



*Marine Fisheries*  
ENVIRONMENTAL QUALITY

Annual Sea Turtle Interaction Monitoring of the Anchored Gill-Net Fisheries in North Carolina  
for Incidental Take Permit Year 2016

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

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## INTRODUCTION

The North Carolina Division of Marine Fisheries (NCDMF) applied for an Incidental Take Permit (ITP) under Section 10(a)(1)(B) of the Endangered Species Act of 1973 (Public Law 93-205) (ESA) on June 14, 2010 to address sea turtle interactions with anchored gill nets in North Carolina's internal coastal (estuarine) waters. Species of sea turtles found in the estuarine waters of North Carolina include green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempii*), loggerhead sea turtle (*Caretta caretta*), hawksbill sea turtle (*Eretmochelys imbricate*), and leatherback sea turtle (*Dermochelys coriacea*). This request was prompted by notification from the National Marine Fisheries Service (NMFS) - Southeast Regional Office (SERO) in July and November 2009 indicating the need for the state of North Carolina to address unauthorized takes of sea turtles occurring in inshore anchored gill-net fisheries. A revised ITP application was submitted on August 17, 2011 based on feedback received from the NMFS on May 12, 2011. Feedback on the revised application from the NMFS was provided again on May 2, 2012 after public and peer review comments had been compiled. In response to requested changes from the NMFS, and considering the public and peer review comments, including the comments made by the North Carolina Sea Turtle Advisory Committee (NCSTAC), the NCDMF made extensive revisions to its application and resubmitted it on September 6, 2012. After another round of public and peer review comments the NMFS requested more information and clarification on certain portions of the application. On November 14, 2012, the response to the information request was discussed via teleconference between the NMFS and the NCDMF and provided to them beforehand. The NMFS recommended that the NCDMF update the current ITP application with an appendix containing all the updated information requested.

During the November 14, 2012 teleconference, the NMFS suggested breaking down the annual requested takes for Kemp's ridley and loggerhead sea turtles cumulatively similar to the previous ITPs for the Pamlico Sound Gill Net Restricted Area (PSGNRA). The NCDMF also suggested annual cumulative requested takes for all species of sea turtles for the exempt areas. A revised application was resubmitted on January 18, 2013.

On April 17, 2013 the NMFS set up a teleconference with the NCDMF to go over the revised ITP application that was submitted on January 18, 2013. Information was provided to the NMFS to clarify issues they had with the application. On April 22, 2013, the NMFS again asked for further clarification on different aspects of the ITP application which the NCDMF promptly responded to. At that time the NCDMF was informed by the NMFS that they hoped to have a draft permit within a month to discuss with the NCDMF. On April 30, 2013, the NCDMF staff were contacted by the NMFS for further explanation on the methodologies of the Observer Program. Explanations were provided and the NMFS did not have any more questions at the time.

On May 20, 2013, the NCDMF had another teleconference with the NMFS concerning the ITP application status and to review the Biological Opinion and Environmental Assessment protocols. At this time the NMFS raised concerns on the number of observed takes requested in the ITP application. During the May teleconference, the NCDMF and the NMFS agreed to base authorized takes by area on an annual basis instead of a seasonal basis. As such, the number of requested observed takes was reduced by taking the seasonal component out of the equation. The NMFS brought up the idea of having an Implementing Agreement for the Sea Turtle ITP, similar to the Implementing Agreement the NMFS has suggested for the Atlantic Sturgeon ITP. The NMFS explained that an Implementing Agreement would provide more flexibility and could reduce the risk of the permit being suspended due to excessive takes, but it will not allow for additional takes. The NMFS explained that any new information could be provided in another appendix to the existing application. The NCDMF asked the NMFS to provide a copy of a draft Implementing Agreement for consideration.

The NCDMF received the Sea Turtle ITP on September 11, 2013. The Sea Turtle ITP defined an ITP Year as beginning on September 1 and running through August 31 of the following year. This ITP authorized the implementation of adaptive management measures to protect threatened and endangered sea turtles and other ESA listed species, while allowing anchored gill-net fisheries to be prosecuted in the estuarine waters of North Carolina. The ITPs Conservation Plan specifies further measures, which the NMFS determined will minimize, monitor, and mitigate the impacts of incidental takes of ESA-listed sea turtle species associated with the otherwise lawful anchored gill-net fisheries operating in estuarine North Carolina waters. Anchored gill nets are passive sets deployed with an anchor, stake, or boat at one or both ends of the net shots or operation. Anchored gill nets do not include the following types of gill nets: run around, strike, drop or drift gill nets.

The Annual Completion Report for ITP Year 2014 (September 1, 2013 – August 31, 2014) was submitted January 30, 2015 (Boyd 2015a). During review of the 2014 Sea Turtle ITP Annual Completion Report, the NMFS requested modifications to certain tables and figures in the annual report. These modifications were addressed in the Annual Completion report for ITP Year 2015 (September 1, 2014 – August 31, 2015) which was submitted January 30, 2016 and included: maps for each management unit to include number of gill-net hauls and sea turtle interactions and tables which have all of the estimated/observed takes exactly as portrayed in the permit with 95% confidence intervals included (Boyd 2016a).

During the summer 2015 season a minor modification was enacted through the NMFS combining authorized takes for management units A ( $n = 4$ ) and C ( $n = 4$ ) for total authorized take limit of eight sea turtles from anchored large or small mesh gill nets and any species or disposition (Boyd 2016a).

## METHODS

### Observer Activity

The conservation plan includes managing the estuarine anchored gill-net fisheries by dividing North Carolina's estuarine waters into six management units (A, B, C, D1, D2, and E; Figure 1). Trip Ticket Program (TTP) data along with Observer Program data from previous years are used when estimating the amount of trips needed for the current year in each management unit and season. Also, real time TTP data are used for areas where effort may be increasing. Each year effort can potentially shift from one management unit to another making it important for the NCDMF to not base the observer effort solely on previous years' data, but also on current effort. To account for fluctuations in TTP data caused by management unit closings, a five-year average was used for estimating anchored large mesh gill-net fishing trips and a three-year average was used for estimating anchored small mesh gill-net fishing trips for ITP Year 2016. This method of estimating trips proves to more accurately reflect the current fishing effort. Once TTP data are finalized in May of 2017, the final observer coverage will be recalculated and the finalized estimates of observer coverage will be provided to the NMFS.

Observer coverage was calculated for each season in each management unit by estimating fishing trips using an average of the previous five years' TTP data (2011-2015) for anchored large mesh gill nets, and the average of the previous three years' (2013-2015) TTP data for anchored small mesh gill nets, while taking reduced season dates in each management unit into account by calculating the proportion of actual to possible fishing days. This calculated estimated fishing effort was compared to the observer trips completed throughout the ITP Year. The average, normalized effort was used when estimating fishing trips to account for the fluctuation of fishing effort throughout the years due to closures and other regulations put in place throughout the time series.

The onboard Observer Program, where observers ride onboard fishermen's vessels, is the preferred method of obtaining observer data and is used most frequently. Protected species interactions, gear parameters, as well as detailed gill-net catch, bycatch, and discard information for all species caught are recorded. The alternative platform Observer program requires two observers in a state owned vessel to monitor commercial fishermen hauling their gill nets. The alternative platform observers document protected species interactions and also provide catch and discard estimates for other species that are observed. The amount of biological data that are collected on alternative platform observer trips is notably less than onboard observer trips. Therefore, onboard observer trips are highly preferred due to the information being used when making management decisions, in stock assessments, in the development of fishery management plans, and for identifying bycatch (finfish, protected species) problem areas. For alternative platform trips, observers and Marine Patrol follow similar protocols using NCDMF vessels to observe the fishing trip. Each observer attempts to obtain a minimum of three to four trips per working week when fishing activity is occurring. Observers are assigned a management unit to

work weekly and the amount of observers assigned to a management unit depends upon the season and fishing effort. Fishing effort is estimated from the previous 3-5 year's TTP data by week, month, and management unit to determine where and how much observer coverage is needed each week and for each management unit by month/season. Reports from observers and other staff are used to determine if effort is fluctuating between management units. Trends from the previous years' TTP data are also analyzed to determine if fishing effort is shifting from one management unit to another. Fishermen holding an Estuarine Gill Net Permit (EGNP) in North Carolina are pooled by management unit and further split into lists by geographic area within units. The contact information for these fishermen is then given to the observers assigned to that area and the observers contact the fishermen to set up trips from the list of names given. Preliminary TTP information is also used to refine the list to represent individuals who are actively participating in fishing activities. Observers continually visit fish houses and dealers where they hand out business cards with their contact information and brochures explaining the Observer Program, giving the fishermen another outlet to allow observers on their vessels. Additionally, the Observer Program uses a website (<http://portal.ncdenr.org/web/mf/observers-program>) to provide outreach to fishermen to facilitate obtaining trips.

Alternative platform trips are utilized for areas that may be hard to get onboard trips (i.e., fishermen in remote locations that leave from their residence by boat). Alternative platform trips are also utilized in areas where fishing effort may increase quickly, where sea turtle abundance is high, and when observers are unable to set-up onboard trips due to fisherman compliance issues. Marine Patrol also conducts alternative platform trips weekly in all management units based on similar methodologies as the Observer Program. Coordination of onboard, alternative platform, and Marine Patrol alternative platform trips is done regularly to avoid sampling bias by avoiding multiple observations of a single trip and to achieve the maximum amount of observer coverage possible for each management unit. Changes in effort, sea turtle abundance (i.e., observed and reported interactions), and other protected species interactions are monitored on a daily, weekly, and monthly basis to ensure proper observer coverage is being maintained. The ITP requires a minimum of 7% observer coverage, with a goal of 10% of the total anchored large mesh gill-net ( $\geq 4$  inches stretched mesh-ISM) fishing trips, and a minimum of 1% coverage, with a goal of 2% of the total anchored small mesh gill-net ( $< 4$  ISM) fishing trips per management unit for the spring, summer, and fall seasons.

Observers are trained to identify, measure, evaluate condition, resuscitate, and tag sea turtles by the NMFS – Beaufort Lab and the NCDMF. Data collected on observed sea turtles includes: 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), and curved carapace length (mm) and width (mm) are recorded for each sea turtle observed. Photographs and environmental parameters (i.e., salinity, water temperature) are also collected when feasible. Dead sea turtles are retained by the observer when feasible.



All live, debilitated sea turtles are retained by the observer and delivered to the North Carolina Sea Turtle Stranding Network for examination and treatment. Observers also collect data on location, gear parameters, catch, and bycatch for each haul depending on the observed trip type (onboard/alternative platform). The catch is sampled throughout each onboard trip including weights, lengths, and disposition (alive/dead). Data are coded on the NCDMF data sheets and uploaded to the NCDMF Biological Database for analysis. All observers are debriefed within 24 hours of each trip to obtain data on catch, set locations, gear parameters, and sea turtle interactions to provide estimates of sea turtle bycatch.

The total bycatch of sea turtles for each management unit was estimated using the stratified ratio method (SAS 2004). The bycatch rate (sea turtles caught per fishing trip) estimated from observer data was multiplied by the total fishing trips (average of the previous 3-5 year's TTP data). To estimate confidence intervals (95%), the bootstrap method was used to sample estimates. Strata consisted of the six management units (A, B, C, D1, D2, and E; Figure 1). Estimates were calculated by date of capture, management unit, species, and disposition. Estimates were accumulated each week to implement necessary management measures if authorized take thresholds were approached.

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

## Seasons

The Observer Program's activities are reported on a weekly, seasonal, and annual basis. Weekly progress reports are required following a week in which a sea turtle interaction occurred and includes information such as take estimates, cumulative totals, number of observed trips, and observed takes with all associated information. The seasonal progress reports include a summary of the weekly reports, additional management measures if taken, compliance, violations that occurred, and any adaptive management actions taken during the season. Annual reports include actual and estimated takes including mortality and the level of uncertainty of the estimates (i.e., 95% confidence intervals) by management unit, size composition along with all other interaction information, one or more maps illustrating the geographic distribution of all observed anchored large and small mesh gill-net hauls and the locations of all interactions, and a description of the mitigation activities, adaptive management actions, and enforcement activities conducted during the ITP year.

## Authorized Takes

Authorized levels of annual incidental take are specified in Tables 1 - 5. The amount of incidental take is expressed as either estimated or observed takes depending on the amount of data available for modeling predicted takes. Extrapolated sea turtle takes were computed by dividing the number of sea turtle interactions observed by the total anchored gill-net trips

observed and then multiplying by the total anchored gill-net trips. Nonparametric confidence intervals (95%) were calculated using standard bootstrapping techniques (Efron and Tibshirani 1993) using the ‘boot’ package in R (Canty and Ripley 2015; Davison and Hinkley 1997; R Core Team 2015). Bootstrap replicates were generated by sampling observer trips with replacement 5,000 times within strata (mesh/season/management unit; Tables 1 - 5). Because reaching the estimated or observed level for any category of authorized takes for any species would end the incidental take authorization for all species; it is highly unlikely that all five species would be impacted at these full levels. Takes must be incidental to otherwise lawful activities associated with the anchored large and small mesh gill-net fisheries, and as conditioned herein. The permit covers incidental takes from the date of issuance through August 31, 2023. The NCDMF will use preliminary data to monitor the total number of live and dead takes by species per unit to determine if the NCDMF is approaching or has reached the authorized takes for any sea turtle species. Once TTP data are finalized in May of 2017, the final authorized estimated sea turtle takes will be recalculated and the finalized estimates will be provided to the NMFS.

### **Compliance**

The NCDMF observers and Marine Patrol conduct weekly fish house visits, boat patrols, fisherman spot checks, gear checks, aerial surveys, and continued outreach to the industry for the purpose of ensuring industry compliance and communicating efforts throughout the state. The Observer Program has various ways to contact fishermen to schedule trips. The most common method is by phone due to limited program resources, fishermen leaving from their residence, and efficiency. The Observer Program has a contact log which is filled out for every phone call or contact that is made when attempting to obtain a trip. Each contact was put into a specific category and other information is gathered (Table 6). The contact log was analyzed by month and category to determine what percentage of phone calls resulted in observer trips.

## RESULTS

### Observer activity

#### Fall 2015

The fall 2015 season for anchored large and small mesh gill nets in North Carolina is September through November for Incidental Take Permit (ITP) Year 2016 (September 1, 2015 – August 31, 2016) as defined in ITP No. 16230. Anchored large and small mesh gill nets opened via proclamation M-13-2015 on September 1, 2015 in the western portion of management unit A with the eastern portion of Albemarle Sound including Croatan and Roanoke sounds remaining closed to minimize sea turtle interactions (Table 7; Boyd 2015b). Management unit E closed to anchored large mesh gill nets via proclamation M-14-2015 on September 1, 2015 to minimize sea turtle interactions. Management unit C opened to anchored large and small mesh gill nets via proclamation M-14-2015 on September 1, 2015 but closed to anchored large mesh gill nets via proclamation M-15-2015 on September 24, 2015 through the end of the fall 2015 season due to approaching authorized Atlantic Sturgeon interactions. Anchored large mesh gill nets closed via proclamation M-20-2015 on October 17, 2015 in management unit B subunits (SGNRA 1-4, CGNRA) to minimize sea turtle interactions with subunit MGNRA remaining open. Anchored large and small mesh gill nets closed via proclamation M-21-2015 on October 17, 2015 in management unit A due to sea turtle interactions. Portions of management unit A (western Albemarle Sound, Currituck Sound) reopened on October 26 and November 2, 2015 via proclamations M-22-2015 and M-23-2015, respectively. Management unit D1 and the eastern subunits of management unit B (SGNRA 1-4, CGNRA) opened to anchored large and small mesh gill nets on November 2, 2015 via proclamation M-24-2015. Management unit B closed to anchored large mesh gill nets via proclamation M-25-2015 on November 5, 2015 due to sea turtle interactions (Table 7; Boyd 2015b).

The Observer Program achieved an estimated 10.2% overall anchored large mesh gill-net coverage for the fall 2015 season meeting the minimum requirement (7.0%) in all management units based on preliminary data (Table 8; Figures 2 - 8; Boyd 2015b).

