

Crab Pot Removal Program FY 17-18
North Carolina General Assembly Appropriations
Project Period: July 1, 2017 – June 30, 2018



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Lost Fishing Gear Recovery Project FY 17-18

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Summary – Lost, derelict and abandoned fishing gear represent one subset of marine debris that can result in degraded habitat, unwanted capture of living marine species, hazards to safety and navigation, and reduced aesthetics. Thousands of crab pots are set in North Carolina waters each year and research has shown upwards of 17 percent of these pots can become lost or abandoned annually. Since the early 1990s, the N.C. Marine Patrol (NCMP) has removed these crab pots during the annual no-potting period. As required by North Carolina state law, internal coastal waters are closed to all crab, eel, fish and shrimp pots from Jan. 15 – Feb. 7 (15A N.C. ADMIN. CODE 03J.0301). Beginning with the 2014 no-potting period, the NCMP agreed to accept assistance from a select group of commercial fisherman within a defined geographic area and timeframe, and under a permit held by the North Carolina Coastal Federation. North Carolina Sea Grant and NOAA Marine Debris Program monies funded the inaugural private-public partnership effort. NOAA monies continued small-scale efforts in 2015 and 2016. In 2016, the N.C. General Assembly appropriated \$100,000, to be administered by the North Carolina Sea Grant, for a statewide, crab pot cleanup project during the 2017 closure. The North Carolina Coastal Federation was awarded the contract and oversaw all cleanup operations. In 2017, the N.C. General Assembly appropriated \$100,000 to the North Carolina Coastal Federation, for a statewide, crab pot cleanup during the 2018 closure. In total, 38, two-person crews of commercial fishermen, canvassed 2,172,800 acres of internal coastal fishing waters statewide (3,395 miles) and removed a total of 3,496 crab pots. The project cost per pot is \$28.60. Five boats were equipped with side-imaging sonar units to detect submerged pots. There was no evidence of sea turtles or diamondback terrapins in any retrieved pots. There was a total of 2,413 blue crabs and 761 finfish released from retrieved pots; 62% constituted dead discards. Resources were leveraged to conduct associated shoreline cleanups in the three NCMP Districts. A total of 138 volunteers removed an estimated 1.7 tons of marine debris. Results show that a full-scale, statewide program is operationally achievable, as well as of value in improving conditions of coastal fisheries and habitat.

Background

Lost fishing gear as used in this report includes crab pots, eel pots, lines, buoys and other recreational or commercial harvest equipment that has been lost or abandoned in internal coastal waterways. The focus of this project is on removal of lost pots, although collection efforts often yield additional lost gear.

Historical Lost Fishing Gear Cleanup Efforts – N.C. Marine Patrol (NCMP) cleanup of lost fishing gear, primarily consisting of lost and abandoned crab pots, began in the early 1990s. However, the data on the number of pots collected was not recorded until 2003 (Table 1). These cleanup efforts were timed with the annual closure spanning Jan. 15- Feb. 7, of internal coastal waters to all crab, eel, fish and shrimp pots (15A N.C. ADMIN. CODE 03J.0301), commonly called the “no-potting” period. As a general practice, once the waters close NCMP uses aircraft to spot concentrations of pots, and then deploys boat patrols. NCMP views all pots left in the water as unlawfully set, and thereby, as having the

authority to take enforcement action on individuals that intentionally have left large arrays (called strings) of pots in the water.

Table 1. Number of lost crab pots recovered during the annual statewide “no-potting” period spanning Jan. 15 – Feb. 7 annually. The N.C. Marine Patrol began recording numbers in 2003. Cells with yellow shading designate years where commercial fishermen assisted with recovery activities. See Appendix for boundaries of NCMP districts.

Crab Pots Recovered, 2003-2018				
Year	D1 - Northern District	D2 - Central District	D3 - Southern District	Total
2003	4047	900	127	5074
2004	7708*	527	108	635
2005	2168	N/A	N/A	2168
2006	1117	391	24	1532
2007	896	135	24	1055
2008	757	190	110	1057
2009	589	257	60	906
2010	570	154	24	748
2011	656	183	141	980
2012	684	160	295	1139
2013	451	445	545	1441
2014	364	64	226	654
2015	1004	149	155	1308
2016	753	80	70	903
2017	2,836	1,219	249	4304
2018	2,245	1,004	247	3496

*During the winter of 2004, the high number of lost pots encountered appears to be a result of Hurricane Isabel (Sept. 2003).

Governing Regulations and Policies – In North Carolina the general public are not freely allowed to remove lost fishing gear. The most pertinent legislation relating to cleanup of lost fishing gear in North Carolina internal coastal waters is North Carolina General Statute §113-268:

§ 113-268. Injuring, destroying, stealing, or stealing from nets, seines, buoys, pots, etc.

