

By-catches of small cetaceans: Local solutions to a global problem



Andrew J. Read



NICHOLAS SCHOOL OF THE
ENVIRONMENT AND EARTH SCIENCES
DUKE UNIVERSITY
MARINE LABORATORY

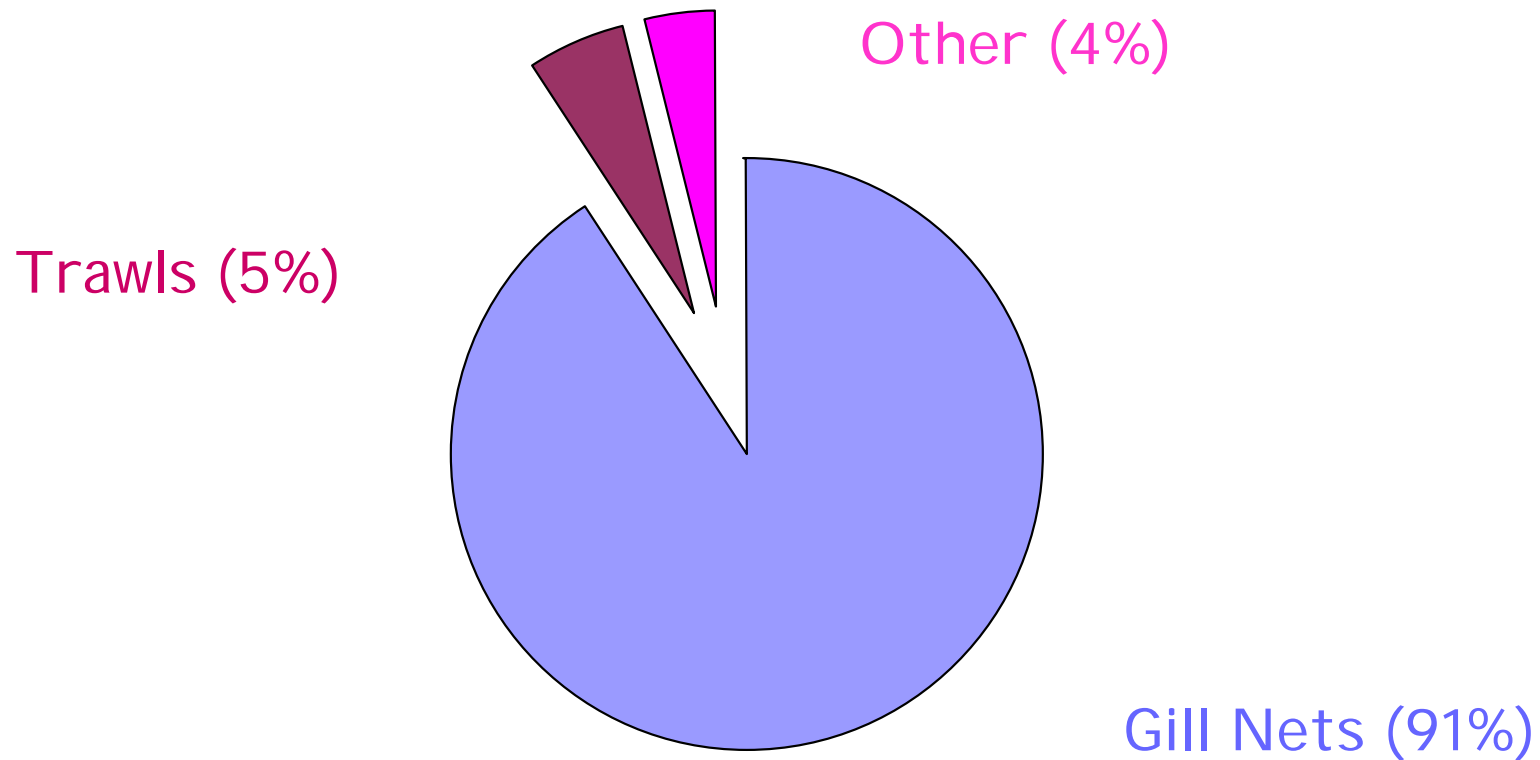
Year	Cetaceans	Pinnipeds	Total
1990	5100	2091	7191
1991	3460	3497	6957
1992	2861	5808	8669
1993	2682	3593	6276
1994	3515	3598	7113
1995	2931	3169	6100
1996	3737	2493	6230
1997	2543	2910	5453
1998	1668	2352	4020
1999	1791	2355	4146
Mean	3029¹	3187	6215

