

ENS 201

Dolphins and Tuna

Pertinent information on commercially important tuna species

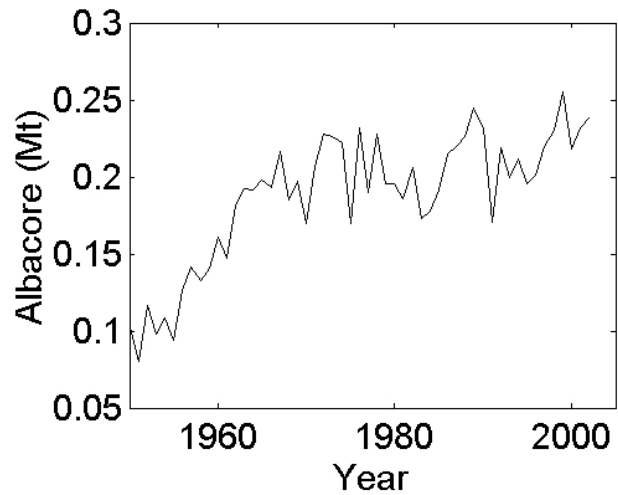
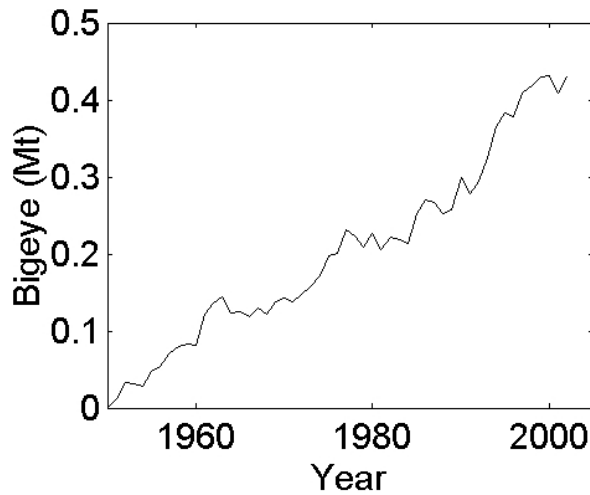
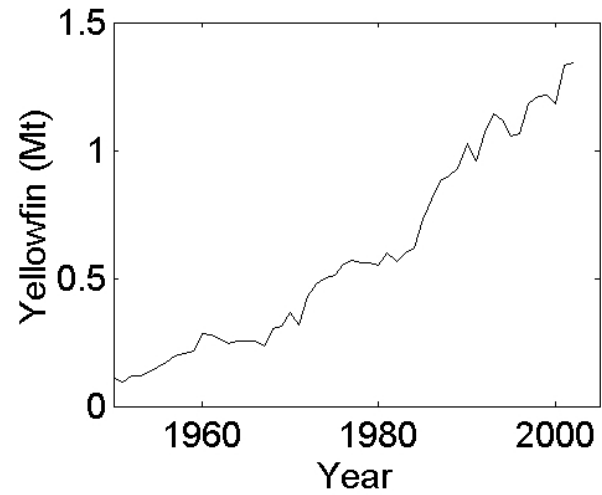
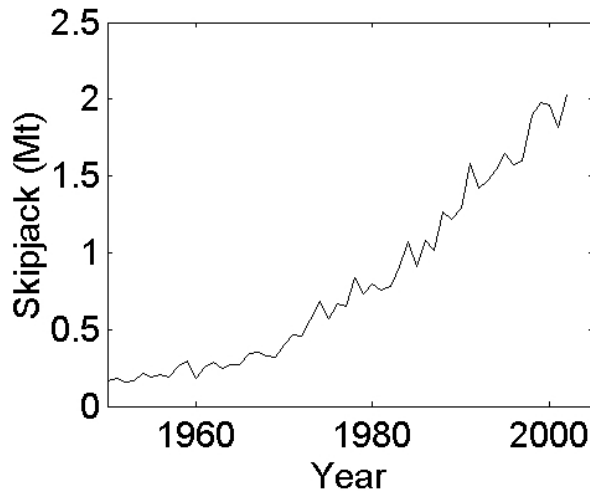
Species	Length (cm)	Weight (kg)	Age of sexual maturity (years)	Lifespan (years)
Albacore	60-90	10-20	5	10
Bigeye	80-180	15-20	4	10
Skipjack	30-80	8-10	2	12
Yellowfin	40-180	5-20	3	10
Atlantic bluefin	45-450	135-680	4-8	15-30
Pacific bluefin	150-300	300-555	6	30
Southern bluefin	200	200	8-12	40

