



Annual Sea Turtle Interaction Monitoring of the Anchored Gill-Net Fisheries in North Carolina
for Incidental Take Permit Year 2017

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 various 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. 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 had 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 (No. 16230) 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.

On November 21, 2016, the NCDMF requested a minor modification to extend the annual report deadlines for the Sea Turtle 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).

The NCDMF Observer Program data were updated using the finalized 2016 Trip Ticket Program (TTP) data in May 2017 (Appendix B). The Annual Completion Report for the Sea Turtle ITP No. 16230 was completed for ITP Year 2016 and submitted in February 2017. Using the finalized 2016 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. The fall 2015 season was based on

finalized 2016 TTP data and did not deviate from the previous report for both anchored large and small mesh gill nets (Appendix B).

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 data along with Observer Program data from previous years are used when estimating the number 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 four-year average was used for estimating anchored small mesh gill-net fishing trips for ITP Year 2017. This method of estimating trips proves to more accurately reflect the current fishing effort. Once TTP data are finalized in May of 2018, 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 (2012-2016) for anchored large mesh gill nets, and the average of the previous four years' (2013-2016) 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 as they fish their gill nets. The alternative platform observers document protected species interactions and 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 amount of biological data collected which are 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 number of observers assigned to a management unit depends upon the season and fishing effort. Fishing effort is estimated from the previous 4-5 years' 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 also 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 used for areas that may be hard to get onboard trips (i.e., fishermen in remote locations that leave from their residence by boat) or when the fisherman's vessel is too small to safely accommodate an onboard observer. Alternative platform trips are also used 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 non-compliance. 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 maximize efficiency 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 (≥ 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 (CCL) mm and curved carapace width (CCW)

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 possible. 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 species, quantities, weights, lengths, and disposition (alive/dead). Data are coded onto 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 years' 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. Seasons are defined as spring (March – May), summer (June – August), and fall (September – November). 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 takes are specified in Tables 1 - 5. The amount of incidental takes 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 uses preliminary data to monitor the total number of live and dead takes by species per unit to determine if the fishery is approaching or has reached the authorized takes for any sea turtle species. Once TTP data are finalized in May of 2018, 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 continual outreach to the industry attempting to ensure industry compliance and to determine anchored large and small mesh gill-net fishing effort 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 was 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 2016

The fall 2016 season for anchored large and small mesh gill nets in North Carolina is September 2016 through November 2016 for ITP Year 2017 (September 1, 2016 – August 31, 2017) as defined in ITP No. 16230. Portions of management unit A (western Albemarle Sound, Currituck Sound, and the rivers) opened to anchored large and small mesh gill nets for the new ITP Year 2017 via proclamation M-15-2016 on September 5, 2016 while maintaining the closure of all anchored gill nets in the eastern portions of the management unit (eastern/southern Albemarle Sound and Croatan and Roanoke sounds) to avoid interactions with sea turtles (Table 7; Boyd 2016b). Further portions of management unit A (western/central Albemarle Sound) opened to anchored large and small mesh gill nets for the new ITP Year 2017 via proclamation M-21-2016 on October 15, 2016 while maintaining the closure of all anchored gill nets in the eastern portions of the management unit (eastern/southern Albemarle Sound and Croatan and Roanoke sounds) to avoid interactions with sea turtles. As the fall 2016 season progressed, further portions of management unit A (central/eastern Albemarle Sound) opened to anchored large and small mesh gill nets for the new ITP Year 2017 via proclamation M-23-2016 on October 31, 2016 while maintaining the closure of all anchored gill nets in the eastern portions of the management unit (eastern/southern Albemarle Sound and Croatan and Roanoke sounds) to avoid interactions with sea turtles (Table 7; Boyd 2016b).

Portions of management unit B (subunits SGNRA2-4, MGNRA) opened to anchored large mesh gill nets for the new ITP Year 2017 via proclamation M-16-2016 on September 5, 2016 while maintaining the closure of subunits SGNRA1 and CGNRA to minimize interactions with sea turtles (Table 7; Boyd 2016b). Remaining portions of management unit B (subunits SGNRA2-4, MGNRA) opened to anchored large mesh gill nets for the new ITP Year 2017 via proclamation M-19-2016 on October 3, 2016. Management unit B closed to anchored large mesh gill nets via proclamation M-24-2016 on November 2, 2016 due to sea turtle interactions and the lack of fishermen compliance (Table 7; Boyd 2016b).

Management unit C closed to anchored large and small mesh gill nets via proclamation M-20-2016 on October 1, 2016 for the remainder of the fall 2016 season due to sea turtle interactions. Management unit D1 opened to anchored large mesh gill nets for the new ITP Year 2017 via proclamation M-22-2016 on October 17, 2016 (Table 7; Boyd 2016b).

Management unit E opened to anchored small mesh gill nets for the new ITP Year 2017 via proclamation M-16-2016 on September 5, 2016 while maintaining the closure of upper Cape Fear and Northeast Cape Fear rivers to anchored large mesh gill nets to minimize sturgeon interactions (Table 7; Boyd 2016b).

The Observer Program achieved an estimated 11.2% overall anchored large mesh gill-net coverage for the fall 2016 season meeting the minimum requirement (7.0%) in all management units based on finalized data (Table 8; Figures 2 - 8; Boyd 2016b).

The Observer Program achieved an estimated 3.3% overall anchored small mesh gill-net coverage for the fall 2016 season meeting the minimum requirement (1.0%) in all management units except management unit A (0.0%) based on finalized data (Table 9; Figures 2 - 8; Boyd 2016b).

There were 28 observed sea turtle interactions from anchored large mesh gill nets during the fall 2016 season (Table 10; Figures 2 - 8; Boyd 2016b). There were no observed sea turtle interactions from anchored small mesh gill nets during this period. The species composition was made up of green sea turtles (n = 15 alive; n = 6 dead) and Kemp's ridley sea turtles (n = 6 alive; n = 1 dead). The majority of the interactions occurred in management unit B (71.5%) with 14.3% in management unit E, 7.1% in management unit C, and 7.1% in management unit D1 (Table 10; Figures 2 - 8). Two fisherman self-reported sea turtle interactions occurred in anchored large mesh gill nets and one in anchored small mesh gill nets during this period (Table 11; Boyd 2016b).

Spring 2017

The spring 2017 season for anchored large and small mesh gill nets in North Carolina is March 2017 through May 2017 for ITP Year 2017 (September 1, 2016 – August 31, 2017) as defined in ITP No. 16230. Management unit A opened to the use of anchored large mesh gill nets with gill-net configurations for harvesting American shad by removing vertical height restrictions for up to 1,000 yards of gill net with stretched mesh lengths of 5 ¼ through 6 ½ inches via proclamation M-5-2017 on March 3, 2017 while implementing the closure of all anchored gill nets in the eastern portions of the management unit (eastern/southern Albemarle Sound and Croatan and Roanoke sounds) to avoid interactions with sea turtles. Gill-net configurations for harvesting American shad were removed in management unit A following the end of the shad season via proclamation M-7-2017 on March 25, 2017 while maintaining the closure of all anchored gill nets in the eastern portions of the management unit (eastern/southern Albemarle Sound and Croatan and Roanoke sounds) to avoid interactions with sea turtles (Table 7; Boyd 2017b).

Management unit B remained closed to anchored large mesh gill nets through the spring 2017 season to allow for the recalculation of allowable sea turtle takes once finalized 2016 Trip Ticket data were completed (Table 7; Boyd 2017b).

Management unit D1 closed to anchored large mesh gill nets as part of the annual closure outlined in the ITP via proclamation M-10-2017 on May 8, 2017 (Table 7; Boyd 2017b).

The Observer Program achieved an estimated 9.7% overall anchored large mesh gill-net coverage for the spring 2017 season meeting the minimum requirement (7.0%) in all management units except management unit D1 (0.0%) based on preliminary data (Table 8; Figures 2 – 8; Boyd 2017b).

The Observer Program achieved an estimated 2.2% overall anchored small mesh gill-net coverage for the spring 2017 season meeting the minimum requirement (1.0%) in all management units except management units A (0.8%) and D2 (0.0%) based on preliminary data (Table 9; Figures 2 - 8; Boyd 2017b).

There were no observed sea turtle interactions from anchored large or small mesh gill nets during the spring 2017 season (Boyd 2017b). Three fisherman self-reported sea turtle interactions occurred in anchored large mesh gill nets during this period (Table 11; Boyd 2017b).

Summer 2017

The summer 2017 season for anchored large and small mesh gill nets in North Carolina is June 2017 through August 2017 for ITP Year 2017 (September 1, 2016 – August 31, 2017) as defined in ITP No. 16230. Management unit B opened to anchored large mesh gill nets except for the Inlet Corridors via proclamation M-11-2017 on June 19, 2017 (Table 7; Boyd 2017c).

Management unit C closed to anchored large and small mesh gill nets for the remainder of the summer 2017 season on July 28, 2017 due to sea turtle interactions via proclamation M-12-2017 (Table 7; Boyd 2017c).

Management unit D1 remained closed through the summer 2017 season to anchored large mesh gill nets as part of the annual closure outlined in the Sea Turtle ITP (Table 7; Boyd 2017c).

The Observer Program achieved an estimated 11.3% overall anchored large mesh gill-net coverage for the summer 2017 season meeting the minimum requirement (7.0%) in all management units except management unit A (4.9%) and C (6.9%) based on preliminary data (Table 8; Figures 2 – 8; Boyd 2017c).

The Observer Program achieved an estimated 1.6% overall anchored small mesh gill-net coverage for the summer 2017 season meeting the minimum requirement (1.0%) in all management units except management unit D1 based on preliminary data (Table 9; Figures 2 – 8; Boyd 2017c).

There were 16 observed sea turtle interactions from anchored large mesh gill nets during the summer 2017 season (Table 10; Figures 2 - 8; Boyd 2017c). There was one observed sea turtle interaction from anchored small mesh gill nets during the summer 2017 season. The species

composition was made up of green sea turtles (n = 8 alive; n = 6 dead), Kemp's ridley sea turtles (n = 2 alive) and one alive loggerhead sea turtle. Interactions primarily occurred in management unit B (58.9%) with 17.6% in management unit C, 17.6% in management unit E, and 5.9% in management unit D2 (Table 10; Figures 2 - 8). Two fisherman self-reported sea turtle interactions occurred in anchored large mesh gill nets during this period (Table 11; Boyd 2017c).

Authorized Takes

There was a total of 44 observed sea turtle interactions in anchored large mesh gill nets and one in anchored small mesh gill nets for ITP Year 2017 (Table 10; Figures 2 – 8; Boyd 2016b, 2017b, 2017c). The species composition consisted of primarily green sea turtles (77.8%; n = 23 alive; n = 12 dead; Table 10; Figures 2 - 8). The remaining species consisted of Kemp's ridley sea turtles (20.0%; n = 8 alive; n = 1 dead), and one alive loggerhead sea turtle (Table 10; Figures 2 - 8). Observed interactions occurred in management unit B (66.7%), management unit C (11.1%), management unit D1 (4.4%), management unit D2 (2.2%), and management unit E (15.6%; Table 10; Figures 2 - 8). There was a total of eight fisherman self-reported sea turtle interactions for ITP Year 2017 (Table 11; Boyd 2016b, 2017b, 2017c).

The size distribution of green sea turtles (n = 25) ranged from a CCL of 263 mm to 395 mm and a CCW of 221 mm to 347 mm (Figures 9 and 10). The size distribution of Kemp's ridley sea turtles (n = 8) ranged from a CCL of 210 mm to 419 mm and a CCW of 205 mm to 429 mm (Table 10; Figures 11 and 12; Boyd 2016b, 2017b, 2017c).

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 2017 based on preliminary data. 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 2017 based on preliminary data (Tables 1 - 5; Boyd 2016b, 2017b, 2017c).