The Observer Program achieved an estimated 4.1% overall anchored small mesh gill-net coverage for the fall 2015 season meeting the minimum requirement (1.0%) in all management units based on preliminary data (Table 9; Figures 2 - 8; Boyd 2015b).

There were 29 observed sea turtle interactions from anchored large mesh gill nets and two observed from anchored small mesh gill nets in the fall 2015 season (Table 10; Figures 2 - 8; Boyd 2015b). The species composition was made up of primarily green sea turtles ( $n = 24$  alive;  $n = 4$  dead), with one alive and one dead Kemp's ridley sea turtles, and one alive unknown sea turtle. The majority of the interactions (74.2%) occurred in management unit B (Table 10;

Figures 2 - 8). No fisherman self-reported sea turtle interactions occurred during this time period (Table 11; Boyd 2015b).

### **Spring 2016**

The spring 2016 season for anchored large and small mesh gill nets in North Carolina is March through May for Incidental Take Permit (ITP) Year 2016 (September 1, 2015 – August 31, 2016) as defined in ITP No. 16230. American shad season began in management unit A on March 3, 2016 via proclamation M-2-2016 implementing gill net restrictions (i.e., 100 yard maximum net length, 25-yard spacing, 12-hour soak time, four-day fishing weeks, 15 meshes deep, maximum of 2,000 yards combined, prohibited to use floats) for anchored large mesh gill nets in the eastern portions of Albemarle Sound including Croatan and Roanoke sounds while implementing gill-net configurations (i.e., remove vertical height restrictions, allow floats) to allow for harvesting American shad in portions of management unit A (Table 7; Boyd 2016b). Portions of management unit E (upper Cape Fear and Northeast Cape Fear rivers) closed to anchored large mesh gill nets via proclamation M-5-2016 on April 10, 2016 due to an interaction with a Shortnose Sturgeon (*Acipenser brevirosturn*). Management unit A closed to anchored large mesh gill nets via proclamation M-6-2016 on April 23, 2016 for the remainder of the spring 2016 season due to reaching authorized dead Atlantic Sturgeon takes. Management unit E closed to anchored small mesh gill nets via proclamation M-8-2016 on May 4, 2016 for the remainder of ITP Year 2016 due to reaching authorized sea turtle takes. Management unit D1 closed to anchored large mesh gill nets via proclamation M-9-2016 on May 9, 2016 as part of the annual closure outlined in the ITP (Table 7; Boyd 2016b).

The Observer Program achieved an estimated 9.5% overall anchored large mesh gill-net coverage for the spring 2016 season meeting the minimum requirement (7.0%) in all management units except management units B (6.7%), D1 (0.0%), and D2 (4.5%) based on preliminary data (Table 8; Figures 2 - 8). Observer coverage for management unit B was 6.7% (Table 8; Figures 2 - 8; Boyd 2016b).

The Observer Program achieved an estimated 2.6% overall anchored small mesh gill-net coverage for the spring 2016 season meeting the minimum requirement (1.0%) in all management units based on preliminary data (Table 9; Figures 2 - 8; Boyd 2016b).

There were three observed sea turtle interactions from anchored large mesh gill nets and three observed from anchored small mesh gill nets in the spring 2016 season (Table 10; Figures 2 - 8; Boyd 2016b). The species composition was made up of primarily green sea turtles (n = 2 alive; n = 2 dead), with one alive Kemp's ridley sea turtle, and one alive unknown sea turtle (Table 10; Figures 2 - 8). The majority of the interactions (66.7%) occurred in management unit B (Table 10; Figures 2 - 8). There were four reported sea turtle interactions during this time period (Table 11). Of the four reported sea turtles, two were fisherman self-reported, one was reported by

Marine Patrol from an illegally set large mesh gill net, and one was reported by Marine Patrol from an abandoned large mesh gill net (Table 11; Boyd 2016b).

### **Summer 2016**

The summer 2016 season for anchored large and small mesh gill nets in North Carolina is June through August for Incidental Take Permit (ITP) Year 2016 (September 1, 2015 – August 31, 2016) as defined in ITP No. 16230. The western portions of management unit A reopened to anchored large mesh gill nets via proclamation M-10-2016 on June 1, 2016 while maintaining the closure of all anchored gill nets in the eastern portion of the management unit to avoid interactions with sea turtles (Table 7; Boyd 2016c). Management unit A was previously closed to the use of anchored large mesh gill nets on April 23, 2016 via proclamation M-6-2016 due to reaching authorized dead Atlantic Sturgeon takes. Management unit B closed to anchored large mesh gill nets via proclamation M-12-2016 on June 6, 2016 for the remainder of the summer 2016 season due to reaching authorized sea turtle takes. Management unit A closed to anchored large and small mesh gill nets via proclamation M-13-2016 on June 7, 2016 for the remainder of the summer 2016 season due to reaching authorized sea turtle takes. Portions of management unit E (upper Cape Fear and Northeast Cape Fear rivers) remained closed from April 10, 2016 through the summer 2016 season to anchored large mesh gill nets due to an interaction with a Shortnose Sturgeon. Management unit E remained closed through the summer 2016 season to anchored small mesh gill nets due to reaching authorized sea turtle takes on May 4, 2016. Management unit D1 remained closed through the summer 2016 season to anchored large mesh gill nets as part of the annual closure outlined in the Sea Turtle ITP (Table 7; Boyd 2016c).

The Observer Program achieved an estimated 14.2% overall anchored large mesh gill-net coverage for the summer 2016 season meeting the minimum requirement (7.0%) in all management units based on preliminary data (Table 8; Figures 2 - 8). Management unit D1 was closed for the duration of the summer 2016 season as part of the annual closure outlined in the ITP (Boyd 2016c).

The Observer Program achieved an estimated 1.2% overall anchored small mesh gill-net coverage for the summer 2016 season meeting the minimum requirement (1.0%) in all management units except management units A and B based on preliminary data (Table 9; Figures 2 - 8). Observer coverage for management unit B was 0.7%, management unit A was 0.0%, and management unit E remained closed to anchored small mesh gill nets for the duration of the summer 2016 season (Table 7; Boyd 2016c).

There were 17 observed sea turtle interactions from anchored large mesh gill nets during the summer 2016 season (Table 10; Figures 2 - 8; Boyd 2016c). There were no sea turtle interactions from anchored small mesh gill nets during the summer 2016 season. The species composition was made up of primarily green sea turtles (n = 7 alive; n = 3 dead), Kemp's ridley

sea turtles (n = 5 alive; n = 1 dead), and one alive unknown sea turtle (Table 10; Figures 2 - 8). Interactions primarily occurred in management unit E (52.9%) and management unit B (23.5%; Table 10; Figures 2 - 8). No fisherman self-reported sea turtle interactions occurred during this time period (Table 11; Boyd 2016c).

### **Authorized Takes**

There was a total of 49 observed sea turtle interactions in anchored large mesh gill nets and five in anchored small mesh gill nets for ITP Year 2016 (Table 10; Figures 2 - 8). The species composition consisted of primarily green sea turtles (77.8%; n = 33 alive; n = 9 dead; Table 10; Figures 2 - 8). The remaining species consisted of a Kemp's ridley sea turtle (16.7%; n = 7 alive; n = 2 dead), and unknown sea turtles (5.6%; n = 3 alive; Table 10; Figures 2 - 8). Observed interactions occurred in management unit A (7.4%), management unit B (57.4%), management unit C (3.7%), management unit D1 (5.6%), management unit D2 (1.8%), and management unit E (24.1%; Table 10; Figures 2 - 8). Of the four reported sea turtle interactions for ITP Year 2016, two were self-reported by fishermen and two were reported by Marine Patrol from illegally set gill nets (Table 11; Boyd 2015b, Boyd 2016b, Boyd 2016c).

The size distribution of green sea turtles (n = 32) ranged from a curved carapace length of 232 mm to 608 mm and a curved carapace width of 196 mm to 482 mm (Figures 9 and 10). The size distribution of Kemp's ridley sea turtles (n = 8) ranged from a curved carapace length of 290 mm to 380 mm and a curved carapace width of 290 mm to 385 mm (Figures 11 and 12; Boyd 2015b, Boyd 2016b, Boyd 2016c).

The cumulative total estimated and observed takes for anchored large mesh gill nets did not reach the threshold of authorized takes for any management unit for ITP year 2016 except for alive Kemp's ridley takes in management unit B based on preliminary data (Tables 1 - 5). The cumulative total observed takes for anchored small mesh gill nets did not reach the threshold of authorized takes for any management unit for ITP year 2016 except for green sea turtle takes in management unit E based on preliminary data (Tables 1 - 5; Boyd 2015b, Boyd 2016b, Boyd 2016c).

The percentage of authorized takes that were utilized in ITP Year 2016 for anchored large mesh gill nets were calculated for estimated takes by species and disposition (green 45.2% alive, 3.0% dead; Kemp's 79.6% alive, 0.0% dead). The percentage of authorized takes that were utilized in ITP Year 2016 were also calculated for observed takes (green 44.4% alive/dead; Kemp's 0.0% alive/dead). Overall, for both anchored large and small mesh gill nets the percentage of estimated takes utilized (53.0% alive, 33.2% dead) and observed takes utilized (17.9% alive/dead) was below the authorized takes provided by the Sea Turtle ITP.

## **Compliance**

Marine Patrol made 909 gill-net checks during the fall 2015 season resulting in 38 citations being issued (Tables 12 and 13). Marine Patrol made 286 gill-net checks for the spring 2016 season resulting in 16 citations being issued. Marine Patrol made 283 gill-net checks for the summer 2016 season with no citations being issued (Tables 12 and 13; Boyd 2015b, Boyd 2016b, Boyd 2016c).

In the fall 2015 season a total of 4,613 phone calls were made with 49.3% ( $n = 2,275$ ) being categorized as 1, 8, 11, 12, 13, and 14, which inclusively represents not being able to get in touch with fishermen or fishermen refusing trips (Table 14). In the spring 2016 season, 3,169 phone calls were made with 52.1% ( $n = 1,638$ ) being categorized as 1, 8, 11, 12, 13, and 14. In the summer 2016 season, 3,996 phone calls were made with 58.0% ( $n = 2,319$ ) being categorized as 1, 8, 11, 12, 13, and 14 (Table 14). Notices of Violations (NOV) were issued when fishermen were found to be out of compliance with the EGNP with 18 NOVs issued during the fall 2015 season, six NOVs were issued during the winter 2015-2016 season, and six NOVs were issued during the spring 2016 season (Table 15; Boyd 2015b, Boyd 2016b, Boyd 2016c). No NOVs were issued during the summer 2016 season.

## DISCUSSION

### Management history

The NCDMF has addressed protected sea turtle issues in the coastal waters since the 1970s. Sea turtle protection has been accomplished by cooperative agreements with the North Carolina Wildlife Resources Commission (NCWRC), establishment of a sea turtle sanctuary, proclamation authority delegated to the Director of the NCDMF, additional queries on recreational surveys, management of the PSGNRA, formation of the NCSTAC, implementation of an Observer Program, commercial bycatch reduction gear testing projects, outreach to the commercial and recreational fishing industries, and collaboration with the NMFS.

The NCDMF applied for and received four ITPs for the PSGNRA from 2000 - 2005 managing the area for sea turtle takes in the fall of each year through 2012 under these permits (Gearhart 2001, 2002, 2003; Price 2004, 2005, 2006, 2007a, 2008, 2009a, 2010a; Murphey 2011; Boyd 2012a, 2013). Between 2000 and 2012, a number of changes were made in the PSGNRA such as: adjustments to authorized fishing areas, modified restrictions (e.g., state closure and net length restriction), and authorized take levels reduced (Gearhart 2003; Price 2010a; Murphey 2011; Boyd 2012a). These adaptations were made feasible as a result of the extensive monitoring program conducted by the NCDMF in the PSGNRA. The NCDMF also observed limited trips in the large and small mesh gill-net fisheries outside of the PSGNRA from 2004 to 2010 (Brown and Price 2005; Price 2007b, Price 2009b, Price 2010b; Boyd 2012b). The information gathered from these direct observations authorized the NCDMF to generate requested estimated take numbers for observed fisheries and draft a functional Conservation Plan.

In June 2009, the NMFS began an Alternative Platform Observer Program in Core Sound, NC. The NMFS observers documented sea turtle interactions in anchored large mesh gill nets in this area beginning in late June and notified the NCDMF of their concern for these unauthorized takes. The NCDMF consulted with the NMFS-SERO via conference calls and correspondence to discuss short and long-term actions to address sea turtle takes in gill nets in Core Sound and throughout the state. In the short term, the agencies agreed for the NCDMF to implement gear restrictions (yardage limits, mesh depth reduction, and net shot reductions) and increased observer coverage in Core Sound and adjacent water bodies (NCDMF Proclamation M-16-2009). For the long-term, the NCDMF continued consultations with the NMFS-SERO concerning the preparation of an ITP application for all internal coastal waters while compiling sea turtle interaction data from gill-net surveys, research projects, and direct observations.

On October 20, 2009, the day that authorized sea turtle takes were reached in the 2009 PSGNRA, a 60-day Notice of Intent (NOI) to sue the NCDMF and the North Carolina Marine Fisheries Commission (NCMFC) was received from the Duke Environmental Law and Policy Clinic on behalf of the Karen Beasley Sea Turtle Rescue and Rehabilitation Center Foundation



(Beasley Center). The NOI stated that the NCDMF and the NCMFC violated Section 9 of the ESA by allowing gear in state waters that had unauthorized takes of threatened or endangered sea turtles.

The NCDMF consulted with the NMFS-SERO concerning this NOI while continuing to work toward the preparation of an application for a statewide ITP for gill-net fisheries in internal coastal waters. In November 2009, the NCDMF received further correspondence from the NMFS-SERO reiterating the need to “satisfy the requirements of the ESA” relative to Core Sound sea turtle interactions. The NCDMF continued to collect sea turtle interaction data while developing an interim plan to address sea turtle interactions in gill-net gear. As a result of discussions and correspondence with the NMFS-SERO, the NCDMF submitted an interim plan in January 2010 to address sea turtle interactions in gill-net fisheries prosecuted in internal coastal waters. The plan proposed to close large mesh gill-net fisheries throughout the majority of the estuarine waters of North Carolina from May to December 2010.

On February 18, 2010 the NCDMF presented the interim proposal to the NCMFC and the public at an emergency NCMFC meeting in New Bern, NC. During the meeting, numerous commercial fishery representatives expressed concern with the proposed closure on the basis of the negative economic impact that would result from such a closure. Representatives from the Coastal Conservation Association (CCA-NC) did not support the interim closure stating the plan was too limited in scope. After thoroughly debating the issue, the NCMFC voted to direct the NCDMF to implement alternative measures that included reductions in the number of days per week that large mesh gill nets were authorized to be fished, restricted soak times, reductions in the length of individual nets (shots), and reductions in total yardage.

On February 23, 2010, the Duke Environmental Law and Policy Clinic filed suit against the NCDMF and the NCMFC on behalf of the Beasley Center. Negotiations between the parties occurred between late February and March 23, 2010, when the NCMFC met again. During the meeting, the NCMFC directed the fisheries director to issue a gill-net proclamation effective May 15, 2010 restricting the number of days during the week that anchored large mesh gill nets would be authorized, limiting soak time, establishing a maximum yardage limit, mandating maximum mesh depth, requiring maximum individual gill-net (shot) lengths, establishing spacing between net shots, and eliminating the use of tie-downs and floats or corks along float lines. The NCDMF Director did not issue the proclamation because, as detailed below, ongoing negotiations with the Beasley Center and the Duke Environmental Law and Policy Clinic produced a settlement agreement which preempted this particular action.

The NCMFC met May 12 through 14, 2010 and discussed the parameters of the final Settlement Agreement between the Beasley Center (plaintiff) and the NCDMF and the NCMFC. At that meeting, the NCMFC reached an agreement concerning restrictions that would be implemented

in the anchored large mesh gill-net fishery in NC estuarine waters. As a result of the NCMFC action, the NCDMF issued Proclamation M-8-2010 effective May 15, 2010 implementing the provisions of the Settlement Agreement. Gill-net restrictions implemented by the proclamation included: a range of 4 ISM to, and including, 6 ½ ISM for anchored large mesh gill nets; soak times limited to overnight soaks an hour before sunset to an hour after sunrise, Monday evenings through Friday mornings; anchored large mesh gill nets were restricted to a height of no more than 15 meshes, constructed with a lead core or leaded bottom line and without corks or floats other than needed for identification; a maximum of 2,000 yards of anchored large mesh gill nets authorized to be used per vessel; and maximum individual net (shot) length of 100 yards with a 25-yard break between shots (except for exempted areas including management unit C and portions of management unit A).

