



Annual Sea Turtle Interaction Monitoring of the Anchored Gill-Net Fisheries
in North Carolina for Incidental Take Permit Year 2020
(1 September 2019–31 August 2020)

Annual Completion Report for Activities under Endangered Species Act
Section 10 Incidental Take Permit No. 16230

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1 INTRODUCTION

The North Carolina Division of Marine Fisheries (NCDMF) has actively addressed the incidental take of sea turtles in commercial estuarine gill nets since 2000. Between 2000 and 2011, the NCDMF had a series of Incidental Take Permits (ITP) from the National Marine Fisheries Service (NMFS) under Section 10(a)(1)(B) of the Endangered Species Act (ESA) of 1973 (Public Law 93-205) to “minimize, monitor, and mitigate” sea turtle interactions in anchored gill nets primarily in Pamlico Sound (Boyd 2012; Gearhart 2001, 2002, 2003; Murphey 2011; Price 2004, 2005, 2006, 2007, 2008, 2009, 2010). Five species of sea turtles can occur in North Carolina: green sea turtle (*Chelonia mydas*), Kemp’s ridley sea turtle (*Lepidochelys kempii*), loggerhead sea turtle (*Caretta caretta*), hawksbill sea turtle (*Eretmochelys imbricata*), and leatherback sea turtle (*Dermochelys coriacea*). Anchored gill nets are passive sets deployed with an anchor, stake, or boat at one or both ends of the net string; they do not include run-around, strike, drop, or drift gill nets. For this report, the term “gill net” refers to anchored gill net unless stated otherwise.

Evidence of incidental takes of sea turtles outside of Pamlico Sound was documented in June 2009 by NMFS observations of gill-net fisheries operating in Core Sound and nearby waterbodies (Byrd et al. 2016). These takes resulted in a series of temporary measures to address sea turtle interactions until the NCDMF obtained an ITP for gill-net fisheries state-wide (see McConnaughey et al. 2019). On 11 September 2013, the NCDMF received the Sea Turtle ITP (No. 16230), which expires on 31 August 2023 (McConnaughey et al. 2019; NMFS 2013). In addition to establishing authorized levels of incidental takes, the ITP included a Conservation Plan that consisted of measures the NMFS determined would monitor, minimize, and mitigate incidental takes of sea turtles in otherwise lawful gill-net fisheries operating in North Carolina estuarine waters. The Conservation Plan included a continuation of restrictions implemented previously as temporary measures for large-mesh (≥ 4 inch stretched mesh) gill nets. Specifically, these restrictions prohibited gill nets in the deep waters of Pamlico Sound; limited soak times to an hour before sunset to an hour after sunrise in portions of the state; limited days of fishing depending on location; restricted net height to no more than 15 meshes; restricted total net yardage to a maximum of 2,000 yards per vessel; and required net configuration for a string of nets (each net is called a ‘shot’) be constructed of shots no longer than 100 yards with a 25-yard break between shots. The only exception to these restrictions was that fishermen in Management Unit D2 (Figure 1) were restricted to a maximum of 1,000 yards per fishing operation (M-31-2014; <http://portal.ncdenr.org/web/mf/proclamation-m-31-2014>). In addition to establishing regulations on how fisheries could be prosecuted, the Conservation Plan included a state-wide estuarine gill-net observer program of estuarine gill nets that would allow for interactions to be counted and extrapolated when applicable across the fishery within a given season and area. Observer data also are used by the NCDMF in an adaptive management approach to mitigate incidental takes by implementing temporary management options using the NCDMF director’s Proclamation authority (General Statute 143B-289.52).

In May 2020, the NCDMF contacted the NMFS to request clarification of tagging protocols for sea turtles. Although the ITP requires that incidental sea turtles be tagged, the NMFS Southeast Fisheries Science Center (SEFSC, Beaufort, NC) staff communicated to the NCDMF that there had been recent changes to their tagging protocols. These changes affected the type of training that available SEFSC provided and resulted in having observers without the training necessary to fulfill the tagging requirement per the ITP. On 1 September 2020, the NMFS provided a notification letter to the NCDMF modifying ITP permit 16230 to remove the requirement for

observers to apply flipper and Passive Integrated Transponders (PIT) tags to incidentally captured sea turtles (Appendix A). This modification applies to the remainder of the current permit.

In July 2014, the NCDMF also received an ITP (No. 18102) to address incidental takes of Atlantic Sturgeon (*Acipenser oxyrinchus*) in gill-net fisheries operating in estuarine waters across the state (NMFS 2014). Although the ITPs and their Conservation Plans addressed different taxa, the fisheries included therein were the same. Both ITPs were reliant on observer coverage to document incidental takes and to estimate total incidental take where possible. Data from observed trips are used for both ITPs. Notably, however, the ITPs defined large mesh differently; the sea turtle ITP defined large-mesh gill nets as ≥ 4 inch stretched mesh and the Atlantic Sturgeon ITP defined them as ≥ 5 inch stretched mesh.

Significant regulatory changes were enacted during fall 2019 for the Southern Flounder (*Paralichthys lethostigma*) fisheries. These regulations were included in Amendment 2 of the Southern Flounder Fishery Management Plan (FMP) adopted by the North Carolina Marine Fisheries Commission on 23 August 2019 (NCDMF 2019). This action was taken because the most recent Southern Flounder stock assessment indicated that the stock is overfished and overfishing is occurring. North Carolina state law requires management actions be taken to end overfishing within 2 years and to recover the stock from an overfished condition within 10 years. To meet these legal requirements, the Division determined that a 62% reduction in harvest was necessary for 2019 and a 72% reduction would be needed beginning in 2020.

To reduce harvest in the anchored large-mesh gill-net fishery, the state was divided into three flounder management areas, Northern, Central, and Southern. These flounder management areas generally aligned with the ITP management units except for the Core Sound portion of B, which was split into a different flounder management area than the rest of B (Figure 1). Each area had specific dates when fishing was allowed: the Northern area was open 15 September–13 October 2019, the Central area was open 1–26 October 2019, and the Southern area was open 1 October–15 November 2019. Yardage restrictions for large-mesh gill nets per the ITPs were further reduced by 25% in the Amendment 2 Flounder FMP (NCDMF 2019). Amendment 2 also reduced large-mesh gill net soak times to overnight soaks state-wide. Flounder management areas were still subject to conditions put forth by federally issued ITPs for sea turtle and sturgeon incidental takes and could be closed by proclamation should incidental take thresholds be approached or exceeded. After November 15, limited allowances for anchored large-mesh gill nets were made during winter and spring for the invasive Blue Catfish (*Ictalurus furcatus*) and American Shad (*Alosa sapidissima*) fisheries. For more information, see the Results section.

Another significant event that occurred during the 2020 ITP Year was the COVID-19 pandemic, which led to a state of emergency declaration by NC's Governor. On 20 March 2020, the NMFS waived the requirement for boats fishing in federally managed fisheries to carry observers or at sea monitors due to concerns about the transmission of COVID-19. The NMFS extended this waiver to the NCDMF Observer Program on 23 March 2020; the waiver was in place throughout the remainder of the 2020 ITP Year.

Per the ITP requirements, the Observer Program provides weekly, seasonal, and annual reports to the NMFS for a given ITP year. As required, weekly progress reports were provided for any week in which a sea turtle interaction occurred. Seasonal reports for the 2019 ITP Year also were provided for fall (September–November 2019; McConnaughey 2020a), spring (March–May 2020; McConnaughey 2020b), and summer (June–August 2020; McConnaughey 2020c). The

Conservation Plan does not require observer coverage or seasonal reports for winter because sea turtles are less likely to be present in North Carolina during this time. This annual report outlines observer activity, fishing activity, and total or estimated takes of sea turtles for the 2020 ITP Year, 1 September 2019–31 August 2020. Data for fishing activity, measured in number of trips, are finalized for fall 2019. After the preliminary data for spring and summer 2020 are finalized in May 2021, observer coverage and authorized estimated sea turtle takes will be recalculated and finalized estimates will be provided to the NMFS in the form of an addendum.

2 METHODS

2.1 Observer Activity

Observer activity was distributed across six management units outlined in the Conservation Plan (A, B, C, D1, D2, and E; Figure 1). Per the sea turtle ITP, Management Unit B was unique in that large-mesh gill nets operating in Pamlico Sound were confined to specific subunits (Shallow Water Gill-Net Restricted Area, SGNRA 1, SNGRA2, SNGRA3, SGNRA4, and Mainland Gill-Net Restricted Area, MGNRA), effectively closing the fishery in the deep waters of Pamlico Sound and in corridors near Ocracoke, Hatteras, and Oregon inlets (Daniel 2013; Figure 1). Within the management units, observer activity was also distributed across three seasons that cross calendar years: fall, spring, and summer. Per the Conservation Plan, the number of projected observer trips was based on the required 7–10% observer coverage of the total large-mesh (≥ 4 inches stretched mesh) gill-net fishing trips, and 1–2% coverage of the total small-mesh (< 4 inch stretched mesh) gill-net fishing trips per season and management unit. Projected observer trips were stratified across seasons and management units proportional to the NCDMF Trip Ticket Program (TTP) data for large-mesh and small-mesh gill-net trips from the previous five years. The exception was for management units and seasons where anchored large-mesh gill nets were prohibited whereby the projected fishing and observer trips were set to zero: Management Unit D2 for the entire 2020 ITP Year; Management Units B, D1, and E during spring and all management units during summer. It is important to note that for the TTP, data are reported as the large-mesh category for gill nets using ≥ 5 inch webbing, not ≥ 4 inch. It is uncommon, however, for gill nets to have a mesh size between these two sizes; therefore, we assumed effort by mesh categories in the TTP dataset would not be greatly affected by the difference in definitions of mesh size.

At the beginning of the 2020 spring season (20 March 2020), the NCDMF temporarily halted observer effort because of the COVID-19 pandemic. Marine Patrol officers were still on the water and continued to include alternative platform trips (i.e., using a state-owned vessel to observe at a distance; see description below) as a part of their weekly duties when fishing effort could be found. In June 2020, the NCDMF outlined protocols for observer staff to resume limited field sampling while preventing the spread of COVID-19. These protocols included among other things, the use of alternative platform observations only and no overnight travel. Observers resumed effort under these guidelines on 6 June 2020. Because all observers were based out of the Morehead City office, coverage of areas too far for a day trip (e.g., Cape Fear River, Albemarle Sound) was dependent on Marine Patrol officers.

During fall, winter, and the first few weeks of spring, each observer attempted to obtain three to four trips per working week when fishing activity was occurring. This approach was used again when observers resumed activities in early June (beginning of summer). Observers were assigned a management unit to work weekly, and the number of observers assigned to a management unit

depended on the season and projected fishing effort. Additionally, Marine Patrol officers attempted to obtain alternative platform trips as part of their regular duties. Reports from observers, fishermen, and other NCDMF staff (e.g., fish house samplers) were used to determine if effort was fluctuating between management units. Trends from the previous years' TTP data and current area closures were also assessed to determine if fishing effort was shifting from one management unit to another.

Obtaining observer trips was facilitated by the requirement that fishermen participating in estuarine anchored gill-net fisheries were required to obtain an Estuarine Gill-Net Permit (EGNP; M-24-2014; <http://portal.ncdenr.org/web/mf/proclamation-m-24-2014>). The most recent list of permit holders was stratified by management unit and then by geographic area within units. Contact information for these fishermen was given to observers assigned to specific management units so they could attempt to schedule an onboard trip. Other outreach efforts, such as visiting fish houses, were limited during the 2020 ITP Year. The Observer Program website (<http://portal.ncdenr.org/web/mf/observers-program>) was available, but fishermen were not necessarily directed to it during the 2020 ITP Year.

The Observer Program employed two methods to obtain trips for documenting protected species interactions. The preferred method has always been onboard observations where observers ride onboard fishermen's vessels. The other method was alternative platform" observations whereby two observers used a state-owned vessel to monitor commercial fishers hauling their gill nets. In addition to traditional observers, Marine Patrol officers also obtained alternative platform trips, following similar data collection protocols. Alternative platform trips were used for areas where fishing effort increased quickly, when a fisherman's vessel was too small to safely accommodate an onboard observer, and when observers are unable to set-up onboard trips due to fisherman avoidance or non-compliance, and when observations resumed in June during the ongoing COVID-19 pandemic. Coordination of onboard, alternative platform, and Marine Patrol alternative platform trips occurred regularly to maximize efficiency, avoid multiple observations of a single trip, and to achieve the maximum amount of observer coverage possible for each management unit. Changes in fishing effort and sea turtle abundance (i.e., observed and reported interactions) were monitored on a daily, weekly, and monthly basis to ensure proper observer coverage was being maintained.

Observers were trained to identify, measure, evaluate condition of, and resuscitate sea turtles by experienced NCDMF and NMFS SEFSC (Beaufort, NC) staff. Data collected on observed sea turtles included: date, time, location (latitude and longitude, when possible), condition (e.g., no apparent harm, injury including a description of the nature of the injury, or mortality), species, sex (if determinable), curved carapace length (CCL, mm), and curved carapace width (CCW, mm). Photographs of the turtles and environmental parameters (e.g., salinity, water temperature) were also collected when feasible. Dead and live, debilitated sea turtles were retained by the observer when possible and delivered to the North Carolina Wildlife Resource Commission (NCWRC) sea turtle biologist for necropsy or examination and treatment.

Observers also collected data on location, gear parameters, fish catch and bycatch (including regulatory discards) for each haul depending on the observed trip type (onboard or alternative platform). For onboard observations, the catch was sampled for each trip whereby the observer recorded species, quantities, weights, lengths, disposition (alive or dead), and whether the catch was kept or discarded. Limited data such as date and waterbodies surveyed were also collected for unsuccessful alternative platform attempts (hereafter termed "No Contact" trips) by observers

and Marine Patrol. All data were coded onto NCDMF data sheets and uploaded to the NCDMF Biological Database for analysis. Observers were debriefed within 24 hours of each trip to obtain data on catch, set locations, gear parameters, and sea turtle interactions to provide running totals and estimates of sea turtle bycatch in near real time.

Ongoing estimates of observer coverage were calculated by comparing the number of observed trips by large-mesh (≥ 4 inch) and small-mesh (< 4 inch) category to the average number of trips from the previous five years' TTP data for (large-mesh = ≥ 5 inch, small-mesh = < 5 inch) by season and management unit. Reduced season dates in each management unit were accounted for by calculating the proportion of actual to possible fishing days. This estimated fishing effort was compared to the number of observer trips completed throughout the ITP year. The average, normalized effort was used when estimating fishing trips to account for the fluctuation of fishing effort throughout the years due to closures and other regulations put in place throughout the time series. No Contact trips were not included in calculations of observer coverage.

At the end of the ITP year, observer coverage was calculated similar to above, but using the actual number of reported trips in the TTP database for the ITP year by season and management unit. The TTP data for 2019 (fall) were finalized, but the data for 2020 (spring and summer) were preliminary. As a result, observer coverage calculated for spring and summer were considered estimates.

2.2 Changes in Fishing Effort

The number of reported fishing trips by mesh size category were compiled by season for the 2020 ITP Year and compared to the last two ITP Years (2018 ITP Year and 2019 ITP Year). This assessment was a general comparison to examine trends in fishing effort.

2.3 Incidental Takes

The ITP outlines authorized levels of incidental takes expressed as either estimated total takes based on observer data or counts of observed takes (Tables 1–5). Both types (estimated and counted) were necessary because there were insufficient data available for modeling predicted estimated takes in the ITP application for some combinations of species, management unit, and gear type (Daniel 2013). As a result, authorized levels of annual estimated interactions were only available for green and Kemp's ridley sea turtles in Management Units B, D1, and E in the large-mesh gill-net fishery, and for Kemp's ridley sea turtles in D2 in the large-mesh gill-net fishery. Authorized levels for all other combinations were based on counts of actual observed (i.e., not estimated) takes. Therefore, comparisons of interactions during the 2020 ITP Year to authorized interactions were based either on annual counts of observed sea turtle takes or annual estimates of sea turtle takes. Also, during summer 2015 a minor modification to the ITP was enacted through the NMFS combining authorized takes for Management Units A ($n = 4$) and C ($n = 4$) for a total authorized take limit of eight sea turtles from large-mesh or small-mesh gill nets and any species or disposition (Boyd 2016). Estimates of incidental take as outlined above were calculated using the stratified ratio method where the bycatch rate calculated from observer data (sea turtles caught per observed trip) was multiplied by the total reported fishing trips.

$$\text{Estimated interactions} = \left(\frac{\text{\# of sea turtle interactions observed}}{n \text{ gill-net trips observed}} \right) * \text{total gill-net trips reported}$$

Throughout each season, this calculation was employed for each incidental take to determine the estimated number of interactions by date of capture, management unit, species, and disposition.

For the real-time estimates, the average number of TTP reported trips for the previous five years was used. Estimated numbers of interactions and running totals of observed interactions were accumulated by interaction date to determine if interactions were approaching authorized take thresholds. The ongoing comparisons allowed for the implementation of management measures to prevent interactions from exceeding authorized levels. The estimated and/or total observed interactions were provided in weekly (when required), monthly, and seasonal reports.

At the end of the ITP year, the estimated number of interactions was recalculated using actual number of trips, albeit preliminary for 2020, reported in the TTP rather than an average from the previous five years. Nonparametric confidence intervals (95%) were calculated using standard bootstrapping techniques (Efron and Tibshirani 1993) using the ‘boot’ package in R (Davison and Hinkley 1997; Canty and Ripley 2015; R Core Team 2019). Bootstrap replicates were generated by sampling observer trips with replacement 5,000 times within strata (mesh/season/management unit).

2.4 Compliance

The Observer Program used various methods to contact fishermen to schedule trips. The most common method was by phone, due to fishermen leaving from private launches and overall efficiency. For each contact made to obtain a trip (phone call or in-person), observers documented the contact in a log maintained by the Observer Program. For each contact, observers assigned a category of the response and noted any additional information (e.g., fisherman stated he did not fish until October; Table 6). Observers also documented calls returned from fishermen, including the response category and notes. Data in the contact log was summarized by month and response category to determine what percentage of phone calls resulted in observer trips.

As part of their regular duties, Marine Patrol officers checked both gill nets for compliance. This effort, combined with the time spent conducting observations and searching for gill nets (No Contact trips), was logged as total “gill-net hours” by officers. Occasionally, citations and/or Notice of Violations (NOVs) were issued to fishermen when gear or fishing practices were out of compliance. A citation is an enforcement action taken by a Marine Patrol officer for person(s) found to be in violation of General Statutes, Rules, or Proclamations under the authority of the Marine Fisheries Commission and is considered a proceeding for District Court. A NOV is the Division’s administrative process to suspend a permit and is initiated by an Officer or Division employee when a permit holder is found to be in violation of general or specific permit conditions. A citation and a NOV may both be initiated by the same permit condition violation; however, they are two separate actions. For this report, NOVs or citations under the codes “EGNP” and “NETG” were compiled, as they are applicable to the estuarine gill-net permits and violations.

