



Annual Sea Turtle Interaction Monitoring of the Anchored Gill-Net Fisheries
in North Carolina for Incidental Take Permit Year 2019
(1 September 2018 – 31 August 2019)

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; limited days of fishing to Monday evenings through Friday morning; 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 Units D2 (Figure 1) were allowed to set large-mesh gill nets an extra day (Sunday evenings through Friday mornings), but 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 where possible extrapolated across the fishery within a given season and area. Observer data also would allow the NCDMF to use 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 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 also to estimate total bycatch. 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.

In early September 2018 North Carolina suffered a direct hit by Hurricane Florence, dramatically affecting fishing and observation effort in estuarine gill-net fisheries during the 2019 ITP Year. The effects occurred prior to the storm due to preparation and evacuations, and after the storm due to the catastrophic damage to roads, structures, and electrical infrastructure in many areas. Although the NCDMF Central District Office (CDO), where Observer Program operations were located, reopened 24 September, four observers had significant damage to their homes that delayed their return to work. Three of them were left homeless and had to collect their belongings and secure new housing; the other observer was unable to return to their home until early October. Once commercial fishing resumed, communicating with commercial fishermen and traveling to obtain trips proved to be difficult because of clean-up efforts, power outages, flooding, and storm debris. Additionally, Marine Patrol officers, who usually contribute a considerable amount of gill net observations, were unable to conduct observations for some time because of new storm-related tasks. Not only did Marine Patrol officers rescue over 60 people, they conducted numerous wellness checks, provided meals and supplies to disaster victims, assisted other law enforcement agencies with securing property, and even managed to rescue storm victim's pets.

Two regulations in place during the 2019 ITP Year also greatly affected gill-net fishing effort. First, Proclamation M-19-2017, issued in October 2017 (2018 ITP Year), remained in effect for the entire 2019 ITP Year (<http://portal.ncdenr.org/web/mf/proclamation-m-19-2017>). This proclamation closed Management Unit D1 to gill nets with a mesh size of ≥ 4 inches as a result of high levels of incidental green sea turtle takes that exceeded authorized levels during the 2018 ITP Year. In an effort to avoid exceeding authorized levels again during the 2019 ITP Year, the decision was made to maintain the partial closure of Management Unit D1. A separate proclamation was issued on 18 March that prohibited the use of all gill nets upstream of the ferry lines from the Bayview Ferry to Aurora Ferry on the Pamlico River and the Minnesott Beach Ferry to Cherry Branch Ferry on the Neuse River (<http://portal.ncdenr.org/web/mf/proclamation-m-06-2019>). During an emergency meeting, the North Carolina Marine Fisheries Commission directed the NCDMF Director to issue the proclamation with the intent of reducing bycatch of striped bass in gill-net fisheries operating in the affected waters, which are part of Management Unit C.

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 2018) (McConnaughey 2018), spring (March-May 2019) (McConnaughey 2019a), and summer (June-August 2019) (McConnaughey 2019b). 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. The deadline for annual reports is the last day in February. However, requests were made by the NCDMF to extend the report deadline into April for one year only due to staffing vacancies and changes that delayed the report generation, and also work interruptions from the coronavirus pandemic. This annual report outlines observer activity, fishing activity, and total or estimated takes of sea turtles for the

2019 ITP Year, 1 September 2018 – 31 August 2019. Data for fishing activity, measured in number of trips, are finalized for fall 2018. After the preliminary data for spring and summer 2019 are finalized in May 2020, 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). Management Unit B is unique in that large-mesh gill nets operating in Pamlico Sound were confined to specific subunits (Shallow Water Gillnet Restricted Area [SGNRA] 1, SNGRA2, SNGRA3, SGNRA4, and Mainland Gillnet 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. 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. No coverage of large-mesh trips was assigned to Management Unit D1 because it was closed to ≥ 4 -inch mesh gill nets for the entire 2019 ITP Year (M-19-2017). (<http://portal.ncdenr.org/web/mf/proclamation-m-19-2017>).

Each observer attempted to obtain three to four trips per working week when fishing activity was occurring. Observers were assigned a management unit to work weekly, and the number of observers assigned to a management unit depended upon the season and projected fishing effort. 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 then given to observers assigned to specific management units so they could attempt to schedule an onboard trip. Preliminary TTP information was also used to identify individuals who were actively participating in fishing activities. In addition to calling fishermen, observers visited fish houses where they provided

business cards and brochures explaining the Observer Program, giving the fishermen another outlet to allow observers on their vessels. Additionally, the Observer Program used a website (<http://portal.ncdenr.org/web/mf/observers-program>) to provide outreach to fishermen to facilitate obtaining trips.

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. Coordination of onboard, alternative platform, and Marine Patrol alternative platform trips was done 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 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, resuscitate, and tag sea turtles (depending on turtle size and accessibility) by experienced NCDMF and NMFS (Beaufort, NC) staff. Data collected on observed sea turtles included: date, time, tag numbers, location (latitude and longitude, when possible), condition (i.e., 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 (i.e., 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. Data were coded onto NCDMF data sheets and uploaded to the NCDMF Biological Database for analysis. All 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 (2014-2018) (large-mesh = ≥ 5 inch, small-mesh = < 5 inch) by season and management unit. Reduced season dates in each management unit were taken into account by calculating the proportion of actual to possible fishing days. 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. 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 2018 (fall) were finalized, but the data for 2019 (spring and summer) were preliminary. As a result, observer coverage calculated for spring and summer were considered estimates.

Reductions in fishing effort, particularly for large-mesh gill nets was expected due to Hurricane Florence and the regulations for Management Units C and D1. As such, the percent change in fishing effort with large-mesh (≥ 5 inch) and small-mesh (< 5 inch) gill nets, as defined by the TTP, between the 2018 and 2019 ITP Years was calculated by management unit and season.

2.2 Incidental Takes

Authorized levels of annual incidental takes outlined in the ITP were expressed as either estimated total takes based on observer data or counts of observed takes (Tables 1-5). Authorized levels of observed (not estimated) interactions were necessary for some combinations of species, management unit, and gear type due to insufficient data available for modeling predicted estimated takes in the ITP application (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 2019 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.

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

Throughout each season, this calculation was employed each time there was an 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 2019, 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 2015). Bootstrap replicates were

generated by sampling observer trips with replacement 5,000 times within strata (mesh/season/management unit).

2.3 Compliance

The NCDMF observers and/or Marine Patrol conducted weekly fish house visits, boat patrols, fisherman spot checks, gear checks, and continual outreach to the industry, attempting to facilitate industry compliance and to track gill-net fishing effort in near real time.

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). Data in the contact log was summarized by month and response category to determine what percentage of phone calls resulted in observer trips.

3 RESULTS

3.1 Observer Activity

Overall observer coverage during the 2019 ITP Year was 7.4% of the large-mesh gill-net fishery and 3.1% of the small-mesh gill-net fishery (Tables 7 and 8, Figure 2). This level of coverage was based on 729 large-mesh gill-net trips (243 onboard and 486 alternative platform) and 145 small-mesh gill-net trips (43 onboard and 102 alternative platform) during fall, spring, and summer. Only five out of 874 (<1%) observed trips recorded a mesh size ≥ 4 and < 5 inch; in each case the mesh size was exactly 4 inches. Across all trips, observers documented 22 sea turtles in large-mesh gill nets and zero in small-mesh gill nets (Table 9). A series of proclamations was issued throughout the ITP Year to regulate gill-net fisheries as part of the adaptive management approach to limit sea turtle or Atlantic sturgeon takes and for other management needs unrelated to protected species interactions (Table 10). As a result, changes in fishing activity influenced the Observer Program's efforts to find trips and maintain coverage level.

3.1.1 Fall 2018

During fall 2018 (September – November), the Observer Program achieved 7.6% state-wide coverage of large-mesh gill nets, and exceeded 7% in all management units (Table 7, Figures 3–8; McConnaughey 2018). Although D1 was closed to large-mesh gill nets during the 2019 ITP Year (M-19-2017), there was one observed trip and one reported trip during fall 2018. For small-mesh gill nets, the Observer Program achieved 4.2% state-wide coverage, and exceeded 1% coverage in all management units (Table 8, Figures 3 – 8) (McConnaughey 2018).

There were four observed sea turtle interactions in large-mesh gill nets (Table 9, Figures 3–8) and none observed in small-mesh gill nets during fall (McConnaughey 2018). Three of the four were green sea turtles ($n = 3$ alive; $n = 0$ dead) and one was a Kemp's ridley sea turtle ($n = 1$

alive; n = 0 dead). All four turtles were observed in Management Unit B. No fisherman self-reported sea turtle interactions were reported (Table 11).

3.1.2 Spring 2019

During spring 2019 (March – May), the Observer Program achieved an estimated 7.6% state-wide coverage of large-mesh gill nets, and exceeded 7% in each management unit except Management Units A (5.9%) and B (6.5%) (Table 7, Figures 9 – 14) (McConnaughey 2019a). Management Unit D1 was closed to large-mesh gill nets for the entire season (M-19-2017). For small-mesh gill nets, the Observer Program achieved an estimated 3.4% state-wide coverage, and exceeded 1% in all management units except Management Units D2 where only nine trips were reported and no observed trips occurred (Table 8; Figures 9 – 14) (McConnaughey 2019a).

There were four observed sea turtle interactions in large-mesh gill nets and none observed in small-mesh gill nets during spring (Table 9, Figures 9 – 14). The interactions comprised two green sea turtles (n = 1 alive; n = 1 dead) and two Kemp's ridley sea turtles (n = 2 alive; n = 0 dead). One of the green sea turtles was observed in D2; the remaining sea turtles were observed in E. No fisherman self-reported sea turtle interactions were reported (Table 11).

3.1.3 Summer 2019

During summer 2019 (June – August), the Observer Program achieved an estimated 7.1% state-wide coverage of large-mesh gill nets, and exceeded 7% in each management unit except Management Units A (4.5%) and B (3.4%) (Table 7, Figures 15 – 20) (McConnaughey 2019b). Management Unit D1 was closed to large-mesh gill nets for the entire season (M-19-2017). For small-mesh gill nets, the Observer Program achieved an estimated 1.1% state-wide coverage. Observer coverage exceeded 1% coverage in all management units except Management Units B where no observed trips occurred and 844 fishing trips were reported, as well as in D1 where no observed trips occurred and four fishing trips were reported (Table 8, Figures 15–20) (McConnaughey 2019b).

Fourteen of the 22 (63.6%) observed sea turtle interactions during the 2019 ITP Year occurred during summer. Half (n = 7 of 14) of the observed interactions during summer occurred in Management Unit B, followed by D2 (n = 4), E (n = 2), and A (n = 1). All 22 interactions occurred in large-mesh gill nets (Table 9, Figures 15 – 20) (McConnaughey 2019b). The interactions comprised 10 green sea turtles (n = 9 alive; n = 1 dead), two Kemp's ridley sea turtles (n = 2 alive; n = 0 dead), one loggerhead sea turtle (n = 1 alive; n = 0 dead), and one live turtle that was not identified because the fisherman discarded it. Of the green sea turtles recovered alive, one had significant carapace fractures and was transferred to the Karen Beasley Sea Turtle Rescue and Rehabilitation Center (KBSTRRC) (Figure 21). The fractures were not fresh and, as such, were not a result of the entanglement. After concluding that the turtle could not successfully recover from its injuries, and with authorization through the US Fish and Wildlife Service and NCWRC, the turtle was euthanized the next day under veterinary supervision. Subsequent necropsy confirmed the severe damage to the carapace, the underlying spine and the left lung (Matthew Godfrey, NCWRC, pers. comm.). Additionally, there were three fisherman self-reported sea turtle interactions in large-mesh gill nets; two were reported for Management Unit A and the other for Management Unit C (Table 11).

3.1.4 Changes in Fishing Effort

Overall fishing effort (measured by trips) during the 2019 ITP Year compared to the 2018 ITP Year was 11.8% lower for large-mesh (≥ 5 inch) gill-net trips and 17.1% lower for small-mesh (< 5 inch) gill-net trips. The patterns among seasons and management units showed the effects of Hurricane Florence and regulation changes between years for gill nets in Management Units B, C, and D1 (Figure 22). Large-mesh and small-mesh fishing effort during fall of the 2019 ITP Year (when Hurricane Florence hit) was lower than the 2018 ITP Year for all management units except one. In Management Unit A, small-mesh fishing effort increased slightly from 193 trips during fall 2017 to 239 trips during fall 2018. For large-mesh gill nets, one of the most striking changes between ITP years was during summer in Management Unit B, which was closed during summer 2018 (M-7-2018) to ≥ 4 -inch mesh gill nets. As a result, no fishing effort was reported during summer 2018, but effort increased to 974 trips during summer 2019 when the closure was no longer in effect. During spring and summer, reductions in large-mesh fishing effort between the 2018 and 2019 ITP Years in Management Unit C were likely a result of gill-net closures in upstream areas of the Neuse and Pamlico Rivers. The closure of ≥ 4 -inch mesh gill nets in Management Unit D1 (implemented during fall 2017) was apparent in the absence of reported large-mesh trips there during spring and summer. Outside of fall, small-mesh fishing effort among management units was more variable, not exhibiting specific trends.

3.2 Incidental Takes

Across seasons, most of the 22 observed sea turtle interactions in large-mesh gill nets were green sea turtles ($n = 15$) followed by Kemp's ridley sea turtles ($n = 5$) (Table 9, Figure 2) (McConnaughey 2018, 2019a, 2019b). The majority of observed takes were recovered alive (20 out of 22). However, as mentioned above, the one injured green turtle that was taken to the KBSTRRC was euthanized the following day. Although the carapace fractures were not due to the entanglement, the animal was included in the dead category for estimation of total observed takes. Green sea turtles ($n = 15$) ranged from 230 to 332 mm CCL (mean = 276.4, SD = 30.2) and 196 to 275 mm CCW (mean = 239.5, SD = 25.0) (Figures 23 and 24). Kemp's ridley sea turtles ($n = 5$) ranged from 228 to 343 mm CCL (mean = 282.6, SD = 41.8) and from 240 to 323 mm CCW (mean = 279.2, SD = 37.1) (Table 9, Figures 23 and 24). The single loggerhead sea turtle was 640 mm CCL and 650 mm CCW; the unidentified sea turtle could not be measured.

Observed interactions occurred primarily in Management Unit B (50%), followed by Management Unit D2 (23%), Management Unit E (23%), and Management Unit A (5%) (Table 9; Figure 2). Of the 22 observed interactions, the majority (64%) occurred during summer with fall and spring each contributing half of the remaining interactions. No interactions were documented in Management Unit C or in Management Unit D1, which was closed for the entire 2019 ITP Year. All three fisherman self-reported sea turtle interactions occurred in large-mesh gill nets during summer; two in Management Unit A and one in Management Unit C (Table 11).

Observed take levels during the 2019 ITP Year did not reach the thresholds of allowed takes for any species or management unit (Tables 1 – 5) (McConnaughey 2018, 2019a, 2019b). Of the thresholds expressed as counts of observed takes (not estimated), green sea turtle takes during the 2019 ITP Year reached only 16.7% of the threshold and loggerhead takes reached 4.2% of the threshold (Table 5). The one green sea turtle observed in Management Unit A was grouped with the authorized level of eight observed takes of "any species" in Management Units A & C,

equaling 12.5% of the threshold. Of the separate thresholds expressed as estimated totals of observed takes, green sea turtle takes during the 2019 ITP Year reached 41.4% of the live threshold and 6.6% of the dead threshold, and Kemp's ridley sea turtle takes reached 25.2% of the live threshold (no dead takes).

3.3 Compliance

There were 2,217 EGNPs issued during the 2019 ITP Year. Using the list of EGNPs, 4,305 phone calls or in-person contacts were made with 42.6% (n = 1,832) representing categories for which the observer was able to get speak with a fisherman (categories 2-10, and 15) (Figure 25). Of those 1,832 contacts, observers booked a trip 9.8% (n = 180) of the time. The greatest number of calls was in spring and the least number of calls was in summer. Nevertheless, the general pattern of distribution across contact response types was similar across all seasons.

Marine Patrol made 1,431 gill-net checks and issued 74 citations during the 2019 ITP Year (Tables 12 – 13). The number of gill net checks were spread out across seasons. Of the 74 citations, half (50%) were issued during fall 2018. In addition to citations, officers issued 31 Notice of Violations (NOV) for fishermen found to be out of compliance with the EGNP (Table 14).

3.4 Marine Mammals

There was no observed marine mammal interaction during the 2019 ITP Year.

4 DISCUSSION

Incidental takes of sea turtles during the 2019 ITP Year were below authorized levels as a result of a combination of management actions as outlined in the ITP, an adaptive management strategy for sea turtles and Atlantic Sturgeon, management actions for other species, and decreased fishing effort due to Hurricane Florence. The number of observed interactions was less than half of the number for the 2018 ITP Year. The most notable differences were the large decrease in observed interactions during fall 2018 (n = 4) compared to fall 2017 (n = 37), and increase in observed interactions during summer 2018 (n = 14) compared to summer 2019 (n = 2) (McConnaughey et al. 2019). During the 2019 ITP Year, observed sea turtle interactions were primarily green sea turtles during summer in Management Unit B with fewer interactions in other combinations of seasons and management units. It was not possible to identify spatiotemporal patterns of Kemp's ridley takes given that only five were observed. All observed sea turtle takes occurred in large-mesh gill nets. Southern Flounder was the primary target species of large-mesh gill-net fishermen in all open management units. Other target species included American Shad (*Alosa sapidissima*) and the invasive Blue Catfish (*Ictalurus furcatus*), particularly in Management Unit A. During the 2019 ITP Year, the NCDMF issued eleven proclamations that allowed these fisheries to operate during certain times while monitoring and limiting incidental takes of protected sea turtle species using observer data in near real time (Table 10). The NCDMF successfully employed an adaptive management strategy for Management Unit D2 using proclamation M-12-2019 to close the area due to approaching allowable take numbers for Kemp's ridley sea turtles. Management unit D1 remained closed for

the entire 2019 ITP Year due to exceeding allowable green sea turtle take numbers in the fall of 2017 during the 2018 ITP Year.

Overall minimum coverage levels were met or exceeded for large-mesh and small-mesh gill nets when combined across the ITP year and management units. However, for particular combinations of mesh category, season, and individual management unit, minimum levels were not always reached. The observer program actively monitors gill-net fisheries and makes real-time adaptations to shifts in activity due to events such as fishery closures in certain areas or changes in targeted fish species. For the large-mesh gill net fishery, observer coverage was below 7% in Management Units A and B for both spring and summer. During spring and summer, fishing effort is often not as high or geographically concentrated as it is during fall. It can be especially difficult to obtain trips and meet minimum coverage requirements when effort is spread out over a large area, such as Management Units A and B. Observer coverage for small-mesh gill nets was generally above the minimum coverage levels for most combinations of mesh category, seasons, and management unit. Exceptions included combinations that had very little reported fishing effort where observer coverage was 0 percent: spring in D2 (only nine fishing trips reported) and summer in D1 (only four fishing trips reported). The most notable exception was during summer in Management Unit B for which there were no observed trips despite 844 reported fishing trips. The observer program continues to have difficulty getting coverage especially during spring and summer when gill-net activity can be occurring at night or while fishermen are participating in other fisheries. For example, fishermen may tell observers that they are crabbing even though they have set some gill-net gear at the same time. Efforts were made to increase observations during times and in areas of difficulty. The observer program continuously communicated with Marine Patrol, fish house samplers, and industry leaders to increase opportunities for observer coverage. Nonetheless, coverage was also impacted by weather events, staff availability, and compliance issues.