(a) It is unlawful for any person without the authority of the owner of the equipment to take fish from nets, traps, pots, and other devices to catch fish which have been lawfully placed in the open waters of the State.

(b) It is unlawful for any master or other person having the management or control of a vessel in the navigable waters of the State to willfully, wantonly, and unnecessarily do injury to any seine, net or pot which may lawfully be hauled, set, or fixed in such waters for the purpose of taking fish except that a net set across a channel may be temporarily moved to accommodate persons engaged in drift netting, provided that no fish are removed and no damage is done to the net moved.

(c) It is unlawful for any person to willfully steal, destroy, or injure any buoys, markers, stakes, nets, pots, or other devices on property lawfully set out in the open waters of the State in connection with any fishing or fishery.

(d) Violation of subsections (a), (b), or (c) is a Class A1 misdemeanor.

(e) The Department may, either before or after the institution of any other action or proceeding authorized by this section, institute a civil action for injunctive relief to restrain a violation or threatened violation of subsections (a), (b), or (c) of this section pursuant to G.S. 113-131. The action shall be brought in the superior court of the county in which the violation or threatened violation is occurring or about to occur and shall be in the name of the State upon the relation of the Secretary. The court, in issuing any final order in any action brought pursuant to this subsection may, in its discretion, award costs of litigation including reasonable attorney and expert-witness fees to any party. (1987, c. 636, s. 1; 1989, c. 727, s. 112; 1993, c. 539, s. 849; 1994, Ex. Sess., c. 24, s. 14(c); 1998-225, s. 3.9.)

Project History - From 2014-2016, the N.C. Coastal Federation has, through grant funding, involved commercial watermen in lost crab pot recovery efforts during the “no-potting” period in NCMP District One. The project received grant monies from N.C. Sea Grant and National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program in the inaugural year to offset equipment and staff costs.

Funding for 2015-2017, in part, was provided once more by the NOAA Marine Debris Program. In 2016, the N.C. General Assembly appropriated \$100,000 to the N.C. Department of Environmental Quality, Division of Marine Fisheries (DMF), to be administered by N.C. Sea Grant at North Carolina State University for a “Crab Pot Removal Pilot Program”. The N.C. Coastal Federation was awarded the contract to conduct this work. In 2017, the N.C. General Assembly appropriated \$100,000 to the N.C. Coastal Federation for a crab pot cleanup program and included reporting requirements.

Methodology

Recruitment and Training – All participating commercial watermen registered under a Scientific and Educational Activity Permit (SEAP) issued by the state of North Carolina. For simplicity, the N.C. Coastal Federation temporarily added the participant names to the existing SEAP (#707067) during the timeframe of the project. By listing waterman participants on the SEAP, they each become “authorized agents” to clean up lost fishing gear, notably crab pots.

To solicit project participants, the N.C. Coastal Federation issued a priority application period to watermen, that were in good standing, that previously participated in the project. A press release was issued on November 1, 2017 opening the application to others that met the following qualifications: 1) All applicants must possess a valid Standard Commercial Fishing License (SCFL) and 2) All vessels were required to carry two people for safety and data collection.

All applicants were screened for any major fisheries-related violations through NCMP. Any applicant with a recent or extensive violation history was not permitted to participate in the project. Vessel size, home port, existing onboard equipment, availability and the order in which the applications were received were additional factors considered when determining whether to accept an applicant. The federation received several hundred inquiries about the project, through applications, phone calls and emails.

In total, 76 watermen (38 captains and 38 mates) were selected to conduct the on-the water cleanup. Each vessel received \$400 per day. All 38, two-person crews were required to carry a single tablet (provided by project personnel) to document data. Training sessions on general project protocol were held in each district, both for hired watermen and NCMP officers. All participating watermen reviewed data collection procedures and project logistics.

Field Work – This project included a shoreline cleanup component, in addition to the water cleanup activities with commercial watermen. The shoreline cleanups took place for about three hours each in three locations coast wide: Kitty Hawk (Jan. 13), Hoop Pole Creek (Jan. 20), Morris Landing (Jan. 13).

Water-based cleanup efforts took place in statewide internal coastal waters. With consultation from both hired commercial watermen and NCMP officers, certain areas were prioritized. Hired watermen crews began cleanup efforts on Jan. 17, 2018, after NCMP did a sweep of the areas. This practice allows watermen participating in the cleanup project not to be involved without any enforcement actions.

On-water cleanup activities occurred, at least in part, through January 27, 2018. Twenty-four vessels were hired in NCMP District 1, eight in NCMP District 2, and six in NCMP District 3. Each waterman worked a minimum of two days, but depending on pot accumulation and area density, up to six days. Individual availability and weather conditions also determined number of days worked. Crews were required to work on the water from 8 a.m. to 2 p.m. Over the course of eleven days, the 38 crews covered approximately 2,172,800 acres of state internal coastal waters (Appendix E).