The Settlement Agreement included gill nets from 4 ISM to less than 5 ISM in the large mesh category because of observed sea turtle takes in 4 ISM and 4 ½ ISM gill nets in the NCDMF Independent Gill Net Survey. The measures were modified slightly several times, with the concurrence of the Beasley Center, to improve gear efficiency or adjust fishing area boundaries without compromising the sea turtle conservation provisions of the Settlement Agreement with fishermen in the southern portion of the state authorized to set anchored large mesh gill nets an extra day (Sunday evenings through Friday mornings) and use floats on nets, but were restricted to the use of a maximum of 1,000 yards of anchored large mesh gill net per fishing operation.

On November 21, 2016, the NCDMF requested a minor modification to extend the future annual report deadlines for the Sea Turtle (No. 16230) and Atlantic Sturgeon (No. 18102) ITPs from January 31 to the last day in February. This extension was to benefit staff due to a lag time in data being uploaded and verified, the time of year, the deadline for the fall seasonal report, and staff availability. On January 4, 2017, the NMFS sent a letter to the NCDMF concurring with NCDMF's request for the minor modification encouraging staff to incorporate any further anticipated minor modifications into the application process for an updated ITP (Appendix A).

## **Outreach**

Staff from the NCDMF met with commercial industry leads on July 11, 2016 to discuss the current ITPs and options for moving forward with amendments. The North Carolina Fisheries Association (NCFA) requested this meeting in response to staff asking industry for their thoughts on potential ITP amendments and ways to further minimize sea turtle takes (in order to keep management units open longer under the current ITPs). During the meeting the NCFA discussed their interest in exploring gear modifications that are proven to reduce sea turtle interactions and would ultimately like to see the estuarine gill-net fishery managed under gear modifications (similar to the shrimp trawl fishery) without the constraints of the current ITPs. Staff from the NCDMF explained that while staff would be able to assist regarding the ITP permit process, the NCFA should work with researchers with expertise in gear development and apply for a research

Section 10 permit. In order to reach their ultimate goal, the NCFA would like to work on minimizing takes and amending the current ITPs by soliciting feedback from commercial gill netters throughout the state.

The NCFA scheduled two meetings on August 30 and 31, 2016 that focused on potential ITP amendments and ways to further minimize sea turtle and Sturgeon takes in the anchored gill-net fisheries. NCFA invited NCDMF staff to attend their meetings to hear the fishermen's feedback and to provide input on the feasibility of the fishermen's ideas. While discussing these meetings with the commercial industry leads, NCDMF staff raised the issue of the lack of fisherman compliance with the ITPs. NCFA fully agreed that it is a problem, and they plan on stressing the need for compliance at their meetings in order for this to be successful. Another comment made by the NCFA was they felt that the onboard observations by the NCDMF are very important. They also mentioned that the onboard observations are needed in order to collect biological information from the catch as opposed to just monitoring protected species interactions.

Staff from the NCDMF attended both meetings NCFA held in Wanchese, NC on August 30, 2016 and in Morehead City, NC on August 31, 2016. While most of the meetings were discussions amongst fishermen or directed at NCFA members, NCDMF staff answered and/or clarified questions as needed. The questions and/or concerns from fishermen included: confusion that self-reporting sea turtle and Sturgeon takes was a requirement of the ITPs, that the definition of a take includes live interactions, that the amount of restrictions already in place on the anchored gill-net fisheries were too great, and the belief that any further restrictions would lead to their inability to make a livelihood in the industry. The North Carolina Watermen United (NCWU), which were in attendance at the August 30, 2016 meeting, sent the NCDMF a letter on September 2, 2016 listing many modifications that are already in place in the anchored gill-net fisheries, but suggests another "more-inclusive" meeting for further discussion (Appendix B). The NCFA sent the NCDMF a follow-up email on September 19, 2016 with questions and concerns following the meetings (Appendix C).

At the August 2016 NCMFC meeting, Chairman Sammy Corbett announced that he was disbanding the STAC because it is not statutorily required and the NCMFC committee system already has a multitude of committees which are statutorily mandated. Chairman Corbett sent a letter explaining his decision to the committee members on August 25, 2016 (Appendix D).

### **Observer Activity**

There was turnover within the Observer Program with positions being filled as quickly as possible to maintain coverage. The Observer Program actively placed observers in areas where fishing effort was high and where known sea turtle and Atlantic Sturgeon interactions occur. There were closures during each season throughout the state due to sea turtles and Atlantic

interactions. When a management unit closes for a portion of time the observers are shifted to the open management units to increase coverage in those management units. The contact log, which includes different categories to place each contact that was made to a fisherman, was beneficial for analyzing the type of contact that was being made and to see the number of observer trips that were obtained through the calling system.

There were multiple closures of various management units throughout the state in ITP Year 2016 (Table 7). Fishermen are more elusive to attempts by observers contacting them to set-up trips after proclamations enacting stricter regulations are implemented. Therefore, making it harder to obtain observer trips. No trips were obtained in management unit D1 during the spring 2016 season due to the management unit being closed for the latter portion of the spring 2016 season and minimal fishing effort while open. In the summer 2016 management unit A was open for only seven days before being closed to anchored large and small mesh gill nets for the duration of the summer 2016 season (Table 7). Therefore, no anchored small mesh trips were able to be obtained during this short time frame.

### **Compliance**

Although ITP Year 2016 is the third year for the statewide ITP, fishermen are not as familiar with the Observer Program and requirements of the ITP as desired, so more time is needed to educate the industry. Alternative platform trips were employed in all management units more frequently throughout ITP Year 2016 in order to maintain observer coverage due to compliance issues with fishermen (i.e., not answering phone calls, not calling back). The required minimum 7% observer coverage is very difficult to achieve when observers must rely on alternative platform trips, as it requires two observers to obtain a trip. The NCDMF discussed the situation with industry leads to improve awareness and increase compliance.

There were no fisherman self-reported sea turtle takes during the fall 2015 and summer 2016 seasons with only two self-reported takes during the spring 2016 season (Table 11). The NCDMF also discussed this situation with industry leads and have provided outreach to fishermen explaining the requirement in the ITP of fishermen self-reporting and further details on the subject to try and increase self-reporting throughout the industry as a whole.

The NCDMF Observer Program data were updated using the finalized 2015 TTP data in May 2016. The Annual Completion Report for the Sea Turtle ITP) No. 16230 was completed for ITP Year 2015 and submitted in January 2016. Using the finalized 2015 data, Tables 1, 5, 10, and 11 from the Completion Report were updated to reflect the final estimates of observer coverage and sea turtle takes (Appendix E). The fall 2014 season was based on finalized 2014 TTP data and did not deviate from the previous report for both anchored large and small mesh gill nets. The spring 2015 season had an increase in fishing trips for anchored large mesh gill nets than previously estimated in all management units, except management units B and D1. The spring

2015 season had an increase in fishing trips for anchored small mesh gill nets than previously estimated in management unit D2. The summer 2015 season had an increase in fishing trips for anchored large mesh gill nets than previously estimated in management units C and E. The summer 2015 season had an increase in fishing trips for anchored small mesh gill nets than previously estimated in management units C and D2. Annual estimated authorized sea turtle takes were recalculated using the finalized 2015 TTP data. The estimates of sea turtle takes decreased or remained constant from previous estimates for all species and dispositions except for alive green sea turtles in management unit E which increased by an estimated four takes. The anchored large mesh gill-net fishery remained below the annual estimated authorized sea turtle takes for all species and dispositions for ITP Year 2015 (Appendix E).

During the summer 2016 season, the NMFS initiated a teleconference to discuss the NCDMF exceeding the estimated Kemp's ridley alive sea turtle take levels for management unit B. On June 6, 2016, management unit B had been reopened for three days when the take levels were exceeded for alive Kemp's ridley sea turtles with management unit B closing to anchored large mesh gill nets via proclamation M-12-2016 (Table 7). Staff from the NMFS and the NCDMF discussed how to move forward on August 24, 2016. Staff from the NCDMF described the methodologies for estimating sea turtle takes explaining how they are based on preliminary trip data and are subject to change based on finalized TTP data. Take estimates are recalculated each year once finalized TTP data become available in late spring and are communicated to NMFS via memo. NMFS reviews the annual report in its entirety once finalized estimates are provided to NMFS staff.

Based on finalized data for ITP Year 2015 and preliminary and finalized data for ITP Year 2016, the number of authorized sea turtle takes that were utilized by the anchored large and small mesh gill-net fisheries under the Sea Turtle ITP were analyzed to determine the percentage of unused takes for each ITP Year and therefore, remained in the populations of sea turtles. The percentage of authorized takes that remained for anchored large and small mesh gill nets was calculated for each species and disposition for estimated and observed takes. For ITP Year 2015, the percentage of authorized takes that remained for anchored large mesh gill nets was calculated for estimated takes by species and disposition (green 42.1% alive, 40.0% dead; Kemp's 64.3% alive, 85.7% dead) with similar numbers illustrated in the ITP Year 2016 data (green 54.8% alive, 57.0% dead; Kemp's 20.4% alive, 100.0% dead) statewide. The percentage of authorized takes that remained in ITP Year 2015 for observed takes was calculated by species (green 50.0% alive/dead; Kemp's 91.7% alive/dead; loggerhead 83.3%; with no interactions with hawksbill or leatherback sea turtles) with similar numbers illustrated in the ITP Year 2016 data (green 55.6% alive/dead; Kemp's 75.0% alive/dead; with no interactions with hawksbill or leatherback sea turtles) statewide. The data clearly illustrate that while there are instances where the NCDMF have exceeded authorized sea turtle takes for specific species and dispositions, overall the management of the Sea Turtle ITP has led to much less sea turtles being utilized from the

number of overall authorized takes. This is also due to management related to the Atlantic Sturgeon ITP as any closure of anchored large or small mesh gill nets caused from sturgeon interactions would in turn lead to infrequent sea turtle interactions due to gear being out of the water for long periods of time. Also, as expected and discussed in the Sea Turtle ITP application, the requested authorized take numbers represent a worst-case scenario and is highly unlikely, if possible, that the total authorized take levels will be approached for the ITP Year because the NCDMF will close a management unit for the remainder of that season or ITP Year if takes approach the authorized level for any of the five species for either disposition (alive/dead), not the authorized level for all species making it impossible to approach all five species authorized take levels for both dispositions. However, by not requesting the proper authorized amount for each species and disposition, the fisheries could close for long periods of time due to anomalous sea turtle events.

### **Estuarine Gill Net Permit**

As per the ITP the NCDMF established an EGNP to register all fishermen participating in the anchored large and small mesh gill-net fisheries via proclamation M-24-2014 on September 1, 2014. The ITP's Implementing Agreement states that the NCDMF has two years to implement the EGNP to serve as a certificate of inclusion for fishermen. However, due to the compliance issues the NCDMF was facing during ITP year 2014, the EGNP was developed and became effective September 1, 2014 (one year from ITP issuance). The multifaceted EGNP was enacted to attempt to allow the NCDMF to closely monitor compliance. The EGNP is also used as a tool to improve fishermen compliance by including Specific Permit Conditions requiring fishermen to allow the NCDMF observers aboard their vessels to monitor catches. Failure to comply with this permit provision can result in a permit suspension. There were 2,849 EGNPs issued for Fiscal Year 2016 (July 1, 2015 – June 30, 2016).

An issue that was discovered during the spring 2015 season was the appeal process for the NCDMF's permitting system, which includes the EGNP. General Counsel for the North Carolina Department of Environmental Quality (NCDEQ) deliberated the situation during which time NOV's were not issued (i.e., summer 2015 season). Their findings determined that any NOV issued by the NCDMF for permits can be appealed by the fisherman. However, the permit will still be suspended for the duration of the violation (i.e., 10-days, 30-days, 6-months). The NOV process has since come under scrutiny for certain Specific Permit Conditions outlined in the EGNP. Therefore, the effectiveness of the NCDMF utilizing the EGNP as a compliance tool for the ITP is uncertain. The EGNP and NOV process will be examined by the NCDMF during ITP Year 2017 to determine the best approach moving forward.

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## TABLES

Table 1. Authorized and actual annual estimated takes with confidence intervals (95%) using a bootstrap method based on observer data for coverage and sea turtle interaction levels in anchored large mesh ( $\geq 4$  inch stretched mesh) gill nets for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Species	Management Unit											
	B				D1				Total			
	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	78 (0,132)	49 (33,62)	9	5	2 (0,4)	0	234	117	80	49
Kemp's ridley	53	26	65 (12,121)	0	15	7	0	0	68	33	65	0
Total	278	138	143	49	24	12	2	0	302	150	145	49

Species	Management Unit											
	D2				E				Total			
	Estimated Takes				Estimated Takes							
	Authorized		Actual		Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	96	48	69 (7,136)	22 (0,30)	96	48	69	22
Kemp's ridley	6	3	0	0	24	13	13 (0,26)	0	30	16	13	0
Total	6	3	0	0	120	61	82	22	126	64	82	22

<sup>1</sup> Insufficient observer data exist to model an estimated annual take level; therefore, for management unit D2, an annual observed take number has been identified for green turtles, and is found in Table 2

Table 2. Authorized and actual annual observed (not estimated) takes in anchored large mesh ( $\geq 4$  inch stretched mesh) gill nets for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Species	Management Unit								Total	
	B <sup>1</sup>		D1		D2		E			
	Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)			
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual		
Green	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	6	1	n/a <sup>2</sup>	n/a <sup>2</sup>	6	1
Kemp's ridley	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>
Hawksbill	1	0	1	0	1	0	1	0	4	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	0	3	0	3	0	3	0	12	0
Total	5	0	5	0	11	1	5	0	27	1

<sup>1</sup> One sea turtle interaction occurred in both management unit B and E where the species identification was unable to be determined; therefore it was not counted towards actual take levels

<sup>2</sup> Insufficient observer data exist to model an estimated annual take level for Kemp's ridley sea turtles in management units B, D1, D2 and E. See Table 1 for the authorized annual estimated take level

Table 3. Authorized and actual annual observed (not estimated) takes in anchored large mesh ( $\geq 4$  inch stretched mesh) and anchored small mesh ( $< 4$  inch stretched mesh) gill nets combined for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Species	Management Unit					
	A <sup>1</sup>		C		Total	
	Authorized (live/dead)	Actual (live/dead)	Authorized (live/dead)	Actual (live/dead)	Authorized (live/dead)	Actual (live/dead)
Green, Hawksbill, Kemp's ridley, Leatherback, Loggerhead	4 (any species)	4 (any species)	4 (any species)	2 (any species)	8 (any species)	6 (any species)
Total	4	4	4	2	8	6

<sup>1</sup> One sea turtle interaction occurred in management unit A where the species identification was unable to be determined. However, it was counted towards total observed take levels

Table 4. Authorized and actual annual observed (not estimated) takes in anchored small mesh ( $< 4$  inch stretched mesh-ISM) gill nets for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Species	Management Unit								Total	
	B		D1		D2		E			
	Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)			
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual		
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual		
Green	3	1	3	1	3	0	3	3	12	5
Hawksbill	1	0	1	0	1	0	1	0	4	0
Kemp's ridley	3	0	3	0	3	0	3	0	12	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	0	3	0	3	0	3	0	12	0
Total	11	1	11	1	11	0	11	3	44	5

Table 5. Total annual authorized and actual takes (estimated and observed) by species and condition for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Species	Estimated					
	Observed (live/dead)		Authorized		Actual	
	Authorized	Actual	Alive	Dead	Alive	Dead
Green	18	8	330	165	149	71
Hawksbill	8	0	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>
Kemp's ridley	12	3	98	49	78	0
Leatherback	8	0	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>
Loggerhead	24	0	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>
Any Species	8	3 <sup>1</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>	n/a <sup>2</sup>
Total	78	14	428	214	227	71

