



Marine Fisheries
ENVIRONMENTAL QUALITY

Annual Sea Turtle Interaction Monitoring of the Gill-Net Fisheries in North Carolina for Incidental
Take Permit Year 2015

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

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BACKGROUND

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 set gill nets in NC internal coastal waters. Species of sea turtles found in internal coastal waters of North Carolina include green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempi*), 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 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 NC Sea Turtle Advisory Committee (STAC), the NCDMF made extensive revisions to its application and resubmitted it on September 6, 2012. After another round of public and peer review comments the NMFS requested more information and clarification on certain portions of the application. On November 14, 2012, the response to the information request was discussed via teleconference between the NMFS and the NCDMF and provided to them beforehand. The NMFS recommended that the NCDMF update the current ITP application with an appendix containing all the updated information requested.

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

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

On May 20, 2013, the NCDMF had another teleconference with the NMFS concerning the ITP application status and to review the Biological Opinion and Environmental Assessment protocols. At this time the NMFS raised concerns on the number of observed takes requested in the ITP application. During the last teleconference, the NCDMF and the NMFS agreed to

base allowable takes by area on an annual basis instead of a seasonal basis. As such, the number of requested observed takes was reduced by taking the seasonal component out of the equation. The NMFS brought up the idea of having an Implementing Agreement for the Sea Turtle ITP, similar to the Implementing Agreement the NMFS has suggested for the Atlantic Sturgeon ITP. The NMFS explained that an Implementing Agreement would provide more flexibility and could reduce the risk of the permit being suspended due to excessive takes, but it will not allow for additional takes. The NMFS explained that any new information could be provided in another appendix to the existing application. The NCDMF asked the NMFS to provide a copy of a draft Implementing Agreement for consideration.

The NCDMF received the Sea Turtle ITP on September 11, 2013. This ITP authorized the implementation of adaptive management measures to protect threatened and endangered sea turtles and other ESA listed species, while allowing estuarine gill-net fisheries prosecuted by commercial license holders to fish in the internal coastal (estuarine) waters of North Carolina. The Annual Completion report for ITP Year 2014 was submitted January 30, 2015 (Boyd 2015b).

During review of the 2014 Sea Turtle ITP Annual Report, the NMFS requested modifications to certain tables and figures in the annual report. These modifications were addressed in the current report and include: 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.

METHODS

OBSERVER ACTIVITY

The conservation plan includes managing inshore gill-net fisheries by dividing estuarine waters into six management units (A, B, C, D1, D2, and E; Figure 1). Existing observer data from previous years is used when estimating the amount of trips needed for the current year in each management unit and season. Also, real time trip ticket data is 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' trip ticket data, but also on current effort changes. To account for fluctuations in trip ticket data caused by management unit closings, a four year average was used for estimating large mesh gill-net fishing trips and a two year average was used for estimating small mesh gill-net fishing trips for ITP Year 2015. This method of estimating trips proves to more accurately reflect the current fishing effort. Once trip ticket data are finalized in May of 2016, the final observer coverage will be recalculated and the finalized estimates of observer coverage will be provided to the NMFS.

Traditional, onboard trips are the preferred method of obtaining observer data and are used most frequently where observers ride aboard fishermen's vessels. For alternative platform trips, observers and Marine Patrol follow the same protocols using the NCDMF vessels to observe the fishing trip. Each observer attempts to obtain a minimum of three to four trips per working week when fishing activity is occurring. Observers are assigned a management unit to work weekly and the amount of observers assigned to a management unit depends upon the season and fishing effort. Fishing effort is estimated from the previous year's trip ticket data by week and by 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 year's trip ticket data are also analyzed to determine if fishing effort is shifting from one management unit to another. Fishermen holding a Standard Commercial Fishing License (SCFL) and landing fish in North Carolina using gill nets in the previous years are pooled by management unit and further split into lists by geographic area within units. The contact information 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 trip ticket information is also used when pooling fishermen to contact along with contacting fishermen at fish houses. Observers hand out business cards with their contact information and brochures explaining the Observer Program and giving the fishermen another outlet to allow observers on their vessels. Additionally, the Observer Program utilizes a website (<http://portal.ncdenr.org/web/mf/observers-program>) to provide outreach to fishermen to obtain trips.

Alternative platform trips are utilized for areas that may be hard to get onboard trips (i.e., fishermen in remote locations that leave from their residence by boat). Alternative platform trips are also utilized in areas where fishing effort may increase quickly or sea turtle abundance is

high. Marine Patrol also conducts alternative platform trips weekly in all management units based on the same methodology as the Observer Program. Coordination of onboard, alternative platform, and Marine Patrol alternative platform trips is done daily, monthly, and yearly to avoid sampling bias 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 large mesh gill-net (≥ 4 inches stretched mesh - ISM) fishing trips and 1% coverage with a goal of 2% of the total small mesh gill-net (< 4 ISM) fishing trips per management unit for the spring, summer, and fall seasons.

Each observer is trained to identify, measure, evaluate condition, resuscitate, and tag sea turtles by the NMFS – Beaufort Lab and the NCDMF. Date, time, tag numbers, location (latitude and longitude, when possible), condition (i.e., no apparent harm, injury including a description of the nature of the injury, or mortality), species, sex (if determinable), and curved carapace length (mm) and width (mm) are recorded for each sea turtle observed. Dead sea turtles are retained by the observer when feasible. All live, debilitated sea turtles are retained by the observer and delivered to the North Carolina Sea Turtle Stranding Network for examination and treatment. Observers collect data on location, gear parameters, catch, and bycatch for each haul. The landed catch is sampled throughout each trip including species, weights, lengths, and disposition (alive/dead). Data are coded on the NCDMF data sheets and uploaded to the NCDMF Biological Database for analysis. All observers are debriefed within 24 hours of each trip to obtain data on catch, set locations, gear parameters, and sea turtle interactions to provide estimates of sea turtle bycatch.

The total bycatch of sea turtles for each management unit was estimated using the stratified ratio method (SAS 1989). The bycatch rate (sea turtles caught per fishing trip) estimated from observer data was multiplied by the total fishing trips. 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.

$$\text{Estimated Interactions} = \frac{\# \text{ sea turtle interactions observed}}{\text{total gill-net trips}} \times \text{total gill-net trips}$$

Seasons

The Observer Program's activities are reported on a weekly, seasonal, and annual basis. Weekly progress reports are required following a week in which a sea turtle interaction occurred and includes information such as take estimates, cumulative totals, number of observed trips, and observed takes with all associated information. The seasonal progress reports include a summary of the weekly reports, additional management measures if taken, compliance, violations that occurred, and any adaptive management actions taken during the

season. Annual reports include actual and estimated takes including mortality and the level of uncertainty of the estimates (i.e., 95% confidence intervals) by management unit, size composition along with all other interaction information, one or more maps illustrating the geographic distribution of all observed large and small mesh gill-net hauls and the locations of all interactions, and a description of the mitigation activities, adaptive management actions, and enforcement activities conducted during the ITP year.

AUTHORIZED TAKES

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

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 allowable take limit of eight sea turtles from large or small mesh gill nets and any species or disposition (Boyd 2015d).

COMPLIANCE

The NCDMF observers and Marine Patrol conduct weekly fish house visits, boat patrols, fisherman spot checks, gear checks, aerial surveys, and continued outreach to the industry for the purpose of ensuring industry compliance and communicating efforts throughout the state.

The Observer Program has various ways to contact fishermen to schedule trips. The most common method is by phone due to limited program resources, fishermen leaving from their residence, and efficiency. The Observer Program has a contact log which is filled out for every phone call that is made when attempting to obtain a trip. Beginning in the spring of 2014 each call 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 positive observer trips.

RESULTS

OBSERVER ACTIVITY

Fall 2014

The fall season for large and small mesh gill nets in North Carolina is September through November as defined in ITP No. 16230. The NCDMF opened large mesh gill nets via proclamation M-25-2014 on September 1, 2014 in management unit A and via proclamation M-29-2014 on September 15, 2014 in management units C and D2 (Table 7; Boyd 2015a). On September 22, 2014 the NCDMF opened management units B and E to large mesh gill nets via proclamation M-30-2014. On September 24, 2014 management unit E was closed via proclamation M-31-2014 due to sea turtle interactions and reopened on November 2, 2014 via proclamation M-39-2014. On October 1, 2014 management unit A was closed via proclamation M-33-2014 due to sea turtle interactions with the western Albemarle Sound and Currituck Sound reopening on October 27, 2014 via proclamation M-36-2014. The remainder of management unit A was reopened on November 6, 2014 via proclamation M-41-2014. The annual management unit D1 opening occurred on October 14, 2014 via proclamation M-34-2014. On October 26, 2014 the eastern portions of management unit B were closed via proclamation M-37-2014 due to sea turtle interactions and was reopened on November 6, 2014 via proclamation M-40-2014 (Table 7; Boyd 2015a). The flounder commercial harvest season in internal coastal waters closed on December 1, 2014 via proclamation FF-72-2014.

There was a total of 33 observed sea turtle interactions from large mesh gill nets and one from small mesh gill nets for the fall season (Table 8; Figures 2 - 7). The species composition consisted of primarily green sea turtles (73.5%; n = 18 alive; n = 7 dead) with Kemp's ridley sea turtles (14.7%; n = 4 alive; n = 1 dead) being the second highest species observed (Table 8; Figures 2 - 7). The remaining species consisted of two loggerhead sea turtles (0.06%) and two unknown sea turtles (0.06%), all of which were alive (Table 8; Figures 2 - 7). The majority of the interactions (73.5%) occurred in management unit B (Table 8; Figures 2 - 7). There were four reported sea turtle interactions during this time period with one coming from illegally set large mesh gill nets reported by Marine Patrol (Table 9; Boyd 2015a).

The Observer Program exceeded the 7% requirement for coverage within each of the management units for large mesh gill nets with 637 total trips (Table 10; Figures 2 - 7). The Observer Program exceeded the 1% requirement for coverage in all management units for small mesh gill nets with 95 total trips (Table 11; Figures 2 - 7; Boyd 2015a).

Spring 2015

The spring season for large and small mesh gill nets in North Carolina is March through May as defined in ITP No. 16230. The NCDMF closed anchored large mesh gill nets via proclamation M-6-2015 on May 8, 2015 in management unit D1 through October 14, 2015 as

part of the annual closure (Table 7). All other management units remained open for the duration of the spring season (Boyd 2015c).