The percentage of authorized takes that were used in ITP Year 2017 for anchored large mesh gill nets were calculated for estimated takes by species and disposition (green 51.1% alive, 35.5% dead; Kemp's ridley 53.5% alive, 0.0% dead; Boyd 2016b, 2017b, 2017c). The percentage of authorized takes that were used in ITP Year 2017 were also calculated for observed takes (green 28.6% alive/dead; Kemp's ridley 25.0% alive/dead). Overall, for both anchored large and small mesh gill nets, the percentage of estimated (51.1% alive, 27.4% dead) and observed (10.3% alive/dead) takes was below the authorized takes provided by the Sea Turtle ITP (Boyd 2016b, 2017b, 2017c).

Compliance

Marine Patrol made 366 gill-net checks during the fall 2016 season resulting in 44 citations issued (Tables 12 and 13; Boyd 2016b, 2017b, 2017c). Marine Patrol made 395 gill-net checks

for the spring 2017 season resulting in 10 citations issued. Marine Patrol made 960 gill-net checks for the summer 2017 season with no citations issued (Tables 12 and 13; Boyd 2016b, 2017b, 2017c).

For ITP Year 2017, phone calls (n = 7,776) were made with 57.0% (n = 4,430) 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; Boyd 2016b, 2017b, 2017c). In the fall 2016 season (n = 2,660), phone calls were made with 49.4% (n = 1,313) categorized as 1, 8, 11, 12, 13, and 14. In the spring 2017 season (n = 2,425), phone calls were made with 61.4% (n = 1,490) categorized as 1, 8, 11, 12, 13, and 14. In the summer 2017 season (n = 2,691), phone calls were made with 60.5% (n = 1,627) categorized as 1, 8, 11, 12, 13, and 14 (Table 14; Boyd 2016b, 2017b, 2017c).

Notice of Violations (NOV) were issued when fishermen were found to be out of compliance with the EGNP with eight NOVs issued during the fall 2016 season, six NOVs issued during the spring 2017 season, and five NOVs issued during the summer 2017 season (Table 15; Boyd 2016b, 2017b, 2017c).

Marine Mammals

There were no observed takes of marine mammals during ITP Year 2017.

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 to 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 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.

The Annual Completion Report for ITP Year 2014 (September 1, 2013 – August 31, 2014) was submitted January 30, 2015 (Boyd 2015). 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).

Outreach

Staff from the NCDMF met with commercial industry leaders on July 11, 2016 to discuss the current ITPs and options for moving forward with amendments. The North Carolina Fisheries Association (NCFA) requested the meeting in response to NCDMF 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 the Observer Program 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 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 were already in place for the anchored gill-net fisheries and suggested another "more-inclusive" meeting for further discussion (Appendix C). The NCFA sent the NCDMF a follow-up email on September 19, 2016 with questions and concerns following the meetings (Appendix D). On November 30, 2016, the NCFA sent the NCDMF a commitment letter concerning their collaboration with Gettysburg College on a project titled, "Development of sensory-based bycatch reduction technologies to reduce sea turtle bycatch in North Carolina coastal gillnet and pound net fisheries" (Appendix E). The work on the project began in September 2017.

At the August 2016 NCMFC meeting, Chairman Sammy Corbett announced that he was disbanding the Sea Turtle Advisory Committee (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 F).

Observer Activity

There was turnover within the Observer Program with positions being filled as quickly as possible to maintain coverage. The Observer Program proportionally placed observers in areas with higher fishing effort. There were multiple closures of various management units throughout the state during ITP Year 2017 (Table 7). Fishermen are more elusive to attempts by observers contacting them to schedule trips after proclamations enacting stricter regulations are implemented. Therefore, making it harder to obtain observer trips. When a management unit closes for a portion of time, the observers are shifted to open management units. The contact log, which includes different categories to place each contact that was made to a fisherman, is 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.

During the fall 2016 season, attendance was required for anchored small mesh gill nets for the duration of the fall 2016 season in management unit A making it difficult to obtain observed trips (Boyd 2016b). In recent years, attendance requirements were lifted during the month of November allowing for observer trips to be obtained. Fishing practices for attended gill nets can be very different than other fishing practices, with fishing activity occurring throughout the night creating safety hazards for observers. Furthermore, fishing effort tends to be lower when attendance is required (Boyd 2016b).

During the spring 2017 season, no anchored large mesh gill-net trips were obtained in management unit D1 due to the management unit being closed for the latter portion of the spring 2017 season and minimal fishing effort ($n = 25$ fishing trips) while open. Observer coverage in the spring 2017 season for anchored small mesh gill-nets in management unit A was 0.8% and no anchored small mesh gill-net trips were obtained in management unit D2 due to minimal fishing effort ($n = 42$ fishing trips; Boyd 2017b).

During the summer 2017 season, observer coverage for anchored large mesh gill-nets in management unit A was 4.9% and C was 6.9% (Boyd 2017c). Management unit D1 was closed for the duration of the summer 2017 season as part of the annual closure outlined in the ITP. No anchored small mesh gill-net trips were obtained in management unit D1 due to minimal fishing effort ($n = 10$ fishing trips) for the summer 2017 season (Boyd 2017c).

Compliance

Although ITP Year 2017 is the fourth year for the statewide ITP, fishermen in many portions of the state 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 2017 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 for anchored large mesh gill nets 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 leaders in an attempt to improve awareness and increase compliance. However, fisherman non-compliance continues to be a hurdle for ensuring the requirements for both ITPs are met. Each ITP Year (2015-2017) had >50% of contacts made by observers not being able to get in touch with fishermen or fishermen refusing trips with a 7.6% increase in non-compliance over the last three years (Boyd 2016a, 2017a).

Eight fishermen self-reported sea turtle takes occurred during ITP Year 2017 (Table 11; Boyd 2016b, 2017b, 2017c). NCDMF has discussed this situation with industry leads numerous times and has provided outreach to fishermen explaining the requirement in the ITP of self-reporting and further details on the subject to try and increase self-reporting throughout the industry as a whole with limited success.

Based on finalized data for ITP Years 2015-2016 and preliminary and finalized data for ITP Year 2017, the number of authorized sea turtle takes that were used 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 the last three years with variation between years. For ITP Year 2015, the percentage of estimated takes that remained for anchored large mesh gill nets was calculated by species and disposition (green 42.1% alive, 40.0% dead; Kemp's ridley 64.3% alive, 85.7% dead) with similar numbers for ITP Year 2016 (green 54.8% alive, 57.0% dead; Kemp's ridley 20.4% alive, 100.0% dead), and ITP Year 2017 (green 51.1% alive, 35.5% dead; Kemp's ridley 53.5% alive, 0.0% dead).

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 for ITP Year 2016 data (green 55.6% alive/dead; Kemp's 75.0% alive/dead; with no interactions hawksbill or leatherback sea turtles), and ITP Year 2017 (green 28.6% alive/dead; Kemp's ridley 25.0% alive/dead; with no interactions hawksbill or leatherback sea turtles).

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 less sea turtle takes in these fisheries. This is also due to management related to the Atlantic Sturgeon ITP as any closure of anchored large or small mesh gill nets from sturgeon interactions leads to infrequent sea turtle interactions with 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 it is highly unlikely, if not impossible, that the total authorized take levels would be approached for an ITP Year because the NCDMF will close a management unit for the remainder of that season or ITP Year if takes approached 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; Boyd 2015). 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 2,670 EGNPs issued for Fiscal Year 2017 (July 1, 2016 – June 30, 2017).

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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 (≥ 4 inch stretched mesh) gill nets for ITP Year 2017 (September 1, 2016 - August 31, 2017).

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	162 (17,227)	40 (0,84)	9	5	1 (0,3)	1 (0,3)	234	117	163	41
Kemp's ridley	53	26	33 (0,69)	0	15	7	0	0	68	33	33	0
Total	278	138	195	40	24	12	1	1	302	150	196	41

Species	Management Unit								Total			
	D2				E							
	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 ¹	n/a ¹	n/a ¹	n/a ¹	96	48	6 (0,18)	17 (0,39)	96	48	6	17
Kemp's ridley	6	3	0	0	24	13	16 (0,55)	0	30	16	16	0
Total	6	3	0	0	120	61	22	17	126	64	22	17

¹ 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 (≥ 4 inch stretched mesh) gill nets for ITP Year 2017 (September 1, 2016 - August 31, 2017).

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		
Green	n/a ¹	n/a ¹	n/a ¹	n/a ¹	6	1	n/a ¹	n/a ¹		1
Kemp's ridley	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Hawksbill	1	0	1	0	1	0	1	0 ⁶	4	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	1	3	0	3	0	3	0	13	1
Total	5	1	5	0	11	1	5	0	28	2

¹ 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 (≥ 4 inch stretched mesh) and anchored small mesh (< 4 inch stretched mesh) gill nets combined for ITP Year 2017 (September 1, 2016 - August 31, 2017).

Species	Management Unit					
	A		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)	0 (any species)	4 (any species)	5 (any species)	8 (any species)	5 (any species)
Total	4	0	4	5	8	5

Table 4. Authorized and actual annual observed (not estimated) takes in anchored small mesh (< 4 inch stretched mesh-ISM) gill nets for ITP Year 2017 (September 1, 2016 - August 31, 2017).

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	0	3	0	3	0	3	1	12	1
Hawksbill	1	0	1	0	1	0	1	0	4	0
Kemp's ridley	3	0	3	0	3	0	3	0	12	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	0	3	0	3	0	3	0	12	0
Total	11	0	11	0	11	0	11	1	44	1

Table 5. Total annual authorized and actual takes (estimated and observed) by species and condition for ITP Year 2017 (September 1, 2016 - August 31, 2017).

Species	Estimated					
	Observed (live/dead)		Authorized		Actual	
	Authorized	Actual	Alive	Dead	Alive	Dead
Green	18	5	330	165	169	59
Hawksbill	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	12	2	98	49	50	0
Leatherback	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Loggerhead	24	1	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Any Species	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Total	78	8	428	214	219	59

¹ 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 2017 (September 1, 2016 - August 31, 2017).

Year	Date(s)	Regulation change
2016	Sept 5	Management unit A open to large and small mesh gill nets for the new ITP Year 2017 for the western part of the sound, Currituck Sound, and the rivers. All the eastern/southern areas (Croatan and Roanoke Sounds) will remain closed until sea turtle abundance decreases to minimize interactions with sea turtles (M-15-2016).
2016	Sept 5	Portions of management unit B (subunits SGNRA2-4, MGNRA) open to large mesh gill nets for the new ITP Year 2017. Subunits SGNRA1 and CGNRA will remain closed until sea turtle abundance decreases to minimize interactions with sea turtles (M-16-2016).
2016	Sept 5	Management unit E open to small mesh gill nets (large mesh gill nets continually open through summer for the new ITP Year 2017. Portions of upper Cape Fear River and Northeast Cape Fear River remain closed to large mesh gill nets due to sturgeon interactions (M-16-2016).
2016	Oct 3	Remaining portions of management unit B (subunits SGNRA1 and CGNRA) open to large mesh gill nets for the new ITP Year 2017 (M-19-2016).
2016	Oct 1	Closed management unit C to large and small mesh gill nets due to sea turtle interactions (M-20-2016).
2016	Oct 15	Further portions of management unit A open to large and small mesh gill nets for the new ITP Year 2017 for the central part of the sound. All the eastern/southern areas (Croatan and Roanoke Sounds) will remain closed until sea turtle abundance decreases to minimize interactions with sea turtles (M-21-2016).
2016	Oct 17	Management unit D1 open to anchored large mesh gill nets (M-22-2016).
2016	Oct 31	Further portions of management unit A open to anchored large and small mesh gill nets for the new ITP Year 2017 for the central and eastern part of the sound. Croatan and Roanoke sounds will remain closed until sea turtle abundance decreases to minimize interactions with sea turtles (M-23-2016).
2016	Nov 2	Management unit B closed to anchored large mesh gill nets due to sea turtle interactions and the lack of fishermen compliance (M-24-2016).
2016	Dec 1	Management unit A small mesh anchored gill nets 3 though 3 3/4 ISM restrictions while removing attendance requirements for those small mesh anchored gill nets, and requiring small mesh anchored gill nets to be set so as to fish on the bottom and not exceed a vertical height of 48 inches (M-25-2016).
2016	Dec 5	Management unit C open to anchored large and small mesh gill nets (M-27-2016).
2016	Dec 13	Management unit A closed to anchored large mesh gill nets due to reaching allowable Atlantic sturgeon takes (M-32-2016).
2017	Jan 29	Portions of management unit A open to anchored large mesh gill nets (northern rivers) while maintaining closure of anchored large mesh gill nets in all other portions to allow directed gill-net fisheries for catfish while minimizing interactions with Atlantic sturgeon (M-1-2017).
2017	Feb 6	Further portions of management unit A open to anchored large mesh gill nets (Alligator River/Currituck Sound) while maintaining closure of anchored large mesh gill nets in all other portions to allow directed gill-net fisheries for catfish while minimizing interactions with Atlantic sturgeon (M-2-2017).