<sup>1</sup> Species identification unknown

<sup>2</sup> Insufficient observer data exist to model an estimated annual take level; therefore, takes are expressed as observed

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

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

Table 7. Regulations for management units by date and regulation change for anchored large and small mesh gill nets for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Year	Date(s)	Regulation change
2015	Sept 1	Management unit A opened to anchored large and small mesh gill nets for the new ITP Year 2016 for the western part of the sound and Currituck Sound. All the eastern/southern areas (Croatan and Roanoke Sounds) will remain closed until early October to minimize interactions with sea turtles (M-13-2015).
2015	Sept 1	Management unit C opened to anchored large and small mesh gill nets for the new ITP Year 2016 (M-14-2015).
2015	Sept 1	Management unit E closed to anchored large mesh gill nets for the new ITP Year 2016 to minimize interactions with sea turtles (M-14-2015).
2015	Sept 1	Management unit B to remain closed to anchored large mesh gill nets to minimize interactions with sea turtles (M-14-2015).
2015	Sept 24	Management unit C closed to anchored large mesh gill nets due to approaching Atlantic sturgeon authorized takes for the Fall 2015 Season (M-15-2015).
2015	Sept 30	Management unit A to opened to anchored large and small mesh gill nets for the new ITP Year 2016 for the western part of the sound. All the eastern/southern areas (south and east of line from Alligator River to 158 Bridge including Croatan and Roanoke Sounds) will open with south of the 64 bridge having sea turtle restrictions (i.e., overnight soaks, 4-day fishing week) (M-16-2015).
2015	Sept 30	Management units B and E opened to anchored large mesh gill nets (M-17-2015)
2015	Oct 17	Management unit B subunits closed to anchored large mesh gill nets except the MGNRA due to sea turtle interactions (M-20-2015).
2015	Oct 17	Management unit A closed to anchored large and small mesh gill nets due to sea turtle interactions (M-21-2015).
2015	Oct 26	Portions of Management unit A opened to anchored large and small mesh gill nets (west of line from Laurel Point and Drummond Point and Currituck Sound (M-22-2015).
2015	Nov 2	Management unit A opened to anchored large and small mesh gill nets the western part of the sound. All the eastern/southern areas (south and east of line from Alligator River to 158 Bridge including Croatan and Roanoke Sounds) will remain closed (M-23-2015).
2015	Nov 2	Management unit D1 and remaining subunits of management unit B opened to anchored large mesh gill nets (M-24-2015).
2015	Nov 5	Management unit B closed to anchored large mesh gill nets due to sea turtle interactions (M-25-2015).



Table 7. (cont.).

Year	Date(s)	Regulation change
2016	Feb 15	Management units B and C opened to anchored large mesh gill nets (M-1-2016).
2016	Feb 22	Management unit E (in portions) implements gear restrictions for the shad fishery (M-1-2016).
2016	Mar 3	Management unit A implements additional gill net restrictions for Subunit A-South of US-64-BYP/US-64, in accordance with the Sea Turtle and Atlantic Sturgeon ITPs (four nights per week (Tuesday - Friday) with 15 meshes deep, a maximum of 2,000 yards with 100-yards of continuous net, leaded bottom lines, prohibited to use floats, and must leave a space of 25-yards between sections of net; M-2-2016).
2016	April 10	Portions of Management unit E (upper Cape Fear River) closed to anchored large mesh gill nets due to sturgeon interactions (M-5-2016).
2016	April 23	Management unit A closed to anchored large mesh gill nets for the remainder of the spring 2016 season due to reaching authorized dead Atlantic sturgeon takes (M-6-2016).
2016	May 4	Management unit E closed to anchored small mesh gill nets for remainder of ITP Year 2016 due to reaching authorized sea turtle takes (M-8-2016).
2016	May 9	Management unit D1 closed to anchored large mesh gill nets (proclamation M-9-2016).**Annual ITP closure***
2016	June 1	Portions of management unit A opened to anchored large mesh gill nets (western) while maintaining closure of all anchored gill nets in the eastern portions to avoid interactions with sea turtles (M-10-2016).
2016	June 6	Management unit B closed to anchored large mesh gill nets for remainder of ITP Year 2016 due to reaching authorized sea turtle takes (M-12-2016).
2016	June 7	Management unit A closed to anchored large and small mesh gill nets for remainder of ITP Year 2016 due to reaching authorized sea turtle takes (M-13-2016).

Table 8. Observer coverage calculated from previous year's trip ticket data and observer data for anchored large mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Season <sup>1</sup>	Management Unit <sup>2</sup>	Large Mesh		
		Fishing Trips	Observed Trips	Coverage <sup>3</sup>
Fall 2015	A	2,258	205	9.1
	B	424	63	14.9
	C	366	58	15.8
	D1	7	7	100.0
	D2	320	27	8.4
	E	518	36	6.9
Spring 2016	A	1,351	138	10.2
	B	568	38	6.7
	C	878	71	8.1
	D1	25	0	0.0
	D2	67	3	4.5
	E	279	52	18.7
Summer 2016	A	25	5	20.0
	B	13	3	23.1
	C	653	58	8.9
	D1	n/a	n/a	n/a
	D2	125	21	16.8
	E	488	98	20.1
Total		8,366	883	10.6

<sup>1</sup> Final trip ticket data for 2015 (Fall 2015) and preliminary trip ticket data for 2016 (Spring and Summer 2016)

<sup>2</sup> Table 7 contains all of the openings and closings for each management unit

<sup>3</sup> Based on final trip ticket data for 2015 (Fall 2015) and the 5-year average trip ticket data for 2016 (Spring and Summer 2016) compared to observer large mesh trips

Table 9. Observer coverage calculated from previous year's trip ticket data and observer data for anchored small mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Season <sup>1</sup>	Management Unit <sup>2</sup>	Small Mesh		
		Fishing Trips	Observed Trips	Coverage <sup>3</sup>
Fall 2015	A	358	10	2.8
	B	706	9	1.3
	C	95	7	7.4
	D1	26	6	23.1
	D2	195	17	8.7
	E	547	29	5.3
Spring 2016	A	1,311	29	2.2
	B	1,295	28	2.2
	C	263	7	2.7
	D1	39	6	15.3
	D2	42	1	2.4
	E	201	10	5.0
Summer 2016	A	17	0	0.0
	B	1,035	7	0.7
	C	363	7	1.9
	D1	12	1	8.3
	D2	66	3	4.5
	E	n/a	n/a	n/a
Total		6,571	177	2.7

<sup>1</sup> Final trip ticket data for 2015 (Fall 2015) and preliminary trip ticket data for 2016 (Spring and Summer 2016)

<sup>2</sup> Table 7 contains all of the openings and closings for each management unit

<sup>3</sup> Based on final trip ticket data for 2015 (Fall 2015) and the 3-year average trip ticket data for 2016 (Spring and Summer 2016) compared to observer small mesh trips

Table 10. Summary of observed sea turtle interactions in anchored large (n = 49) and small (n = 5) mesh gill nets through the NCDMF Observer Program for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Date	Management Unit	Latitude	Longitude	Species	Disposition	Tag		Curved Carapace (mm)	
						PIT	Inconel	Length	Width
9/17/2015	C	35.35521	76.73609	green	alive	982.000364298089	n/a	291	252
10/9/2015	E	33.97131	77.92719	green <sup>1</sup>	alive	989.001001951690	EET849	352	289
10/9/2015	B	34.82598	76.42235	green	dead	n/a	n/a	325	285
10/9/2015	B	34.82598	76.42235	green	dead	n/a	n/a	290	245
10/9/2015	B	34.82598	76.42235	green	dead	n/a	n/a	260	230
10/9/2015	B	34.99605	76.25909	green	alive	989.001001951719	n/a	260	220
10/9/2015	B	34.99605	76.25909	green	alive	989.001001951688	XXP528	360	300
10/9/2015	B	34.82598	76.42235	green	alive	n/a	n/a	n/a	n/a
10/9/2015	B	34.86173	76.38188	green	alive	n/a	n/a	267	241
10/13/2015	B	34.94096	76.22081	green	alive	4B186D0165	n/a	270	225
10/13/2015	E	34.40409	77.59546	green	alive	989.001001951706	EET850/EET848	315	279
10/14/2015	A	36.00106	75.79977	Kemp's	dead	n/a	n/a	355	360
10/15/2015	B	34.86188	76.40993	green	alive	989.001001952804	n/a	302	250
10/15/2015	B	34.85750	76.41089	green	alive	989.001001951696	n/a	281	238
10/15/2015	B	34.85187	76.40974	green	alive	989.001001952771	n/a	310	267
10/15/2015	A	35.99273	76.26373	unknown	alive	n/a	n/a	n/a	n/a
10/16/2015	B	34.95572	76.27612	green	alive	n/a	n/a	n/a	n/a
10/16/2015	B	35.30542	75.55242	Kemp's	alive	989.001001951949	XXP545	310	320
10/28/2015	B	35.03148	76.34999	green	alive	989.001001952717	n/a	295	250
11/4/2015	B	34.99644	76.26168	green	dead	n/a	n/a	330	280
11/4/2015	B	34.99427	76.24520	green	alive	989.001001951697	n/a	260	230
11/4/2015	B	34.99427	76.24520	green	alive	989.001001951935	n/a	280	250
11/4/2015	B	34.99501	76.24482	green	alive	989.001001951764	XXP405	310	270
11/4/2015	B	35.28052	75.55285	green	alive	n/a	n/a	n/a	n/a
11/4/2015	B	35.28052	75.55285	green	alive	n/a	n/a	n/a	n/a
11/4/2015	B	35.28052	75.55285	green	alive	n/a	n/a	n/a	n/a
11/4/2015	B	35.28083	75.55405	green	alive	n/a	n/a	n/a	n/a

<sup>1</sup> Indicates small mesh gear

Table 10. (cont.).

Date	Management Unit	Latitude	Longitude	Species	Disposition	Tag		Curved Carapace (mm)	
						PIT	Inconel	Length	Width
11/4/2015	B	35.27993	75.55545	green	alive	n/a	n/a	n/a	n/a
11/11/2015	D1	34.69143	76.49080	green <sup>1</sup>	alive	989.001001952698	n/a	301	264
11/12/2015	D1	34.78495	76.42412	green	alive	n/a	n/a	330	279
11/12/2015	D1	34.78495	76.42412	green	alive	n/a	n/a	304	250
3/29/2016	B	34.87328	76.36694	green <sup>1</sup>	alive	989.001001951731	n/a	262	220
4/29/2016	E	33.97506	77.92197	green <sup>1</sup>	dead	n/a	n/a	281	253
4/29/2016	E	33.97506	77.92197	green <sup>1</sup>	alive	n/a	n/a	n/a	n/a
5/13/2016	B	34.98833	76.24257	Kemp's	alive	982.000364358551/ 3D6.0015B7AB97	XXP602/XXP538	340	330
5/19/2016	B	35.01501	76.18875	green	dead	n/a	n/a	307	253
5/26/2016	B	35 40.556	75 30.500	unknown	alive	n/a	n/a	n/a	n/a
6/3/2016	B	35.67877	75.51375	green	alive	n/a	n/a	n/a	n/a
6/3/2016	B	35.68895	75.51233	Kemp's	alive	n/a	n/a	300	300
6/3/2016	B	35.68788	75.51173	Kemp's	alive	n/a	n/a	294	307
6/3/2016	B	35.28800	76.49800	green	dead	n/a	n/a	273	229
6/6/2016	A	36.17042	76.06388	Kemp's	alive	982.000364296910	XXP484	370	375
6/6/2016	A	36.18794	76.06252	Kemp's	dead	n/a	n/a	290	290
7/1/2016	E	34.26232	77.76476	green	dead	n/a	n/a	334	280
7/7/2016	D2	34.68766	77.02272	green	alive	982.000364297237/ 982.000364301041	n/a	305	265
7/14/2016	E	33.97233	77.92189	green	alive	n/a	n/a	n/a	n/a
7/14/2016	E	33.97160	77.92764	green	dead	n/a	n/a	305	275
7/14/2016	E	34.66973	77.15123	Kemp's	alive	n/a	n/a	n/a	n/a
7/14/2016	E	34.66973	77.15123	unknown	alive	n/a	n/a	n/a	n/a
7/21/2016	E	34.67767	77.16055	Kemp's	alive	982.000364296732	XXP663/XXP665	380	385
8/3/2016	E	34.40041	77.59606	green	alive	982.000364297456	n/a	340	290
8/12/2016	C	35.19078	76.53419	green	alive	982.000364297488	n/a	315	265
8/16/2016	E	34.01200	77.91645	green	alive	982.000364216511	UUE080	608	482
8/25/2016	E	34.54690	77.33181	green	alive	982.000364306006	n/a	232	196

<sup>1</sup> Indicates small mesh gear

Table 11. Summary of reported sea turtle interactions in large mesh gill nets through the NCDMF Observer Program for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Date	Management Unit	Latitude	Longitude	Species	Disposition	Curved Carapace (mm)	
						Length	Width
5/8/2016	E	34.5821	77.3906	green <sup>1</sup>	dead	n/a	n/a
5/14/2016	C	n/a	n/a	unknown	alive	n/a	n/a
5/14/2016	C	n/a	n/a	unknown	alive	n/a	n/a
5/26/2016	B	35.7062	75.5367	Kemp's <sup>2</sup>	alive	n/a	n/a

<sup>1</sup> Reported by Marine Patrol from abandoned large mesh gill net

<sup>2</sup> Reported by Marine Patrol from illegally set large mesh gill net

Table 12. Number of gill-net checks made and citations issued by Marine Patrol for large and small mesh gill nets by season during ITP Year 2016 (September 1, 2015 - August 31, 2016).

Season	# Gill Net Checks	# Citations
Fall 2015	909	38
Spring 2016	286	16
Summer 2016	283	0
Total	1,478	54

Table 13. Citations written by Marine Patrol for large and small mesh gill nets by season and violation code during ITP Year 2016 (September 1, 2015 - August 31, 2016).

Season	Violation		
	Date	Code	Description
Fall 2015	9/7/2015	NETG29	RCGL gear without proper buoys
	9/10/2015	NETG01	Leave gill net in coastal waters unattended
	9/10/2015	NETG37	Leave small mesh gill nets unattended
	9/11/2015	NETG03	Using gill net with improper buoys or identification
	9/12/2015	NETG22	Improperly set gill net
	9/17/2015	NETG09	Gill net set too close to bridge
	9/21/2015	NETG03	Using gill net with improper buoys or identification
	9/29/2015	NETG01	Leave gill net in coastal waters unattended
	10/7/2015	NETG03	Using gill net with improper buoys or identification
	10/7/2015	NETG29	RCGL gear without proper buoys
	10/9/2015	NETG22	Improperly set gill net
	10/9/2015	NETG39	Use large mesh gill nets more than 15 meshes in height and w/out lead core or leaded bottom
	10/9/2015	NETG44	Use large mesh gill nets w/out leaving a space of at least 25 yard between separate lengths
	10/10/2015	NETG22	Improperly set gill net
	10/13/2015	NETG03	Using gill net with improper buoys or identification
	10/13/2015	NETG34	Use unattended gill net w/mesh less than 5" in commercial operation from May 1 through Nov
	10/14/2015	NETG29	RCGL gear without proper buoys
	10/15/2015	NETG01	Leave gill net in coastal waters unattended
	10/15/2015	NETG04	Leave gill net in waters when could not be legally fished
	10/17/2015	NETG03	Using gill net with improper buoys or identification
	10/18/2015	NETG29	RCGL gear without proper buoys
	10/20/2015	NETG03	Using gill net with improper buoys or identification
	10/21/2015	NETG01	Leave gill net in coastal waters unattended
	10/21/2015	NETG02	Using gill net without buoys or identification
	10/23/2015	NETG03	Using gill net with improper buoys or identification
	10/23/2015	NETG29	RCGL gear without proper buoys
	10/30/2015	NETG03	Using gill net with improper buoys or identification
	11/6/2015	NETG03	Using gill net with improper buoys or identification
	11/6/2015	NETG05	Use a stationery gill net in channel of ICWW
	11/7/2015	NETG01	Leave gill net in coastal waters unattended
	11/7/2015	NETG01	Leave gill net in coastal waters unattended
	11/11/2015	NETG29	RCGL gear without proper buoys
	11/11/2015	NETG46	Set or retrieve large mesh gill nets later than one hour after sunrise on Tuesday through Friday
	11/11/2015	NETG53	Use large mesh gill net with corks or floats on top line
	11/12/2015	NETG01	Leave gill net in coastal waters unattended
	11/14/2015	NETG03	Using gill net with improper buoys or identification
	11/23/2015	NETG12	Net in middle third of marked navigational channel
	11/24/2015	NETG03	Using gill net with improper buoys or identification

Table 13. (cont.).