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 (9.8%) requires an alternative method of getting trips. Although onboard observations are the preferred method, alternative platform observations play a critical role to achieving the minimal percent coverage. In fact, 67.3% of all observed trips during the 2019 ITP Year were alternative platform observations. Alternate 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 (Kolkmeyer et al. 2007). The alternative platform method, however, 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.

The 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 gill-net fisheries. Although it is not known what impacts Hurricane Florence had directly on adult and juvenile sea turtle populations in North Carolina, indirectly the hurricane reduced fishing effort and contributed to reduced takes. Management measures implemented for other species also reduced fishing effort. For future ITP years, significant reductions in effort are expected because of regulatory changes for large-mesh gill nets and other gears targeting Southern Flounder. These regulations were included in Amendment 2 of the Southern Flounder Fishery Management Plan (NCDMF 2019) adopted by the North Carolina Marine Fisheries Commission on 23 August 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 two years and recover the stock from an overfished condition within 10 years. To meet these legal requirements, the NCDMF implemented a 62% reduction in harvest for 2019 (2020 ITP Year) and a 72% reduction in 2020 (2021 ITP Year) (NCDMF 2019). In addition to the effects on gill-net fisheries, these changes will require the observer program to incorporate new approaches to project observer coverage rather than relying on the average trips from the previous five years.

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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 2019 ITP Year. Estimated actual takes were calculated from observer data; 95% confidence intervals are provided in parentheses.

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	129.5 (32.1, 350.3)	0	9	5	0	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	53	26	7.2 (0, 21.5)	0	15	7	0	0	6	3	6.0 (0, 15.5)	0
Total	278	138	136.7	0	24	12	0	0	6	3	6.0	0

Species	E				Total			
	Estimated Takes				Estimated Takes			
	Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	96	48	7.2 (0, 21.5)	10.9 (0, 32.8)	330	165	136.7	10.9
Kemp's ridley	24	13	11.5 (0-34.4)	0	98	49	24.7	0
Total	120	61	18.7	10.9	428	214	161.4	10.9

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).

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 2019 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	n/a ¹	n/a ¹	n/a ¹	n/a ¹	6	3	n/a ¹	n/a ¹	6	3
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	1	3	0	3	0	3	0	12	1
Total	5	1	5	0	11	3	5	0	26	4

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).

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 2019 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		1		0		1
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 2019 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	0	3	0	3	0	3	0	12	0
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	0	11	0	11	0	11	0	44	0

Table 5. Total annual authorized and actual takes (observed and estimated) of sea turtles by species and for estimated takes by condition for the 2019 ITP Year. The incidental take of an unidentified sea turtle is not represented in the actual observed counts or estimated totals.

Species	Observed (live/dead)		Estimated			
	Authorized	Actual	Authorized		Actual	
	Live/Dead	Live/Dead	Alive	Dead	Alive	Dead
Green	18	3	330	165	137	11
Hawksbill	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	12	0	98	49	25	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	1 ²	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Total	78	5	428	214	162	11

¹ Insufficient observer data exist to model an estimated annual take level; therefore, takes are expressed as observed.

² Green sea turtle in Management Unit A (see Table 4)

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 2019 ITP Year. Trip Ticket Program data are considered finalized for 2018 (fall) and preliminary for 2019 (spring and summer). Management Unit D1 was closed to large-mesh (≥ 4 inch) gill nets for the entire ITP year; however, one trip was reported and observed during fall.

Season	Management Unit	Large Mesh		
		Reported trips	Observed Trips	Coverage
Fall 2018	A	1,812	131	7.2
	B	955	80	8.4
	C	485	37	7.6
	D1	1 (closed)	1 (closed)	100.0
	D2	374	26	7.0
	E	713	54	7.6
	State-wide	4,340	329	7.6
Spring 2019	A	1,699	100	5.9
	B	448	29	6.5
	C	45	20	44.4
	D1	closed	closed	closed
	D2	61	11	18.0
	E	247	30	12.1
	State-wide	2,500	190	7.6
Summer 2019	A	1,044	46	4.4
	B	974	34	3.5
	C	313	27	8.6
	D1	closed	closed	closed
	D2	124	10	8.1
	E	497	93	18.7
	State-wide	2,952	210	7.1
Overall		9,792	729	7.4

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 2019 ITP Year. Trip Ticket Program data are considered finalized for 2018 (fall) and preliminary for 2019 (spring and summer).

Season	Management Unit	Small Mesh		
		Reported trips	Observed Trips	Coverage
Fall 2018	A	239	5	2.1
	B	580	21	3.6
	C	81	9	11.1
	D1	34	4	11.8
	D2	67	9	13.4
	E	261	5	1.9
	State-wide	1,262	53	4.2
Spring 2019	A	727	13	1.8
	B	1,351	39	2.9
	C	97	16	16.5
	D1	39	6	15.4
	D2	9	0	0.0
	E	81	5	6.2
	State-wide	2,304	79	3.4
Summer 2019	A	118	2	1.7
	B	844	0	0.0
	C	45	1	2.2
	D1	4	0	0.0
	D2	19	5	26.3
	E	116	5	4.3
	State-wide	1,146	13	1.1
Overall		4,712	145	3.1

Table 9. Summary of observed sea turtle interactions in large-mesh (≥ 4 inch, $n = 22$) and small-mesh (< 4 inch), $n = 0$) gill nets during the 2019 ITP Year. Tags were applied by observers. PIT = Passive Integrated Transponders ¹ Turtle was transferred for rehabilitation based on severe carapace fractures, and was euthanized the next day.

Date	Season	Management Unit	Latitude (N)	Longitude (W)	Species	Disposition	Applied Tags		Curved Carapace (mm)	
							PIT	Inconel	Length	Width
10/3/2018	Fall	B	34.99438	76.28997	Kemp's	alive	n/a	n/a	228	241
10/4/2018	Fall	B	35.36187	75.55748	Green	alive	n/a	n/a	304	267
10/30/2018	Fall	B	35.25243	75.61018	Green	alive	n/a	n/a	290	260
11/8/2018	Fall	B	35.26151	75.62806	Green	alive	982.000362056415 3D6.0015948ADF	n/a	286	247
5/16/2019	Spring	E	33.9702	77.92483	Green	dead	n/a	n/a	332	256
5/16/2019	Spring	E	33.97090	77.92675	Kemp's	alive	982.000364048805 3D6.0015B2F1A5	n/a	274	300
5/16/2019	Spring	E	33.97146	77.92725	Kemp's	alive	982.000363950045 3D6.0015B16FDD	n/a	296	292
5/30/2019	Spring	D2	34.7526	76.69836	Green	alive	n/a	n/a	243	n/a
6/4/2019	Summer	D2	34.69337	76.98663	Kemp's	alive	n/a	n/a	343	323
6/7/2019	Summer	D2	34.68357	77.04107	Green	alive	982.000364297643 3D6.0015BCDAB	n/a	262	210
6/7/2019	Summer	D2	34.68368	77.04096	Green	dead	n/a	n/a	282	251
6/11/2019	Summer	D2	34.68367	76.99529	Kemp's	alive	n/a	n/a	272	240
7/3/2019	Summer	E	34.67980	77.13325	Green	alive	982.000362191618 3D6.0015969B023	n/a	268	244
7/17/2019	Summer	E	33.88800	78.47000	Green	alive ¹	n/a	n/a	n/a	n/a
7/18/2019	Summer	B	34.81551	76.38171	Loggerhead	alive	982.0004106 3D6.001879D717	MMG064/ MMG066	640	650
7/24/2019	Summer	B	34.99500	76.30190	Green	alive	n/a	n/a	303	255
7/29/2019	Summer	A	35.93329	75.78285	Green	alive	n/a	n/a	244	220
8/9/2019	Summer	B	34.90955	76.32888	Green	alive	n/a	n/a	230	196
8/9/2019	Summer	B	34.90952	76.32928	Green	alive	n/a	n/a	250	209
8/14/2019	Summer	B	34.99207	76.17590	Unidentified	alive	n/a	n/a	n/a	n/a
8/15/2019	Summer	B	35.11880	75.96291	Green	alive	n/a	n/a	261	224
8/22/2019	Summer	B	35.04076	76.11522	Green	alive	n/a	n/a	315	275

Table 10. Regulations for management units by date and regulation change for large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets for the 2019 ITP Year.

Year	Date(s)	Regulation change
2018	September 1	This proclamation opened a previously closed area in the western part of Management Unit A to gill nets with stretched mesh lengths of 5 ½ inches through 6 ½ inches in accordance with the Sea Turtle ITP. It maintained small mesh gill net attendance requirements in Management Unit A. (M-8-2018)
2018	September 3	This proclamation opened Management Unit B Subunit MGNRA to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches for the new ITP year (September 1, 2018 through August 31, 2019) in accordance with the Sea Turtle ITP. This proclamation maintained attendance requirements for gill nets with a stretched mesh length less than 4 inches in Management Subunit B. 1. It maintained openings for Management Units C, D2 and portions of Management Unit E (except those described in Section II.) to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches. This proclamation also maintained the closure of Management Unit D1 to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches. (M-9-2018)
2018	October 1	This proclamation opened Management Unit B Subunits SGNRA 1-4, and CGNRA to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches for the new ITP year (September 1, 2018 through August 31, 2019) in accordance with the Sea Turtle ITP. (M-10-2018)
2018	November 24	This proclamation closed a portion of the lower Chowan River and western Albemarle Sound to all gill nets with stretched mesh lengths of 5 ½ through 6 ½ inches due to dead sturgeon takes nearing the authorized amount for Management Unit A, and maintained additional gill net restrictions in accordance with the Sea Turtle and Atlantic Sturgeon ITPs. (M-13-2018)
2018	December 1	This proclamation implemented the December closed commercial season provision identified in the N.C. Southern Flounder Fishery Management Plan Amendment 1. Commercial flounder harvest in Internal Coastal Waters opened by this proclamation at 12:01 A.M., Tuesday, January 1, 2019. (FF-48-2018)

Table 10 cont.

Year	Date(s)	Regulation Change
2018	December 1	In Management Unit A, this proclamation closed the Albemarle Sound proper to the use of gill nets with a stretched mesh length of 5 ½ inches through 6 ½ inches, limited large-mesh gill net length to 1,000 yards in open areas, and maintained nets must have been set to fish the bottom of the water column and not to have exceeded a vertical height of 48 inches. Anchored small-mesh gill nets (gill nets with a stretched mesh of 3 ¾ inches and smaller) could be unattended but must have been set to fish the bottom of the water column and not to have exceeded a vertical height of 48 inches. This action was taken due to low observer coverage and approaching the take limit of dead Atlantic sturgeon. (M-14-2018)
2019	January 1	In Management Unit A, this proclamation made it unlawful to use gill nets with a stretched mesh length other than 3 ¼ inches, or from 5 ½ inches through 6 ½ inches, EXCEPT IN THE AREAS DESCRIBED IN SECTION IV. It also maintained large-mesh gill net closures and vertical height restrictions for all anchored gill net sets. This action was taken to allow various directed gill net fisheries while minimizing interactions with endangered Atlantic sturgeon and to reduce river herring regulatory discards. (M-17-2018)
2019	February 1	This proclamation superseded proclamation M-17-2018 dated December 21, 2018. In a portion of Management Unit A, it made it lawful to use runaround, strike, and drop gill nets with a stretched mesh length from 5 ½ inches through 6 ½ inches. It also maintained large-mesh gill net closures and vertical height restrictions for all anchored gill net sets. This action was taken to allow a directed fishery for invasive blue catfish and continued to allow other various directed gill net fisheries while minimizing interactions with endangered Atlantic sturgeon and to reduce river herring regulatory discards. (M-2-2019)
2019	February 15	This proclamation implemented gear exemptions for portions of the Internal Coastal Waters south of Management Unit A to allow fishermen to set gill nets for the shad fishery (See Section III.). It opened the remaining portions of Management Unit B 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 the Sea Turtle Incidental Take Permit. This proclamation also maintained openings for Management Units C, D2 and portions of Management Unit E (except those described in Section II.) to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches. This action was taken to allow directed gill net fisheries for shad while minimizing interactions with threatened and/or endangered species. (M-3-2019)

Table 10 cont.

Year	Date(s)	Regulation Change
2019	March 2	This proclamation opened all of Management Unit A to the use of gill nets and allowed gill net configurations for harvesting American shad by removing vertical height restrictions for up to 1,000 yards of gill net with stretched mesh lengths of 5 ¼ through 6 ½ inches. This proclamation also implemented additional gill net restrictions for Management Unit A, Subunit A1-South of US-64-BYP/US-64, in accordance with the Sea Turtle and Atlantic Sturgeon ITPs. Proclamation FF-56-2018 made it unlawful to possess American shad for commercial purposes prior to 12:01 A.M. Sunday, March 3, 2019 and after 12:01 A.M. Sunday, March 24, 2019. (M-4-2019)
2019	March 11	This proclamation implemented tie-down (vertical net height restrictions) and distance from shore restrictions for gill nets with a stretched mesh length five inches or greater in the western Pamlico Sound and rivers in accordance with Supplement A to Amendment 1 to the N.C. Estuarine Striped Bass Fishery Management Plan. (M-5-2019)
2019	March 18	During an emergency meeting on March 13, 2019, the N.C. Marine Fisheries Commission directed the N.C. Division of Marine Fisheries Director to issue this proclamation pursuant to N.C. General Statute 113-221.1 (d). The Director has no legal authority to modify or change a proclamation when the proclamation is specifically directed by the Commission under this statute. This proclamation superseded proclamation M-5-2019, dated March 7, 2019. This proclamation prohibited the use of ALL gill nets upstream of the ferry lines from the Bayview Ferry to Aurora Ferry on the Pamlico River and the Minnesott Beach Ferry to Cherry Branch Ferry on the Neuse River. It maintained tie-down (vertical net height restrictions) and distance from shore restrictions for gill nets with a stretched mesh length 5 inches and greater in the western Pamlico Sound and rivers (excluding the areas described in Section I. B.) in accordance with Supplement A to Amendment 1 to the N.C. Estuarine Striped Bass Fishery Management Plan. (M-6-2019)
2019	March 25	In Management Unit A, this proclamation removed the use of gill nets configured for harvesting American shad by implementing vertical height restrictions for all stationary gill nets. This proclamation also closed portions of Management Unit A to large-mesh stationary gill nets, allowed the use of run-around, strike, and drop nets with a stretched mesh length of 5½ inches through 6½ inches in a portion of Management Unit A, and maintained additional gill net restrictions for Management Unit A, Subunit A1, South of US-64-BYP/US-64, in accordance with the Sea Turtle and Atlantic Sturgeon ITPs. (M-7-2019)

Table 10 cont.

Year	Date(s)	Regulation Change
2019	April 8	This proclamation opened additional portions of Management Unit A to the use of stationary large-mesh gill nets with vertical height restrictions. It also maintained the allowance for the use of run-around, strike, and drop nets with a stretched mesh length of 5½ inches through 6½ inches in a portion of Management Unit A, Subunit A2, and maintained additional gill net restrictions for Management Unit A, Subunit A1, South of US-64-BYP/US-64, in accordance with the Sea Turtle and Atlantic Sturgeon ITPs. (M-9-2019)
2019	May 1	This proclamation implemented attendance requirements for gill nets with a stretched mesh length less than 4 inches in Management Subunit B.1. It also decreased mesh size allowance for exempted gears in Section III. It maintained openings of Management Units B, C, D2 and E to the use of gill nets with a stretched mesh length of 4 inches through 6 ½ inches. (M-10-2019)
2019	May 1	This proclamation implemented small-mesh gill net attendance requirements in Management Unit A and implemented additional gill net restrictions in accordance with the Sea Turtle and Atlantic Sturgeon ITPs. (M-11-2019)
2019	June 13	This proclamation closed Management Unit D2 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 the Sea Turtle Incidental Take Permit. Take levels for endangered and/or threatened sea turtles for gill nets with a stretched mesh length of 4 inches through 6 ½ inches in Management Unit D2 had been reached and the fishery needed to be closed. This proclamation maintained attendance requirements for gill nets with a stretched mesh length less than 4 inches in Management Subunit B.1. (M-12-2019)

Table 11. Summary of self-reported sea turtle interactions in large-mesh (≥ 4 inch) gill nets during the 2019 ITP Year. None were reported for small-mesh (< 4 inch) gill nets.

Date	Management Unit	Latitude (N)	Longitude (W)	Species	Disposition
7/12/2019	C	not reported	not reported	Green	alive
7/14/2019	A	not reported	not reported	Kemp's	unknown
7/28/2019	A	not reported	not reported	Green	alive

Table 12. Number of gill-net checks and citations issued by Marine Patrol for large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets by season during the 2019 ITP Year. See Table 13 for details on individual citations.

Season	# Gill Net Checks	# Citations	Citation Percentage
Fall 2018	513	37	7.2
Spring 2019	487	18	3.7
Summer 2019	431	19	4.4
Total	1,431	74	5.2

Table 13. Citations written by Marine Patrol for large-mesh (≥ 4 inch) and small-mesh (< 4 inch) gill nets by season and violation code during the 2019 ITP Year.

Season	Date	Violation code	Violation description
Fall	9/6/2018	NETG04	Leave gill net in waters when could not be legally fished
	9/6/2018	NETG60	Use gill nets with a mesh size of more than 6.5 inches (stretched mesh) in violation of proclamation M-7-12
	9/6/2018	NETG60	Use gill nets with a mesh size of more than 6.5 inches (stretched mesh) in violation of proclamation M-7-12
	9/23/2018	NETG04	Leave gill net in waters when could not be legally fished
	9/24/2018	NETG03	Using gill net with improper buoys or identification
	9/26/2018	NETG04	Leave gill net in waters when could not be legally fished
	9/26/2018	NETG03	Using gill net with improper buoys or identification
	9/27/2018	NETG38	Use large-mesh gill net in Pamlico Sound later than 1 hour after sunrise in violation of proclamation M-8-10
	9/30/2018	NETG02	Using gill net without buoys or identification
	10/2/2018	NETG02	Using gill net without buoys or identification
	10/2/2018	NETG54	Violate provisions of Proclamation M-30-2011 to wit failed to have 25 yard space between nets
	10/3/2018	NETG45	Set or retrieve large-mesh gill nets no sooner than one hour before sunset on Monday through Thursday
	10/5/2018	NETG05	Use a stationery gill net in channel of ICWW
	10/5/2018	NETG06	Gill net causing hazard to navigation
	10/9/2018	NETG03	Using gill net with improper buoys or identification
	10/10/2018	NETG37	Leave small-mesh gill nets unattended
	10/10/2018	NETG03	Using gill net with improper buoys or identification
	10/17/2018	NETG48	Having large-mesh gill net set in violation of Proclamation M-14-2010
	10/18/2018	NETG30	Leave RCGL gill net unattended
	10/18/2018	NETG27	Gill net set within 50 yards from shore
	10/19/2018	NETG04	Leave gill net in waters when could not be legally fished
	10/19/2018	NETG53	Use large-mesh gill net with corks or floats on top line
	10/19/2018	NETG03	Using gill net with improper buoys or identification
	10/20/2018	NETG45	Set or retrieve large-mesh gill nets no sooner than one hour before sunset on Monday through Thursday
	10/22/2018	NETG02	Using gill net without buoys or identification
	10/24/2018	NETG04	Leave gill net in waters when could not be legally fished
	10/24/2018	NETG02	Using gill net without buoys or identification
	10/25/2018	NETG37	Leave small-mesh gill nets unattended

Table 13 cont.