Table 7. (cont.).

Year	Date(s)	Regulation change
2017	Feb 15	Further portions of management unit A open to anchored large mesh gill nets (Alligator River/Currituck Sound) while maintaining closure of anchored large mesh gill nets in all other portions to allow directed gill-net fisheries for catfish while minimizing interactions with Atlantic sturgeon (M-2-2017).
2017	Feb 15	Management units C, D1, D2, and E implements gear restrictions for the shad fishery (M-4-2017).
2017	Mar 3	Management Unit A open to the use of gill nets and allows gill-net configurations for harvesting American shad by removing vertical height restrictions for up to 1,000 yards of gill net with stretched mesh lengths of 5 ¼ through 6 ½ inches while implementing additional gill-net restrictions for management subunit A-South of US-64-BYP/US-64, in accordance with the Sea Turtle and Atlantic Sturgeon ITPs (M-5-2017).
2017	Mar 25	Removes management Unit A gill-net configurations for harvesting American shad and maintains gill-net restrictions for management subunit A-South of US-64-BYP/US-64, in accordance with the Sea Turtle and Atlantic Sturgeon ITPs (M-7-2017).
2017	Apr 3	Gill nets with mesh length greater than 5 inches must be equipped with tie downs 10 yards apart and cannot be within 50 yards of the shore in the Neuse, Pamlico, and Pungo Rivers through December 31, 2017. Use of gill nets 5 inches or greater is prohibited within 10 feet of any point on the shoreline while set or deployed unless the net is attended from June to October (proclamation M-8-2017)
2017	May 1	Management unit A small mesh anchored gill-net attendance requirement (through November 30, 2017) and closes portions of management unit A (Subunit A-South of US-64-BYP/US-64) to the use of anchored large and small mesh gill nets (M-9-2017).
2017	May 8	Management unit D1 closed to large mesh gill nets and implements attendance requirements for gill nets with a stretched mesh length less than 4 inches in Management Subunit B. 1. (proclamation M-10-2017). **Annual ITP closure***
2017	Jun 19	Management unit B open to large mesh gill nets with a stretched mesh length of 4 inches through 6 1/2 inches. Portions of management unit B (Inlet Corridors) remain closed to the use of gill nets with a stretched mesh length of 4 inches through 6 1/2 inches to minimize interactions with threatened and/or endangered species (M-11-2017).

Table 8. Observer coverage calculated from previous years' 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 2017 (September 1, 2016 - August 31, 2017).

Season ¹	Management Unit ²	Large Mesh		
		Fishing Trips	Observed Trips	Coverage ³
Fall 2016	A	2,234	175	7.8
	B	950	131	13.8
	C	266	37	13.9
	D1	49	15	30.6
	D2	295	33	11.2
	E	461	85	18.5
Spring 2017	A	2,277	181	7.9
	B	n/a	n/a	n/a
	C	878	96	10.9
	D1	25	0	0.0
	D2	67	10	14.8
	E	279	55	19.7
Summer 2017	A	1,338	66	4.9
	B	812	128	15.8
	C	403	28	6.9
	D1	n/a	n/a	n/a
	D2	123	24	19.6
	E	505	112	22.2
Total		10,961	1,176	10.7

¹ Final trip ticket data for 2016 (Fall 2016) and preliminary trip ticket data for 2017 (Spring and Summer 2017)

² Table 7 contains all the openings and closings for each management unit

³ Based on final trips for 2016 (Fall 2016) and estimated trips for 2017 (Spring and Summer 2017) compared to observer large mesh trips

Table 9. Observer coverage calculated from previous years' 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 2017 (September 1, 2016 - August 31, 2017).

Season ¹	Management Unit ²	Small Mesh		
		Fishing Trips	Observed Trips	Coverage ³
Fall 2016	A	380	0	0.0
	B	1,058	18	1.7
	C	79	7	8.9
	D1	60	10	16.7
	D2	240	15	6.3
	E	483	27	5.6
Spring 2017	A	1,311	10	0.8
	B	1,295	21	1.6
	C	263	16	6.1
	D1	39	8	20.3
	D2	42	0	0.0
	E	201	14	7.0
Summer 2017	A	280	4	1.4
	B	1,048	10	1.0
	C	312	10	3.2
	D1	10	0	0.0
	D2	54	4	7.5
	E	253	4	1.6
Total		7,406	178	2.4

¹ Final trip ticket data for 2016 (Fall 2016) and preliminary trip ticket data for 2017 (Spring and Summer 2017)

² Table 7 contains all the openings and closings for each management unit

³ Based on final trips for 2016 (Fall 2016) and estimated trips for 2017 (Spring and Summer 2017) compared to observer large mesh trips

Table 10. Summary of observed sea turtle interactions in anchored large (n = 44) and small (n = 1) mesh gill nets through the NCDMF Observer Program for ITP Year 2017 (September 1, 2016 - August 31, 2017).

Date ¹	Management Unit	Latitude	Longitude	Species	Disposition	Tag		Curved Carapace (mm)	
						PIT	Inconel	Length	Width
9/7/2016	B	35.65913	75.52035	kemp's	alive	n/a	n/a	410	420
9/7/2016	B	35.65847	75.51970	kemp's	alive	n/a	n/a	370	380
9/13/2016	E	34.59066	77.40371	green	alive	989.001001951909	n/a	n/a	n/a
9/14/2016	B	35.30472	75.60518	green	alive	989.001001951749	EFT822	354	321
9/14/2016	E	34.47231	77.49011	kemp's	alive	989.001001951912	n/a	340	330
9/22/2016	B	35.13381	75.99700	green	alive	982.000364358025	n/a	315	245
9/22/2016	B	35.13408	75.99580	green	alive	982.000364301028	n/a	337	263
9/22/2016	B	35.13388	75.99703	green	dead	n/a	n/a	317	245
9/28/2016	B	35.17496	75.84647	green	dead	n/a	n/a	310	240
9/30/2016	C	35.51297	76.63842	kemp's	alive	n/a	n/a	406	429
9/30/2016	C	35.51297	76.63842	kemp's	dead	n/a	n/a	419	425
9/30/2016	B	35.28333	75.53361	green	dead	n/a	n/a	n/a	n/a
10/6/2016	B	35.02762	76.11351	green	alive	982.000364301837	n/a	290	250
10/6/2016	B	35.02029	76.11481	green	alive	n/a	n/a	n/a	n/a
10/12/2016	B	34.81970	76.36897	green	alive	n/a	n/a	n/a	n/a
10/12/2016	B	34.82031	76.36897	green	alive	989.001001952695	n/a	300	255
10/12/2016	B	35.01688	76.13003	green	dead	n/a	n/a	330	285
10/13/2016	B	34.81567	76.37873	green	alive	n/a	n/a	n/a	n/a
10/13/2016	B	35.04165	76.10800	green	alive	982.000364298693	n/a	347	304
10/14/2016	B	34.81885	76.36508	kemp's	alive	982.000364296939	n/a	210	205
10/18/2016	D1	34.79901	76.48180	green	alive	n/a	n/a	n/a	n/a
10/18/2016	D1	34.79735	76.48749	green	dead	n/a	n/a	350	310
10/20/2016	B	35.14932	75.90034	green	alive	n/a	n/a	n/a	n/a
10/25/2016	B	34.80941	76.38654	green	alive	982.000364297135	XXP661/XXP662	340	280
10/28/2016	E	34.12214	77.86340	kemp's	alive	989.001001951766	EET844/EET875	336	335
11/1/2016	B	35.14508	75.92924	green	alive	n/a	n/a	n/a	n/a
11/1/2016	B	35.14551	75.92901	green	alive	n/a	n/a	n/a	n/a

¹ No interactions occurred during the spring 2017 season

² Interaction occurred in anchored small mesh gill nets

Table 10. (cont.).

Date ¹	Management Unit	Latitude	Longitude	Species	Disposition	Tag		Curved Carapace (mm)	
						PIT	Inconel	Length	Width
11/4/2016	E	34.41676	77.57641	green	dead	n/a	n/a	263	221
6/14/2017	D2	34.68267	77.04958	green	dead	n/a		315	270
6/21/2017	E	33.97268	77.92255	green ²	alive	3DD.003BB895A4/ 989.001001952676	EET846/ EET847	352	301
6/22/2017	B	35.30167	75.60813	green	alive	3DD.003BB895FE/ 989.001001952766	EET830/ EET831	320	290
6/27/2017	B	34.86224	76.37999	green	alive	3DD.003BB891EA/ 989.001001951722	EET821/ EET826	328	286
6/27/2017	E	33.93750	77.95202	green	dead	n/a	n/a	281	252
6/27/2017	E	33.93965	77.95006	green	dead	n/a	n/a	342	281
6/30/2017	C	35.19890	76.52740	green	dead	n/a	n/a	300	265
7/5/2017	B	35.61508	75.48758	loggerhead	alive	n/a	n/a	n/a	n/a
7/11/2017	B	35.20396	75.81295	kemp's	alive	n/a	n/a	n/a	n/a
7/11/2017	B	35.20090	75.80848	green	dead	n/a	n/a	372	302
7/13/2017	B	35.38477	75.54202	kemp's	alive	3D6.0015B6BAE5/ 982.000364296933	XXP659/ UUE037	325	332
7/25/2017	B	35.19176	75.83566	green	alive	n/a	n/a	304	254
7/26/2017	C	35.15580	76.57945	green	alive	3D6.001596B818/ 982.000362199064	UUE079/ UUE044	395	347
7/26/2017	C	35.15540	76.57973	green	dead	n/a	n/a	280	245
7/27/2017	B	35.20288	75.81908	green	alive	n/a	n/a	n/a	n/a
8/24/2017	B	35.14482	75.92638	green	alive	3D6.0015B2EFDE/ 982.000364048350	n/a	291	232
8/25/2017	B	35.06642	76.07711	green	alive	3D6.0015B2F2CC/ 982.000364049100	n/a	303	257

¹ No interactions occurred during the spring 2017 season

² Interaction occurred in anchored small mesh gill nets

Table 11. Summary of reported sea turtle interactions in anchored large and small mesh gill nets through the NCDMF Observer Program for ITP Year 2017 (September 1, 2016 - August 31, 2017).