Watermen were instructed to bring lost fishing gear to designated collection site. Project personnel disposed of unidentifiable pots that were collected, once the project was completed.

The DMF director issued two proclamations, reopening internal coastal fishing waters to the setting of pots in a staggered fashion. District 3 watermen crews encountered less lost fishing gear, and as such, waters south and west of the Highway 58 Bridge to the North Carolina/South Carolina state line were reopened on January 27, 2018. A second proclamation issued was effective on January 31, 2018, which opened up the remaining internal waters – those north and east of the Highway 58 Bridge to the North Carolina/Virginia state line – for the setting of pots.

Data Collection and Analysis – Each crew was required to carry a Samsung Galaxy Tablet equipped with a custom data collection program that was built using a free program from “Cybertracker.” Created for data collection in remote locations where wireless internet and cellular data signals are not readily available, the program utilizes existing satellite networks. If a crew experienced a tablet or software malfunction, each was equipped with backup data sheets that could be used to manually write down the GPS coordinates of the encountered pot; other data would not be collected in this circumstance.

Watermen participants recorded physical and geographical attributes of each crab pot retrieved, including: (1) GPS coordinate, (2) pot condition (e.g., whole versus partial), (3) whether the pot was in a reusable condition (4) number of live and dead finfish and blue crabs. Maps depicting the number of pots retrieved were created using ArcGIS software.

A select number of crews (5 total) attempted to use a Garmin echo MAP 74sv side-scan sonar to aid in recovery efforts of submerged pots, as weather and time allowed. Various retrieval methods required grappling hooks and snag lines. Since 2014, these retrieval methods and equipment were designed and created by watermen (who volunteered time and materials) from different areas of the coast.

Results

Lost Fishing Gear Recovered - Thirty-eight, two-person crews retrieved a total of 3,496 lost crabs statewide (Figure 1 and Appendix A).