Season	Violation		
	Date	Code	Description
Spring 2016	3/11/2016	NETG03	Using gill net with improper buoys or identification
	3/27/2016	NETG10	Gill net with illegal mesh size
	4/8/2016	NETG03	Using gill net with improper buoys or identification
	4/8/2016	NETG03	Using gill net with improper buoys or identification
	4/8/2016	NETG10	Gill net with illegal mesh size
	4/14/2016	NETG10	Gill net with illegal mesh size
	4/14/2016	NETG10	Gill net with illegal mesh size
	4/14/2016	NETG10	Gill net with illegal mesh size
	4/14/2016	NETG22	Improperly set gill net
	4/14/2016	NETG22	Improperly set gill net
	4/14/2016	NETG22	Improperly set gill net
	4/14/2016	NETG22	Improperly set gill net
	5/6/2016	NETG09	Gill net set too close to bridge
	5/10/2016	NETG01	Leave gill net in coastal waters unattended
	5/17/2016	NETG01	Leave gill net in coastal waters unattended
	5/26/2016	NETG03	Using gill net with improper buoys or identification



Table 14. Contacts attempted (n = 11,778) by the observers trying to set up trips by season categorized by contact type (0-14) and by total number, percent for each season, and percent for the entire ITP Year 2016 for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Categories (%) <sup>1</sup>															
Season	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
Fall 2015	155	897	286	115	60	85	263	17	564	68	160	40	452	1,451	4,613
	3.4%	19.4%	6.2%	2.5%	1.3%	1.8%	5.7%	0.4%	12.2%	1.5%	3.5%	0.9%	9.8%	31.5%	100.0%
Categories (%) <sup>1</sup>															
Spring 2016	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
	104	727	192	11	43	30	110	6	336	72	126	22	419	971	3,169
	3.3%	22.9%	6.1%	0.3%	1.4%	0.9%	3.5%	0.2%	10.6%	2.3%	4.0%	0.7%	13.2%	30.6%	100.0%
Categories (%) <sup>1</sup>															
Summer 2016	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
	129	794	247	27	45	72	100	15	366	26	245	47	547	1,336	3,996
	3.2%	19.9%	6.2%	0.7%	1.1%	1.8%	2.5%	0.4%	9.2%	0.7%	6.1%	1.2%	13.7%	33.4%	100.0%
Categories (%) <sup>1</sup>															
Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
	388	2,418	725	153	148	187	473	38	1,266	166	531	109	1,418	3,758	11,778
	3.3%	20.5%	6.2%	1.3%	1.3%	1.6%	4.0%	0.3%	10.7%	1.4%	4.5%	0.9%	12.0%	31.9%	100.0%

<sup>1</sup> Contact type categories: 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

Table 15. Notice of Violations issued by season, date and violation code for the Estuarine Gill Net Permit for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Season	Date	Code	Description
Fall 2015	10/22/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/22/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/22/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/22/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/22/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/22/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/22/2015	EGNP11	Failure to attend nets
	10/22/2015	EGNP12	Failure to return observers' phone calls within a 14-day period
	10/22/2015	EGNP25	Refuse to allow fisheries observers onboard or collect data
	10/22/2015	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	10/26/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/26/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/26/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/26/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/26/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/26/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	11/5/2015	EGNP11	Failure to attend nets
	11/17/2015	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
Spring 2016	3/1/2016	EGNP10	Set more than the legal length of gill net
	5/4/2016	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	5/4/2016	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	5/4/2016	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	5/16/2016	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	5/17/2016	EGNP25	Refuse to allow fisheries observers onboard or collect data

## FIGURES

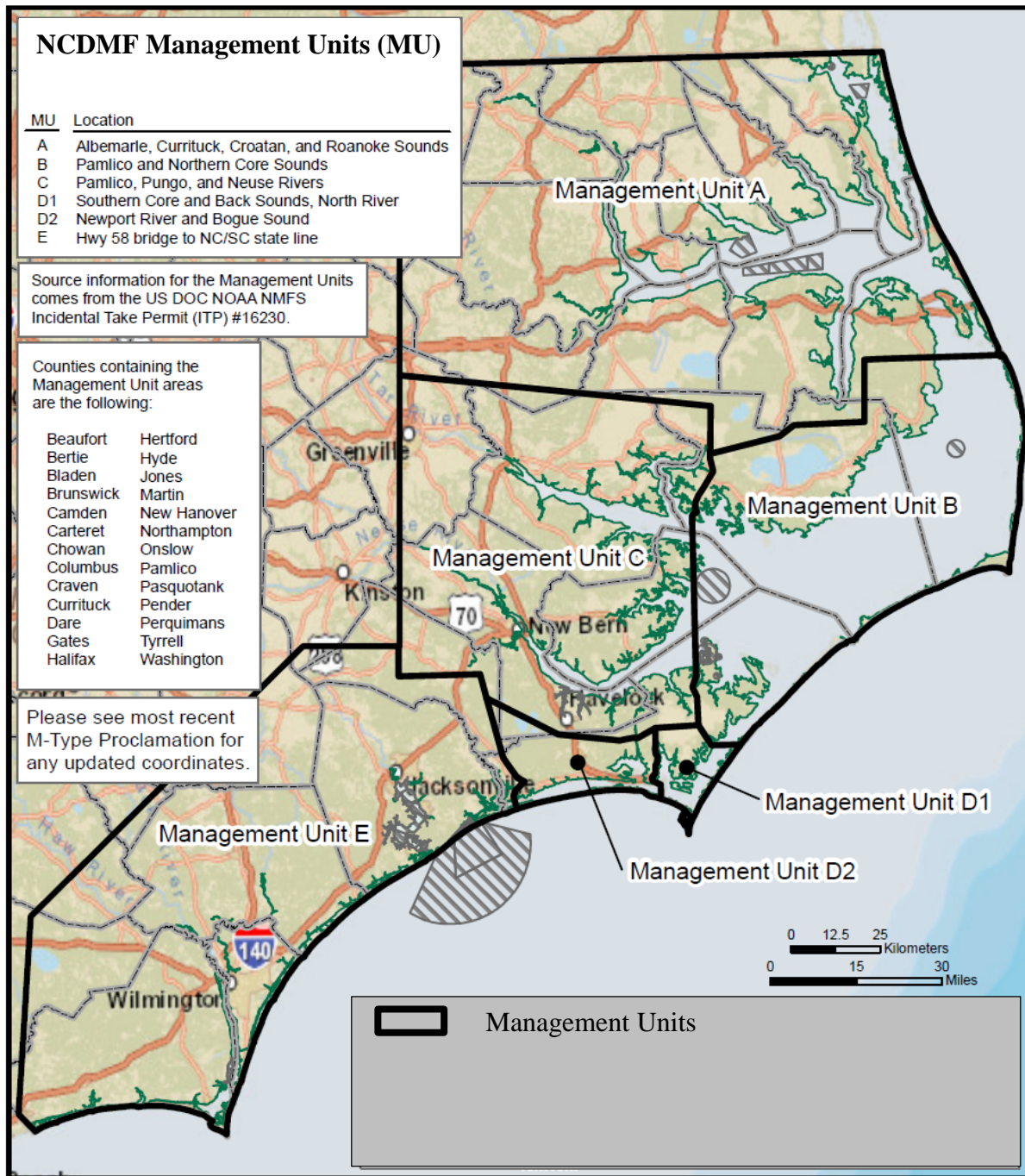


Figure 1. Management units (A, B, C, D1, D2, and E) as outlined in the Conservation Plan and utilized by the Observer Program for ITP Year 2016 (September 1, 2015 – August 31, 2016).

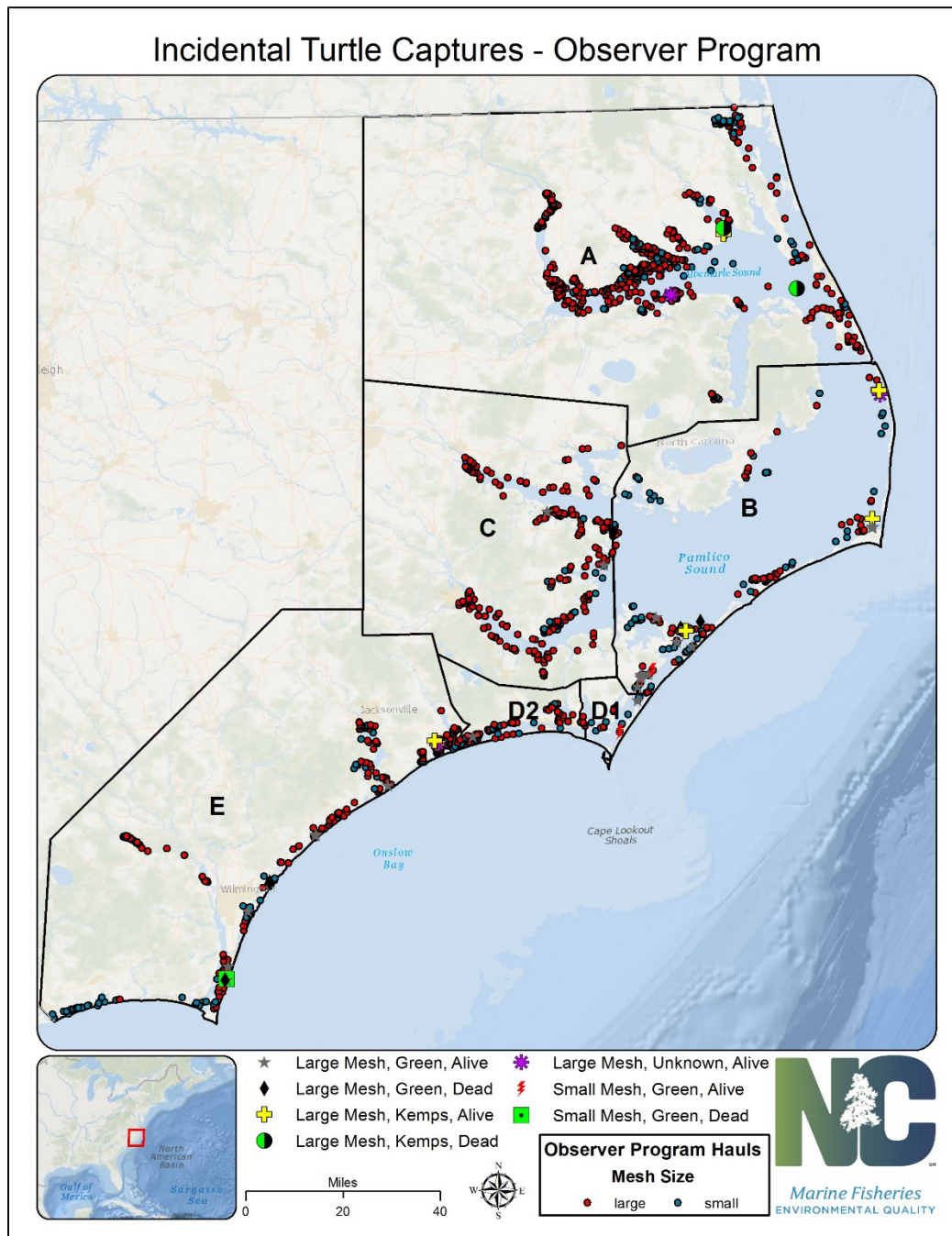


Figure 2. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear throughout all management units for ITP Year 2016 (September 1, 2015 – August 31, 2016).



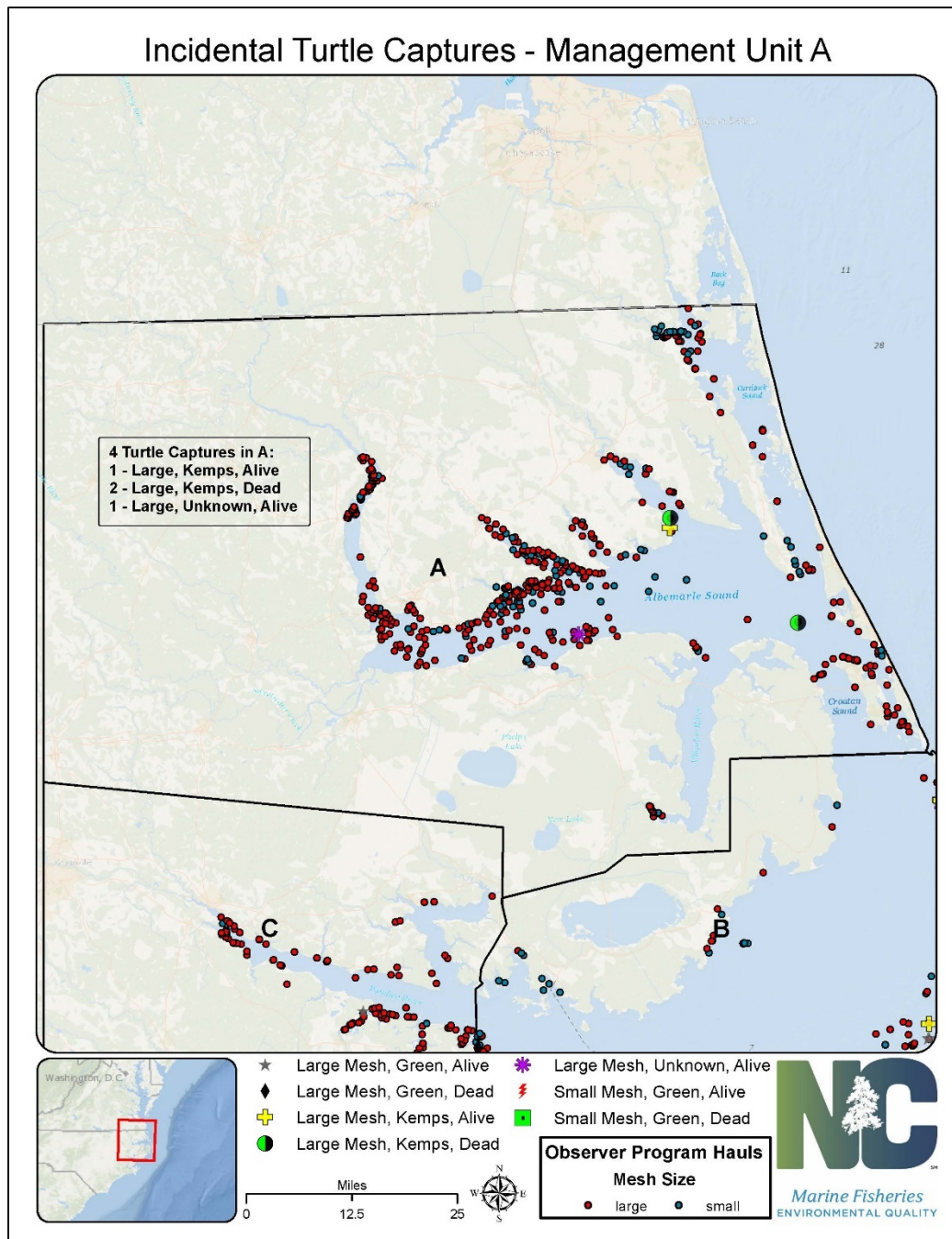


Figure 3. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit A for ITP Year 2016 (September 1, 2015 – August 31, 2016).