3 RESULTS

3.1 Observer Activity

Overall observer coverage during the three seasons covered for 2020 ITP Year was 7.8% of the large-mesh gill-net fishery and 1.7% of the small-mesh gill-net fishery (Tables 7 and 8; Figure 2). This level of coverage was based on 249 large-mesh gill-net trips (62 onboard and 187 alternative platform) and 103 small-mesh gill-net trips (5 onboard and 98 alternative platform) during fall, spring, and summer. Only one out of 354 (<0.3%) observed trips recorded a mesh size ≥ 4 and < 5 inch; the mesh size was exactly 4 inches. The COVID-19 pandemic and associated waiver from

the NMFS impacted observer coverage during spring and summer. Additionally, there were 1,345 No Contact trips (Table 9).

During the 352 observed trips, observers documented 25 sea turtles (24 green turtles and one unidentified) in large-mesh and two sea turtles (both green) in small-mesh gill nets (Table 10; Figures 2-14). One of the green sea turtles was documented during winter in a small-mesh gill net set in Management Unit B (Figure 8). The turtle fell out of the net and swam off as the fisherman was pulling in the net. No self-reported interactions were reported.

A series of proclamations was issued throughout the ITP year for management needs unrelated to protected species interactions (Table 11). A significant change in regulations for the Southern Flounder fishery during fall 2019 was noted above. After these regulations closed anchored large-mesh gill nets, portions of Management Unit A were re-opened to anchored large-mesh gill nets during late fall, winter, and spring (23 November–25 March) for harvesting Blue Catfish and American Shad, and portions of Management Unit C were re-opened to anchored large-mesh gill nets during winter and spring (February 15–April 15) for harvesting American Shad. Separately, Management Unit D1 was closed to anchored large-mesh gill nets for the entire 2020 ITP Year and closed to anchored small-mesh gill nets effective 20 April.

3.1.1 Fall 2019

During fall 2019 (September–November), the Observer Program achieved 10.0% state-wide coverage of large-mesh gill-net trips, and exceeded 7% in all management units except B (5.4%) and D2 (5.5%; Table 7; Figures 3–7). Based on the estimated ($n = 373$) large-mesh fishing trips for Management Unit B, the observer program would have attained 8% coverage (Table 7). However, the actual number of reported trips was greater than estimated by 180 trips. As such, the observer program needed 12 additional trips that were not obtained (nine in Management Unit B and three in D2). For small-mesh gill nets, the Observer Program achieved 2.5% state-wide coverage and exceeded 1% coverage in all management units (Table 8; Figures 3–7). There were 324 No Contact trips including 35 in Management Unit B and 52 in D2 (Table 9).

There were 25 observed sea turtle interactions in large-mesh gill nets and one observed in small-mesh gill nets during fall (Table 10; Figures 3–7). The interactions comprised 25 green sea turtles ($n = 19$ alive; $n = 6$ dead) and one identified sea turtles ($n = 1$ alive; $n = 0$ dead). The identified sea turtle fell out of the net and swam away before the observer was able to positively identify the species. The majority of interactions occurred in Management Unit B (22 out of 26) with three in D2 and one in E. No fisherman self-reported sea turtle interactions were reported.

3.1.2 Spring 2020

During spring 2020 (March–May), the Observer Program achieved an estimated 4.1% state-wide coverage of large-mesh gill nets (Table 7; Figures 9–11). Only Management Units A and C were open to large-mesh gill nets, and 41 observed trips occurred in A before observations were halted in response to the COVID-19 pandemic. There were 34 fishing trips reported across the three closed units. For small-mesh gill nets, the Observer Program achieved an estimated 1.1% state-wide coverage, and exceeded 1% in Management Units C, D1, and E (Table 8; Figures 9–11). The shortage represents an additional six trips that were not obtained (four in Management Unit A, one in B, and one in D2). There were 448 No Contact trips including 90 in Management Unit A, 40 in B, and 96 in D2 (Table 9).

No sea turtle interactions were observed during spring (Table 10; Figures 9–11). Additionally, no fisherman self-reported sea turtle interactions were reported.

3.1.3 Summer 2020

During summer 2020 (June–August), the Observer Program did not observe any large-mesh gill-net trips as the gear was prohibited state-wide (Table 7; Figures 12–14). The entire state was closed to large-mesh gill nets. Nevertheless, 90 large-mesh fishing trips were reported. For small-mesh gill nets, the Observer Program achieved an estimated 1.4% state-wide coverage and exceeded 1% in all management units except Management Unit B (0.9%) (Table 8; Figures 12–14). The shortage represents one additional trip that was not obtained in Management Unit B. There were 573 No Contact trips including 77 in Management Unit B (Table 9).

No sea turtle interactions were observed during summer (Table 10; Figures 12–14). Additionally, no fisherman self-reported sea turtle interactions were reported.

3.2 Changes in Fishing Effort

Overall large-mesh gill-net effort during the 2020 ITP Year (seasons fall, spring, and summer) was 67% lower than during the 2019 ITP Year and 71% lower than during the 2018 ITP Year (Figure 7). The decrease in large-mesh trips occurred during fall, spring, and summer in all management units. Overall small-mesh gill-net effort during the 2020 ITP Year was 30% higher than during the 2019 ITP Year and 8% higher than during the 2018 ITP Year (Figure 8). When comparing the 2020 and 2019 ITP Years, the increase in small-mesh gill-net trips was attributed primarily to fall when small-mesh gill-net trips nearly doubled from the previous ITP Year (1,262 trips during the 2019 ITP Year and 2,294 during the 2020 ITP Year). The greater number of small-mesh trips during fall occurred in all management units, but was particularly sharp in Management Unit B (97% increase) and D2 (255% increase).

3.3 Incidental Takes

Across the seasons covered by the sea turtle ITP, there were 26 observed sea turtle interactions (25 green and one unidentified sea turtle), all during fall (Table 10; Figures 2–14). An additional green sea turtle was documented during winter (see above). The observed takes occurred primarily in large-mesh gill nets (all but two sea turtles). The majority of observed takes were recovered alive (21 of 27). Measured green sea turtles ($n = 19$ of 26) ranged from 206 to 332 mm CCL (mean = 287.1, SD = 28.0) and 202 to 288 mm CCW (mean = 244.0, SD = 24.3; Figure 17). The single unidentified sea turtle could not be measured. Observed interactions occurred primarily in Management Unit B (85%), followed by Management Unit D2 (11%), Management Unit E (4%) (Figures 4, 6–7).

Observed take levels during the 2020 ITP Year did not reach the thresholds of allowed takes for any species or management unit (Tables 1–5). Of the thresholds expressed as counts of observed takes (not estimated), green sea turtle takes during the 2020 ITP Year reached only 17% of the threshold (Table 5). Of the separate thresholds expressed as estimated totals of observed takes, green sea turtle takes during the 2019 ITP Year reached 40% of the live threshold and 37% of the dead threshold.

3.4 Compliance

Estuarine Gill-Net Permits were issued to 2,629 fishermen during the 2020 ITP year; however, only 598 of them reported trips using anchored estuarine gill-net gear. Using the full list of EGNPs, 659 phone calls or in-person contacts were made with 5.6% ($n = 37$) representing occasions where a fishermen returned a phone call. Nevertheless, only 2.9% ($n = 19$) of the 659 contacts resulting in a booked trip (Figure 18). The greatest number of calls occurred during fall, and the least number of calls occurred in spring when observations temporarily stopped due to the COVID-19 pandemic.

During the 2020 ITP Year, Marine Patrol officers spent 1,584 hours investigating the proper and legal use of gill nets in estuarine waters, conducting and entering observations, and searching for gill nets to be observed (No Contact; Table 12). During these hours, they issued 27 citations (Tables 12–13). In addition to citations, officers issued eight Notice of Violations (NOVs) for fishermen found to be out of compliance with the EGNP (Table 14).

3.5 Marine Mammals

There was no observed marine mammal interaction during the 2020 ITP Year.

4 DISCUSSION

Incidental takes of sea turtles during the 2020 ITP Year, all green sea turtles, were below authorized levels. All 26 observed sea turtle interactions during the months covered by the sea turtle ITP were during the fall. The interactions were primarily in Management Unit B with only four interactions in other management units. Incidental takes continue to be primarily alive and in large-mesh gill nets. No new proclamations had to be imposed during the 2020 ITP Year to maintain take levels below thresholds. However, new regulations from Amendment 2 imposed on the state-wide Southern Flounder fishery greatly reduced large-mesh gill-net effort during fall and prevented the previous low levels of effort in this fishery during spring and summer. Limited allowance for anchored large-mesh gill nets occurred only during winter and spring for portions of Management Unit A and C, and for an additional seven days during late fall in portions of Management Unit A.

Compared to the previous 2019 ITP Year ($n = 22$; Byrd et al. 2020), the overall count of incidental takes was slightly higher during the 2020 ITP Year. The most notable differences were the large decrease in observed interactions during summer 2020 ($n = 0$) compared to summer 2019 ($n = 14$), and the increase in observed interactions during fall 2019 ($n = 26$) compared to fall 2018 ($n = 4$). The decrease in incidental takes in summer was likely due to the regulations associated with the Southern Flounder FMP Amendment 2, restricting the use of large-mesh gill nets during summer. Possible factors affecting the increase in takes during fall 2019 over fall 2018 were not identified. Increased takes were not coincident with increased large-mesh fishing effort. In fact, effort was greatly decreased in fall 2019 compared to fall 2018 because of the Southern Flounder regulations. Further investigation is needed to determine what factors may have affected the observed count of takes during fall 2019 compared to the previous year.

Overall minimum coverage levels were met or exceeded for large-mesh and small-mesh gill-net trips when combined across the ITP year and management units. Although coverage exceeded the overall 7% minimum of large-mesh gill-net trips for fall, minimum coverage levels were not reached for Management Unit B (5.4%) and D2 (5.5%). The shortage of 12 observed trips during

fall is despite the 35 No Contact trips (attempts to find trips) in Management Unit B and 52 No Contact trips in Management Unit D2. In contrast, coverage of small-mesh gill-net trips during fall exceeded the 1% minimum in all management units and exceeded 2% in three of six management units. Observers were active for only several weeks during spring prior the temporary halt of observer-led trips in March because of the COVID-19 pandemic. Marine Patrol officers contributed greatly to this continued coverage during spring when observers did not go in the field, and in summer when observers returned to the field at reduced capacity due to the NCDMF requirement of having two observers per alternative platform observation. Nevertheless, coverage of large-mesh gill-net trips during spring in open management units (A and C) did not meet the minimum 7%. Observer coverage of small-mesh gill-net trips met or exceeded the 1% minimum in three of six management units during spring and five of six management units during summer. It is surprising that there were reported fishing trips using anchored large-mesh gill nets during management units and seasons when this gear was prohibited. These reported trip data are being examined; it is likely that the dealers recorded fishing trips that used run-around/strike gill nets incorrectly as anchored gill nets during these months.

Obtaining observed trips continues to be a challenge for the NC Observer Program, not unlike other observer programs (e.g., Lyssikatos and Garrison 2018). The EGNP is a useful tool to improve fishermen compliance by including specific permit conditions requiring fishermen to allow observers aboard their vessels to monitor catches and by providing contact information of permit holders. Phone calls made using the contact information contribute to observers scheduling trips, but the low success rate of scheduling a trip (3%) is low. This assessment of success rate and the assignment of call lists are being re-evaluated for the 2021 ITP Year given that only 23% of EGNP holders during the 2020 ITP Year reported trips with anchored gill-net gear. For the contacts that were made during the 2020 ITP Year, a sharp decrease in phone calls was made during the 2020 ITP Year ($n = 659$) compared to the previous year ($n = 4,305$), due in large part to effects of COVID-19 on observer activity.

Although onboard observations are the preferred method, alternative platform observations played a critical role to achieving the minimum percent coverage especially after the COVID-19 pandemic. In fact, 81.0% of observed trips during the 2020 ITP Year were alternative platform observations. Alternative platform observations have several advantages. Primarily, they do not rely on previous contact with fishermen to obtain an observable trip. Alternative platform observations also allow Marine Patrol to conduct observations as part of their daily patrols; their observed trips contribute a substantial portion of the total alternative platform observations. Even for fishermen who would willingly take an observer, many vessels used by gillnetters in estuarine waters are too small to easily accommodate an observer, making alternative platform observations ideal for capturing trips with this size class of vessel (Kolkmeier et al. 2007); however, the alternative platform method has several drawbacks. First, it requires two observers, halving observer effort and program efficiency. Also, observers cannot collect the same breadth of biological data for kept catch and discards (e.g., length and weight of individual fish) compared to onboard observer trips. Another drawback is that observers can spend a significant amount of time searching for fishing activity, sometimes unsuccessfully, when fishing activity is less concentrated. Obtaining alternative platform observations also can be a challenge as some fishermen avoid being observed by retrieving their gear before sunrise or changing fishing locations if observers have been seen in an area. Although refusal of an observed trip by a fisherman can result in a suspension of their EGNP, non-compliance typically does not include such a direct refusal. As such, non-compliance continues to be a hurdle for ensuring the observer coverage requirements for both ITPs

are met. Outreach activities are an ongoing necessity to improve fishermen compliance. These activities will resume when risks associated with COVID-19 are abated.

Significant staffing changes occurred during the 2020 ITP Year. The program supervisor left in September 2019 and the position was not filled until January 2020. The observer coordinator left in June 2019 and the position was not filled until March 2020. Additionally, a data analyst position was created in July 2019. These filled positions should increase efficiencies in the program. Changes in observer staffing also occurred during the 2020 ITP Year. Two long-term temporary observers left or significantly reduced their hours before March. Those positions were not refilled when observations resumed in June given the uncertainty of the effects of COVID-19 on the safety of continued, but limited, observation efforts.

The NCDMF observer program uses a combination of real-time monitoring of sea turtle takes and an adaptive management approach to successfully control the number of interactions in the estuarine anchored gill-net fisheries. Specific actions to limit sea turtle takes were not necessary during the 2020 ITP Year; however, Management Unit D1 was kept closed to large-mesh gill nets based on historical sea turtle densities and take levels. The new management measures for Southern Flounder significantly reduced large-mesh gill-net effort throughout the year, especially during fall 2019 when effort was historically high. These management measures, along with challenges faced from the COVID-19 pandemic and its' associated field restrictions, presented additional and unique challenges in predicting fishing effort and obtaining coverage during the 2020 ITP Year. These ongoing changes require the Observer Program to incorporate new approaches to project observer coverage for the fishery in subsequent ITP years as the fishery is undergoing regulatory changes that impact fishermen strategy and effort.

5 LITERATURE CITED

- Boyd, J. 2012. Sea turtle bycatch monitoring of the 2011 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries.
- Boyd, J.B. 2016. North Carolina Division of Marine Fisheries Incidental Take Permit Annual Report for ITP Year 2015 Section 10 ITP # 16230 (September 1, 2014–August 31, 2015). North Carolina Division of Marine Fisheries Annual Report for Incidental Take Permit # 16230. 45 p.
- Byrd, B. L., L. R. Goshe, T. Kolkmeier, and A. A. Hohn. 2016. Sea turtle bycatch in the large-mesh gillnet flounder fishery in Carteret County, North Carolina, USA, June–November 2009. *Journal of the North Carolina Academy of Science*, 132(1):10–24.
- Byrd, B. L., J. K. McConnaughey, and S. A. Smith. 2019. Annual Sea Turtle Interaction Monitoring of the Gill-Net Fisheries in North Carolina for Incidental Take Permit Year 2019. Annual Completion Report for Activities under Endangered Species Act Section 10 Incidental Take Permit # 16230. North Carolina Department of Environmental Quality, Division of Marine Fisheries, 3441 Arendell Street, Morehead City, NC. 59 p.
- Canty, A., and B. Ripley. 2015. boot: Bootstrap R (S-Plus) Functions. R package version 1.3-17.
- Daniel, L. B. 2013. Application for an Individual Incidental Take Permit under the Endangered Species Act of 1973 for Atlantic Sea Turtle Populations of: Loggerhead, *Caretta caretta*, Green, *Chelonia mydas*, Kemp's ridley, *Lepidochelys kempii*, Leatherback, *Dermochelys coriacea*, Hawksbill, *Eretmochelys imbricata*. 13 June 2013. North Carolina Division of Marine Fisheries, 3441 Arendell Street, Morehead City, NC. 154 p. (<https://www.fisheries.noaa.gov/webdam/download/66756029>)
- Davison, A. C., and D. V. Hinkley. 1997. Bootstrap methods and their applications. Cambridge University Press, Cambridge. ISBN 0-521-57391-2.
- Efron, B., and R. J. Tibshirani. 1993. An Introduction to the Bootstrap. Chapman and Hall, New York. 436 p.
- Gearhart, J. 2001. Sea turtle bycatch monitoring of the 2000 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1259. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 26 p.
- Gearhart, J. 2002. Sea turtle bycatch monitoring of the 2001 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1348. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 44 p.
- Gearhart, J. 2003. Sea turtle bycatch monitoring of the 2002 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1398. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 39 p.

- Kolkmeier, T., B. Guthrie, B. L. Byrd, and A. A. Hohn. 2007. Report on the Alternative Platform Observer Program in North Carolina: March 2006 to March 2007: NOAA Technical Memorandum NMFS-SEFSC-558. 20 p.
- Lyssikatos, M. C., and L. P. Garrison. 2018. Common bottlenose dolphin (*Tursiops truncatus*) gillnet bycatch estimates along the US Mid-Atlantic coast, 2007-2015. US Department of Commerce, Northeast Fisheries Science Center Reference Document 18-07, 37 p.
- McConnaughey, J. K. 2018. Fall 2018 Seasonal Progress Report for Incidental Take Permit No. 16230 (September 1 – November 30, 2018). North Carolina Department of Environmental Quality, Division of Marine Fisheries. Morehead City, NC. 19 p.
- McConnaughey, J. K. 2019a. 2019 spring seasonal Progress Report for Incidental Take Permit No. 16230 (March 1 – May 31, 2019). North Carolina Department of Environmental Quality, Division of Marine Fisheries. Morehead City, NC. 21 p.
- McConnaughey, J. K. 2019b. 2019 Summer Seasonal Progress Report for Incidental Take Permit No. 16230 (June 1 – August 31, 2019). North Carolina Department of Environmental Quality, Division of Marine Fisheries. Morehead City, NC. 14 p.
- McConnaughey, J. K. 2020a. 2019 Fall Seasonal Progress Report for Incidental Take Permit No. 16230 (September 1 – November 30, 2019). North Carolina Department of Environmental Quality, Division of Marine Fisheries. Morehead City, NC. 20 p.
- McConnaughey, J. K. 2020b. 2020 Spring Seasonal Progress Report for Incidental Take Permit No. 16230 (March 1 – May 31, 2020). North Carolina Department of Environmental Quality, Division of Marine Fisheries. Morehead City, NC. 14 p.
- McConnaughey, J. K. 2020c. 2020 Summer Seasonal Progress Report for Incidental Take Permit No. 16230 (June 1 – August 31, 2020). North Carolina Department of Environmental Quality, Division of Marine Fisheries. Morehead City, NC. 9 p.
- McConnaughey, J. K., J. Boyd, and L. Klibansky. 2019. Annual Sea Turtle Interaction Monitoring of the Gill-Net Fisheries in North Carolina for Incidental Take Permit Year 2018. Annual Completion Report for Activities under Endangered Species Act Section 10 Incidental Take Permit # 16230. North Carolina Department of Environmental Quality, Division of Marine Fisheries, 3441 Arendell Street, Morehead City, NC. 58 p.
- Murphey, T. 2011. Sea turtle bycatch monitoring of the 2010 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Department of Environmental Quality, Division of Marine Fisheries. 4 p.
- National Marine Fisheries Service (NMFS). 2013. Endangered Species; File No. 16230. Notice of permit issuance. Federal Register 78: 57132-57133 (<https://www.federalregister.gov/d/2013-22592>).
- NMFS. 2014. Endangered Species; File No. 18102. Issuance of permit. Federal Register 79:43716-43718 (<https://www.federalregister.gov/d/2014-17645>).
- North Carolina Division of Marine Fisheries. 2019. North Carolina Southern Flounder (*Paralichthys lethostigma*) Fishery Management Plan Amendment 2. September 2019.