Date	Management Unit	Latitude	Longitude	Species	Disposition	Curved Carapace (mm)	
						Length	Width
9/26/2016	E	n/a	n/a	green	alive	n/a	n/a
10/25/2016	D1	n/a	n/a	unknown	alive	n/a	n/a
11/8/2016	D2	34.68254	77.03699	green ¹	alive	n/a	n/a
5/2/2017	D2	n/a	n/a	unknown	alive	n/a	n/a
5/2/2017	D2	n/a	n/a	unknown	alive	n/a	n/a
5/8/2017	E	n/a	n/a	green	alive	n/a	n/a
7/10/2017	E	n/a	n/a	green	alive	n/a	n/a
8/1/2017	E	n/a	n/a	unknown	alive	n/a	n/a

¹ Indicates small mesh gear

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 2017 (September 1, 2016 - August 31, 2017).

Season	# Gill Net Checks	# Citations
Fall 2016	366	44
Spring 2017	395	10
Summer 2017	960	0
Total	1,721	54

Table 13. Citations written by Marine Patrol for large and small mesh gill nets by season and violation code during ITP Year 2017 (September 1, 2016 - August 31, 2017).

Season ¹	Violation		
	Date	Code	Description
Fall 2016	9/1/2016	NETG04	Leave gill net in waters when could not be legally fished
	9/8/2016	NETG03	Using gill net with improper buoys or identification
	9/13/2016	NETG01	Leave gill net in coastal waters unattended
	9/14/2016	NETG03	Using gill net with improper buoys or identification
	9/15/2016	NETG03	Using gill net with improper buoys or identification
	9/15/2016	NETG03	Using gill net with improper buoys or identification
	9/17/2016	NETG04	Leave gill net in waters when could not be legally fished
	9/20/2016	NETG03	Using gill net with improper buoys or identification
	9/20/2016	NETG53	Use large mesh gill net with corks or floats on top line
	9/22/2016	NETG03	Using gill net with improper buoys or identification
	9/22/2016	NETG08	Gill net within 200 yards of pound net
	9/25/2016	NETG03	Using gill net with improper buoys or identification
	9/29/2016	NETG03	Using gill net with improper buoys or identification
	10/2/2016	NETG04	Leave gill net in waters when could not be legally fished
	10/3/2016	NETG04	Leave gill net in waters when could not be legally fished
	10/17/2016	NETG01	Leave gill net in coastal waters unattended
	10/17/2016	NETG03	Using gill net with improper buoys or identification
	10/18/2016	NETG03	Using gill net with improper buoys or identification
	10/20/2016	NETG03	Using gill net with improper buoys or identification
	10/20/2016	NETG33	Violate provisions of Proc M-19-09 setting gill net more than 15 meshes deep in Core Sound
	10/20/2016	NETG53	Use large mesh gill net with corks or floats on top line
	10/22/2016	NETG03	Using gill net with improper buoys or identification
	10/23/2016	NETG03	Using gill net with improper buoys or identification
	10/29/2016	NETG17	Sink net in Neuse River during closed season
	10/30/2016	NETG34	Use unattended gill net w/mesh less than 5" in commercial operation from May 1 through Nov 30
	10/31/2016	NETG04	Leave gill net in waters when could not be legally fished
	11/3/2016	NETG03	Using gill net with improper buoys or identification
	11/3/2016	NETG03	Using gill net with improper buoys or identification
	11/3/2016	NETG30	Leave RCGL gill net unattended
	11/5/2016	NETG03	Using gill net with improper buoys or identification
	11/5/2016	NETG16	Use an unattended gill net in a restricted area
	11/5/2016	NETG30	Leave RCGL gill net unattended
	11/6/2016	NETG01	Leave gill net in coastal waters unattended
	11/6/2016	NETG04	Leave gill net in waters when could not be legally fished
	11/17/2016	NETG37	Leave small mesh gill nets unattended
	11/17/2016	NETG37	Leave small mesh gill nets unattended
	11/17/2016	NETG37	Leave small mesh gill nets unattended

¹ There were no citations written during the summer 2017 season

Table 13. (cont.).

Season ¹	Violation		
	Date	Code	Description
Fall 2016	11/19/2016	NETG02	Using gill net without buoys or identification
	11/19/2016	NETG03	Using gill net with improper buoys or identification
	11/22/2016	NETG01	Leave gill net in coastal waters unattended
	11/22/2016	NETG02	Using gill net without buoys or identification
	11/22/2016	NETG03	Using gill net with improper buoys or identification
	11/22/2016	NETG37	Leave small mesh gill nets unattended
	11/22/2016	NETG37	Leave small mesh gill nets unattended
	11/22/2016	NETG37	Leave small mesh gill nets unattended
Spring 2017	3/28/2017	NETG46	Set or retrieve large mesh gill nets later than one hour after sunrise on Tuesday through Friday
	3/28/2017	NETG53	Use large mesh gill net with corks or floats on top line
	4/10/2017	NETG22	Improperly set gill net
	4/15/2017	NETG03	Using gill net with improper buoys or identification
	4/15/2017	NETG60	Use gill nets with a mesh size of more than 6.5 inches (stretched mesh) in violation of proclamation
	4/20/2017	NETG03	Using gill net with improper buoys or identification
	4/20/2017	NETG29	RCGL gear without proper buoys
	4/21/2017	NETG22	Improperly set gill net
	5/7/2017	NETG29	RCGL gear without proper buoys
	5/17/2017	NETG45	Set or retrieve large mesh gill nets no sooner than one hour before sunset on Monday through Friday

¹ There were no citations written during the summer 2017 season

Table 14. Contacts attempted (n = 7,776) 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 2017 for ITP Year 2017 (September 1, 2016 - August 31, 2017).

Season	Categories (%) ¹														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Fall 2016	63	514	181	66	47	34	160	5	284	61	53	11	296	885	2,660
	2.4%	19.3%	6.8%	2.5%	1.8%	1.3%	6.0%	0.2%	10.7%	2.3%	2.0%	0.4%	11.1%	33.3%	100.0%
Spring 2017	Categories (%) ¹														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	61	440	171	30	18	28	98	9	130	20	93	16	320	991	2,425
	2.5%	18.1%	7.1%	1.2%	0.7%	1.2%	4.0%	0.4%	5.4%	0.8%	3.8%	0.7%	13.2%	40.9%	100.0%
Summer 2017	Categories (%) ¹														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	64	482	161	24	26	37	104	4	177	53	107	17	385	1,050	2,691
	2.4%	17.9%	6.0%	0.9%	1.0%	1.4%	3.9%	0.1%	6.6%	2.0%	4.0%	0.6%	14.3%	39.0%	100.0%
Total	Categories (%) ¹														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	188	1,436	513	120	91	99	362	18	591	134	253	44	1,001	2,926	7,776
	2.4%	18.5%	6.6%	1.5%	1.2%	1.3%	4.7%	0.2%	7.6%	1.7%	3.3%	0.6%	12.9%	37.6%	100.0%

¹ 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 2017 (September 1, 2016 - August 31, 2017).

Season	Date	Code	Description
Fall 2016	11/3/2016	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	11/3/2016	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	11/3/2016	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	11/3/2016	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	11/29/2016	EGNP11	Failure to attend nets
	11/29/2016	EGNP11	Failure to attend nets
	11/29/2016	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	11/29/2016	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
Spring 2017	3/6/2017	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	4/24/2017	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	4/24/2017	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	4/24/2017	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	4/28/2017	EGNP10	Set more than the legal length of gill net
	4/28/2017	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
Summer 2017	6/28/2017	EGNP10	Set more than the legal length of gill net
	6/28/2017	EGNP99	Failure to comply with statutes(s), rules(s), and/or proclamation(s)
	8/24/2017	EGNP30	Failure to comply with gill net configurations outlined in proclamation

FIGURES

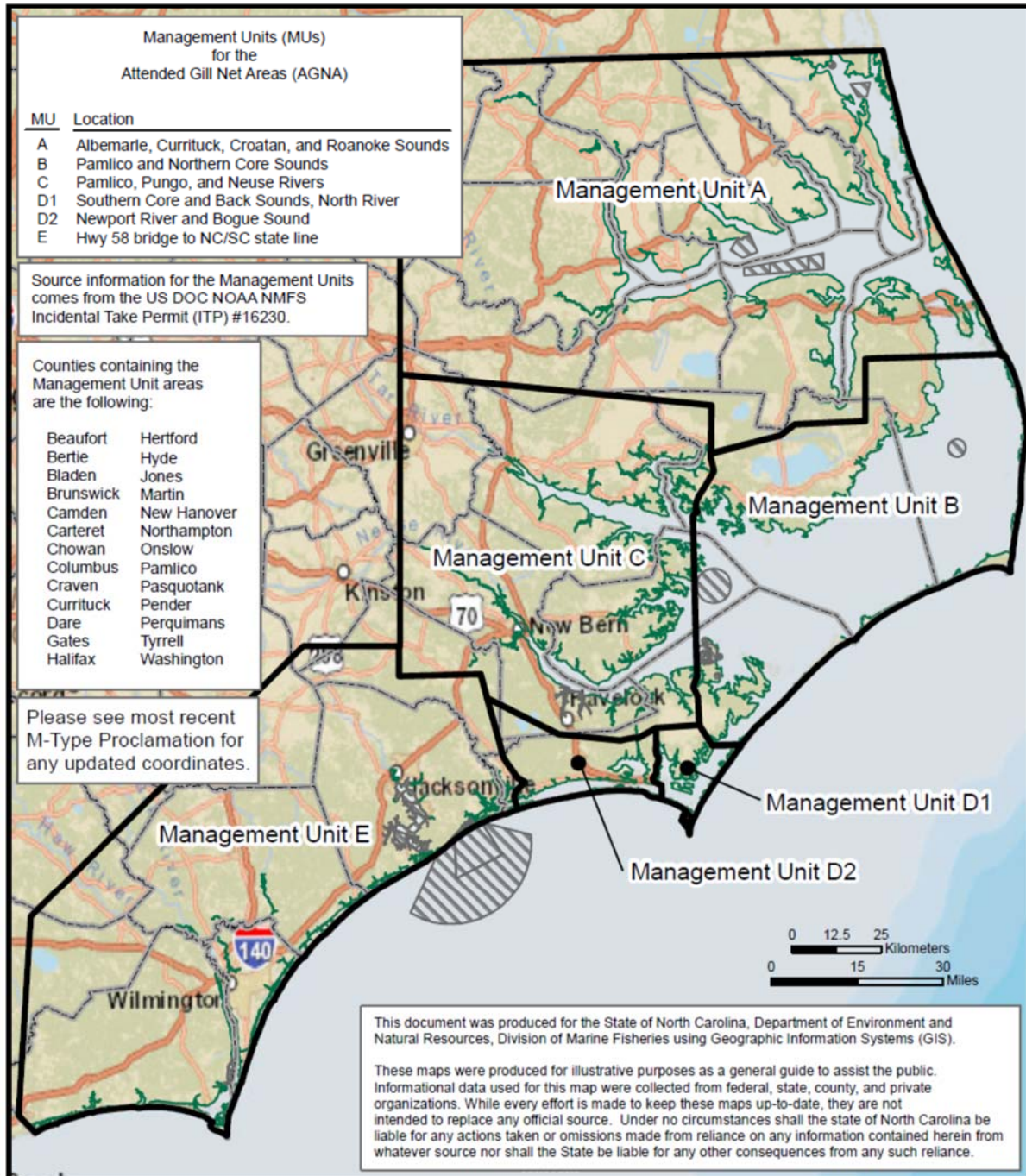


Figure 1. Management units (A, B, C, D1, D2, and E) as outlined in the Conservation Plan and utilized by the Observer Program for ITP Year 2017 (September 1, 2016 – August 31, 2017).

