Preliminary Examination of Available Information on the Capture of Turtles Incidental to Fishing in Southeast U.S. Waters

By

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Executive Summary

- NMFS observer data are available on the capture, release of live turtles for the domestic longline fishery. No mortalities have been reported, although the subsequent condition and fate of turtles released alive is unknown.

- Fisherman in North Carolina voluntarily report incidental capture of turtles in pound nets, longline, long hauling, and trawling fishes.

- Stranding data recently provided circumstantial evidence on the capture and mortality of turtles incidental to the North Carolina summer flounder fishery. Capture was confirmed by state observers. TED's, as modefied and tested by NMFS gear specialists from Pascagoula demonstrated that this gear is effective in significantly reducing turtle capture and mortality.

- Pound net fishermen off North Carolina report significant turtle captures and live releases, as compared to relatively high incidental mortality by Chesapeake Bay pound net entanglement suggesting that smaller mesh sizes prevent prolonged submergence and death.

- The only approach available to verify and quantify turtle capture and mortality is through the placement of observers on vessels.

I. Introduction

An examination of SEFC data on the take of turtles incidental to non-shrimp trawling fisheries was completed. Published reports and unpublished data were reviewed for both the Atlantic from North Carolina to Florida and the Gulf of Mexico. Information from the Gulf of Mexico includes data from the now defunct Japanese longline fishery, the more recent domestic longline fishing, and the very limited butterfish fishery. In the Atlantic information is primarily available from pound net fishery of North Carolina.

An examination of stranding data collected over the past 10 years was completed to determine the feasibility of utilizing these data define the relative extent of fisheries related mortality throughout the region. The primary limitation of these data is assigning cause of death. Whether entanglement occurred before or after a turtle died, is not known and cannot be ascertained through histopathological examination of the tissues. Thus, stranding data are circumstantial unless the entanglement was directly observed and reported as such.

II. Fishery Interactions

A. Gulf of Mexico

1. Surface Longline Fishing

The take of turtles incidental to longline fishing has been documented (Thompson, Jr. 1982; Reese 1983; Witzell 1984; M. Grace 1990 unpub. data NMFS Pascagoula Laboratory). Witzell (1984) provides a review of data on turtle take incidental to the Japanese bluefin tuna longline fishery in the North Atlantic from 1978 through 1981. Observer reports and logbooks provided the data summarized by Witzell (1984). As reported by Witzell (1984), of a total 57 turtles captured, 30 (53% of total) were caught in the Gulf of Mexico. Of these 30, 12 (40%) were identified as leatherback turtles and for the remaining 18 (60%), species was not included. Of these 30 total, 28 (93.3%) were released alive. Eleven (92%) of the 12 leatherbacks were released alive. Twenty-six turtles (87%) were caught within an area that represented 56.1% of the total fishing effort in the Gulf of Mexico. Witzell (1984) estimated catch rates as defined as turtles caught per 10,000 hooks (1805) and expanded this over the total effort in hooks from 1978-1981 (11,329,069) to derive a value of 204 turtles captured over this four year period. These could be apportioned as 82 leatherbacks (40%) and 122 unknown (60%) based on observed proportions. More recently, observers have been placed on domestic longline vessels from May 1985 to

March 1986, and from October 1987 to the present. The domestic effort in directed at yellowfin tuna, sharks, and swordfish. These data were summarized by area which includes the Gulf of Mexico; the "South Atlantic" defined as from North Carolina to South Florida; the "North Atlantic" from Virginia to Maine; and U.S. Caribbean waters off Puerto Rico. Within the Gulf of Mexico, 4 turtles were captured and released alive from 8 trips totalling 70 observer days and 43 sets. Since October 1987, an observer program on domestic longline vessels is continuing in the northern Gulf funded by MARFIN, to Louisiana State University (LSU). During this period, 2 turtles were captured; both were identified as leatherback turtle; both were released alive; and both were caught during swordfish longlining. These data bases include positional and effort information such that CPUE estimates could be developed and stratified by space and time and probably compared with these of Witzell (1984). The fate of turtles released "alive" is unknown. Turtles will probably be impacted if they swallow hooks and these remain in turtles or lines are cut leaving hooks in turtles. Thus, even though turtles are released alive, mortalities may occur which cannot be detected through our stranding network.

2. **Bottom Trawling**

The Pascagoula Laboratory directed an in-house observer program on butterfish vessels from 1986 through 1989 (M. Grace 1990 unpub. data). Thirteen vessels participated in the observer program and during 1,291 observed tows, 1 loggerhead turtle was captured and released alive. The turtle was captured and released about 30 miles south of Pascagoula, Mississippi in 26 fathoms of water. Over the four year observe period, it was estimated that over 3,000,000 pounds of butterfish were landed. By 1990 it was determined that this fishery included only one vessel operating out of Mississippi. The extent of this fishery is so limited that at this time it is not a risk to turtles.

B. **Atlantic**

Fisheries operating within the southeast U.S., (North Carolina to Florida) were evaluated from the North Atlantic. The Caribbean SEA has been included, and only includes waters off Puerto Rico.

1. **Surface Longline Fishing**

During the Pascagoula Laboratory observer program for the domestic yellowfin fishery referred to previously, 4 turtles were reported captured and released alive from the Caribbean. These turtles were captured on 2 observer days and 34 sets.