- North Carolina Department of Environmental Quality, Division of Marine Fisheries, 3441 Arendell Street, Morehead City, NC. 62 p.
- Price, B. 2004. Sea turtle bycatch monitoring of the 2003 fall flounder gillnet fisheries in southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1398. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 26 p.
- Price, B. 2005. Sea turtle bycatch monitoring of the 2004 fall flounder gillnet fisheries in southeastern Pamlico Sound, North Carolina. Completion report for ITP 1398. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 33 p.
- Price, B. 2006. Sea turtle bycatch monitoring of the 2005 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 31 p.
- Price, B. 2007. Sea turtle bycatch monitoring of the 2006 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 21 p.
- Price, B. 2008. Sea turtle bycatch monitoring of the 2007 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 25 p.
- Price, B. 2009. Sea turtle bycatch monitoring of the 2008 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 22 p.
- Price, B. 2010. Sea turtle bycatch monitoring of the 2009 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 27 p.
- R Core Team. 2019. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.

6 TABLES

Table 1. For large-mesh (≥ 4 inch) gill nets, annual estimated authorized and actual takes of sea turtles by species and Management Units B, D1, D2, and E for the 2020 ITP Year. Estimated actual takes were calculated from observer data; 95% confidence intervals are provided in parentheses. ¹ Insufficient observer data existed to model an estimated annual take level for the permit application; therefore, for Management Unit D2, an annual observed take number was identified for green turtles (see Table 2).

Species	B				D1				D2			
	Estimated Takes				Estimated Takes				Estimated Takes			
	Authorized		Actual		Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	225	112	127.7 (62.1, 237.8)	61.3 (20.5, 129.5)	9	5	0	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	53	26	0	0	15	7	0	0	6	3	0	0
Total	278	138	127.7	61.3	24	12	0	0	6	3	0	0

Species	E				Total			
	Estimated Takes				Estimated Takes			
	Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	96	48	5.7 (0, 17.2)	0	330	165	133.4	61.3
Kemp's ridley	24	13	0	0	98	49	0	0
Total	120	61	5.7	0	428	214	133.4	61.3

Table 2. For large-mesh (≥ 4 inch) gill nets, annual authorized and actual observed (not estimated) takes of sea turtles by species and Management Units B, D1, D2, and E for the 2020 ITP Year. ¹ Authorized levels of Kemp's ridley sea turtles in Management Units B, D1, D2, and E and green sea turtles in Management Units B, D1, and E are expressed as estimated takes for the fishery because sufficient observer data existed to model estimated annual take levels in the ITP application (See Table 1).

Species	B		D1		D2		E		Total	
	Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)	
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual
Green	n/a ¹	n/a ¹	n/a ¹	n/a ¹	6	2	n/a ¹	n/a ¹	6	2
Kemp's ridley	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Hawksbill	1	0	1	0	1	0	1	0	4	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	0	3	0	3	0	3	0	12	0
Total	5	0	5	0	11	2	5	0	26	2

Table 3. For large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets combined, annual authorized and actual observed (not estimated) takes of sea turtles by Management Unit A and C for the 2020 ITP Year. Authorized levels per management unit are 4 sea turtles of any species.

Species	A		C		Total	
	Authorized (live/dead)	Actual (live/dead)	Authorized (live/dead)	Actual (live/dead)	Authorized (live/dead)	Actual (live/dead)
Green		0		0		0
Kemp's ridley		0		0		0
Hawksbill	4 (any species)	0	4 (any species)	0	8 (any species)	0
Leatherback		0		0		0
Loggerhead		0		0		0

Table 4. For small-mesh (<4 inch) gill nets, annual authorized and actual observed (not estimated) takes of sea turtles by species and Management Unit B, D1, D2, and E for the 2020 ITP Year.

Species	B		D1		D2		E		Total	
	Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)	
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual
Green	3	1	3	0	3	0	3	0	12	1
Hawksbill	1	0	1	0	1	0	1	0	4	0
Kemp's ridley	3	0	3	0	3	0	3	0	12	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	0	3	0	3	0	3	0	12	0
Total	11	1	11	0	11	0	11	0	44	1

Table 5. Total annual authorized and actual takes (observed and estimated) of sea turtles by species and for estimated takes by condition for the 2020 ITP Year. The incidental take of an unidentified sea turtle in a large-mesh gill net is not represented in the actual observed counts or estimated totals. ¹ Insufficient observer data exist to model an estimated annual take level; therefore, takes are expressed as observed.

Species	Observed (live/dead)		Estimated			
	Authorized	Actual	Authorized		Actual	
	Live/Dead	Live/Dead	Alive	Dead	Alive	Dead
Green	18	3	330	165	133.4	61.3
Hawksbill	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	12	0	98	49	0	0
Leatherback	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Loggerhead	24	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Any Species	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Total	78	3	428	214	133.4	61.3

Table 6. Categories and descriptions of fisherman responses for the Observer Program's contact logs.

Categories	Category description
1	Left message with someone else
2	Not fishing general
3	Fishing other gear
4	Not fishing because of weather
5	Not fishing because of boat issues
6	Not fishing because of medical issues
7	Booked trip
8	Hung up, got angry, trip refused
9	Call back later time/date
10	Saw in person
11	Disconnected
12	Wrong number
13	No answer
14	No answer, left voicemail
15	Not fishing because of natural disaster (e.g., hurricane)

Table 7. For large-mesh gill nets, observer coverage calculated from observer data (≥ 4 inch) and reported trips from the Trip Ticket Program (≥ 5 inch) by season and management unit for the 2020 ITP Year. Observer coverage was calculated using estimated fishing trips based on the Trip Ticket Program data for the previous five years and using actual reported trips from the program for the 2020 ITP Year. Estimated trips = “*closed*” when/where anchored large-mesh gill nets were prohibited, and any reported trips are *italicized*. Trip Ticket Program data are considered finalized for 2019 and preliminary for 2020.

Season	Management Unit	Large Mesh				
		Estimated Fishing Trips	Reported Fishing Trips	Observed Trips	Coverage - Estimated Fishing Trips	Coverage - Reported Fishing Trips
Fall 2019	A	759	636	81	10.7	12.7
	B	373	553	30	8.1	5.4
	C	297	190	29	9.8	15.3
	D1	<i>closed</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	D2	195	217	12	6.2	5.5
	E	342	493	56	16.4	11.4
	Overall	1,966	2,089	208	10.6	10.0
Spring 2020	A	743	959	41	5.5	4.3
	B	<i>closed</i>	<i>31</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	C	197	4	0	0.0	0.0
	D1	<i>closed</i>	<i>0</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	D2	<i>closed</i>	<i>0</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	E	<i>closed</i>	<i>3</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	Overall	2,474	997	41	1.7	4.2
Summer 2020	A	<i>closed</i>	<i>65</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	B	<i>closed</i>	<i>18</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	C	<i>closed</i>	<i>1</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	D1	<i>closed</i>	<i>0</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	D2	<i>closed</i>	<i>0</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	E	<i>closed</i>	<i>6</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
	Overall	<i>closed</i>	<i>90</i>	<i>closed</i>	<i>closed</i>	<i>closed</i>
Annual		2,906	3,176	249	8.6	7.8

Table 8. For small-mesh gill nets, observer coverage calculated from observer trips (<4 inch) and reported trips from the Trip Ticket Program (<5 inch) by season and management unit for the 2020 ITP Year. Observer coverage was calculated using estimated fishing trips based on the Trip Ticket Program data for the previous five years and using actual reported trips from the program for the 2020 ITP Year. Trip Ticket Program data are considered finalized for 2019 and preliminary for 2020. On April 4 2020, Management Unit D1 was closed to small-mesh gill nets.

Season	Management Unit	Small Mesh				
		Estimated Fishing Trips	Reported Fishing Trips	Observed Trips	Coverage - Estimated Fishing Trips	Coverage - Reported Fishing Trips
Fall 2019	A	252	383	5	2.0	1.3
	B	729	1,140	12	1.6	1.1
	C	140	124	3	2.1	2.4
	D1	40	64	1	2.5	1.6
	D2	188	238	13	6.9	5.5
	E	447	345	23	5.1	6.7
	Overall	1,796	2,294	57	3.2	2.5
Spring 2020	A	743	612	2	0.3	0.3
	B	1,347	1,274	12	0.9	0.9
	C	197	315	4	2.0	1.3
	D1	32	14	0	0.0	0.0
	D2	29	39	0	0.0	0.0
	E	126	111	7	5.6	6.3
	Overall	2,474	2,365	25	1.1	1.1
Summer 2020	A	164	212	3	1.8	1.4
	B	836	959	9	1.1	0.9
	C	117	58	4	3.4	6.9
	D1	closed	closed	closed	closed	closed
	D2	45	11	1	2.2	9.1
	E	203	226	4	2.0	1.8
	Overall	1,363	1,466	21	1.5	1.4
Annual		5,633	6,125	103	1.8	1.7

Table 9. Number of "No Contact" trips by season and management unit completed by Marine Patrol and observers during the 2020 ITP Year. No Contact refers to unsuccessful attempts to find and observe anchored gill-net effort.

Season	Management Unit	Marine Patrol No Contact Trips	Observer No Contact Trips	Total No Contact Trips
Fall 2019	A	66	5	71
	B	28	8	35
	C	21	3	24
	D1	9	1	10
	D2	47	5	52
	E	130	1	131
	Overall	301	23	324
Spring 2020	A	89	1	90
	B	40	0	40
	C	34	2	36
	D1	14	0	14
	D2	96	0	96
	E	173	0	173
	Overall	445	3	448
Summer 2020	A	104	0	104
	B	51	26	77
	C	32	12	44
	D1	15	2	17.5
	D2	132	6	138
	E	191	2	193
	Overall	525	48	573
Annual		1,271	74	1,345

Table 10. Summary of observed sea turtle interactions in large-mesh (≥ 4 inch, $n = 25$) and small-mesh (< 4 inch, $n = 2$) gill nets during the 2020 ITP Year. One of the interactions was recorded during winter observations to monitor for Atlantic sturgeon interactions. PIT = Passive Integrated Transponders.

Date	Season	Management Unit	Mesh Size	Latitude (N)	Longitude (W)	Species	Disposition	Applied Tags		Curved Carapace (mm)	
								PIT	Inconel	Length	Width
10/3/2019	Fall	B	Large	35.30813	75.58702	Unknown	Alive	n/a	n/a	n/a	n/a
10/4/2019	Fall	B	Large	35.29235	76.49730	Green	Alive	n/a	n/a	272	255
10/4/2019	Fall	B	Large	35.30377	75.58100	Green	Dead	n/a	n/a	293	243
10/4/2019	Fall	B	Large	35.30486	75.57900	Green	Dead	n/a	n/a	246	212
10/8/2019	Fall	B	Large	35.31400	76.49846	Green	Alive	n/a	n/a	302	232
10/8/2019	Fall	B	Large	35.31400	76.49631	Green	Alive	n/a	n/a	274	229
10/11/2019	Fall	B	Large	34.88595	76.40133	Green	Alive	n/a	n/a	n/a	n/a
10/11/2019	Fall	B	Large	34.88773	76.40265	Green	Alive	n/a	n/a	n/a	n/a
10/11/2019	Fall	B	Large	34.88653	76.40430	Green	Alive	n/a	n/a	n/a	n/a
10/11/2019	Fall	B	Large	34.88643	76.40437	Green	Dead	n/a	n/a	n/a	n/a
10/15/2019	Fall	B	Large	34.86201	76.38114	Green	Alive	n/a	n/a	276	222
10/15/2019	Fall	B	Large	34.86162	76.38148	Green	Alive	n/a	n/a	299	234
10/15/2019	Fall	E	Large	34.67700	77.13400	Green	Alive	n/a	n/a	314	265
10/15/2019	Fall	B	Large	35.19303	75.79633	Green	Dead	n/a	n/a	276	251
10/15/2019	Fall	B	Large	35.18925	75.80685	Green	Dead	n/a	n/a	283	205
10/16/2019	Fall	B	Large	35.32789	75.59853	Green	Alive	n/a	n/a	298	261
10/18/2019	Fall	D2	Large	34.68332	76.99551	Green	Alive	n/a	n/a	332	288
10/29/2019	Fall	B	Large	34.99532	76.28635	Green	Alive	n/a	n/a	295	256
10/29/2019	Fall	B	Large	34.99582	76.28541	Green	Dead	n/a	n/a	295	252
10/31/2019	Fall	B	Small	34.96300	76.27880	Green	Alive	n/a	n/a	275	235
11/1/2019	Fall	D2	Large	34.68233	77.04841	Green	Alive	n/a	n/a	326	280
11/1/2019	Fall	D2	Large	34.68352	77.03974	Green	Alive	n/a	n/a	298	274
11/5/2019	Fall	B	Large	34.99495	76.28717	Green	Alive	n/a	n/a	n/a	n/a
11/5/2019	Fall	B	Large	34.99495	76.28717	Green	Alive	n/a	n/a	295	240
11/12/2019	Fall	B	Large	34.98670	76.24600	Green	Alive	n/a	n/a	206	202
11/12/2019	Fall	B	Large	34.98650	76.24610	Green	Alive	n/a	n/a	n/a	n/a
12/6/2019	Winter	B	Small	35.28000	75.54000	Green	Alive	n/a	n/a	n/a	n/a

Table 11. Regulations for management units by date and regulation change for large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets for the 2020 ITP Year. Proclamations during winter months affected fishing effort in subsequent months.

Year	Date(s)	Regulation change
2019	Sep 4	This proclamation superseded Proclamation FF-3-2016, dated January 21, 2016 and FF-48-2018, dated November 27, 2018. It closed the commercial flounder fishery to all gears in Internal Coastal Waters and to all gears except trawls in the Atlantic Ocean Waters. The commercial fishery will re-open by proclamation later in 2019. This action was being taken to comply with the requirements of Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (FF-31-2019)
2019	Sep 4	This proclamation superseded Proclamation M-11-2019 dated April 26, 2019. This proclamation closed all of Management Unit A to the use of gill nets with a stretched mesh length of greater than $3 \frac{3}{4}$ inch stretched mesh (except as described in Section IV.) in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (M-13-2019)
2019	Sep 4	This proclamation superseded Proclamation M-12-2019 dated June 11, 2019. This proclamation closed all Management Units south of Management Unit A to the use of gill nets with a stretched mesh length of 4 inches and greater (except as described in Section III.) in accordance Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (M-14-2019)
2019	Sep 15	This proclamation supersedes Proclamation M-13-2019 dated August 30, 2019. It opens the previously closed Management Unit A to the use of gill nets with stretched mesh lengths of $5 \frac{1}{2}$ inches through $6 \frac{1}{2}$ inches in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan and the Sea Turtle ITP. It maintains small mesh gill net attendance requirements in the entirety of Management Unit A. (M-15-2019)
2019	Sep 15	This proclamation superseded Proclamation FF-31-2019, dated August 28, 2019. It established commercial flounder season dates for Internal Coastal Waters, by Flounder Management Area. It maintained a 15-inch total length minimum size limit. It maintained the regulation making it unlawful to possess flounder taken from anchored large mesh gill nets with a stretched mesh length less than 6 inches. It also made it unlawful for a commercial fishing operation to possess flounder from the Atlantic Ocean Waters taken by any method other than trawls. This action was being taken to comply with the requirements of Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (FF-34-2019)
2019	Sep 30	This proclamation superseded Proclamation M-15-2019 dated September 12, 2019. It made it unlawful for Recreational Commercial Gear License holders to use gill nets with stretched mesh lengths of $5 \frac{1}{2}$ inches through $6 \frac{1}{2}$ inches. It maintained the openings in Management Unit A to the use of gill nets with stretched mesh lengths of $5 \frac{1}{2}$ inches through $6 \frac{1}{2}$ inches in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan and the Sea Turtle ITP. It maintained small mesh gill net attendance requirements in the entirety of Management Unit A. (M-17-2019)

Table 11. *(continued)* Regulations for management units by date and regulation change for large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets for the 2020 ITP Year. Proclamations during winter months affected fishing effort in subsequent months.

2019	Oct 1	This proclamation superseded Proclamation M-14-2019 dated August 30, 2019. This proclamation opened Management Units B (subunits only), C, D2 and E to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches (except as described in Section III.) in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (M-16-2019)
2019	Oct 13	This proclamation superseded Proclamation M-17-2019 dated September 27, 2019. It closed all of Management Unit A to the use of gill nets with a stretched mesh length of greater than 3 ¾ inch stretched mesh (except as described in Section IV.) in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. It maintained small mesh gill net attendance in Management Unit A. (M-20-2019)
2019	Oct 26	This proclamation superseded Proclamation M-16-2019 dated September 27, 2019. This proclamation closed Management Units B (subunits SGNRA 1-4, MGNRA and portions of CGNRA) and Management Unit C to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches (except as described in Section III.). It maintained openings in Management Units D2 and E. These actions were being taken in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (M-21-2019)
2019	Nov 15	This proclamation supersedes proclamation M-21-2019 dated October 23, 2019. This proclamation closes all Management Units South of Management Unit A to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches (except as described in Section III.). This action is being taken in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (M-22-2019)
2019	Nov 23	This proclamation superseded Proclamation M-20-2019 dated October 10, 2019. It opened portions of Management Unit A to the use of gill nets with a stretched mesh length of 5 ½ inches through 6 ½ inches in accordance with Amendment 2 to the N. C. Southern Flounder Fishery Management Plan. It maintained attendance on small mesh nets. (M-23-2019)
2019	Dec 1	This proclamation superseded Proclamation M-23-2019 dated November 21, 2019. In Management Unit A, it removed attendance requirements and implemented vertical height restrictions for anchored gill nets with a stretched mesh length of 3 inches through 3 ¾ inches. It continued to allow the use of gill nets with a stretched mesh length of 5 ½ inches through 6 ½ inches in portions of Management Unit A. (M-24-2019)
2020	Jan 1	This proclamation superseded Proclamation M-24-2019 dated November 27, 2019. In Management Unit A, it was unlawful to use small mesh gill nets with a stretched mesh length other than 3 ¼ inches, except as described in Section II. C. and D. and Section IV. It continued to allow the use of gill nets with a stretched mesh length of 5 ½ inches through 6 ½ inches in certain portions of Management Unit A. (M-26-2019)
2020	Feb 15	This proclamation superseded Proclamation M-22-2019 dated November 12, 2019. This proclamation opened Management Unit C to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches and implemented gear exemptions for the shad fishery in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (M-2-2020)

Table 11. *(continued)* Regulations for management units by date and regulation change for large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets for the 2020 ITP Year. Proclamations during winter months affected fishing effort in subsequent months.