**Marine
mammal
by-catches
in U.S.
fisheries**

¹ Large whales = 20

Data Source: NOAA Fisheries Stock Assessment Reports

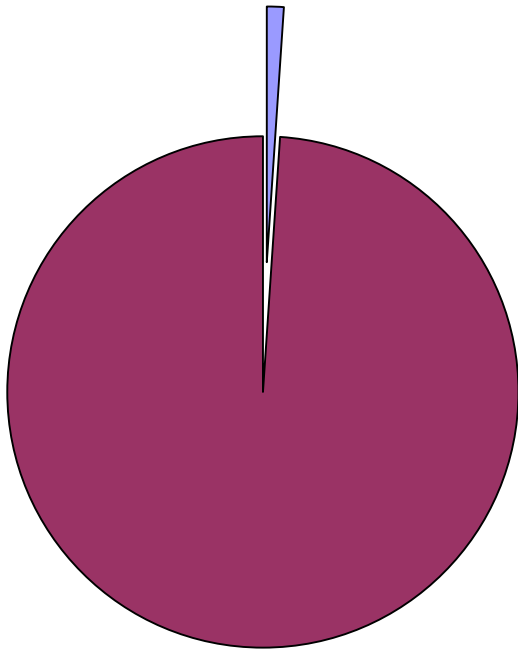
U.S. marine mammal by-catches by gear type



Data Source: NOAA Fisheries Stock Assessment Reports

Global cetacean by-catches ~ 1990-1994

U.S. gill net vessels



Number of Gill
Net Vessels

Global 215,883

U.S. 2,288

U.S. Proportion 0.011

Global By-Catch 305,304

Global gill net vessels

Reducing small cetacean by-catches in the U.S. through the *Take Reduction Process*

Gulf of Maine Harbor Porpoise TRT (1996)

Atlantic Offshore Cetacean TRT (1996)

Atlantic Large Whale TRT (1996)

Pacific Offshore Cetacean TRT (1996)

Mid-Atlantic Harbor Porpoise TRT (1997)

Mid-Atlantic Bottlenose Dolphin TRT (2002)

Marine mammal by-catches in U.S. fisheries

	Cetaceans	Pinnipeds	Total
1990 - 1999	3029	3187	6215
1990 - 1994	3524	3718	7241
1995 - 1999	2534	2656	5190
Significance	0.12	0.12	0.01

Classifying by-catches

1. Fishery intentionally targets cetaceans
2. Cetaceans are captured accidentally
3. Cetaceans are captured while taking fish from gear



Strategies for reducing by-catches

1. Reduce mortality after capture
2. Reduce number of individuals captured
3. Increase utilization of by-catches

Alverson et al. (1994)

Reducing mortality after capture

Grand Manan Harbour Porpoise Release Program (1992 - 2001)

Total Porpoises	657	
Released	588	(90%)
Died	69	(10%)