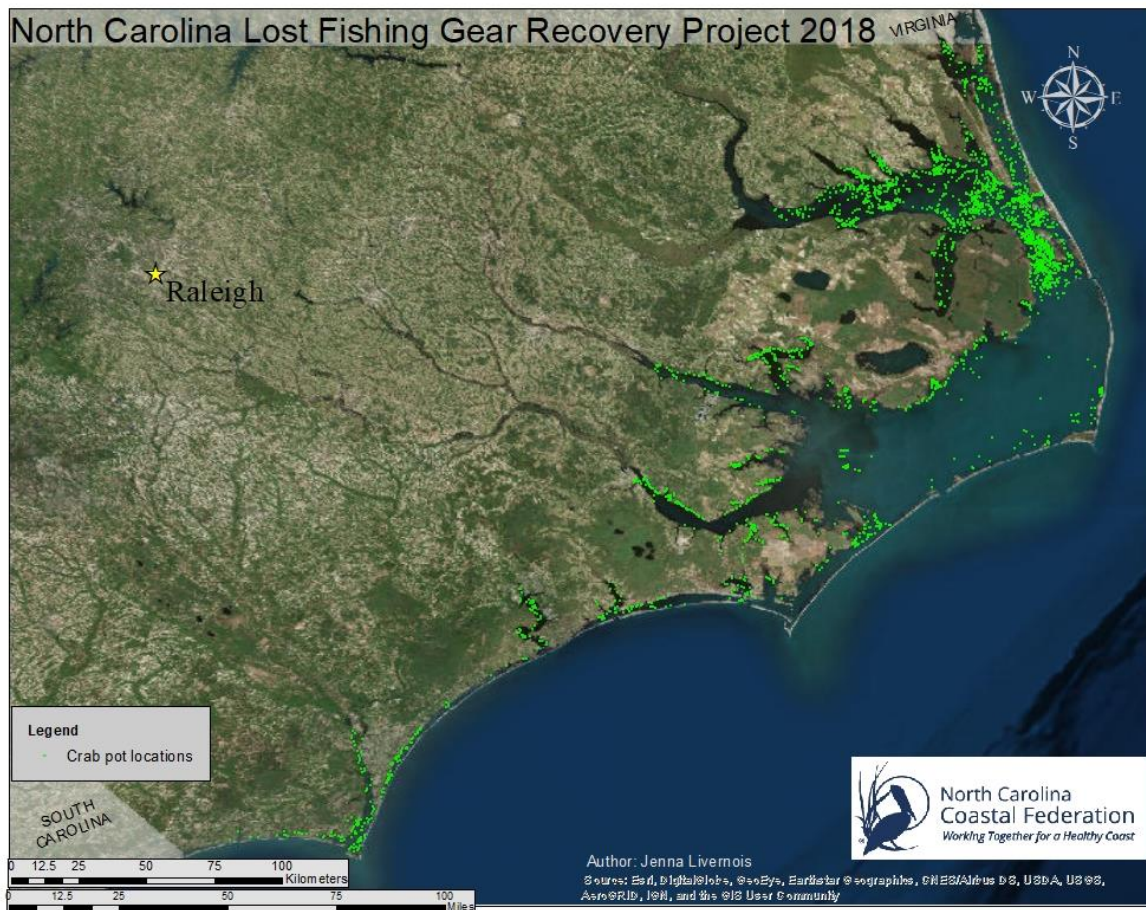


Figure 1. Map showing the entire North Carolina coastline and numbers and locations of lost crab pots (n=3,496) retrieved by 38 watermen crews over the period spanning January 17 -27, 2018.

The five watermen crews that set out to use side scan sonar to identify submerged pots successfully retrieved 28 crab pots. Additionally, four pots were located using side scan methods and were unable to be removed from the water due to weather, safety or simple logistics.

Separated out by Marine Patrol Districts, the average number of lost crab pots retrieved by boat over the course of the cleanup period was: 94 crab pots/boat in District 1; 126 crab pots/boat in District 2; 41 crab pots/boat in District 3.

Total project costs were \$100,000. With 3,496 derelict crab pots collected, the cost per pot recovered was \$28.60. Of the \$100,000 project budget, the total amount that went to third parties was \$76,301.00

A total of 138 volunteers removed an estimated 1.7 tons of marine debris. In District 1, select areas of Kitty Hawk Woods, which is managed by the N.C. Coastal Reserve, were the focus of the cleanup. Here, forty volunteers collected an estimated 1,500 pounds of debris, 475 pounds of which was recycled. The

District 2 cleanup took place at the Hoop Pole Creek Preserve in Atlantic Beach, where eighty volunteers removed an estimated 1,400 pounds of debris. In District 3, eighteen volunteers removed an estimated 500 pounds of debris from Morris Landing Clean Water Preserve in Holly Ridge.

Bycatch Encountered –There was no evidence of sea turtles or diamondback terrapins in any retrieved pots. Of the 3,496 retrieved, 405, or 11.5%, were considered “partial pots,” consisting of only one or all of the following: buoy, line or pot iron. These categories of partial pots were removed from bycatch analysis. An additional 147 crab pots were removed from bycatch analysis, as the crew was unable to record contents due to data tablet error. In total, 2,944 whole, or intact, crab pots were retrieved and used for bycatch characterization.

Out of the 2,944 intact pots retrieved, 1,852 (63 percent) were free of bycatch. Within the remaining pots, a total of 2,413 blue crabs and 761 finfish had been captured as a product of ghost fishing (Figure 2). A total of 1,531 blue crabs were dead, versus 448 dead finfish; combined 62% of all the bycatch was dead (n=3,174). A total of 882 blue crabs and 313 finfish were released alive.

Watermen also had the option of recording additional observations. Other species not officially tracked, but observed by some as bycatch included: stone crabs, spider crabs, conch, eels and a duck.

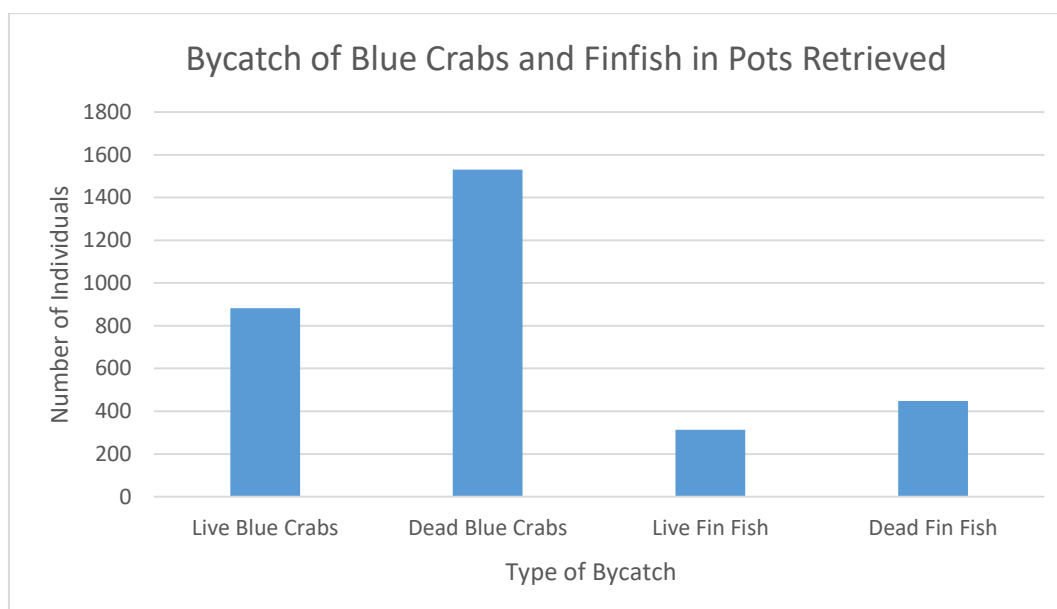


Figure 2. Breakdown of bycatch observed in intact crab pots retrieved (n=2,944).