Season	Date	Violation code	Violation description
Fall	10/25/2018	NETG45	Set or retrieve large-mesh gill nets no sooner than one hour before sunset on Monday through Thursday
	10/25/2018	NETG30	Leave RCGL gill net unattended
	10/25/2018	NETG29	RCGL gear without proper buoys
	10/31/2018	NETG46	Set or retrieve large-mesh gill nets later than one hour after sunrise on Tuesday through Friday
	11/7/2018	NETG30	Leave RCGL gill net unattended
	11/7/2018	NETG29	RCGL gear without proper buoys
	11/10/2018	NETG03	Using gill net with improper buoys or identification
	11/10/2018	NETG30	Leave RCGL gill net unattended
	11/13/2018	NETG46	Set or retrieve large-mesh gill nets later than one hour after sunrise on Tuesday through Friday
Spring	3/9/2019	NETG03	Using gill net with improper buoys or identification
	4/5/2019	NETG22	Improperly set gill net
	4/5/2019	NETG22	Improperly set gill net
	4/5/2019	NETG22	Improperly set gill net
	4/5/2019	NETG22	Improperly set gill net
	4/6/2019	NETG39	Use large-mesh gill nets more than 15 meshes in height and w/out lead core or leaded bottomline
	5/3/2019	NETG01	Leave gill net in coastal waters unattended
	5/7/2019	NETG45	Set or retrieve large-mesh gill nets no sooner than one hour before sunset on Monday through Thursday
	5/10/2019	NETG04	Leave gill net in waters when could not be legally fished
	5/11/2019	NETG01	Leave gill net in coastal waters unattended
	5/14/2019	NETG03	Using gill net with improper buoys or identification
	5/22/2019	NETG02	Using gill net without buoys or identification
	5/23/2019	NETG03	Using gill net with improper buoys or identification
	5/23/2019	NETG10	Gill net with illegal mesh size
	5/23/2019	NETG45	Set or retrieve large-mesh gill nets no sooner than one hour before sunset on Monday through Thursday
	5/23/2019	NETG46	Set or retrieve large-mesh gill nets later than one hour after sunrise on Tuesday through Friday
	5/29/2019	NETG45	Set or retrieve large-mesh gill nets no sooner than one hour before sunset on Monday through Thursday
	5/30/2019	NETG04	Leave gill net in waters when could not be legally fished

Table 13 cont.

Season	Date	Violation code	Violation description
Summer	6/27/2019	NETG22	Improperly set gill net
	6/28/2019	NETG03	Using gill net with improper buoys or identification
	7/4/2019	NETG01	Leave gill net in coastal waters unattended
	7/4/2019	NETG03	Using gill net with improper buoys or identification
	7/6/2019	NETG29	Improperly set gill net
	7/12/2019	NETG46	Set or retrieve large-mesh gill nets later than one hour after sunrise on Tuesday through Friday
	7/21/2019	NETG03	Using gill net with improper buoys or identification
	7/27/2019	NETG30	Leave RCGL gill net unattended
	7/29/2019	NETG04	Leave gill net in waters when could not be legally fished
	7/31/2019	NETG04	Leave gill net in waters when could not be legally fished
	8/6/2019	NETG45	Set or retrieve large-mesh gill nets no sooner than one hour before sunset on Monday through Thursday
	8/6/2019	NETG29	Improperly set gill net
	8/10/2019	NETG04	Leave gill net in waters when could not be legally fished
	8/11/2019	NETG02	Using gill net without buoys or identification
	8/15/2019	NETG44	Use large-mesh gill nets w/out leaving a space of at least 25 yards between separate lengths of net
	8/17/2019	NETG02	Using gill net without buoys or identification
	8/17/2019	NETG32	Set gill net w/stretched mesh of 5 inches or greater without proper tie downs
	8/30/2019	NETG34	Use unattended gill net w/mesh less than 5" in commercial operation from May 1 through November 30 in coastal waters of the State
	8/31/2019	NETG04	Leave gill net in waters when could not be legally fished

Table 14. Notice of Violations issued by season, date and violation code for the Estuarine Gill Net Permit (EGNP) during the 2019 ITP Year.

Season	Date	Violation code	Violation description
Fall	10/8/2018	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	10/29/2018	EGNP11	Failure to attend nets
		EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	11/5/2018	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	11/6/2018	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	11/6/2018	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	11/6/2018	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
		EGNP30	Failure to comply with gill net configurations outlined in proclamation
	11/6/2018	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
		EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
Spring	11/19/2018	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	4/4/2019	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
		EGNP30	Failure to comply with gill net configurations outlined in proclamation
	4/15/2019	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	4/15/2019	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	4/16/2019	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	5/1/2019	EGNP11	Failure to attend nets
		EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	5/14/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	5/15/2019	EGNP11	Failure to attend nets
	5/15/2019	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
		EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)
	5/31/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
		EGNP09	Failure to set or retrieve nets in accordance with time restrictions
		EGNP30	Failure to comply with gill net configurations outlined in proclamation
Summer	6/5/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	6/5/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	6/5/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	6/5/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	7/31/2019	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	8/5/2019	EGNP99	Failure to comply with statute(s), rule(s), and/or proclamation(s)

7 FIGURES

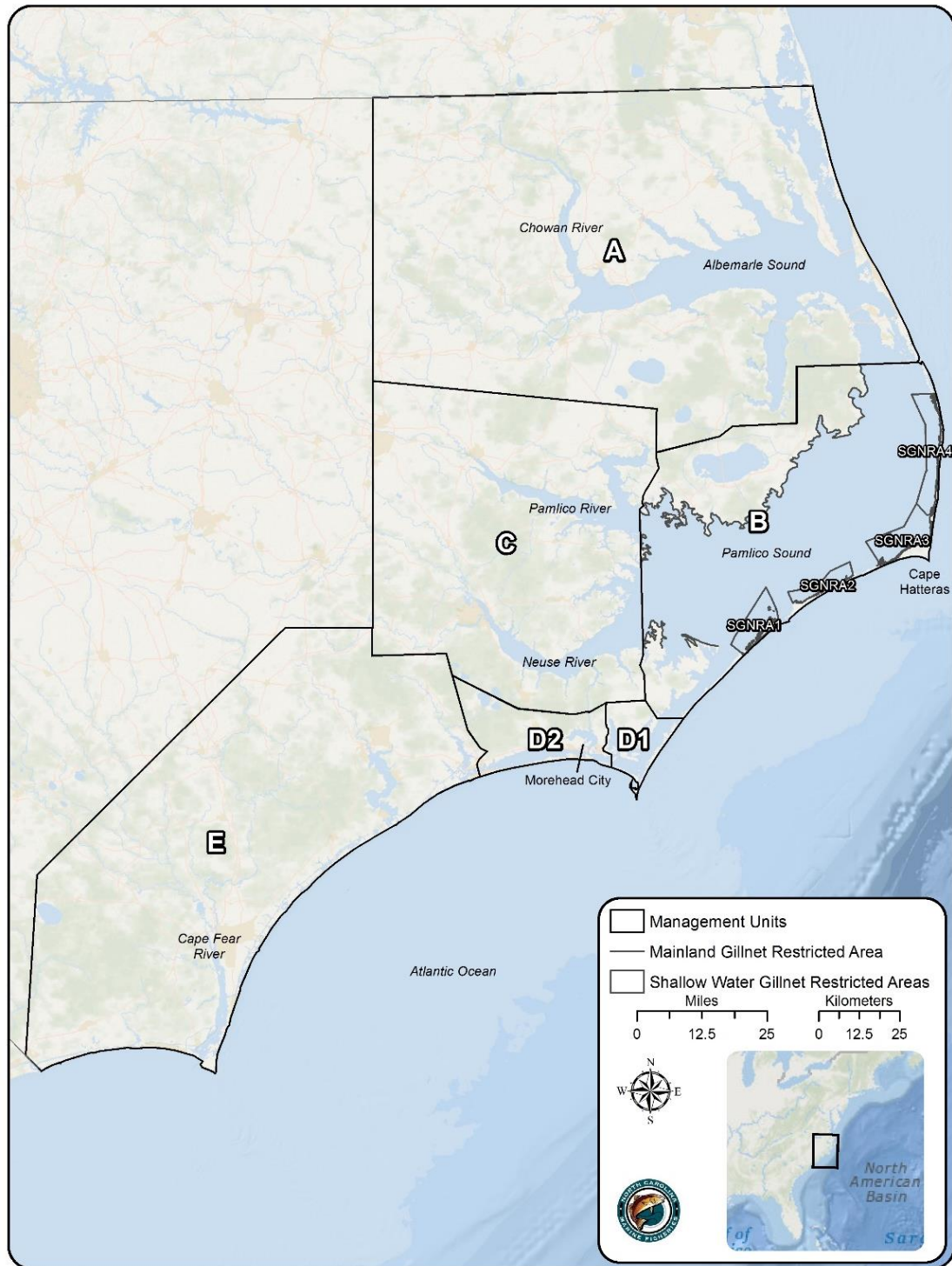


Figure 1. Management units (A, B, C, D1, D2, and E) as outlined in the Conservation Plan and used by the Observer Program for the 2019 ITP Year. In the Pamlico Sound Portion of B, large-mesh gill nets were confined to Shallow Water Gillnet Restricted Areas (SGNRA) 1-4 and the Mainland Gillnet Restricted Area (200 yards from shore).

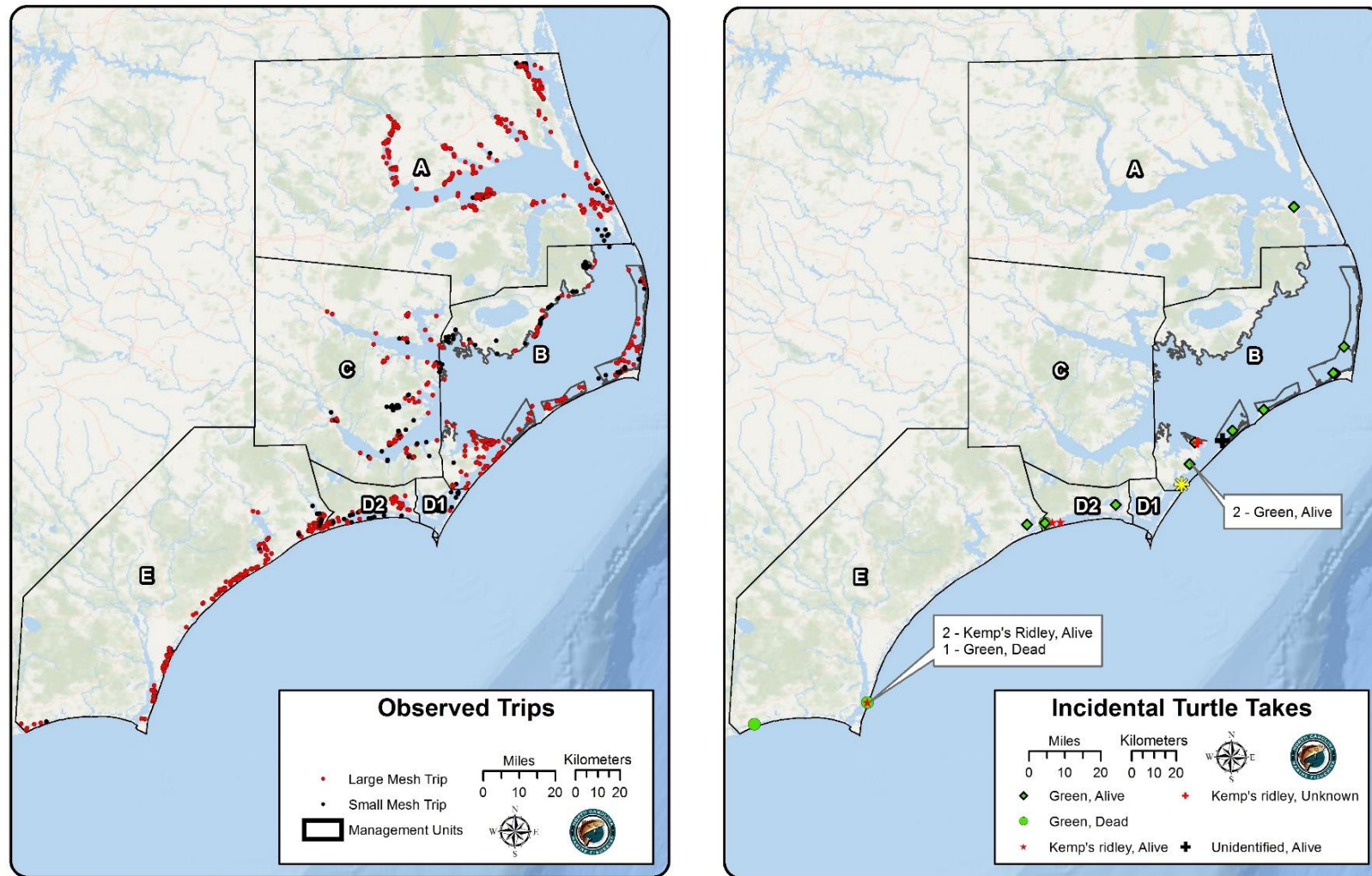


Figure 2. For the entire 2019 ITP Year, observed gill-net trips (left) by mesh-size category (729 large mesh ≥ 4 inch; 145 small mesh < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 19$; dead, $n = 3$) across management units. One of the dead takes (green sea turtle) was recovered from the net alive, but was euthanized the next day due to extensive carapace fractures not associated with the entanglement. See Figure 21.

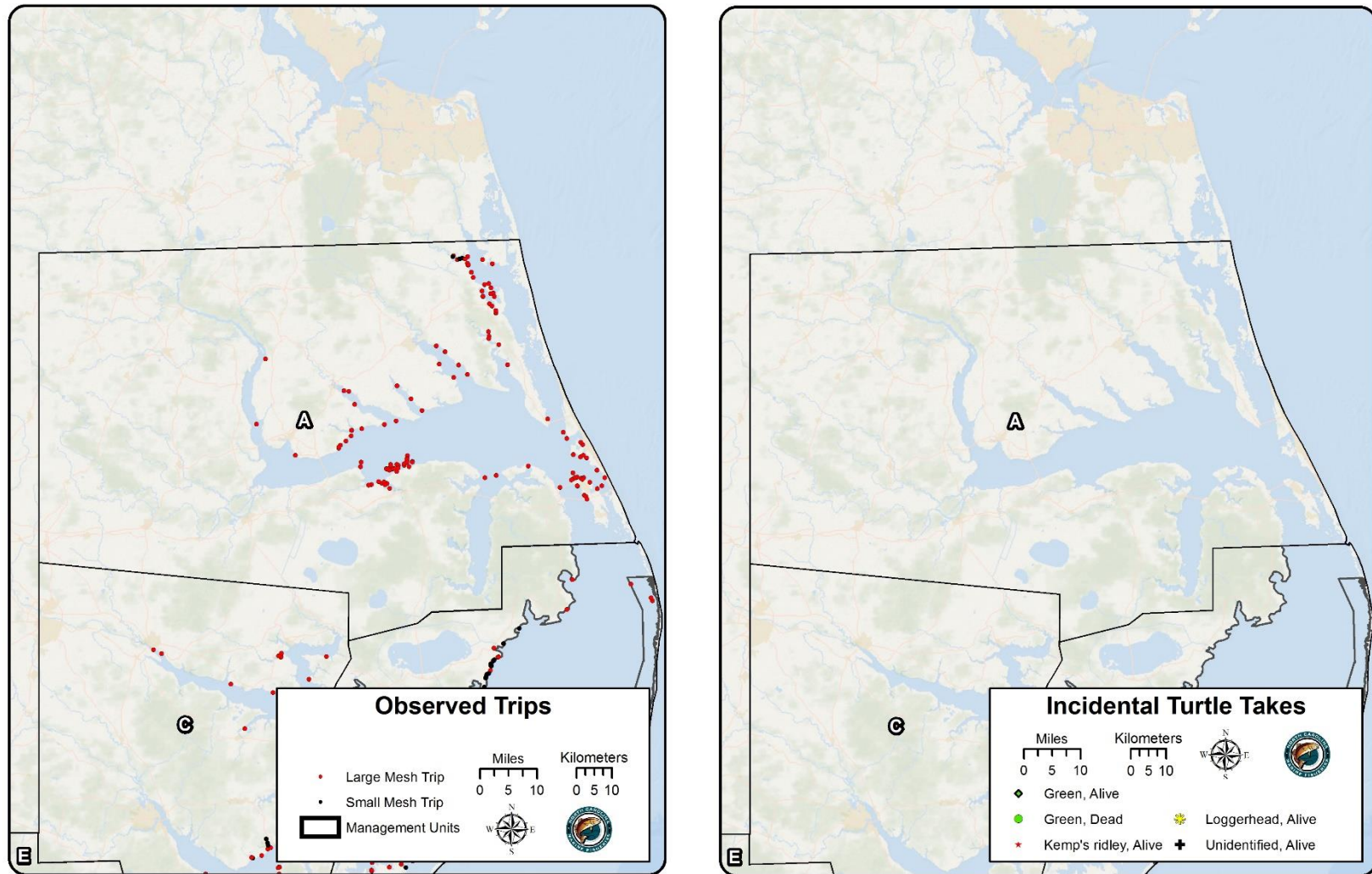


Figure 3. For fall 2018, observed gill-net trips (left) by mesh-size category (131 large mesh = ≥ 4 inch; 5 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit A.

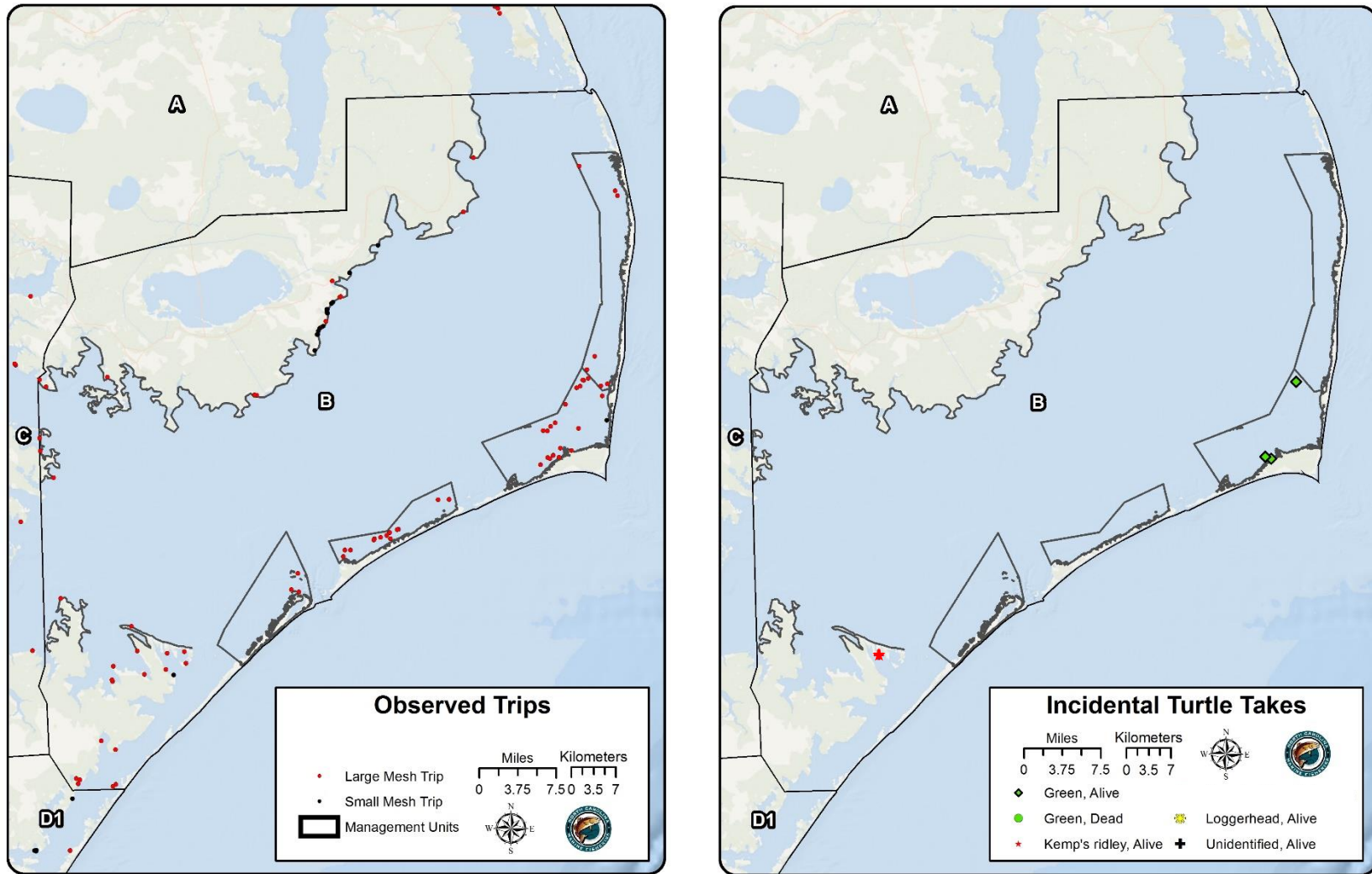


Figure 4. For fall 2018, observed gill-net trips (left) by mesh-size category (80 large mesh = ≥ 4 inch; 21 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 4$; dead, $n = 0$) for Management Unit B.

