

## Protected Species and NC Commercial Fisheries: Observers and Federal Permits Maintain Access to Traditional Fisheries

By Sara Mirabilio and Scott Baker

### Protecting Imperiled Species

If a plant or animal is facing severe population loss, the species can be protected through listing under the federal Endangered Species Act, or ESA. Plants or animals close to extinction become classified as “endangered.” The second-most severe conservation status is “threatened.”

Once listed, a “take” of an endangered or threatened species without a federal government permit is illegal, regardless of who you are or the business you are conducting. This law applies to even those activities that happen on private or public lands in North Carolina or in state waters.

A take is to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect a protected species.”

The federal government may make an exception and allow a small number of incidental takes during a lawful activity if a permit applicant develops an acceptable species conservation plan. Through what’s called an Incidental Take Permit, or ITP, federal scientists allot a number of incidental takes, called an authorized take limit, which will not greatly reduce the recovery rate of a protected species.

For coastal and marine species, such as those shown in Figure 1, the permit applicant must provide scientific justification and data to the National Oceanic and Atmospheric Administration’s Fisheries Service, known as NMFS, to help officials decide the number of incidental takes to authorize under the ITP.

### Steps to Maintain a Fishery

In July and November 2009, NMFS notified the State of North Carolina that its estuarine gill net fisheries for southern flounder would be subject to federal closure unless the state addressed unauthorized takes of sea turtles occurring in the fisheries. Further, in January

#### ENDANGERED



Atlantic Sturgeon



Hawksbill



Shortnose Sturgeon



Kemp's Ridley



Leatherback

#### THREATENED



Loggerhead



Green

**Figure 1.** In North Carolina coastal waters, two species of fishes and five species of sea turtles are protected under the federal Endangered Species Act, or ESA. Each protected species appears above, grouped by its ESA status — endangered or threatened. Endangered species occur much less frequently in N.C. coastal waters than threatened species. Source: U.S. Fish and Wildlife Service, [www.fws.gov/raleigh/es\\_tes.html](http://www.fws.gov/raleigh/es_tes.html). Illustrations copyright Garth Mix (turtles), Duane Raver (sturgeon).

2012 NMFS listed under the ESA a population segment of Atlantic sturgeon that occurs in North Carolina.

When it comes to protected species, the N.C. Division of Marine Fisheries, or DMF, must follow federal regulations. At the state level, DMF manages marine and estuarine fisheries and habitat for the benefit of all North Carolina residents. In an effort to maintain commercial fishing activity in the face of interactions with protected species, DMF applied for and received two ITPs for anchored gill nets in estuarine waters – one for sea turtles, and the other for Atlantic sturgeon. Due to the rarity of shortnose sturgeon in North Carolina waters, the species was not included in the Atlantic sturgeon ITP. These permits allow North Carolina fishermen to continue to fish anchored large- and small-mesh gill nets that may interact with these protected species in estuarine waters.

Georgia is the only other state to have an ITP for a commercial fishery. That ITP is for sturgeon takes in the commercial shad fishery. State officials in New York, Maryland and Hawaii have previously considered ITPs for their fisheries.

While DMF may hold permits that allow fishermen to proceed with commercial fishing, the state is required to minimize harm to the protected species during commercial fishing.

**Two major requirements of the species conservation plan for each ITP are:**

1) have someone observe a portion of inshore gill net fishing activity – at the very minimum, 7 percent of large-mesh fishing and 1 percent of small-mesh fishing; and

2) require gill net fishermen to obtain an Estuarine Gill Net Permit, or EGNP, each year before fishing.

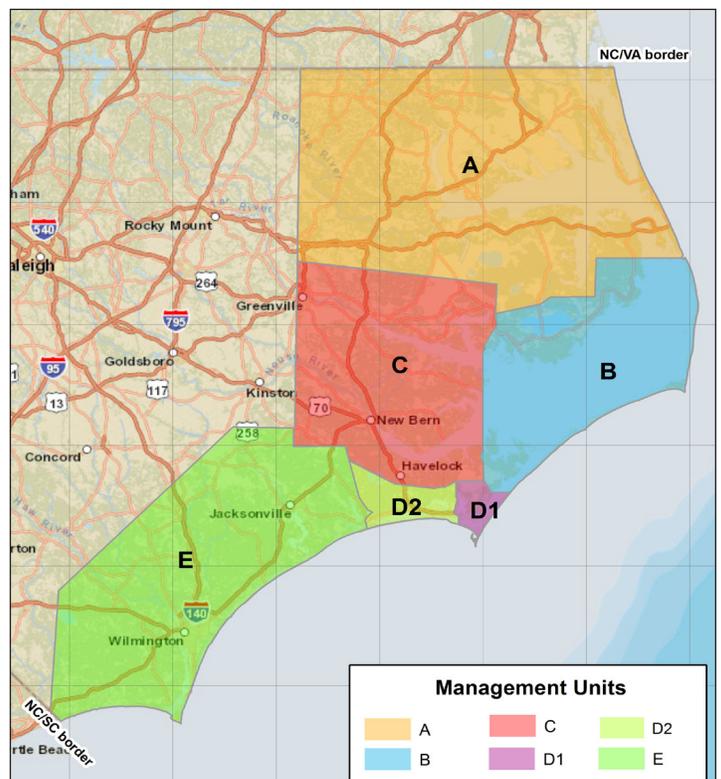
*Note: It is important to read the Specific Permit Conditions document each time you receive an EGNP to make sure you are aware of all the requirements of the permit and avoid receiving a Notice of Violation.*