Analysis of Reuse of Retrieved Pots – Members of the N.C. General Assembly suggested collecting additional data on pots retrieved to better understand the number of pots, if any, could be reused. The term “reused” is defined here as any pot that is in good condition and able to “fish, as is” for another season or more. This judgement call was made by watermen. Of the 2,425 whole pots, 1,555 (64%) could be reused.

Conclusions

Fishing Gear Recovery – In comparison with other years, the cleanup in 2017 yielded the highest number of pots retrieved statewide since 2004. The higher number of pots retrieved could be associated with two factors: weather and expanded search efforts by project crews statewide. In 2016, there were several weather events that brought extremely high winds and flooding to coastal fishing waters at a time when commercial crabbers were actively fishing crab pots (Hurricane Matthew, October 8-9, 2016). The 2017 hurricane season spared the North Carolina Coast, thus it was expected to encounter a decreased number of pots retrieved during the 2018 cleanup.

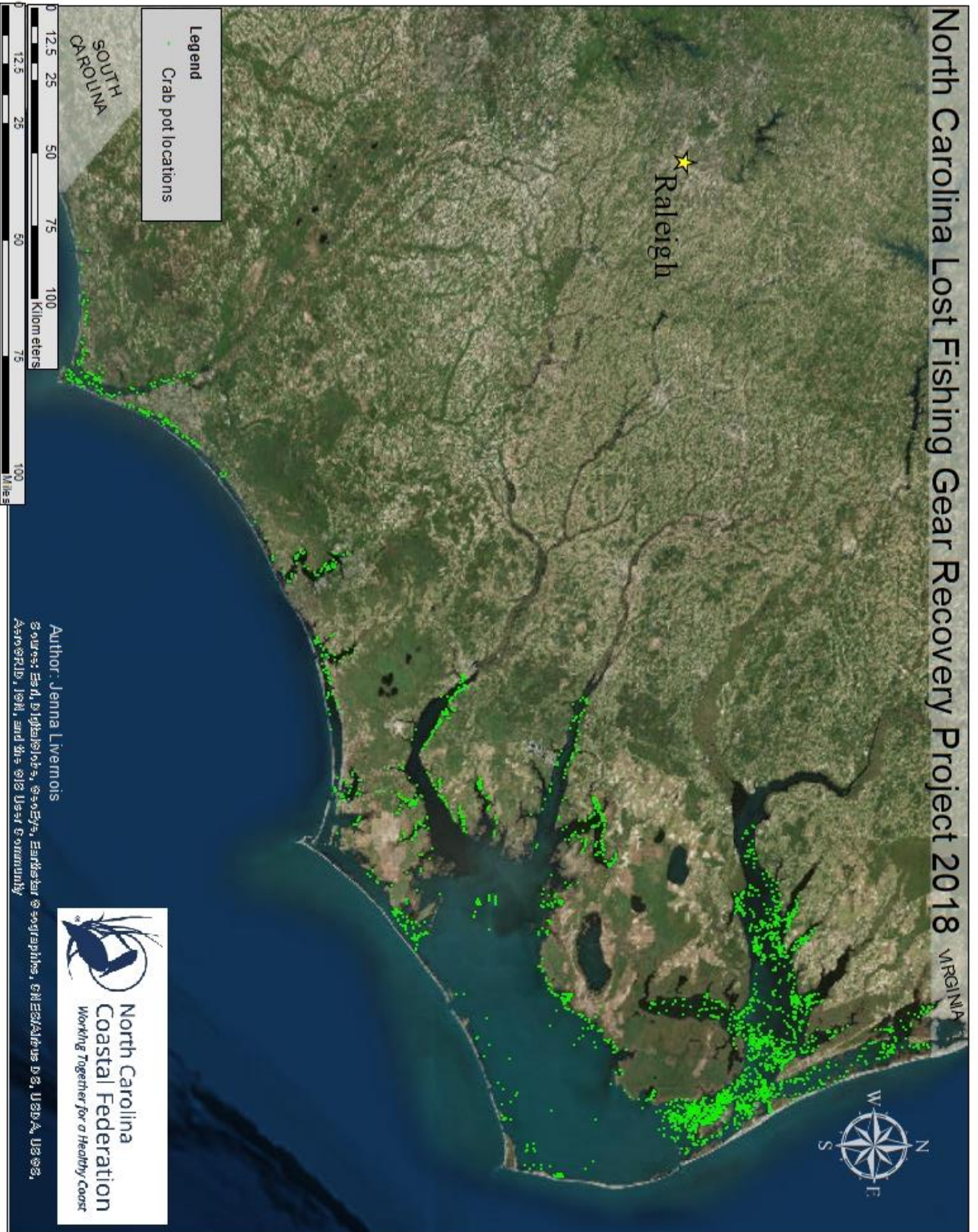
The partnerships between the N.C. Coastal Federation, N.C. Marine Patrol and commercial watermen have resulted in another successful Lost Fishing Gear Recovery Project statewide. The highest number of watermen were contracted for the cleanup work in 2018, since these partnership efforts began in 2014. Funding from the N.C. General Assembly has enabled this project to both continue and expand.