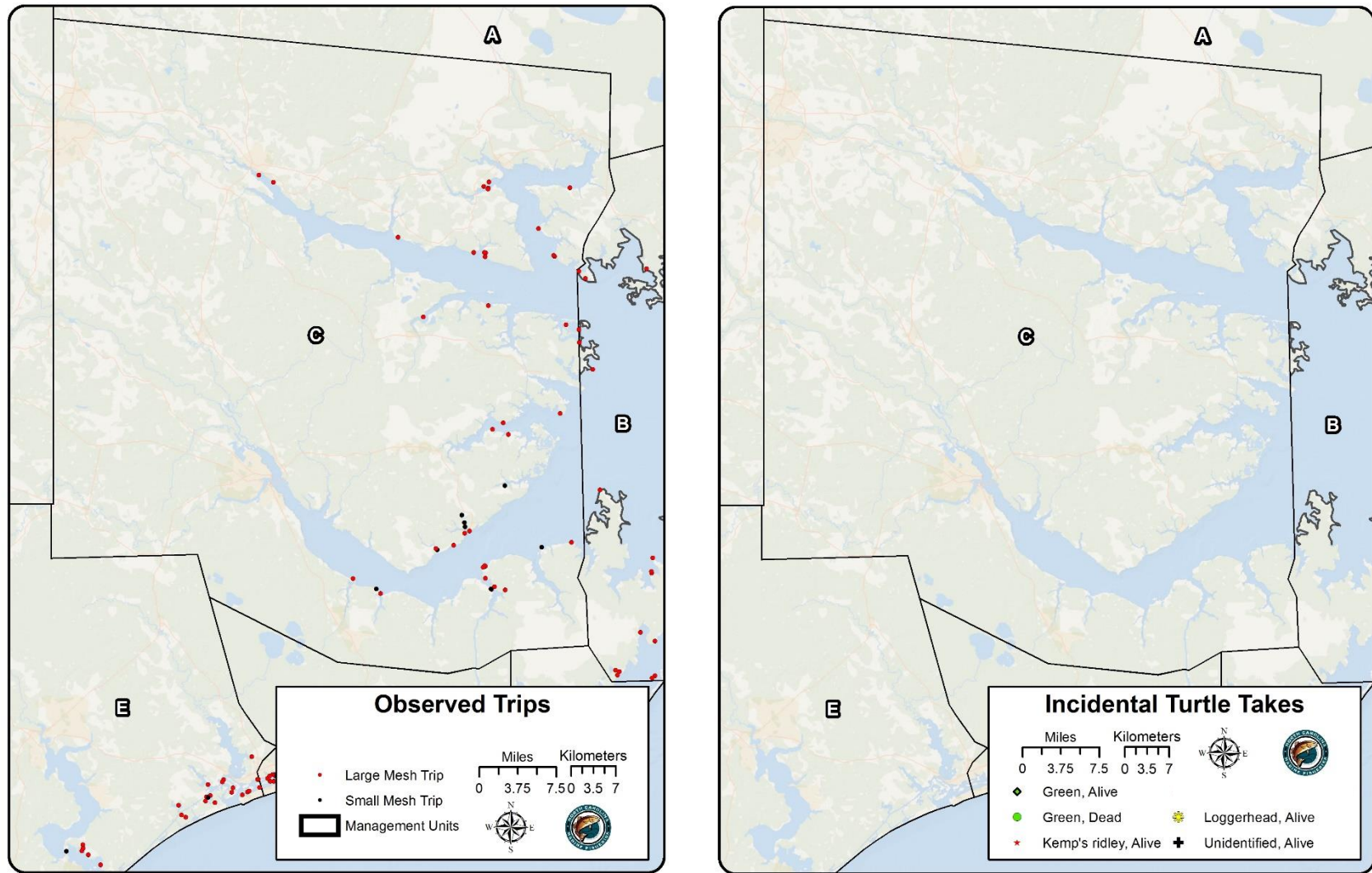


Figure 5. For fall 2018, observed gill-net trips (left) by mesh-size category (37 large mesh = ≥ 4 inch; 9 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit C.

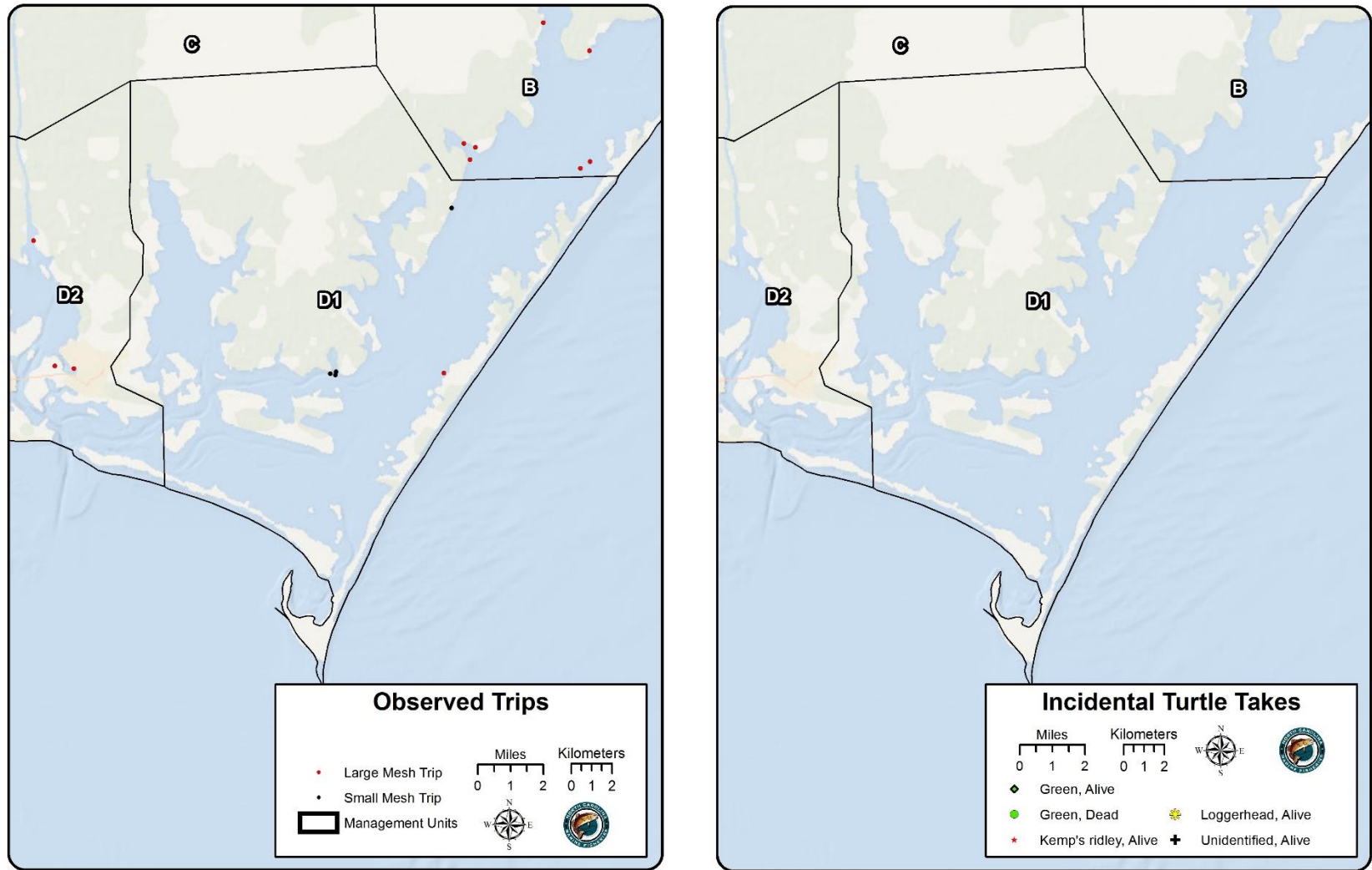


Figure 6. For fall 2018, observed gill-net trips (left) by mesh-size category (1 large mesh = ≥ 4 inch; 4 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit D1. D1 was closed to large-mesh gill nets for the entire 2019 ITP Year.

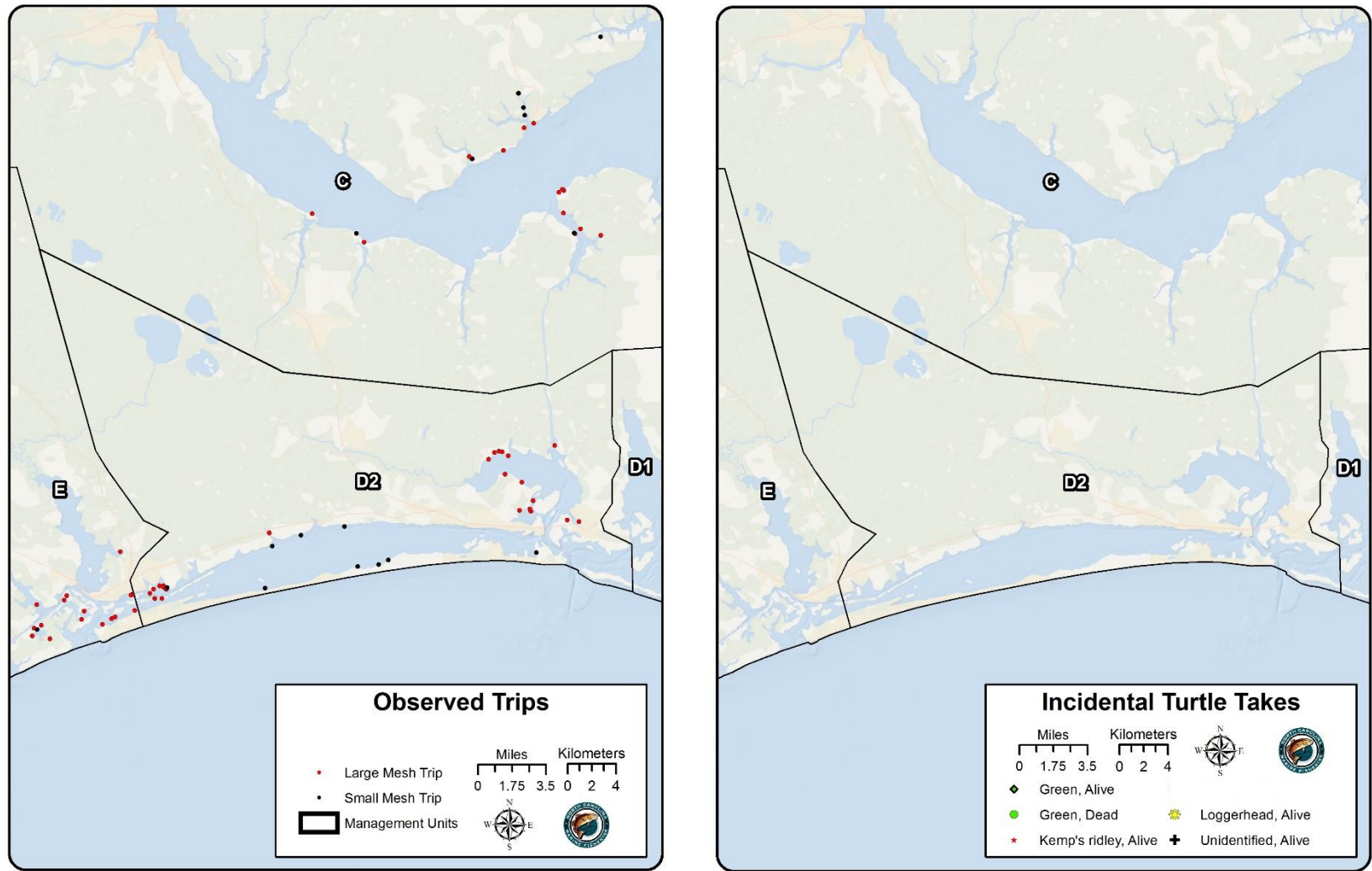


Figure 7. For fall 2018, observed gill-net trips (left) by mesh-size category (26 large mesh = ≥ 4 inch; 9 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit D2.

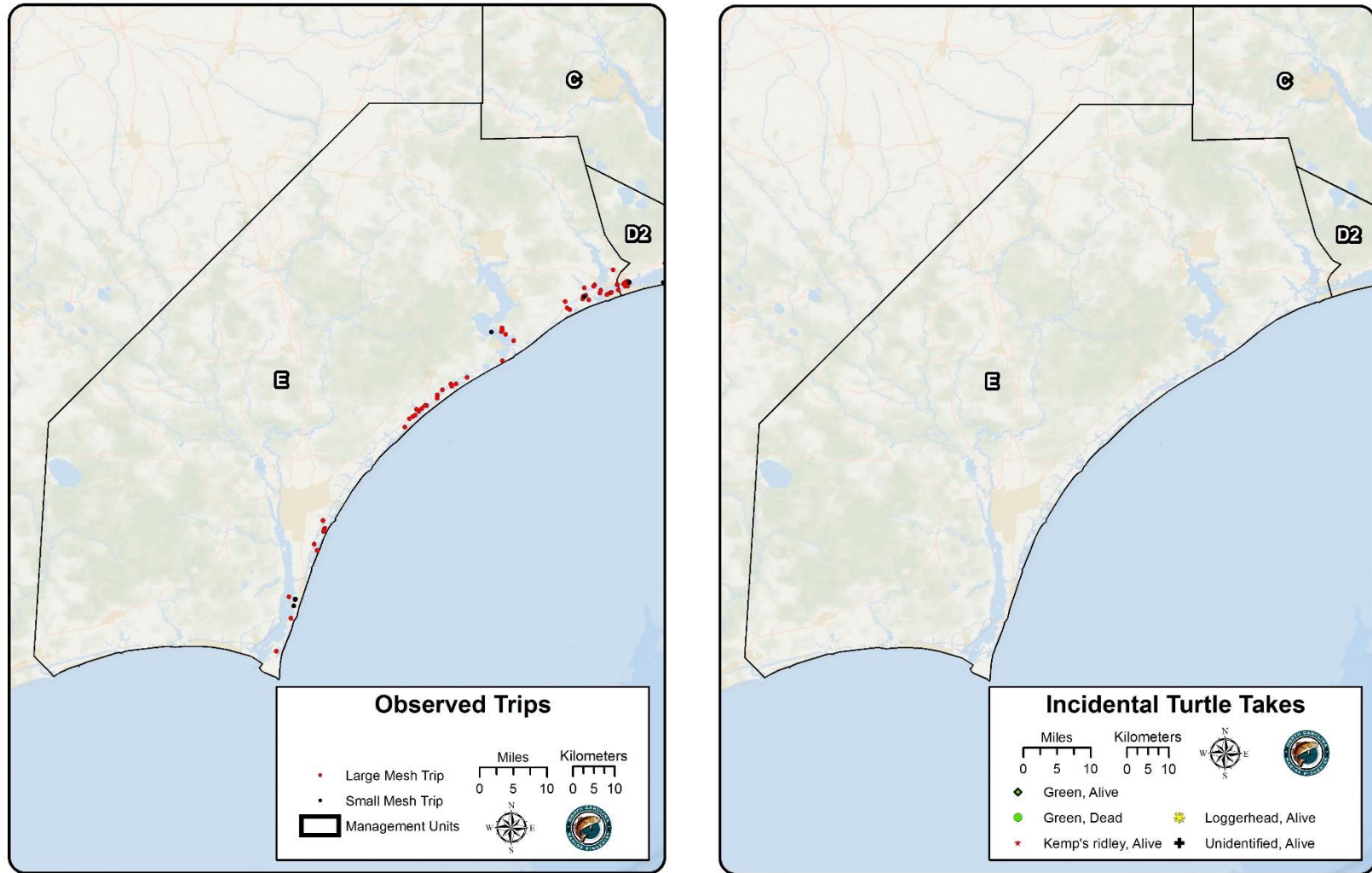


Figure 8. For fall 2018, observed gill-net trips (left) by mesh-size category (54 large mesh = ≥ 4 inch; 5 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit E.

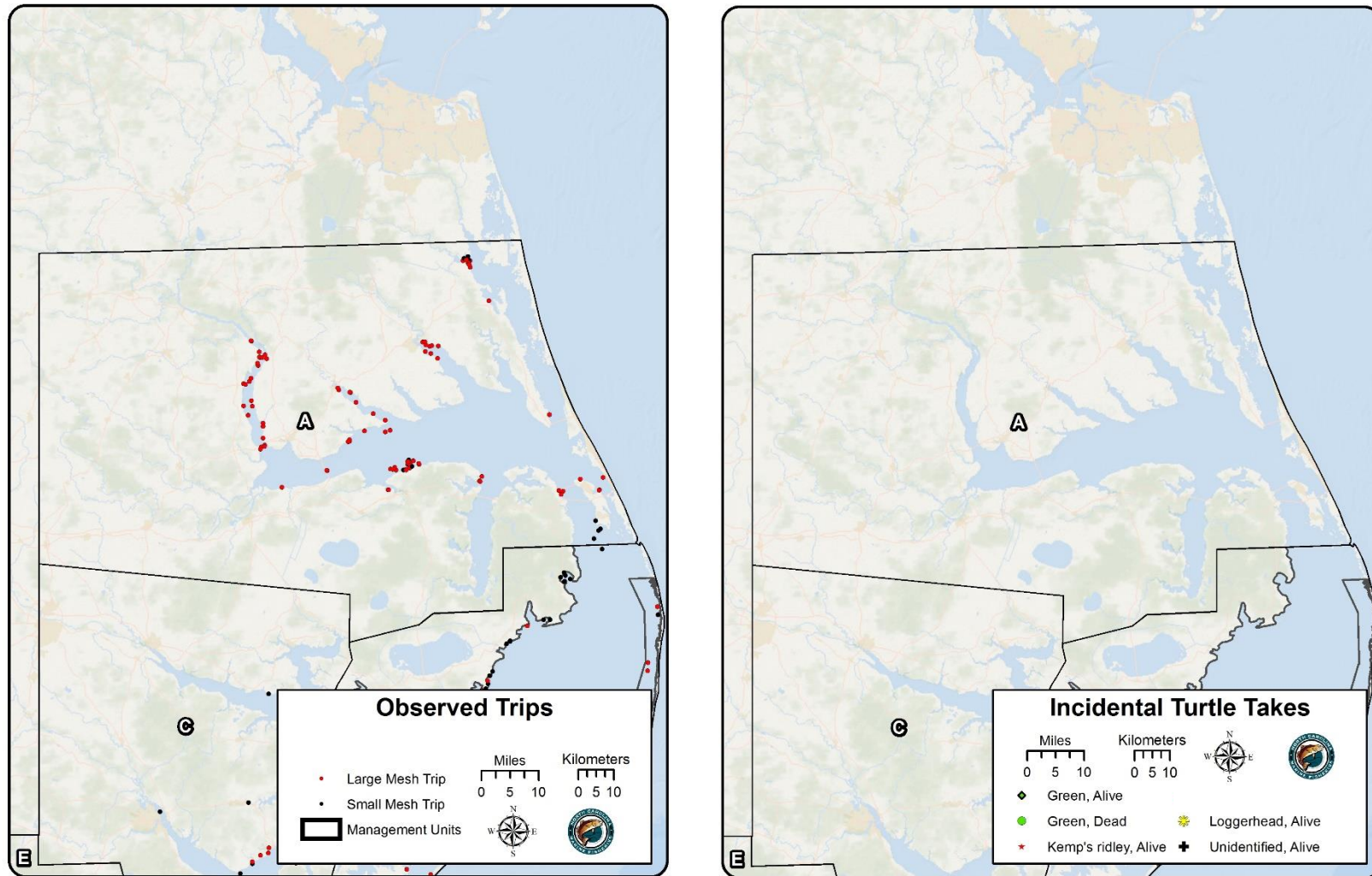


Figure 9. For spring 2019, observed gill-net trips (left) by mesh-size category (100 large mesh = ≥ 4 inch; 13 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit A.