There was a total of eight observed sea turtle interactions from large mesh gill nets and one from small mesh gill nets for the spring season (Table 8; Figures 2 - 7). The species composition consisted of primarily green sea turtles (88.9%; n = 4 alive; n = 4 dead) with one live Kemp's ridley sea turtle observed (Table 8; Figures 2 - 7). All of the observed interactions occurred in management unit B (Table 8; Figures 2 - 7). There were no reported sea turtle interactions during this time period (Boyd 2015c).

The Observer Program exceeded the 7% requirement for coverage within each of the management units for large mesh gill nets with 342 total trips except in management unit D1 (Table 10; Figures 2 - 7). Coverage was not met in management unit D1 due to the minimal amount of fishing effort that occurred and the closure of 25 days in the management unit. The Observer Program exceeded the 1% requirement for coverage in all management units for small mesh gill nets with 108 total trips (Table 11; Figures 2 - 7; Boyd 2015c).

Summer 2015

The summer season for large and small mesh gill nets in North Carolina is June through August as defined in ITP No. 16230. The NCDMF closed anchored large mesh gill nets via proclamation M-10-2015 on June 8, 2015 in management unit B through the end of ITP Year 2015 (August 31, 2015) due to approaching allowable sea turtle interactions (Table 7; Boyd 2015d). The NCDMF closed anchored large and small mesh gill nets via proclamation M-11-2015 on June 12, 2015 in management unit A through the end of ITP Year 2015 due to reaching allowable sea turtle interactions. The NCDMF closed anchored large and small mesh gill nets via proclamation M-12-2015 on July 23, 2015 in management unit C through the end of ITP Year 2015 due to reaching allowable sea turtle interactions after a minor modification combined the authorized sea turtle interactions in management units A and C. Management unit D1 remained closed to large mesh gill nets through the summer season as part of the annual closure outlined in the ITP (May 8 – October 14; Table 7). All other management units remained open for the duration of the summer season (Boyd 2015d).

There was a total of 11 observed sea turtle interactions from large mesh gill nets and one from small mesh gill nets for the summer season (Table 8; Figures 2 - 7). The species composition consisted of primarily green sea turtles (83.3%; n = 8 alive; n = 2 dead) with two alive loggerhead sea turtles observed (Table 8; Figures 2 - 7). Observed interactions occurred in management unit A (25.0%), management unit B (16.7%), management unit C (16.7%), management unit D2 (16.7%), and management unit E (25.0%; Table 8; Figures 2 - 7). There were two reported sea turtle interactions during this time period with both coming from illegally set large mesh gill nets reported by Marine Patrol (Table 9; Boyd 2015d).

The Observer Program exceeded the 7% requirement for coverage within each of the management units for large mesh gill nets with 183 total trips except in management unit A where coverage averaged 5.3% (Table 10; Figures 2 - 7). Coverage was not met in

management unit A due to the minimal amount of fishing effort that occurred prior to the closure of 80 days in the management unit (Table 7). The Observer Program exceeded the 1% requirement for coverage in all management units for small mesh gill nets with 33 total trips except management unit D1 where no observer trips occurred (Table 11; Figures 2 - 7; Boyd 2015d). Coverage was not met in management unit D1 due to the minimal amount of fishing effort that occurred.

AUTHORIZED TAKES

There was a total of 52 observed sea turtle interactions in large mesh gill nets and three in small mesh gill nets for ITP Year 2015 (Table 8; Figures 2 – 7). The species composition consisted of primarily green sea turtles (78.2%; n = 30 alive; n = 13 dead; Table 8; Figures 2 - 7). The remaining species consisted of a Kemp's ridley sea turtle (10.9%; n = 5 alive; n = 1 dead), loggerhead sea turtles (7.3%; n = 4 alive; n = 0 dead) and unknown sea turtles (3.6%; n = 2 alive; n = 0 dead; Table 8; Figures 2 - 7). Observed interactions occurred in management unit A (10.9%), management unit B (65.5%), management unit C (3.6%), management unit D1 (3.6%), management unit D2 (3.6%), and management unit E (12.7%; Table 8; Figures 2 - 7). Of the seven reported sea turtles interactions for ITP Year 2015, four were reported by fishermen and three were reported by Marine Patrol from illegally set gill nets (Table 9; Boyd 2015a, Boyd 2015c, Boyd 2015d).

The size distribution of green sea turtles (n = 30) ranged from a curved carapace length of 236 mm to 362 mm and a curved carapace width of 200 mm to 266 mm (Figure 8). The size distribution of Kemp's ridley sea turtles (n = 6) ranged from a curved carapace length of 240 mm to 318 mm and a curved carapace width of 200 mm to 343 mm (Figure 9).

The cumulative total estimated and observed takes for large and small mesh gill nets did not reach the threshold of allowed takes for any management unit for ITP year 2015 (Tables 1 - 5). For large mesh gill nets, management unit B consisted of live (estimated n = 180, 95% CI [48, 214]) and dead (estimated n = 99, 95% CI [50, 266]) green sea turtles and live (estimated n = 27, 95% CI [0, 35]) and dead (estimated n = 7, 95% CI [0, 60]) Kemp's ridley sea turtles (Table 1). Management unit D1 consisted of live (estimated n = 2, 95% CI [0, 34]) green sea turtles (Table 1). Management unit E consisted of live (estimated n = 9, 95% CI [0, 18]) green sea turtles and live (estimated n = 8, 95% CI [0, 21]) Kemp's ridley sea turtles (Table 1). There were six observed takes from large mesh gill nets in management unit A and two in management unit C (Table 3). A minor modification to the permit in July 2015 combined annual allowed takes in management units A and C for a cumulative total of 8. For observed takes in small mesh gill nets, management units B and E consisted of two green sea turtles each (Table 4).

COMPLIANCE

Marine Patrol made 465 gill-net checks for the fall 2014 season (Table 12). Of these 465 gill-net checks, there were five citations (Tables 12 and 13). Marine Patrol made 512 gill-

net checks for the spring 2015 season (Table 12). Of these 512 gill-net checks, there were 14 citations (Tables 12 and 13). Marine Patrol made 309 gill-net checks for the summer 2015 season (Table 12). Of these 309 gill-net checks, there were 14 citations issued (Tables 12 and 13).

In the fall 2014 season a total of 2,083 phone calls were made with 46.3% being categorized as 1, 8, 11, 12, 13, and 14, which inclusively represents not being able to get in touch with fishermen or fishermen refusing trips (Table 14). In the spring 2015 season, 4,080 phone calls were made with 57.2% being categorized as 1, 8, 11, 12, 13, and 14. In the summer 2015 season, 815 phone calls were made with 50.7% being categorized as 1, 8, 11, 12, 13, and 14 (Table 14). Proclamation M-24-2014 implemented the Estuarine Gill-Net Permit (EGNP) on September 1, 2014 (Table 7). Notices of Violations (NOV) were issued when fishermen were found to be out of compliance with the EGNP with 20 NOVs issued during the fall 2014 season and 14 NOVs issued during the spring 2015 season (Table 15).

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 NC STAC, implementation of a large and small mesh gill-net observer program, commercial bycatch reduction gear testing projects, outreach to the commercial and recreational fishing industries, and collaboration with the NMFS.

The NCDMF applied and received four ITPs for the PSGNRA from 2000 - 2005 managing the area for sea turtle takes in the fall of each year through 2012 under these permits (Gearhart 2001, 2002, 2003; Price 2004, 2005, 2006, 2007a, 2008, 2009a, 2010a; Murphey 2011; Boyd 2012a, 2013a). Between 2000 and 2012, a number of changes were made in the PSGNRA such as: adjustments to allowable fishing areas, modified restrictions (e.g., state closure and net length restriction), and allowable 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 - 2010 (Brown and Price 2005; Price 2007b, Price 2009b, Price 2010b; Boyd 2012b). The information gathered from these direct observations allowed 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 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 allowed 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 large mesh gill nets would be allowed, limiting soak time, establishing a maximum yardage limit, mandating maximum mesh depth, requiring maximum individual gill-net (shot) lengths, establishing spacing between net shots, and eliminating the use of tie-downs and floats or corks along float lines. The NCDMF Director did not issue the proclamation because, as detailed below, ongoing negotiations with the Beasley Center and the Duke Environmental Law and Policy Clinic produced a settlement agreement which preempted this particular action.

The NCMFC met May 12 through 14, 2010 and discussed the parameters of the final Settlement Agreement between the Beasley Center (plaintiff) and the NCDMF and the NCMFC. At that meeting, the NCMFC reached an agreement concerning restrictions that would be implemented in the 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 large mesh gill nets; soak times limited to overnight soaks an hour before sunset to an hour after sunrise, Monday evenings through Friday mornings; 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 large mesh gill nets allowed to be used per vessel; and maximum individual net (shot) length of 100 yards with a 25-yard break between shots. Fishermen in the southern portion of the state were allowed to set large mesh gill nets an hour before sunset to an hour after sunrise, Sunday evenings through Friday mornings, and use floats on nets, but were restricted to the use of a maximum of 1,000 yards of large mesh gill net per fishing operation.

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.

OBSERVER ACTIVITY

There was turnover within the Observer Program with positions being filled as quickly as possible to maintain coverage. The Observer Program actively placed observers in areas where fishing effort was high and where known sea turtle interactions occur. During the fall 2014 and summer 2015 seasons during ITP year 2015 there were closures throughout the state due to sea turtle interactions. When a management unit closes for a portion of time the observers are shifted to the open management units to increase coverage in those management units. The contact log, which includes different categories to place each contact that was made to a fisherman, was beneficial for analyzing the type of contact that was being made and to see the number of positive observer trips that were obtained through the calling system.

COMPLIANCE

The previous ITPs (PSGNRA) did not require observer coverage in the northern portion of North Carolina (management unit A). Although ITP Year 2015 is the second year for the statewide ITP, fishermen were still not as familiar with the Observer Program and requirements of the ITP, so more time was needed to educate the industry. Management unit A had compliance issues (i.e., not answering phone calls, not calling back) throughout ITP Year 2015. The NCDMF discussed the situation with industry leads to improve awareness and increase compliance. While overall compliance has improved, difficulties still arose from fishermen compliance in certain areas of the state.