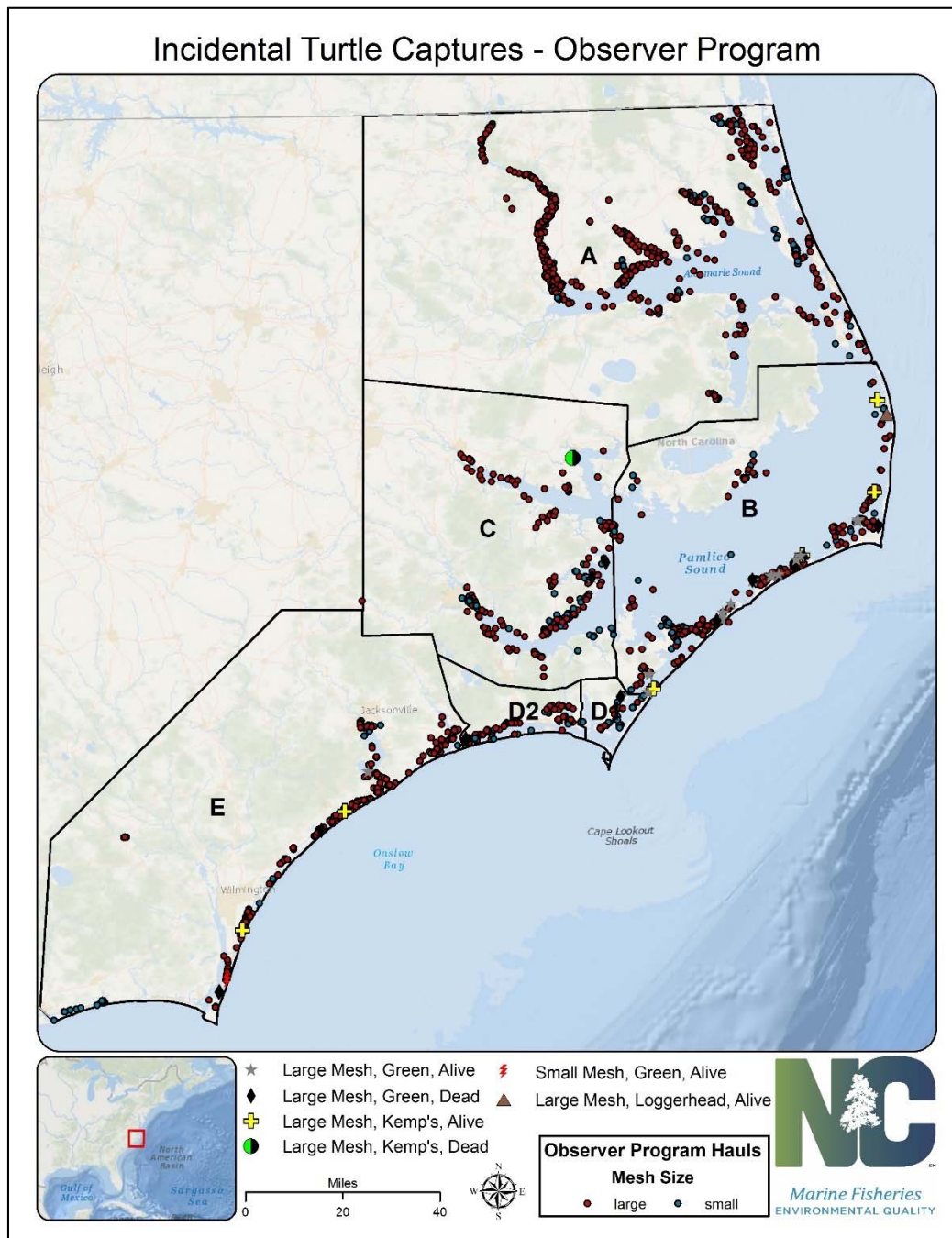


Figure 2. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear throughout all management units for ITP Year 2017 (September 1, 2016 – August 31, 2017).

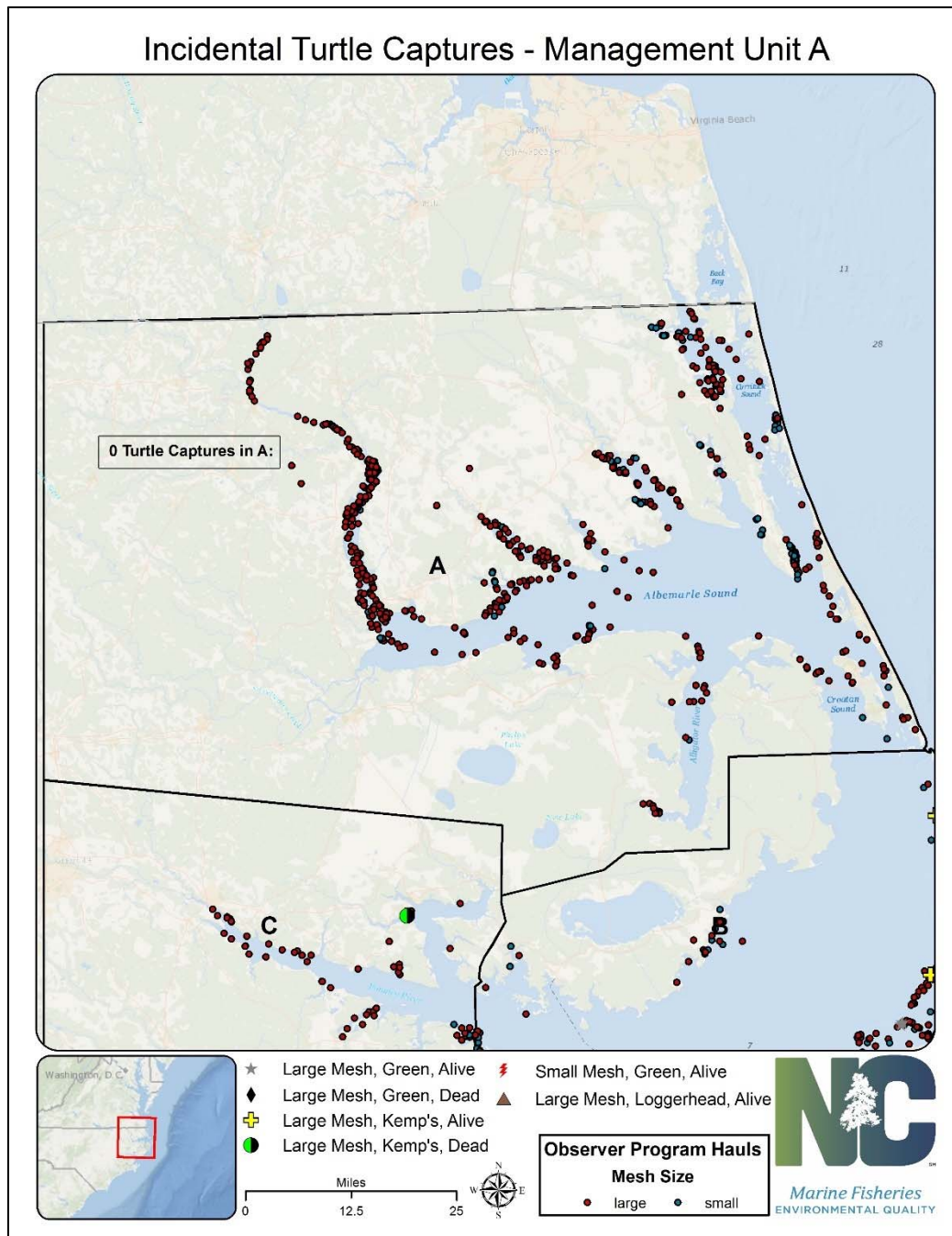


Figure 3. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit A for ITP Year 2017 (September 1, 2016 – August 31, 2017).

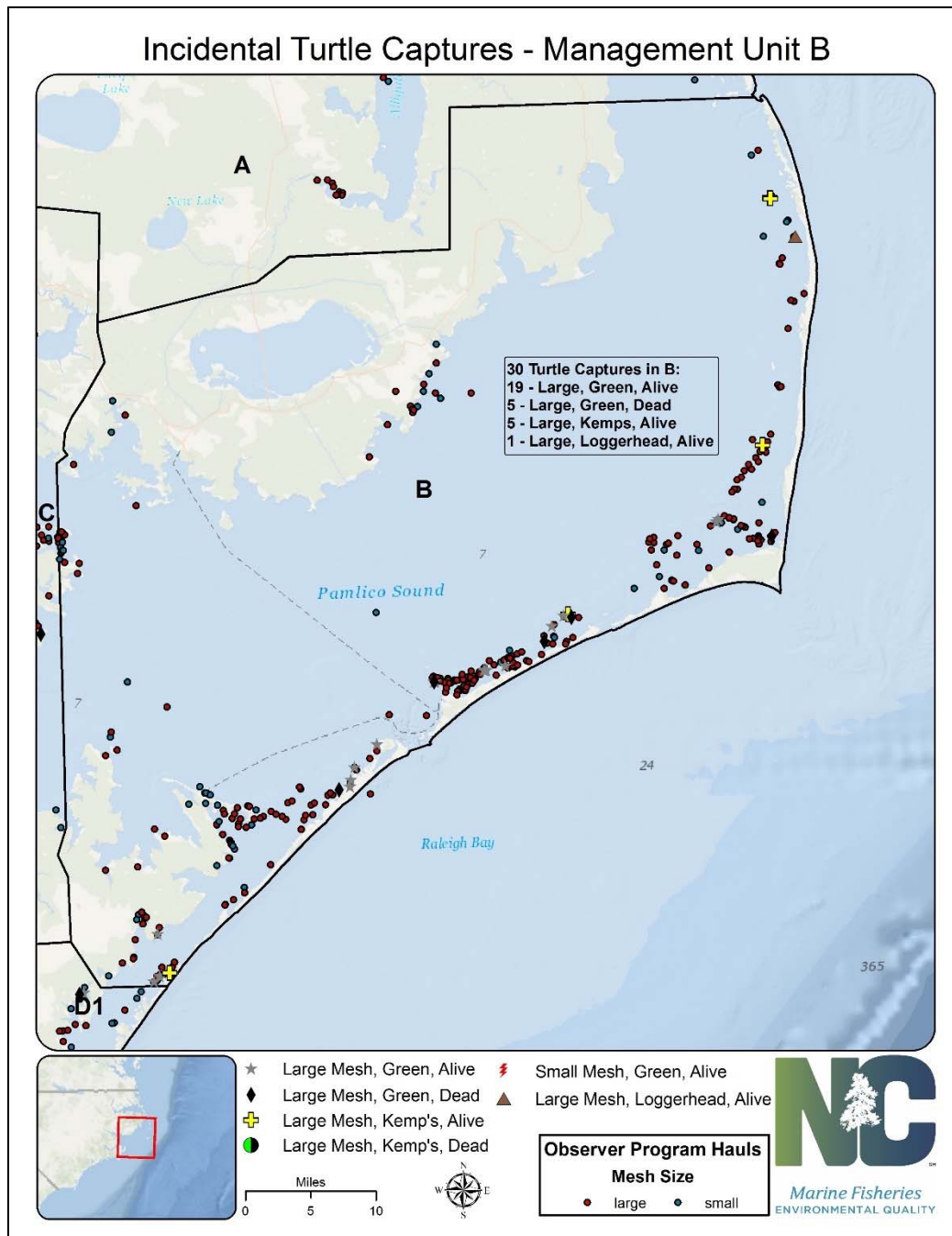


Figure 4. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit B for ITP Year 2017 (September 1, 2016 – August 31, 2017).