2020	Mar 2	This proclamation opens a portion of Management Unit A to the use of floating gill nets configured for harvesting American shad by removing vertical height restrictions for all gill nets with stretched mesh lengths of 5 ¼ through 6 ½ inches. (M-3-2020)
2020	Mar 25	This proclamation supersedes Proclamation M-3-2020 dated February 28, 2020. In Management Unit A, it removes gill nets configured for harvesting American shad. It maintains restrictions on the use of fixed, stationary, or unattended gill nets and allows the use of run-around, strike, drop, and trammel gill nets and with a stretched mesh length of 5 ½ inches through 6 ½ inches in portions of Management Unit A. (M-5-2020)
2020	Apr 15	This proclamation maintains closures in all other management units south of Management Unit A and closes Management Unit C to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches (except as described in Section II.; coincides with the commercial shad fishery closure) in accordance with Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. (M-6-2020)
2020	Apr 20	This proclamation implements yardage and time setting restrictions for gill nets with a stretched mesh length less than 4 inches and attendance restrictions for gill nets with a stretched mesh length less than 5 inches in the Internal Coastal Waters of the state, south of Management Unit A. Yardage limit increases will be considered for the May-October Spanish mackerel drift gill net fishery. Those increases will be implemented by proclamation at a later time. This proclamation also closed D1 to anchored nets with a stretched mesh length less than 4 inches. (M-4-2020)
2020	May 1	This proclamation implements attendance requirements for gill nets with a stretched mesh length less than 4 inches in Subunit B.1. (M-9-2020)
2020	May 1	This proclamation implements small mesh gill net attendance requirements. It maintains restrictions on the use of run-around, strike, drop, and trammel gill nets and with a stretched mesh length of 5 ½ inches through 6 ½ inches in portions of Management Unit A. (M-10-2020)
2020	May 8	This proclamation increases yardage limits for the commercial Spanish mackerel drift gill net fishery in Management Unit B. (M-11-2020)

Table 11. *(continued)* Regulations for management units by date and regulation change for large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets for the 2020 ITP Year. Proclamations during winter months affected fishing effort in subsequent months.

2020	Jun 15	<p>This proclamation supersedes Proclamation FF-34-2019, dated September 12, 2019. It establishes commercial flounder season dates for Internal Coastal Waters by Flounder Management Area. It maintains a 15-inch total length minimum size limit. It also maintains the regulation making it unlawful to possess flounder taken from anchored large mesh gill nets with a stretched mesh length less than 6 inches. It makes it unlawful for a commercial fishing operation to possess flounder from the Atlantic Ocean Waters taken by any method other than trawls. This action is being taken to comply with the requirements of Amendment 2 to the N.C. Southern Flounder Fishery Management Plan. The flounder harvest period for the Northern Management Area will open at 12:01 A.M., Tuesday, September 15, 2020 and close at 8:00 P.M., Tuesday, October 6, 2020.</p> <p>The flounder harvest period for the Central Management Area will open at 12:01 A.M., Thursday, October 1, 2020 and close at 8:00 P.M., Monday, October 19, 2020. The flounder harvest period for the Southern Management Area will open at 12:01 A.M., Thursday, October 1, 2020 and close at 8:00 P.M., Monday, November 2, 2020. (FF-25-2020)</p>
2020	Jul 22	<p>This proclamation reduced the yardage limit for gill nets with a stretched mess length less than 4 inches in Management Unit B. Yardage limit decrease in Management Unit B were being implemented to coincide with the 500 lb daily trip limit in the commercial Spanish mackerel fishery. (M-12-2020)</p>

Table 12. Number of gill-net hours logged and citations issued by Marine Patrol for anchored gill nets by season during the 2020 ITP Year. Gill-net hours represent time officers checked gill nets for compliance, conducted observations, or searched for trips to observe (No Contact trips). See Table 13 for details on individual citations.

Season	Gill-Net Hours	# Citations
Fall 2019	511	18
Spring 2020	542	6
Summer 2020	531	3
Total	1,584	27

Table 13. All EGNP and NETG Citations written by Marine Patrol for anchored gill nets by season and violation code during the 2020 ITP Year. Details for citations with a notice of violation (NOV) are described in Table 14.

Season	Date	Violation Code	Violation Description	NOV Notice Date
Fall 2019	9/20/2019	NETG04	Leave gill net in waters when could not be legally fished	n/a
	9/20/2019	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
	9/23/2019	NETG04	Leave gill net in waters when could not be legally fished	n/a
	9/23/2019	NETG04	Leave gill net in waters when could not be legally fished	n/a
	9/23/2019	NETG03	Using gill net with improper buoys or identification	n/a
	9/23/2019	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
	9/26/2019	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
	10/14/2019	NETG02	Using gill net without buoys or identification	10/21/2019
	10/14/2019	NETG46	Set or retrieve large mesh gill nets later than one hour after sunrise on Tuesday through Friday. Proclamation M-8-2010	10/21/2019
	10/14/2019	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
	10/23/2019	NETG29	RCGL gear without proper buoys 3J.0103(c)	n/a
	10/24/2019	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
	10/25/2019	NETG03	Using gill net with improper buoys or identification	n/a
	10/28/2019	NETG22	Improperly set gill net	n/a
	10/31/2019	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
	11/2/2019	NETG37	Leave small mesh gill nets unattended 3J.0103	n/a
	11/2/2019	NETG02	Using gill net without buoys or identification	n/a
	11/4/2019	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
Spring 2020	3/27/2020	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)	3/30/2020
	4/11/2020	NETG30	Leave RCGL gill net unattended 3O.09302	n/a
	5/10/2020	NETG02	Using gill net without buoys or identification	n/a
	5/10/2020	NETG37	Leave small mesh gill nets unattended 3J.0103	n/a
	5/14/2020	NETG03	Using gill net with improper buoys or identification	n/a
	5/14/2020	NETG04	Leave gill net in waters when could not be legally fished	n/a
	5/25/2020	EGNP01	Fishing gill net without a valid Estuarine Gill Net Permit	n/a
Summer 2020	7/14/2020	NETG04	Leave gill net in waters when could not be legally fished	n/a
	7/14/2020	NETG02	Using gill net without buoys or identification	n/a

Table 14. Notice of Violations issued by season, date, and violation code for the Estuarine Gill Net Permit (EGNP) during the 2020 ITP Year. Details for NOV with an associated citation are described in Table 13.

Season	Notice Date	Serve Date	Violation code	Violation description
Fall 2019	9/18/2019	9/19/2019	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	10/21/2019	10/25/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions.
	10/21/2019	10/28/2019	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	10/21/2019	10/28/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions.
	10/23/2019	10/27/2019	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	10/23/2019	10/27/2019	EGNP10	Set more than the legal length of gill net
	10/23/2019	10/27/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions.
Spring 2020	3/30/2020	4/27/2020	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)

7 FIGURES

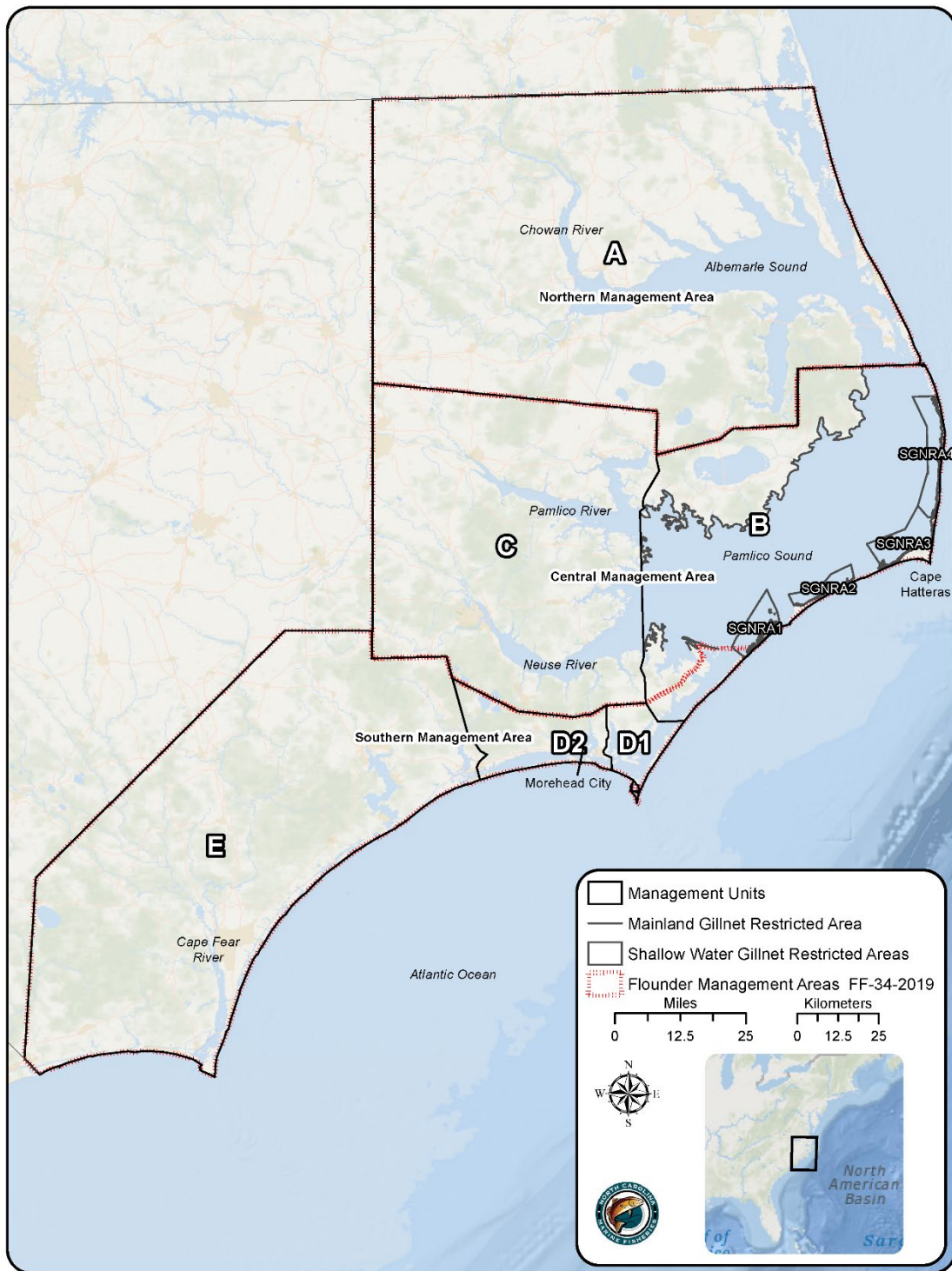


Figure 1. Management units (A, B, C, D1, D2, and E) as outlined in the Conservation Plan and used by the Observer Program for the 2020 ITP Year. In the Pamlico Sound Portion of B, large-mesh gill nets were confined to Shallow Water Gillnet Restricted Areas (SGNRA) 1-4 and the Mainland Gillnet Restricted Area (200 yards from shore).

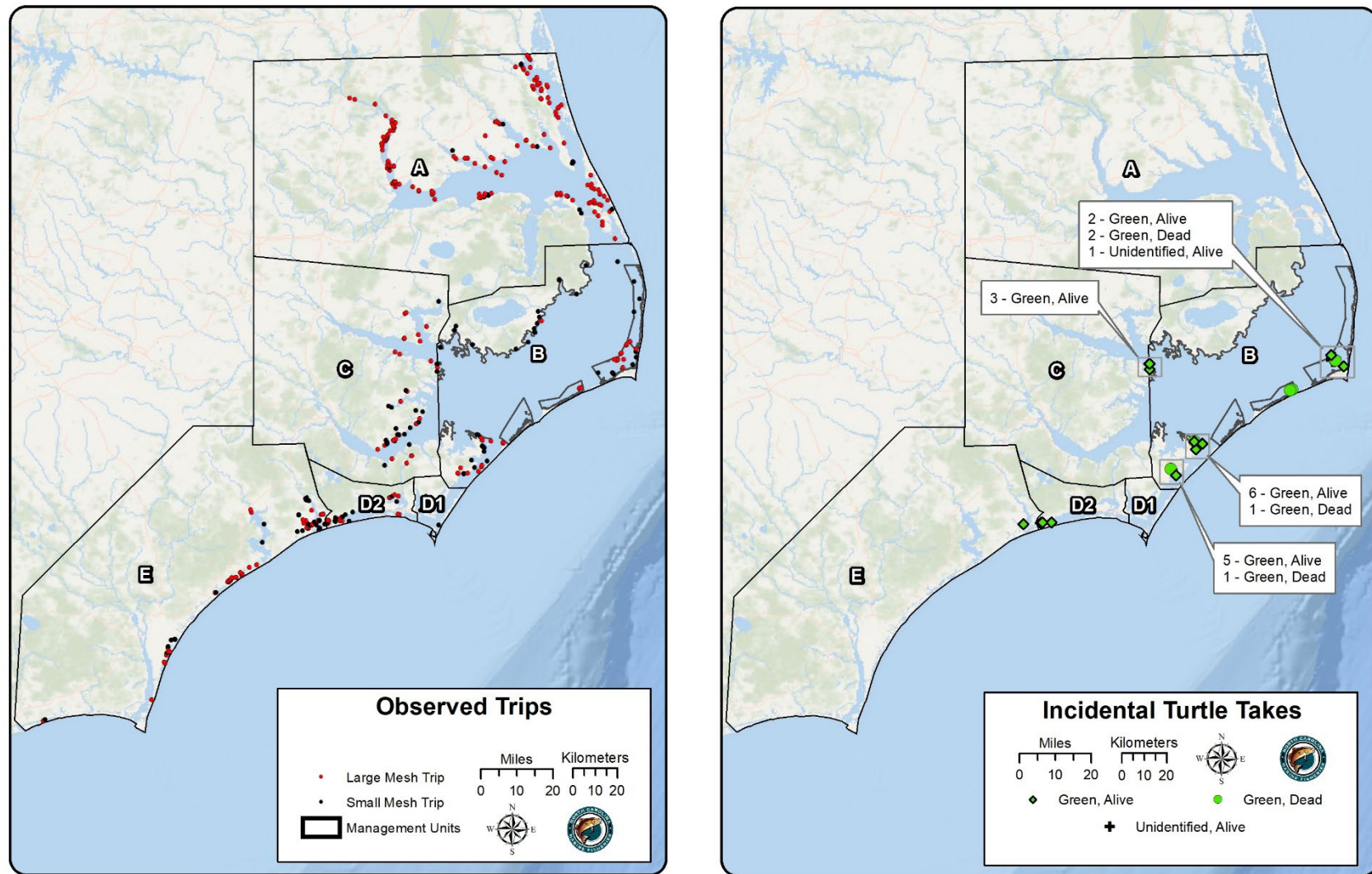


Figure 2. For the entire 2020 ITP Year, observed gill-net trips (left) by mesh-size category (249 large mesh = ≥ 4 inch; 103 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, = 21; dead, n = 6) across management units. One of the interactions was recorded during winter observations to monitor for Atlantic sturgeon interactions.

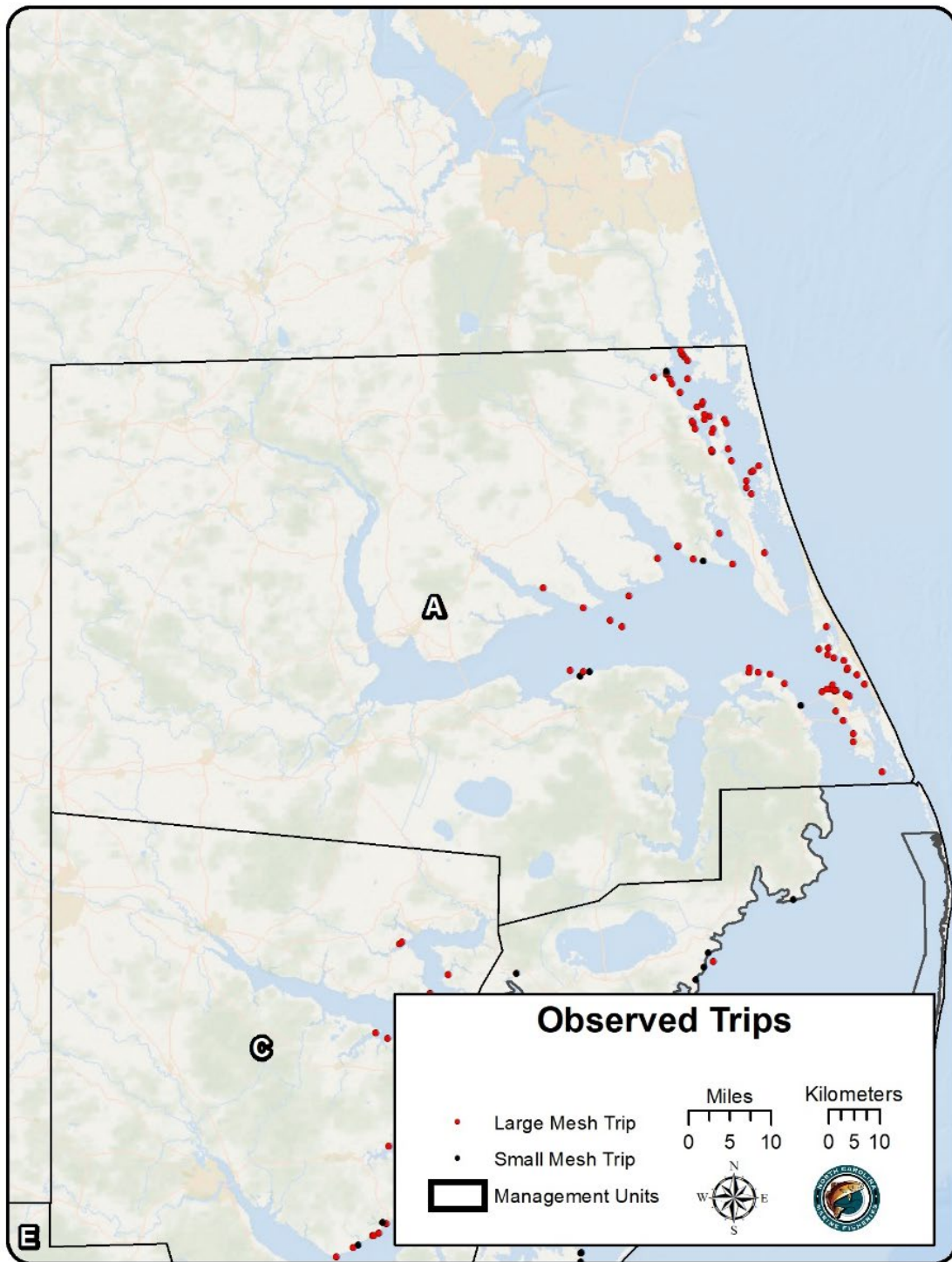


Figure 3. For fall 2019, observed gill-net trips by mesh-size category for Management Unit A (81 large mesh = ≥ 4 inch; 5 small mesh = < 4 inch). No sea turtle interactions were observed.