Recommendations for Future work – In a follow-up meeting with District 1 N.C. Marine Patrol (6/4/2018), it was suggested to hire a greater number of watermen for the next project cycle. Even with watermen dispersed statewide, and all areas covered, it was suggested to have more time spent searching in the middle of the sounds, especially Pamlico Sound. It is also encouraged to have watermen overlap their routes, as a change in wind direction can turn over and uncover pots repeatedly. N.C. Marine Patrol also made recommendations to improve methods for the collection of crab pots at the end of the project, and requested assistance from the watermen to help with moving and offloading to the scrap yards to increase efficiency.

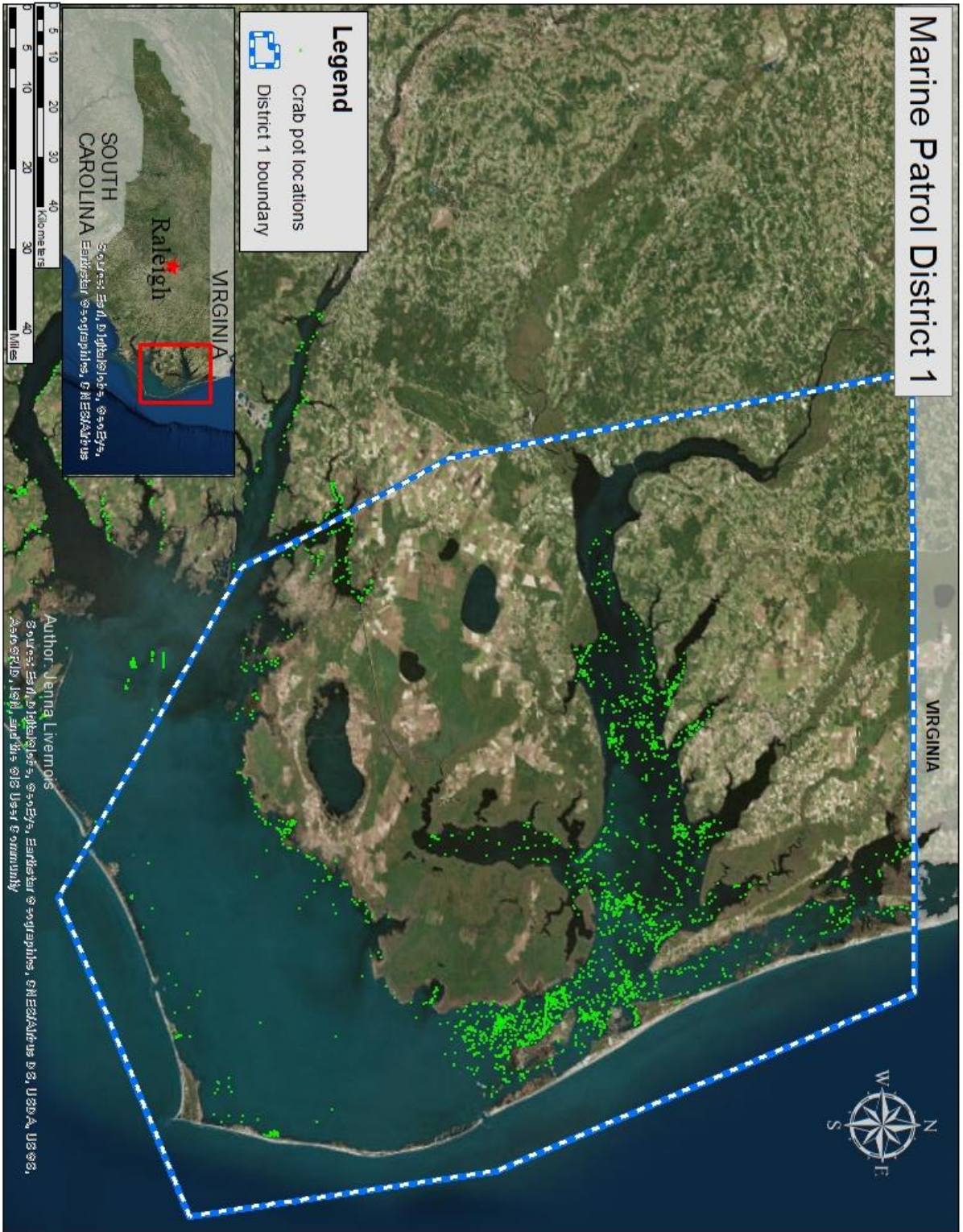
Conversations were held with select watermen and N.C. Marine Patrol exploring the possibility of selling the recovered crab pots in an effort to create supplemental funding for the project going forward. Some watermen did not support this idea, as it would cause greater confusion in proper ownership of crab pots. They had concerns about theft and dishonesty with the change of ownership through this approach. Though feedback was not gathered from all participating watermen. N.C. Marine Patrol attempted the resale of recovered crab pots in 2005; power washing the re-usable pots and gathering them on the central coast to auction them off in blocks. Those that were involved stated that the re-sale efforts were unsuccessful; they were not able to auction off all the recovered pots and most were hauled off in the end and scrapped. As the value of an individual crab pot has greatly increased since that attempt, and it is predicted the re-sale of recovered pots may be more well received.