The same potential for mortality exists with this fishery as with the Gulf of Mexico longline effort.

2. **Pound Nets**

Since 1988, the Beaufort Laboratory has tagged marine turtles in Pamlico and Core Sounds, North Carolina through the cooperative efforts of pound net fishermen. Since 1988, a total of 134 turtles have been captured. Of these 134 turtles, have been recaptured once, and one has been recaptured seven times. Of these 134 turtles, 93 (69%) were loggerhead; 15 (11%) were Kemp's ridley; and 26 (19%) were green turtles, 2 of which were reported as dead. These two dead green turtles were also reported to the STSSN as cold-stunned and both turtles were captured in December 1989 in Pamlico Sound. Cold-stunning is not an unreasonable assumption since December waters off North Carolina are relatively cold for this tropical/subtropical species.

Perhaps, the combined stress from capture and sudden change in water temperature may have acted synergistically to result in death.

Notably, the mesh sizes used by North Carolina pound net fishermen range from 2 inch to 6 inch stretched mesh. Bellamund et al (1987) report on the catch and mortality of

turtles in the Chesapeake Bay pound net fishery. These nets were either of 6-12 inch stretched mesh or 12-16 inch stretched mesh. In 1983 and 1984, Bellamund et al (1987) reported that 57 turtles became entangled and died in pound nets. The very low mortality reported from North Carolina is likely attributed to the very small mesh sizes used which probably entangle flippers rather than heads and thus, avoids prolonged submergence. The best available information suggests that pound nets may be a significant cause of turtle mortality in the Chesapeake Bay while turtles are not killed in North Carolina pound nets. Verification of this requires an observer program.

3. **Summer Flounder Bottom Trawling**

The winter extension of the summer flounder fishery includes North Carolina waters. During the week of Dec. 2, 1990 about 50 turtles stranded along North Carolina beaches coincidental to the opening of this bottom trawling fishery in state waters to up to 15 vessels.

Examination of high-resolution sea surface temperatures from satellites that are received routinely by the Southeast Fisheries Center through NOAA's Coastwatch Program indicated the presence of an intrusion of extremely warm Gulf Stream water along the North Carolina coast from Cape Hatteras to Cape Lookout. It is hypothesized that this warm water

provided a haven for both fish and turtles, concentrating them along the beach.

On December 7, 1990, the State of North Carolina closed state waters for finfish trawling from Cape Hatteras to Ocracoke Inlet. Turtle strandings ceased at this time.

Experimental trawling by the State of North Carolina using a commercial vessel confirmed a large number of turtles in the area. Catch rates averaged one turtle for every 3-4 hours of trawling.

Aerial surveys were conducted by North Carolina using trained observers from the Southeast Fisheries Center and by scientists from VIMS. These surveys indicated that large numbers of turtles were present from Cape Hatteras to Cape Lookout, extending into the EEC.

Assistance was requested from the Southeast Fisheries Center by North Carolina to modify an existing TED to allow exclusion of turtles and retention of flounder. A test of a modified TED was made in the affected area. During 12 hours of trawling aboard a commercial vessel, three turtles were caught in the standard net and none were caught in the TED-equipped net. The flounder catch in the TED-equipped net was only about 6% less than in the standard net when a Southeast

Fisheries Center accelerator funnel was used. The states of North Carolina reopened the closed area to finfish trawling on December 26, 1990. Each vessel was required to use the modified TED and to keep a logbook to evaluate its effectiveness. Staff from the Southeast Fisheries Center are providing assistance to local net makers on proper installation and use of the modified TED.

Monitoring of the affected area continues. The Southeast Fisheries Center is providing observers for aerial surveys and also is monitoring sea surface temperatures. North Carolina plans to require the use of TEDs in this area until decreasing water temperatures force the turtles offshore and/or south.

C. **Stranding Data**

Data collected on turtles that wash up along the coastline are reported to the SEFC Turtle Stranding and Salvage Network (STSSN). In addition, turtles captured alive and dead incidental to fishing activities are reported opportunistically. Over the period 1980 through 1989, a total of 16,574 turtles have been reported to the STSSN. These reports are provided to the STSSN via a state coordinator responsible for data verification. Capture or entanglement by fishing gear has been reported for 378 (2%) turtles captured by 13 different fishing gear types (Table 1). All turtles were reported as captured and released alive.

Miscellaneous Data

North Carolina Fisherman have voluntary reported a few captures incidental to fisheries other than pound netting. These include long trawling (8 turtle), trawlers (5 turtles), gill nets (3 turtles) and longline (1 turtle). All were reported as captured and released alive.

Conclusions

An examination of available observer data for longline fishing indicate that turtles, primarily leatherbacks, are captured and released alive. However, the fate of these released turtles is not known and cannot be determined without observers on vessels. Pound net fishermen in North Carolina also captured turtles and report releasing them alive. This take would be verified via an observer program. Pound nets fishermen in Chesapeake Bay report significant mortalities and use nets of larger mesh size than those used by North Carolina fisherman. A recent occurrence of turtle strandings and observer data indicate that the summer flounder fishery resulted in turtle mortalities off North Carolina. This take was first suggested via strandings and verified by the state with observers. This fishery extends north from North Carolina and the extent of turtle captures and mortality outside of NC waters is not known. Observer coverage is the only method available to document turtle captures and mortalities.

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