Estuarine Gill Net Permit

As per the ITP the NCDMF established a permit to register all fishermen participating in the large and small mesh gill-net fisheries via proclamation M-24-2014 on September 1, 2014 (Table 7). The ITP's Implementing Agreement states that the NCDMF has two years to implement this permit to serve as a certificate of inclusion for fishermen. However, due to the compliance issues the NCDMF was facing during ITP year 2014, the permit was developed (EGNP) and became effective September 1, 2014 (one year from ITP issuance). This multifaceted permit allows the NCDMF to closely monitor for compliance with the already successful permit system the NCDMF has in place. The EGNP is also used as a tool to improve fishermen compliance by requiring fishermen to allow the NCDMF observers aboard their vessels to monitor catches. Failure to comply with this permit provision results in a permit suspension. This results in more effective regulation and better compliance. There were 2,678 EGNPs issued for Fiscal Year 2015 (July 1, 2014 – June 30, 2015).

An issue that was discovered during the spring season was the appeal process for the NCDMF's permitting system, which includes the EGNP. General Counsel for the North Carolina Department of Environmental Quality (NCDEQ) deliberated the situation during which time NOV's were not issued (i.e., summer 2015 season). Their findings determined that any NOV issued by the NCDMF for permits can be appealed by the fisherman. However, the permit will still be suspended for the duration of the violation (i.e., 10-days, 30-days, 6-months).

LITERATURE CITED

- Boyd, J.B. 2012a. North Carolina Division of Marine Fisheries Pamlico Sound Gill Net Restricted Area Report for 2011 Section 10 ITP # 1528 (September 19 – November 30, 2011). North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries Completion Report for Incidental Take Permit # 1528. 4pp.
- Boyd, J.B. 2012b. North Carolina Fishery Observer Response Team. Final Report to the NOAA National Marine Fisheries Service and Atlantic Coastal Cooperative Statistics Program. Grant Award #NA10NMF4740073. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 24pp.
- Boyd, J.B. 2013a. North Carolina Division of Marine Fisheries Pamlico Sound Gill Net Restricted Area Report for 2012 Section 10 ITP # 1528 (September 19 – November 30, 2011). North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries Completion Report for Incidental Take Permit # 1528. 4pp.
- Boyd, J.B. 2015a. North Carolina Division of Marine Fisheries Incidental Take Permit Seasonal Report for Fall 2014 Section 10 ITP # 16230 (September 1 – November 30, 2014). North Carolina Division of Marine Fisheries Seasonal Report for Incidental Take Permit # 16230. 9pp.
- Boyd, J.B. 2015b. North Carolina Division of Marine Fisheries Incidental Take Permit Annual Report for ITP Year 2014 Section 10 ITP # 16230 (September 1, 2013 – August 31, 2014). North Carolina Division of Marine Fisheries Annual Report for Incidental Take Permit # 16230. 32pp.
- Boyd, J.B. 2015c. North Carolina Division of Marine Fisheries Incidental Take Permit Seasonal Report for Spring 2015 Section 10 ITP # 16230 (March 1 – May 31, 2015). North Carolina Division of Marine Fisheries Seasonal Report for Incidental Take Permit # 16230. 7pp.
- Boyd, J.B. 2015d. North Carolina Division of Marine Fisheries Incidental Take Permit Seasonal Report for Summer 2015 Section 10 ITP # 16230 (June 1 – August 31, 2015). North Carolina Division of Marine Fisheries Seasonal Report for Incidental Take Permit # 16230. 10pp.
- Brown, K.B., and B. Price. 2005. Evaluation of Low Profile Flounder Gill-net in Southeastern Pamlico Sound, North Carolina. Completion Report for NOAA Award No. NA 04 NMF 4740180 Segment 1. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 24 pp.
- Canty, A. and B. Ripley. 2015. boot: Bootstrap R (S-Plus) Functions. R package version 1.3-17.

- Davison, A.C., and D.V. Hinkley. 1997. Bootstrap Methods and Their Applications. Cambridge University Press, Cambridge. ISBN 0-521-57391-2.
- Efron, B., and R.J. Tibshirani. 1993. An introduction to the bootstrap. Chapman and Hall, New York. 436 pp.
- ESA 1973. Endangered Species Act, 1973.
- Gearhart J. 2001. Sea turtle bycatch monitoring of the 2000 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1259. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 26pp.
- Gearhart J. 2002. Sea turtle bycatch monitoring of the 2001 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1348. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 44pp.
- Gearhart J. 2003. Sea turtle bycatch monitoring of the 2002 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1398. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 39pp.
- Murphey, T. 2011. Sea turtle bycatch monitoring of the 2010 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 4pp.
- Price B. 2004. Sea turtle bycatch monitoring of the 2003 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion Report for ITP 1398. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 26pp.
- Price B. 2005. Sea turtle bycatch monitoring of the 2004 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1398. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 33 pp.
- Price B. 2006. Sea turtle bycatch monitoring of the 2005 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 31 pp.
- Price, B. 2007a. Sea turtle bycatch monitoring of the 2006 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 21 pp.

- Price, B. 2007b. Estuarine Observer Program in North Carolina. Report to the United States Fish and Wildlife Service. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Grant No. F-83-R. 44 pp.
- Price B. 2008. Sea turtle bycatch monitoring of the 2007 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 25 pp.
- Price, B. 2009a. Sea turtle bycatch monitoring of the 2008 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 22 pp.
- Price, B. 2009b. Estuarine Bycatch Assessment in NC Commercial Fisheries. NOAA Award Grant #NA07NMF4740061, under the Atlantic Coastal Cooperative Statistics Program. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 19 pp.
- Price, B. 2010a. Sea turtle bycatch monitoring of the 2009 fall flounder gill-net fishery of southeastern Pamlico Sound, North Carolina. Completion report for ITP 1528. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 27pp.
- Price, B. 2010b. North Carolina Estuarine Gill-net Biological and Bycatch Assessment. Report to NOAA/NMFS and ACCSP under grant award NA05NMF4741032. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. 24 pp.
- R Core Team. 2015. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- SAS 1989. Institute. SAS version 9.1 Cary, NC.

TABLES

Table 1. Authorized and actual annual estimated takes with confidence intervals (95% shown in parenthesis) using a bootstrap resampling method based on observer data for coverage and sea turtle interaction levels in large mesh (≥ 4 inch stretched mesh) gill nets for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Species	Management Unit											
	B				D1							
	Estimated Takes				Estimated Takes				Total			
	Authorized		Actual		Authorized		Actual		Authorized		Actual	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Green	225	112	180 (87,350)	99 (50,266)	9	5	2 (0,34)	0	234	117	182	99
Kemp's ridley	53	26	27 (0,35)	7 (0,60)	15	7	0	0	68	33	27	7
Total	278	138	207	106	24	12	2	0	302	150	209	106

Species	Management Unit											
	D2				E							
	Estimated Takes				Estimated Takes				Total			
	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	9 (0,19)	0	96	48	9	0
Kemp's ridley	6	3	0	0	24	13	8 (0,21)	0	30	16	8	0
Total	6	3	0	0	120	61	17	0	126	64	17	0

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 large mesh (≥ 4 inch stretched mesh) gill nets for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Species	Management Unit									
	B ¹		D1		D2		E		Total	
	Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)			
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual
Green	n/a ²	n/a ²	n/a ²	n/a ²	6	1	n/a ²	n/a ²	6	1
Kemp's ridley	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²
Hawksbill	1	0	1	0	1	0	1	0	4	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	1	3	0	3	1	3	2	16	4
Total	5	1	5	0	11	2	5	2	31	5

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

² 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 large mesh (≥ 4 inch stretched mesh) and small mesh (< 4 inch stretched mesh) gill nets combined for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Species	Management Unit		Total
	A ^{1,2}	C ²	
	Observed (live/dead)	Observed (live/dead)	
Green, Hawksbill, Kemp's ridley, Leatherback, Loggerhead	4 turtles of any species	4 turtles of any species	8
Total	6	2	8

¹ One sea turtle interaction occurred in management unit A where the species identification was unable to be determined; however it was counted towards total observed take levels

² A minor modification to the Sea Turtle ITP was implemented in July 2015 combining observed takes in management units A and C for a cumulative total of $n = 8$

Table 4. Authorized and actual annual observed (not estimated) takes in small mesh (<4 inch stretched mesh-ISM) gill nets for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Species	Management Unit									
	B		D1		D2		E		Total	
	Observed (live/dead)		Observed (live/dead)		Observed (live/dead)		Observed (live/dead)			
	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual	Authorized	Actual
Green	3	1	3	0	3	0	3	1	12	2
Hawksbill	1	0	1	0	1	0	1	0	4	0
Kemp's ridley	3	0	3	0	3	0	3	0	12	0
Leatherback	1	0	1	0	1	0	1	0	4	0
Loggerhead	3	0	3	0	3	0	3	0	12	0
Total	11	1	11	0	11	0	11	1	44	2

Table 5. Total annual authorized and actual takes (estimated and observed) by species and condition for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Species	Estimated					
	Observed (live/dead)		Authorized		Actual	
	Authorized	Actual	Alive	Dead	Alive	Dead
Green	18	9	330	165	191	99
Hawksbill	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Kemp's ridley	12	1	98	49	34	7
Leatherback	8	0	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Loggerhead	24	4	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Any Species ²	8	2	n/a ¹	n/a ¹	n/a ¹	n/a ¹
Total	78	16	428	214	225	106

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

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

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 large and small mesh gill nets for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Year	Date(s)	Regulation change
2014	May 5 ¹	Use of large mesh gill nets prohibited in Internal Coastal Waters to avoid discards of red drum. Major portions of management units A and C and the New River were allowed to open Jun 1-Sep 15 (M-16-2014 and M-21-2014).
2014	Sept 1	The remainder of management unit A is reopened from the red drum closure (M-25-2014).
2014	Sept 1	The Estuarine Gill-Net Permit (EGNP) is implemented (M-24-2014).
2014	Sept 15	The remainder of management unit C is reopened and all of management unit D2 is reopened from the red drum closure (M-29-2014).
2014	Sept 22	Management units B and E are opened to large mesh gill nets (M-30-2014).
2014	Sept 24	Management unit E closed to large mesh gill nets due to turtle interactions (M-31-2014).
2014	Oct 1	Management unit A closed to large mesh gill nets due to turtle interactions (M-33-2014).
2014	Oct 15	Management unit D1 open to large mesh gill nets (M-34-2014).
2014	Oct 26	Shallow water portions of area B closed to large mesh gill nets due to turtle interactions (M-37-2014).
2014	Oct 27	Portions of western Albemarle Sound and Currituck (management unit A) reopened (M-36-2014).
2014	Nov 2	Management unit E open to large mesh gill nets (M-39-2014).
2014	Nov 6	Remainder of management unit A reopened (M-41-2014).
2014	Nov 6	Shallow water portions of area B reopened to large mesh gill nets (M-40-2014).
2015	May 8	Management unit D1 closed to large mesh gill nets for annual ITP closure (M-6-2015).
2015	May 18	Established attendance requirements for <5 inches for Subunit B.1 (small portion of management unit B located south and west of Oregon Inlet (M-7-2015).
2015	June 8	Closed management unit B to large mesh gill nets due to approaching allowable sea turtle interactions (M-10-2015).
2015	June 12	Closed management unit A to large and small mesh gill nets due to reaching allowable sea turtle interactions (M-11-2015).
2015	July 23	Closed management unit C to large and small mesh gill nets due to reaching allowable sea turtle interactions because. The division requested a minor modification to the Sea Turtle ITP that combines the authorized takes for management units A and C to provide more flexibility in managing the fishery and ensure that authorized take levels are not exceeded during the ITP year. For management units A and C the number of allowable takes had been reached (n=8; M-12-2015).