Interesting Facts

- In 2000, vacuum-packed pouches were made for convenience.
- Americans eat over one billion pounds of canned and/or pouched tuna a year.
- Tuna is convenient, affordable, rich in protein, low in fat and calories, and a great source of the essential omega-3 fatty acids, and vitamins B6 and B12.

- <http://www.tunafacts.com>
- www.foodservicedirect.com





Commercial catches of skipjack, yellowfin, bigeye, and albacore tuna



Yellowfin tuna
and Dolphin
Problem



Background information on the tuna/dolphin problem

<https://www.youtube.com/watch?v=ushetSrZw3I&feature=youtu.be> (Min 3-13)

Problem is confined to the eastern tropical Pacific, where yellowfin tuna tend to congregate under schools of certain species of dolphins

Combination of fishing tuna located under schools of dolphins proved deadly to dolphins and damaging to tuna stocks

Key strategies for releasing dolphins from net include backing down procedure (1960) and Medina (safety) panels (1971)

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— - **pantropical spotted dolphin**

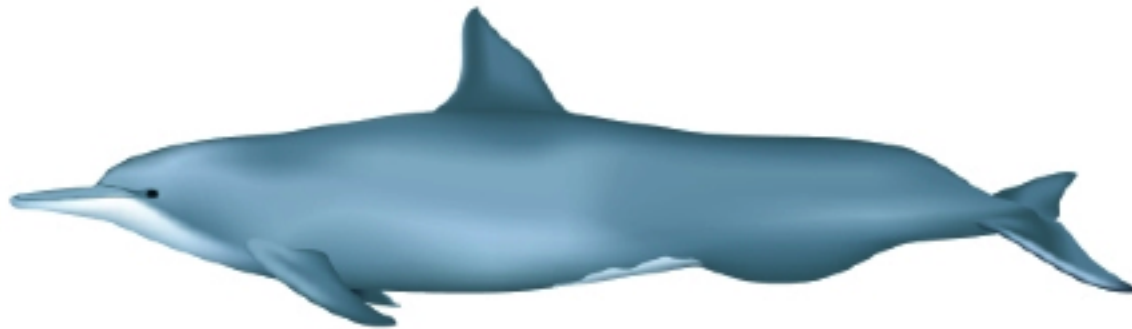


— - **Atlantic spotted dolphin**

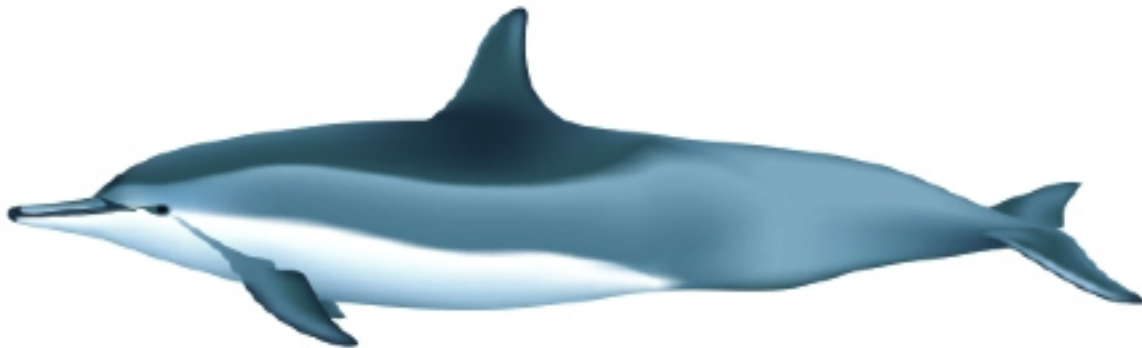
— **length averages 7 feet (2 m)** —

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eastern spinner dolphin



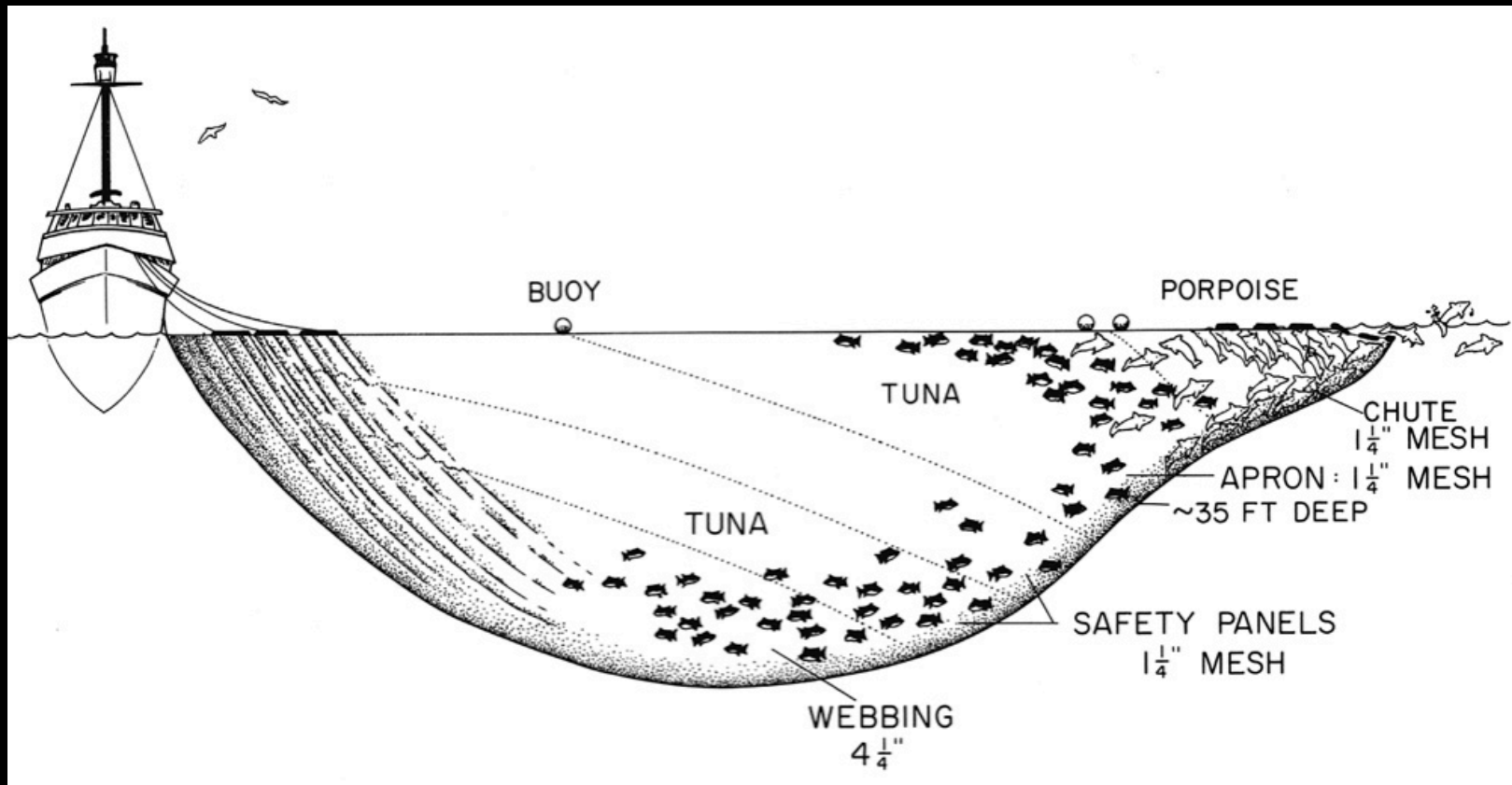
Gray's spinner dolphin

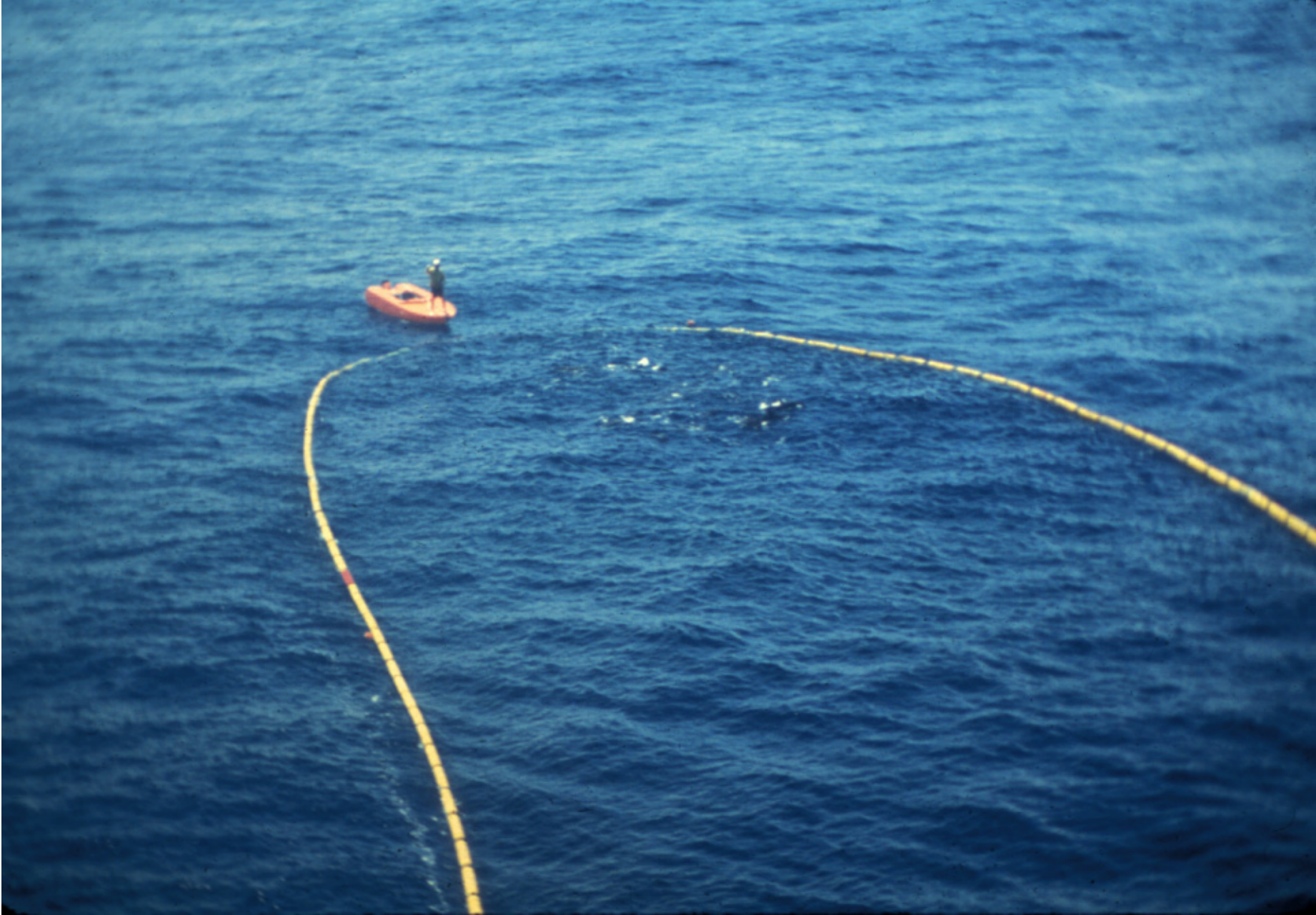
**length varies by subspecies
—typically 5.5 - 7 feet (1.65 - 2 m) —**



Final stages of setting the purse seine

Schematic Depiction of a "Porpoise Set"