### Observers Improve Data Quality

Trained observers provide DMF with independent and standardized information on protected species interactions, fishing effort, gear characteristics and fish populations. Observers perform duties in ways to minimize interference with fishing operations. With each observer following the same scientific protocol, DMF will gather the best available information on protected species interactions while collecting valuable biological data on other managed finfish species. The DMF observer coordinator can deploy observers to monitor

fishing operations wherever state officials identify data needs.

The conservation plan for sea turtles includes managing inshore gill net fisheries by dividing estuarine waters into six management units (A, B, C, D1, D2, E), as shown in Figure 2. The management unit approach allows the DMF director to use proclamation authority to prohibit gill net fishing in management units where incidental takes approach the authorized limits – rather than closing all inshore gill net fishing. Each of the management units is monitored seasonally and by fishery. Management units were delineated on the basis of three primary factors: similarity of fisheries and management; extent of known protected species interactions in commercial gill net fisheries; and unit size and the ability of observers to monitor fishing effort.



**Figure 2.** The North Carolina coast is divided into six management units based on differences in where fish are caught and water characteristics. This allows DMF to close a single management unit – as opposed to all of the state’s estuarine waters – to gill nets when that unit’s authorized number of incidental takes for Atlantic sturgeon or a species of sea turtle is approached. Source: N.C. Division of Marine Fisheries.

### Snapshots Reveal Big Picture

Observers cannot be on all fishing trips all the time. Because Observer Program resources are limited, DMF uses an approved statistical approach to observe a portion of trips and provide an estimate of takes (if any) that occur on fishing trips that do not carry an observer.

The DMF observer coordinator knows where to send observers for trips, in part, by DMF annually issuing an EGNP to every commercial and recreational fishermen who plans to inshore gill net. North Carolina Trip Ticket Program data also are used to verify fishing activity. Observers schedule trips with fishermen randomly selected from the permit pool. Full observer coverage is not required because DMF staff can understand what is going on in the fisheries by sampling a portion of fishing activity and applying a statistical model.

As an example, on average do you need to eat a whole bowl of chicken noodle soup to know if there is chicken in it? No. By simply stirring the soup up with your spoon (to get a random sample) and then taking a few spoonfuls, you can say with a high degree of confidence whether the soup has chicken.

Similarly, fisheries observer coverage usually is applied to a random sample of the total trips. Statistical models allow scientists to predict what will occur in the unobserved trips based on what happened in the observed trips. For the sea turtle and Atlantic sturgeon ITPs, the most important pieces of information needed to make predictions with a high degree of accuracy are:

- 1) information about the number of fishing trips (by season, locations and yardage); and
- 2) the extent of known protected species interactions, with identified protected species incidental takes coming from data collected through the Observer Program.

Going back to our chicken noodle soup example: What if there were just a few tiny pieces of chicken in the soup? You might need to consume half a bowl before getting a piece of chicken and being able to say with confidence it is chicken noodle soup. Similarly, the more infrequent the species of interest is, the more observed trips – the more spoonfuls of soup – are required to produce an accurate or true account of whether protected species are in unobserved fishing areas.

Sea turtle and Atlantic sturgeon interactions with commercial gear inside North Carolina coastal waters are infrequent, as shown in Table 1. Thus, a minimum

**Table 1.** Total sea turtle takes (statewide, all species, per year) as observed in a sample of large- and small-mesh gill net fishing trips. Source: N.C. Division of Marine Fisheries.

Year	Observed Trips	Sea Turtle Takes
2010	695	48
2011	946	27
2012	1,032	26
2013	926	31
2014	1,339	34

percentage of fishing effort must be observed to get an accurate estimate of incidental takes.