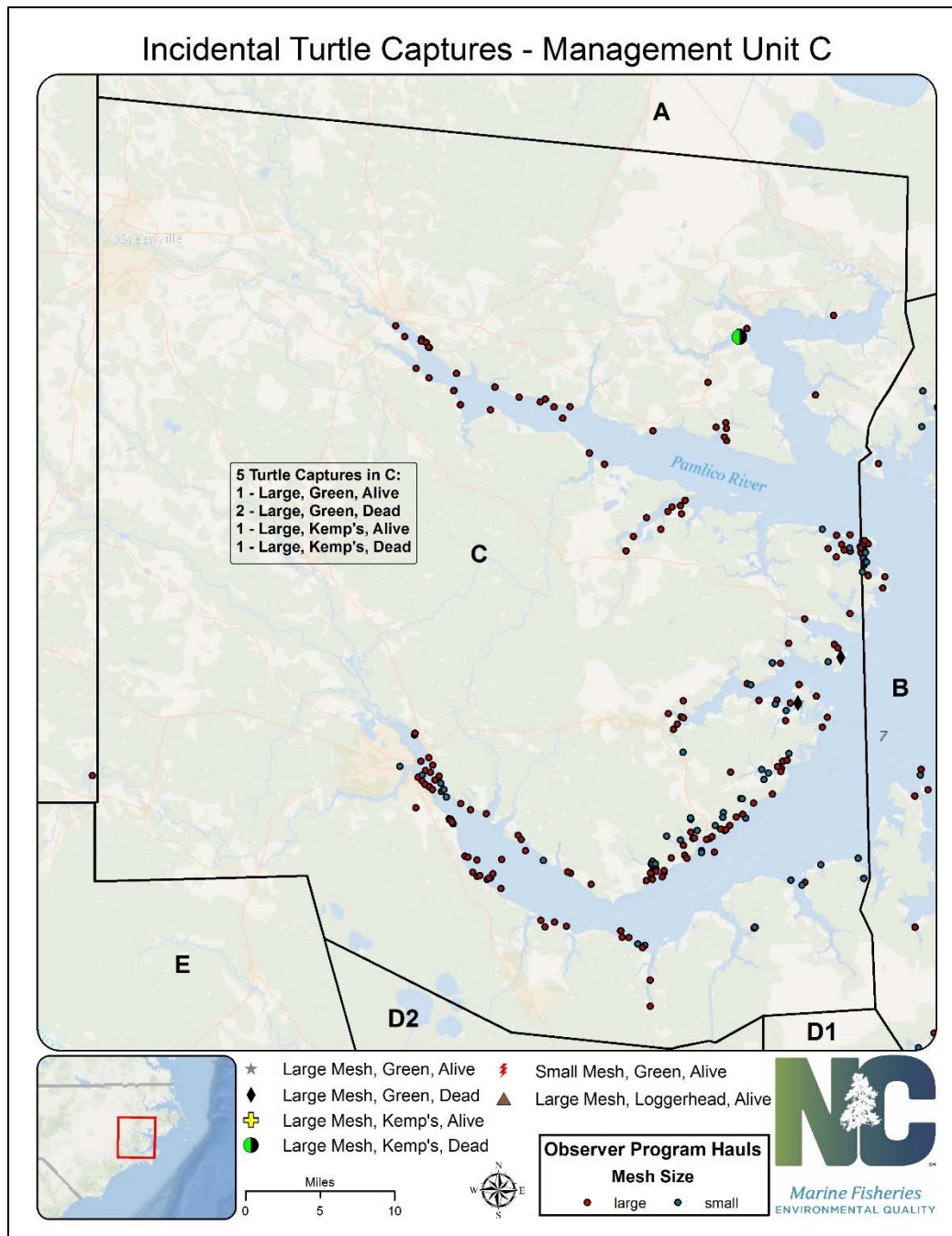


Figure 5. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit C for ITP Year 2017 (September 1, 2016 – August 31, 2017).

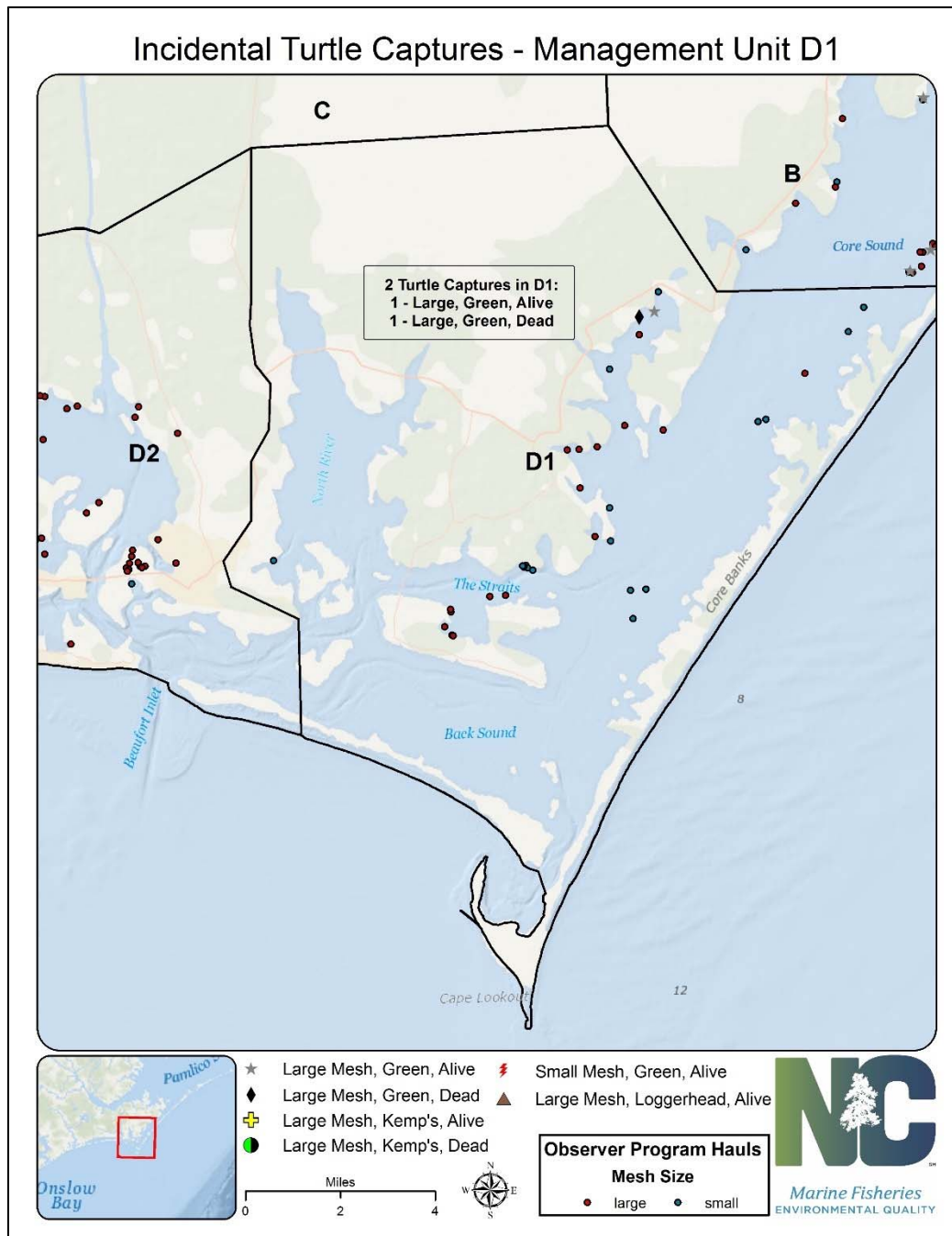


Figure 6. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit D1 for ITP Year 2017 (September 1, 2016 – August 31, 2017).

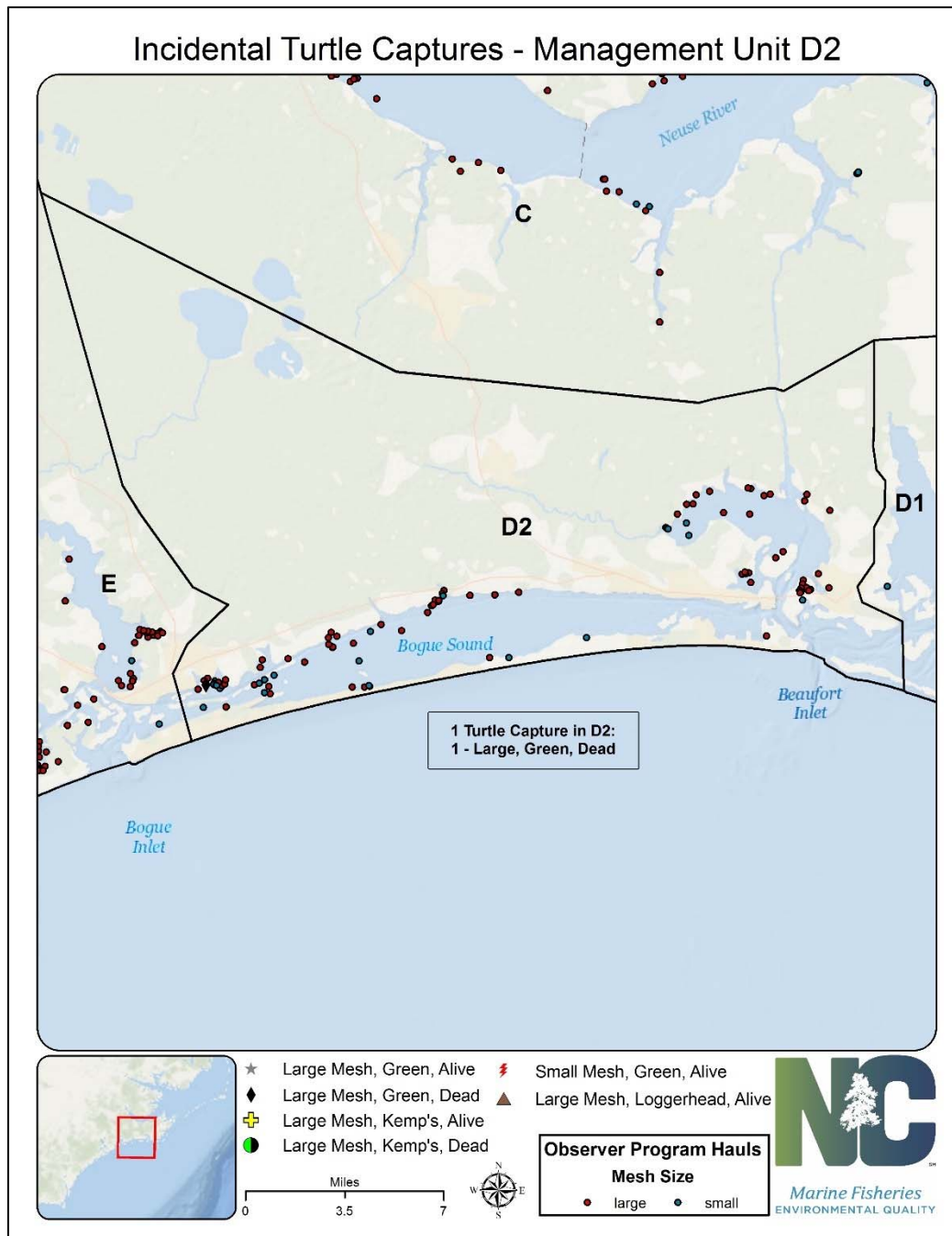


Figure 7. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit D2 for ITP Year 2017 (September 1, 2016 – August 31, 2017).