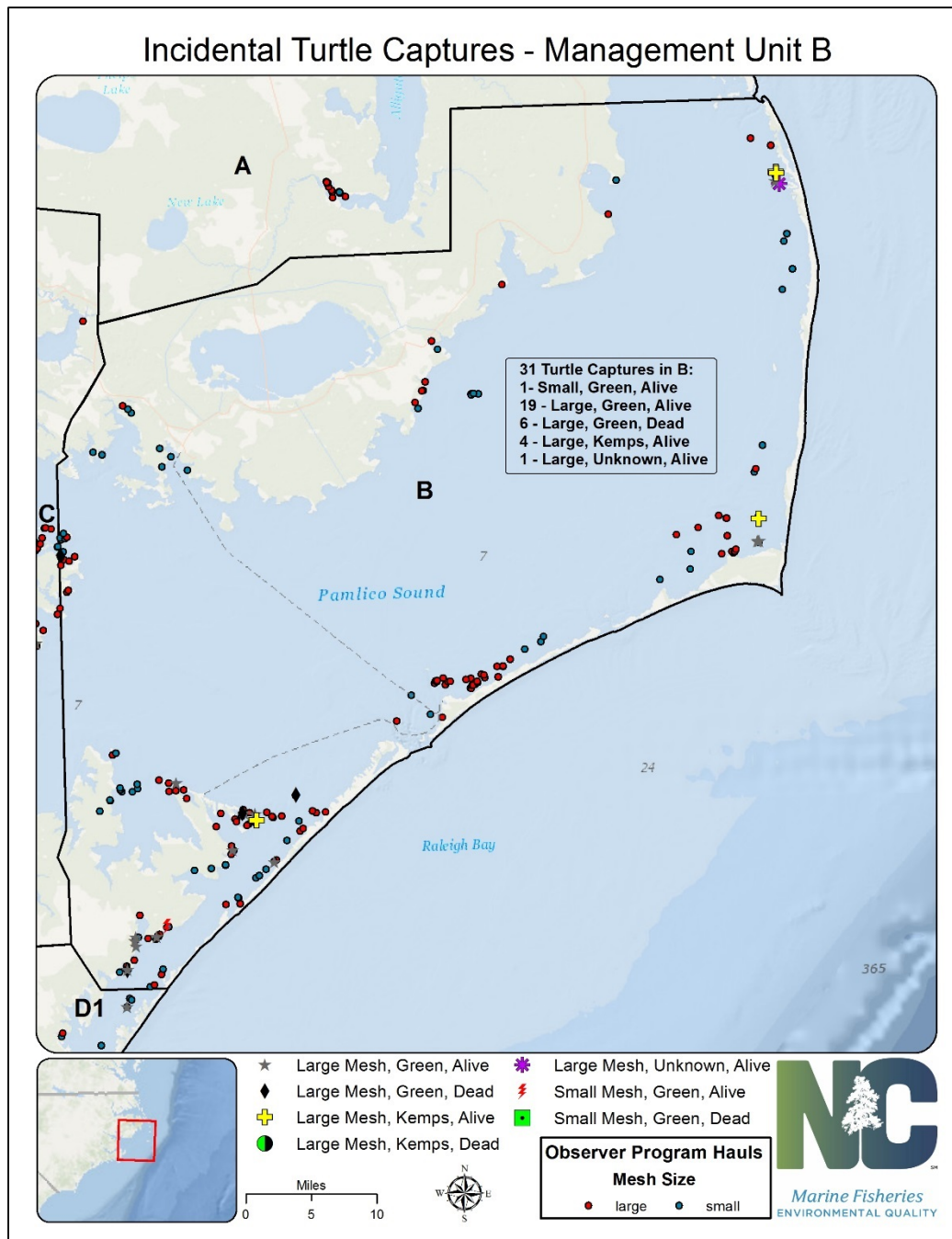


Figure 4. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit B for ITP Year 2016 (September 1, 2015 – August 31, 2016).

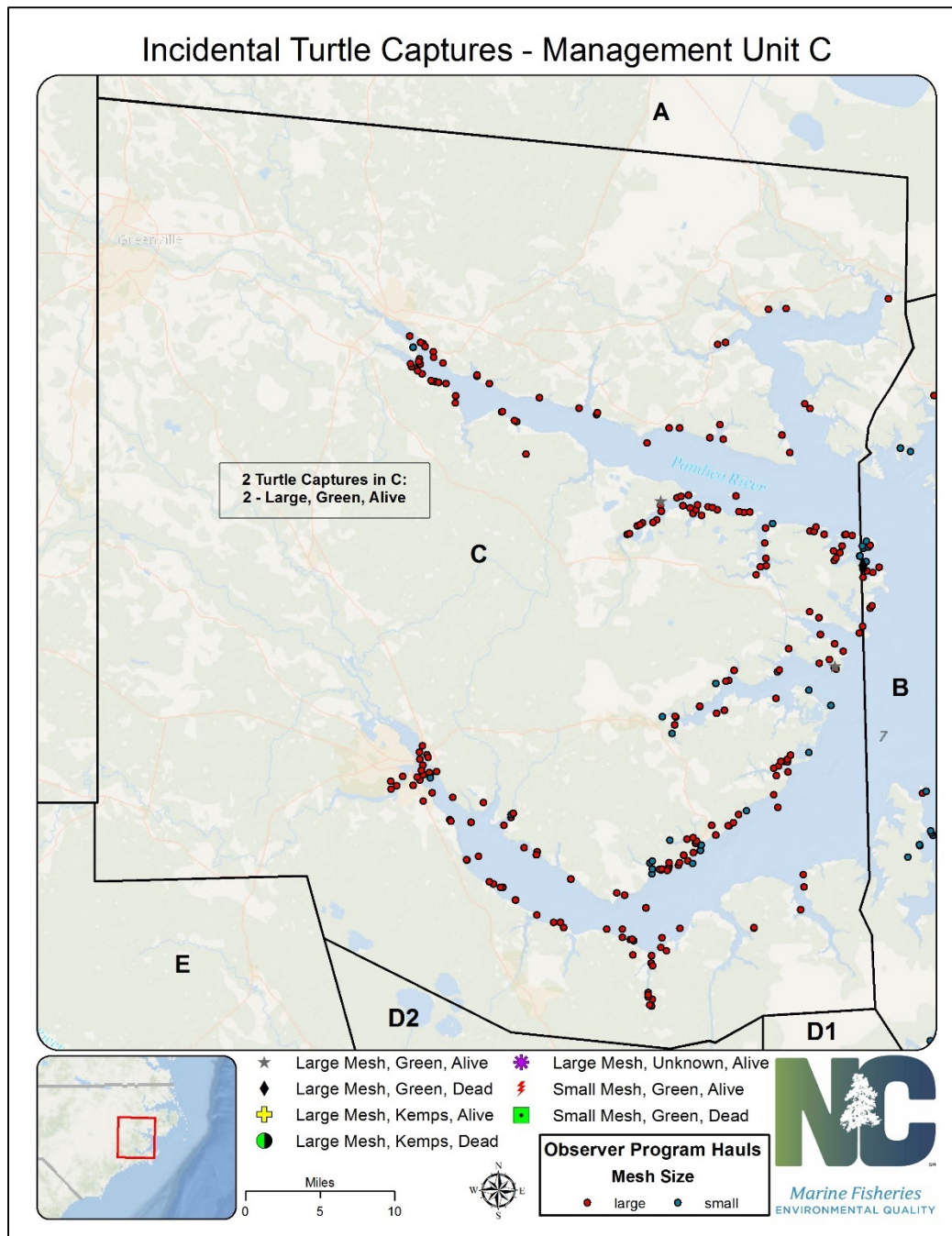


Figure 5. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit C for ITP Year 2016 (September 1, 2015 – August 31, 2016).



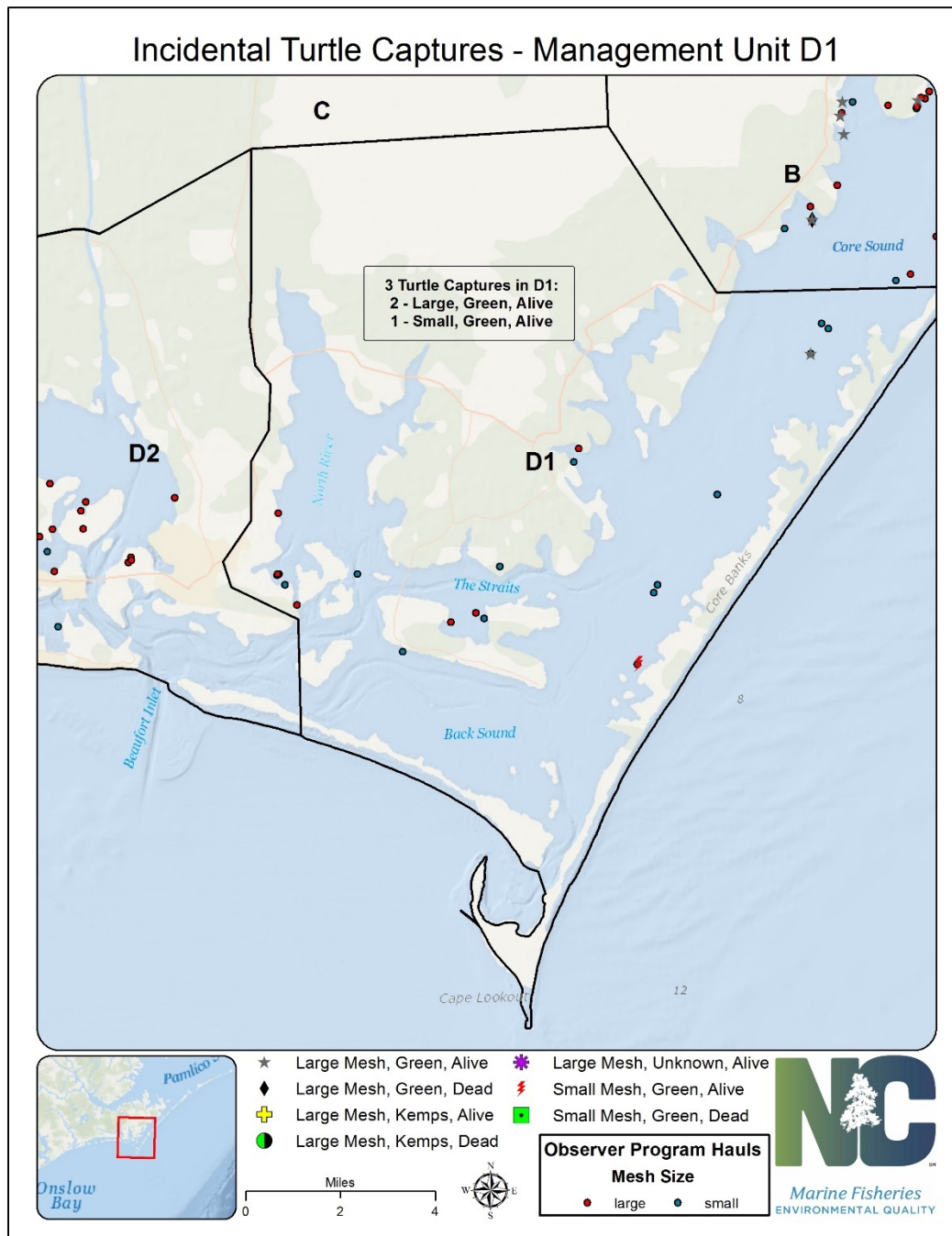


Figure 6. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit D1 for ITP Year 2016 (September 1, 2015 – August 31, 2016).



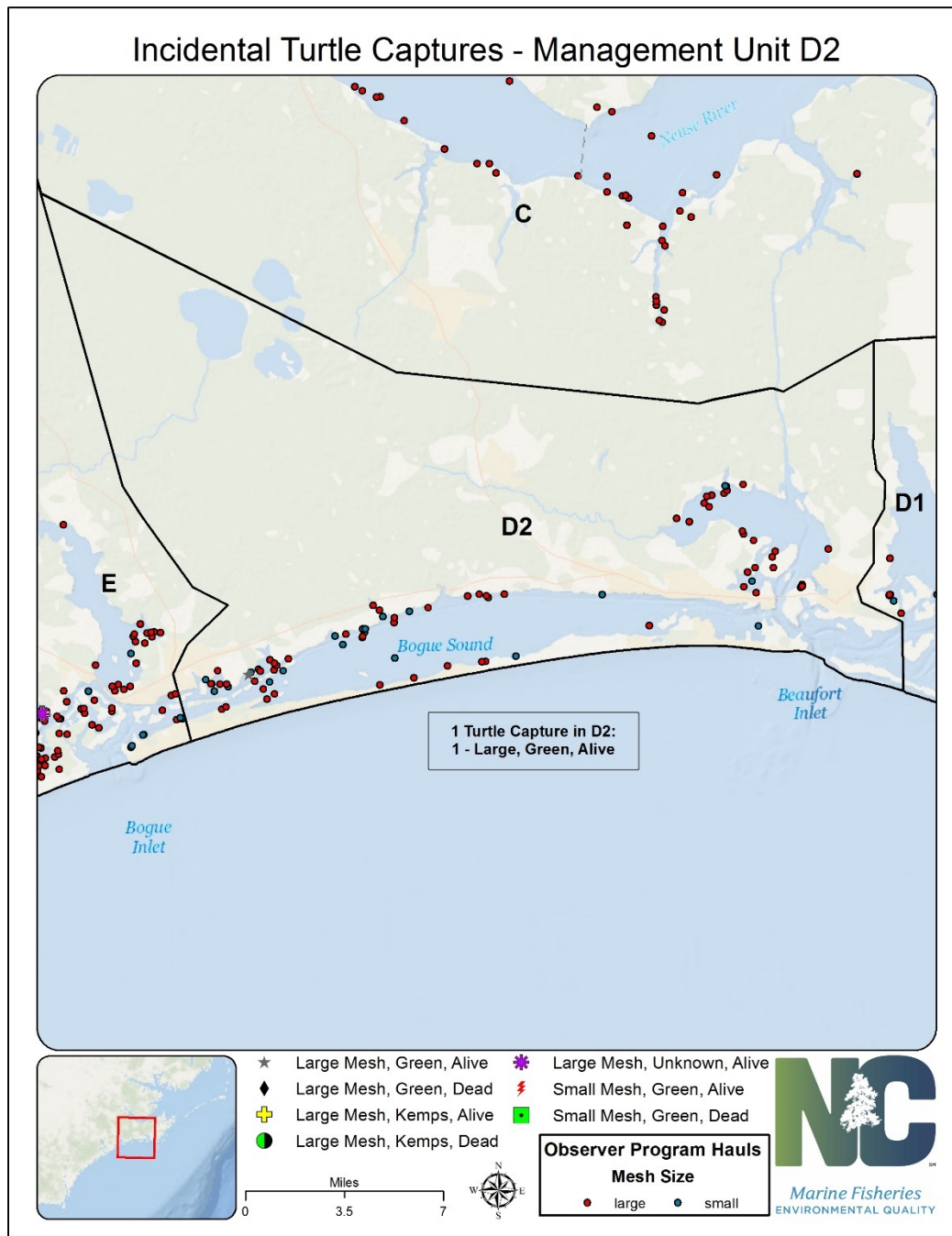


Figure 7. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit D2 for ITP Year 2016 (September 1, 2015 – August 31, 2016).