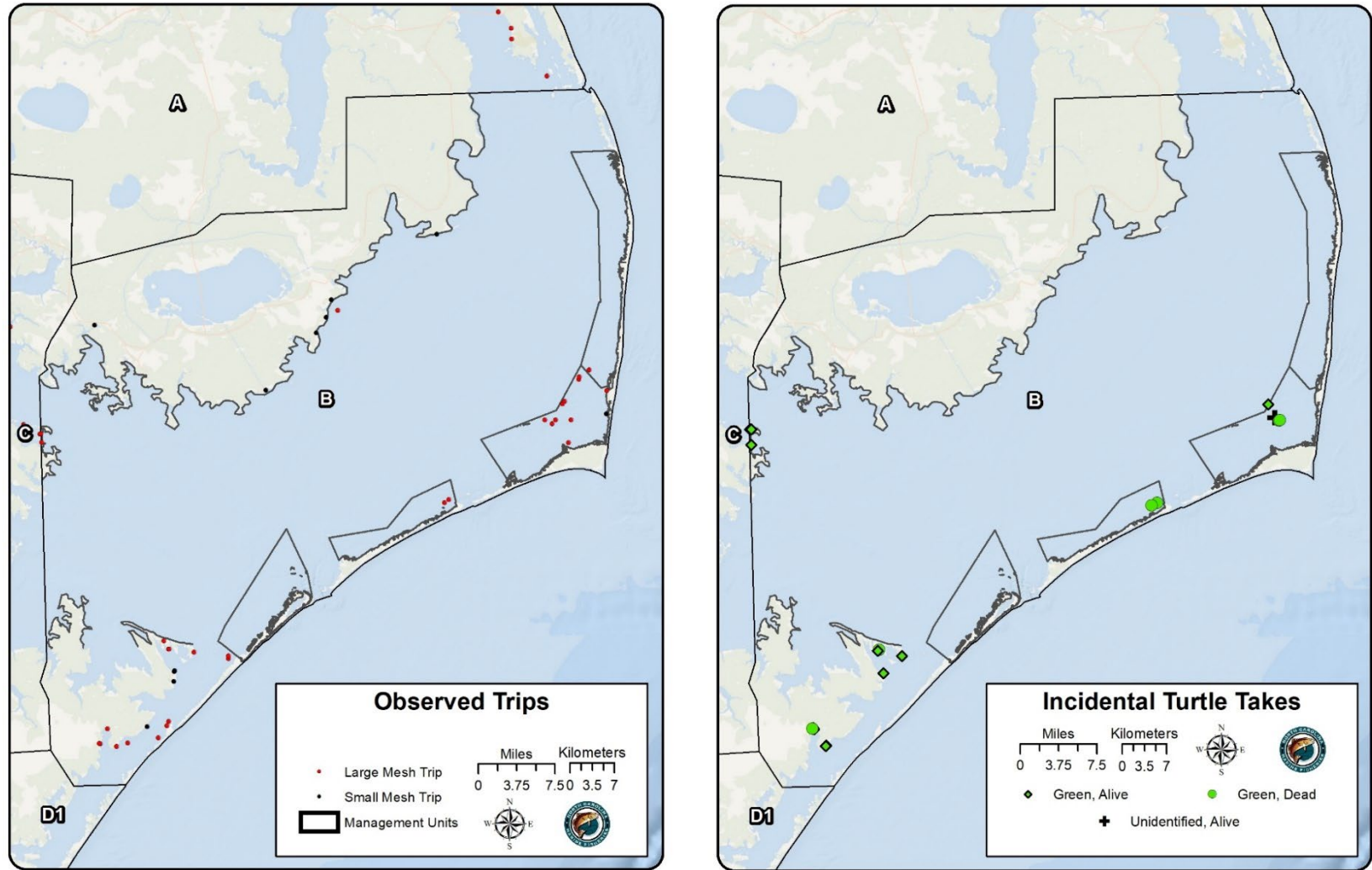


Figure 4. For fall 2019, observed gill-net trips (left) by mesh-size category (30 large mesh = ≥ 4 inch; 12 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 16$; dead, $n = 6$) for Management Unit B. Trips and turtle location at the border of Management Units B and C occurred in B.

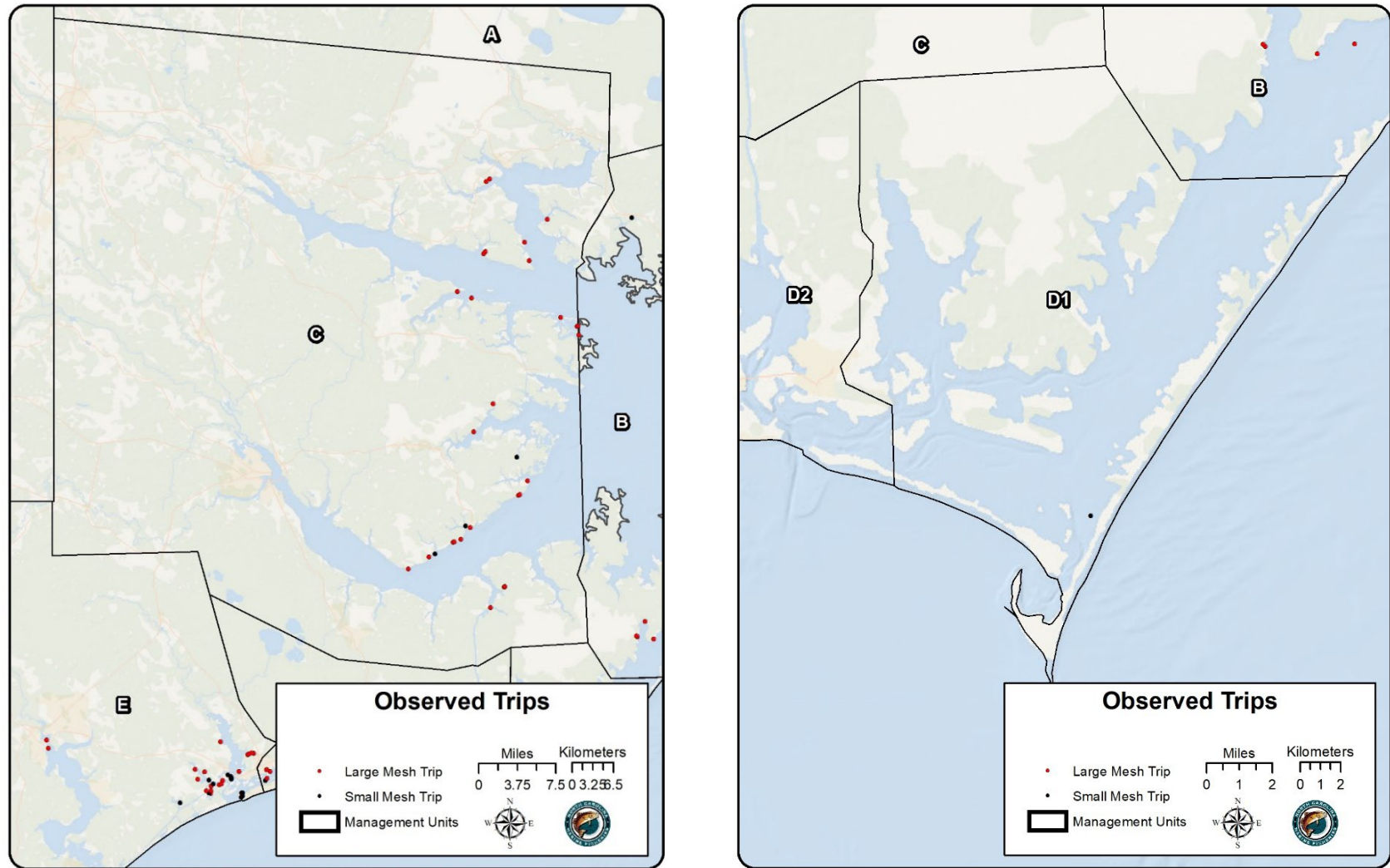


Figure 5. For fall 2019, observed gill-net trips by mesh-size category (large mesh = ≥ 4 inch; small mesh = < 4 inch) for Management Unit C (left: 29 large mesh; 3 small mesh) and Management Unit D1 (right: 0 large mesh; 1 small mesh). D1 was closed to large-mesh gill nets the entire 2020 ITP Year. No sea turtle interactions were observed in Management Unit C or D1.

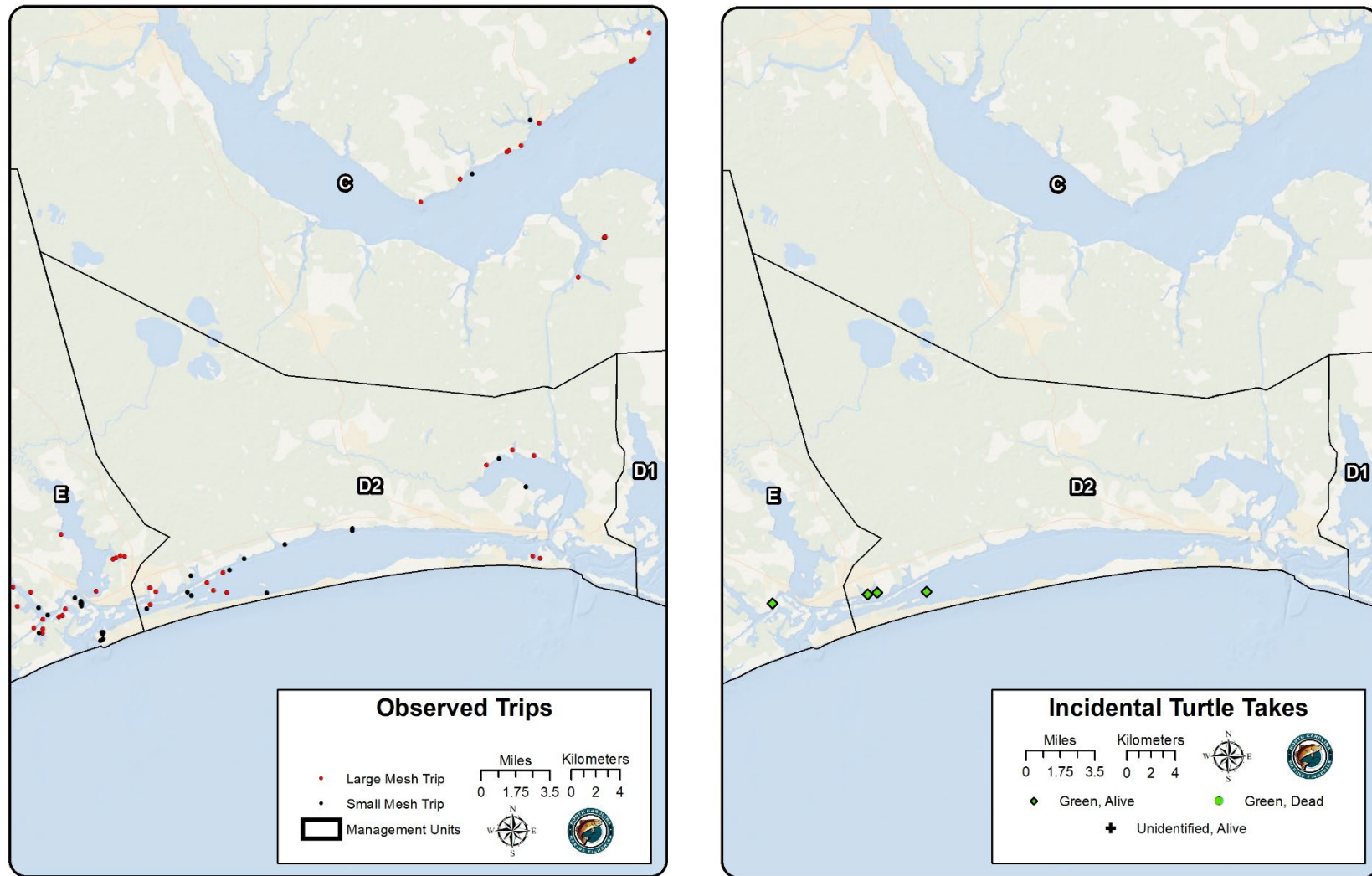


Figure 6. For fall 2019, observed gill-net trips (left) by mesh-size category (12 large mesh = ≥ 4 inch; 13 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 3$; dead, $n = 0$) for Management Unit D2.

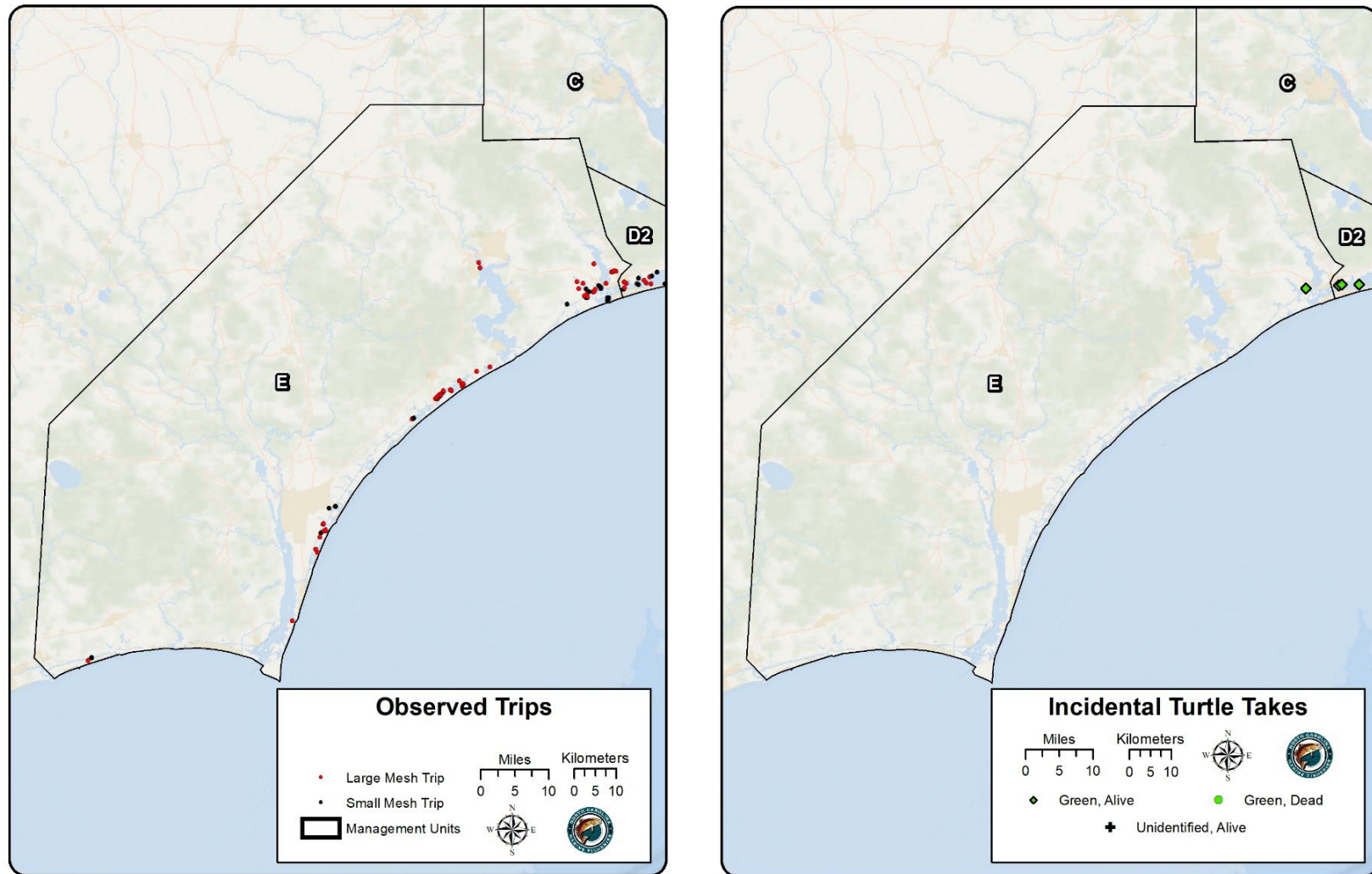


Figure 7. For fall 2019, observed gill-net trips (left) by mesh-size category (56 large mesh = ≥ 4 inch; 23 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 1$; dead, $n = 0$) for Management Unit E.

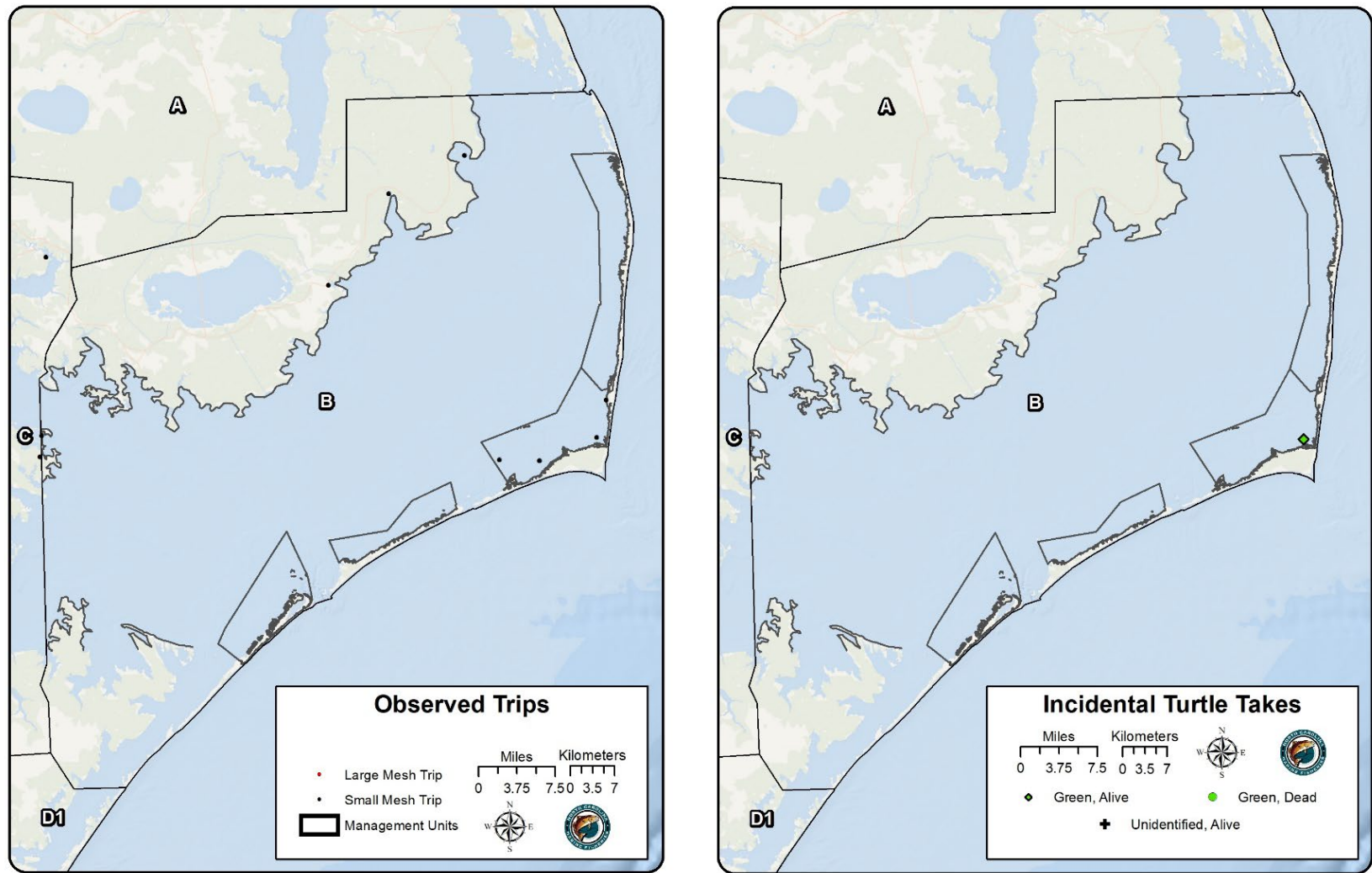


Figure 8. For winter 2019-2020, observed gill-net trips (left) by mesh-size category (0 large mesh = ≥ 4 inch; 10 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 1$; dead, $n = 0$) for Management Unit B. Management Unit B was closed to large-mesh gill-net effort for winter 2020. This interaction was recorded in a small-mesh gill net during winter observations to monitor for Atlantic Sturgeon interactions.