¹ Although this regulation change occurred during ITP Year 2014 it was included as reference for other regulatory changes which occurred in the fall season of ITP Year 2015

Table 8. Summary of observed sea turtle interactions in large (n = 52) and small (n = 3) mesh gill nets through the NCDMF Observer Program for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Date	Management Unit	Latitude	Longitude	Species	Disposition	Tag		Curved Carapace (mm)	
						PIT	Inconel	Length	Width
9/9/2014	E	3357.177	7756.161	loggerhead	alive	n/a	n/a	n/a	n/a
9/16/2014	A	3559.705	7614.192	unknown	alive	n/a	n/a	n/a	n/a
9/23/2014	B	3514.421	7540.129	green	alive	n/a	n/a	330	279
9/23/2014	B	3514.421	7540.129	green	alive	n/a	n/a	336	266
9/23/2014	E	3426.444	7732.555	kemps	alive	n/a	n/a	240	200
9/23/2014	E	3426.491	7732.518	kemps	alive	n/a	n/a	290	280
9/24/2014	B	3507.575	7557.166	green	alive	n/a	n/a	n/a	n/a
9/26/2014	A	3547.304	7533.153	green	alive	989.001001951894	EET810	240	192
10/1/2014	A	3557.824	7545.917	kemps	alive	989.001001952697	UUE046	318	343
10/3/2014	B	3504.484	7604.897	green	dead	n/a	n/a	351	310
10/7/2014	B	3516.398	7541.830	green	alive	989.001001951677	n/a	281	232
10/7/2014	B	3516.227	7541.878	green	alive	989.001001951710	n/a	362	266
10/8/2014	B	3516.227	7534.571	loggerhead	alive	989.001001951907	EET806	584	541
10/8/2014	B	3542.397	7531.306	unknown	alive	n/a	n/a	n/a	n/a
10/10/2014	B	3518.323	7532.758	green	alive	n/a	n/a	n/a	n/a
10/10/2014	E	3439.111	7709.080	green ¹	alive	n/a	n/a	n/a	n/a
10/16/2014	B	3508.558	7555.952	green	dead	n/a	EET820	280	250
10/16/2014	B	n/a	n/a	green	dead	n/a	n/a	n/a	n/a
10/17/2014	D1	3446.637	7636.866	green	alive	989.001001951714	n/a	341	308
10/17/2014	B	3519.899	7534.882	green	alive	989.001001951878	EET804/5	324	278
10/21/2014	B	3521.120	7534.783	green	alive	3DD.003BB892B3	n/a	290	250
10/21/2014	B	3521.048	7534.364	green	alive	3DD.003BB892DB	EET802/3	350	310
10/21/2014	B	n/a	n/a	kemps	alive	989.001002	n/a	250	243
10/21/2014	B	3449.165	7622.689	green	dead	n/a	n/a	241	203
10/21/2014	B	3448.754	7622.859	green	dead	n/a	n/a	292	248
10/21/2014	B	3448.740	7622.873	green	dead	n/a	n/a	305	273
10/22/2014	B	3503.212	7605.637	green	alive	989.001001952679	UUE95/100	340(est)	281(est)
10/22/2014	B	3503.967	7605.268	green	alive	989.001001952761	n/a	295(est)	249(est)
10/22/2014	B	3503.639	7605.206	green	dead	n/a	n/a	313(est)	276(est)

¹ Indicates small mesh gear

Table 8. Cont...

Date	Management Unit	Latitude	Longitude	Species	Disposition	Tag		Curved Carapace (mm)	
						PIT	Inconel	Length	Width
10/22/2014	B	3503.517	7605.456	kemps ²	dead	n/a	n/a	241(est)	264(est)
10/22/2014	D1	3444.704	7630.175	green	alive	4B02465510	UUE078	500(est)	400(est)
11/11/2014	B	3509.678	7553.358	green	alive	989001001952701	n/a	280	230
11/12/2014	B	3506.066	7603.325	green	alive	n/a	n/a	n/a	n/a
11/13/2014	B	3505.551	7603.006	green	alive	9890001001952680	n/a	267	246
4/10/2015	B	3510.924	7549.519	green ¹	dead	n/a	n/a	238	206
4/17/2015	B	3507.242	7557.741	green	alive	989.001001952762	n/a	236	200
5/14/2015	B	3449.196	7622.597	green	alive	n/a	n/a	n/a	n/a
5/14/2015	B	3448.986	7622.668	green	dead	n/a	n/a	289	241
5/14/2015	B	3449.582	7622.140	kemps	alive	989.001001951753	n/a	257	264
5/27/2015	B	3458.360	7622.268	green	dead	n/a	n/a	240	216
5/28/2015	B	3448.900	7622.949	green	alive	989.001001952770	n/a	320	290
5/29/2015	B	3459.148	7614.202	green	alive	989.001001951712	n/a	239	217
5/29/2015	B	3504.129	7625.871	green	dead	n/a	n/a	240	216
6/2/2015	C	3519.423	7632.507	green ¹	alive	989.001001951915	n/a	240	210
6/5/2015	B	3508.589	7555.541	green	alive	n/a	n/a	298	255
6/5/2015	B	3508.575	7555.604	green	dead	n/a	n/a	271	239
6/10/2015	A	3550.834	7535.639	green	alive	982.000364297009	n/a	275	235
6/10/2015	A	3550.579	7535.419	green	alive	982.000364299962	n/a	277	246
6/11/2015	C	3511.202	7639.629	green	alive	n/a	n/a	n/a	n/a
6/12/2015	A	3550.876	7537.263	green	dead	n/a	n/a	260	230
7/1/2015	E	3434.889	7725.502	green	alive	n/a	n/a	n/a	n/a
7/2/2015	E	3424.650	7735.031	green	alive	n/a	n/a	n/a	n/a
7/7/2015	E	3435.420	7722.167	loggerhead	alive	989.001001951676	EEU660	457	340
7/15/2015	D2	3443.559	7642.855	green	alive	989.001001951746	n/a	361	323
8/27/2015	D2	34.68745	76.97218	loggerhead	alive	n/a	n/a	n/a	n/a

¹ Indicates small mesh gear

² Turtle died on 11/28/2014 at Karen Beasley Sea Turtle Hospital

Table 9. Summary of reported sea turtle interactions in large mesh gill nets through the NCDMF Observer Program for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Date	Management Unit	Latitude	Longitude	Species	Disposition	Curved Carapace (mm)	
						Length	Width
9/23/2014	E	n/a	n/a	unknown	alive	n/a	n/a
9/24/2014	E	n/a	n/a	unknown	alive	n/a	n/a
9/26/2014 ¹	B	3514.602	7538.192	green	alive	330	279
10/2/2014	B	n/a	n/a	unknown	alive	n/a	n/a
10/22/2014	D1	n/a	n/a	loggerhead	alive	n/a	n/a
6/23/2015 ¹	A	3553.947	7537.567	kemps ridley	dead	300	320
6/25/2015 ¹	B	3521.549	7530.886	kemps ridley	alive	n/a	n/a

¹ Reported sea turtle interactions from illegally set large mesh gill nets and were reported by Marine Patrol

Table 10. Observer coverage calculated from previous year's trip ticket data and observer data for large mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Season	Management Unit	Large Mesh		
		Fishing Trips ²	Observed Trips	Coverage ³
Fall 2014	A	2,529	192	7.6
	B	1,448	154	10.6
	C	904	152	16.8
	D1	23	23	100.0
	D2	264	58	22.0
	E	282	58	20.6
Spring 2015 ¹	A	2,254	158	7.0
	B	614	44	7.2
	C	839	72	8.6
	D1	22	0	0.0
	D2	61	7	11.4
	E	251	61	24.3
Summer 2015 ¹	A	228	12	5.3
	B	117	16	13.7
	C	184	40	21.7
	D1	0	0	0.0
	D2	125	17	13.6
	E	446	98	22.0
Total		10,593	1,162	11.0

¹ Number of days management units closed factored into estimated fishing trips for the spring and summer 2015 seasons

² Final trip ticket data for 2014 (September - December) and preliminary trip ticket data for 2015 (January - August)

³ Based on final trips for 2014 (September - December) and estimated trips for 2015 (January - August) compared to observer large mesh trips

Table 11. Observer coverage calculated from previous year's trip ticket data and observer data for small mesh gill nets by season and management unit through the NCDMF Observer Program for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Season	Management Unit	Small Mesh		
		Fishing Trips ²	Observed Trips	Coverage ³
Fall 2014	A	566	18	3.2
	B	1,381	22	1.6
	C	309	15	4.9
	D1	80	7	8.8
	D2	325	9	2.8
	E	624	24	3.8
Spring 2015 ¹	A	1,436	52	3.6
	B	1,337	23	1.7
	C	276	12	4.4
	D1	49	5	10.3
	D2	42	2	4.8
	E	209	14	6.7
Summer 2015 ¹	A	58	3	5.2
	B	1,104	12	1.1
	C	114	6	5.3
	D1	15	0	0.0
	D2	44	1	2.3
	E	292	11	3.8
Total		8,258	236	2.9

¹ Number of days management units closed factored into estimated fishing trips for the spring and summer 2015 seasons

² Final trip ticket data for 2014 (September - December) and preliminary trip ticket data for 2015 (January - August)

³ Based on final trips for 2014 (September - December) and estimated trips for 2015 (January - August) compared to observer large mesh trips

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 2015 (September 1, 2014 - August 31, 2015).