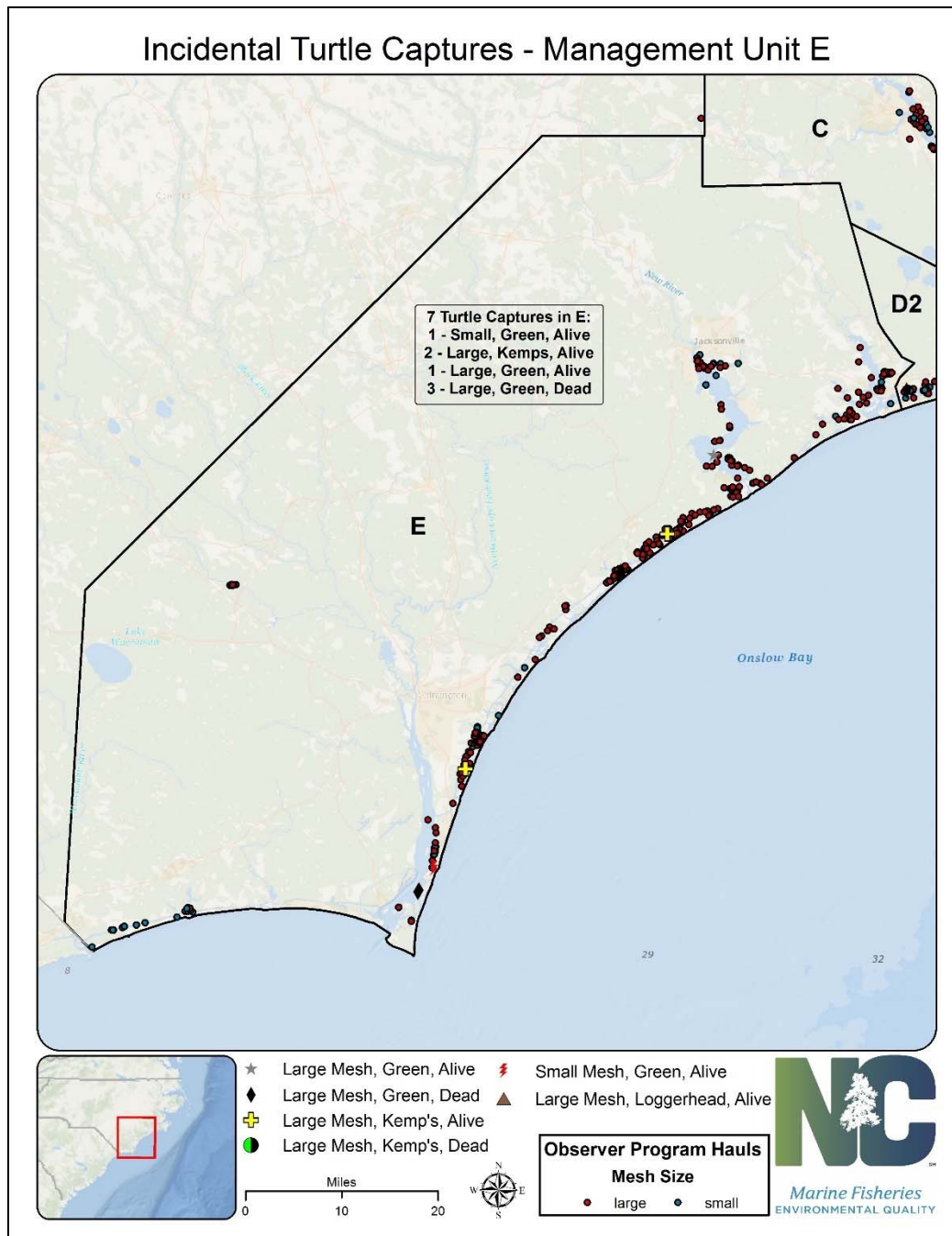


Figure 8. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit E for ITP Year 2017 (September 1, 2016 – August 31, 2017).

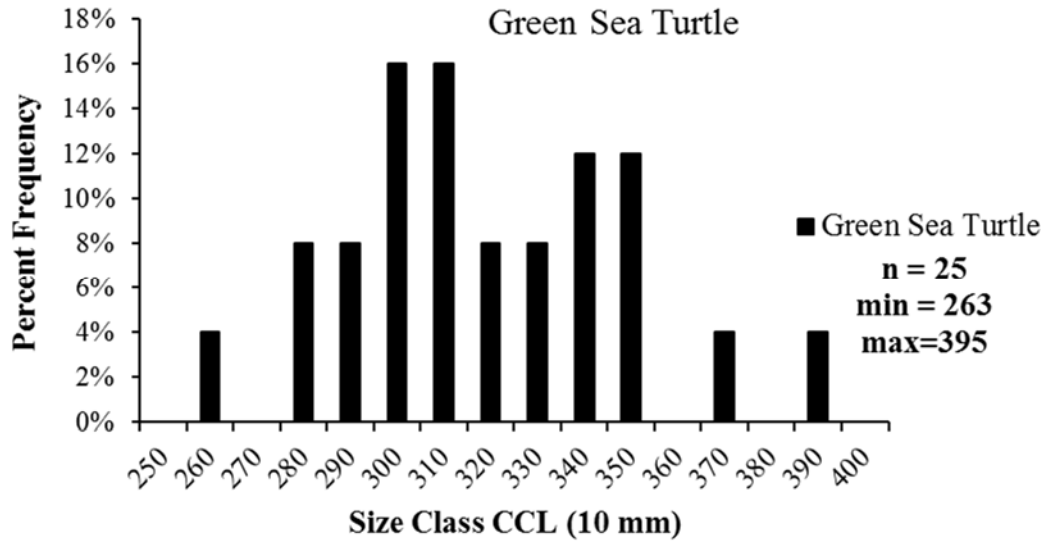


Figure 9. Length-frequency (curved carapace length) from notch to tip of observed incidental captures of green sea turtles where measurements were obtained (n = 25) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2017 (September 1, 2016 – August 31, 2017).

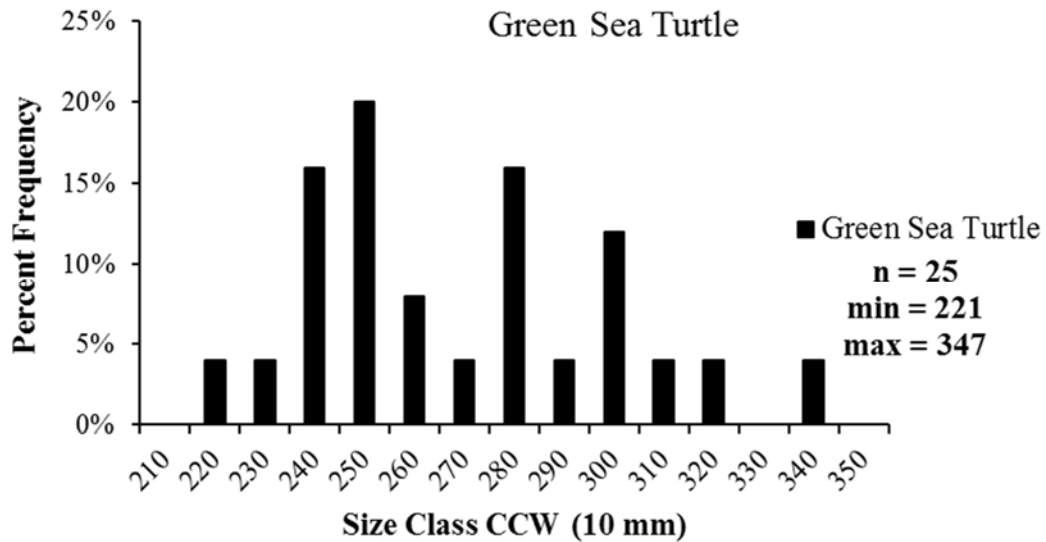


Figure 10. Length-frequency (curved carapace width) of observed incidental captures of green sea turtles where measurements were obtained (n = 25) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2017 (September 1, 2016 – August 31, 2017).

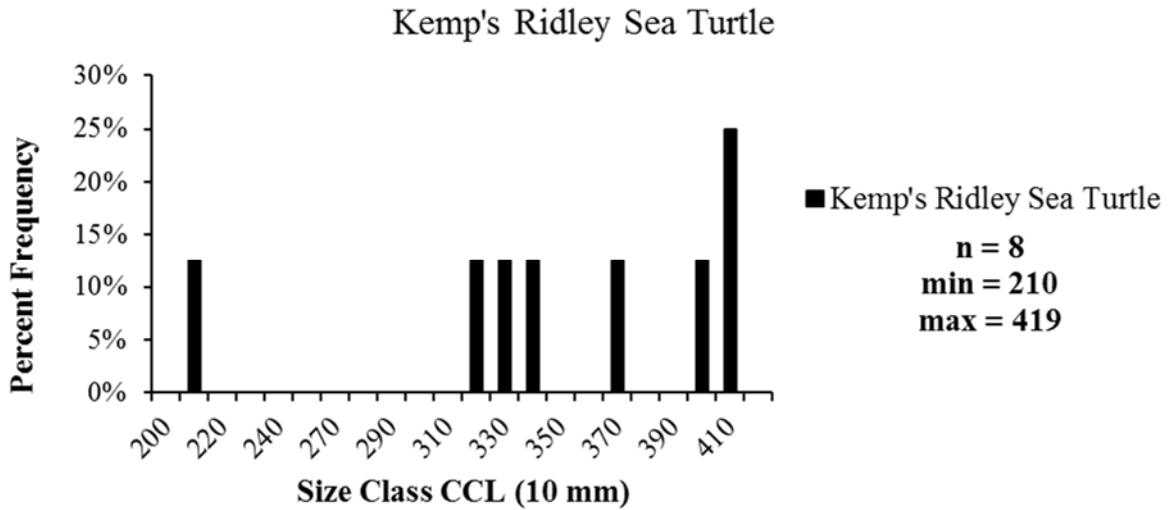


Figure 11. Length-frequency (curved carapace length) from notch to tip of observed incidental captures of Kemp's ridley sea turtles where measurements were obtained (n = 8) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2017 (September 1, 2016 – August 31, 2017).

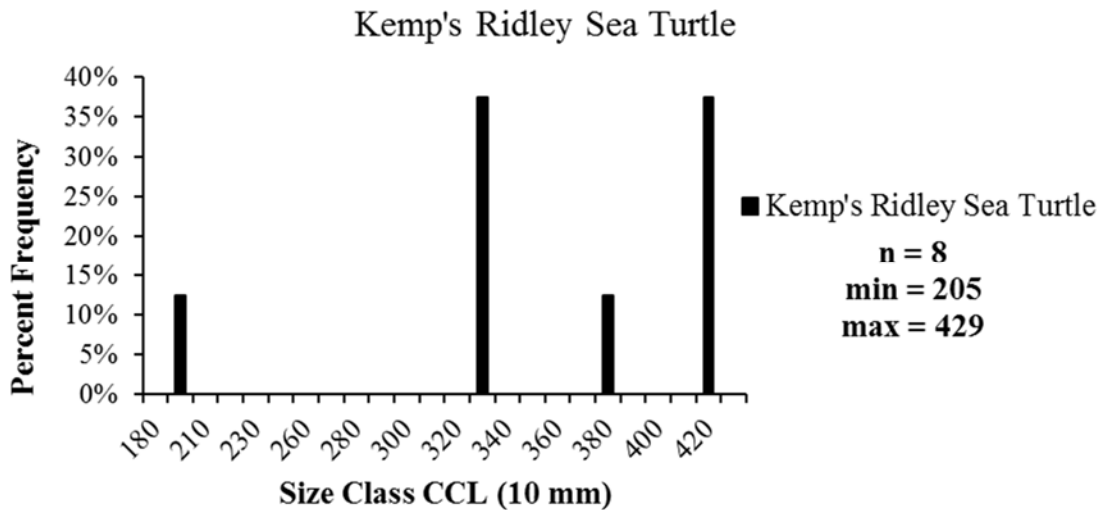


Figure 12. Length-frequency (curved carapace width) from notch to tip of observed incidental captures of Kemp's ridley sea turtles where measurements were obtained (n = 8) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2017 (September 1, 2016 – August 31, 2017).