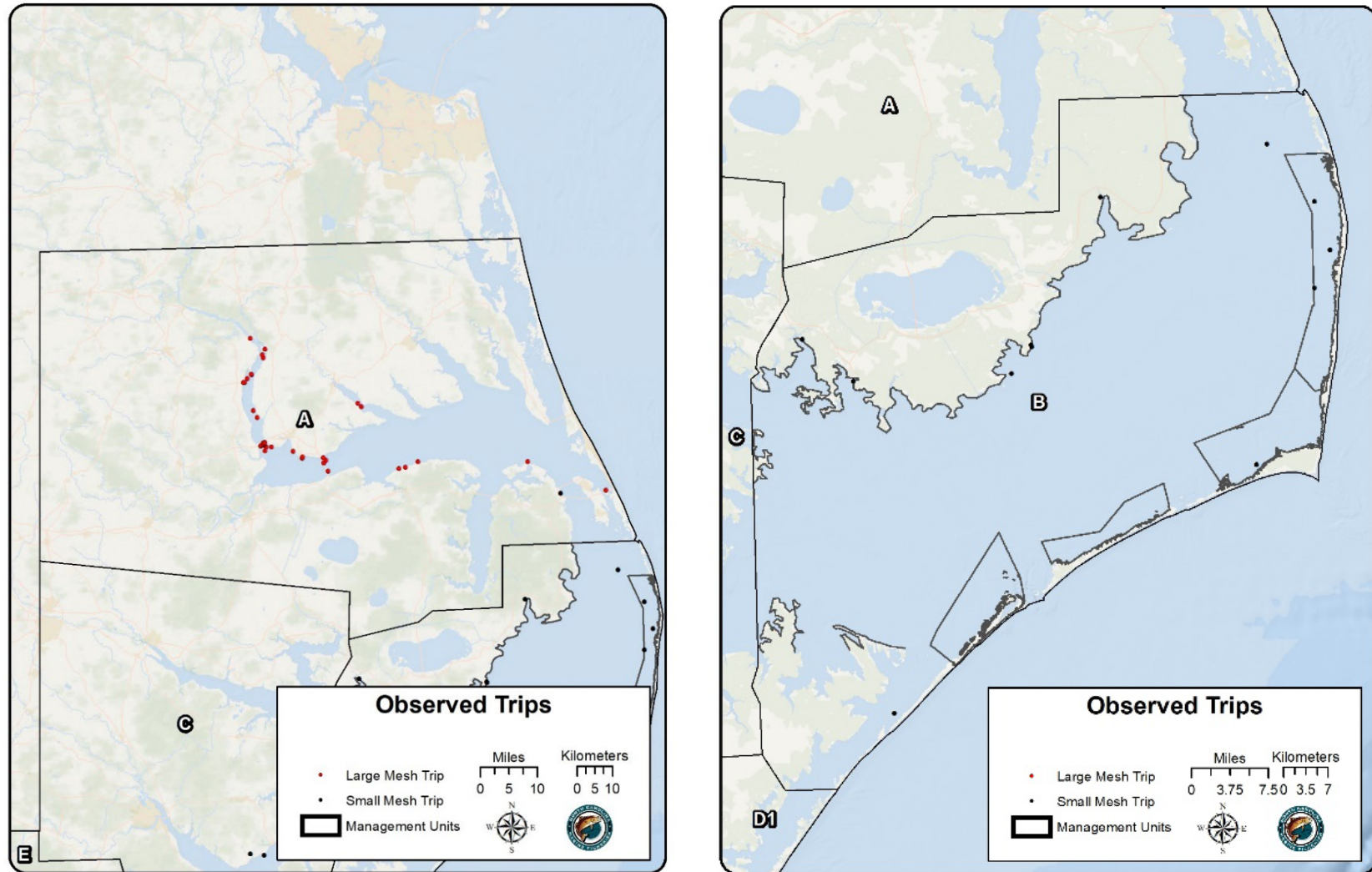


Figure 9. For spring 2020, observed gill-net trips by mesh-size category (large mesh = ≥ 4 inch; small mesh = < 4 inch) for Management Unit A (left: 41 large mesh; 2 small mesh) and Management Unit B (right: 0 large mesh; 12 small mesh). Management Unit B was closed to large-mesh gill nets during spring 2020. No sea turtle interactions were observed.

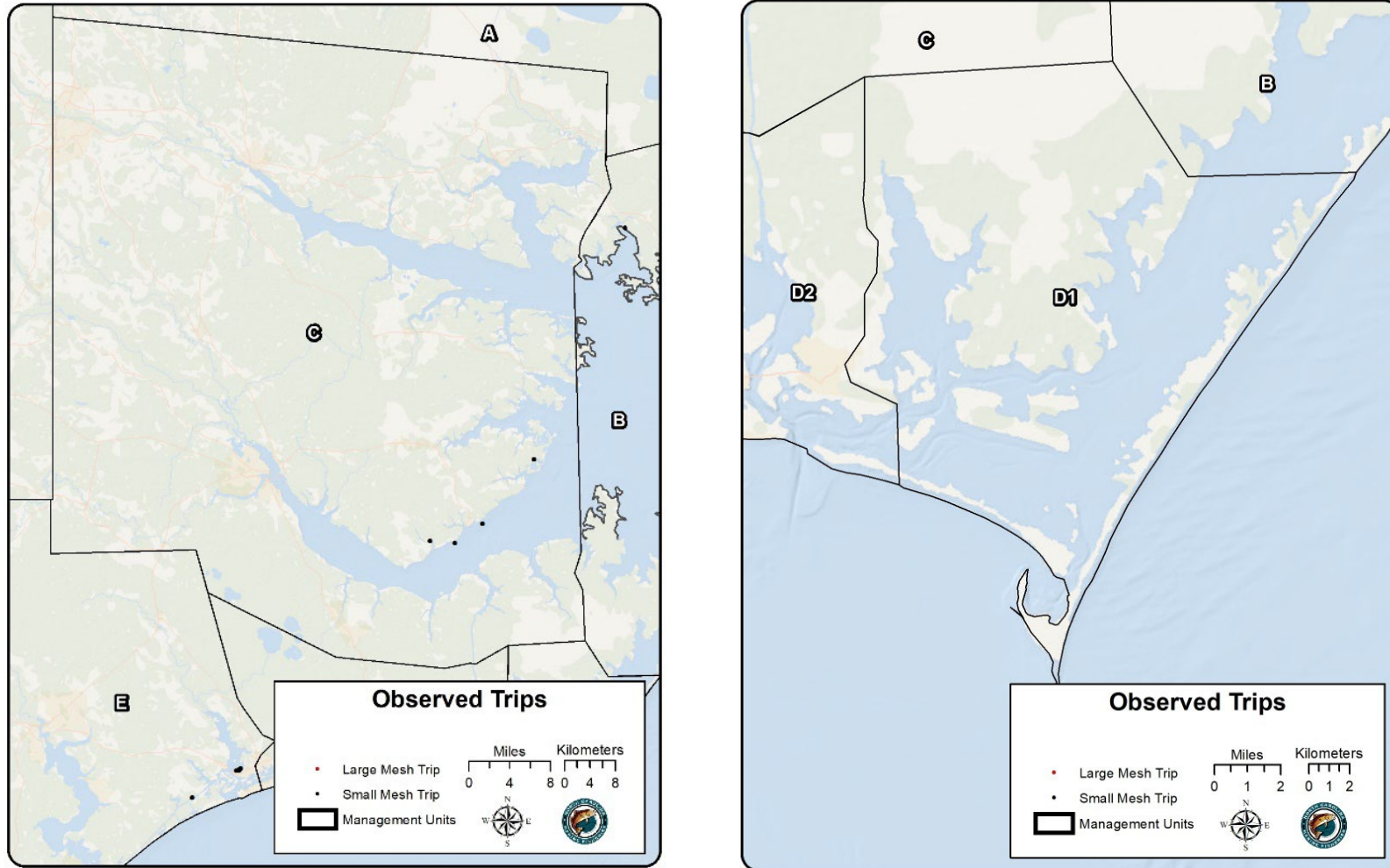


Figure 10. For spring 2020, observed gill-net trips by mesh-size category (large mesh = ≥ 4 inch; small mesh = < 4 inch) for Management Unit C (left: 0 large mesh; 4 small mesh) and Management Unit D1 (right: 0 large mesh; 0 small mesh). Management Unit D1 was closed to large-mesh gill nets for spring 2020. No sea turtle interactions were observed.

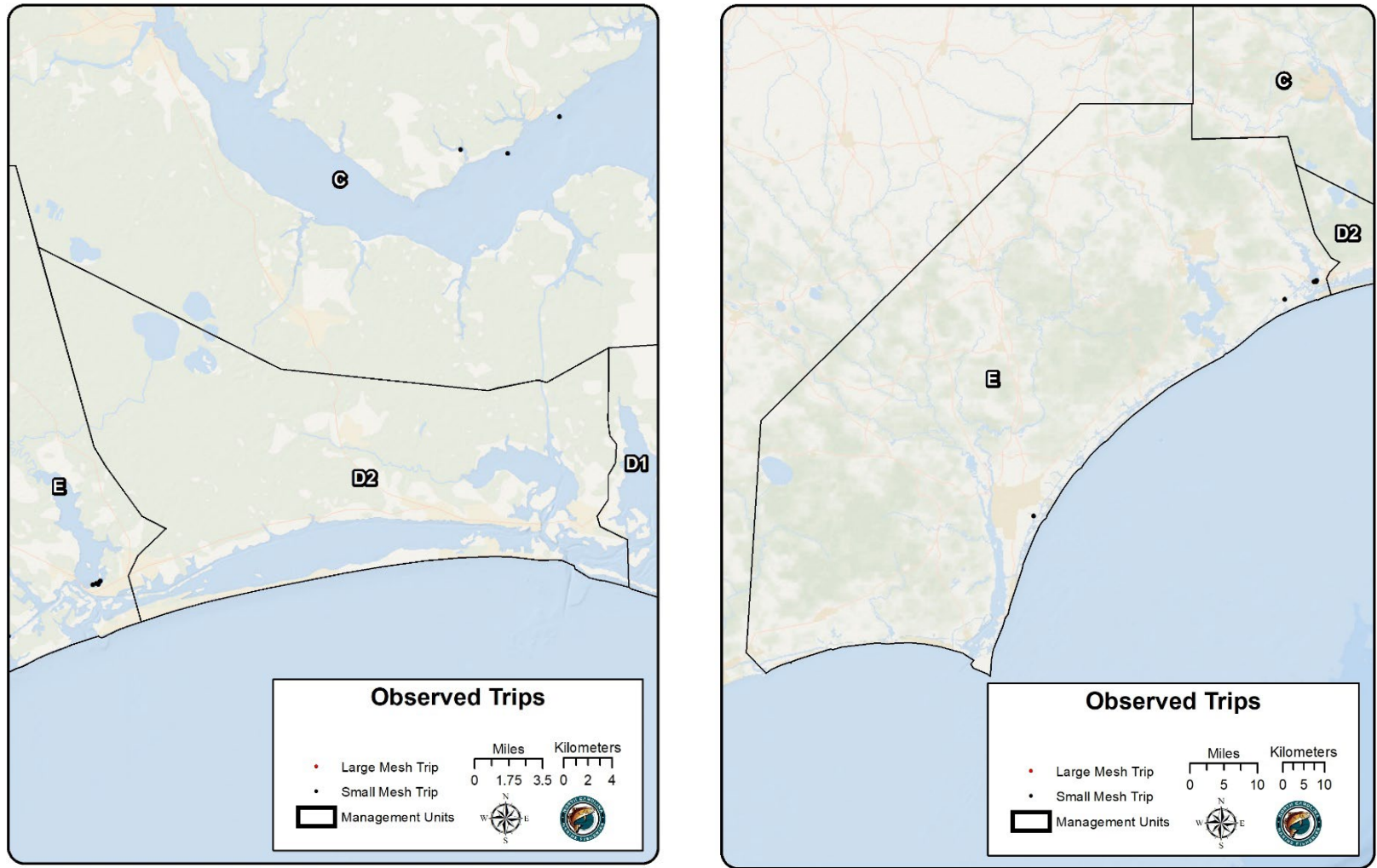


Figure 11. For spring 2020, observed gill-net trips by mesh-size category (large mesh = ≥ 4 inch; small mesh = < 4 inch) for Management Unit D2 (left: 0 large mesh; 0 small mesh) and Management Unit E (right: 0 large mesh; 7 small mesh). Management Units D2 and E were closed to large-mesh gill nets during spring 2020. No sea turtle interactions were observed.

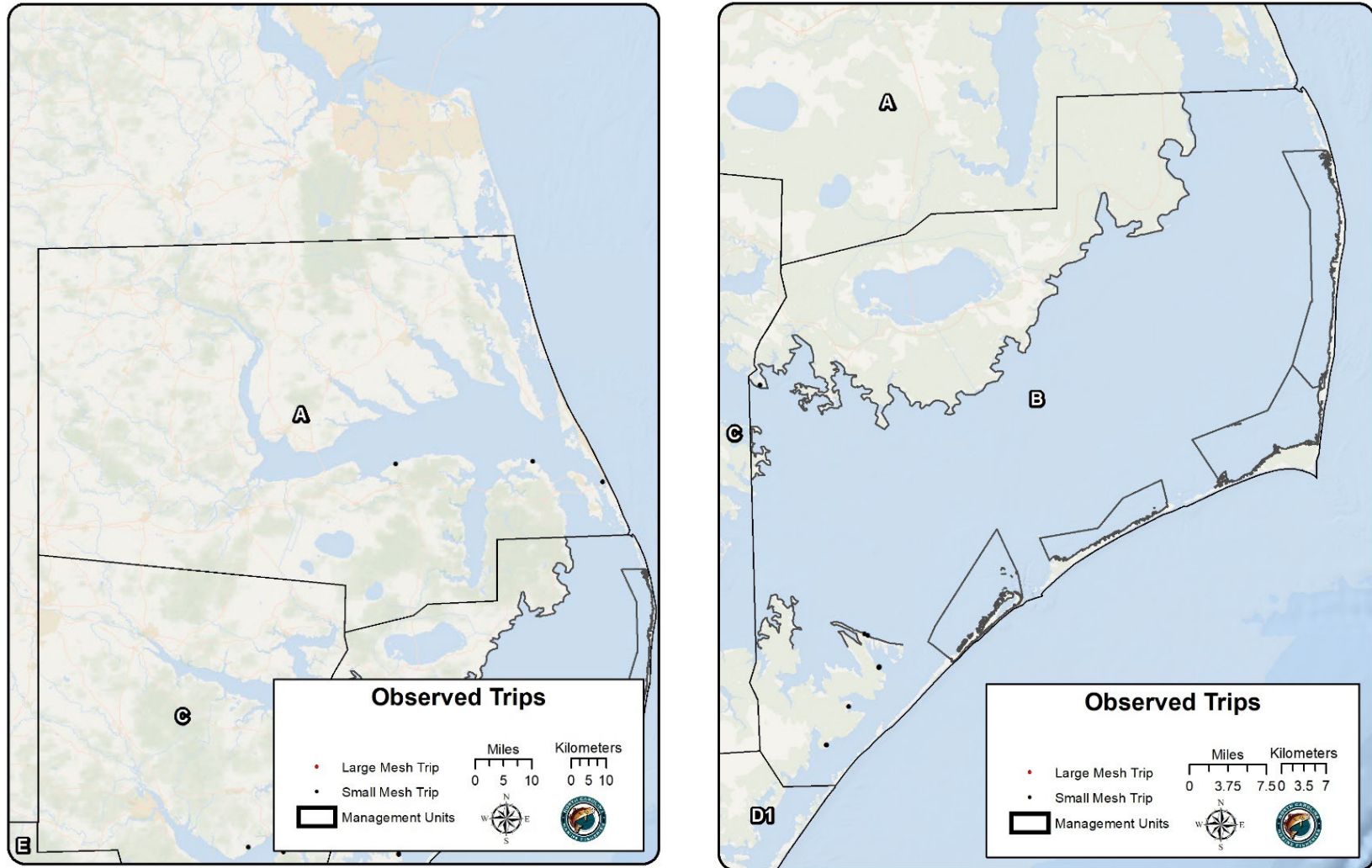


Figure 12. For summer 2020, observed gill-net trips by mesh-size category (large mesh = ≥ 4 inch; small mesh = < 4 inch) for Management Unit A (left: 0 large mesh; 3 small mesh) and Management Unit B (right: 0 large mesh; 9 small mesh). Management Units A and B were closed to large-mesh gill nets during summer 2020. No sea turtle interactions were observed.