### Applying Observer Data

NMFS sets incidental take limits by considering DMF data, among other things. At the time DMF applied for the two ITPs, Observer Program data were limited for the entire state. In instances where sufficient data were available, DMF could use statistical models to predict the number of incidental takes for all estuarine gill net trips over the course of a year. However, some management units lacked sufficient observer data to predict incidental takes of protected species across the entire fishery.

In situations where there were insufficient data or poor model predictions, actual observed takes documented by observers in previous years (a very low number), not predicted takes (a much higher number), had to be used for management decisions. This combination of observations and estimations resulted in incidental take limits that were lower, in total, than what might have occurred if DMF staff had been able to use statistical models to estimate the number of takes for all protected species within all management units.

DMF staff know whether they have sufficient observer data to make model predictions by calculating a ratio called the coefficient of variation, or CV. The CV shows the extent of variability in relation to the calculated average size of the protected species population. A model that has 20 percent or less unexplained variability, or having a CV equal to 0.2, is considered a ‘good’ model. Table 2 shows the number of trips needed to achieve the 20 percent precision levels for green and Kemp’s ridley sea turtles, assuming fishing effort similar to that which occurred in 2010.

In the seasons and management units shown in Table 2, actual observed trips were never enough to achieve a 20 percent precision level. Also, because Kemp’s ridleys were rarer than green sea turtles in North Carolina inshore waters in previous years, the number of needed observed trips to get a 20 percent precision level for that species model was significantly higher than for green.

Generally, the frequency of protected species interactions is variable, with the rarer species having more restrictive authorized take limits. In some instances, DMF must close a management unit based on just a single species approaching its authorized take limit in that unit. In 2010, when submitting the ITP application for sea turtles, there were too few observations of loggerhead, hawksbill and leatherback turtles to support modeling at all.

**Table 2.** Example of actual versus needed observed trips in North Carolina’s large-mesh estuarine gill net fishery to achieve 20 percent unexplained variability in green and Kemp’s ridley predictive population models. Numbers are based on 2010 fishing effort by season and management unit. Source: N.C. Division of Marine Fisheries.

Sea Turtle Species	Season	Management Unit	Actual Observed Trips	Needed Observed Trips
Green	Summer	B	35	41
Kemp’s Ridley	Summer	B	35	151
Green	Summer	E	53	276
Kemp’s Ridley	Summer	E	53	488
Green	Fall	B	189	218
Kemp’s Ridley	Fall	B	189	672
Green	Fall	E	53	268
Kemp’s Ridley	Fall	E	53	633

**Future for Observer Program and Fishermen**

In 2013, the North Carolina legislature appropriated \$1.1 million for the Observer Program for fiscal year 2013-14. They approved a 25 percent increase in commercial fishing license fees beginning in fiscal year 2014-15 to fund the program in the future. The legislature instructed DMF to seek public input and develop a plan for additional funding for the program.

In February 2014, the N.C. Fisheries Association presented a proposal to the N.C. Marine Fisheries Commission, or MFC. The MFC accepted and approved that plan to establish a Commercial Fishing Resource Fund to receive revenues from a 100 percent increase in fees for six commercial fishing licenses. The 100 percent increase was based on fiscal year 2013-14 license fees.

Money from the increased fees will go into a Commercial Fishing Resource Fund to pay for observer coverage to fulfill the state’s obligations under the ITPs. Additional money from the fund will be used for other projects to develop and support long-term viability of commercial fishing in the state.

As the Observer Program continues to operate, more and more data will be collected. This eventually will allow DMF to build more accurate models to predict incidental takes based on observations. The ITPs come up for renewal in 2023. A more robust data set also

will help fisheries management discussions, including incidental take requests for sea turtles, sturgeon or perhaps other as-yet-to-be-identified species of concern. The longer the Observer Program remains operational, the better prepared DMF and the commercial fishing industry will be in addressing future bycatch and protected species issues and concerns.

**Self-Reporting Requirement**

In addition to the Observer Program, self reporting is another requirement of the ITPs. When fishing without an observer, it is important that commercial and recreational fishermen using gill nets in estuarine waters call DMF to report an interaction with a sea turtle species or an Atlantic sturgeon.

This will not count as an incidental take under the ITP guidelines. Self reports will, however, help DMF biologists improve understanding of protected species behavior and habitat use in North Carolina waters, so DMF can work with fishermen to avoid “hot spot” areas.

To report a sea turtle species or Atlantic sturgeon take, call DMF at 800-682-2632.

**For More Information  
North Carolina Sea Grant**

[ncseagrant.ncsu.edu/observer\\_program](http://ncseagrant.ncsu.edu/observer_program)

A video is available that explains the Observer Program.

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[portal.ncdenr.org/web/mf/observers-program](http://portal.ncdenr.org/web/mf/observers-program)  
252-726-7021 or 800-682-2632

**NOAA Office of Protected Resources**

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