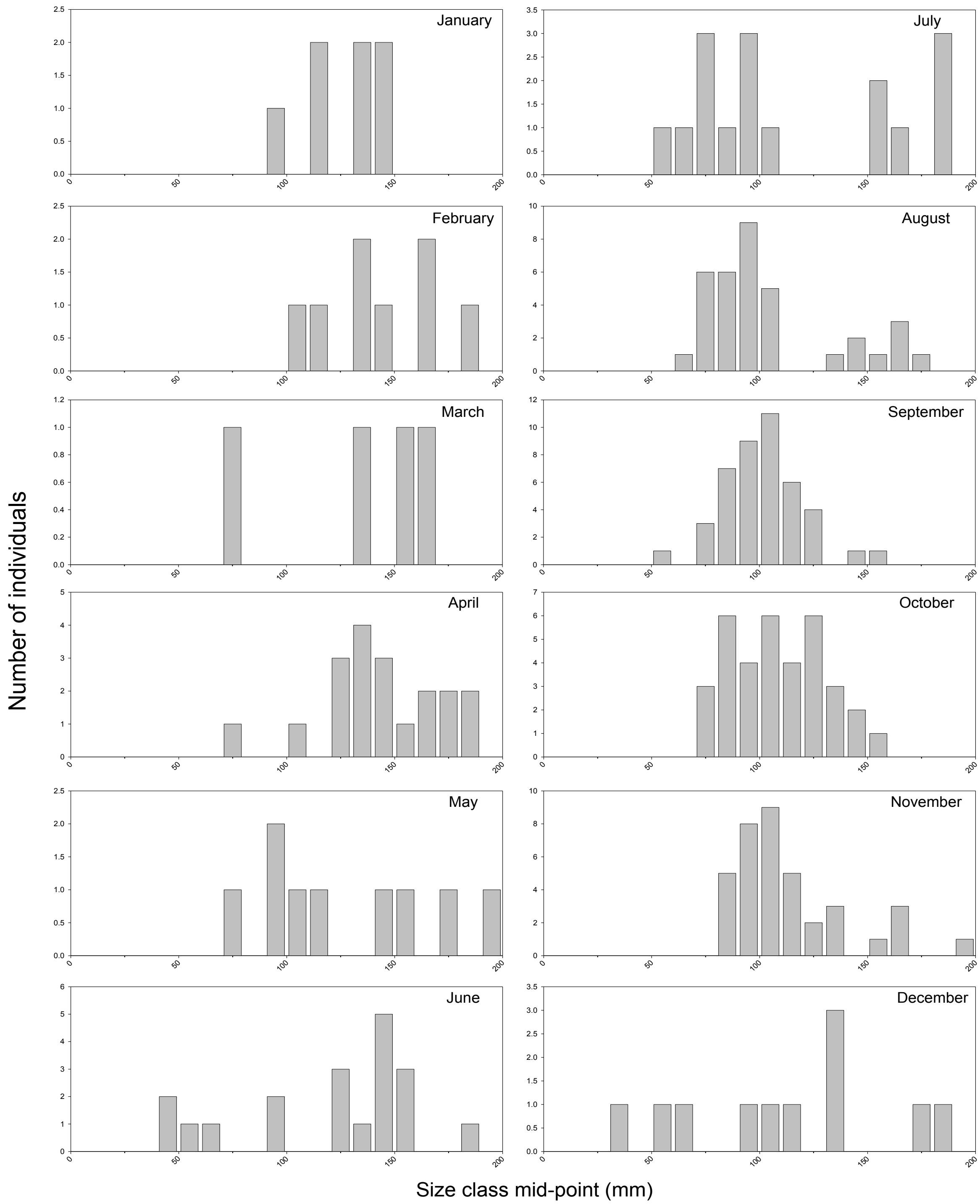
Appendix 8, Figure 36. Length frequencies of black drum by month collected with 183-m seines in the lower St. Johns River.

Lepisosteus platyrhincus (Florida gar) in 183-m seines



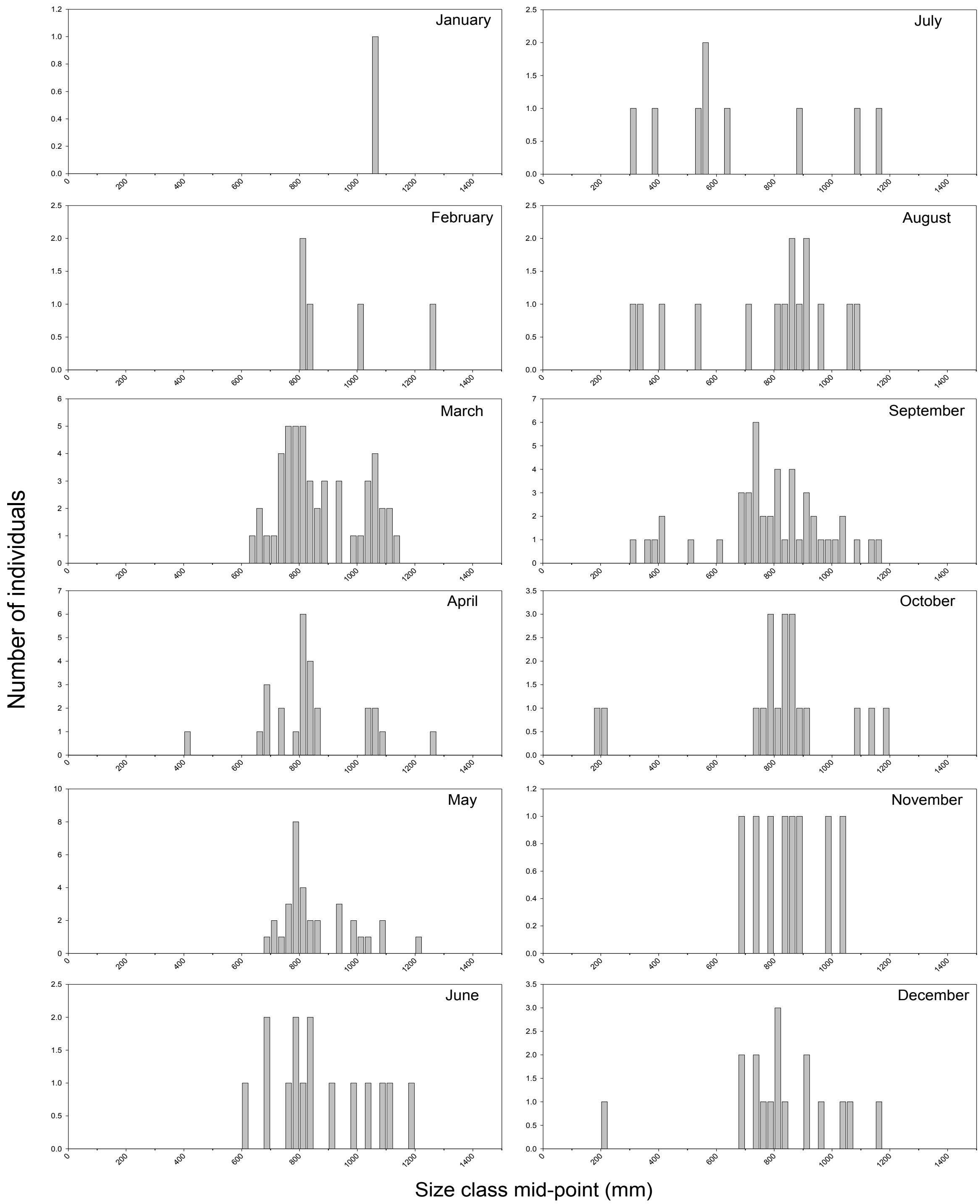
Appendix 8, Figure 37. Length frequencies of florida gar by month collected with 183-m seines in the lower St. Johns River.

Sphoeroides nephelus (Southern puffer) in 183-m seines



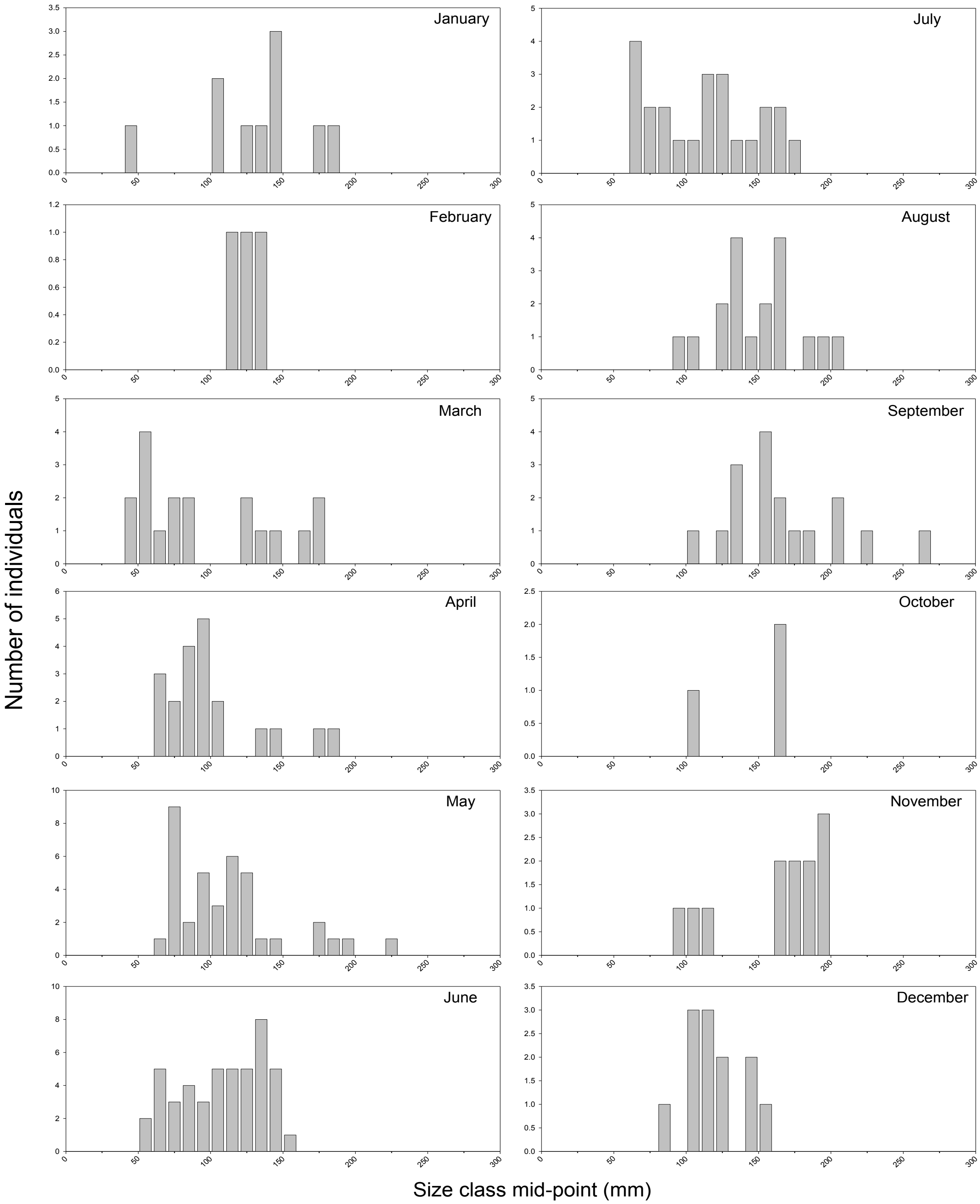
Appendix 8, Figure 38. Length frequencies of southern puffer by month collected with 183-m seines in the lower St. Johns River.

Lepisosteus osseus (Longnose gar) in 183-m seines



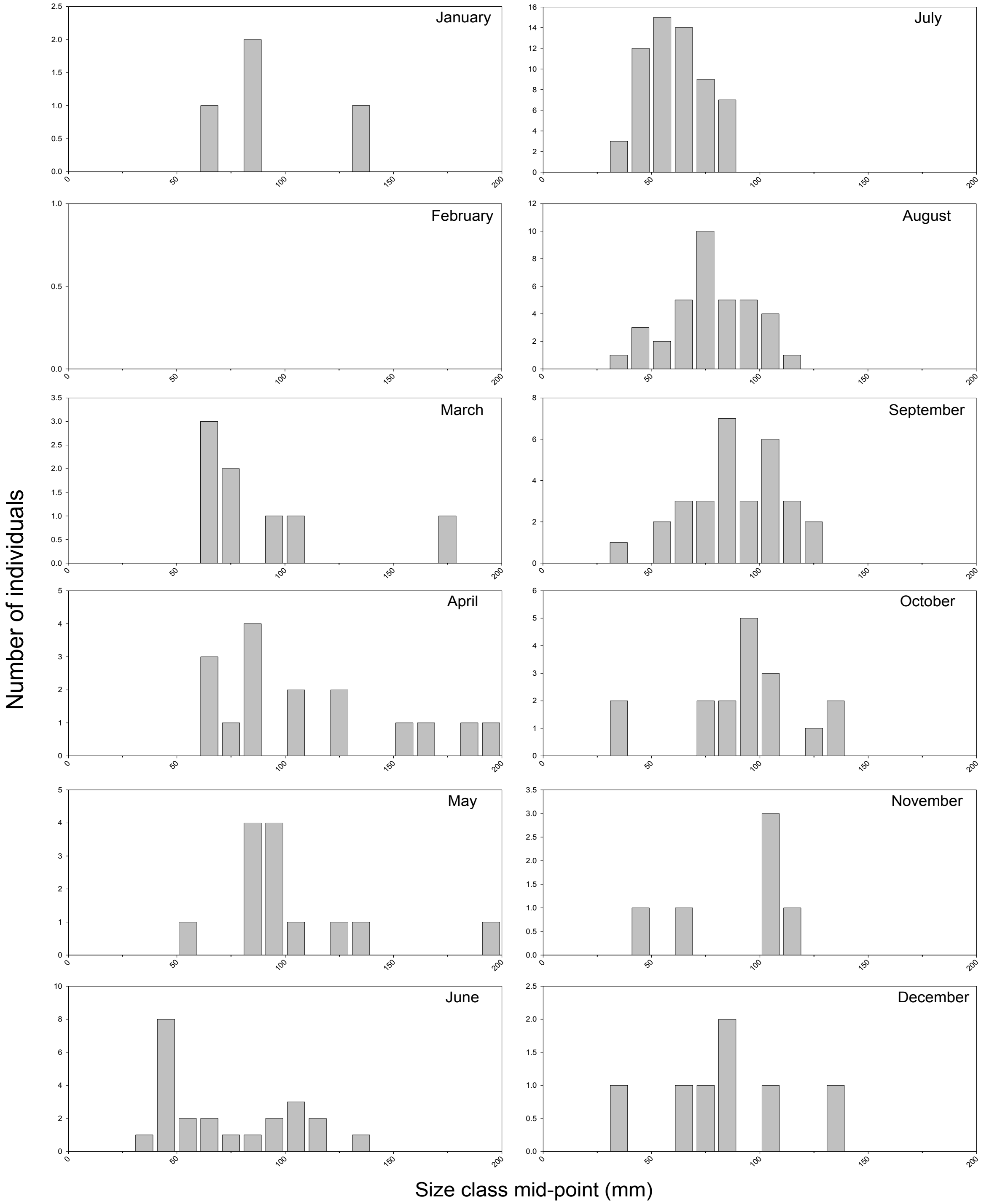
Appendix 8, Figure 39. Length frequencies of longnose gar by month collected with 183-m seines in the lower St. Johns River.

Paralichthys albigutta (Gulf flounder) in 183-m seines



Appendix 8, Figure 40. Length frequencies of gulf flounder by month collected with 183-m seines in the lower St. Johns River.

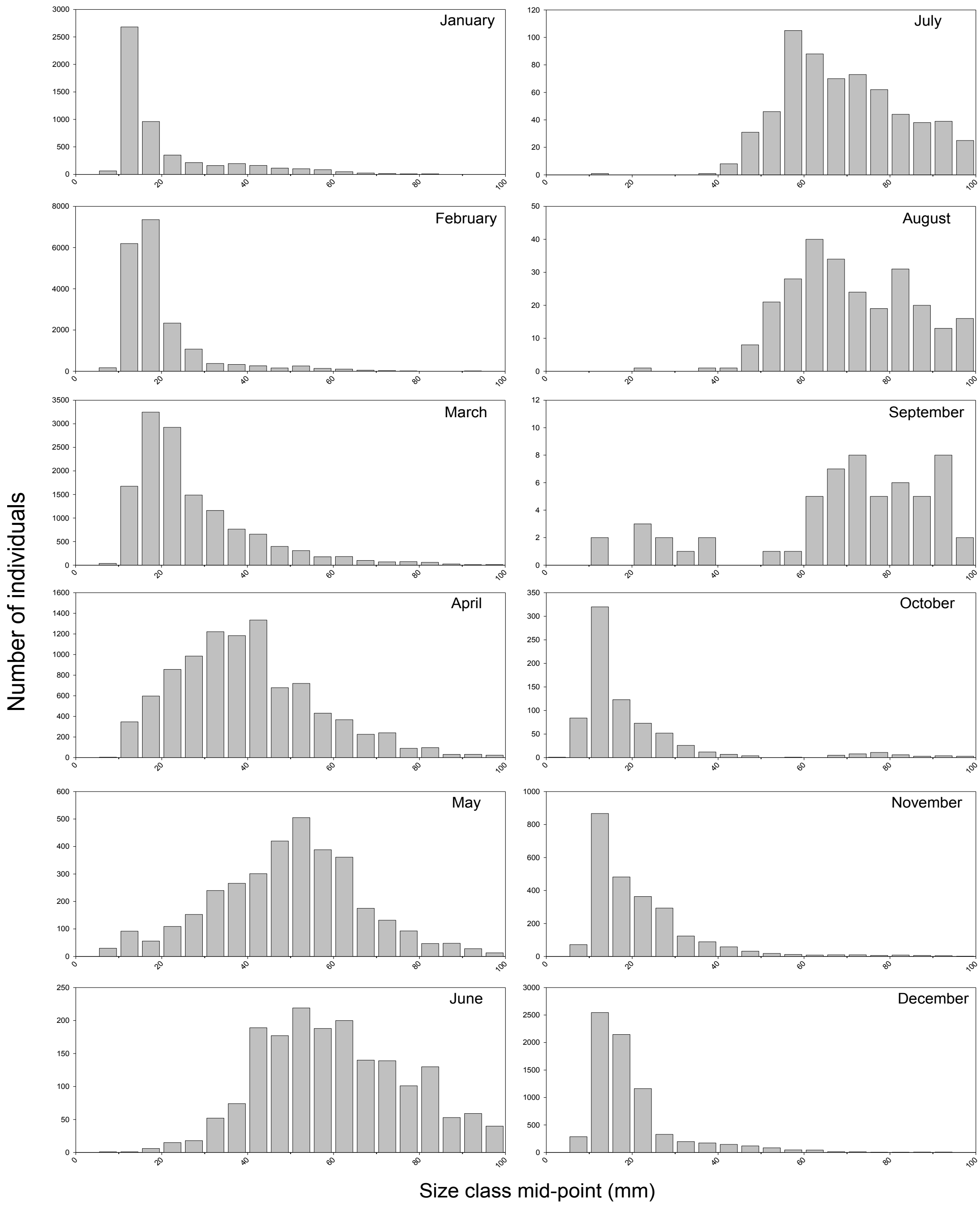
Chilomycterus schoepfii (Striped burrfish) in 183-m seines



Appendix 8, Figure 41. Length frequencies of striped burrfish by month collected with 183-m seines in the lower St. Johns River.