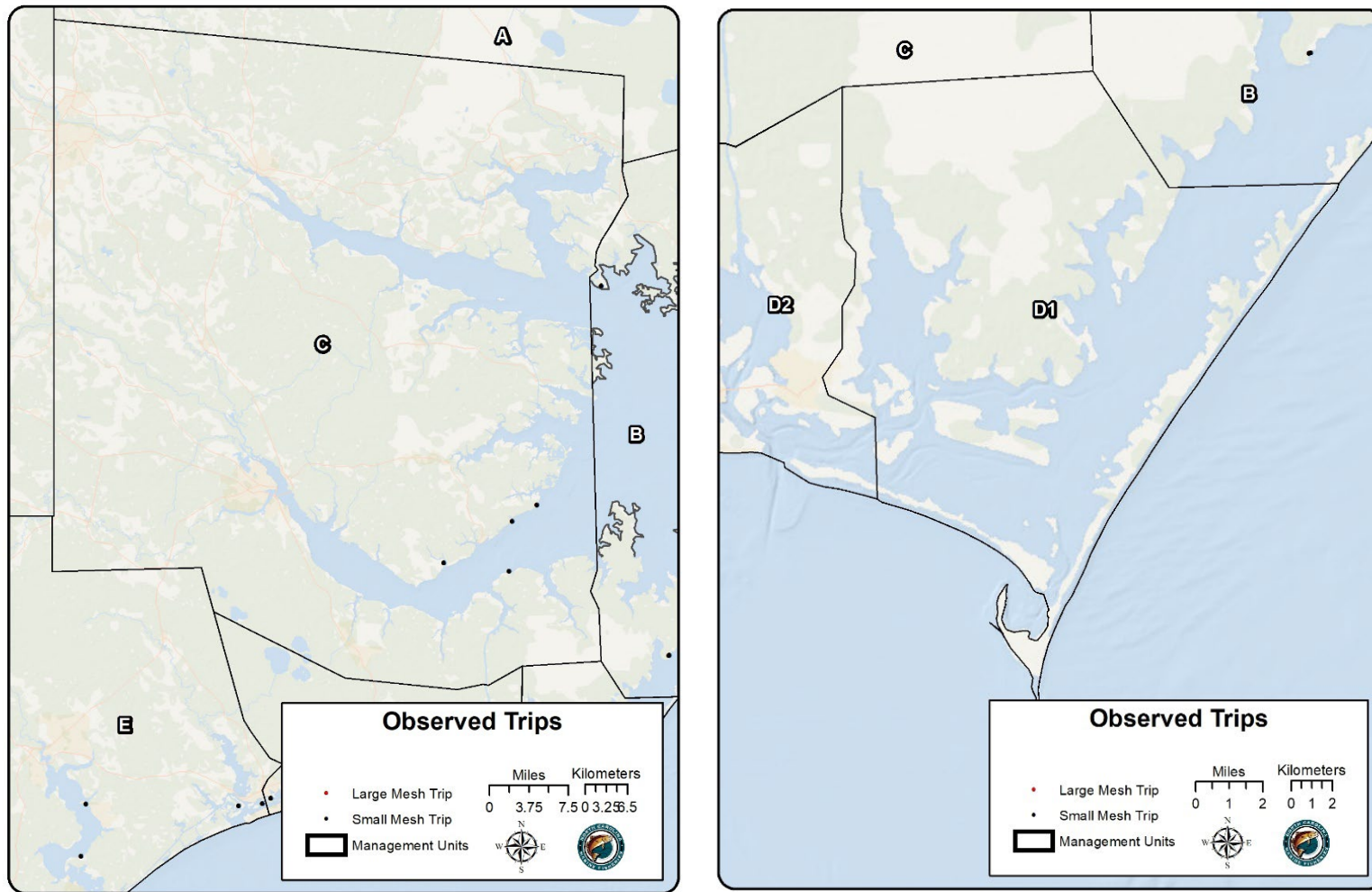


Figure 13. For summer 2020, observed gill-net trips by mesh-size category (large mesh = ≥ 4 inch; small mesh = < 4 inch) for Management Unit C (left: 0 large mesh; 4 small mesh) and Management Unit D1 (right: 0 large mesh; 0 small mesh). Management Units C and D1 were closed to large-mesh gill nets, and D1 was closed to small-mesh gill nets during summer 2020. No sea turtle interactions were observed.

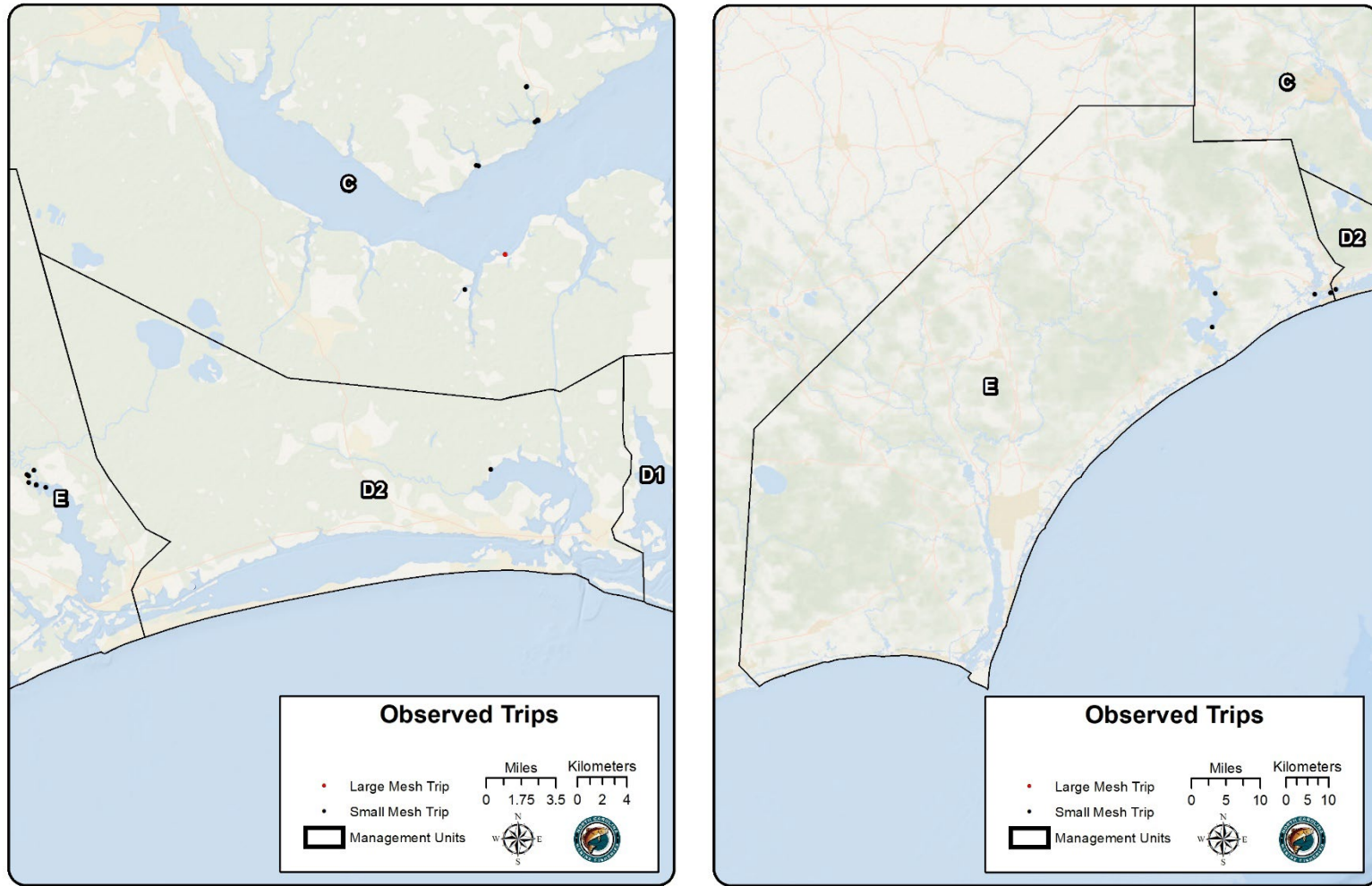


Figure 14. For summer 2020, observed gill-net trips by mesh-size category (large mesh = ≥ 4 inch; small mesh = < 4 inch) for Management Unit D2 (left: 0 large mesh; 1 small mesh) and Management Unit E (right: 0 large mesh; 4 small mesh). Management Units D2 and E were closed to large mesh during summer 2020. No sea turtle interactions were observed.

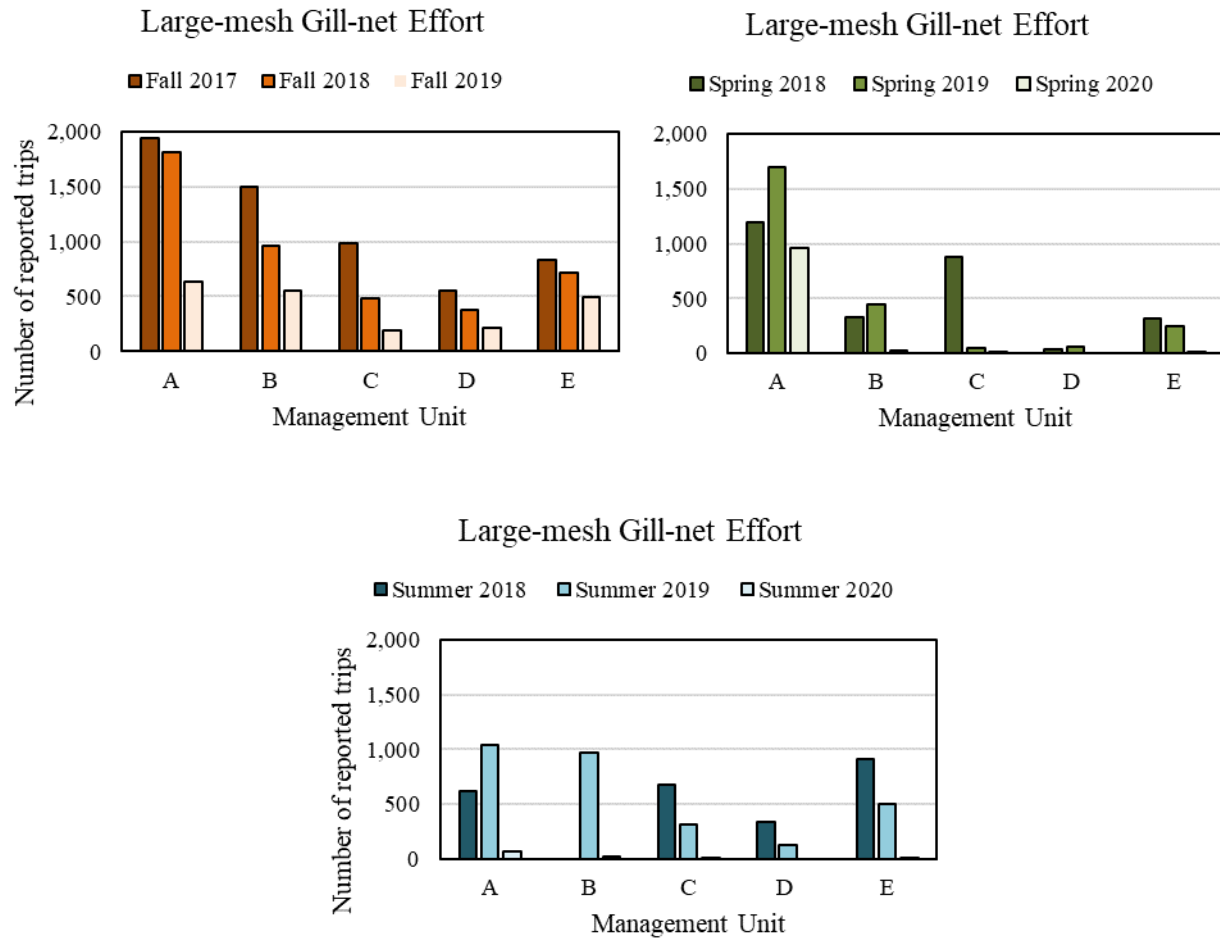


Figure 15. Number of fishing trips using large-mesh (≥ 5 inch) gill nets reported to the Trip Ticket Program during the 2018, 2019, and 2020 ITP Years by season and management unit.

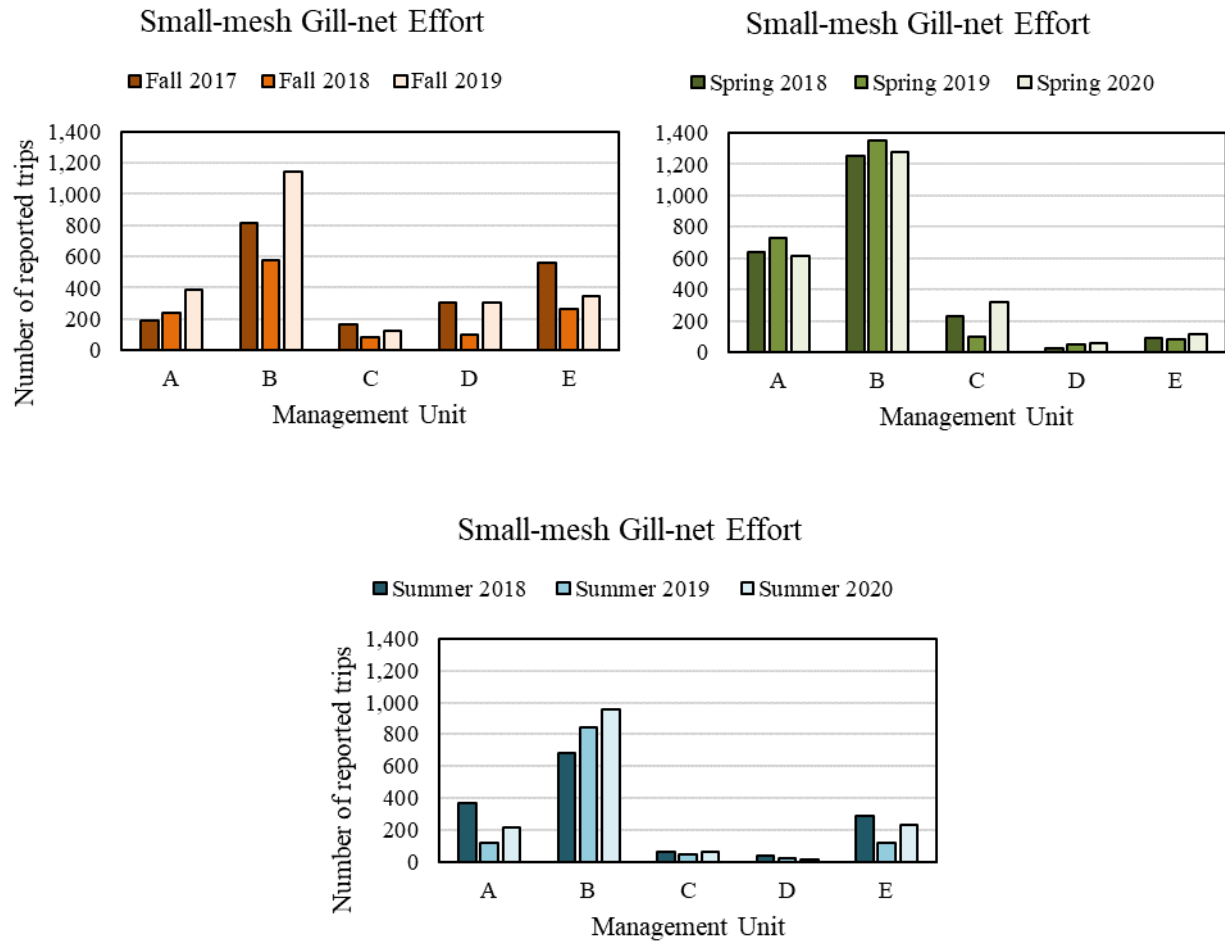


Figure 16. Number of fishing trips using small-mesh (<5 inch) gill nets reported to the Trip Ticket Program during the 2018, 2019, and 2020 ITP Years by season and management unit.

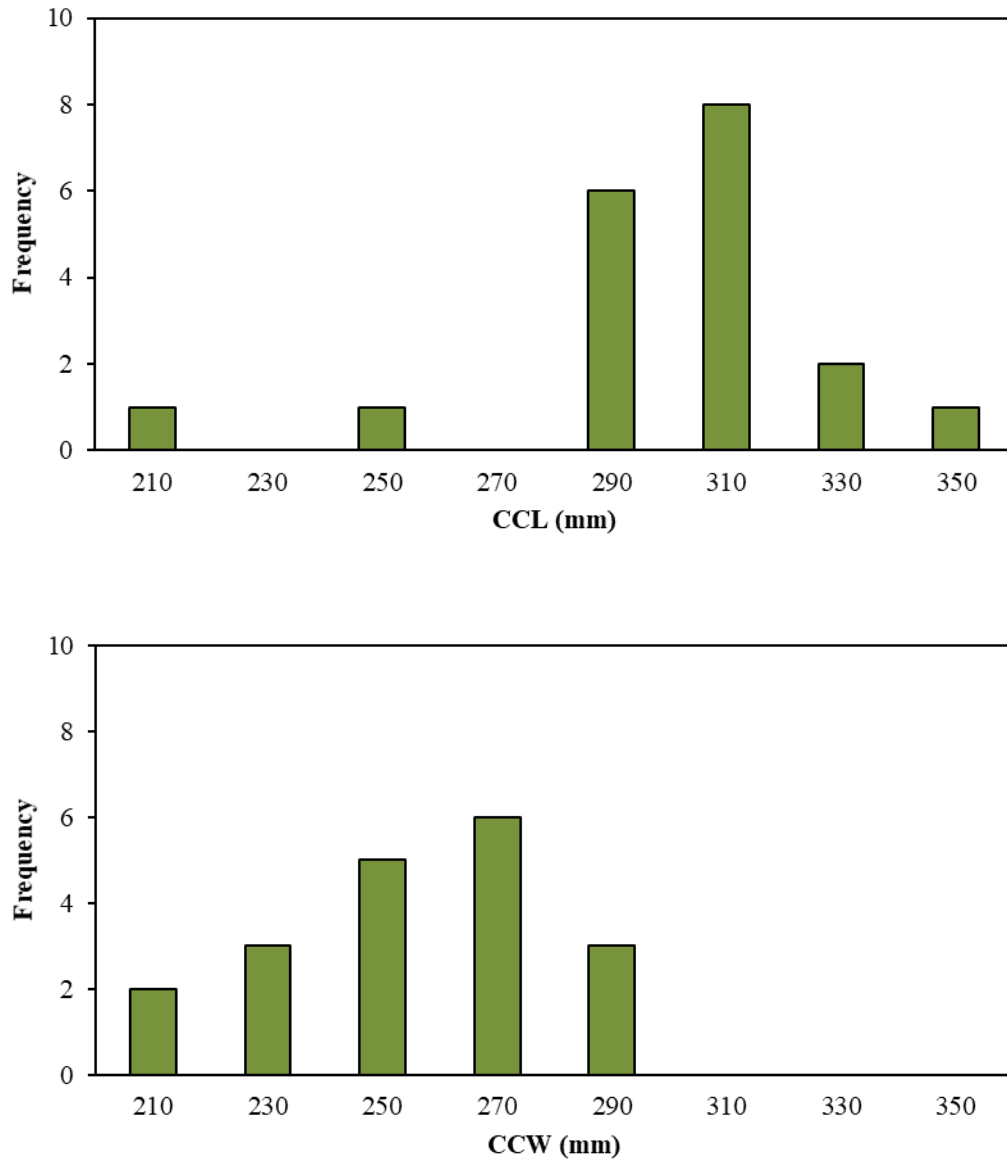


Figure 17. For observed and measured incidental takes of green sea turtles during the 2020 ITP Year (n = 19 of 27 included winter take), length-frequency of (top) curved carapace length (CCL, mm) and (bottom) curved carapace width (CCW, mm).