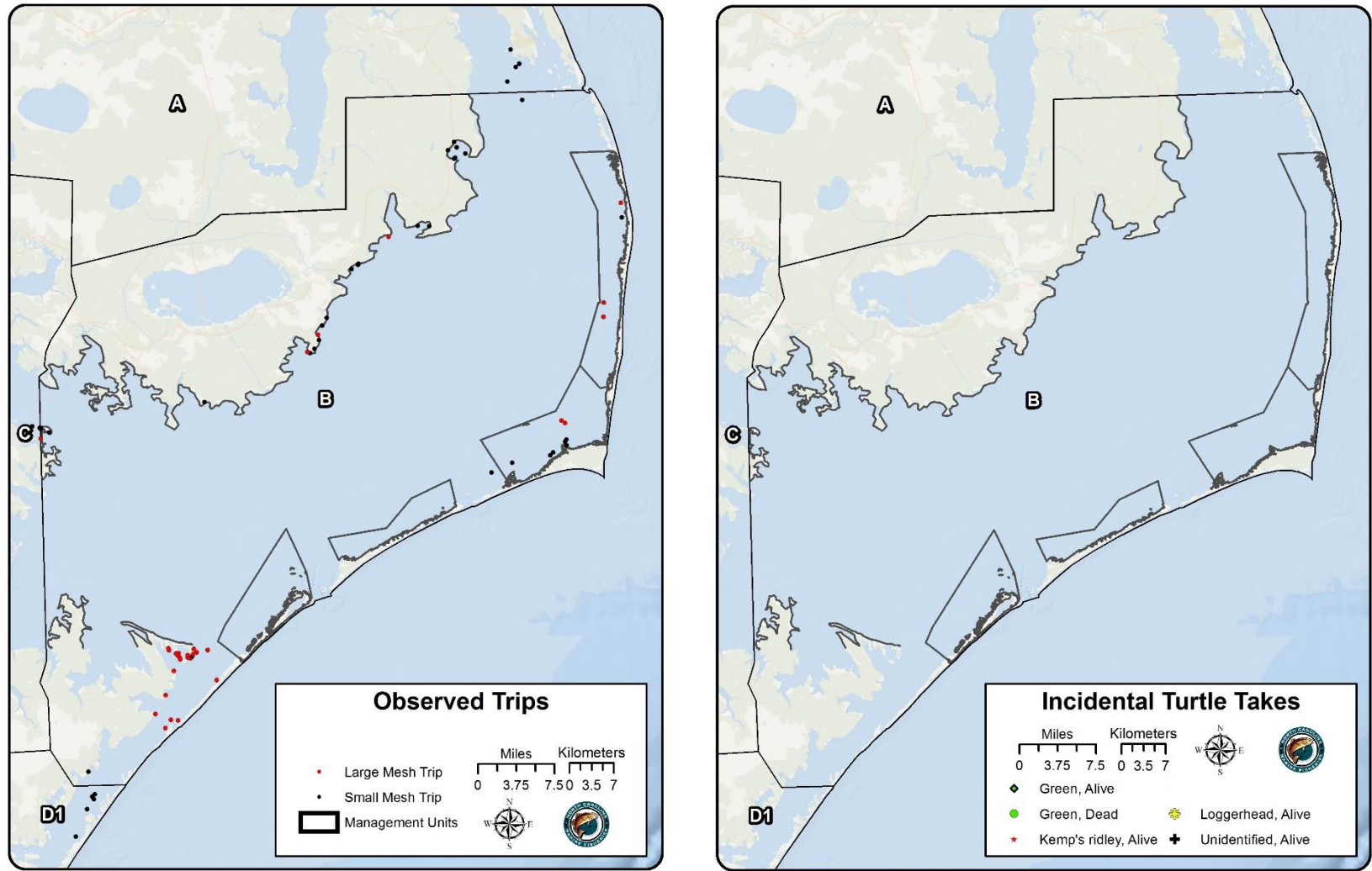


Figure 10. For spring 2019, observed gill-net trips (left) by mesh-size category (29 large mesh = ≥ 4 inch; 39 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit B.

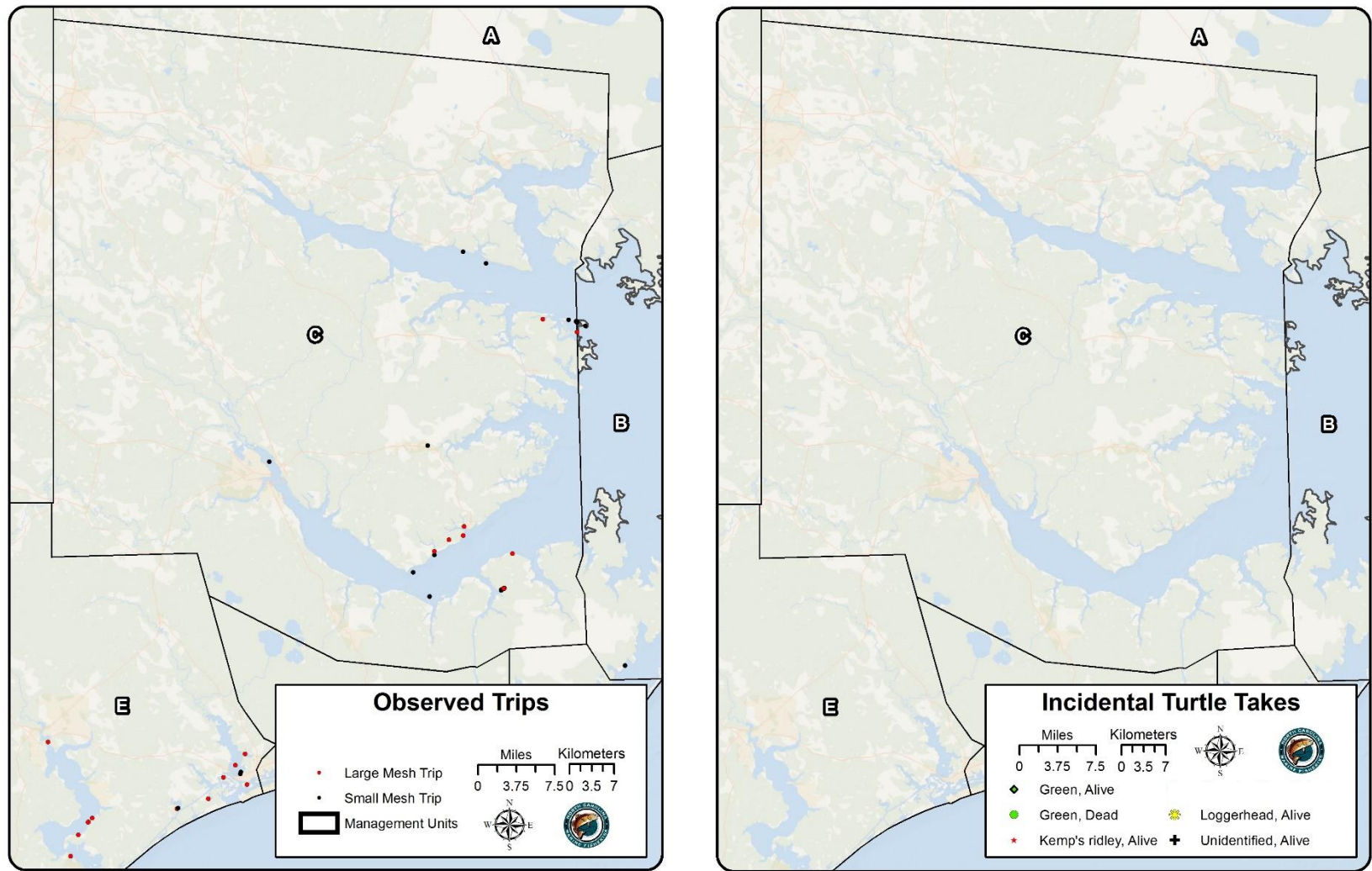


Figure 11. For spring 2019, observed gill-net trips (left) by mesh-size category (20 large mesh = ≥ 4 inch; 16 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit C.

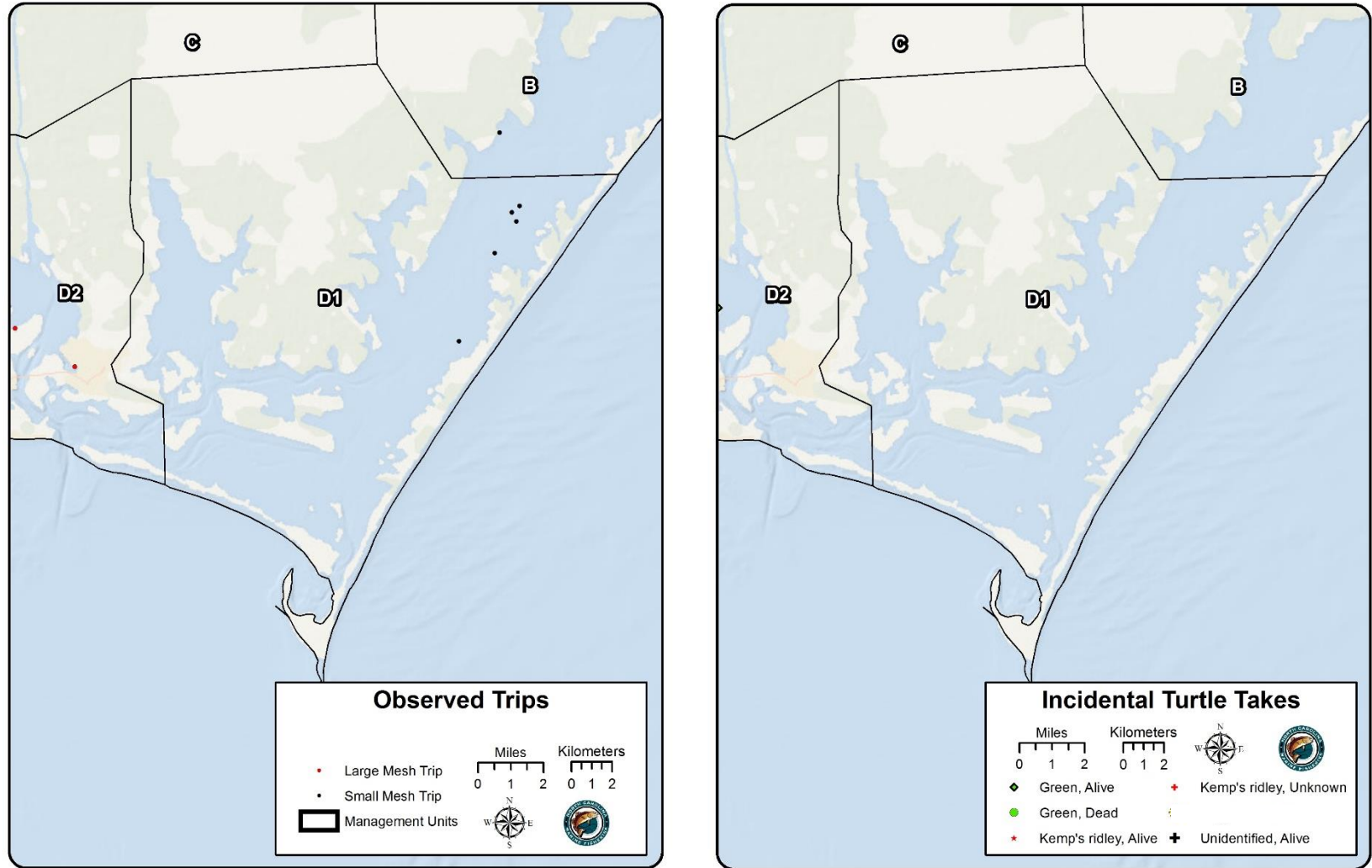


Figure 12. For spring 2019, observed gill-net trips (left) by mesh-size category (0 large mesh = ≥ 4 inch; 6 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit D1. D1 was closed to large-mesh gill nets for the entire 2019 ITP Year.

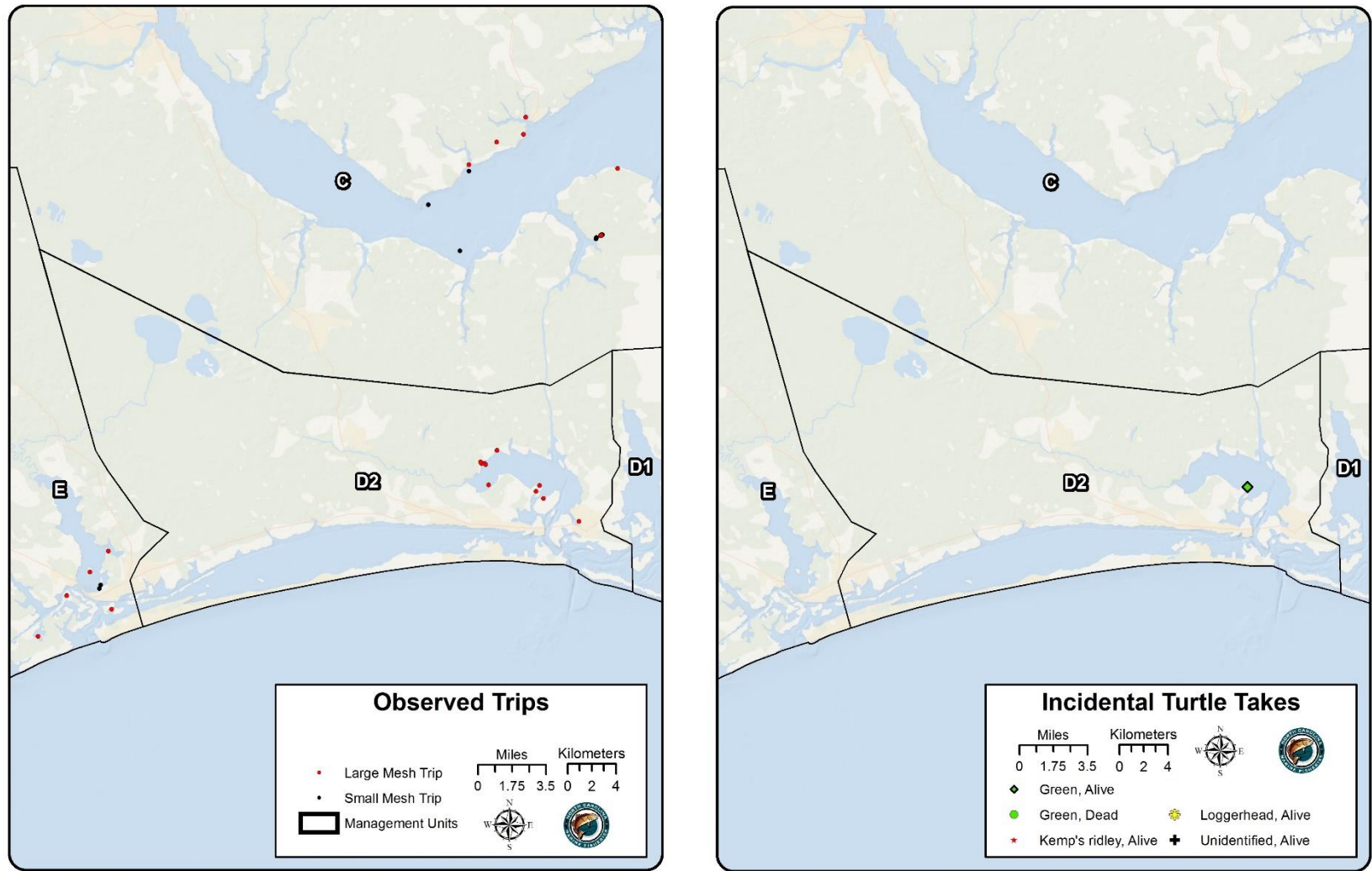


Figure 13. For spring 2019, observed gill-net trips (left) by mesh-size category (11 large mesh = ≥ 4 inch; 0 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 1$; dead, $n = 0$) for Management Unit D2.