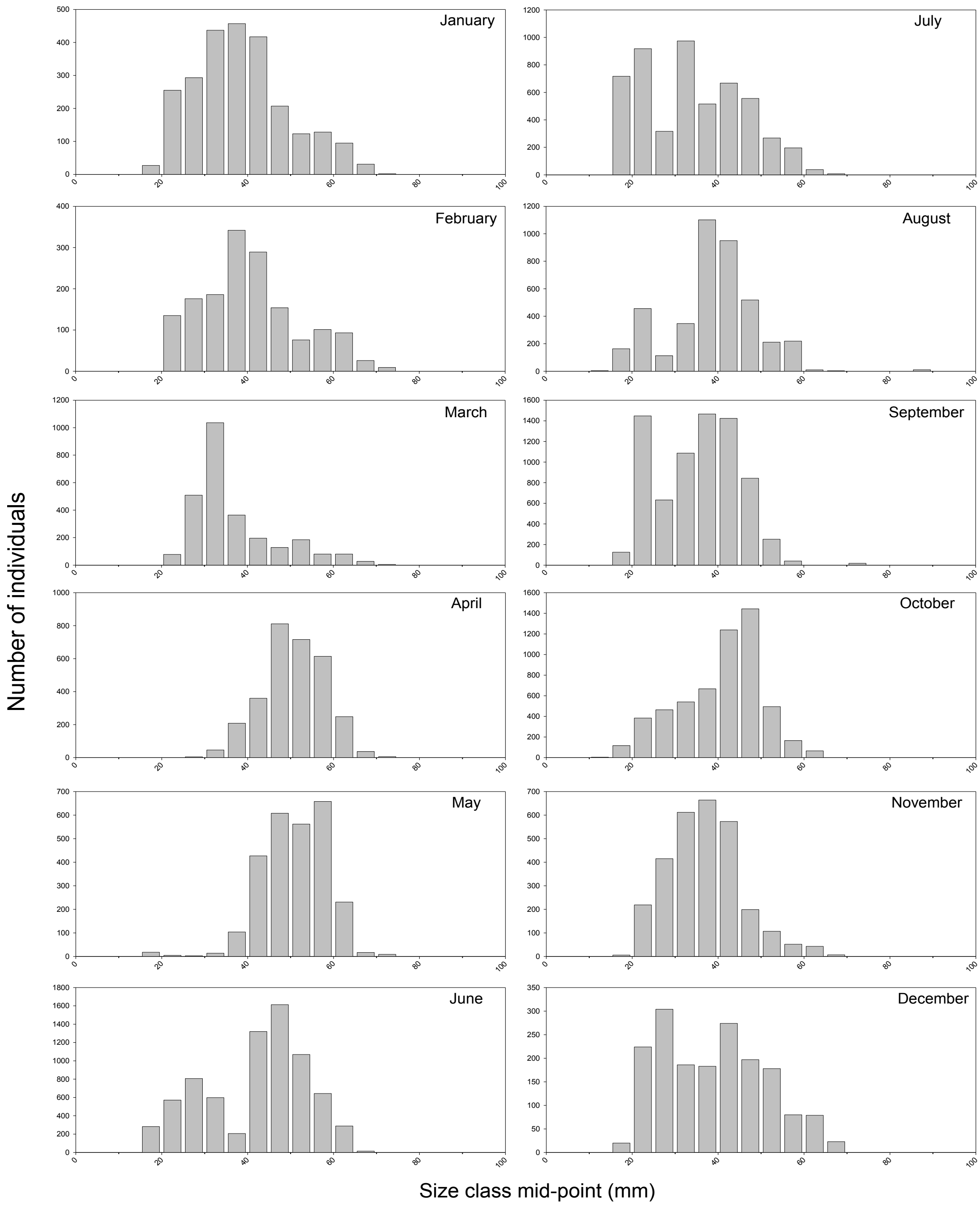
APPENDIX 9: Monthly length-frequency plots for 6.1-m otter trawls

Micropogonias undulatus (Atlantic croaker) in 6.1-m trawls



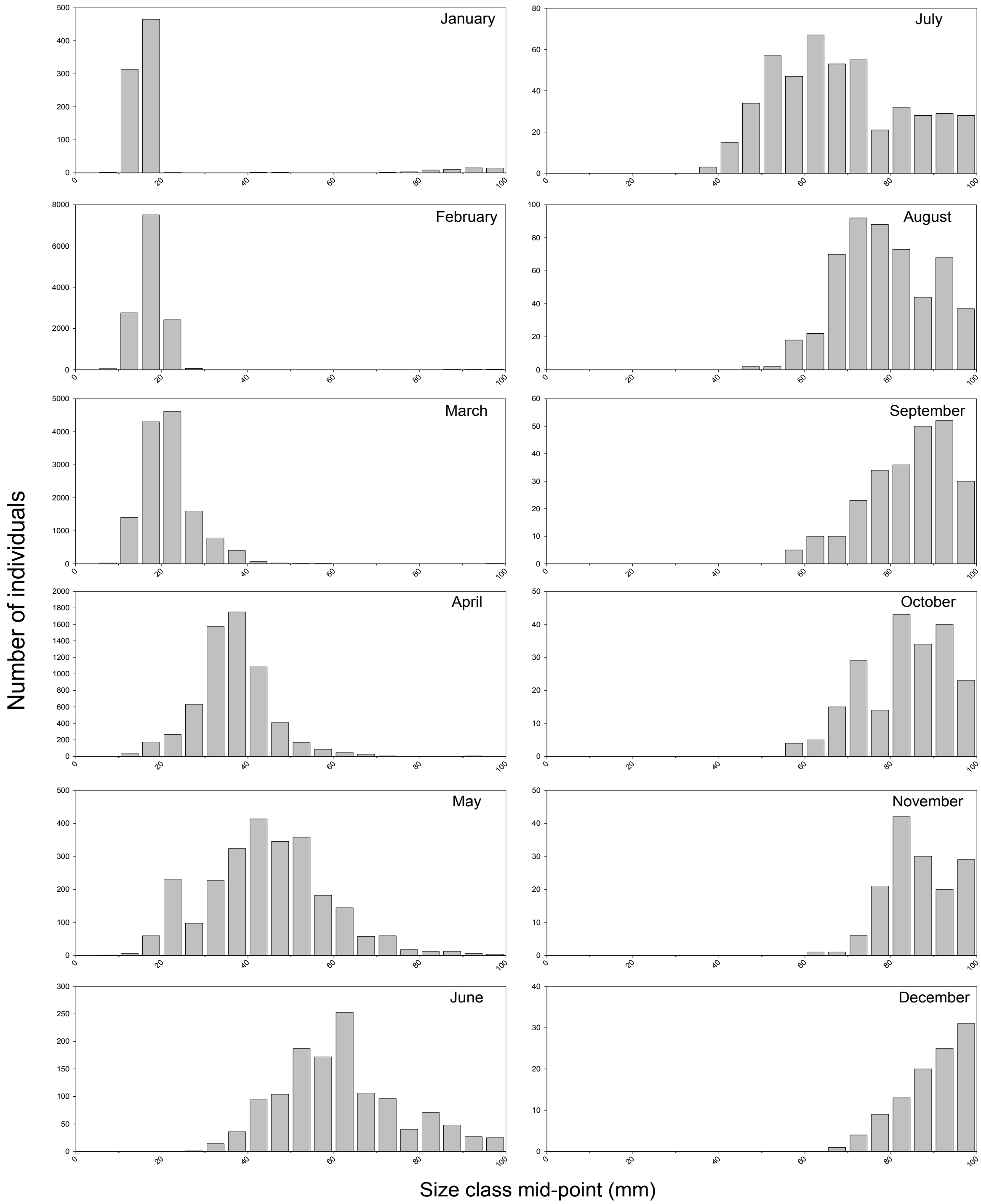
Appendix 9, Figure 1. Length frequencies of Atlantic croaker by month collected with 6.1-m trawls in the lower St. Johns River.

Anchoa mitchilli (Bay anchovy) in 6.1-m trawls



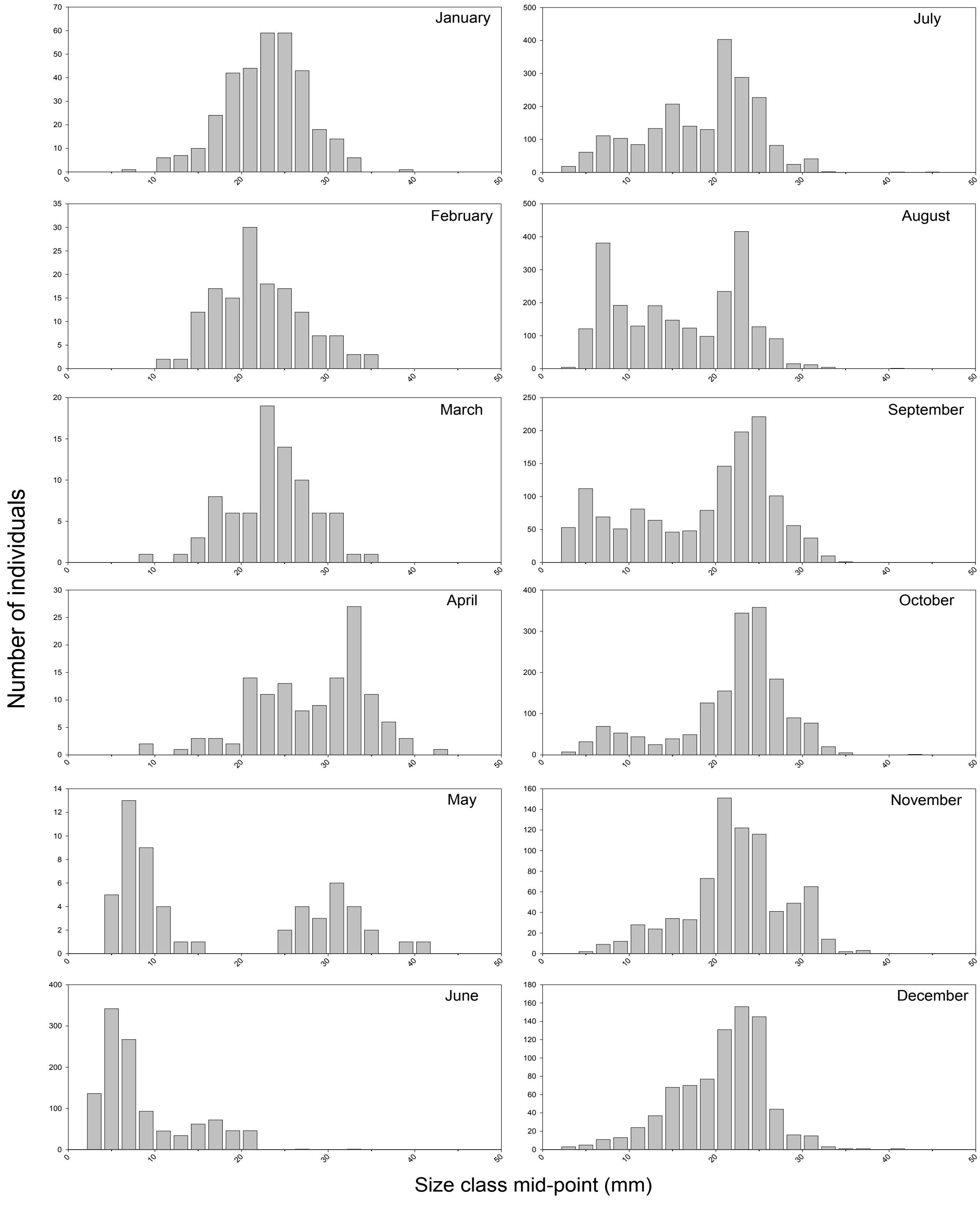
Appendix 9, Figure 2. Length frequencies of bay anchovy by month collected with 6.1-m trawls in the lower St. Johns River.

Leiostomus xanthurus (Spot) in 6.1-m trawls



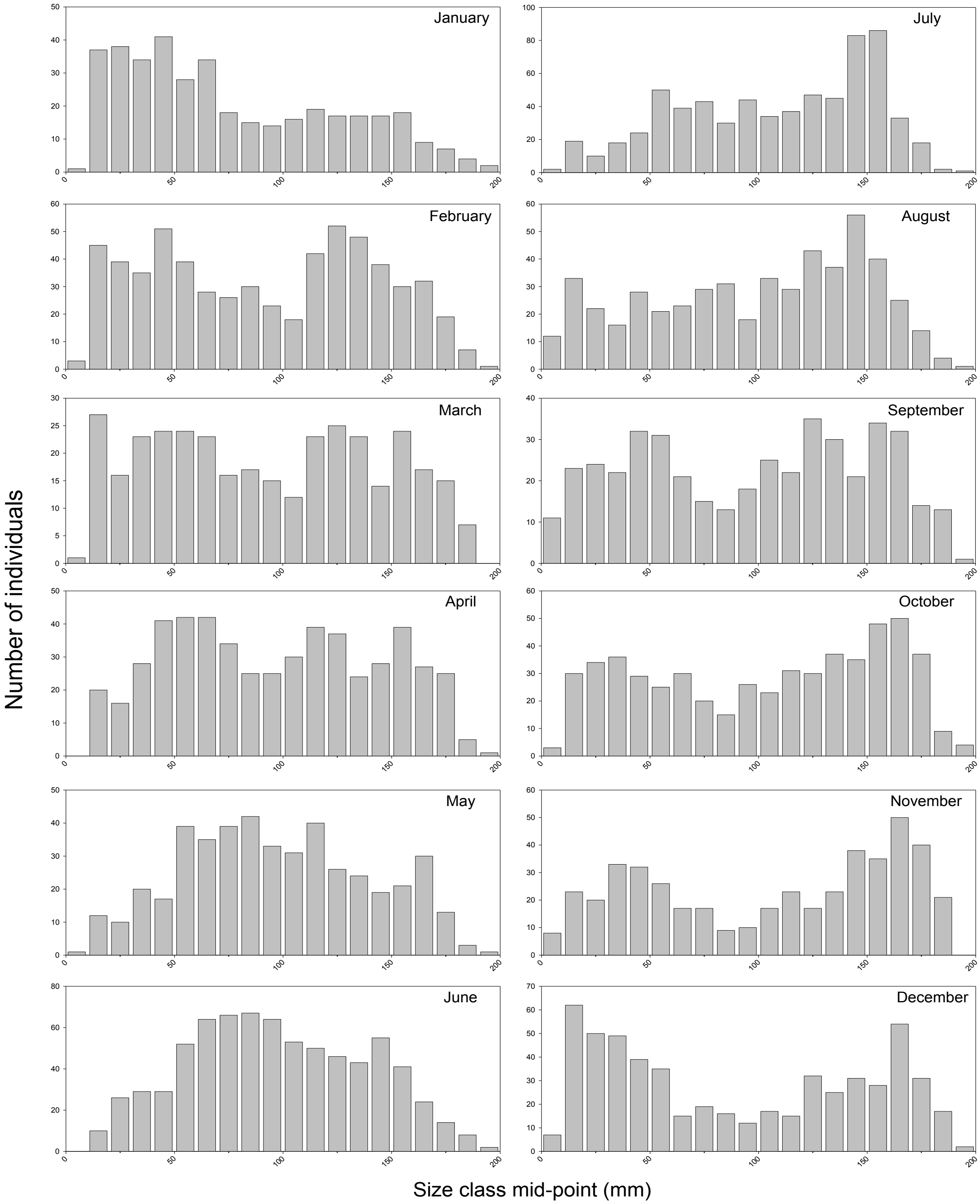
Appendix 9, Figure 3. Length frequencies of spot by month collected with 6.1-m trawls in the lower St. Johns River.

Litopenaeus setiferus (White shrimp) in 6.1-m trawls



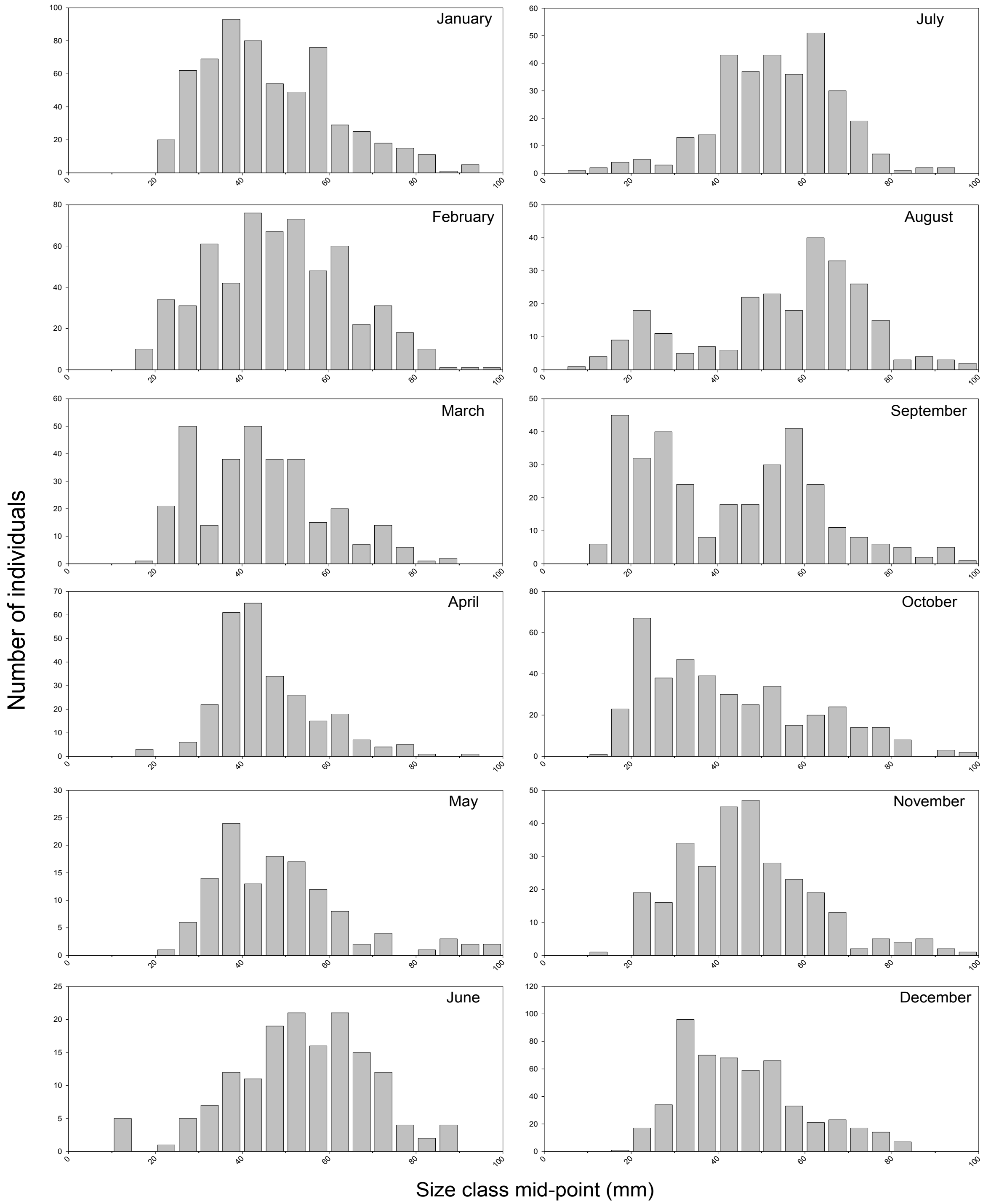
Appendix 9, Figure 4. Length frequencies of white shrimp by month collected with 6.1-m trawls in the lower St. Johns River.