Season	# Gill Net Checks	# Citations
Fall 2014	465	5
Spring 2015	512	14
Summer 2015	309	14
Total	1,286	33

Table 13. Citations written by Marine Patrol for large and small mesh gill nets by season and violation code during ITP Year 2015 (September 1, 2014 - August 31, 2015).

Season	Violation		
	Date	Code	Description
Fall 2014	9/14/2014	NETG04	Leave gill nets in waters when could not be legally fished
	9/26/2014	NETG04	Leave gill nets in waters when could not be legally fished
	10/21/2014	NETG03	Using gill net with improper buoys or identification
	10/22/2014	NETG22	Improperly set gill net
	10/25/2014	NETG10	Gill net with illegal mesh size
Spring 2015	3/4/2015	NETG09	Gill net set too close to bridge
	3/9/2015	NETG09	Gill net set too close to bridge
	3/21/2015	NETG22	Improperly set gill net
	3/21/2015	NETG53	Use large mesh gill net with corks or floats on top line
	3/21/2015	NETG38	Use large mesh gill net in Pamlico Sound later than 1 hour after sunrise
	4/2/2015	NETG08	Gill net within 200 yards of pound net
	4/2/2015	NETG12	Net in middle third of marked navigational channel
	4/2/2015	NETG08	Gill net within 200 yards of pound net
	4/2/2015	NETG12	Net in middle third of marked navigational channel
	4/5/2015	NETG10	Gill net with illegal mesh size
	4/10/2015	NETG29	RCGL gear without proper buoys
	5/4/2015	NETG04	Leave gill net in waters when could not be legally fished
	5/5/2015	NETG03	Using gill net with improper buoys or identification
	5/20/2015	NETG01	Leave gill net in coastal waters unattended
Summer 2015	6/2/2015	NETG46	Set or retrieve large mesh gill nets later than one hour after sunrise on Tuesday through Friday
	6/8/2015	NETG22	Improperly set gill net
	6/14/2015	NETG10	Gill net with illegal mesh size
	6/24/2015	NETG03	Using gill net with improper buoys or identification
	6/24/2015	NETG04	Leave gill net in waters when could not be legally fished
	7/3/2015	NETG22	Improperly set gill net
	7/4/2015	NETG22	Improperly set gill net
	7/16/2015	NETG46	Set or retrieve large mesh gill nets later than one hour after sunrise on Tuesday through Friday
	7/21/2015	NETG01	Leave gill net in coastal waters unattended
	7/21/2015	NETG04	Leave gill net in waters when could not be legally fished
	7/21/2015	NETG29	RCGL gear without proper buoys
	7/22/2015	NETG03	Using gill net with improper buoys or identification
	7/22/2015	NETG04	Leave gill net in waters when could not be legally fished
	7/22/2015	NETG30	Leave RCGL gill net unattended

Table 13. Cont...

Season	Date	Code	Violation	
			Description	
	7/22/2015	NETG39	Use large mesh gill nets more than 15 meshes in height and w/out lead core or leaded bottom	
	7/30/2015	NETG03	Using gill net with improper buoys or identification	
	8/5/2015	NETG29	RCGL gear without proper buoys	
	8/8/2015	NETG12	Net in middle third of marked navigational channel	
	8/10/2015	NETG03	Using gill net with improper buoys or identification	
	8/10/2015	NETG16	Use an unattended gill net in a restricted area	
	8/10/2015	NETG37	Leave small mesh gill nets unattended	
	8/13/2015	NETG03	Using gill net with improper buoys or identification	
	8/14/2015	NETG22	Improperly set gill net	
	8/14/2015	NETG30	Leave RCGL gill net unattended	
	8/15/2015	NETG22	Improperly set gill net	
	8/15/2015	NETG29	RCGL gear without proper buoys	
	8/15/2015	NETG46	Set or retrieve large mesh gill nets later than one hour after sunrise on Tuesday through Friday	
	8/19/2015	NETG03	Using gill net with improper buoys or identification	
	8/19/2015	NETG10	Gill net with illegal mesh size	
	8/19/2015	NETG22	Improperly set gill net	
	8/19/2015	NETG46	Set or retrieve large mesh gill nets later than one hour after sunrise on Tuesday through Friday	
	8/20/2015	NETG30	Leave RCGL gill net unattended	
	8/23/2015	NETG03	Using gill net with improper buoys or identification	
	8/23/2015	NETG04	Leave gill net in waters when could not be legally fished	
	8/28/2015	NETG04	Leave gill net in waters when could not be legally fished	
	8/28/2015	NETG29	RCGL gear without proper buoys	

Table 14. The number of calls (n = 6,968) made by the observers trying to set up trips by season and month categorized by call type (0-14) and defined in Table 6 for ITP Year 2015 (September 1, 2014 - August 31, 2015).

Season	Month	Categories (%) ¹														Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Fall 2014	September	0.0	0.3	0.2	0.0	0.0	0.0	1.3	0.0	0.8	0.0	0.1	0.0	0.5	1.2	4.6
	October	1.5	9.8	3.3	1.5	0.9	0.8	6.9	0.1	4.7	0.0	1.2	0.3	5.2	16.0	52.4
	November	1.2	11.0	3.1	1.1	0.8	0.2	3.2	0.1	3.2	0.3	0.9	0.2	4.8	12.9	43.0
	Total	2.8	21.2	6.7	2.6	1.7	1.1	11.4	0.2	8.7	0.3	2.1	0.5	10.5	30.1	100.0
Spring 2015	March	1.3	9.5	2.1	0.6	0.5	0.6	2.5	0.0	2.0	1.3	2.2	0.7	5.7	15.2	44.2
	April	1.3	5.7	2.0	0.2	0.4	0.3	1.4	0.1	2.3	0.3	1.8	0.5	3.5	9.5	29.2
	May	1.0	5.4	2.7	0.1	0.3	0.3	0.8	0.0	1.2	0.4	1.0	0.2	3.0	10.1	26.6
	Total	3.6	20.6	6.8	1.0	1.2	1.2	4.6	0.1	5.4	2.1	5.0	1.4	12.2	34.8	100.0
Summer 2015	June	4.5	21.2	9.0	1.0	1.2	2.0	5.2	0.4	6.5	0.7	3.2	1.8	10.8	27.4	94.8
	July	0.0	0.9	0.1	0.0	0.0	0.1	0.0	0.0	0.5	0.1	0.4	0.1	0.5	1.1	3.8
	August	0.0	0.5	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.3
	Total	4.5	22.6	9.1	1.0	1.2	2.1	5.5	0.4	7.0	0.9	3.6	2.0	11.3	29.0	100.0
Total		3.5	21.0	7.0	1.4	1.4	1.2	6.7	0.2	6.6	1.4	4.0	1.2	11.6	32.7	100.0

¹ Categories as defined in Table 6: 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 2015 (September 1, 2014 - August 31, 2015).

Season ¹	Date	Code	Description
Fall 2014	9/13/2014	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	9/17/2014	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	9/18/2014	EGNP25	Refuse to allow fisheries observers onboard or collect data
	9/23/2014	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	9/23/2014	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	9/24/2014	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	9/29/2014	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	9/25/2014	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	10/2/2014	EGNP14	Mislead observers to avoid fishing trip
	10/2/2014	EGNP14	Mislead observers to avoid fishing trip
	10/3/2014	EGNP09	Failure to set or retrieve nets in accordance with time restrictions.
	10/3/2014	EGNP11	Failure to attend nets
	10/3/2014	EGNP99	Failure to comply with statute(s), rule(s) and/or proclamation(s)
	10/3/2014	EGNP09	Failure to set or retrieve nets in accordance with time restrictions.
	10/3/2014	EGNP30	Failure to comply with gill net configurations outlined in proclamation
	10/10/2014	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	10/17/2014	EGNP99	Failure to comply with statute(s), rule(s) and/or proclamation(s)
	10/29/2014	EGNP99	Failure to comply with statute(s), rule(s) and/or proclamation(s)
	10/23/2014	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	10/31/2014	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
Spring 2015	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/12/2015	EGNP08	Failure to notify DMF of a change in phone number within 14 days
	3/13/2015	EGNP25	Refuse to allow fisheries observers onboard or collect data
	3/17/2015	EGNP25	Refuse to allow fisheries observers onboard or collect data
	3/17/2015	EGNP25	Refuse to allow fisheries observers onboard or collect data
	3/25/2015	EGNP09	Failure to set or retrieve nets in accordance with time restrictions
	4/6/2015	EGNP25	Refuse to allow fisheries observers onboard or collect data

¹ Notices of Violation were not issued during the summer 2015 season due to the legal review of the permit appeal process