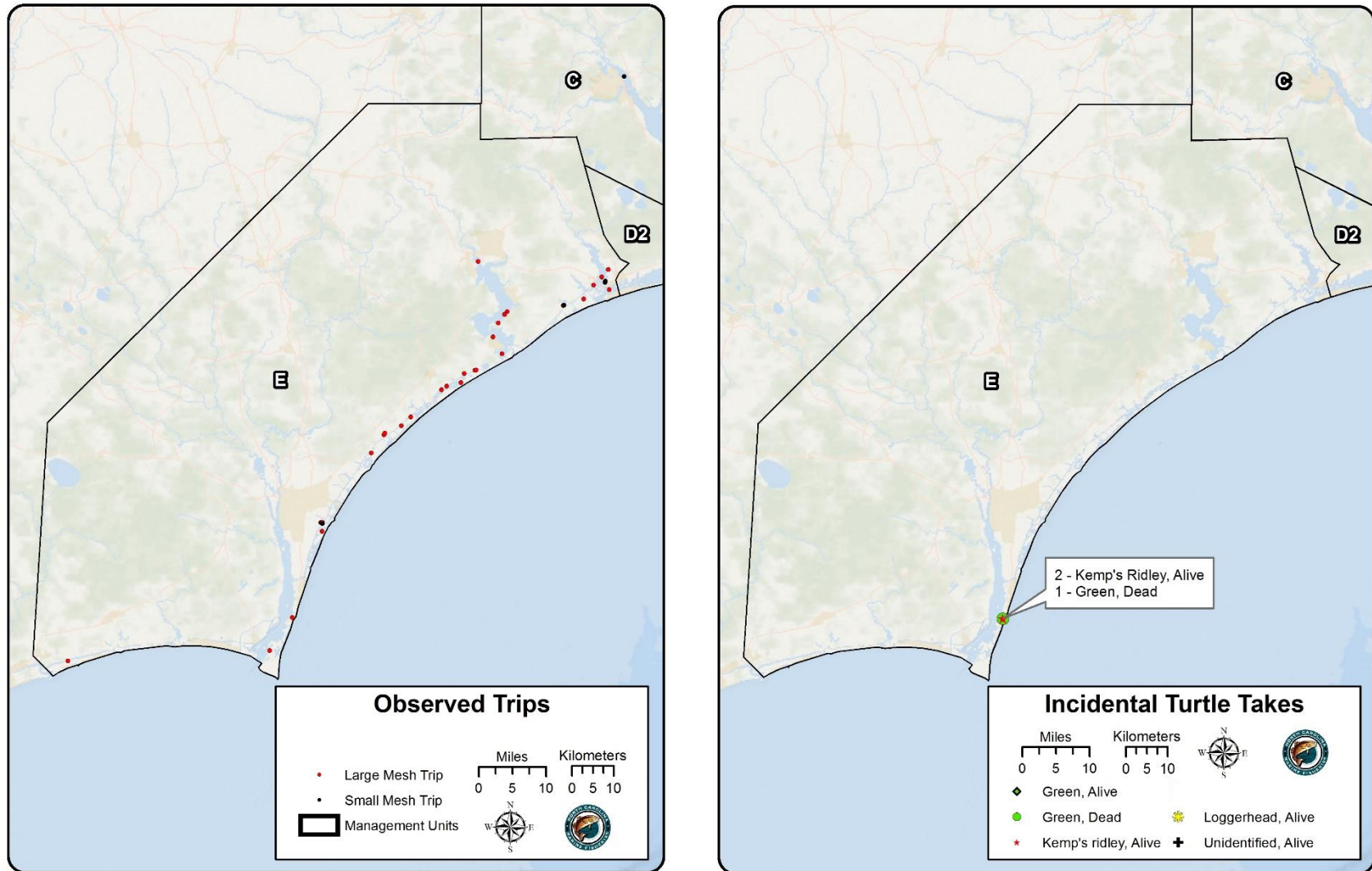


Figure 14. For spring 2019, observed gill-net trips (left) by mesh-size category (30 large mesh = ≥ 4 inch; 5 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 2$; dead, $n = 1$) for Management Unit E.

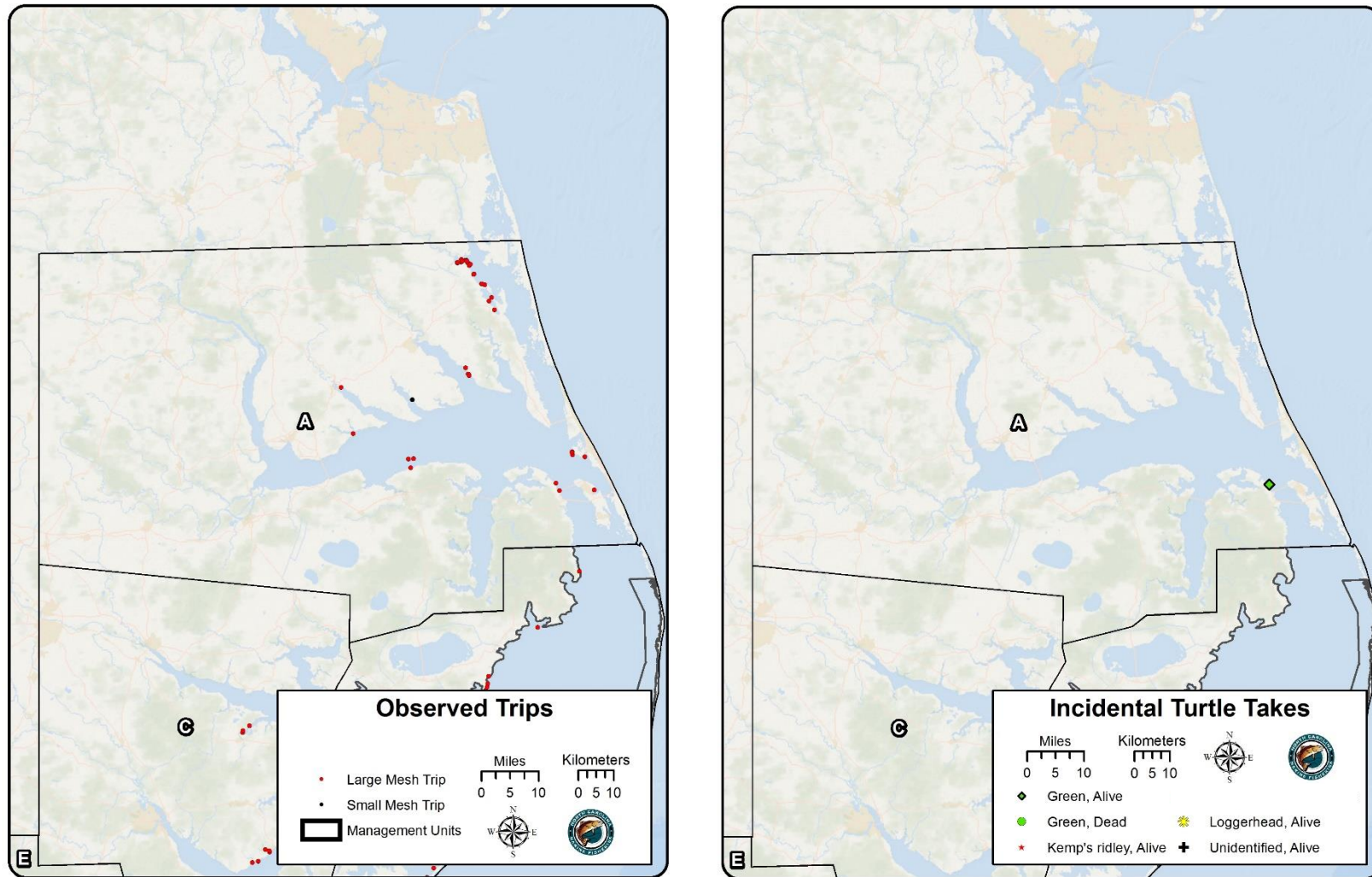


Figure 15. For summer 2019, observed gill-net trips (left) by mesh-size category (46 large mesh = ≥ 4 inch; 2 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 1$; dead, $n = 0$) for Management Unit A.

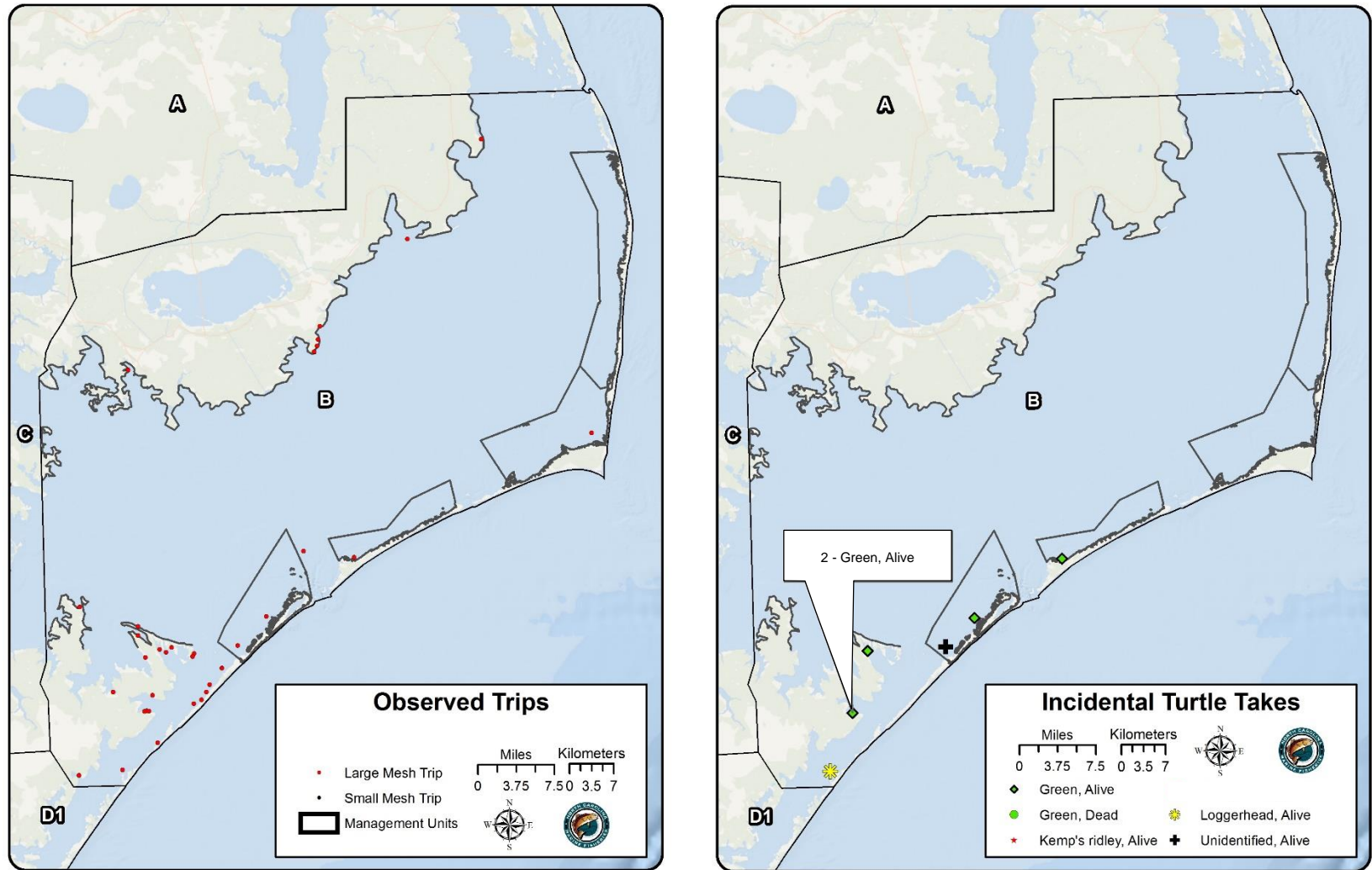


Figure 16. For summer 2019, observed gill-net trips (left) by mesh-size category (34 large mesh = ≥ 4 inch; 0 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 7$; dead, $n = 0$) for Management Unit B.

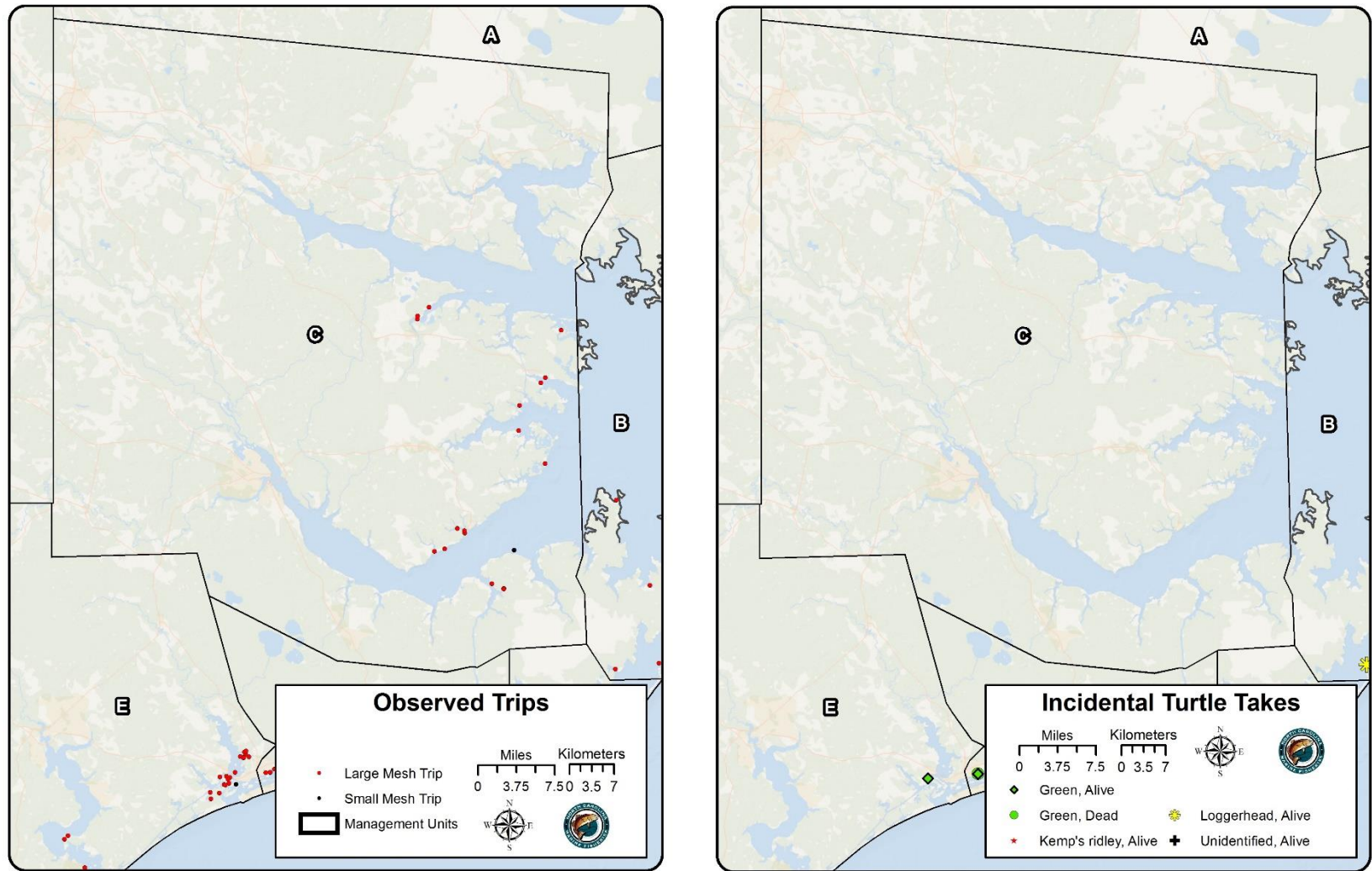


Figure 17. For summer 2019, observed gill-net trips (left) by mesh-size category (27 large mesh = ≥ 4 inch; 1 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit C.

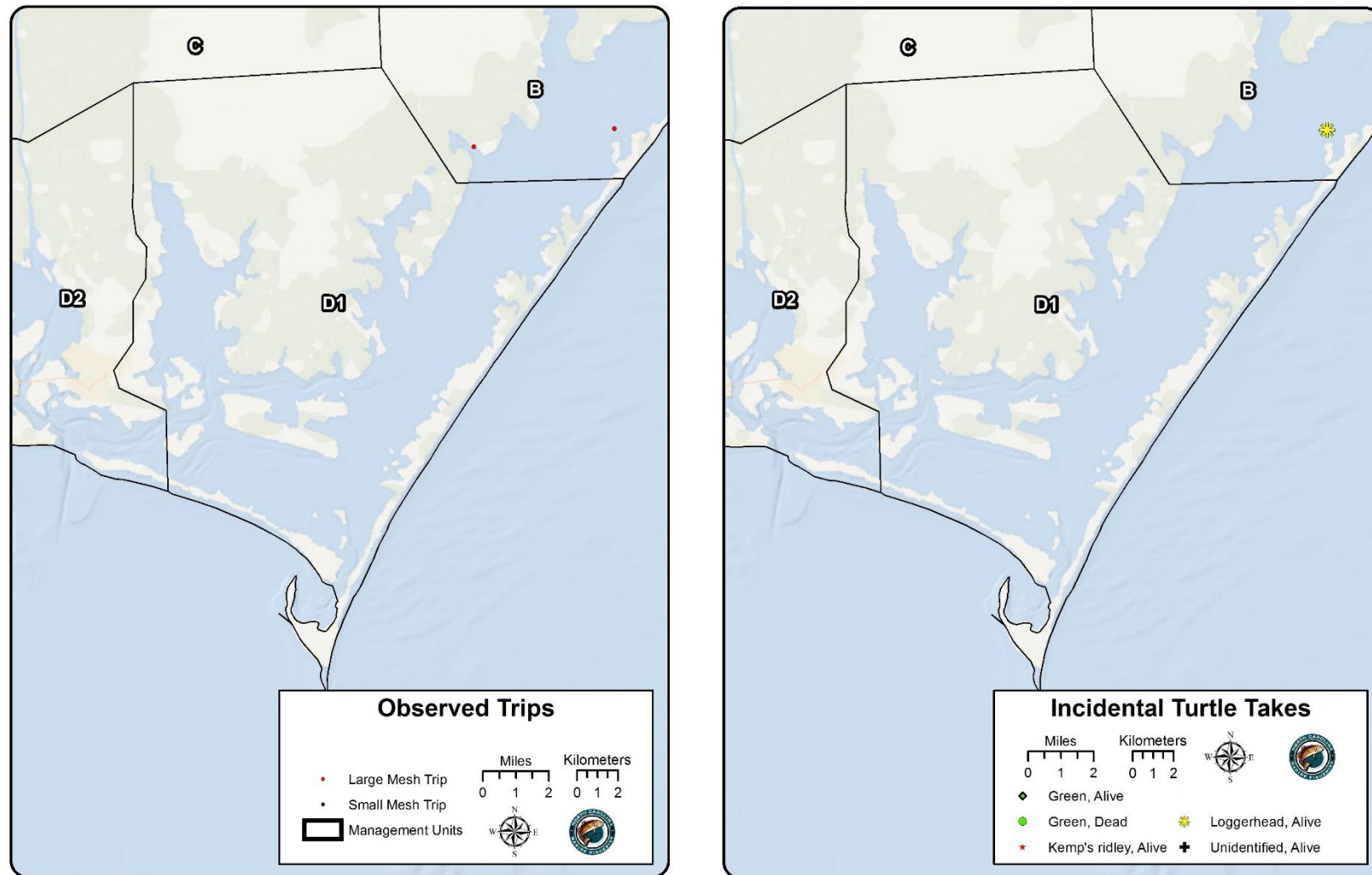


Figure 18. For summer 2019, observed gill-net trips (left) by mesh-size category (0 large mesh = ≥ 4 inch; 0 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 0$; dead, $n = 0$) for Management Unit D1. D1 was closed to large-mesh gill nets for the entire 2019 ITP Year.