Callinectes sapidus (Blue crab) in 6.1-m trawls



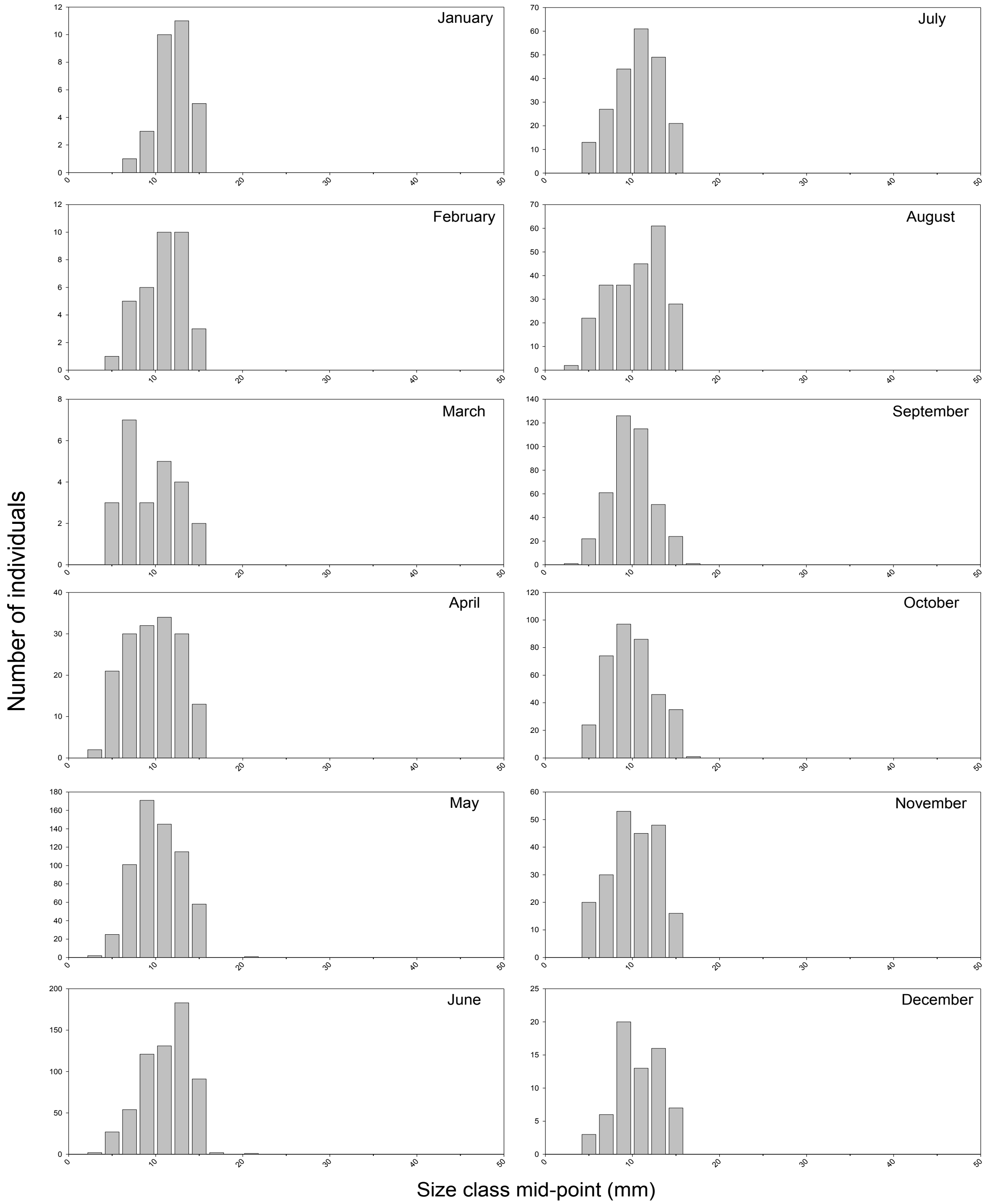
Appendix 9, Figure 5. Length frequencies of blue crab by month collected with 6.1-m trawls in the lower St. Johns River.

Trinectes maculatus (Hogchoker) in 6.1-m trawls

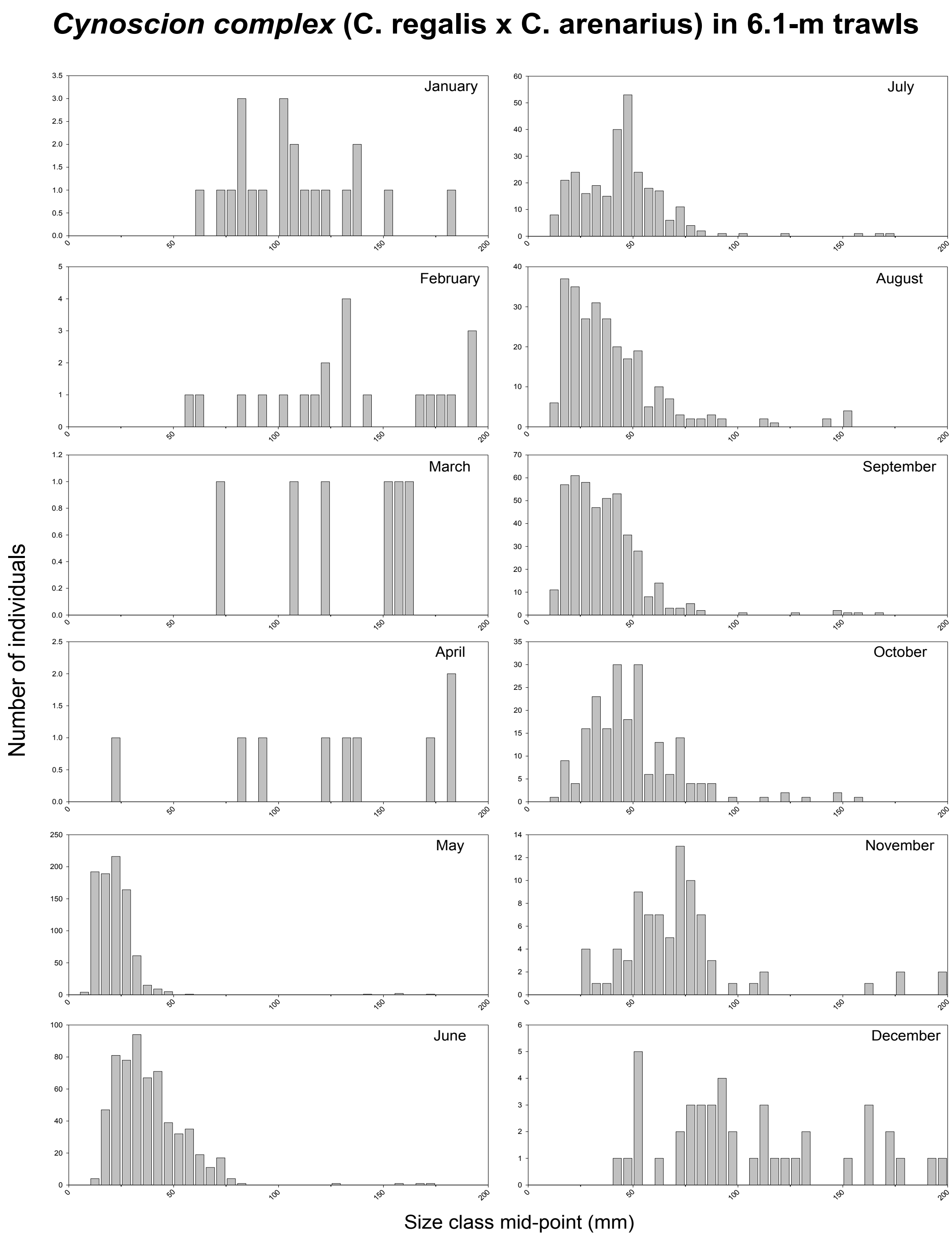


Appendix 9, Figure 6. Length frequencies of hogchoker by month collected with 6.1-m trawls in the lower St. Johns River.

Farfantepenaeus spp. (Commercial shrimp) in 6.1-m trawls

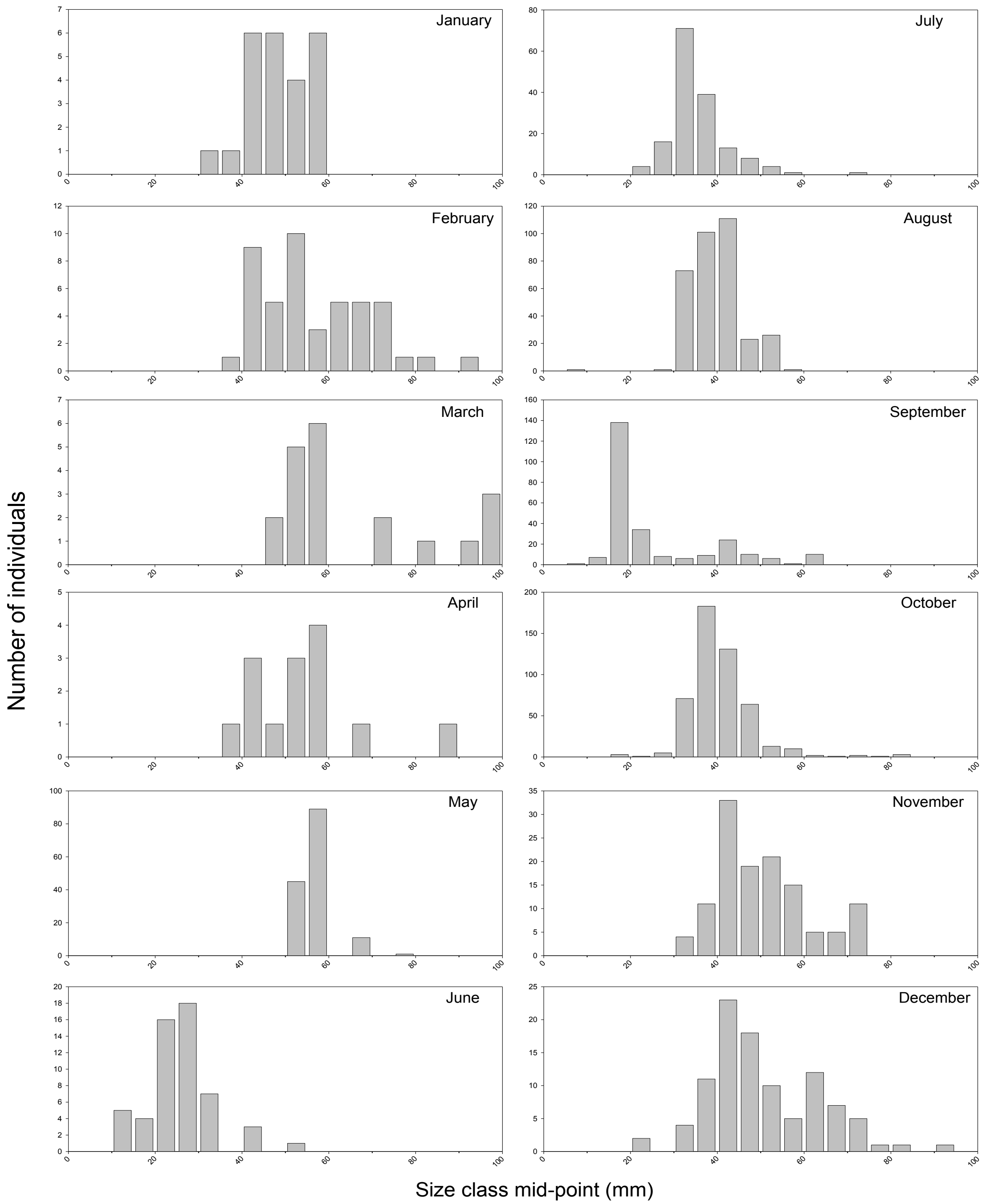


Appendix 9, Figure 7. Length frequencies of commercial shrimp by month collected with 6.1-m trawls in the lower St. Johns River.



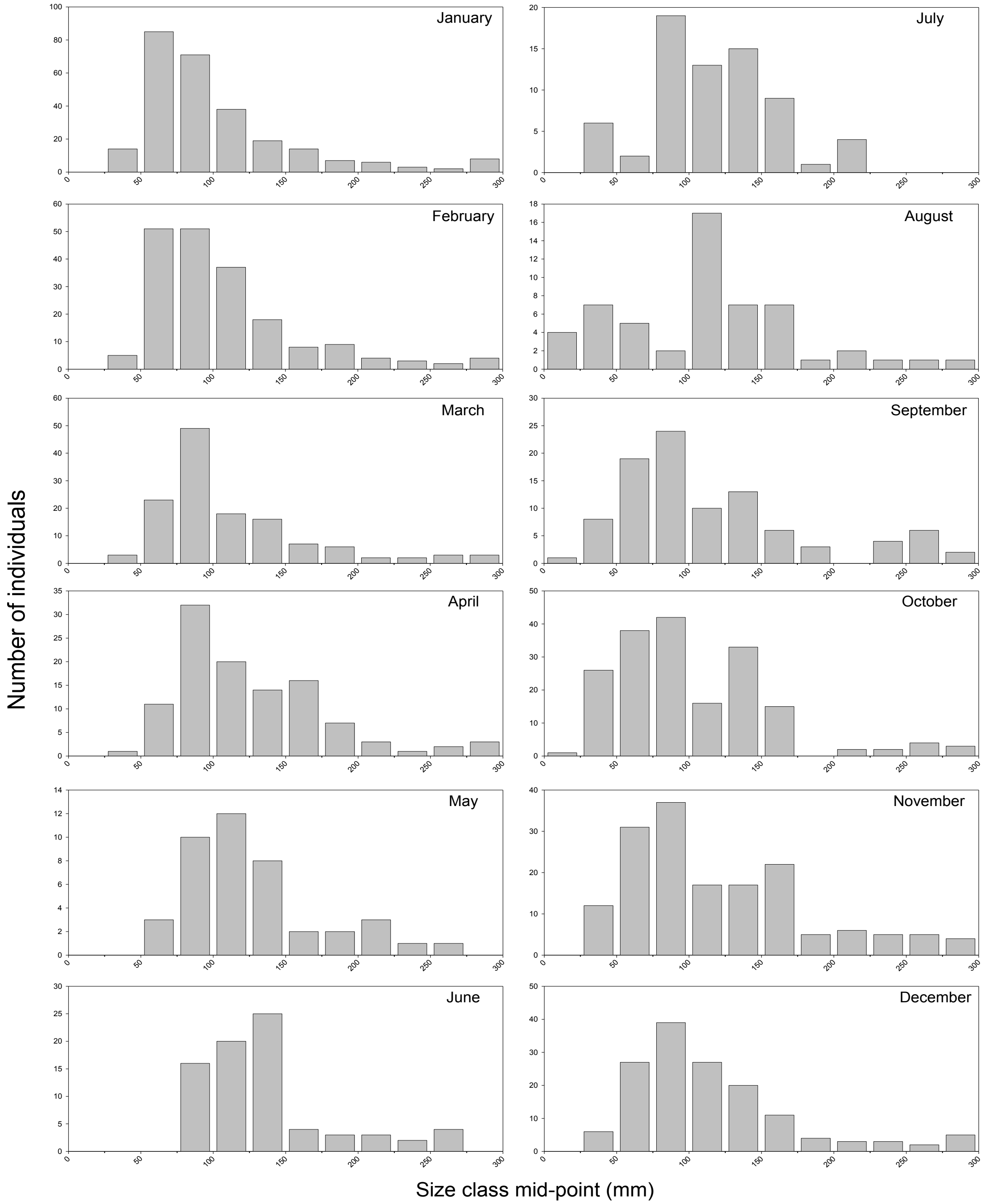
Appendix 9, Figure 8. Length frequencies of *C. regalis* x *C. arenarius* by month collected with 6.1-m trawls in the lower St. Johns River.

Stellifer lanceolatus (Star drum) in 6.1-m trawls



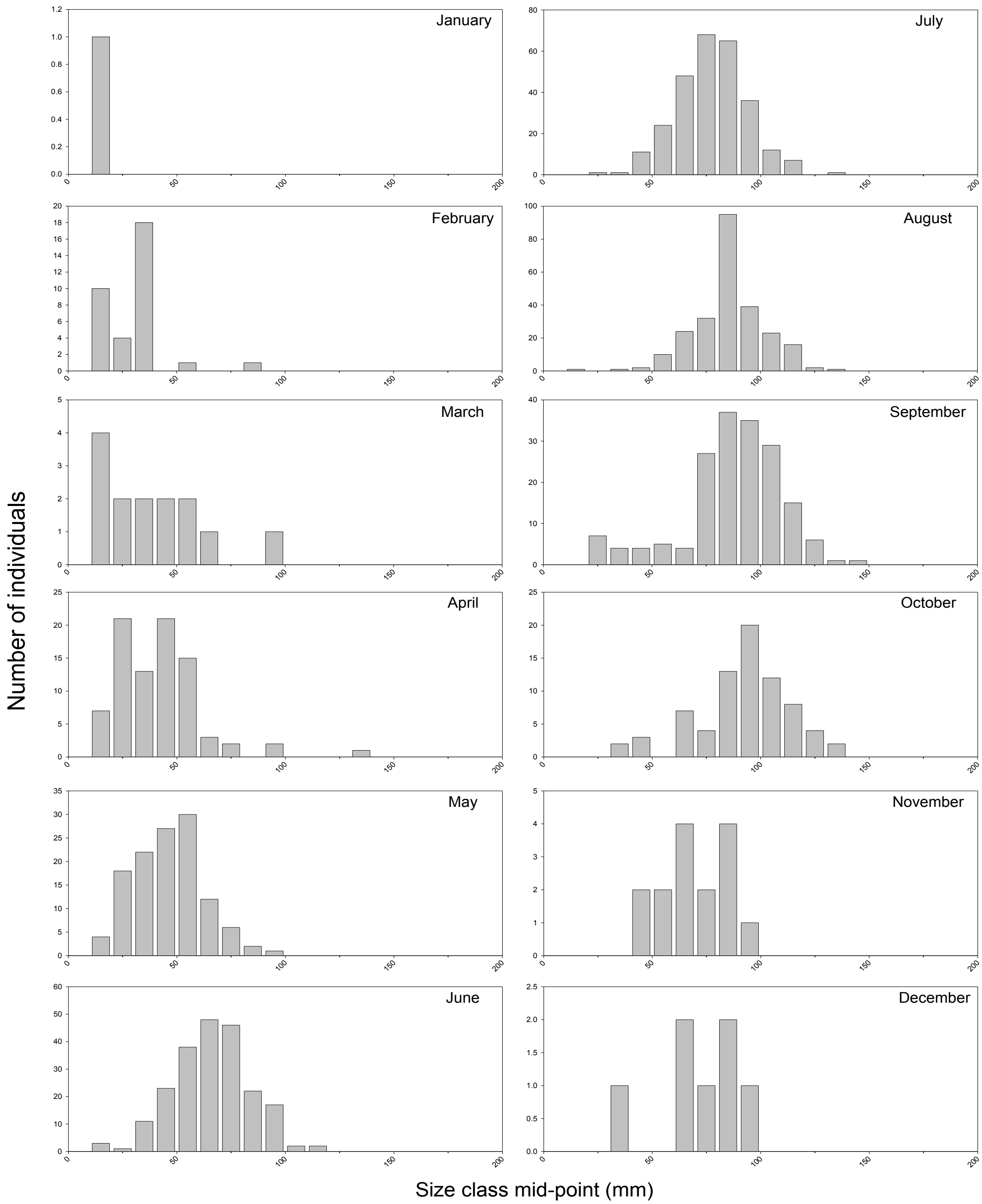
Appendix 9, Figure 9. Length frequencies of star drum by month collected with 6.1-m trawls in the lower St. Johns River.