FIGURES

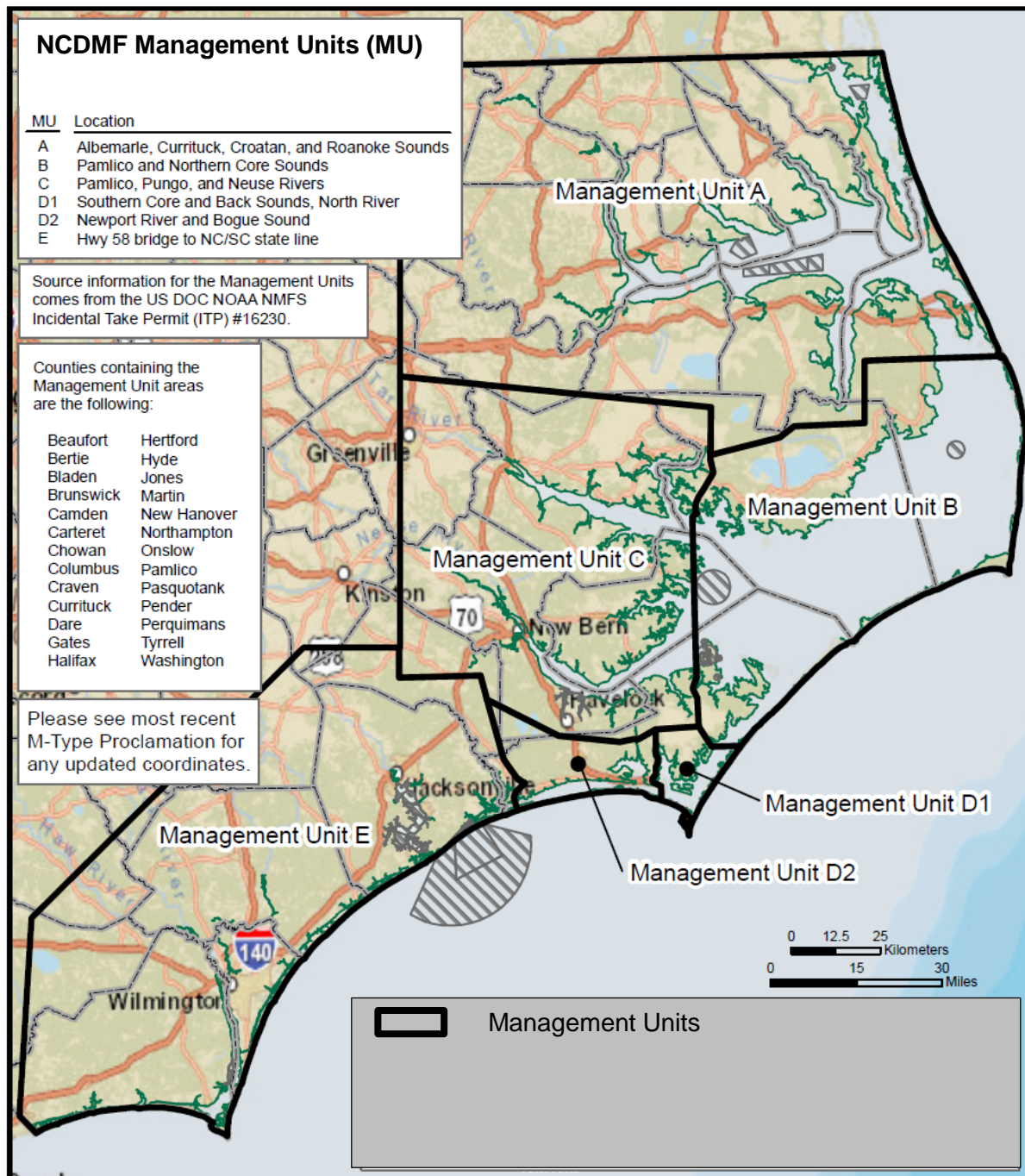


Figure 1. Management units (A, B, C, D1, D2, and E) as outlined in the Conservation Plan and utilized by the Observer Program for ITP Year 2015 (September 1, 2014 – August 31, 2015).

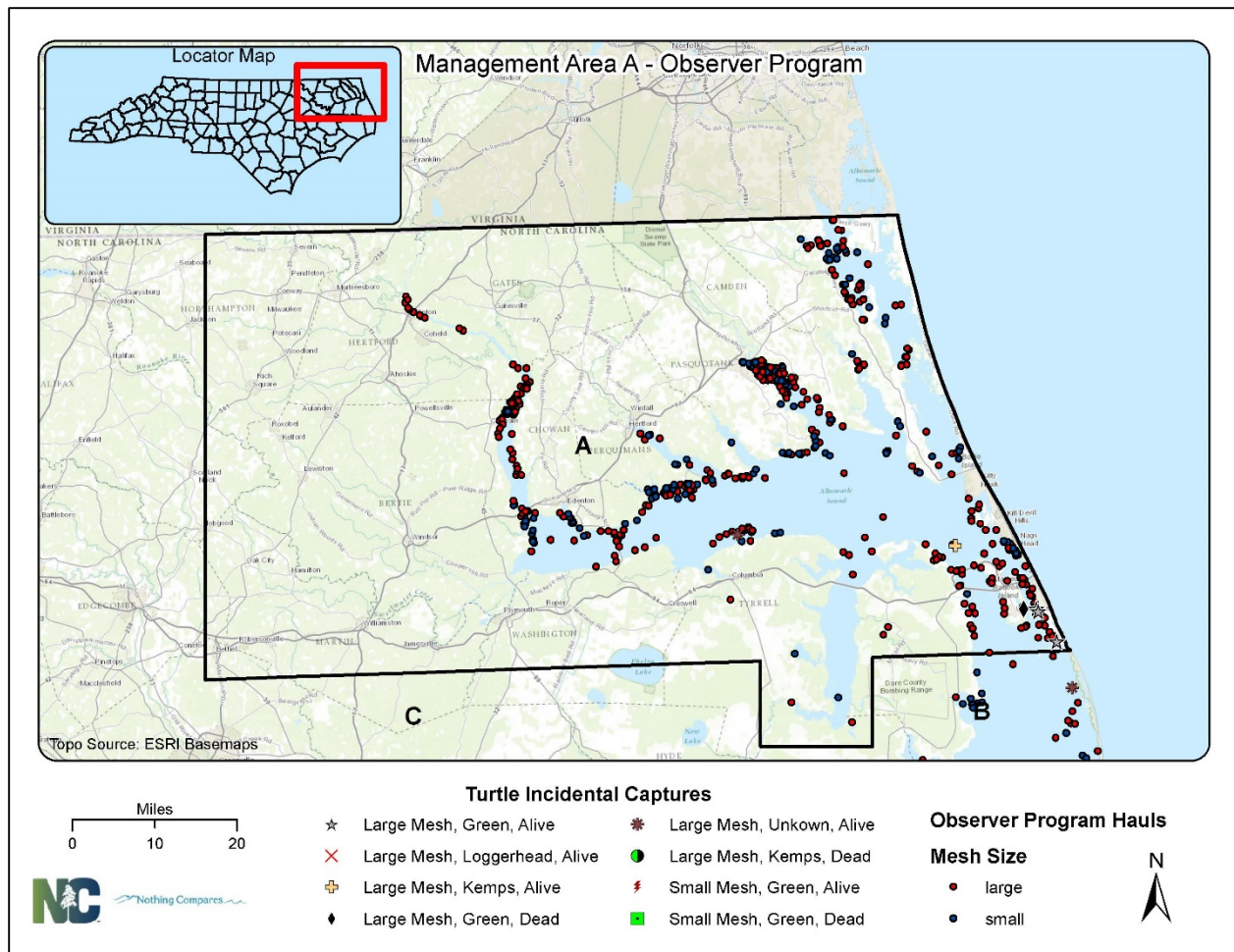


Figure 2. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit A for ITP Year 2015 (September 1, 2014 – August 31, 2015).

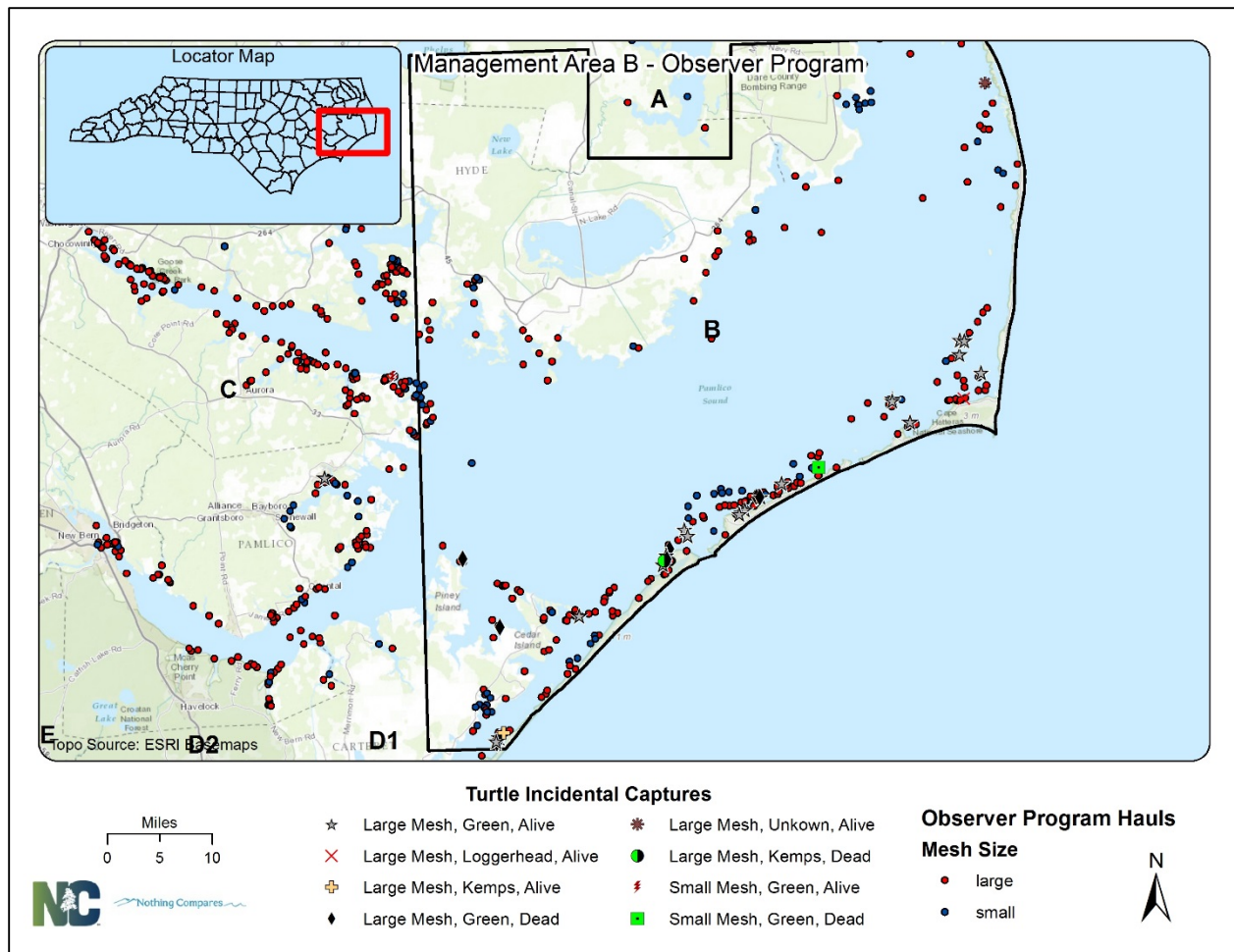


Figure 3. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit B for ITP Year 2015 (September 1, 2014 – August 31, 2015).