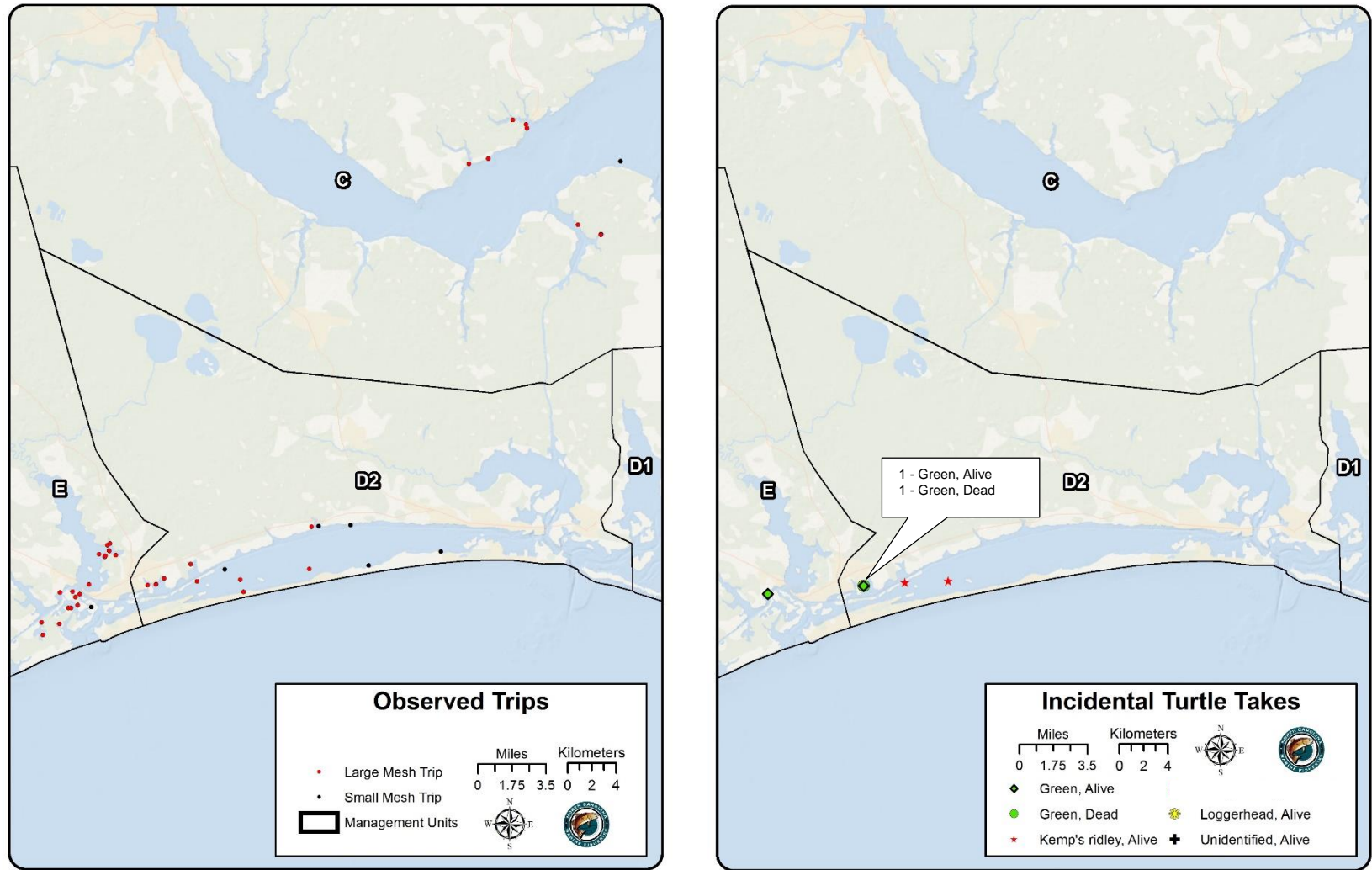


Figure 19. For summer 2019, observed gill-net trips (left) by mesh-size category (10 large mesh = ≥ 4 inch; 5 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 3$; dead, $n = 1$) for Management Unit D2.

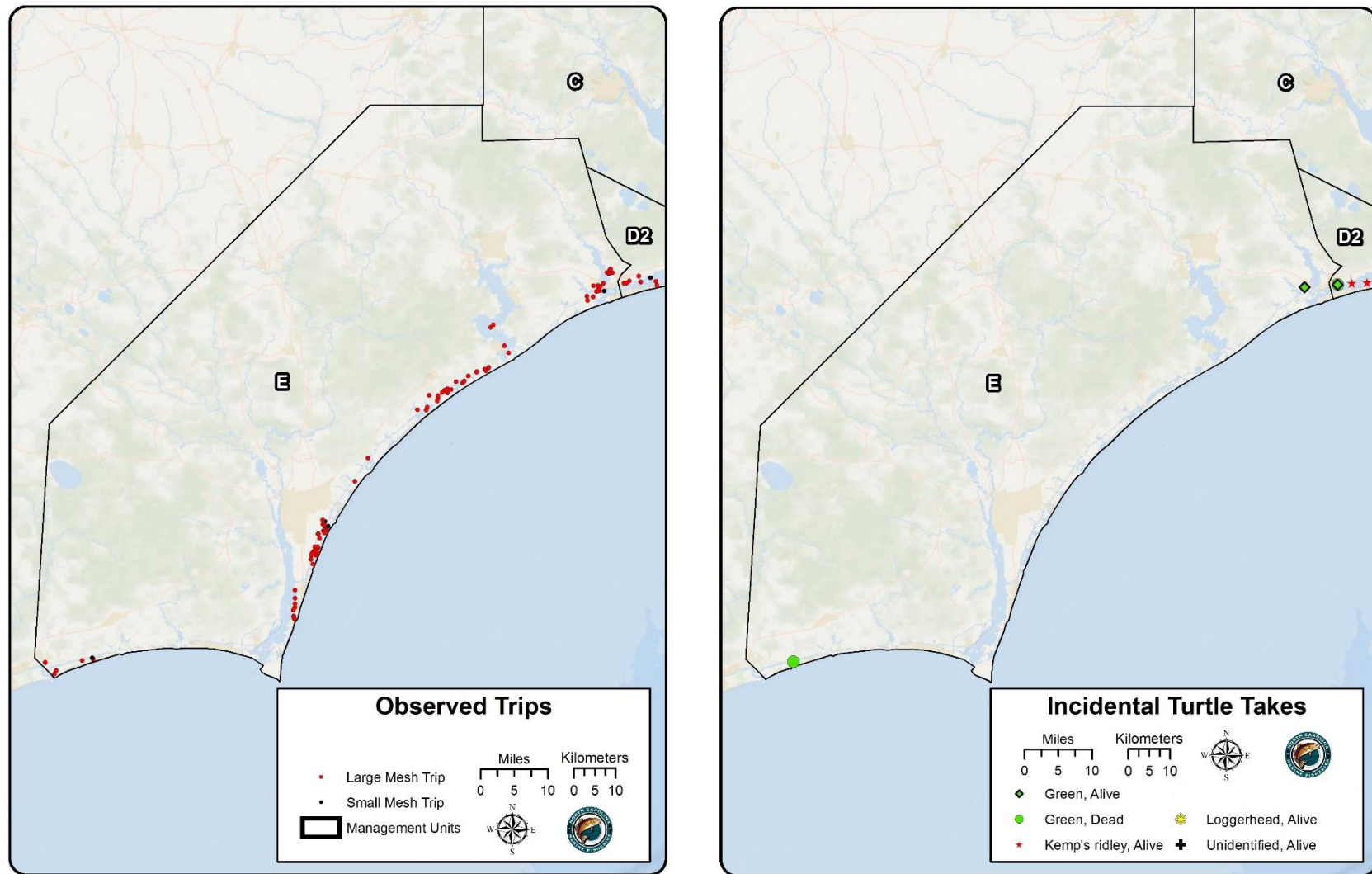


Figure 20. For summer 2019, observed gill-net trips (left) by mesh size category (93 large mesh = ≥ 4 inch; 5 small mesh = < 4 inch) and sea turtle interactions (right) by species and disposition (alive, $n = 1$; dead, $n = 1$) for Management Unit E. The dead green turtle was recovered from the net alive, but was euthanized the next day due to extensive carapace fractures not associated with the entanglement. See Figure 21.

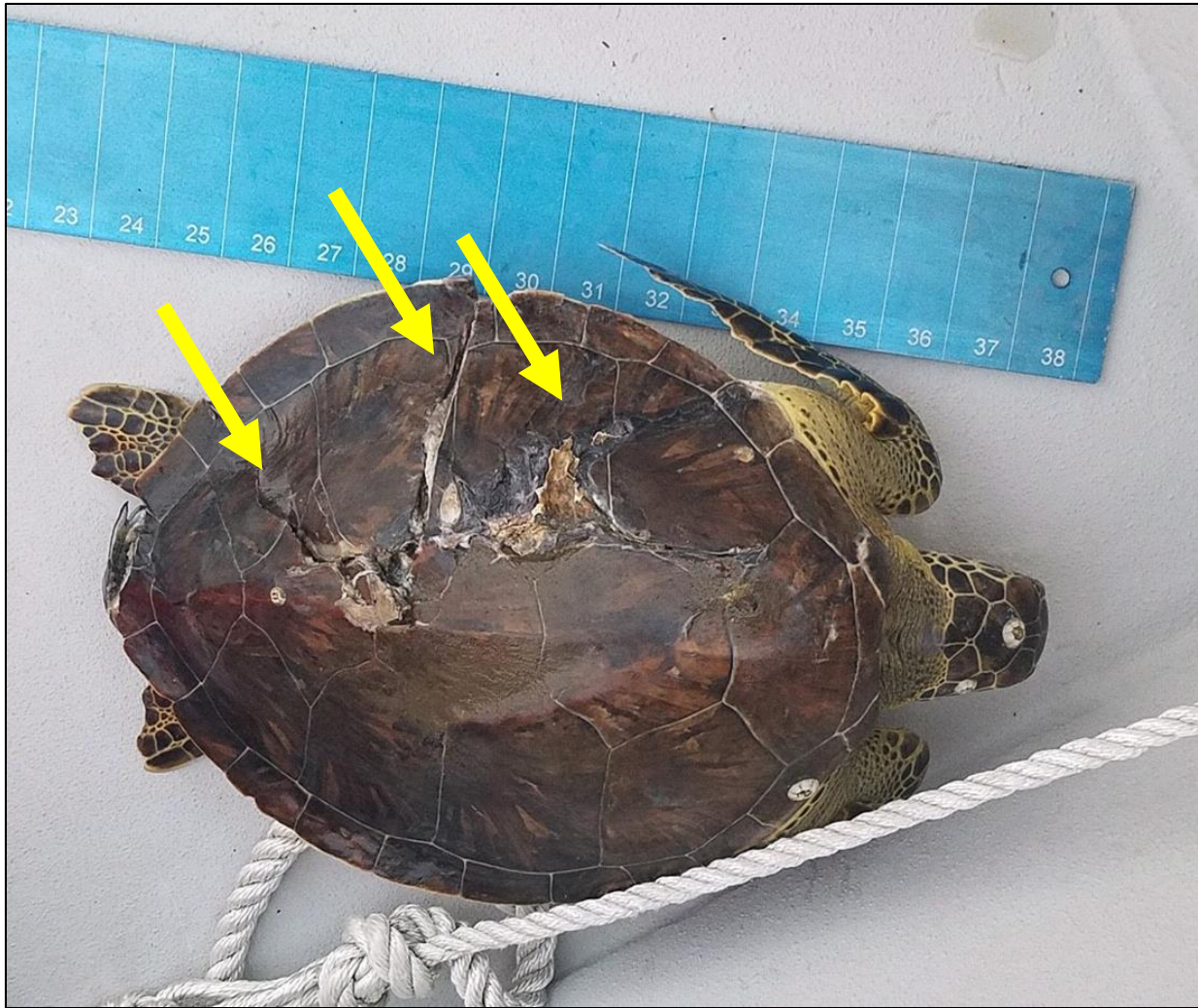


Figure 21. Green sea turtle recovered alive from a large-mesh (6 inch) gill net near Ocean Isle (Management Unit E) during an observed trip conducted by Marine Patrol on 17 July 2019. The turtle was transferred to the Karen Beasley Sea Turtle Rescue and Rehabilitation Center because of significant carapace fractures (yellow arrows). After assessment, the turtle was euthanized the next day because of the severity of the damage to the carapace and underlying spine and left lung. Photo credit: NCDMF.

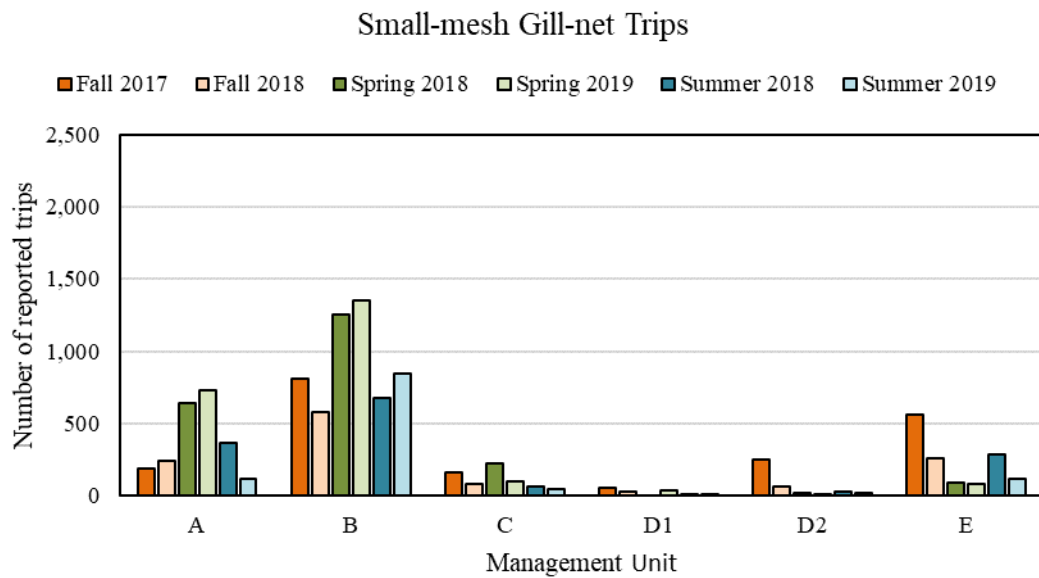
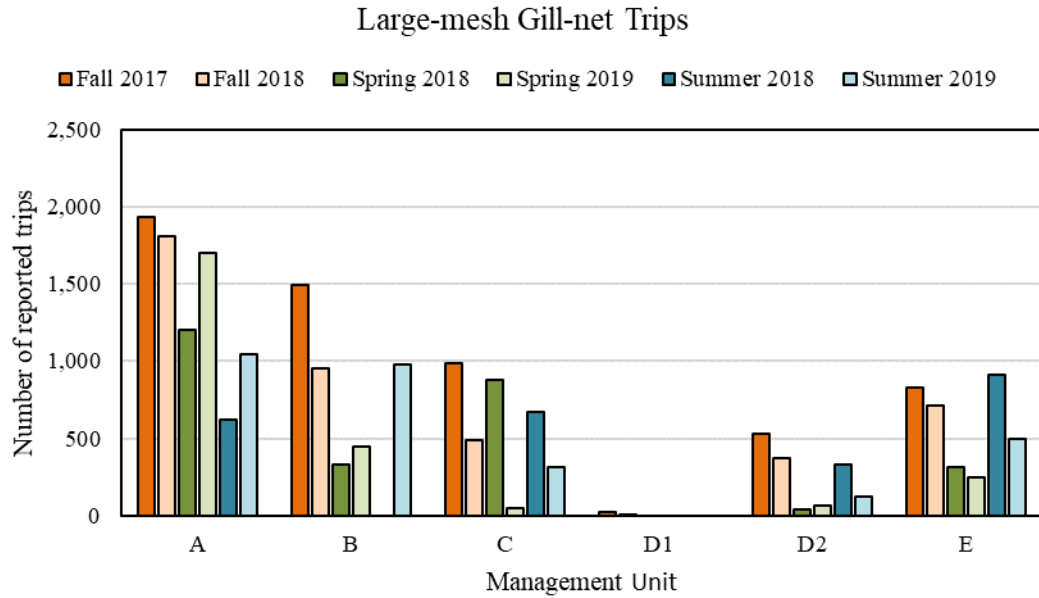


Figure 22. Number of fishing trips using large-mesh (≥ 5 inch, top) and small mesh (< 5 inch, bottom) gill nets reported to the Trip Ticket Program during the 2018 and 2019 ITP Years by season and management unit. Seasons for the 2018 ITP Year (fall 2017, spring 2018, summer 2018) are shown with darker shades that those for the 2019 ITP Year (fall 2018, spring 2019, summer 2019). Management Unit D1 was closed to large-mesh gill nets during fall 2017 and did not re-open during either ITP Year. Management Unit B was closed to large-mesh gill nets during late spring through summer 2018.

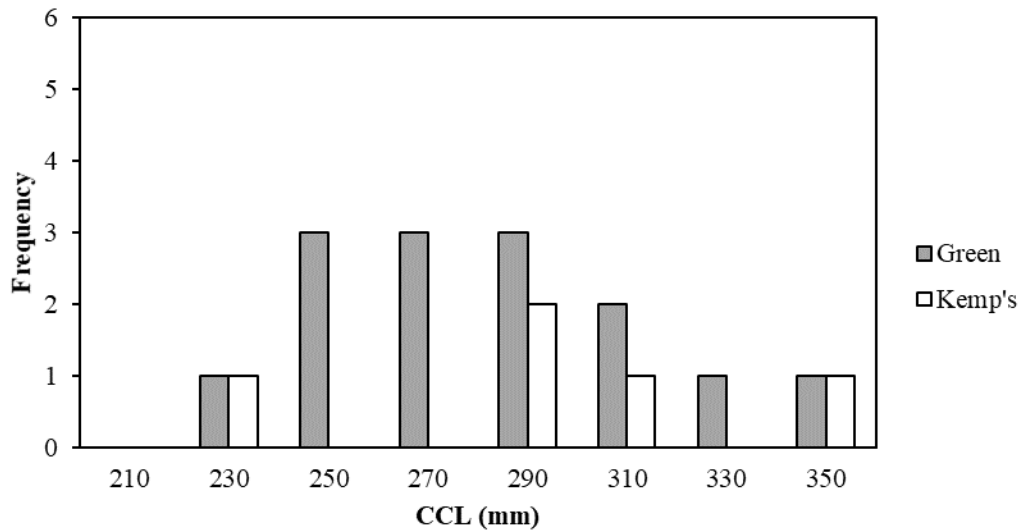


Figure 23. Length-frequency (curved carapace length [CCL], mm) of observed and measured incidental takes of green (n = 14 out of 15 observed) and Kemp's ridley (n = 5 out of 5 observed) sea turtles during the 2019 ITP Year. The measurement from the single observed loggerhead sea turtle (CCL = 640 mm) is not shown.

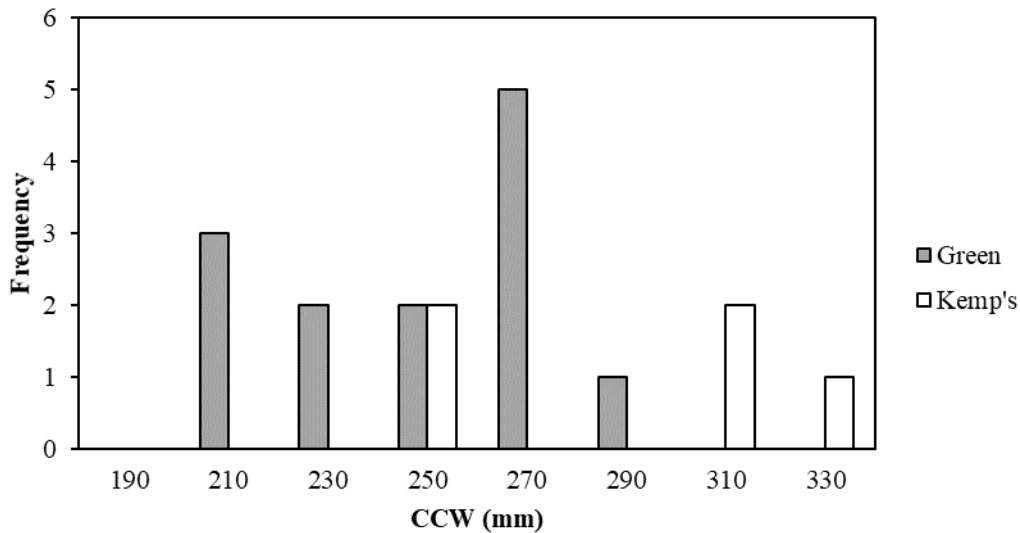


Figure 24. Length-frequency (curved carapace width, mm) of observed and measured incidental takes of green (n = 13 out of 15 observed) and Kemp's ridley (n = 5 out of 5 observed) sea turtles where measurements were obtained during the 2019 ITP Year. The measurement from the single observed loggerhead sea turtle (CCW = 650 mm) is not shown.