Reducing number of individuals captured

Total By-Catch =
Fishing Effort × By-Catch Rate

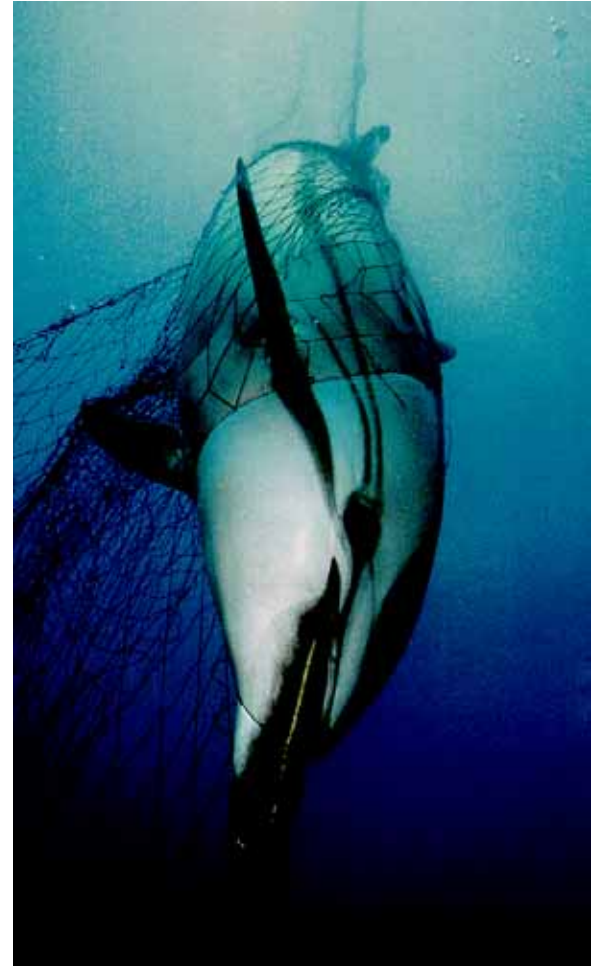


Reducing by-catch rate

Time and Area Fisheries Restrictions

Conservation Engineering - Acoustic Alarms

Modification of Fishing Gear or Practices



Time and area restrictions

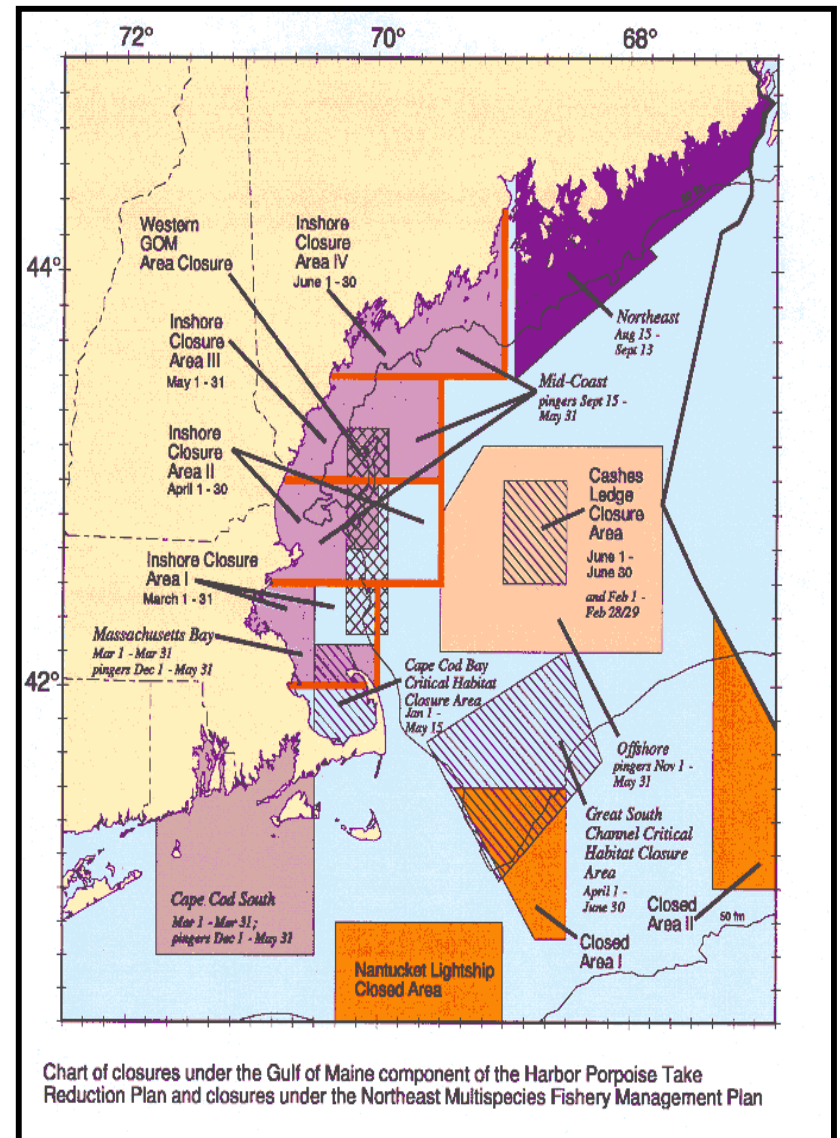
Patterns of bycatch are predictable in time and space