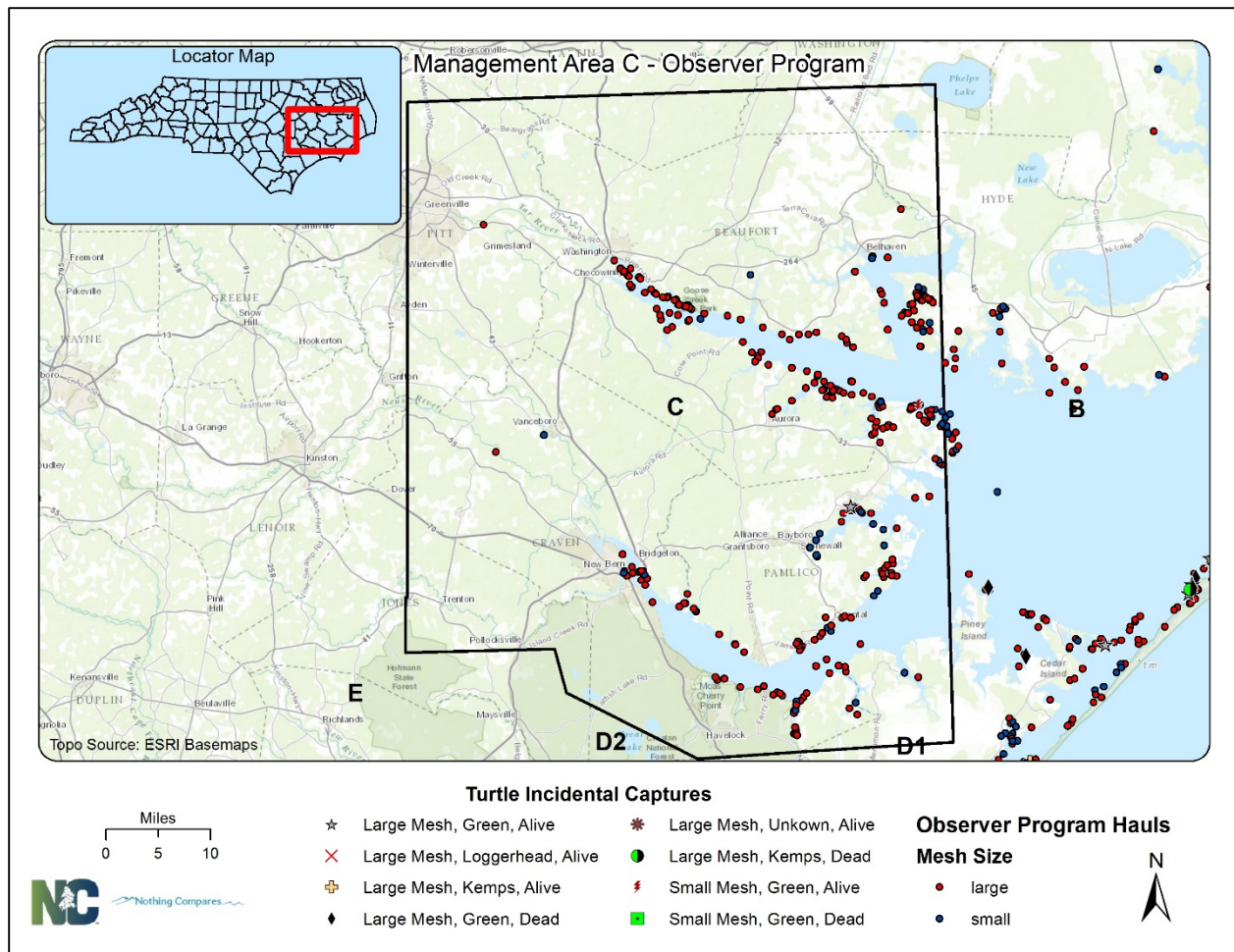


Figure 4. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit C for ITP Year 2015 (September 1, 2014 – August 31, 2015).

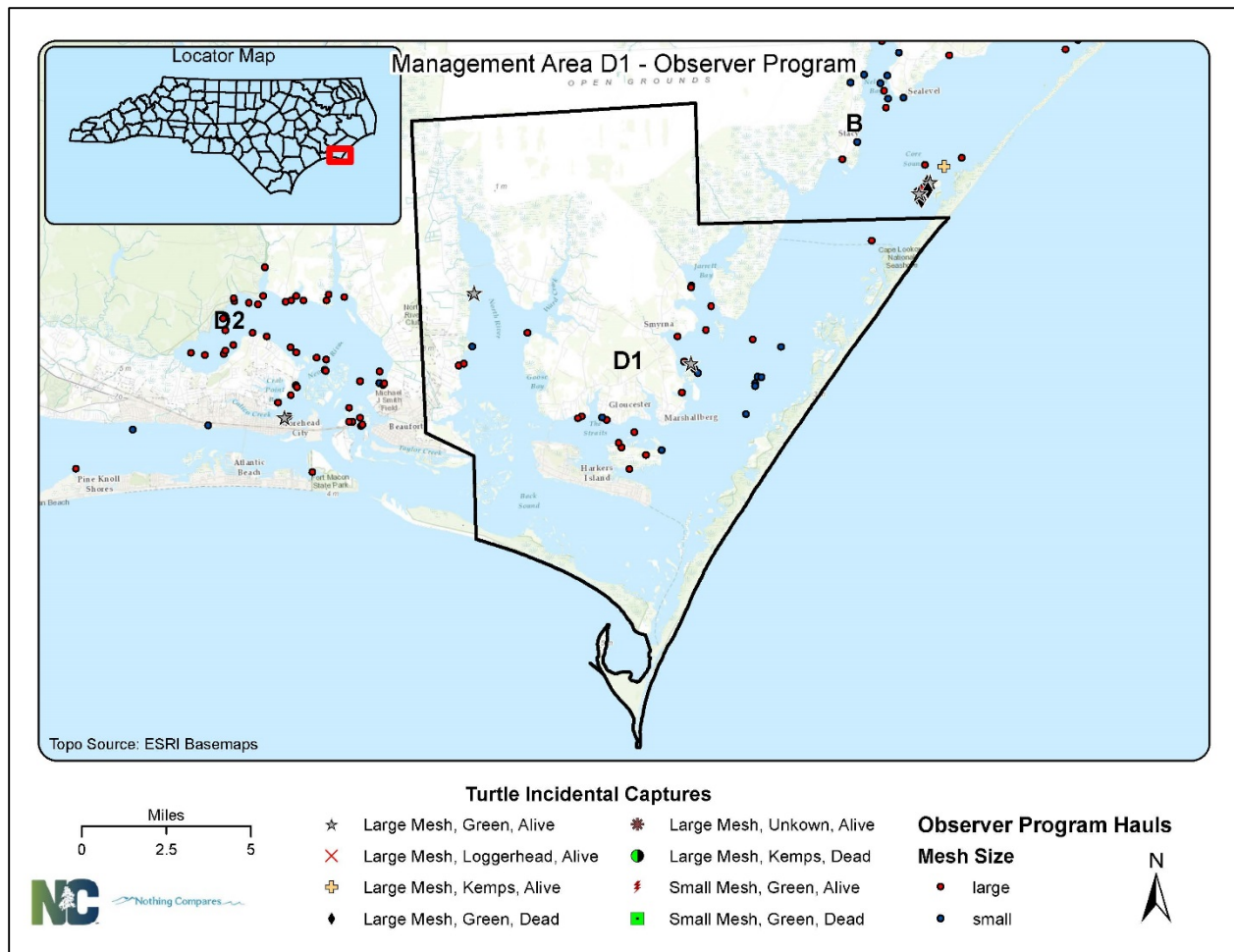


Figure 5. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit D1 for ITP Year 2015 (September 1, 2014 – August 31, 2015).