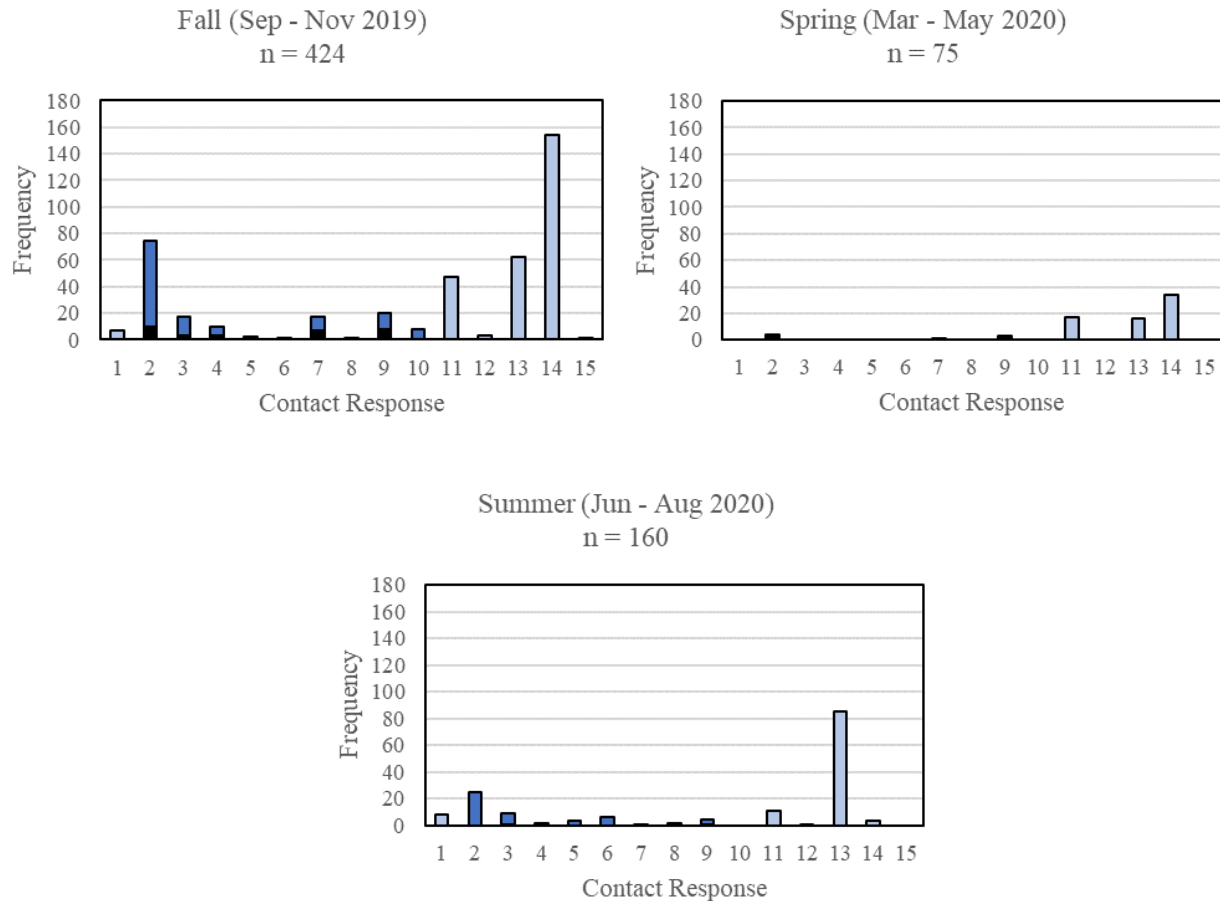


Figure 18. For the 2020 ITP Year, contacts attempted (n = 659) by observers to schedule trips categorized by contact type (0-15) and presented as a percentage of the total for fall, spring, and summer. Contact type categories include the following: 1) Left message with someone else; 2) Not fishing general; 3) Fishing other gear; 4) Not fishing because of weather; 5) Not fishing because of boat issues; 6) Not fishing because of medical issues; 7) Booked trip; 8) Hung up, got angry, trip refused; 9) Call back later time/date; 10) Saw in person; 11) Disconnected; 12) Wrong number; 13) No answer; 14) No answer, left voicemail; 15) Not fishing because of natural disaster (e.g., hurricane). Contact types are shown as those when the observer talked to a fisherman (dark blue bars), when the observer did not (light blue bars), and when the fisherman returned an observer's call (black bars).



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 1315 East-West Highway
 Silver Spring, Maryland 20910

Stephen W. Murphey
 Director, North Carolina Division of Marine Fisheries
 3441 Arendell Street
 P.O. Box 769
 Morehead City, North Carolina 28557

Dear Mr. Murphey:

On May 26, 2020, North Carolina Department of Marine Fisheries (NCDMF) staff contacted NOAA's National Marine Fisheries Service (NOAA Fisheries) Office of Protected Resources requesting clarification of observed sea turtle tagging protocols as required by Permit No. 16230 issued under Section 10 (a)(1)(B) of the Endangered Species Act to incidentally take threatened and endangered sea turtles in gillnet fisheries operating in internal North Carolina (NC) waters. NCDMF staff requested clarification regarding updated flipper and Passive Integrated Transponder (PIT) tagging protocols required in the NOAA Fisheries Southeast Fisheries Science Center (SEFSC) Permit No. 21233-01 for research activities on sea turtles, and the availability of NOAA Fisheries SEFSC personnel to conduct tagging training for NC observers during the COVID-19 pandemic. In response to this request, we have consulted with SEFSC sea turtle staff at the NOAA Beaufort Laboratory, and collaborated with NCDMF staff and the NC Wildlife Resources Commission to conduct an analysis of available sea turtle tagging and recapture data under the current NCDMF incidental take permit.

Tagging of incidentally taken sea turtles is required under the incidental take permit as a mitigation activity to assist in determining the fate of incidentally captured individuals after release. Based on the available data, NCDMF observers (or rehabilitation facilities) have tagged 113 incidentally captured sea turtles (3 loggerhead, 18 Kemp's ridley, and 92 green sea turtles) as part of the current incidental take permit (September, 2013 to October, 2019). Data from the NC Sea Turtle Stranding and Salvage Network Database and the Archie Carr Center for Sea Turtle Research Cooperative Marine Turtle Tagging Program indicate that four of the tagged green sea turtles have been recaptured. Three of these green sea turtles stranded in NC due to cold stunning (one dead, two alive) at least two months after incidental capture, and one green sea turtle stranded in NC dead of undetermined causes approximately one month after incidental capture.

The updated flipper tagging protocols in the SEFSC permit require the use of smaller (1005 series) tags for turtles measuring 20-30 centimeters (cm) in straight carapace length, and standard (681 series) tags for turtles greater than 30 cm in straight carapace length. The updated PIT tagging protocols require researchers with specialized experience, use of a local anesthetic, and use of small needle gauge sizes for applying PIT tags in sea turtles measuring 16-30 cm in straight carapace length. Based on the approximately 200 sea turtles captured under the incidental take permit for which we have carapace measurements, more than 50 percent would require smaller flipper tags, requiring observers to have appropriate training and multiple size



tags available, at a minimum. Given the specialized experience required to apply the smaller tags to smaller turtles, we have determined that it would not be appropriate for observers to flipper or PIT tag these turtles.

Therefore, given the very low recapture rate (3.5 percent), the observer experience and training required to safely tag the size of sea turtles commonly incidentally captured, and the challenges with observers acquiring tagging training during the COVID-19 pandemic, we are modifying the permit to remove the requirement for observers to flipper and PIT tag incidentally captured sea turtles for the remainder of the current incidental take permit (No. 16230, expiring August, 2023). NOAA Fisheries and NCDMF will revisit the tagging requirement when developing any future incidental take permits for gillnet fisheries operating in NC waters as appropriate.

Please sign below to acknowledge that you will comply with this minor permit modification specified in this letter and send a copy of the signed letter to Wendy Piniak on my staff at your earliest convenience.

Please feel free to contact Wendy Piniak (wendy.piniak@noaa.gov) or Kristy Long (kristy.long@noaa.gov) with any questions about this minor modification.

We look forward to continuing to work with you on sea turtle conservation in North Carolina.

Sincerely,

WIETING.DONNA
A.S.1365710607
Donna S. Wieting
Director, Office of Protected Resources

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I acknowledge the minor modification specified above to Permit No. 16230 issued under Section 10 (a)(1)(B) of the Endangered Species Act to incidentally take threatened and endangered sea turtles in gillnet fisheries operating in inshore waters of North Carolina.

Stephen W. Murphey
Director
N.C. Division of Marine Fisheries

Date



ROY COOPER
Governor

JOHN NICHOLSON
Interim Secretary

KATHY B. RAWLS
Director

30 June 2021

Wendy Piniak
Office of Protected Resources (F/PR)
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910

Dear Wendy:

The North Carolina Division of Marine Fisheries (NCDMF) submitted the Annual Completion Report for the Sea Turtle Incidental Take Permit (ITP) No. 16230 in February 2021 for the 2020 ITP Year (September 2019 through August 2020). Since then, the NCDMF Trip Ticket Program (TTP) finalized the 2020 data for reported fishing trips. Using the finalized TTP data, Tables 1, 2, 5, 7, and 8 from the Annual Completion Report were updated to reflect the final estimates of observer coverage and sea turtle takes and are presented in this memo. Although TTP data for fall 2019 were finalized in the Annual Completion Report, small changes to the dataset were found during the recent data pull especially for reported small-mesh gill-net trips. As a reminder, the sea turtle ITP defines large-mesh gill nets as those with ≥ 4 -inch webbing, but the TTP data are categorized as large-mesh gill nets for those with ≥ 5 -inch webbing. Because it is uncommon for gill nets to have a mesh size between these two sizes (see Annual Completion Report), we assumed effort by mesh categories in the TTP dataset would not be greatly affected by the difference in definitions of mesh size between the ITP and the TTP.

Anchored Large Mesh

Using finalized TTP data, there were 3,045 reported large-mesh gill-net trips during fall, spring, and summer seasons of the 2020 ITP Year (Table 1), a net difference of 131 trips fewer than reported in the Annual Completion Report. Most of the difference ($n=124$ trips) was due to trips being reported originally in management units during periods when anchored large-mesh gill nets were prohibited. These trips could be reporting errors by the seafood dealer or illegal trips. The TTP is in the process of reviewing these reports; so far, they have identified reporting errors. The remaining difference of seven trips was spread among Management Unit B during fall (additional two trips), and management units A (six fewer trips) and C (three fewer trips) during spring. The finalized data affected percent observer coverage for a given season only slightly (0.3% or less) and did not push observer coverage over the 7% threshold for management units and seasons that were $<7\%$ with preliminary data.

Anchored Small Mesh

Using finalized TTP data, there were 5,634 reported small-mesh gill-net trips during fall, spring, and summer seasons of the 2020 ITP Year (Table 2), a net difference of 491 trips fewer than reported in the Annual Completion Report. The net difference in the finalized data was due primarily to a reduction in reported trips during fall (125 fewer trips) and spring (391 fewer trips). The finalized data affected percent observer coverage for a given season only slightly but did increase percent observer coverage as high as 4.5% for some management units within a season (e.g., Management Unit C during summer). However, only in Management Unit B during spring did the finalized data change the percent observer coverage from below the 1% threshold (0.9) to above it (1.1%).

Sea Turtle Takes

The NCDMF's ITP outlines authorized levels of annual incidental takes that are expressed as either estimated total takes based on observer data or counts of observed takes. For the combinations of species, management unit, and gear type where annual takes need to be estimated, those estimates were recalculated using the finalized 2020 TTP data. The number of estimated sea turtle takes using finalized TTP data was lower than the Annual Completion Report for green sea turtles in management unit B (alive: 94.7 vs 127.7, dead: 51.9 vs 61.3), but there was no difference to the number of estimated takes for green sea turtles in management unit E (Table 3). Additionally, the actual count of observed sea turtle takes in the Annual Completion Report was missing one green turtle in Table 2, but not Table 5. The relevant table was revised and included in this memo (Table 4). Overall, the annual sea turtle takes for all species during the 2020 ITP Year remained well below authorized thresholds (Table 5). The updates presented here, like the Annual Completion Report, do not include the observed interaction of an unidentified sea turtle during fall in Management Unit B or the observed interaction of a green sea turtle in Management Unit B during winter observations to monitor for Atlantic sturgeon interactions.

Sincerely,



Barbie L. Byrd
NC Division of Marine Fisheries
NC Department of Environmental Quality
3441 Arendell Street / P.O. Box 769
Morehead City, NC 28557

cc: Kathy Rawls, Dee Lupton, Steve Poland, John McConnaughey, Meghan Gahm, and Scott Smith (NCDMF); Kristy Long, Celeste Stout, and Angela Somma (NMFS)

Table 1. For large-mesh gill nets, percent observer coverage calculated from observer data (≥ 4 inch) and finalized reported fishing trips (≥ 5.0 inch) from the Trip Ticket Program (TTP) by season and management unit for the 2020 ITP Year. Differences are shown for the number of fishing trips and percent observer coverage using finalized versus preliminary TTP data as reported in the Annual Completion Report; positive numbers indicate more reported trips or higher coverage using finalized data while negative numbers indicate fewer reported trips or lower coverage. “closed” represents when/where anchored large-mesh gill nets were prohibited. Gray cells represent occurrences of reported fishing trips presented in the Annual Completion Report for closed areas. The TTP has identified errors in reporting and those trips are not included here.

Season	Management Unit	Large Mesh				
		Reported Fishing Trips	Observed Trips	Percent Observer Coverage	Difference in Fishing Trips	Difference in Observer Coverage
Fall 2019	A	636	81	12.7	0	0.0
	B	555	30	5.4	2	-0.02
	C	190	29	15.3	0	0.0
	D1	closed	closed	closed	closed	closed
	D2	217	12	5.5	0	0.0
	E	493	56	11.4	0	0.0
	Overall	2,091	208	9.9	2	-0.01
Spring 2020	A	953	41	4.3	-6	0.03
	B		closed	closed	-31	closed
	C	1	0	0.0	-3	0.00
	D1	closed	closed	closed	0	closed
	D2	closed	closed	closed	0	closed
	E		closed	closed	-3	closed
	Overall	954	41	4.3	-43	0.2
Summer 2020	A		closed	closed	-65	closed
	B		closed	closed	-18	closed
	C		closed	closed	-1	closed
	D1	closed	closed	closed	closed	closed
	D2	closed	closed	closed	closed	closed
	E		closed	closed	-6	closed
	Overall		closed	closed	-90	closed
All Seasons		3,045	249	8.2	-131	0.3

Table 2. For small-mesh gill nets, observer coverage calculated from observer data (< 4 inch) and finalized reported fishing trips (< 5.0 inch) from the Trip Ticket Program (TTP) by season and management unit for the 2020 ITP Year. Differences are shown for the number of fishing trips and percent observer coverage using finalized versus preliminary TTP data as reported in the Annual Completion Report; positive numbers indicate more reported trips or higher coverage using finalized data while negative numbers indicate fewer reported trips or lower coverage. On April 4 2020, Management Unit D1 was closed to anchored small-mesh gill nets.

Season	Management Unit	Small Mesh				
		Reported Fishing Trips	Observed Trips	Percent Observer Coverage	Difference in Fishing Trips	Difference in Observer Coverage
Fall 2019	A	383	5	1.3	0	0.0
	B	1,047	12	1.1	-93	0.1
	C	122	3	2.5	-2	0.04
	D1	68	1	1.5	4	-0.1
	D2	204	13	6.4	-34	0.9
	E	345	23	6.7	0	0.0
	Overall	2,169	57	2.6	-125	0.1
Spring 2020	A	623	2	0.3	11	-0.01
	B	1,127	12	1.1	-147	0.1
	C	89	4	4.5	-226	3.2
	D1	closed	closed	closed	closed	closed
	D2	25	0	0.0	-14	0.0
	E	110	7	6.4	-1	0.1
	Overall	1,974	25	1.3	-391	0.2
Summer 2020	A	270	3	1.1	58	-0.3
	B	948	9	0.9	-11	0.01
	C	35	4	11.4	-23	4.5
	D1	closed	closed	closed	closed	closed
	D2	10	1	10.0	-1	0.9
	E	228	4	1.8	2	-0.02
	Overall	1,491	21	1.4	25	-0.02
All Seasons		5,634	103	1.8	-491	0.1

Table 3. For large-mesh (≥ 4 inch) gill nets, annual estimated authorized and actual takes of sea turtles by species and Management Units B, D1, D2, and E during fall, spring, and summer of the 2020 ITP Year. Estimated actual takes were calculated from observer data and finalized Trip Ticket Program data. 95% confidence intervals are provided in parentheses. Annual estimated takes for green sea turtles in D2 are not applicable (n/a) because authorized takes are expressed as counts (see Table 4).

Species	B				D1				D2			
	Estimated Takes				Estimated Takes				Estimated Takes			
	Authorized		Actual		Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	225	112	94.7 (41.4, 186.7)	51.9 (17.4, 109.3)	9	5	0	0	n/a	n/a	n/a	n/a
Kemp's ridley	53	26	0	0	15	7	0	0	6	3	0	0
Total	278	138	94.7	51.9	24	12	0	0	6	3	0	0

Species	E				Total			
	Estimated Takes				Estimated Takes			
	Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	96	48	5.7 (0, 17.2)	0	330	165	100.4	51.9
Kemp's ridley	24	13	0	0	98	49	0	0
Total	120	61	5.7	0	428	214	100.4	51.9

Table 4. For large-mesh (≥ 4 inch) gill nets, annual authorized and actual observed (not estimated) takes of sea turtles by species and Management Units B, D1, D2, and E during fall, spring, and summer of the 2020 ITP Year. Authorized and actual observed take counts are not applicable (n/a) for green sea turtles in Management Unit E and Kemp's ridley sea turtles in Management Units B, D1, D2, and E because authorized takes are expressed as estimates, not counts (see Table 3). An additional interaction green sea turtle was recorded during winter observations to monitor for Atlantic sturgeon interactions in management Unit B.

Species	B		D1		D2		E		Total	
	Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)	
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual
Green	n/a	n/a	n/a	n/a	6	3	n/a	n/a	6	3
Kemp's ridley	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hawksbill	1	0	1	0	1	0	1	0	4	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	0	3	0	3	0	3	0	12	0
Total	5	0	5	0	11	3	5	0	26	3

Table 5. Total annual authorized and actual takes (observed and estimated) of sea turtles by species and for estimated takes by condition during fall, spring, and summer of the 2020 ITP Year using finalized Trip Ticket Program data. Annual estimated takes for hawksbill, leatherback, and loggerhead sea turtles are not applicable (n/a) because authorized takes are expressed as counts.

Species	Observed		Estimated			
	Authorized	Actual	Authorized		Actual	
	Alive/Dead	Alive/Dead	Alive	Dead	Alive	Dead
Green	18	3	330	165	100.4	51.9
Hawksbill	8	0	n/a	n/a	n/a	n/a
Kemp's ridley	12	0	98	49	0	0
Leatherback	8	0	n/a	n/a	n/a	n/a
Loggerhead	24	0	n/a	n/a	n/a	n/a
Any Species	8	0	n/a	n/a	n/a	n/a
Total	78	3	428	214	100.4	51.9