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) or Kristy Long (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

Printed on Recycled Paper



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



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

 Nothing Compares.

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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).



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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



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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 ¹	n/a	n/a	n/a
Total		5,674	179	3.2

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



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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 (≥ 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	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		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	n/a ¹	n/a ¹	n/a ¹	n/a ¹	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

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

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

² Species identification unknown



State of North Carolina | Division of Marine Fisheries
3441 Arendell Street | P.O. Box 769 | Morehead City, North Carolina 28557
252-726-7021

Sincerely,

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

cc: Chris Batsavage
Braxton Davis
Dee Lupton
John McConnaughey



State of North Carolina | Division of Marine Fisheries
3441 Arendell Street | P.O. Box 769 | Morehead City, North Carolina 28557
252-726-7021

APPENDIX C



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

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 D

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 E



November 23, 2016

Laura Runyan, Director
Foundation, Government and Faculty Grants Gettysburg College
300 North Washington Street
Gettysburg, PA 17325

Subj: Saltonstall-Kennedy Competitive Research Program Grant Proposal

Title: Development of sensory-based bycatch reduction technologies to reduce sea turtle bycatch in North Carolina coastal gillnet and pound net fisheries.

North Carolina Fisheries Association (NCFA) is excited at the opportunity to collaborate with Gettysburg College on the above referenced project. As a primary goal of our organization, we attempt to support all possible efforts to solidify the future of one of the oldest and proudest of professions, the commercial fishing industry. NCFA understands that to accomplish this, sustainable fishing efforts to harvest public trust resources is an absolute requirement.

The goal of this research, sea turtle bycatch reduction, is an important yet very complicated issue. It is one that NC fishermen understand, supporting substantial research efforts and enduring the subsequent changes to their fisheries to accomplish. The Turtle Excluder Device, or TED, is a prime example of successful collaboration between fishermen, academia, government scientists and management. The positive results of these efforts compound the issue within our internal water fisheries where the ever-increasing numbers of these animals are now encountered. This research is vital in finding ways to coexist with these endangered species, and it is hopeful that technology derived from this research will also be applicable to other industries and projects that affect them.

NCFA is experienced and knowledgeable in supporting research to develop bycatch reduction methods for finfish and sea turtles, and is eager to contribute to this project's successful implementation. We are currently in our second of three years of research concerning finfish bycatch reduction in the shrimp trawl industry. In collaboration with our state management agency, our preliminary results surpass all state and federal requirements. We support this proposed research methodology, and will also support the project to completion if awarded the requested grant.

We (NCFA) agree to act as subcontractor with Gettysburg College to complete the work plan as outlined in the proposal. It is understood that general concept of this work will involve coordination of the appropriate industry and state management personnel, facilitate workshops

as required, train and supervise independent observer efforts, directly contribute to this research utilizing accepted scientific methodology, and travel as required in performance of these duties.

NCFA Fisheries Biologist David Bush will perform that work. He will coordinate with his Co-PI Wendy Piniak of Gettysburg College and report to his board of directors with work results and updates as outlined in the scope of work enclosed within the application.

It is our understanding that, in the event this proposal is awarded, a subcontract will be issued in the estimated amount of \$12,505 for the period covering 9/1/2017 through 8/31/2019. While this amount and dates appear in the application, the actual amount and project dates awarded to NCFA will be determined based on Gettysburg College's executed award.

The appropriate programmatic and administrative personnel of each institution involved in this grant application are aware of the sponsor's guidelines and pertinent regulations and policies and are prepared to establish the necessary inter-institutional agreement(s) consistent with all such policies. NCFA hereby certifies that neither it nor its principles nor those performing services under this application are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency from participation in this transaction.

Thank you for the opportunity to contribute to this project and we look forward to working with Dr. Piniak and Gettysburg College.

Respectfully,



Jerry Schill,
President,
NC Fisheries Association
2807 Neuse Blvd Suite 11
New Bern, NC 28562
252-633-6232 Ext. 100

cc: NCDMF - Director Braxton Davis, Biologists: Chris Batsavage, Jacob Boyd
NCFA - Board and Director

APPENDIX F



NORTH CAROLINA MARINE FISHERIES COMMISSION DEPARTMENT OF ENVIRONMENTAL QUALITY

COMMISSIONERS

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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 name "Sammy" and last name "Corbett" clearly distinguishable.

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Chris Batsavage, Division of Marine Fisheries



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

STEPHEN W. MURPHEY
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 2017 Trip Ticket Program (TTP) data. The Annual Completion Report for the Sea Turtle Incidental Take Permit (ITP) No. 16230 was completed for ITP Year 2017 and submitted in February 2018. Using the finalized 2017 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). In past Annual Completion Reports the data used for the fall season was based on finalized TTP data that had been generated by the NCDMF before drafting the annual report. Due to a clerical error, the wrong information was transcribed to the tables that were supposed to contain finalized fall 2016 TTP data for both large and small mesh anchored gill net gear. Corrections have been made and are reflected in the update below. In addition, some of the observed trip numbers in Tables 1 and 2 changed due to data corrections since the Annual Completion Report was submitted.

Anchored Large Mesh

The Observer Program recorded an overall coverage of 11.1% for the fall 2016 season of the anchored large mesh gill net fishery, meeting minimum coverage requirements (7.0%) in all management units based on finalized 2016 TTP data (Table 1). Using the proper finalized data, anchored large mesh gill net trip numbers decreased in management units A and D1, and increased in management units B, C, D2, and E (Table 1). As stated above, minimum coverage requirements were met in all management units despite the annual report having incorrect data for the fall 2016 anchored large mesh gill net fishery. Coverage increased in management units A (12.1%) and D1 (68.2%) when the proper data was used to populate tables (Table 1). Coverage percentages dropped in management units B (11.3%), C (7.7%), D2 (8.0%), and E (11.1%) when the correct information was applied to data table (Table 1).

The spring 2017 season had a higher number of fishing trips for anchored large mesh gill nets than previously estimated in management units C and D2 (Table 1). Anchored large mesh gill net fishing trip numbers decreased from previous estimates in management units A, D1, and E (Table 1). Management unit B was closed to anchored large mesh gill nets and therefore experienced no change in trips. Observer coverage goals for anchored large mesh gill nets were met in all management units except management unit D1 for the spring 2017 season. No trips



were obtained in management unit D1 during the spring 2017 season due to the management unit being closed for the latter portion of the spring 2017 season and minimal fishing effort (n = 2 fishing trips) while open (Table 1).

The summer 2017 season saw an increase in fishing trips compared with previously estimated trip numbers for anchored large mesh gill nets in management units B, D2, and E (Table 1). Management units A and C experienced a decrease in trips compared to estimates, while management unit D1 was closed and therefore remained constant (management unit D1 is closed annually from May 8 through October 14 as described in the ITP) (Table 1). Observer coverage goals for anchored large mesh gill nets were met in all management units except management unit A for the summer 2017 season.

Anchored Small Mesh

The Observer Program recorded an overall coverage of 4.3% for the fall 2016 season of the anchored small mesh gill net fishery, meeting minimum coverage requirements (1.0%) in all management units except management unit A, based on finalized 2016 TTP data (Table 2). Using the proper finalized data, anchored small mesh gill net trip numbers decreased in management units A, B, D1, and E, while trip numbers increased in management units C and D2 (Table 2). As stated above, minimum coverage requirements were met in all management units except management unit A, despite the annual report having incorrect data for the fall 2016 anchored small mesh gill net fishery. Coverage increased in management units B (2.2%), D1 (22.5%), D2 (7.5%), and E (6.7%) when the proper data was used to populate tables (Table 1). Coverage percentages dropped in management unit C (3.6%) when the correct information was applied to data table (Table 2). Coverage percentage in management unit A remained unchanged (Table 2).

The spring 2017 season showed more fishing trips for anchored small mesh gill nets than previously estimated in management units B, C, and D2 (Table 2). Management units A, D1, and E all had less anchored small mesh gill net trips than originally estimated. Observer coverage goals for anchored small mesh gill nets were met in all management units except for management unit D2 for the spring 2017 season (Table 2).

The summer 2017 season showed more fishing trips for anchored small mesh gill nets than the annual reports estimate in management unit D1 (Table 2). Management units A, B, C, D2, and E all had less anchored small mesh gill net trips than originally estimated (Table 2). Observer coverage goals for anchored small mesh gill nets were met in all management units except management unit D1. While observer coverage goals were not met in management unit D1, they were far exceeded in management units A (4.0%), C (7.7%), and D2 (8.5%), for anchored small mesh gill nets (Table 2).

Sea Turtle Takes

Annual estimated allowable sea turtle takes were recalculated using the finalized 2017 TTP data (Tables 3 and 4). The estimates of sea turtle takes increased for alive and dead green sea turtles and increased for alive Kemp's ridley sea turtles. The anchored large mesh gill net fishery remained below the annual estimated allowable sea turtle takes for all species and dispositions



for ITP Year 2017 (Tables 3 and 4). Confidence intervals for take estimates were not updated due to staffing limitations.

Table 1. Observer coverage calculated from finalized 2017 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 2017 (September 1, 2016 - August 31, 2017).

Season	Management Unit	Fishing Trips	Large Mesh	
			Observed Trips	Coverage
Fall 2016	A	1,446	175	12.1
	B	1,156	131	11.3
	C	480	37	7.7
	D1	22	15	68.2
	D2	424	34	8.0
	E	769	85	11.1
Spring 2017	A	1,549	167	10.8
	B	n/a	n/a	n/a
	C	1,024	92	9.0
	D1	2	0	0.0
	D2	119	11	9.2
	E	259	56	21.6
Summer 2017	A	1,018	65	6.4
	B	1,464	129	8.8
	C	380	28	7.4
	D1	n/a	n/a	n/a
	D2	255	22	8.6
	E	643	113	17.6
Total		11,010	1,160	10.5



Table 2. Observer coverage calculated from finalized 2017 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 2017 (September 1, 2016 - August 31, 2017).

Season	Management Unit	Fishing Trips	Small Mesh	
			Observed Trips	Coverage
Fall 2016	A	147	0	0.0
	B	819	18	2.2
	C	222	8	3.6
	D1	40	9	22.5
	D2	241	18	7.5
	E	420	28	6.7
Spring 2017	A	572	10	1.7
	B	1,517	21	1.4
	C	327	16	4.9
	D1	34	8	23.5
	D2	49	0	0.0
	E	141	14	9.9
Summer 2017	A	101	4	4.0
	B	674	10	1.5
	C	130	10	7.7
	D1	14	0	0.0
	D2	47	4	8.5
	E	203	4	2.0
Total		5,698	182	3.2



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 large mesh (≥ 4 inch stretched mesh) gill nets for ITP Year 2017 (September 1, 2016 - August 31, 2017).

Species	Management Unit								Total			
	B				D1							
	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	207	42	9	5	1	1	234	117	208	43
Kemp's ridley	53	26	36	0	15	7	0	0	68	33	36	0
Total	278	138	243	42	24	12	1	1	302	150	244	43

Species	Management Unit								Total			
	D2				E							
	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 ¹	n/a ¹	n/a ¹	n/a ¹	96	48	6	18	96	48	6	18
Kemp's ridley	6	3	0	0	24	13	16	0	30	16	16	0
Total	6	3	0	0	120	61	22	18	126	64	22	18

¹ 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 4. Total annual authorized and actual takes (estimated and observed) by species and condition for ITP Year 2017 (September 1, 2016 - August 31, 2017).

Species	Observed (live/dead)		Estimated			
			Authorized		Actual	
	Authorized	Actual	Alive	Dead	Alive	Dead
Green	18	5	330	165	214	61
Hawksbill	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	12	2	98	49	52	0
Leatherback	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Loggerhead	24	1	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Any Species	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Total	78	8	428	214	266	61

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

Sincerely,

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