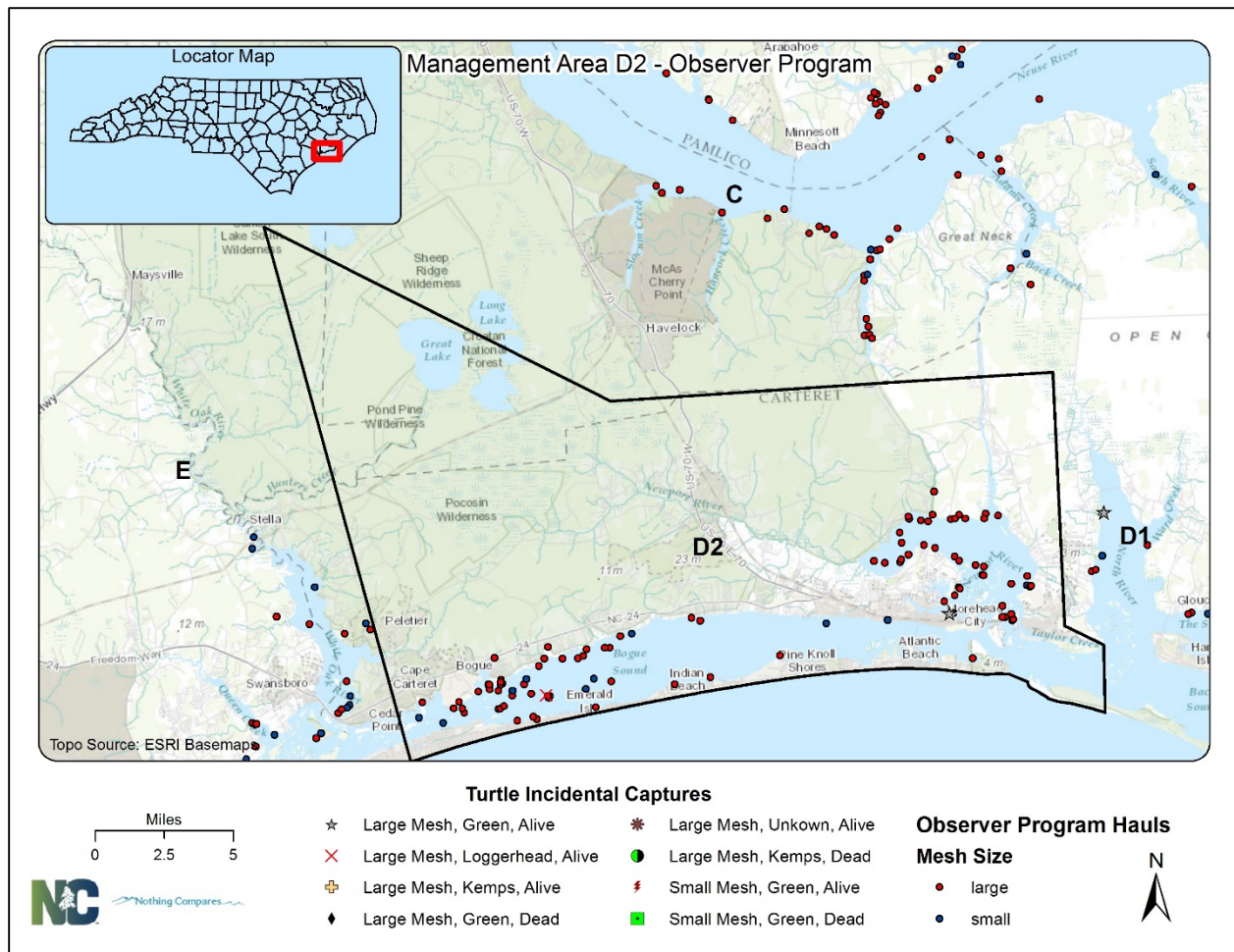


Figure 6. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit D2 for ITP Year 2015 (September 1, 2014 – August 31, 2015).

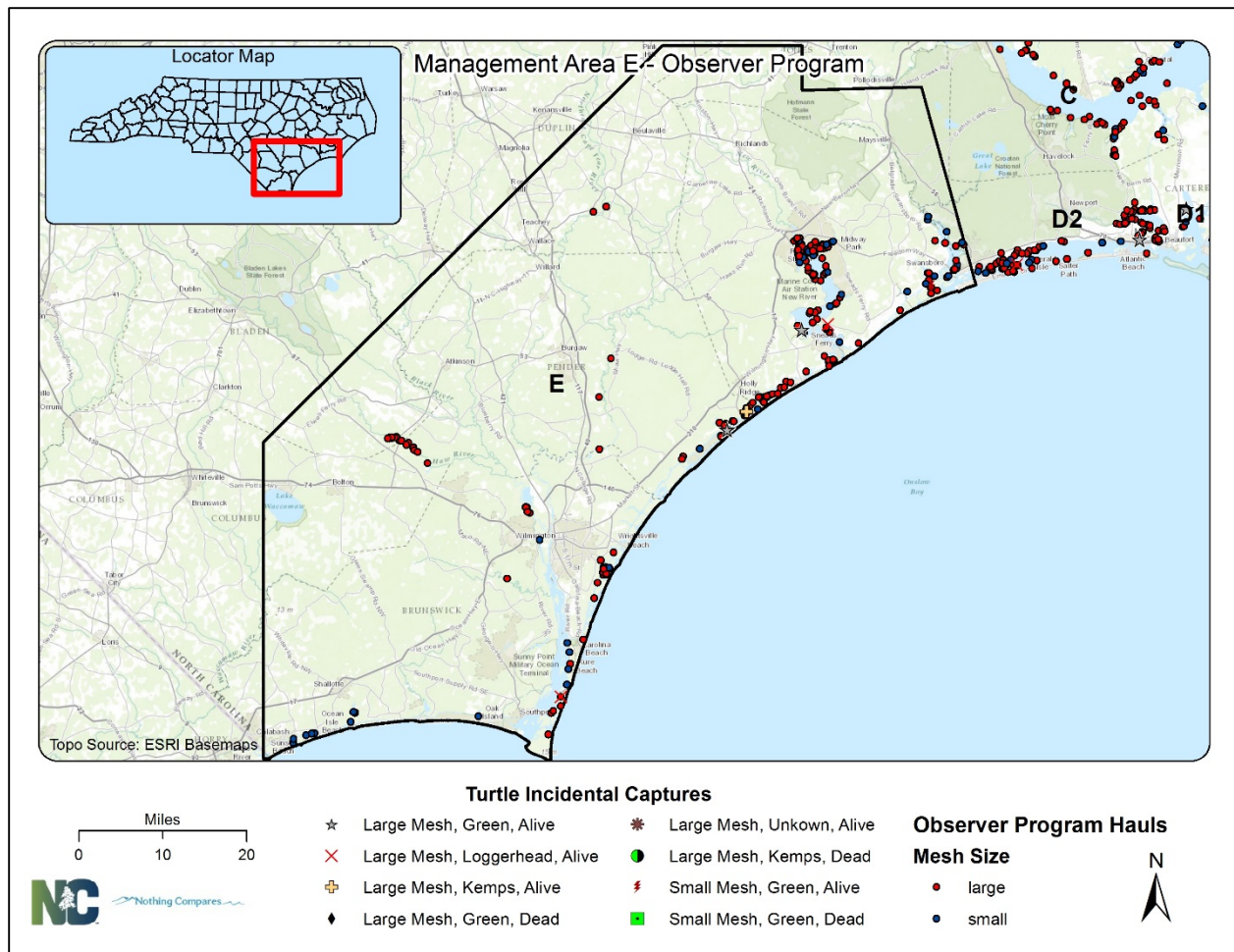


Figure 7. Sea turtle interaction locations by species, disposition, and gear and observer trips (hauls) by gear in management unit E for ITP Year 2015 (September 1, 2014 – August 31, 2015).

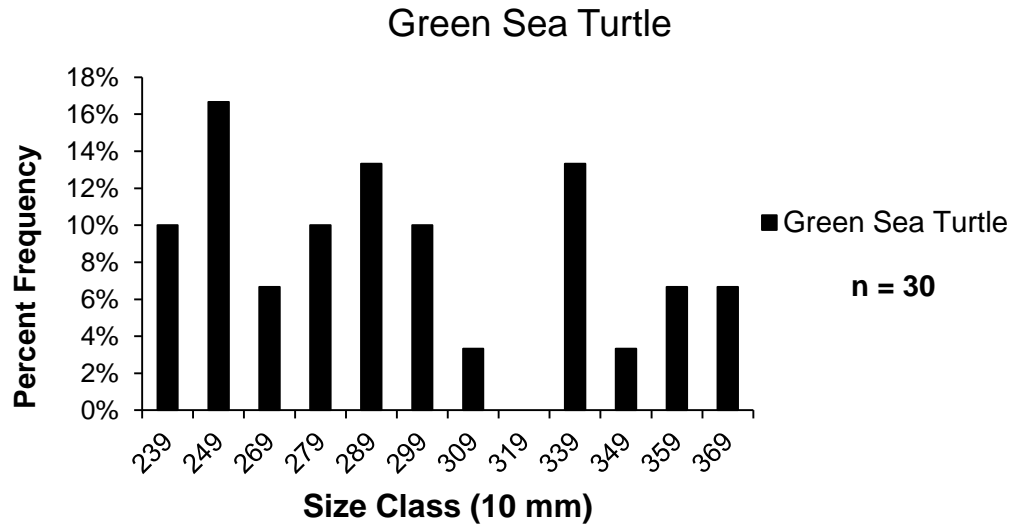


Figure 8. Length-frequency (curved carapace length) from notch to tip of observed incidental captures of green sea turtles where measurements were obtained (n = 30) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2015 (September 1, 2014 – August 31, 2015).

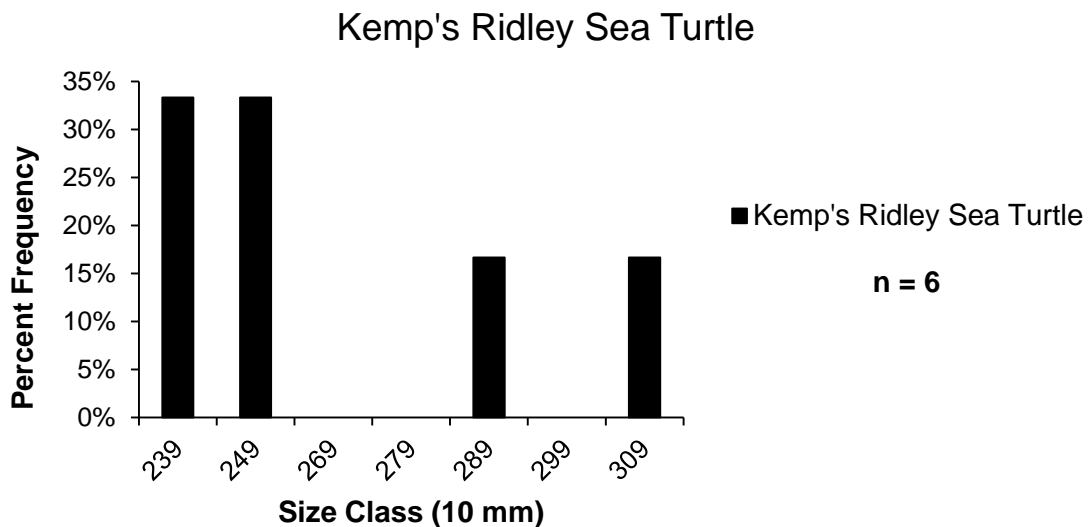


Figure 9. Length-frequency (curved carapace length) from notch to tip of observed incidental captures of Kemp's ridley sea turtles where measurements were obtained (n = 6) collected by the Observer Program from onboard and alternative platform observations for ITP Year 2015 (September 1, 2014 – August 31, 2015).



PAT McCrory
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON C. DAVIS
Director

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

Dear Kristy:

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

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

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

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



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

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

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



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

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



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

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

Species	Management Unit											
									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	13	0	96	48	13	0
Kemp's ridley	6	3	0	0	24	13	8	0	30	16	8	0
Total	6	3	0	0	120	61	21	0	126	64	21	0

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 of the Annual Completion Report for the Sea Turtle ITP No. 16230 for ITP Year 2015.



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

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

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

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

Sincerely,

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

cc: Chris Batsavage
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