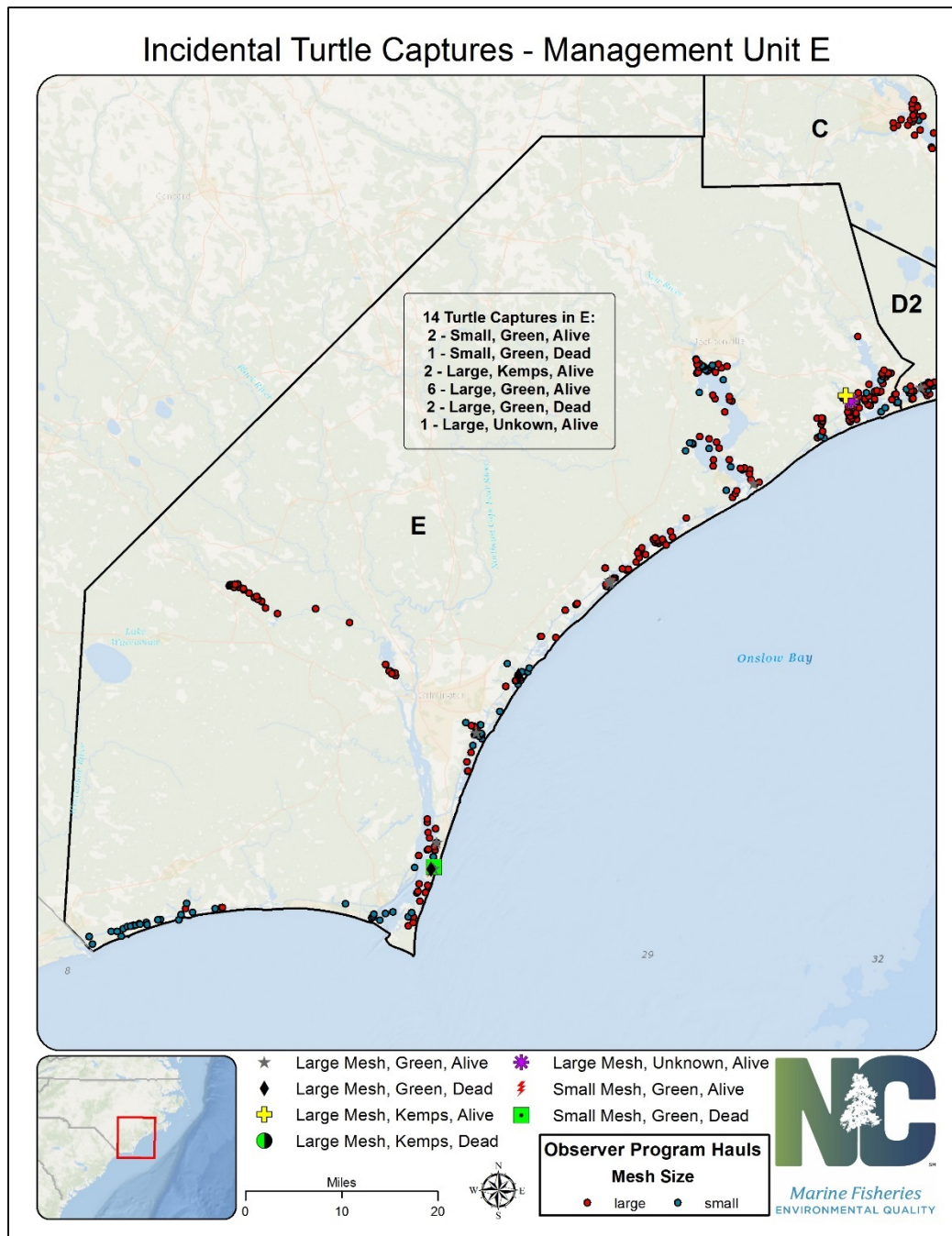


Figure 8. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit E for ITP Year 2016 (September 1, 2015 – August 31, 2016).

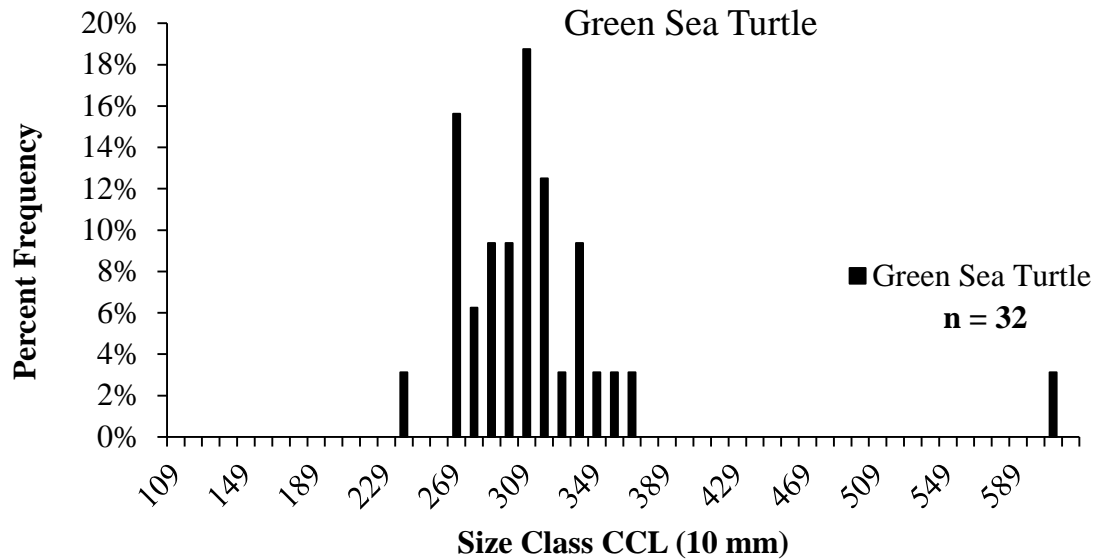


Figure 9. Length-frequency (curved carapace length) from notch to tip of observed incidental captures of green sea turtles where measurements were obtained (n = 32) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2016 (September 1, 2015 – August 31, 2016).

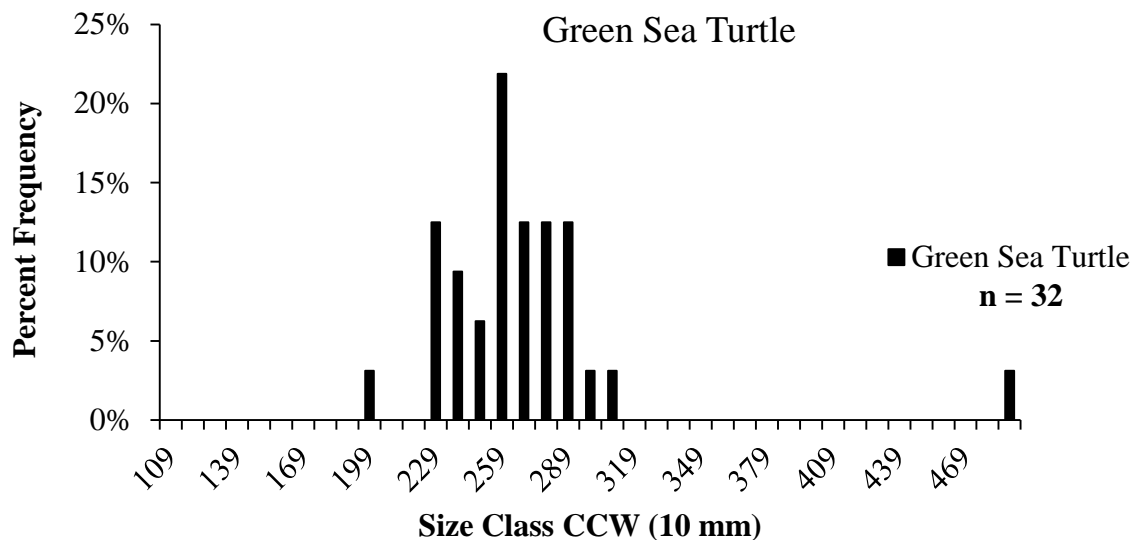


Figure 10. Length-frequency (curved carapace width) of observed incidental captures of green sea turtles where measurements were obtained (n = 32) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2016 (September 1, 2015 – August 31, 2016).

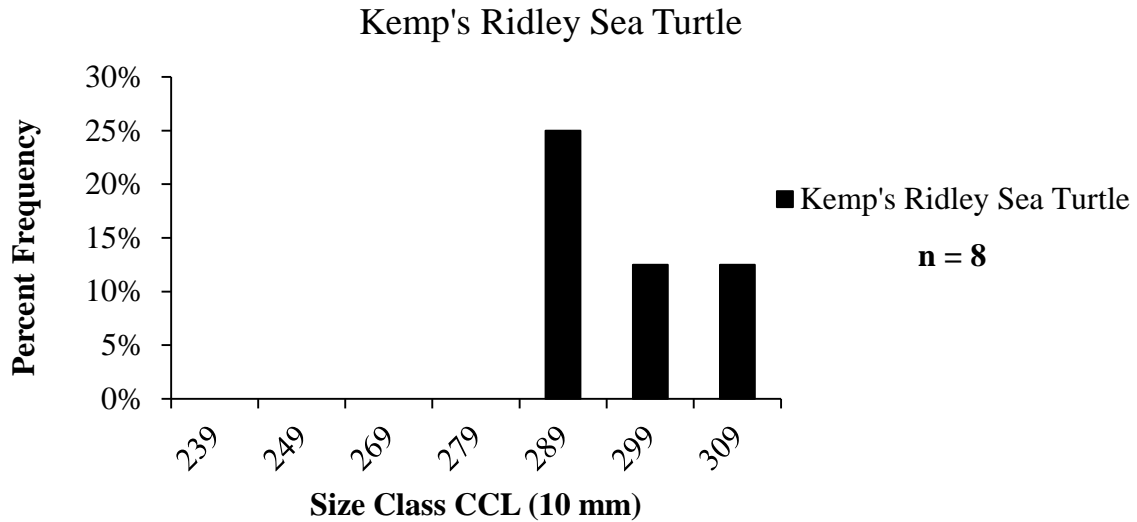


Figure 11. Length-frequency (curved carapace length) from notch to tip of observed incidental captures of Kemp's ridley sea turtles where measurements were obtained (n = 8) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2016 (September 1, 2015 – August 31, 2016).

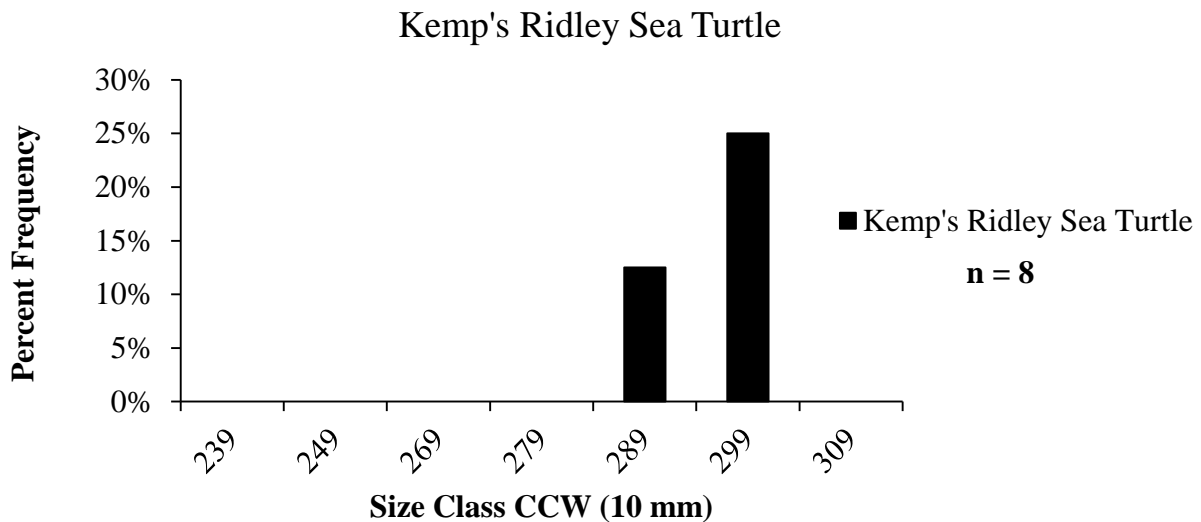


Figure 12. Length-frequency (curved carapace width) from notch to tip of observed incidental captures of Kemp's ridley sea turtles where measurements were obtained (n = 8) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2016 (September 1, 2015 – August 31, 2016).

## APPENDIX A



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Silver Spring, MD 20910

JAN 4 2017

Braxton C. Davis  
Director, North Carolina Division of Marine Fisheries  
3441 Arendell Street  
P.O. Box 769  
Morehead City, North Carolina 28557

Dear Mr. Davis:

On November 21, 2016, the North Carolina Division of Marine Fisheries (NCDMF) requested a minor modification to extend the future annual report deadlines for the Sea Turtle (No. 16230) and Atlantic Sturgeon (No. 18102) Incidental Take Permits from January 31 to the last day in February. You note that this extension would benefit your staff due to a lag time in data being uploaded and verified, the time of year, the deadline for the fall seasonal report, and staff availability.

We appreciate the challenges associated with staff availability and the data accessibility at this time of year, and this delay will not significantly impact our ability to review the annual report. National Marine Fisheries Service (NMFS) therefore concurs with your request for this minor modification. Please sign below to acknowledge that you will comply with the minor modifications specified in this letter and send a copy of the signed letter to Kristy Long on my staff at your earliest convenience.

We note that NCDMF has requested several modifications since the permit began and understand that you are in the process of developing an updated Incidental Take Permit application. We encourage you to incorporate any further anticipated minor modifications into that application process so we can more efficiently analyze these requests.

Please feel free to contact Ron Dean ([ron.dean@noaa.gov](mailto:ron.dean@noaa.gov)) or Kristy Long ([kristy.long@noaa.gov](mailto:kristy.long@noaa.gov)) with any questions about this minor modification request approval or your pending updated application.

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

Sincerely,

Donna S. Wieting  
Director, Office of Protected Resources

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

Braxton C. Davis  
Director  
N.C. Division of Marine Fisheries

1-5-17  
Date

## APPENDIX B



September 2, 2016

David,

The North Carolina Watermen United (NCWU) would like to thank you setting up the meeting with gill- and pound- netters. We appreciate your efforts to help re-open closed areas and keep others from being closed.

However, as many of the attendees at the meeting in Wanchese on Tuesday, August 30, 2016 mentioned, every possible action has been in effect for years to reduce interactions with endangered sea turtles under the regulations of the Sea Turtle ITPs since 2002. We already have many gear modifications, closures in high turtle interaction areas, a reduction in fishing times and a reduction in fishing efforts that include -

- 1. The state is divided into 6 Unit Areas and 4 of those 6 units have 4 days a week fishing only; night-time soaks only; 15-mesh deep nets and no floats. These are year-round restrictions in the 4 areas.
- 2. The southern portion of Unit A is also under these same restrictions. The entire deep-water area of Pamlico Sound is closed to the use of large mesh gillnet from September 1 until January of the next year.
- 3. All inlet corridors are closed to large mesh gillnets after September 1 each year.
- 4. Unit E is closed to the use of large mesh gillnets every May until October.
- 5. In all internal waters, the only areas that do not have gear modifications and further restrictions under the ITP are the northern parts of Unit A and Unit C – both of which have minimal interactions with sea turtles, and still only 4 interactions per unit per year are authorized.

At this time, NCWU would like to ask again that a meeting be set up with NCWU and NCFA fishermen, especially gill- and pound- netters, with representatives from the NC Division of



Marine Fisheries and with Jean Beasley from the Karen Beasley Sea Turtle Foundation. Jean Beasley and NCWU asked the previous DMF Director for this meeting many times, but he never acted on our request. It is the perfect time to listen to her ideas and experiment with the devices that she has been advocating for years that she believes would help lessen the number of turtle interactions. I am a gillnetter and very willing to help test and monitor these devices.

We are hopeful that the cooperation between NCWU, NCFA and the NCDMF with Jean Beasley may help us all to solve some of the problems that our state's gillnet fishermen are experiencing.

Thank you.

Yours truly,

*Andrew Berry*

Andrew Berry

NCWU Board Member

252-722-4293

[bowhunterab14@gmail.com](mailto:bowhunterab14@gmail.com)

Board of Directors

Perry Wood Beasley Billy Maxwell

Capt Sonny Davis Greg Mayer

Ernie Doshier Jamie Reibel

Ernie Foster Britt Shackelford

Tom Harper Bradley Styron

Glen Hopkins Duke Spencer

Rom Whitaker

AB: mm

cc: NCDMF Director Braxton Davis, Chris Batsavage; Jacob Berg

NCDEQ Secretary van der Vaart

NCFA Director Jerry Schill, Chairman Brent Fulcher

## APPENDIX C

Chris,

I am following up on the Protected Species Workgroup meetings. As was discussed at both meetings, there have been more than substantial measures directly, and indirectly, reducing mitigation of turtle interactions, but those measures need quantified.

I am requesting per the direction of the fishermen, that NCDFM quantify the total sea turtle mitigation reduction that has taken place from prior to the sea turtle lawsuit to present. It should also include impacts by other regulations such as fishery effort/harvest reductions. For the information to be useful, it may be necessary to separate reductions based on ITP closures from other reductions, so that we can determine how effective all of the other measures have been without closures. You may even include one total with, and one without closures.