Ameiurus catus (White catfish) in 6.1-m trawls



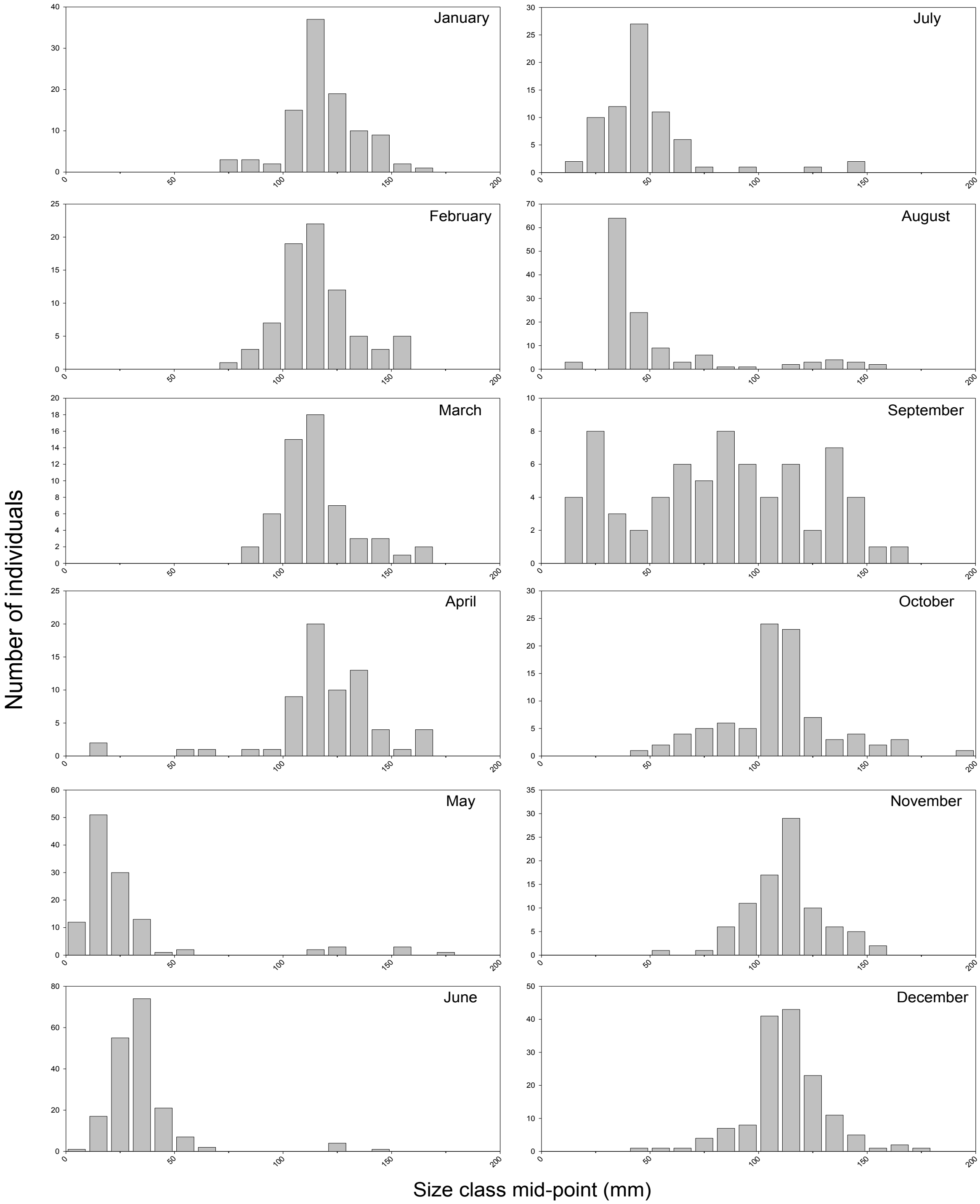
Appendix 9, Figure 10. Length frequencies of white catfish by month collected with 6.1-m trawls in the lower St. Johns River.

Citharichthys spilopterus (Bay whiff) in 6.1-m trawls



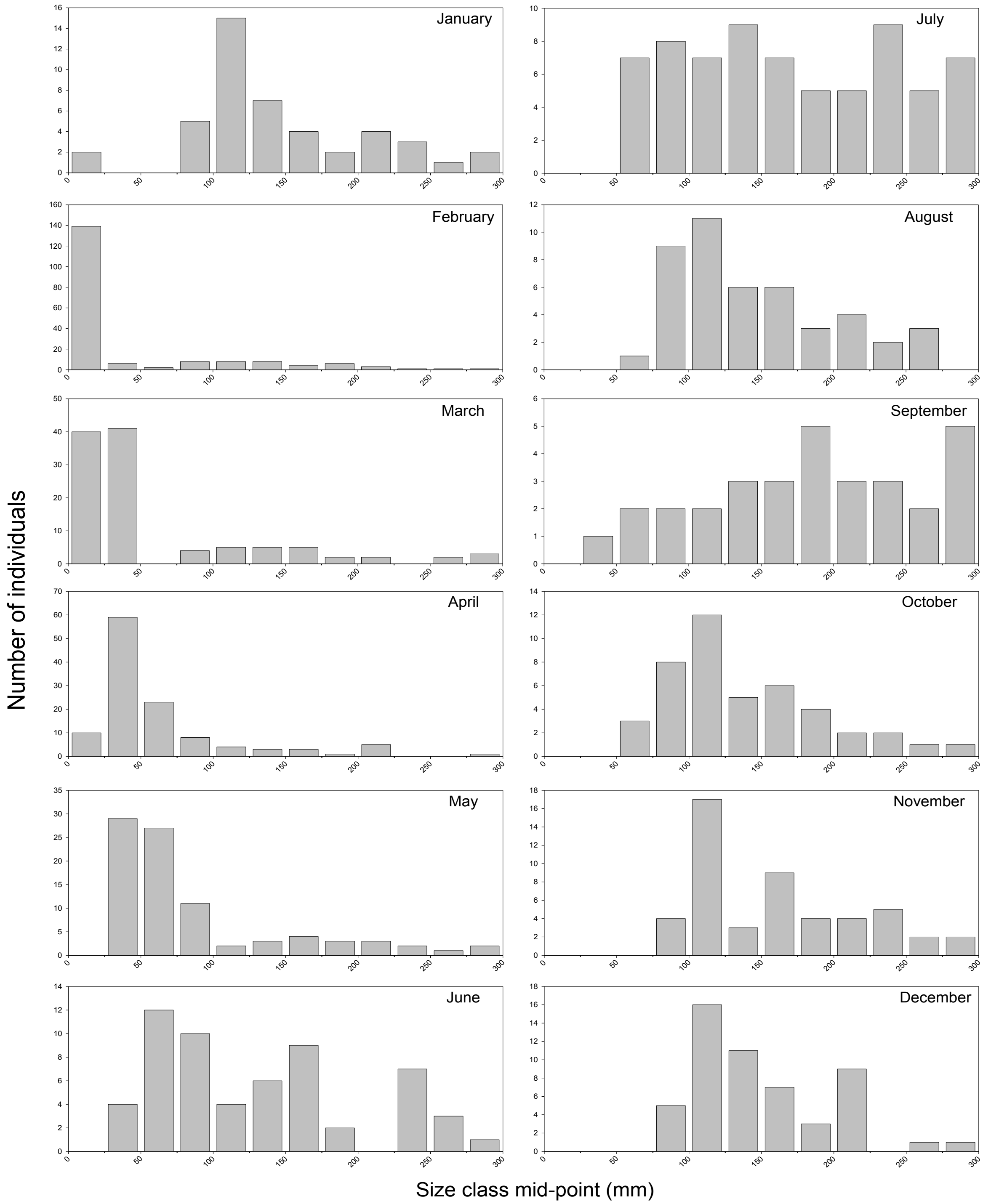
Appendix 9, Figure 11. Length frequencies of bay whiff by month collected with 6.1-m trawls in the lower St. Johns River.

Bairdiella chrysoura (Silver perch) in 6.1-m trawls



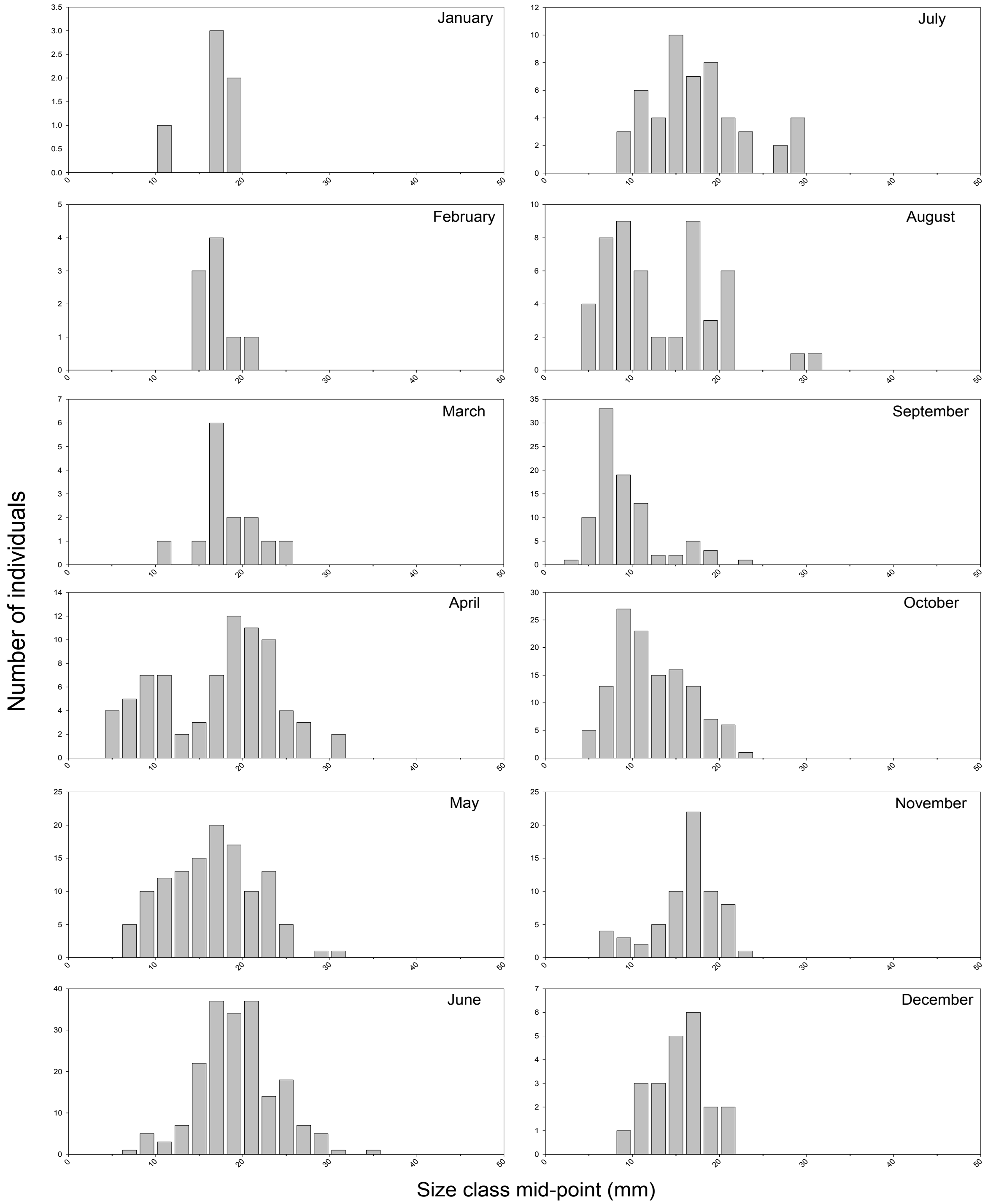
Appendix 9, Figure 12. Length frequencies of silver perch by month collected with 6.1-m trawls in the lower St. Johns River.

Paralichthys lethostigma (Southern flounder) in 6.1-m trawls



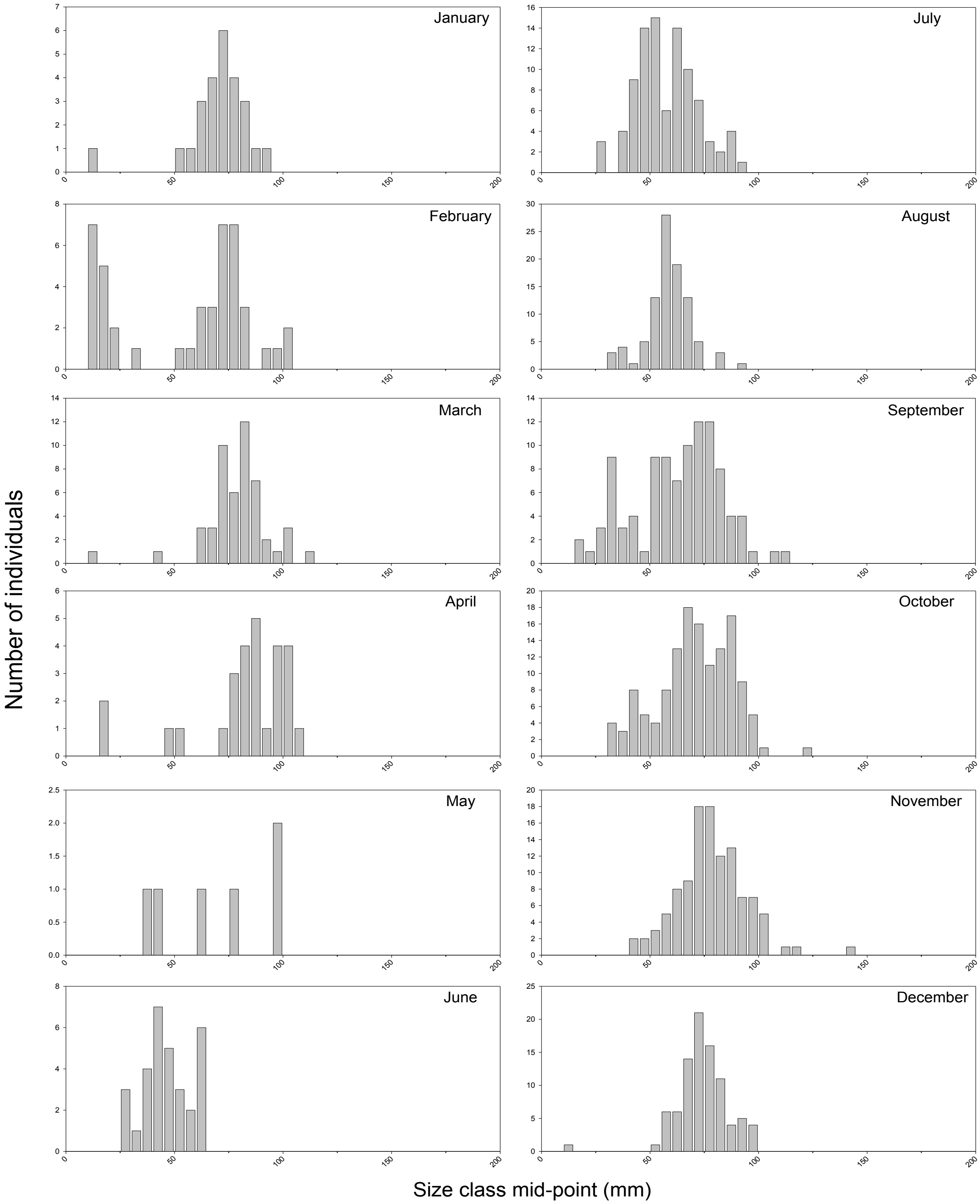
Appendix 9, Figure 13. Length frequencies of southern flounder by month collected with 6.1-m trawls in the lower St. Johns River.

Farfantepenaeus duorarum (Pink shrimp) in 6.1-m trawls



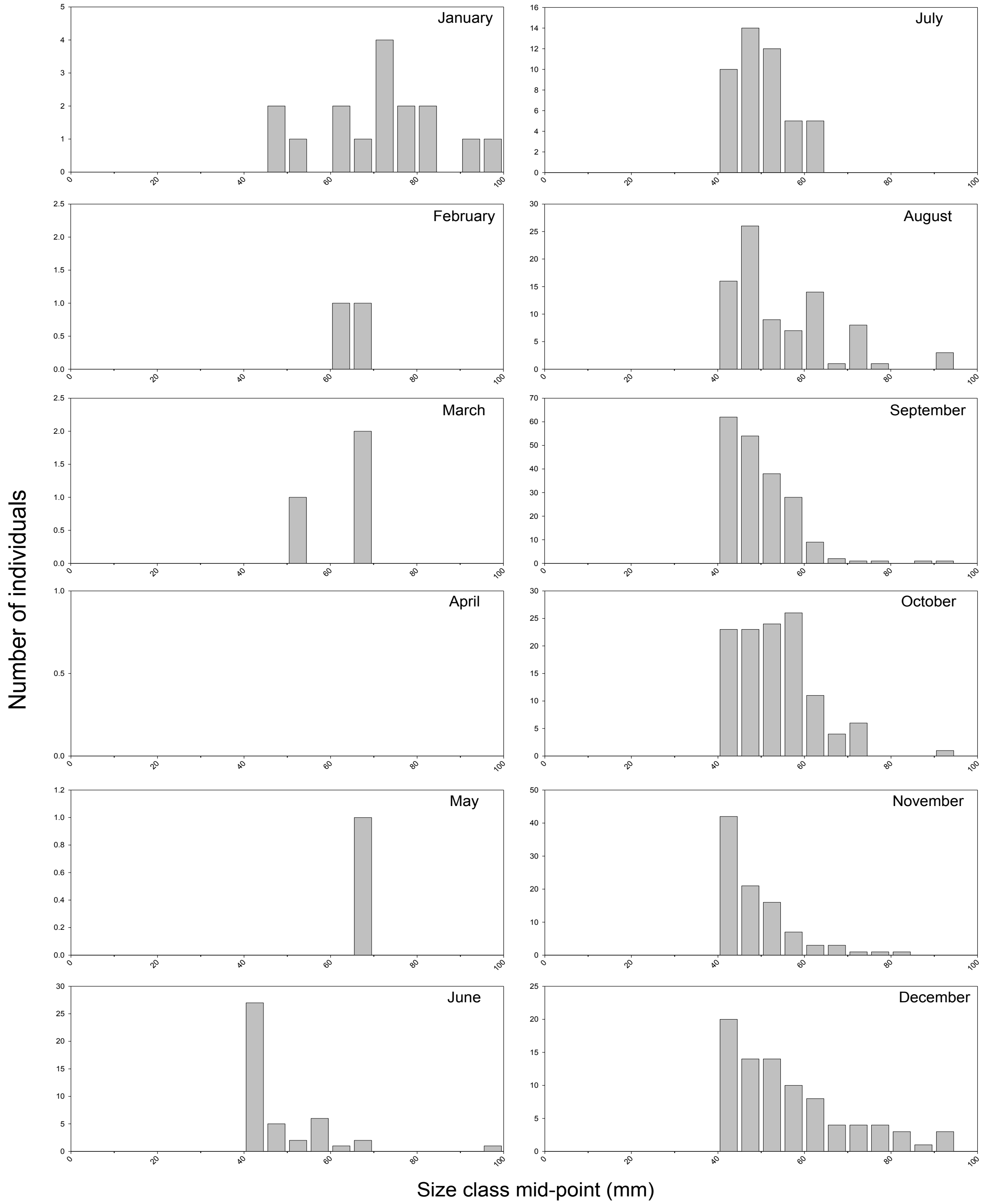
Appendix 9, Figure 14. Length frequencies of pink shrimp by month collected with 6.1-m trawls in the lower St. Johns River.