The N.C. Coastal Federation continues to monitor and analyze the success of oyster reefs built using re-purposed crab pots, around Roanoke Island, to determine the effectiveness of using crab pots for restoration efforts. Sites will be monitored in the summer of 2018.

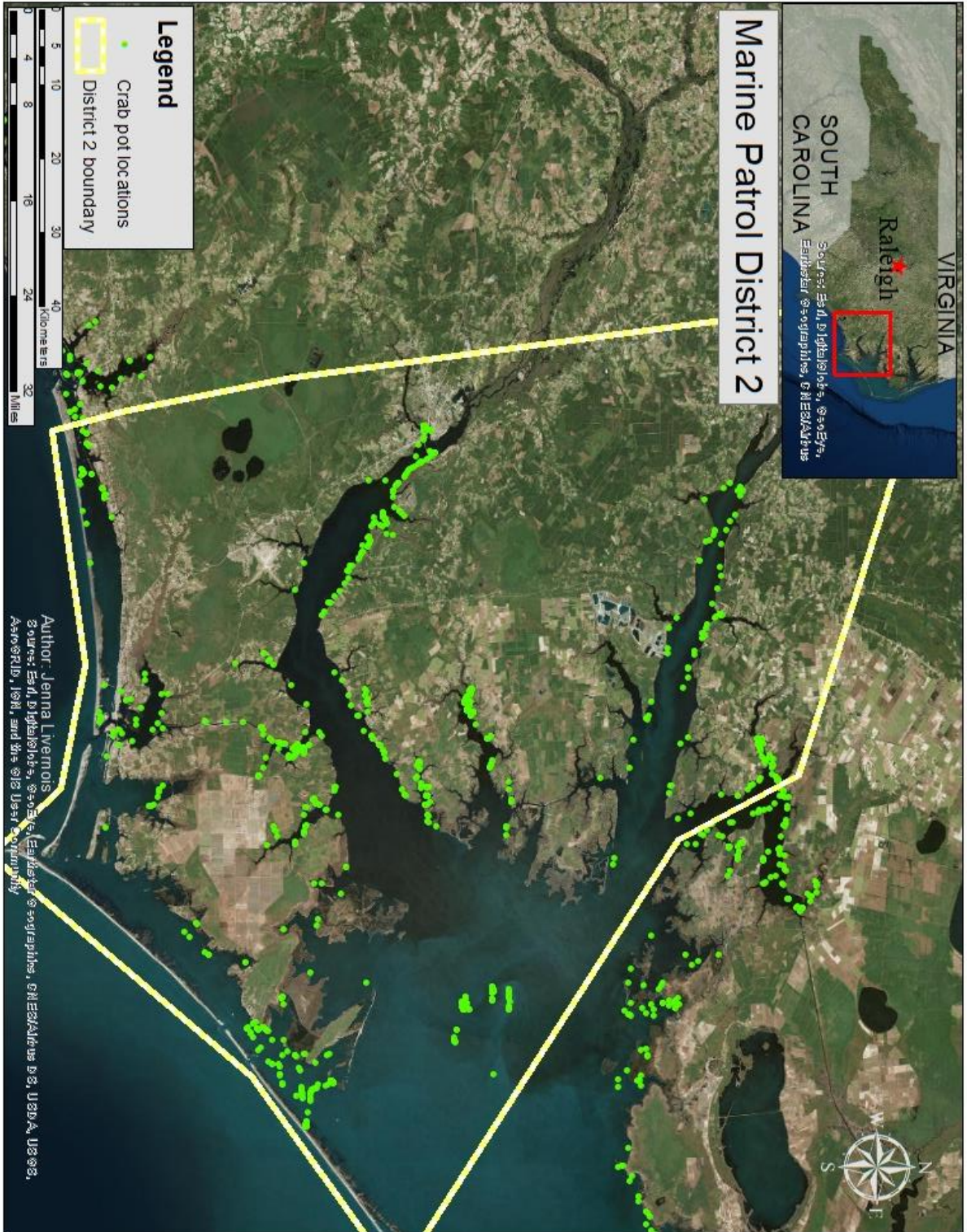
Appendix A. Map of Pots Collected statewide