Area where bycatch occurs is small relative to total fishing area

Little displacement of fishing effort and bycatch

Costs are borne equitably among fishermen

Fishermen support regulatory approach (or enforcement)



Acoustic alarms

No habituation occurs

Animals are not displaced from important habitat

Target species do not respond

Other predators are not attracted to devices

Fishermen support regulatory approach (or enforcement)



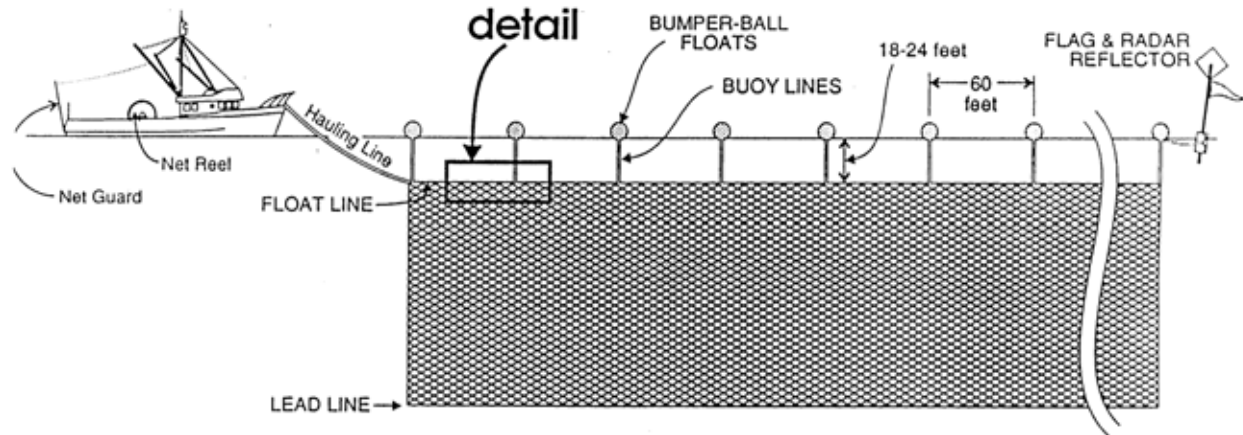
Modifying fishing gear or practices

Little adverse effect on catch of target species

Reasonable cost

Practical and safe

Fishermen support regulatory approach (or enforcement)



The problem of depredation

Many fisheries and several species of small cetaceans

Animals are attracted to gear

To date, very few practical solutions

Solution to depredation could result in by-catch reduction



Conclusions

Specific conservation strategies are required in each case

Observer programs generate much useful and unused data

Working directly with fishermen is essential

- Developing concepts

- Field testing ideas

- Implementing solutions

Follow-up monitoring is required, sometimes with enforcement

Are these estimates of global by-catch reasonable?

Species	Country	Fishery Type	Years	Number
Dall's porpoises	Japan	Drift Net	1991	3,207
Harbour porpoises	Denmark	Gill Net	1992-4	6,785
Harp seals	Canada	Gill Net	1994	36,000
Pelagic dolphins	IATTC	Purse Seine	1990	78,927
			1991	96,679
			1992	15,539
			1993	3,601
			1994	3,274

Harbour porpoise by-catches in New England