Etropus crossotus (Fringed flounder) in 6.1-m trawls



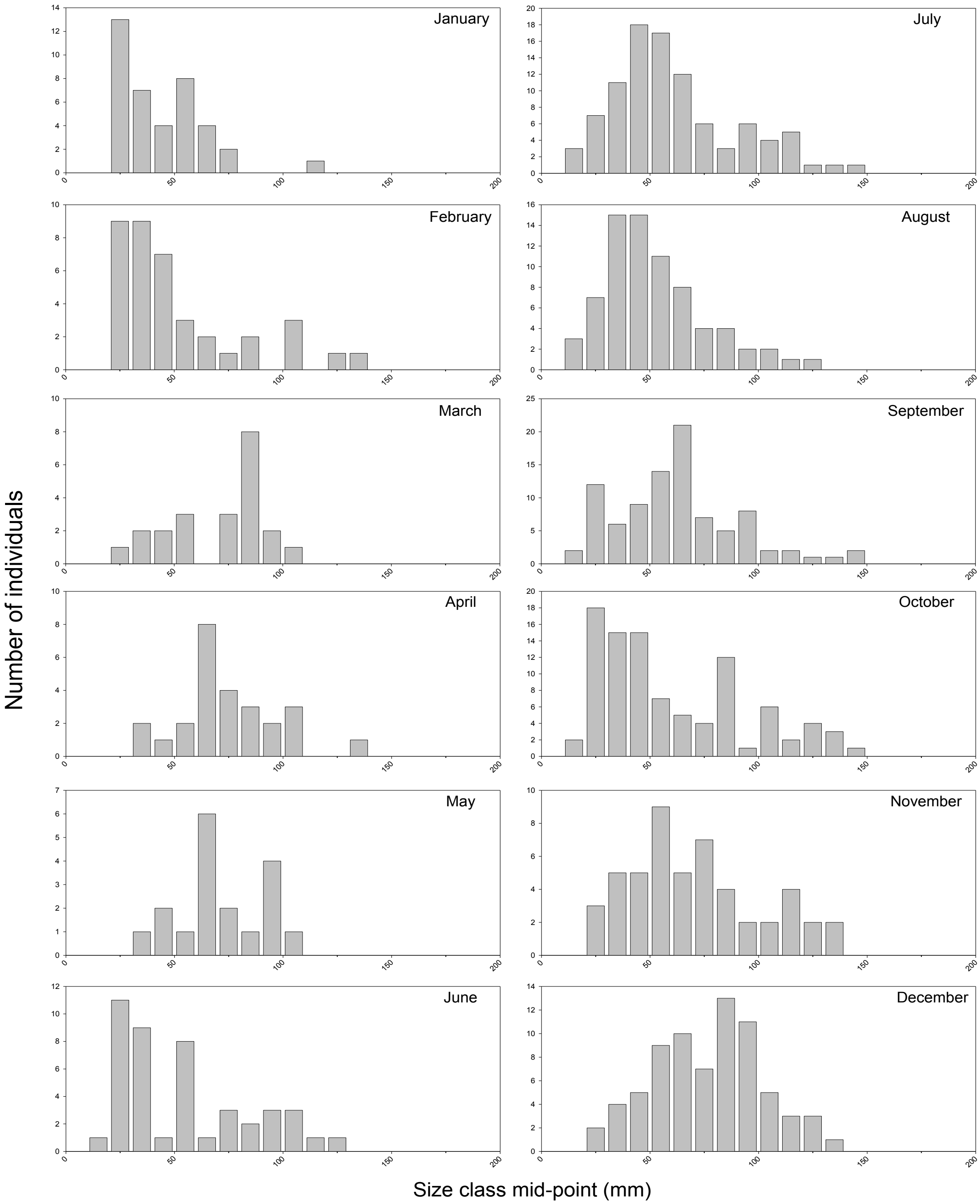
Appendix 9, Figure 15. Length frequencies of fringed flounder by month collected with 6.1-m trawls in the lower St. Johns River.

Eucinostomus harengulus (Tidewater mojarra) in 6.1-m trawls



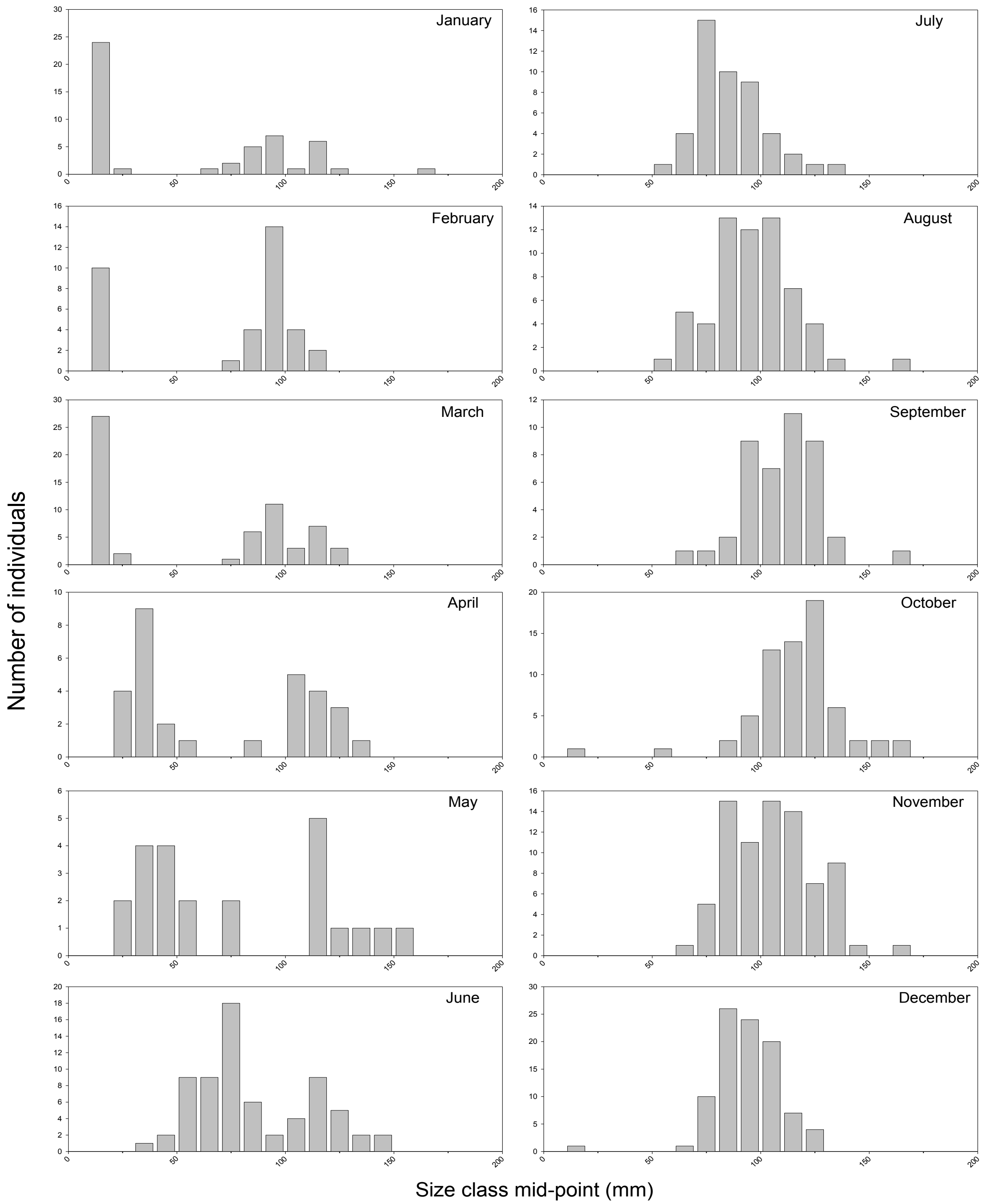
Appendix 9, Figure 16. Length frequencies of tidewater mojarra by month collected with 6.1-m trawls in the lower St. Johns River.

Symphurus plagiusa (Blackcheek tonguefish) in 6.1-m trawls



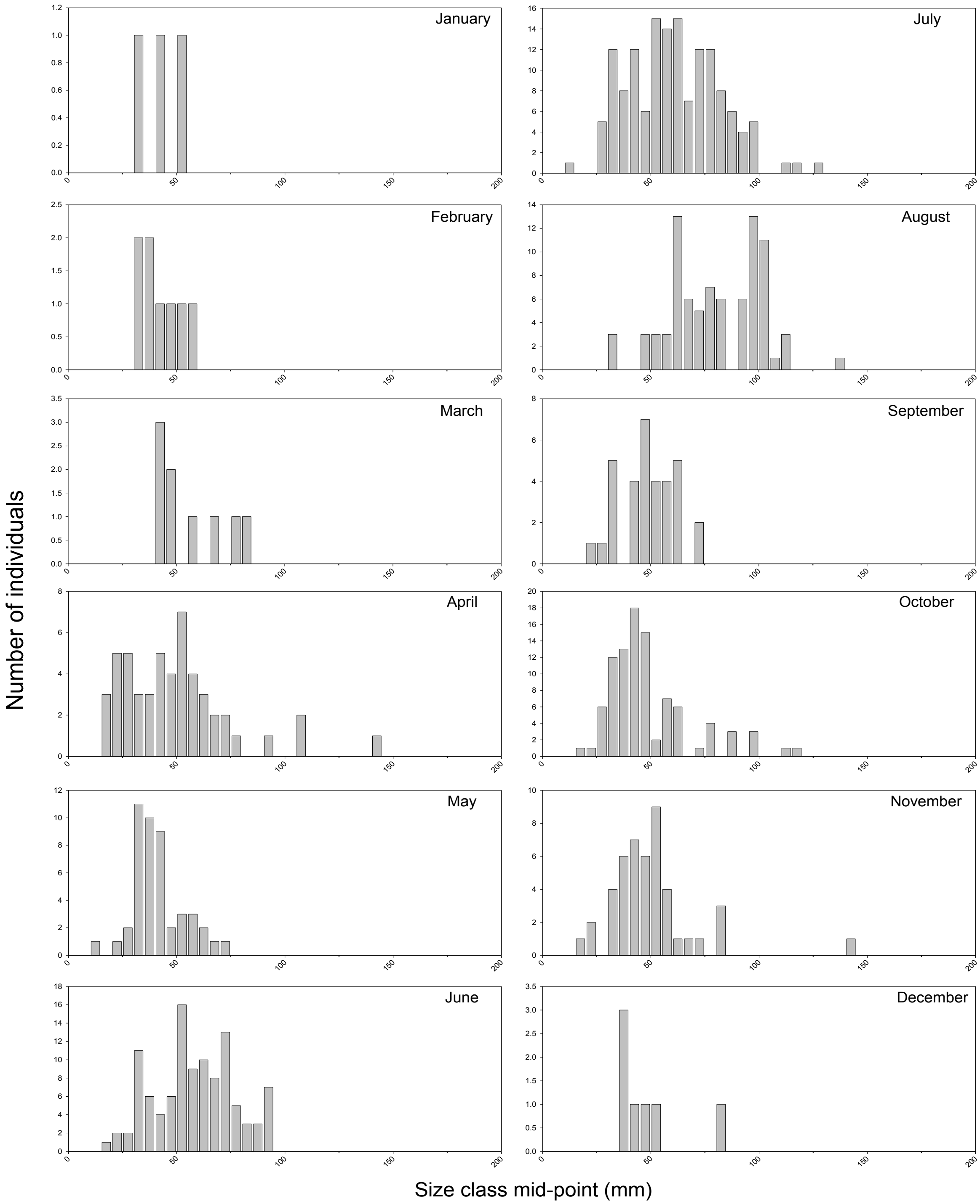
Appendix 9, Figure 17. Length frequencies of blackcheek tonguefish by month collected with 6.1-m trawls in the lower St. Johns River.

Lagodon rhomboides (Pinfish) in 6.1-m trawls



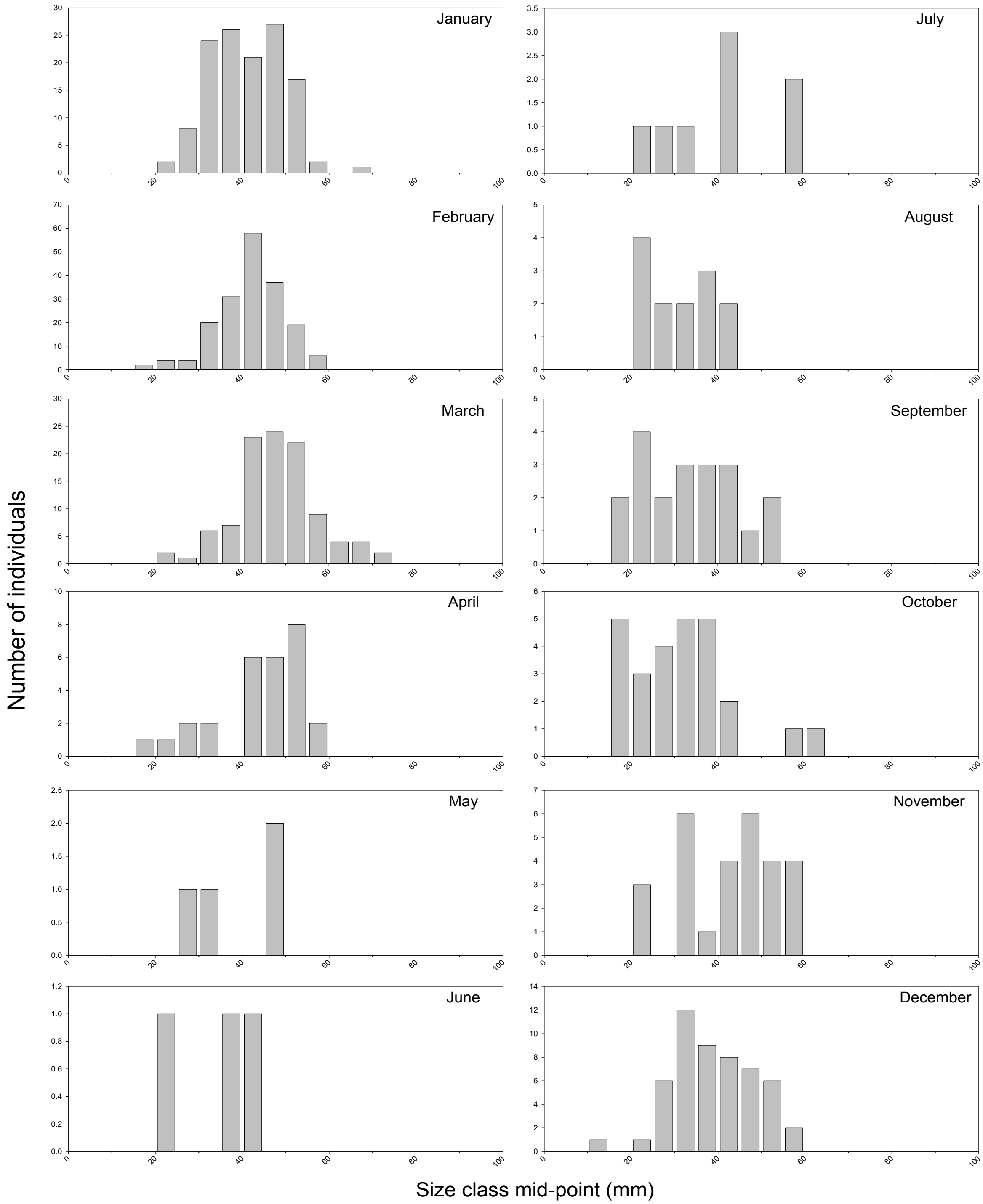
Appendix 9, Figure 18. Length frequencies of pinfish by month collected with 6.1-m trawls in the lower St. Johns River.

Callinectes similis (Lesser blue crab) in 6.1-m trawls



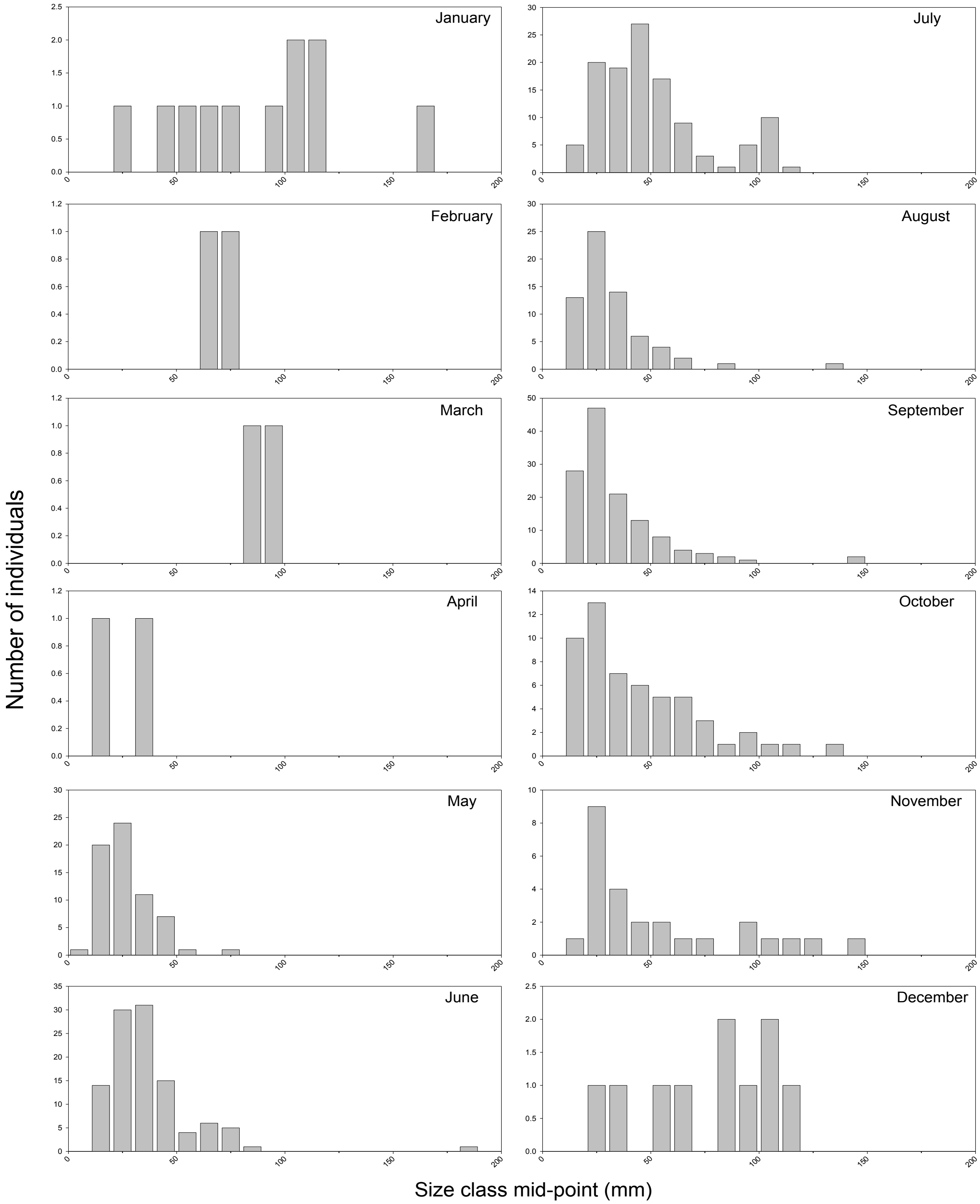
Appendix 9, Figure 19. Length frequencies of lesser blue crab by month collected with 6.1-m trawls in the lower St. Johns River.