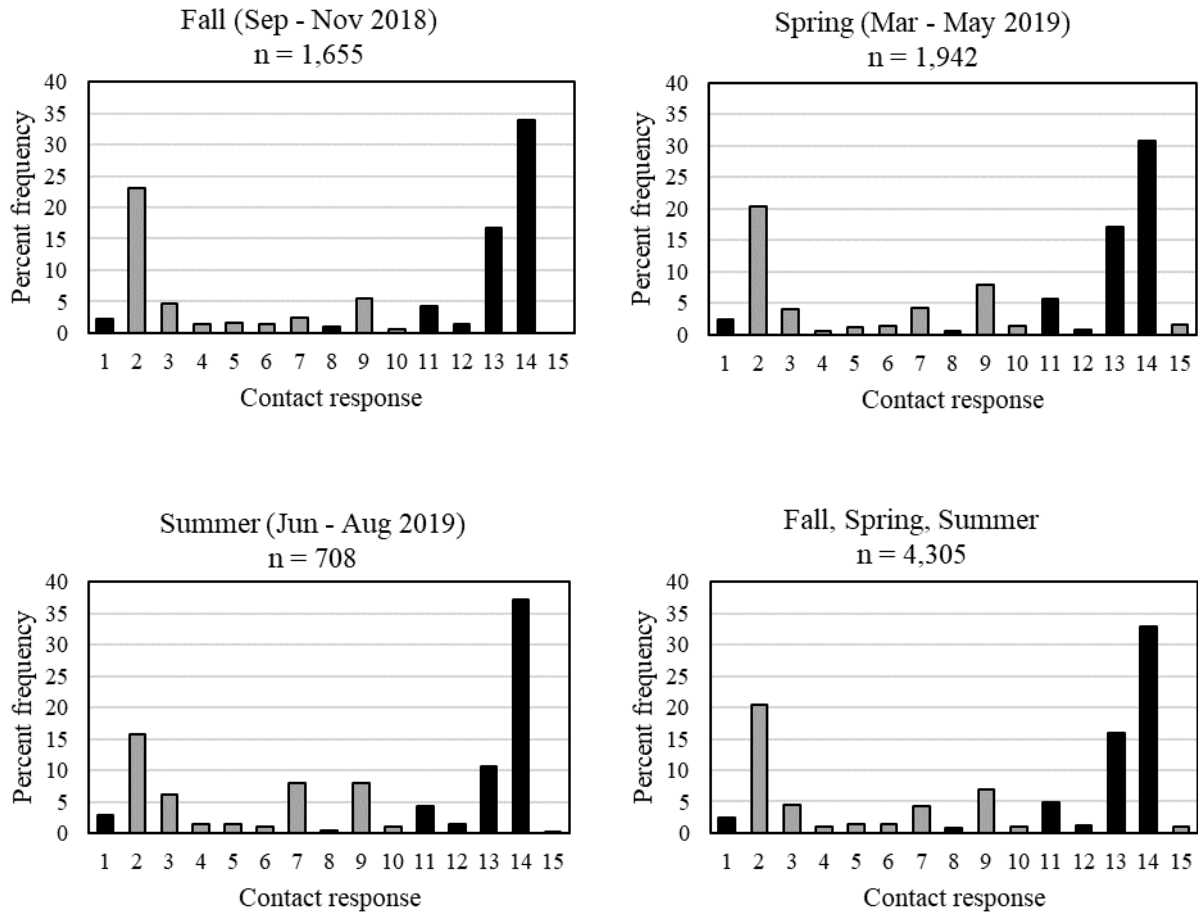


Figure 25. For the 2019 ITP Year, contacts attempted (n = 4,305) by observers to set up trips categorized by contact type (0-15) and presented as a percentage of the total for fall, spring, summer, and all three seasons combined. Contact type categories include the following: 1) Left message with someone 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 (gray bars) and when the observer did not (black bars).



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

STEPHEN W. MURPHEY
Director

26 June 2020

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

Dear Kristy:

The North Carolina Division of Marine Fisheries (NCDMF) Observer Program data have been updated using the finalized 2019 Trip Ticket Program (TTP) data for reported fishing trips. The Annual Completion Report for the Sea Turtle Incidental Take Permit (ITP) No. 16230 was completed for the 2019 ITP Year (September 2018 through August 2019) and submitted in April 2020. Using the finalized TTP 2019 data, Tables 1, 5, 7, and 8 from the Completion Report were updated to reflect the final estimates of observer coverage and sea turtle takes (Tables 1 - 4). Although TTP data for the fall 2018 season were finalized in the annual Completion Report, small changes to the dataset were found during the recent data pull. 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 9,794 reported large-mesh gill net trips during the 2019 ITP Year (Table 1) as compared to the 9,792 trips included in the 2019 Annual Completion Report. The small net difference (2 trips) between the finalized data and the preliminary data was due, in part, because there were 12 fewer large mesh trips for management unit A during spring 2019 that offset the 14 additional trips during fall (management units A and B) and summer (management units A, B, and E). The finalized data barely changed the percent observer coverage (0.1% or less) and did not reduce coverage below the minimum target for any season and management unit combination.



Anchored Small Mesh

Using finalized TTP data, there were 4,749 reported small-mesh gill net trips during the 2019 ITP Year (Table 2) as compared to the 4,712 trips included in the 2019 Annual Completion Report. This net difference of 37 more trips in the finalized data was due primarily to additional trips in management unit A during spring (n=26) and summer (n=11). Additionally, there were five fewer trips reported in management unit B during spring (n=2) and fall (n=3) that were offset by five additional trips reported across all three seasons. The finalized data did not significantly affect percent observer coverage (change of 1.3% or less) and did not reduce coverage to below the minimum target for any season and management unit combination.

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 2019 TTP data (Tables 3 and 4); the actual counts of observed sea turtle takes for other combinations were not affected (Table 4). Changes to the number of estimated sea turtle takes from the Annual Completion Report were negligible with the greatest difference being 0.5 for green sea turtles in management unit B (Table 3) and no difference to the overall rounded numbers of estimated takes (Table 4). As such, the annual estimated sea turtle takes for all species during the 2019 ITP Year remained well below authorized thresholds.

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
Steve Murphey
Dee Lupton
John McConnaughey
Wendy Piniak
Celeste Stout



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 2019 ITP Year. Differences are shown for the number of fishing trips and percent observer coverage using finalized TTP data versus the preliminary TTP data as reported in the Annual Completion Report; positive numbers indicate more reported trips and higher coverage using finalized data while negative numbers indicate fewer reported trips and lower coverage. Management Unit D1 was closed to gill nets with ≥ 4 inch mesh size for the entire ITP year; however, one trip was reported and observed during fall.

Season	Management Unit	Large Mesh				
		Fishing Trips	Observed Trips	Percent Coverage	Difference in Fishing Trips	Difference in Percent Coverage
Fall 2018	A	1,817	131	7.2	5	0.0
	B	957	80	8.4	2	0.0
	C	485	37	7.6	0	0.0
	D1	1 (closed)	1 (closed)	100.0	0	0.0
	D2	374	26	7.0	0	0.0
	E	713	54	7.6	0	0.0
	Overall	4,347	329	7.6	7	0.0
Spring 2019	A	1,687	100	5.9	-12	0.0
	B	448	29	6.5	0	0.0
	C	45	20	44.4	0	0.0
	D1	closed	closed	closed	closed	closed
	D2	61	11	18.0	0	0.0
	E	247	30	12.1	0	0.0
	Overall	2,488	190	7.6	-12	0.0
Summer 2019	A	1,045	46	4.4	1	0.0
	B	977	34	3.5	3	0.0
	C	313	27	8.6	0	0.0
	D1	closed	closed	closed	closed	closed
	D2	124	10	8.1	0	0.0
	E	500	93	18.6	3	-0.1
	Overall	2,959	210	7.1	7	0.0
All Seasons		9,794	729	7.4	2	0.0



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 2019 ITP Year. Differences are shown for the number of fishing trips and percent observer coverage using finalized TTP data versus the preliminary TTP data as reported in the Annual Completion Report; positive numbers indicate more reported trips and higher coverage using finalized data while negative numbers indicate fewer reported trips and lower coverage.

Season	Management Unit	Small Mesh				
		Fishing Trips	Observed Trips	Percent Coverage	Difference in Fishing Trips	Difference in Percent Coverage
Fall 2018	A	239	5	2.1	0	0.0
	B	581	21	3.6	1	0.0
	C	81	9	11.1	0	0.0
	D1	34	4	11.8	0	0.0
	D2	67	9	13.4	0	0.0
	E	262	5	1.9	1	0.0
	Overall	1,264	53	4.2	2	0.0
Spring 2019	A	753	13	1.7	26	-0.1
	B	1,349	39	2.9	-2	0.0
	C	97	16	16.5	0	0.0
	D1	39	6	15.4	0	0.0
	D2	10	0	0.0	1	0.0
	E	81	5	6.2	0	0.0
	Overall	2,329	79	3.4	25	0.0
Summer 2019	A	129	2	1.6	11	-0.1
	B	841	0	0.0	-3	0.0
	C	46	1	2.2	1	0.0
	D1	4	0	0.0	0	0.0
	D2	20	5	25.0	1	-1.3
	E	116	5	4.3	0	0.0
	Overall	1,156	13	1.1	10	0.0
All Seasons		4,749	145	3.1	37	0.0



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 for the 2019 ITP Year. Estimated actual takes were calculated from observer data and finalized Trip Ticket Program data. 95% confidence intervals are provided in parentheses. No sea turtle takes in small-mesh gill nets (< 4 inch) were observed during the 2019 ITP Year.

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	130.0 (32.2, 353.4)	0	9	5	0	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	53	26	7.2 (0, 21.7)	0	15	7	0	0	6	3	6.0 (0, 14.5)	0
Total	278	138	137.2	0	24	12	0	0	6	3	6.0	0

Species	E				Total			
	Estimated Takes				Estimated Takes			
	Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	96	48	7.3 (0, 21.9)	11.0 (0, 33.0)	330	165	137.3	11.0
Kemp's ridley	24	13	11.5 (0, 34.4)	0.0	98	49	24.7	0.0
Total	120	61	18.8	11.0	428	214	162.0	0.0

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.

Table 4. Total annual authorized and actual takes (observed and estimated) of sea turtles by species and for estimated takes by condition for the 2019 ITP Year using finalized Trip Ticket Program data. The incidental take of an unidentified sea turtle is not represented in the actual observed counts or estimated totals.

Species	Observed (live/dead)		Estimated			
	Authorized		Authorized		Actual	
	Live/Dead	Live/Dead	Alive	Dead	Alive	Dead
Green	18	3	330	165	137	11
Hawksbill	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	12	0	98	49	25	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	1 ²	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Total	78	5	428	214	162	11

¹ Insufficient observer data existed to model an estimated annual take level for the permit application; therefore, an annual observed take number was identified.

² Green sea turtle in Management Unit A (see Table 3 in the Annual Completion Report)





ROY COOPER

Governor

ELIZABETH S. BISER

Secretary

KATHY B. RAWLS

Director

27 January 2022

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

Dear Wendy:

As communicated to you in an email on 11 January 2022, the North Carolina Division of Marine Fisheries (NCDMF) Observer Program conducted a review to make sure that all observed takes by observers and Marine Patrol officers have been reported to the Observer Program and included in our reports to you. This review included a comparison of takes in our Biological Database to takes that are entered into a mobile phone application, "Collector". The Collector application is used in the field to record data and upload photos for trips and takes in real-time; the data are linked to an AGOL (ArcGIS Online) web interface that can be accessed from a computer.

During this review, we found two additional sea turtle takes (no sturgeon takes) that were in Collector, but had no other data trail (e.g., not in the Biological Database, corresponding ITP report, real-time running counts, etc.). The takes were in summer of 2019: (1) green sea turtle, alive, captured in large-mesh gear in Management Unit (MU) E, 7/17/2019, and (2) green sea turtle, alive, captured in large-mesh gear in MU A, 8/10/2019.

Neither of the takes listed above increased estimated or observed numbers above authorized thresholds. This memo is being provided per your request to correct the annual estimated number and confidence intervals of green turtle incidental takes in large-mesh gill nets in MU E (Table 1), and the annual observed (not estimated) number of green turtle incidental takes in large-mesh gill nets in MU A (Table 2) for the ITP Year 2019. Although no updates were needed, to be comprehensive this memo also includes the table of annual observed (not estimated) takes in large-mesh gill nets for green turtles in MU D2 and for hawksbill, leatherback, and loggerhead turtles in MUs B, D1, D2, and E memo (Table 3). There were no observed takes in small-mesh gill nets during ITP Year 2019, so those tables are not repeated here. However, the revisions are included in the summary table of all observed or estimated takes combined (Table 4) and the table of data specific to each observed take (Table 5).

Feel free to contact me with any questions.

Sincerely,

A handwritten signature in dark ink, reading "Barbie L. Byrd". The signature is written in a cursive style with a large, looped "B" and a stylized "Byrd".

Barbie L. Byrd

Cc: Kristy Long
Celeste Stout
Matthew Godfrey
Kathy Rawls
Dee Lupton
Steve Poland
Casey Knight
Carter Witten
Marina Barrineau
Lucas Pensinger

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 2019 ITP Year. Estimated actual takes were calculated from observer data and finalized Trip Ticket Program data. 95% confidence intervals are provided in parentheses. No sea turtle takes in small-mesh gill nets (< 4 inch) were observed during the 2019 ITP Year. Annual estimated takes for green sea turtles in D2 are not applicable (n/a) because authorized takes are expressed as counts (see Table 3).

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	130.0 (32.2, 353.4)	0	9	5	0	0	n/a	n/a	n/a	n/a
Kemp's ridley	53	26	7.2 (0, 21.7)	0	15	7	0	0	6	3	6.0 (0, 14.5)	0
Total	278	138	137.2	0	24	12	0	0	6	3	6.0	0

Species	E				Total			
	Estimated Takes				Estimated Takes			
	Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	96	48	12.6 (0, 39.8)	11.0 (0, 33.0)	330	165	142.6	11.0
Kemp's ridley	24	13	11.5 (0, 34.4)	0.0	98	49	24.7	0.0
Total	120	61	24.1	11.0	428	214	167.3	0.0

Table 2. 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 2019 ITP Year. Authorized levels per management unit are 4 sea turtles of any species. No sea turtle takes in small-mesh gill nets (< 4 inch) were observed, so takes represent interactions in large-mesh gill nets only.

Species	A		C		Total	
	Authorized (Alive/Dead)	Actual (Alive/Dead)	Authorized (Alive/Dead)	Actual (Alive/Dead)	Authorized (Alive/Dead)	Actual (Alive/Dead)
Green		2		0		2
Kemp's ridley		0		0		0
Hawksbill	4	0	4	0	4	0
Leatherback	(any species)	0	(any species)	0	(any species)	0
Loggerhead		0		0		0

Table 3. 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 2019 ITP Year. Annual observed takes 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 not applicable (n/a) because authorized takes are expressed as estimates (See Table 1). There is no change to this table from the version in the annual report submitted in April 2020.

Species	B		D1		D2		E		Total	
	Observed (Alive/Dead)		Observed (Alive/Dead)		Observed (Alive/Dead)		Observed (Alive/Dead)		Observed (Alive/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	1	3	0	3	0	3	0	12	1
Total	5	1	5	0	11	3	5	0	26	4

Table 4. Total annual authorized and actual takes (observed and estimated) of sea turtles by species and for estimated takes by condition for the 2019 ITP Year using finalized Trip Ticket Program data. The incidental take of an unidentified sea turtle is not represented in the actual observed counts or estimated totals. Annual estimated takes for hawksbill, leatherback, and loggerhead turtles are not applicable (n/a) because authorized takes are expressed as counts of observed takes.

Species	Observed		Estimated			
	Authorized	Actual	Authorized		Actual	
	(Alive/Dead)		Alive	Dead	Alive	Dead
Green	18	3	330	165	143	11
Hawksbill	8	0	n/a	n/a	n/a	n/a
Kemp's ridley	12	0	98	49	25	0
Leatherback	8	0	n/a	n/a	n/a	n/a
Loggerhead	24	1	n/a	n/a	n/a	n/a
Any Species	8	2 ¹	n/a	n/a	n/a	n/a
Total	78	6	428	214	167	11

¹ Two green sea turtles in Management Unit A (see Tables 2 and 5).

Table 5. Summary of observed sea turtle interactions (n = 24) during the 2019 ITP Year. All observed interactions occurred in large-mesh (≥ 4 inch) gill nets. PIT = Passive Integrated Transponders. n/a = not applied. n/r = not recorded. CCL = Curved Carapace Length. CCW = Curved Carapace Width. ¹Turtle was transferred for rehabilitation based on severe carapace fractures and was euthanized the next day. Shaded lines represent turtles not originally reported in the annual report or addendum submitted in 2020.

Date	Season	Management Unit	Latitude (N)	Longitude (W)	Species	Disposition	Applied PIT tags	Applied Inconel Tags	CCL (mm)	CCW (mm)
10/3/2018	Fall	B	34.99438	76.28997	Kemp's	alive	n/a	n/a	228	241
10/4/2018	Fall	B	35.36187	75.55748	Green	alive	n/a	n/a	304	267
10/30/2018	Fall	B	35.25243	75.61018	Green	alive	n/a	n/a	290	260
11/8/2018	Fall	B	35.26151	75.62806	Green	alive	982.000362056415 3D6.0015948ADF	n/a	286	247
5/16/2019	Spring	E	33.97020	77.92483	Green	dead	n/a	n/a	332	256
5/16/2019	Spring	E	33.97090	77.92675	Kemp's	alive	982.000364048805 3D6.0015B2F1A5	n/a	274	300
5/16/2019	Spring	E	33.97146	77.92725	Kemp's	alive	982.000363950045 3D6.0015B16FDD	n/a	296	292
5/30/2019	Spring	D2	34.75260	76.69836	Green	alive	n/a	n/a	243	n/a
6/4/2019	Summer	D2	34.69337	76.98663	Kemp's	alive	n/a	n/a	343	323
6/7/2019	Summer	D2	34.68357	77.04107	Green	alive	982.000364297643 3D6.0015BCDAB	n/a	262	210
6/7/2019	Summer	D2	34.68368	77.04096	Green	dead	n/a	n/a	282	251
6/11/2019	Summer	D2	34.68367	76.99529	Kemp's	alive	n/a	n/a	272	240
7/3/2019	Summer	E	34.67980	77.13325	Green	alive	982.000362191618 3D6.0015969B023	n/a	268	244
7/17/2019	Summer	E	33.88800	78.47000	Green	alive ¹	n/a	n/a	n/a	n/a
7/18/2019	Summer	B	34.81551	76.38171	Loggerhead	alive	982.0004106 3D6.001879D717	MMG064/ MMG066	640	650
7/24/2019	Summer	B	34.99500	76.30190	Green	alive	n/a	n/a	303	255
7/29/2019	Summer	A	35.93329	75.78285	Green	alive	n/a	n/a	244	220
8/9/2019	Summer	B	34.90955	76.32888	Green	alive	n/a	n/a	230	196
8/9/2019	Summer	B	34.90952	76.32928	Green	alive	n/a	n/a	250	209
8/14/2019	Summer	B	34.99207	76.17590	Unidentified	alive	n/a	n/a	n/a	n/a
8/15/2019	Summer	B	35.11880	75.96291	Green	alive	n/a	n/a	261	224
8/22/2019	Summer	B	35.04076	76.11522	Green	alive	n/a	n/a	315	275