Accounting for Bycatch; a Southeast United States Perspective.

James M. Nance, Ph.D.
NOAA Fisheries Service
Southeast Fisheries Science Center
Galveston Laboratory
Galveston, TX USA
Bycatch - Discards

Incidental catch: undersized fish, non-target fish

Over-quota target species

Discards

- Market
- Target species catch
- Bycatch - valuable
- Undersized and non-valuable

Jennings, Kaiser, Reynolds
Marine Fisheries Ecology
Southeast U.S. Fisheries
Large Recreational Sector
Southeast U.S. Fisheries
Diverse Commercial Sector
Southeast U.S. Fisheries

Bycatch Example: Shrimp Trawl Fishery

1,500 Offshore Vessels (45 – 80 Feet Length)
Several Thousand Inshore Boats (<45 Feet Length)
Bycatch Technology in Shrimp Trawls
Bycatch Technology in Shrimp Trawls

Enlarged View

BRD Opening

TED Opening
Coast Guard suspends use of turtle excluder devices

By JOHN TOTH

The Coast Guard has suspended its enforcement for turtle excluder devices (TEDs) as a result of new regulations implementing a recent ruling by the U.S. Court of Appeals. The court found that the mandatory use of TEDs is not justified by the need to protect sea turtles.

As long as there are no new developments, we will not enforce the regulations.

Coast Guard Lt. Jeff Phillips

Coast Guard officials could not be reached for comment.

Mosbacher orders shrimpners to use controversial device to protect turtles

By KEN LAMBERT

The Commerce Department has ordered shrimpners to use a controversial device to protect turtles. The device, called a TED, is designed to exclude turtles from shrimp nets.

The Commerce Department has received numerous complaints from consumers and environmentalists about the use of TEDs. The department is also considering a proposal to ban the use of TEDs completely.

Group sues to require TED use

By BILL DAWSON

A group of biologists has filed a lawsuit to require the use of TEDs in shrimp nets. The group argues that the use of TEDs is necessary to protect sea turtles.

Conservationists question U.S. turtle death figures

Associated Press

Washington, D.C. - A new study by the National Marine Fisheries Service shows that the number of sea turtles killed in shrimp nets has increased dramatically in recent years.

Administration officials don't expect Bush to reverse federal TED decision

By JUDY WESSLER

The Commerce Department has no plans to reverse its decision to require the use of TEDs in shrimp nets.

"I would not expect the president to reverse the decision," said a Commerce Department spokesperson.

"We believe that the use of TEDs is necessary to protect sea turtles."
Gulf of Mexico Statistical / Depth Areas
Average Catch Gulf of Mexico Shrimp Fishery by Statistical Subareas (1960 - 2001)
Shrimp Fishery Bycatch Estimation

- Ability to estimate catch rate of bycatch
  - Offshore observer program
- Ability to estimate total effort
  - Port agent interviews / electronic logbook
Shrimp Trawl Bycatch Observer Program
Otter Trawl Configurations
Fishery observer sorting catch by species
Observer Program gives us estimate of CPUE for bycatch species
Monthly Zone Effort Calculations

Zone Landings  
---------------  =  Zone Effort
Zone Catch Rate

Landings Value is the month’s total pounds of shrimp reported by dealers to NMFS, allocated to the biological zone in question.

Zone catch rate is calculated from trip interview data (Port Agents).
Port Agent Interviews

At the end of a fishing trip NMFS port agents would interview the captain regarding the location(s) and the amount of the effort expended. Thus, a CPUE could be estimated for the trip for a particular location.
Calculation of Effort

Why is calculating effort so difficult?

- Fleet is large and are widely scattered
- Trips are often long (up to 60 days)
- Species of interest are not uniformly distributed
- Effort must be calculated for each month
- Effort must be calculated for small areas
Electronic Logbook
MultiConnect™ OCG-D Features

- External antenna for cellular communication and GPS reception
- LEDs to indicate device is communicating and GPS is valid
- Internal peripherals: GPS and cellular modem
- External interfaces: serial, USB, ethernet, and SD card memory slot
- Five year warranty from the manufacturer
- Device runs on 9V DC or 120V AC
Field Test 3:
NOAA research vessel Caretta October 2013 cruise

RV Caretta October Cruise
Vessel Speed (knots)
- < 1
- 1.0 - 2.0
- 2.0 - 3.8 (fishing)
- 3.8 - 5.0
- >5.0

Area enlarged above

Projection: Albers Equal Area Conic
Data: NOAA Fisheries Service
Map Created by Jo Williams
trip match previous study
trip match previous study
trip match previous study
trip match previous study
Interviews and ELBs gives us estimates for shrimp CPUE
Zone Landings = Zone Effort

Zone Catch Rate

Total Offshore Effort – Gulf of Mexico
Zone Bycatch Calculations

Zone Bycatch CPUE \times \text{Zone Effort}

= Zone Bycatch Estimate

\ln(\text{CPUE})_{ijklm} = \text{year}_i + \text{season}_j + \text{area}_k + \text{depth}_l + \text{dataset}_m + \text{local}_{ijklm}
Penaeid Shrimp Trawl Species Composition by Weight

Gulf of Mexico
- Atlantic Croaker (21%)
- Brown Shrimp (14%)
- Grouped Fish - Pisces (27%)
- Invertebrate (5%)
- Longspine Porgy (5%)
- Non-Shrimp Crustaceans (6%)
- Other (4%)
- Pink Shrimp (3%)
- Seatrout Genus (5%)
- White Shrimp (9%)

Southeastern Atlantic
- Atlantic Croaker (32%)
- Brown Shrimp (7%)
- Grouped Fish - Pisces (8%)
- Invertebrate (5%)
- Jellyfish Family (3%)
- Non-Shrimp Crustaceans (3%)
- Other (18%)
- Spot (8%)
- Star Drum (5%)
- White Shrimp (12%)
Shrimp Trawl:
Fish CPUE by State and Depth
Shrimp Trawl: Red Snapper CPUE by State and Depth
Questions ?