Ctenogobius shufeldti (Freshwater goby) in 6.1-m trawls



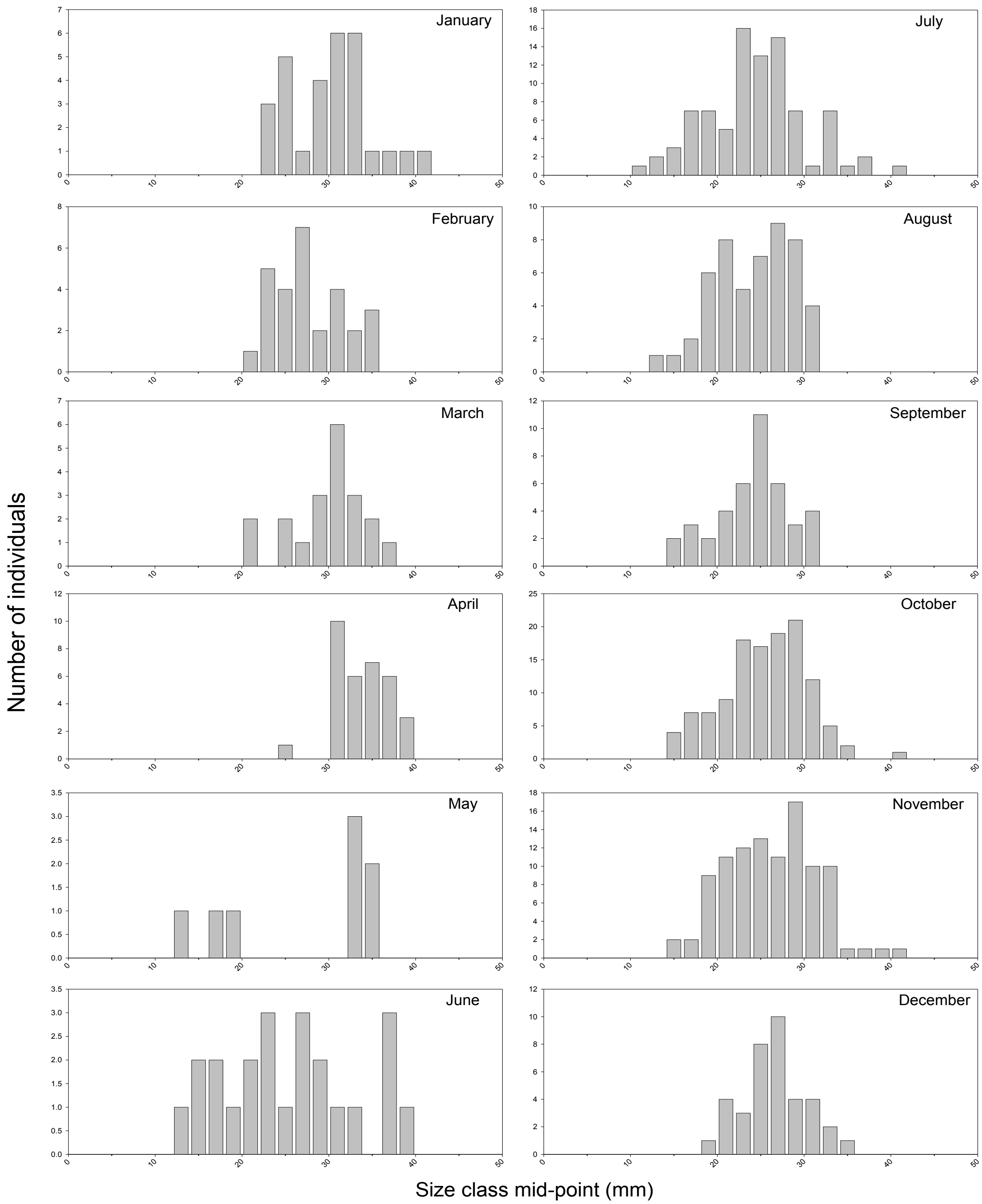
Appendix 9, Figure 20. Length frequencies of freshwater goby by month collected with 6.1-m trawls in the lower St. Johns River.

Menticirrhus americanus (Southern kingfish) in 6.1-m trawls



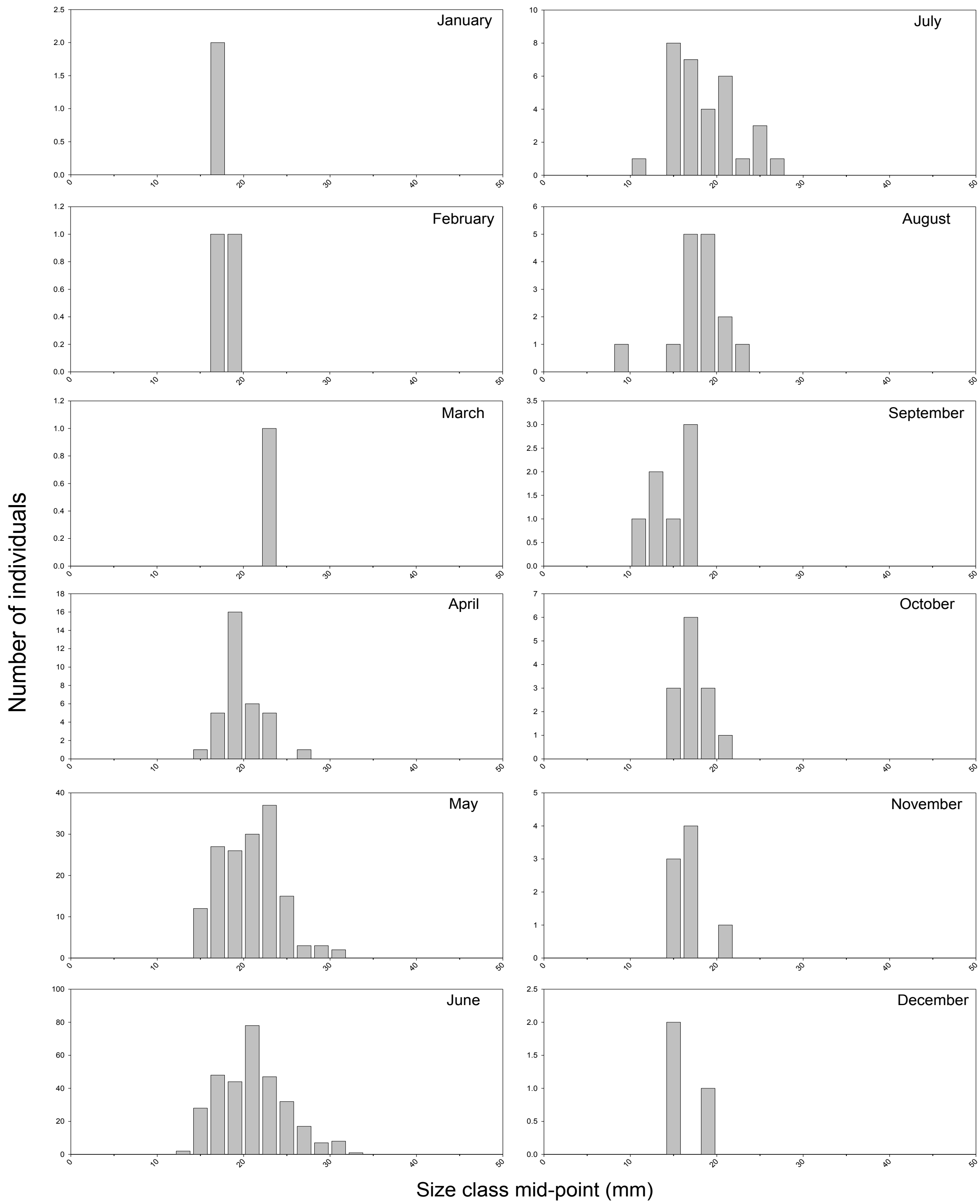
Appendix 9, Figure 21. Length frequencies of southern kingfish by month collected with 6.1-m trawls in the lower St. Johns River.

Microgobius thalassinus (Green goby) in 6.1-m trawls



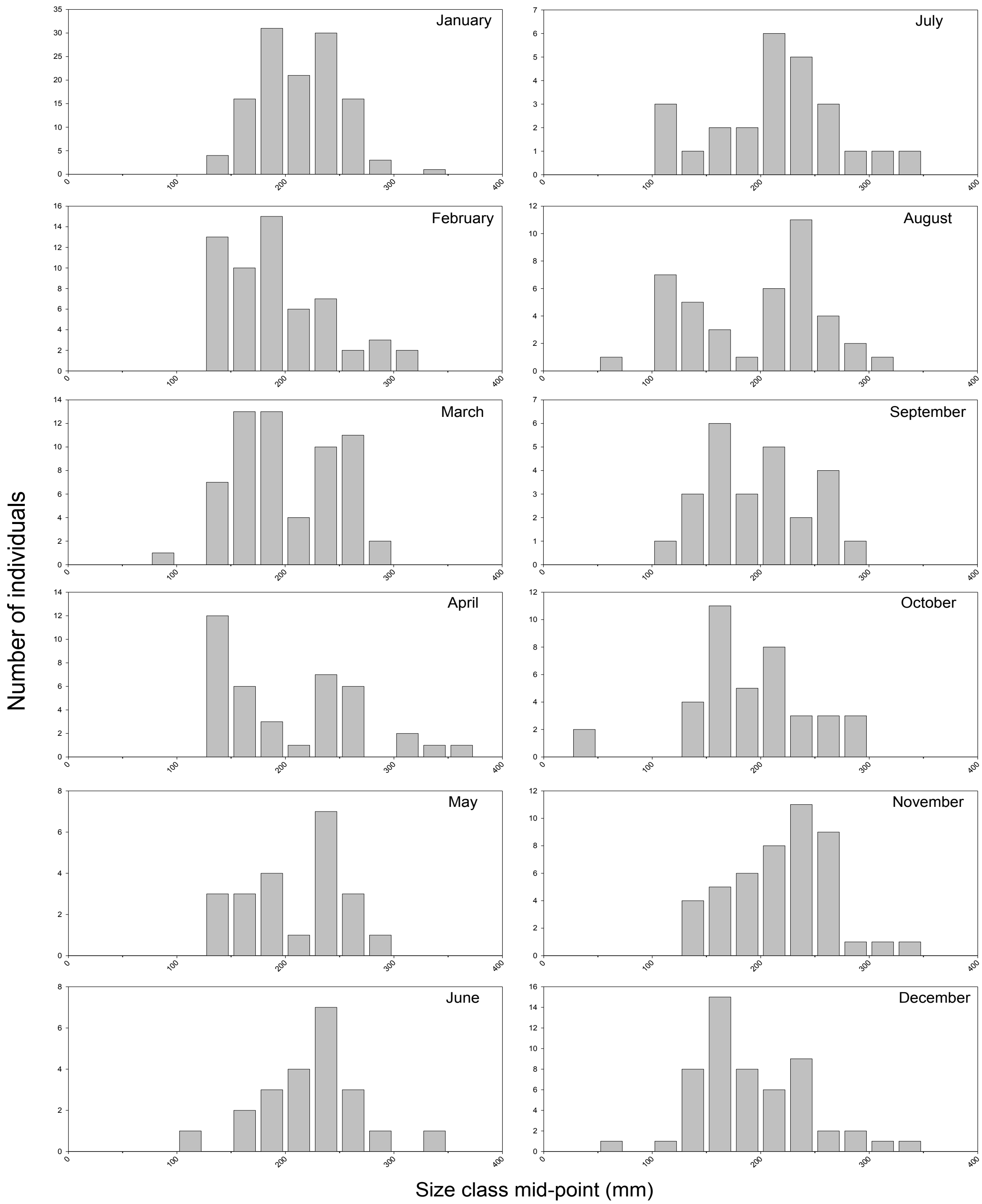
Appendix 9, Figure 22. Length frequencies of green goby by month collected with 6.1-m trawls in the lower St. Johns River.

Farfantepenaeus aztecus (Brown shrimp) in 6.1-m trawls



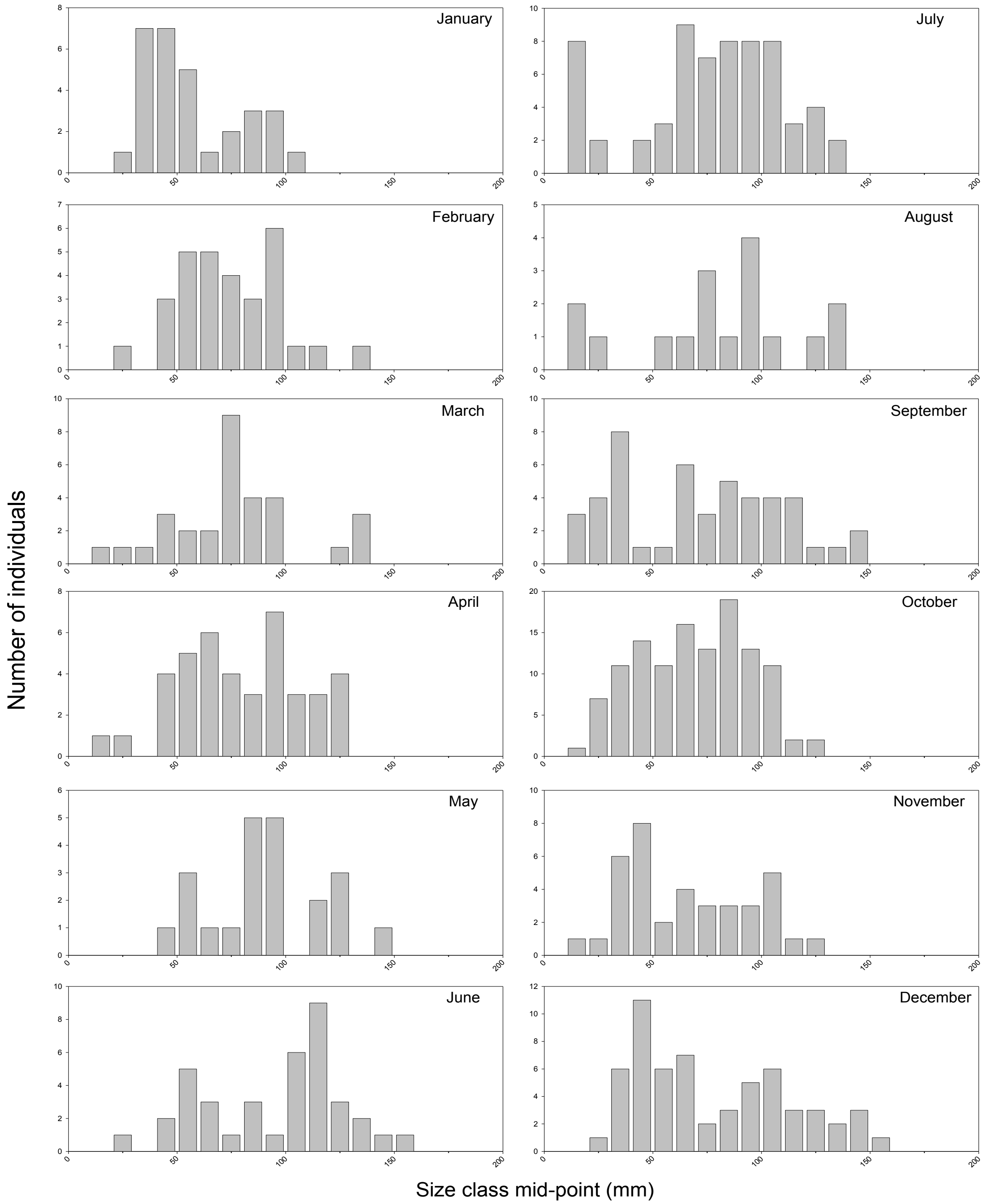
Appendix 9, Figure 23. Length frequencies of brown shrimp by month collected with 6.1-m trawls in the lower St. Johns River.

Dasyatis sabina (Atlantic stingray) in 6.1-m trawls



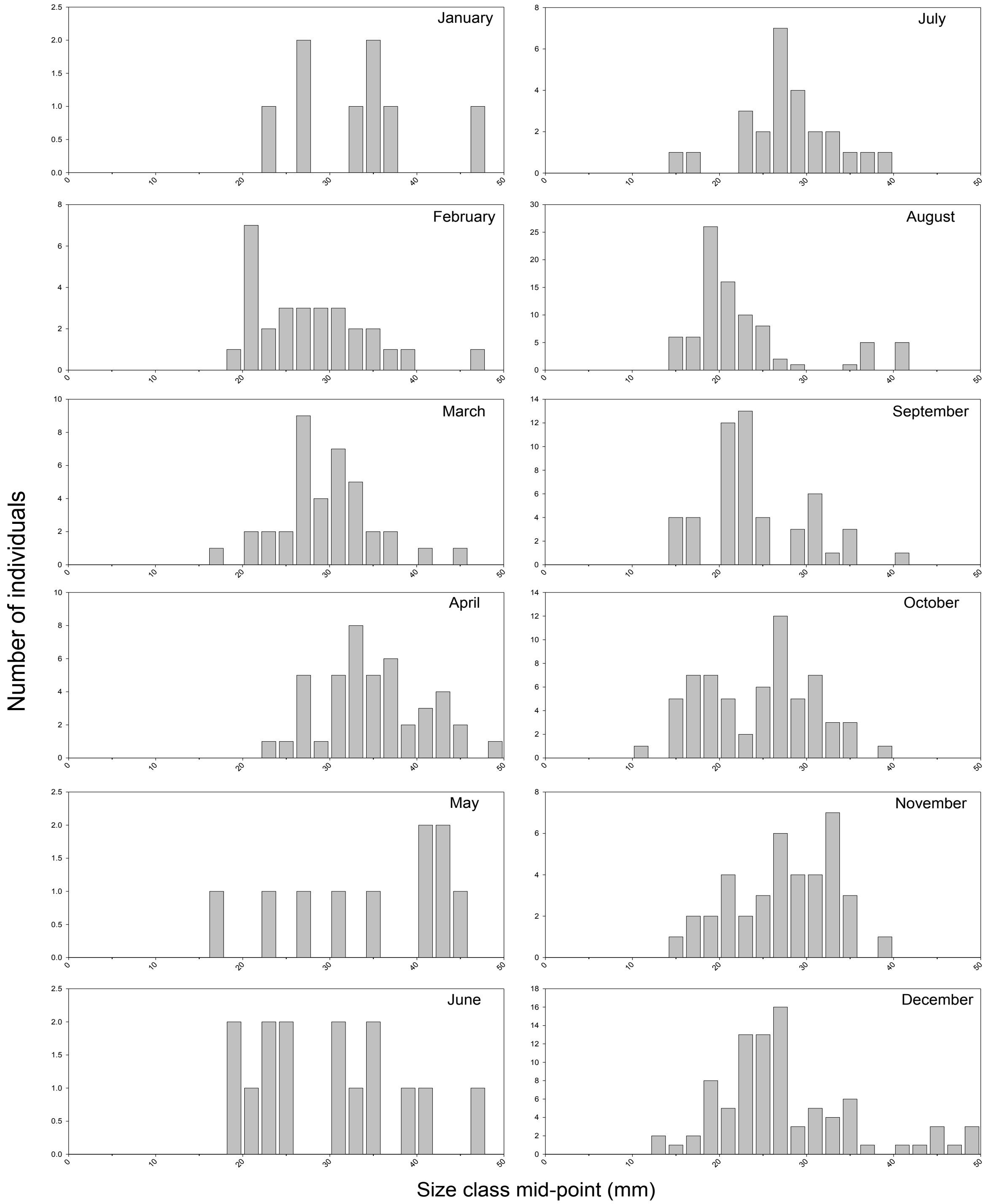
Appendix 9, Figure 24. Length frequencies of Atlantic stingray by month collected with 6.1-m trawls in the lower St. Johns River.