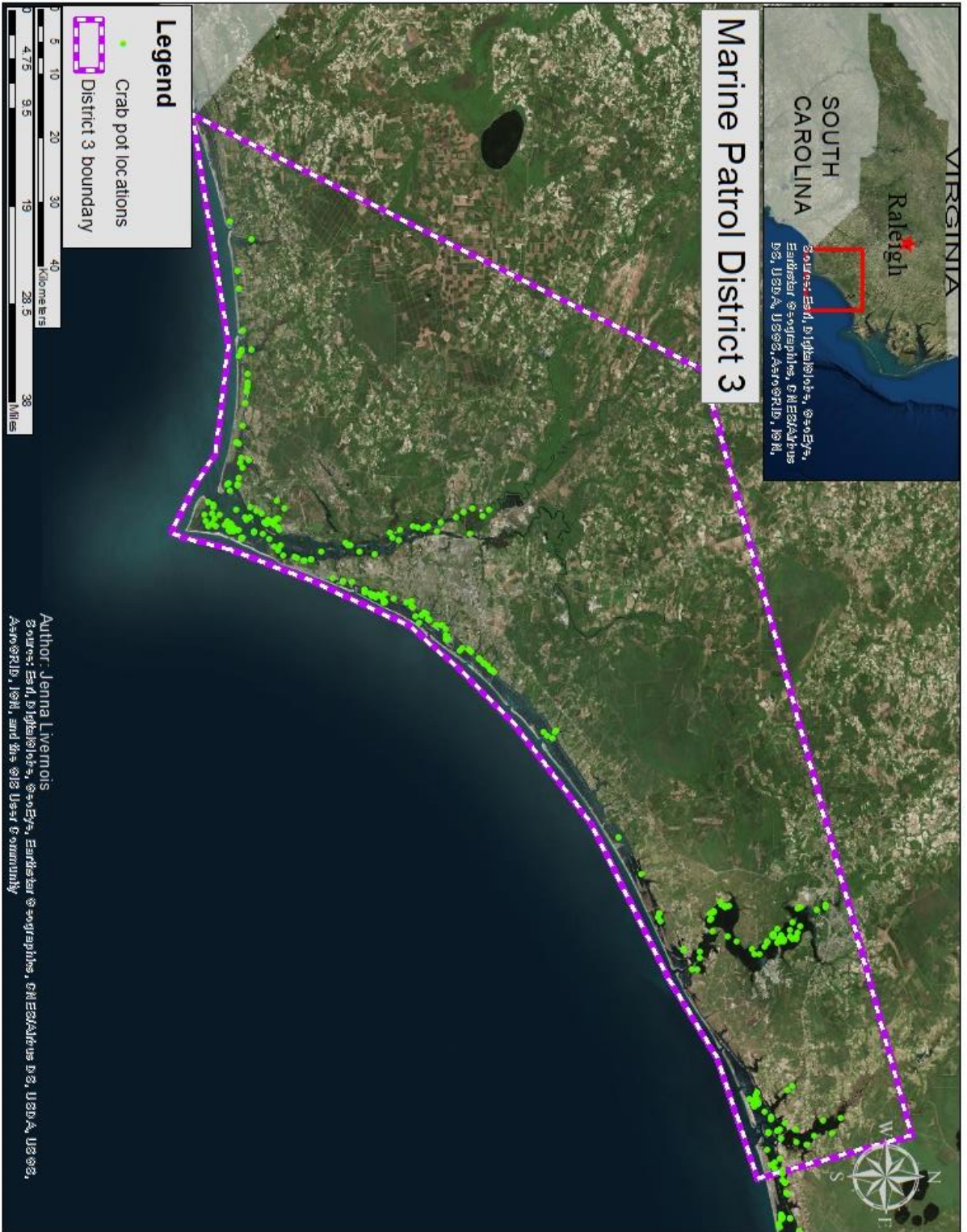
Appendix B. Map of Pots Collected in District 1



Appendix C. Map of Pots Collected in District 2



Appendix D. Map of Pots Collected in District 3



Appendix E. Map of Acres Covered During Lost Fishing Gear Recovery Project 2018