It is also requested that a biological opinion be completed relating to those measures, once quantified, addressing the successful mitigation of sea turtles. It should include any potential measures that might be necessary, and only if necessary, to reduce interactions sufficiently, without relying on a set number to base closures on. This opinion should address both large and small mesh fisheries that have substantial interaction with turtles.

These items are being requested to work towards an ITP that sufficiently protects the species, while preventing unnecessary closures to the fishery.

I was just directed to make this request and wanted to get it to you as soon as possible. If in my haste I was unclear and need to clarify anything, please contact me anytime.

Take care,

David Bush  
Fisheries Biologist,  
NC Fisheries Association  
(910)777-1605





## APPENDIX D



### NORTH CAROLINA MARINE FISHERIES COMMISSION DEPARTMENT OF ENVIRONMENTAL QUALITY

#### COMMISSIONERS

**PAT MCCRORY**  
Governor

**DONALD VAN DER VAART**  
Secretary

**SAMMY CORBETT**  
Chairman

**MARK GORGES**  
Wrightsville Beach

**CHUCK  
LAUGHRIDGE**  
Harkers Island

**JANET ROSE**  
Moyock

**JOE SHUTE**  
Morehead City

**RICK SMITH**  
Greenville

**MIKE WICKER**

Raleigh

**ALISON WILLIS**  
Harkers Island

Aug. 25, 2016

Mr. Bob Lorenz  
P.O. Box 10512  
Wilmington, NC 28404

Dear Bob:

I wanted to let you know at last week's Marine Fisheries Commission meeting I announced the Sea Turtle Advisory Committee was being disbanded. I wanted to contact you directly and let you know I had taken this action and the reason why.

The commission has a multitude of committees, many of which are statutorily mandated, such as the Northern and Southern regional advisory committees and the Finfish, Shellfish/Crustacean and Habitat and Water Quality advisory committees. These committees require a great deal of attention, both in staff time and in resources. In looking for efficiencies in our committee system, I felt our regional and pertinent standing advisory committees could serve as venues to review and provide the needed input on sea turtle issues. So, after much consideration, I decided to disband the Sea Turtle Advisory Committee, because it is not statutorily required. This was a difficult decision, especially since I served on the Sea Turtle Advisory Committee prior to being appointed to the Marine Fisheries Commission.

Later this fall we will be doing our annual solicitation for advisers. If any of you are interested in serving on other committees, please let me know and I will make every effort to place you on one of these committees as openings become available.

In closing, please know how much I appreciate your dedication and service to the state. I encourage you to please stay involved in fisheries issues and I hope to see you or hear from you in the future.

Sincerely,

A handwritten signature in black ink that reads "Sammy Corbett". The script is fluid and cursive, with the first letters of each name being capitalized and prominent.

Sammy Corbett, Chairman  
N.C. Marine Fisheries Commission

cc: Chris Batsavage, Division of Marine Fisheries

## APPENDIX E



PAT McCrory

*Governor*

DONALD R. VAN DER VAART

*Secretary*

BRAXTON C. DAVIS

*Director*

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

Dear Kristy:

North Carolina Division of Marine Fisheries (NCDMF) Observer Program data have been updated using the finalized 2015 Trip Ticket Program (TTP) data. The Annual Completion Report for the Sea Turtle Incidental Take Permit (ITP) No. 16230 was completed for ITP Year 2015 and submitted in January 2016. Using the finalized 2015 data, Tables 1, 5, 10, and 11 from the Completion Report were updated to reflect the final estimates of observer coverage and sea turtle takes (Tables 1-4). The fall 2014 season was based on finalized 2014 TTP data and did not deviate from the previous report for both large and small mesh gill nets (Tables 1 and 2).

The spring 2015 season had an increase in fishing trips for large mesh gill nets than previously estimated in all management units except management units B and D1 (Table 1). Observer coverage goals for large mesh gill nets were met in all management units except management units A and D1 for the spring 2015 season. Little fishing effort occurred ( $n = 5$  fishing trips) in management unit D1 for the spring 2015 season making it difficult to obtain observer trips. Management unit A had 6.7% observer coverage for large mesh gill nets in the spring 2015 season. The summer 2015 season had an increase in fishing trips for large mesh gill nets than previously estimated in management units C and E. Observer coverage goals for large mesh gill nets were met in all management units that were open for the summer 2015 season (management unit D1 is closed annually from May 8 through October 14 as described in the ITP; Table 1).

The spring 2015 season had an increase in fishing trips for small mesh gill nets than previously estimated in management unit D2 (Table 2). Observer coverage goals for small mesh gill nets were met in all management units for the spring 2015 season. The summer 2015 season had an increase in fishing trips for small mesh gill nets than previously estimated in management units C and D2. Observer coverage goals for small mesh gill nets were met in all management units except management unit D1 where no observed trips occurred. Little fishing effort occurred ( $n = 6$  fishing trips) in management unit D1 for the summer 2015 season making it difficult to obtain observer trips. Management unit D2 had 0.9% observer coverage for small mesh gill nets in the summer 2015 season (Table 2).

Annual estimated allowable sea turtle takes were recalculated using the finalized 2015 TTP data (Tables 3 and 4). The estimates of sea turtle takes decreased or remained constant



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252.726.7021 T

from previous estimates for all species and dispositions except for alive green sea turtles in management unit E which increased by an estimated four takes. The large mesh gill-net fishery remained below the annual estimated allowable sea turtle takes for all species and dispositions for ITP Year 2015 (Tables 3 and 4).

Table 1. Observer coverage calculated from finalized 2015 Trip Ticket data and observer data for large mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Season	Management Unit	Large Mesh		
		Fishing Trips	Observed Trips	Coverage
Fall 2014	A	2,529	192	7.6
	B	1,448	154	10.6
	C	904	152	16.8
	D1	23	23	100.0
	D2	264	58	22.0
	E	282	58	20.6
Spring 2015	A	2,369	158	6.7
	B	383	44	11.5
	C	1,033	72	7.0
	D1	5	0	0.0
	D2	92	7	7.6
	E	389	61	15.7
Summer 2015	A	115	12	10.4
	B	109	16	14.7
	C	328	40	12.2
	D1	0	0	0.0
	D2	124	17	13.7
	E	661	98	14.8
Total		11,058	1,162	10.5



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Table 2. Observer coverage calculated from finalized 2015 Trip Ticket data and observer data for small mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Season	Management Unit	Small Mesh		
		Fishing Trips	Observed Trips	Coverage
Fall 2014	A	566	18	3.2
	B	1,381	22	1.6
	C	309	15	4.9
	D1	80	7	8.8
	D2	325	9	2.8
	E	624	24	3.8
Spring 2015	A	1,062	52	4.9
	B	1,210	23	1.9
	C	238	12	5.0
	D1	21	5	23.8
	D2	44	2	4.5
	E	185	14	7.6
Summer 2015	A	172	3	1.7
	B	899	12	1.3
	C	181	6	3.3
	D1	6	0	0.0
	D2	110	1	0.9
	E	275	11	4.0
Total		7,688	236	3.1



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Table 3. Final authorized and actual annual estimated sea turtle takes in large mesh ( $\geq 4$  inch stretched mesh) gill nets for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Species	Management Unit											
	B				D1				Total			
	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	150	72	9	5	2	0	234	117	152	72
Kemp's ridley	53	26	18	7	15	7	0	0	68	33	18	7
Total	278	138	168	79	24	12	2	0	302	150	170	79

Species	Management Unit											
	D2				E				Total			
	Estimated Takes				Estimated Takes							
	Authorized		Actual		Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	96	48	13	0	96	48	13	0
Kemp's ridley	6	3	0	0	24	13	8	0	30	16	8	0
Total	6	3	0	0	120	61	21	0	126	64	21	0

<sup>1</sup> Insufficient observer data exist to model an estimated annual take level; therefore, for management unit D2, an annual observed take number has been identified for green turtles, and is found in Table 2 of the Annual Completion Report for the Sea Turtle ITP No. 16230 for ITP Year 2015.



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Table 4. Final total annual authorized and actual takes (estimated and observed) by species and condition for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Species	Observed (live/dead)		Estimated			
			Authorized		Actual	
	Authorized	Actual	Alive	Dead	Alive	Dead
Green	18	9	330	165	165	72
Hawksbill	8	0	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Kemp's ridley	12	1	98	49	26	7
Leatherback	8	0	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Loggerhead	24	4	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Any Species <sup>2</sup>	8	2	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Total	78	16	428	214	191	79

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

<sup>2</sup> This category was listed in Table 5 of the Sea Turtle ITP No. 16230 to incorporate allowed takes from management units A and C. However, there were two unidentified (unknown) sea turtle interactions during ITP Year 2015 which are now included in this category. All other observed interactions in management units A and C where a positive species identification was obtained are included in the specific species categories.

Sincerely,

Jacob Boyd, Protected Species Biologist  
Division of Marine Fisheries, NCDEQ

cc: Chris Batsavage  
Braxton Davis  
Dee Lupton  
John McConnaughey



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ROY COOPER  
*Governor*

MICHAEL S. REGAN  
*Secretary*

BRAXTON C. DAVIS  
*Director*

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 2016 Trip Ticket Program (TTP) data. The Annual Completion Report for the Sea Turtle Incidental Take Permit (ITP) No. 16230 was completed for ITP Year 2016 and submitted in February 2017. Using the finalized 2016 data, Tables 1, 5, 8, and 9 from the Completion Report were updated to reflect the final estimates of observer coverage and sea turtle takes (Tables 1 - 4). The fall 2015 season was based on finalized 2015 TTP data and did not deviate from the previous report for both anchored large and small mesh gill nets (Tables 1 and 2).

### **Anchored Large Mesh**

The spring 2016 season had an increase in fishing trips for anchored large mesh gill nets than previously estimated in management units A, C, and D2 with all other management units having a decrease in fishing trips (Table 1). Observer coverage goals for anchored large mesh gill nets were met in all management units except management units D1 and D2 for the spring 2016 season. No trips were obtained in management unit D1 during the spring 2016 season due to the management unit being closed for the latter portion of the spring 2016 season and minimal fishing effort ( $n = 5$  fishing trips) while open. Fishing effort ( $n = 92$  fishing trips) in management unit D2 was also low compared to other management units during the same period. While observer coverage goals were not met in management units D1 and D2, they were far exceeded in management units B (15.8%) and E (30.2%) for anchored large mesh gill nets (Table 1).

The summer 2016 season had an increase in fishing trips for anchored large mesh gill nets than previously estimated in all management units except for C (Table 1). Observer coverage goals for anchored large mesh gill nets were met in all management units except management units A and B for the summer 2016 season (management unit D1 is closed annually from May 8 through October 14 as described in the ITP). Management unit A was open for only seven days before being closed to anchored large and small mesh gill nets for the remainder of the summer 2016 season allowing for only five trips to be obtained before the closure was implemented. Management unit B was open for only three days before being closed to anchored large mesh gill





nets for the remainder of the summer 2016 season allowing for only three trips to be obtained before the closure was implemented. While observer coverage goals were not met in management units A and B, they were exceeded in management units C (11.0%), D2 (13.5%), and E (19.8%) for anchored large mesh gill nets (Table 1).

### **Anchored Small Mesh**

The spring 2016 season had an increase in fishing trips for anchored small mesh gill nets than previously estimated in management unit B (Table 2). Management unit E closed to anchored small mesh gill nets on May 4, 2016 for the remainder of ITP Year 2016 due to reaching allowable sea turtle takes. Observer coverage goals for anchored small mesh gill nets were met in all management units for the spring 2016 season. Furthermore, observer coverage goals were far exceeded in management units A (4.1%), C (7.4%), D1 (17.6%), D2 (10.0%), and E (8.3%) for anchored small mesh gill nets (Table 2).

The summer 2016 season had an increase in fishing trips for anchored small mesh gill nets than previously estimated in management units A and B (Table 2). Management unit E remained closed to anchored small mesh gill nets for the duration of the summer 2016 season. Observer coverage goals for anchored small mesh gill nets were met in all management units except management units A and B. Management unit A was open for only seven days before being closed to anchored large and small mesh gill nets for the duration of the summer 2016 season. Therefore, no anchored small mesh trips were able to be obtained during this short time frame. Attendance requirements for anchored small mesh gill nets during the summer season made it difficult to obtain trips in management unit B. While observer coverage goals were not met in management units A and B, they were far exceeded in management units C (4.5%), D1 (25.0%), D2 (18.8%) and E (7.8%) for anchored small mesh gill nets (Table 2).

### **Sea Turtle Takes**

Annual estimated allowable sea turtle takes were recalculated using the finalized 2016 TTP data (Tables 3 and 4). The estimates of sea turtle takes decreased or remained constant from previous estimates for all species and dispositions except for alive green sea turtles in management unit E which increased by an estimated four takes. The anchored large mesh gill-net fishery remained below the annual estimated allowable sea turtle takes for all species and dispositions for ITP Year 2016 (Tables 3 and 4).



Table 1. Observer coverage calculated from finalized 2016 Trip Ticket data and observer data for anchored large mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Season	Management Unit	Anchored Large Mesh		
		Fishing Trips	Observed Trips	Coverage
Fall 2015	A	2,258	205	9.1
	B	424	63	14.9
	C	366	58	15.8
	D1	7	7	100.0
	D2	320	27	8.4
	E	518	36	6.9
Spring 2016	A	1,510	138	9.1
	B	273	43	15.8
	C	996	73	7.3
	D1	5	0	0.0
	D2	92	4	4.3
	E	179	54	30.2
Summer 2016	A	148	5	3.4
	B	159	3	1.9
	C	528	58	11.0
	D1	0	0	0.0
	D2	163	22	13.5
	E	500	99	19.8
Total		8,446	895	10.6



Table 2. Observer coverage calculated from finalized 2016 Trip Ticket data and observer data for anchored small mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Season	Management Unit	Anchored Small Mesh		
		Fishing Trips	Observed Trips	Coverage
Fall 2015	A	358	10	2.8
	B	706	9	1.3
	C	95	7	7.4
	D1	26	6	23.1
	D2	195	17	8.7
	E	547	29	5.3
Spring 2016	A	675	28	4.1
	B	1,478	29	2.0
	C	95	7	7.4
	D1	34	6	17.6
	D2	20	2	10.0
	E	133	11	8.3
Summer 2016	A	51	0	0.0
	B	1,084	7	0.6
	C	157	7	4.5
	D1	4	1	25.0
	D2	16	3	18.8
	E <sup>1</sup>	n/a	n/a	n/a
Total		5,674	179	3.2

<sup>1</sup> Management unit E closed to anchored small mesh gill nets for the duration of the summer 2016 season



Table 3. Authorized and actual annual estimated takes with confidence intervals (95%) using a bootstrap method based on observer data for coverage and sea turtle interaction levels in anchored large mesh ( $\geq 4$  inch stretched mesh) gill nets for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Species	Management Unit											
	B				D1				Total			
	Estimated Takes				Estimated Takes							
	Authorized		Actual		Authorized		Actual					
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	225	112	59 (0,132)	26 (33,62)	9	5	1 (0,4)	0	234	117	60	26
Kemp's ridley	53	26	22 (12,121)	0	15	7	0	0	68	33	22	0
Total	278	138	81	26	24	12	1	0	302	150	82	26

Species	Management Unit											
	D2				E				Total			
	Estimated Takes				Estimated Takes							
	Authorized		Actual		Authorized		Actual					
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	96	48	73 (7,136)	19 (0,30)	96	48	73	19
Kemp's ridley	6	3	0	0	24	13	11 (0,26)	0	30	16	11	0
Total	6	3	0	0	120	61	84	19	126	64	84	19

<sup>1</sup> Insufficient observer data exist to model an estimated annual take level; therefore, for management unit D2, an annual observed take number has been identified for green turtles

Table 4. Total annual authorized and actual takes (estimated and observed) by species and condition for ITP Year 2016 (September 1, 2015 - August 31, 2016).

Species	Estimated					
	Observed (live/dead)		Authorized		Actual	
	Authorized	Actual	Alive	Dead	Alive	Dead
Green	18	8	330	165	133	45
Hawksbill	8	0	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Kemp's ridley	12	3	98	49	33	0
Leatherback	8	0	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Loggerhead	24	0	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Any Species	8	3 <sup>2</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
Total	78	14	428	214	166	45

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

<sup>2</sup> Species identification unknown



Sincerely,

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