Achirus lineatus (Lined sole) in 6.1-m trawls



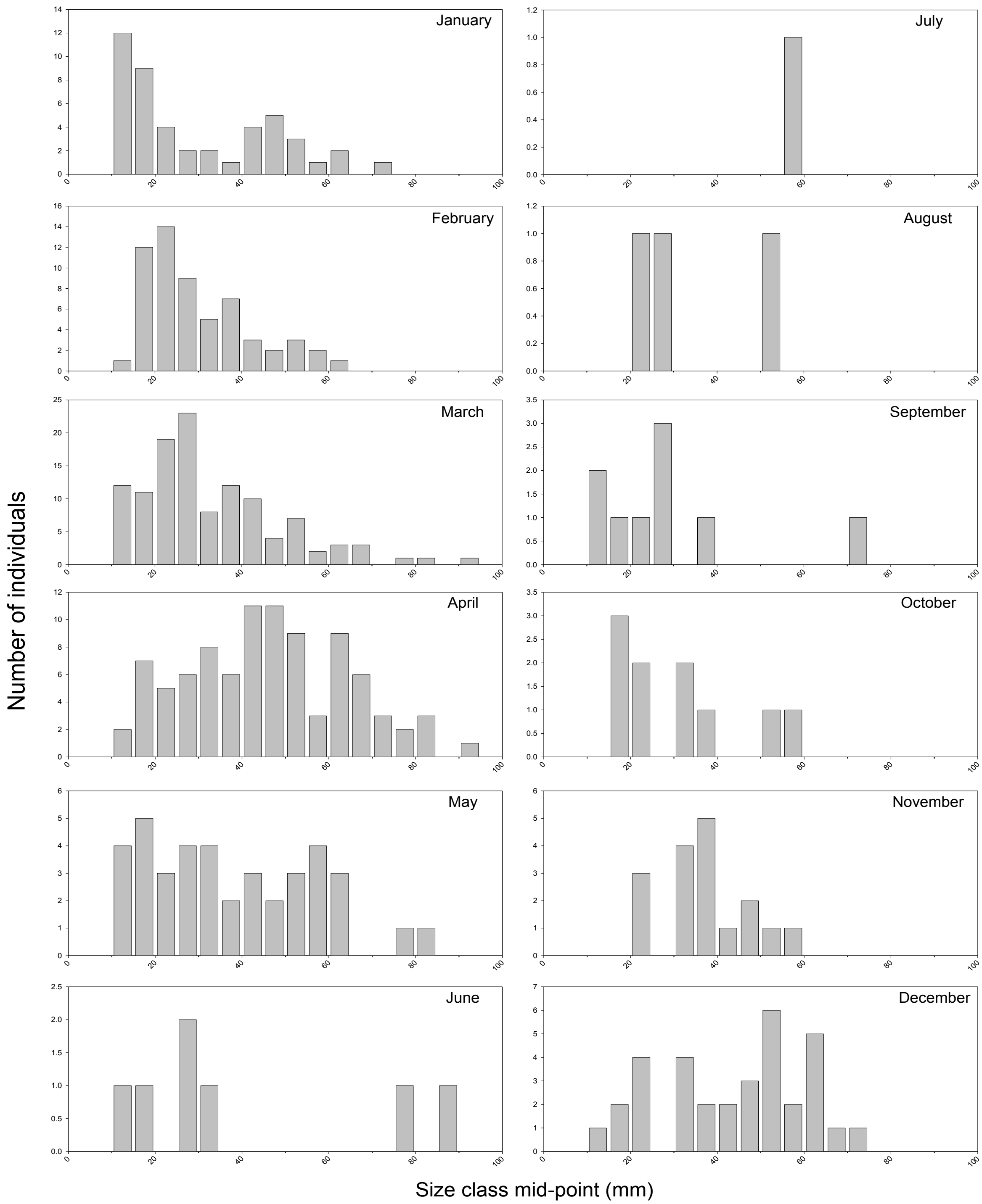
Appendix 9, Figure 25. Length frequencies of lined sole by month collected with 6.1-m trawls in the lower St. Johns River.

Microgobius gulosus (Clown goby) in 6.1-m trawls



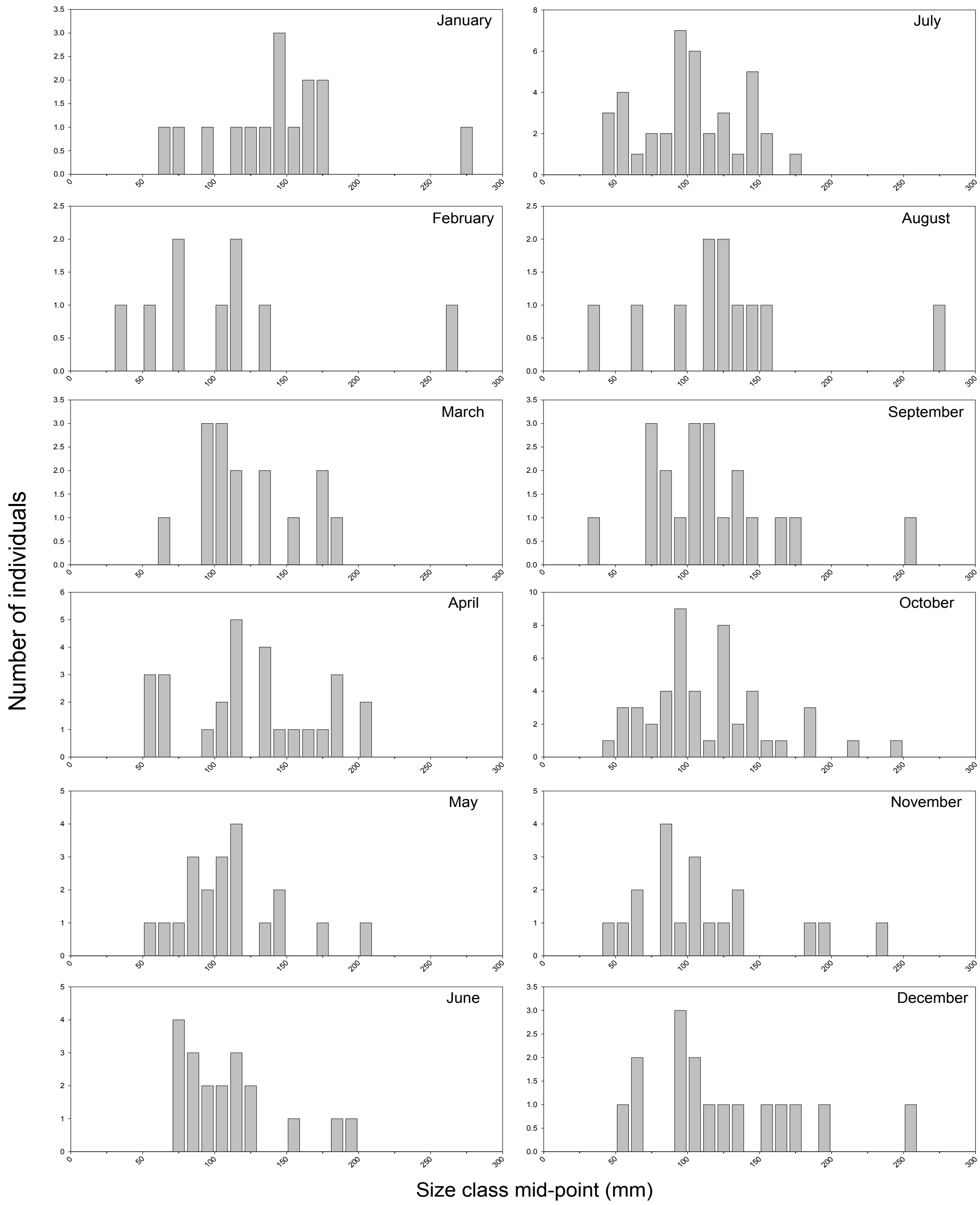
Appendix 9, Figure 26. Length frequencies of clown goby by month collected with 6.1-m trawls in the lower St. Johns River.

Prionotus tribulus (Bighead searobin) in 6.1-m trawls



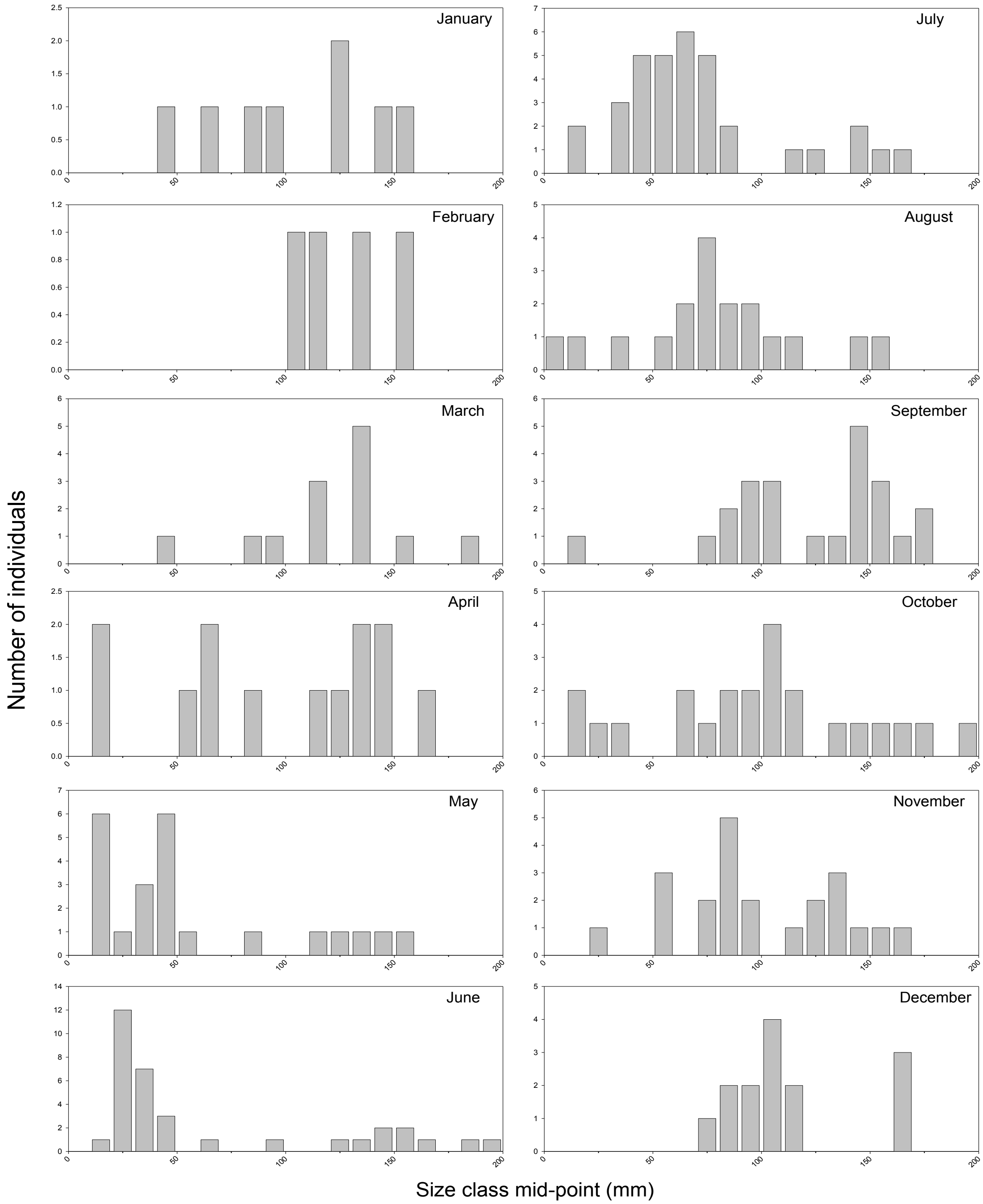
Appendix 9, Figure 27. Length frequencies of bighead searobin by month collected with 6.1-m trawls in the lower St. Johns River.

Opsanus tau (Oyster toadfish) in 6.1-m trawls



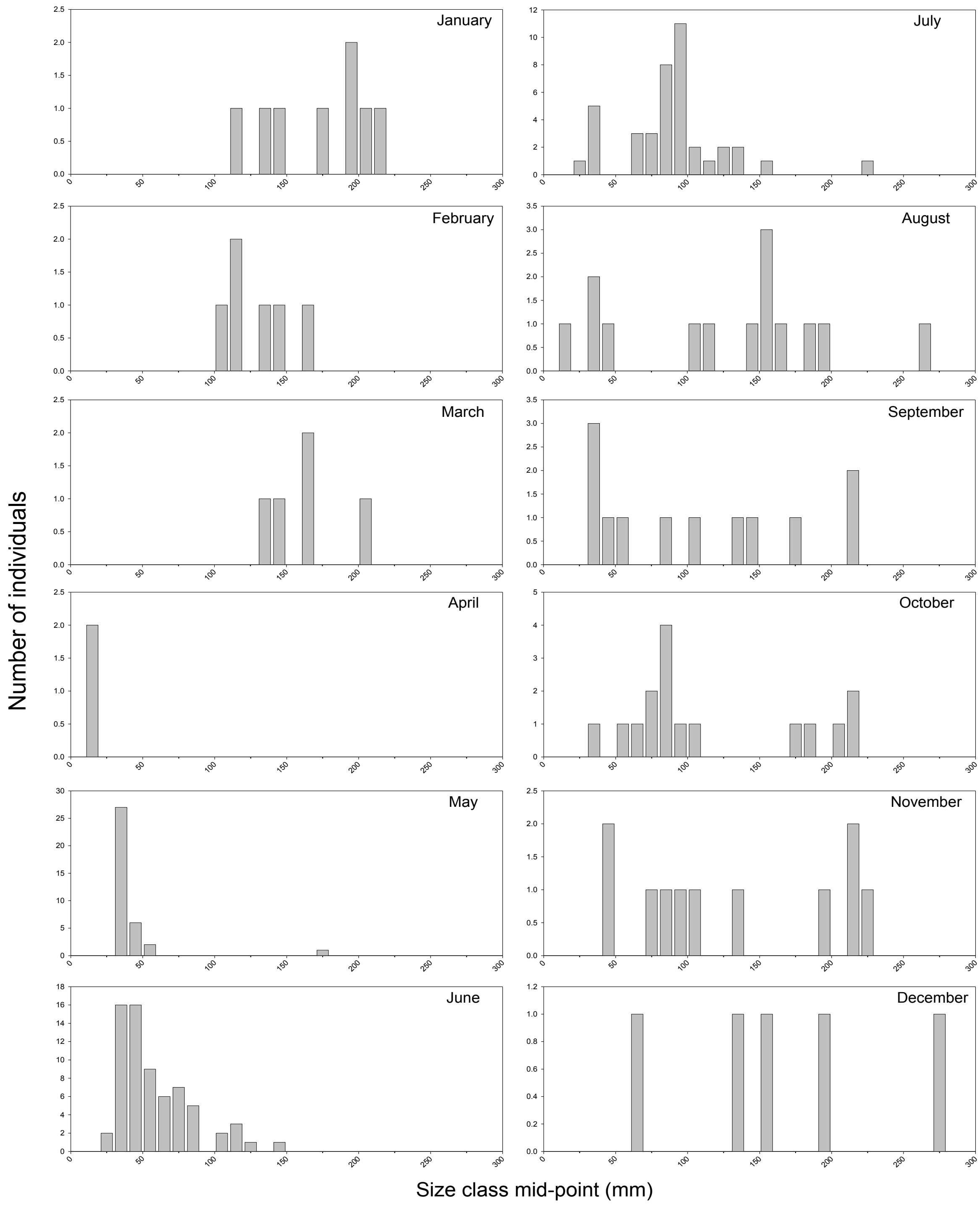
Appendix 9, Figure 28. Length frequencies of oyster toadfish by month collected with 6.1-m trawls in the lower St. Johns River.

Sphoeroides nephelus (Southern puffer) in 6.1-m trawls



Appendix 9, Figure 29. Length frequencies of southern puffer by month collected with 6.1-m trawls in the lower St. Johns River.

Synodus foetens (Inshore lizardfish) in 6.1-m trawls



Appendix 9, Figure 30. Length frequencies of inshore lizardfish by month collected with 6.1-m trawls in the lower St. Johns River.

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APPENDIX 10: Detailed salinity statistics for mainstem and tidal tributary habitats in the LSJR during FIM sampling (2001-2011).

Appendix 10, Table 1. Salinity statistics for mainstem samples in the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. Data was analyzed in 3 river-km bins. *n* is the number of samples per river-km designation (all gears combined); the mean, minimum (min), and maximum (max) salinity values are shown as well as the standard deviation and the 10th, 25th, 75th, and 90th percentiles.

River-Km	*n*	Salinity Values			Standard Deviation	Percentiles			
		Mean	Min	Max		10th	25th	75th	90th
0 - 2.9	84	31.0	9.8	40.2	5.7	23.0	28.2	34.6	35.6
3 - 5.9	51	28.9	9.5	35.7	6.8	18.2	26.5	33.7	34.6
6 - 8.9	56	26.8	9.0	36.4	6.3	18.3	23.0	32.4	33.3
9 - 11.9	62	22.7	5.3	38.1	8.9	10.6	14.1	30.3	33.3
12 - 14.9	93	19.6	0.9	34.5	8.6	7.2	12.7	26.8	30.9
15 - 17.9	268	19.1	0.5	35.5	8.0	8.1	12.9	25.2	29.8
18 - 20.9	154	16.9	0.3	34.7	7.9	5.6	10.2	23.4	26.5
21 - 23.9	155	15.7	0.3	32.0	7.9	4.9	9.1	22.3	25.9
24 - 26.9	157	14.8	0.3	34.8	8.8	3.3	7.1	21.4	27.4
27 - 29.9	109	13.2	0.3	28.3	7.9	2.3	6.5	19.5	25.2
30 - 32.9	103	12.4	0.3	30.3	7.6	0.9	6.4	17.7	21.7
33 - 35.9	140	9.4	0.3	28.3	6.6	0.6	3.9	14.6	18.2
36 - 38.9	7	6.9	0.3	18.1	6.7	0.3	0.5	12.0	18.1
39 - 41.9	183	7.4	0.3	23.2	5.8	0.4	2.1	12.3	15.6
42 - 44.9	244	5.9	0.2	22.8	5.2	0.4	1.5	9.5	12.6
45 - 47.9	203	5.7	0.2	21.4	5.1	0.3	1.2	9.1	13.9
48 - 50.9	219	4.4	0.2	23.9	4.8	0.3	0.4	6.9	11.1
51 - 53.9	181	3.3	0.3	14.9	3.5	0.3	0.4	5.7	8.5
54 - 56.9	158	2.9	0.2	17.0	3.6	0.3	0.3	5.0	8.6
57 - 59.9	180	2.7	0.2	13.1	3.4	0.3	0.4	3.9	8.3
60 - 62.9	150	2.4	0.2	14.4	3.1	0.3	0.4	3.8	7.2
63 - 65.9	18	2.3	0.2	9.7	3.1	0.3	0.3	2.5	9.0

Appendix 10, Table 2. Annual salinity statistics for mainstem samples by zone (all gears combined) in the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. *n* is the number of samples per year (all gears combined); the mean, minimum (min), and maximum (max) salinity values are shown as well as the standard deviation and the 10th, 25th, 75th, and 90th percentiles.

Zone	Year	*n*	Salinity Values			Standard Deviation	Percentiles			
			Mean	Min	Max		10th	25th	75th	90th
1	2001	20	28.4	12.7	36.3	7.2	16.0	23.5	33.4	35.7
	2002	31	26.8	15.3	34.2	6.1	16.4	23.4	32.3	33.6
	2003	34	21.1	6.2	35.6	7.9	11.0	16.2	26.0	33.9
	2004	24	25.6	6.6	36.8	9.1	10.6	19.1	33.1	34.6
	2005	28	19.8	3.4	31.3	8.5	6.2	12.9	26.5	30.9
	2006	38	28.1	3.3	35.5	8.7	11.4	27.4	33.2	34.6
	2007	32	29.3	19.9	35.6	4.7	21.3	25.6	32.9	34.0
	2008	38	24.0	5.3	35.4	9.8	9.5	13.9	33.6	34.8
	2009	28	24.1	6.7	37.0	9.3	11.1	16.2	31.6	36.1
	2010	29	26.2	5.3	36.2	9.0	12.0	19.3	33.7	34.6
	2011	36	29.3	11.9	40.2	7.2	19.1	25.7	33.5	35.8
2	2001	37	16.4	4.5	26.9	7.6	6.9	8.6	23.7	25.9
	2002	58	16.8	3.2	32.0	7.7	5.3	11.2	21.9	26.5
	2003	71	13.2	4.1	26.5	6.5	5.7	7.6	17.6	22.8
	2004	68	15.8	0.3	29.7	9.1	1.6	6.4	22.9	26.5
	2005	77	10.5	0.3	29.2	6.8	1.3	5.3	15.3	20.0
	2006	71	22.1	2.5	33.3	7.7	9.6	18.7	27.4	30.6
	2007	77	21.1	5.9	35.2	8.1	9.4	15.4	26.2	31.8
	2008	71	16.2	0.9	30.1	7.9	3.7	10.9	21.4	26.6
	2009	69	15.0	4.2	29.1	6.3	7.3	10.4	20.0	24.1
	2010	73	17.3	2.3	32.5	8.1	6.8	11.8	24.2	27.8
	2011	69	22.5	9.9	35.5	6.2	14.3	17.4	25.9	30.7
3	2001	41	7.8	0.4	28.9	8.3	0.5	0.5	12.7	17.7
	2002	50	8.2	0.3	25.2	7.7	0.5	1.4	15.2	19.6
	2003	90	4.0	0.2	16.7	4.3	0.3	0.4	6.1	11.1
	2004	93	7.2	0.2	23.5	6.3	0.3	0.6	11.2	16.0
	2005	98	3.7	0.2	18.8	3.7	0.3	0.5	5.4	8.3
	2006	92	12.0	0.6	27.5	6.4	1.8	8.2	15.4	20.5
	2007	96	11.0	0.8	28.3	6.5	2.0	6.3	15.6	19.8
	2008	95	7.4	0.3	21.1	6.2	0.5	2.5	11.7	17.1
	2009	95	7.1	0.4	30.3	6.2	0.6	2.5	10.1	14.3
	2010	88	8.5	0.4	25.3	5.8	1.5	2.3	12.3	15.5
	2011	96	13.7	1.2	27.2	6.0	6.0	9.0	18.5	21.6
4	2001	29	3.5	0.4	13.2	4.0	0.4	0.4	6.4	9.6
	2002	63	2.9	0.2	14.9	4.1	0.3	0.3	4.8	10.5
	2003	94	0.5	0.2	3.8	0.5	0.3	0.3	0.5	0.8
	2004	89	1.6	0.2	12.3	2.1	0.3	0.3	2.0	4.2
	2005	100	0.8	0.2	7.1	1.4	0.3	0.3	0.5	1.7
	2006	99	6.0	0.2	21.4	4.2	0.3	2.5	8.2	11.2
	2007	94	6.1	0.6	20.8	5.3	0.8	1.5	10.1	11.6
	2008	91	2.9	0.3	11.3	3.0	0.3	0.5	6.2	7.0
	2009	100	2.5	0.3	15.6	3.1	0.3	0.4	3.5	6.7
	2010	101	2.9	0.3	10.0	2.7	0.4	0.4	5.5	6.8
	2011	102	6.9	0.6	23.9	4.3	1.2	4.0	10.5	12.2

Appendix 10, Table 3. Salinity statistics for selected tidal tributaries in the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. *n* is the number of samples per tributary (all gears combined); the mean, minimum (min), and maximum (max) salinity values are shown as well as the standard deviation and the 10th, 25th, 75th, and 90th percentiles. Tributaries are listed in order of proximity to the St. Johns River mouth (closest to farthest).

Tributary	*n*	Salinity Values			Standard Deviation	Percentiles			
		Mean	Min	Max		10th	25th	75th	90th
SICW	247	23.9	6.8	39.9	7.0	14.5	18.4	30.4	32.4
Sisters Creek	281	25.8	7.5	39.3	7.4	14.3	21.3	31.7	33.6
Blount Island Channel	205	22.0	3.0	36.9	7.9	10.0	16.5	28.0	31.6
Clapboard Creek	191	21.8	4.7	36.9	7.6	12.1	16.3	27.6	31.6
Browns Creek	72	24.8	8.0	36.0	6.3	16.1	20.6	29.7	31.6
Dunn Creek	90	15.6	1.2	33.8	8.4	4.9	8.0	22.4	26.3
Broward Creek	108	13.1	0.5	30.6	7.8	3.7	6.9	19.9	23.5
Trout River	324	11.2	0.1	27.4	7.0	2.3	5.1	17.4	20.6
Arlington River	156	6.0	0.1	27.1	5.7	0.3	0.9	8.2	14.2
Ortega River	214	3.9	0.0	15.1	4.1	0.1	0.3	6.4	10.7
Doctors Lake	400	2.5	0.2	13.0	2.8	0.3	0.5	4.1	6.5
Julington Creek	188	1.8	0.0	13.4	2.6	0.1	0.2	2.9	5.4

Appendix 10, Table 4. Annual salinity statistics for selected tidal tributaries in the lower St. Johns River recorded during FIM sampling, May 2001 – December 2011. *n* is the number of samples per year (all gears combined); the mean, minimum (min), and maximum (max) salinity values are shown as well as the standard deviation and the 10th, 25th, 75th, and 90th percentiles. Tributaries are listed in order of proximity to the St. Johns River mouth (closest to farthest).

Tributary	Year	N	Salinity Values			Standard Deviation	Percentiles			
			Mean	Min	Max		10th	25th	75th	90th
SICW	2001	18	26.0	14.4	34.7	6.9	16.3	19.1	32.3	33.1
	2002	24	22.0	12.6	32.8	5.9	14.6	18.4	26.9	32.2
	2003	26	18.9	9.7	27.2	5.0	11.7	15.5	23.3	25.7
	2004	27	21.5	6.8	34.1	7.9	9.5	14.4	28.4	31.1
	2005	27	21.0	12.4	27.5	3.9	17.2	18.1	24.4	26.3
	2006	22	26.3	12.7	35.1	7.3	14.4	26.2	31.2	32.5
	2007	15	26.6	16.7	36.6	5.6	17.5	22.4	30.5	33.8
	2008	15	22.6	8.6	34.3	9.4	8.6	10.0	29.3	33.3
	2009	25	24.3	12.8	36.0	6.4	16.8	20.3	25.7	35.3
	2010	29	26.1	9.7	31.9	6.3	16.7	22.7	31.2	31.4
	2011	19	31.0	20.4	39.9	4.8	21.7	29.4	32.4	39.6
Sisters Creek	2001	14	29.2	19.8	35.8	5.2	20.5	24.8	32.8	34.6
	2002	27	25.5	16.4	33.9	5.6	17.5	21.0	29.7	33.6
	2003	27	23.9	11.2	33.2	6.9	11.8	17.5	29.4	31.5
	2004	32	22.1	7.5	34.1	10.2	8.2	10.7	30.7	33.1
	2005	33	22.1	8.3	30.4	6.7	12.1	18.0	28.2	29.9
	2006	19	29.4	15.4	35.9	6.5	18.1	25.2	33.6	35.5
	2007	23	28.5	17.3	36.2	5.9	19.7	24.7	34.0	34.6
	2008	23	25.0	7.6	34.1	9.3	8.3	22.3	31.0	33.5
	2009	24	28.5	14.9	36.0	5.9	21.4	22.9	33.5	34.2
	2010	31	25.8	10.8	35.5	7.3	14.5	20.1	32.6	33.0
	2011	28	28.7	18.4	39.3	4.8	21.3	26.5	32.1	33.6

Tributary	Year	N	Salinity Values			Standard Deviation	Percentiles			
			Mean	Min	Max		10th	25th	75th	90th
Blount Island Channel	2001	7	18.4	10.5	31.6	8.0	10.5	11.5	27.3	31.6
	2002	15	20.1	6.5	28.9	7.2	7.7	17.3	26.0	28.0
	2003	21	20.7	10.2	31.4	6.9	12.0	13.5	24.9	30.1
	2004	20	18.9	3.0	32.4	9.5	3.6	11.8	26.2	30.6
	2005	22	14.4	5.7	26.7	7.2	6.2	7.9	19.4	26.1
	2006	19	28.8	21.2	33.6	4.1	22.6	25.5	32.2	33.5
	2007	21	23.8	14.8	33.6	5.1	16.8	20.6	27.1	28.2
	2008	27	22.8	7.0	32.5	6.9	12.1	18.5	26.9	32.3
	2009	17	21.9	11.2	30.9	5.9	13.1	18.3	25.4	30.5
	2010	13	19.9	4.9	31.9	9.7	6.0	13.5	28.8	31.8
	2011	23	28.6	15.4	36.9	5.2	21.1	26.4	31.9	33.9
Clapboard Creek	2001	10	21.0	13.1	29.4	6.1	14.1	15.9	25.8	28.3
	2002	21	19.6	6.2	30.0	6.8	13.0	13.6	24.2	29.3
	2003	19	20.7	8.6	30.0	6.3	11.5	16.3	26.7	27.3
	2004	19	18.6	4.7	29.2	8.9	4.9	8.0	25.9	28.2
	2005	10	14.7	9.0	28.5	5.7	9.4	11.8	16.1	23.7
	2006	20	26.0	14.6	32.4	5.4	16.2	25.8	29.9	31.8
	2007	16	26.3	14.4	34.3	6.8	14.9	20.6	32.6	33.7
	2008	18	20.3	6.5	33.2	8.5	7.0	18.1	26.1	32.8
	2009	25	20.4	11.0	35.9	5.9	14.5	17.1	23.5	29.0
	2010	18	21.7	11.5	32.9	7.4	12.1	16.3	28.9	32.8
	2011	15	29.6	18.4	36.9	5.5	19.2	26.1	32.9	36.9

Tributary	Year	N	Salinity Values			Standard Deviation	Percentiles			
			Mean	Min	Max		10th	25th	75th	90th
Browns Creek	2001	5	24.1	17.1	30.3	5.7	17.1	21.0	29.7	30.3
	2002	1	27.1	27.1	27.1	.	27.1	27.1	27.1	27.1
	2003	6	18.6	9.1	23.7	5.4	9.1	16.1	23.4	23.7
	2004	4	22.9	14.5	31.2	7.0	14.5	17.9	28.0	31.2
	2005	2	20.9	17.7	24.0	4.5	17.7	17.7	24.0	24.0
	2006	6	29.0	25.0	32.9	3.5	25.0	25.1	31.6	32.9
	2007	8	26.8	20.7	30.8	3.4	20.7	25.0	29.1	30.8
	2008	7	21.7	8.0	32.0	9.3	8.0	11.3	31.6	32.0
	2009	13	24.6	14.0	31.9	6.0	17.6	18.2	29.4	29.8
	2010	10	25.2	13.7	34.9	7.9	14.0	18.8	29.8	34.7
	2011	10	28.3	23.3	36.0	4.1	23.4	24.0	30.9	33.6
Dunn Creek	2001	4	10.4	5.7	22.2	8.0	5.7	5.7	15.1	22.2
	2002	4	8.0	4.2	17.6	6.4	4.2	4.3	11.7	17.6
	2003	2	7.1	3.8	10.4	4.7	3.8	3.8	10.4	10.4
	2004	4	11.2	3.5	23.0	8.6	3.5	4.9	17.5	23.0
	2005	6	9.1	1.2	13.5	4.4	1.2	7.5	11.8	13.5
	2006	11	17.8	5.3	26.4	7.8	6.4	11.4	25.7	25.9
	2007	11	20.0	7.0	33.8	8.8	7.9	13.2	28.9	29.8
	2008	13	13.2	2.5	23.3	7.9	4.0	6.7	21.9	22.3
	2009	9	17.4	3.8	26.8	7.6	3.8	13.0	22.4	26.8
	2010	14	15.5	4.2	28.6	8.1	8.3	9.1	20.8	28.2
	2011	12	21.3	7.8	30.3	7.0	11.6	16.8	26.1	30.0

Tributary	Year	N	Salinity Values			Standard Deviation	Percentiles			
			Mean	Min	Max		10th	25th	75th	90th
Broward Creek	2001	10	8.2	1.0	17.6	5.2	2.6	4.7	9.9	16.9
	2002	6	12.1	5.0	30.6	9.8	5.0	5.2	15.1	30.6
	2003	4	8.1	3.7	18.0	6.7	3.7	3.8	12.5	18.0
	2004	14	12.3	0.9	23.9	8.0	0.9	4.6	18.7	23.5
	2005	14	9.7	0.9	22.8	6.4	3.3	6.9	11.7	21.5
	2006	10	17.2	6.0	25.3	7.4	6.6	8.7	22.6	24.9
	2007	9	16.3	6.5	25.3	6.0	6.5	14.3	19.6	25.3
	2008	13	12.4	1.0	27.2	9.2	3.7	5.1	22.3	25.6
	2009	9	10.2	0.5	20.1	7.7	0.5	1.8	14.9	20.1
	2010	7	18.6	13.9	25.9	4.6	13.9	14.5	22.2	25.9
	2011	12	18.7	5.6	26.3	6.2	7.7	17.7	22.0	24.7
Trout River	2001	38	12.2	0.2	23.3	7.9	2.7	5.0	19.7	22.9
	2002	31	9.4	3.2	26.2	6.1	4.2	4.5	12.1	18.6
	2003	37	6.1	0.1	17.2	4.7	0.2	1.7	9.4	12.2
	2004	34	11.1	0.3	23.9	6.4	1.9	5.9	15.1	19.3
	2005	23	5.9	0.1	19.4	5.4	0.1	1.1	9.5	11.4
	2006	28	14.9	4.5	24.9	6.5	5.0	6.8	19.6	21.8
	2007	23	14.9	0.3	27.4	7.7	2.6	10.9	20.1	24.4
	2008	24	12.9	0.2	25.7	6.9	2.9	7.6	19.1	19.6
	2009	33	8.4	0.9	21.9	5.3	2.5	4.3	10.7	17.2
	2010	26	12.1	0.2	19.7	5.8	1.4	9.8	17.6	19.1
	2011	27	18.1	9.8	26.5	4.0	13.2	16.5	21.1	24.2

Tributary	Year	N	Salinity Values			Standard Deviation	Percentiles			
			Mean	Min	Max		10th	25th	75th	90th
Arlington River	2001	6	5.1	0.1	17.5	7.7	0.1	0.2	12.3	17.5
	2002	5	2.0	0.2	4.9	1.9	0.2	0.4	2.5	4.9
	2003	17	2.3	0.1	7.5	2.2	0.2	0.3	3.8	5.3
	2004	16	4.3	0.3	11.9	3.5	0.3	0.9	7.2	7.6
	2005	20	3.2	0.2	7.0	2.6	0.3	0.6	6.1	6.8
	2006	19	9.5	0.2	21.1	6.7	0.5	1.0	12.9	19.1
	2007	13	7.4	2.2	19.2	6.0	2.6	2.9	8.2	18.4
	2008	15	4.7	0.1	16.8	4.7	0.2	0.3	6.9	10.6
	2009	9	6.1	0.2	27.1	8.5	0.2	0.3	6.9	27.1
	2010	17	6.6	0.8	18.2	4.9	1.0	3.0	8.9	14.0
	2011	19	10.8	0.5	22.5	5.5	4.5	7.2	15.0	20.3
Ortega River	2001	12	4.7	0.1	9.1	3.4	0.2	0.7	7.2	8.7
	2002	14	2.5	0.1	8.4	2.8	0.3	0.5	5.6	6.4
	2003	22	0.7	0.1	3.4	1.2	0.1	0.1	0.3	3.3
	2004	21	1.8	0.1	6.8	1.8	0.1	0.2	2.8	3.9
	2005	13	1.9	0.1	5.9	1.8	0.2	0.3	2.2	5.2
	2006	21	6.6	0.1	13.2	4.4	0.2	4.4	9.9	11.9
	2007	23	5.2	0.2	14.6	4.0	1.7	2.5	7.3	11.8
	2008	21	2.3	0.0	9.0	2.9	0.2	0.3	3.7	7.7
	2009	25	3.7	0.1	14.0	3.8	0.2	0.6	6.1	8.6
	2010	27	4.2	0.1	13.1	4.6	0.4	0.5	9.7	11.1
	2011	15	9.6	3.1	15.1	4.2	3.4	5.7	13.2	14.2

Tributary	Year	N	Salinity Values			Standard Deviation	Percentiles			
			Mean	Min	Max		10th	25th	75th	90th
Doctors Lake	2001	14	3.0	0.6	6.9	2.8	0.6	0.6	6.3	6.8
	2002	25	2.7	0.3	10.5	3.1	0.5	0.6	3.4	9.5
	2003	36	0.5	0.3	0.9	0.2	0.3	0.3	0.5	0.7
	2004	44	1.2	0.2	3.3	0.9	0.4	0.6	1.6	2.7
	2005	39	0.4	0.2	0.8	0.2	0.3	0.3	0.5	0.7
	2006	39	3.9	0.3	7.4	3.0	0.3	0.3	6.6	7.2
	2007	49	5.1	0.7	13.0	3.5	1.7	2.2	6.5	10.7
	2008	45	2.0	0.3	5.9	1.8	0.6	0.7	2.5	5.4
	2009	38	1.9	0.4	6.7	1.6	0.5	0.6	2.9	4.4
	2010	36	2.2	0.3	6.3	2.3	0.4	0.6	3.9	6.1
	2011	35	5.1	0.8	9.7	2.8	1.5	2.4	7.0	9.3
Julington Creek	2001	8	1.3	0.0	4.9	1.8	0.0	0.2	2.3	4.9
	2002	15	2.5	0.0	11.1	4.0	0.1	0.2	2.9	10.2
	2003	20	0.2	0.1	0.4	0.1	0.1	0.2	0.2	0.3
	2004	23	0.5	0.1	1.9	0.5	0.1	0.2	0.4	1.0
	2005	17	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.3
	2006	17	4.0	0.1	7.3	2.4	0.3	3.5	5.5	7.3
	2007	13	3.9	0.5	13.4	4.4	0.6	1.1	4.1	12.5
	2008	20	1.1	0.1	4.7	1.4	0.2	0.2	1.6	3.7
	2009	18	0.8	0.1	4.9	1.2	0.1	0.2	0.7	2.9
	2010	19	1.4	0.1	4.9	1.5	0.2	0.4	2.8	4.1
	2011	18	4.9	0.7	9.4	2.6	1.2	3.4	6.3	8.6

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