Initial stages of backing down operation



Tuna caught in purse seine



Dolphins escaping from purse seine during backing down operation

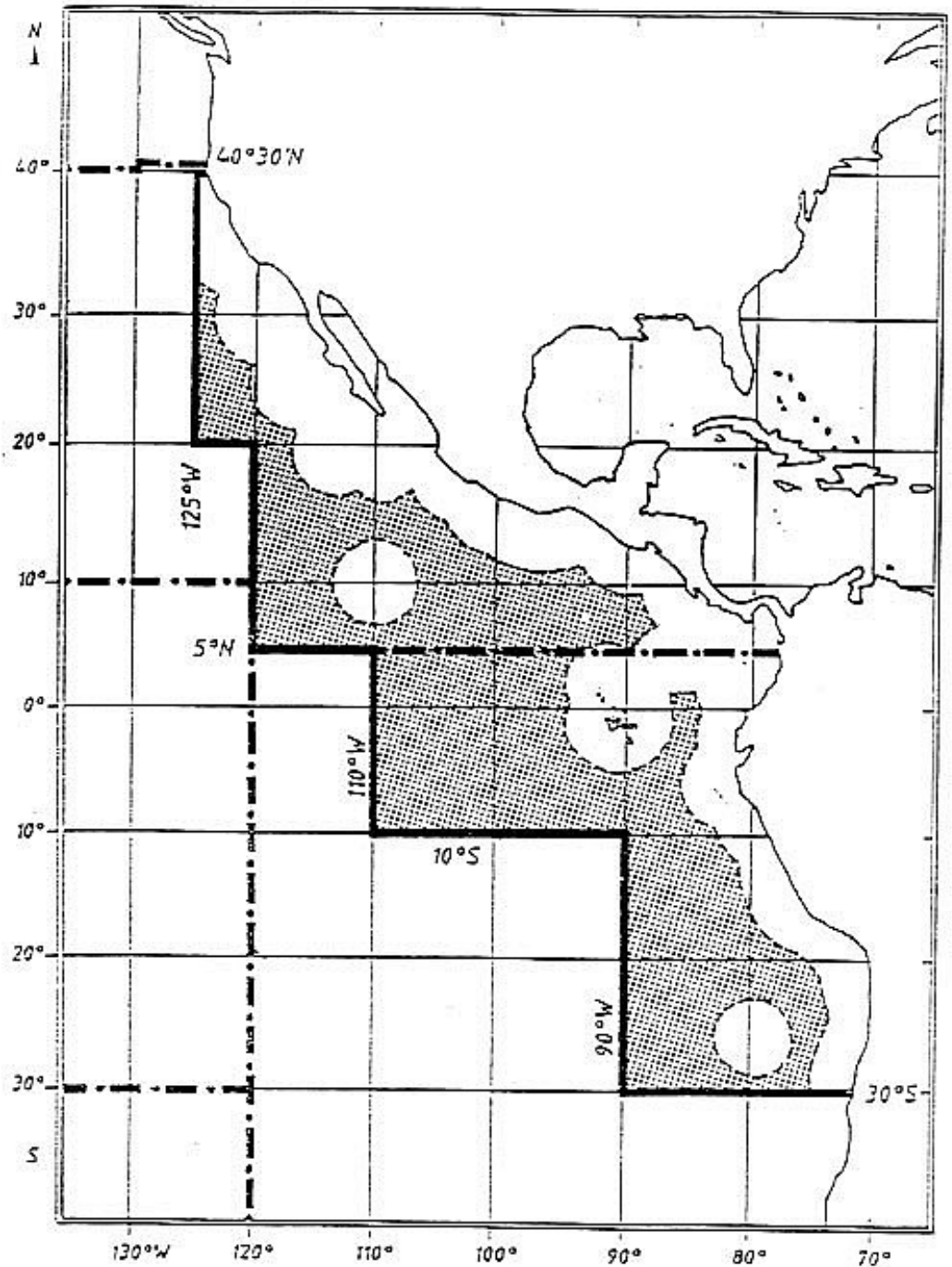
Marine Mammal Protection Act – 1972

“Certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man’s activities They should not be permitted to diminish below their optimum sustainable population Measures should be immediately taken to replenish any species or population stock which has already diminished below [its optimum sustainable] population.”

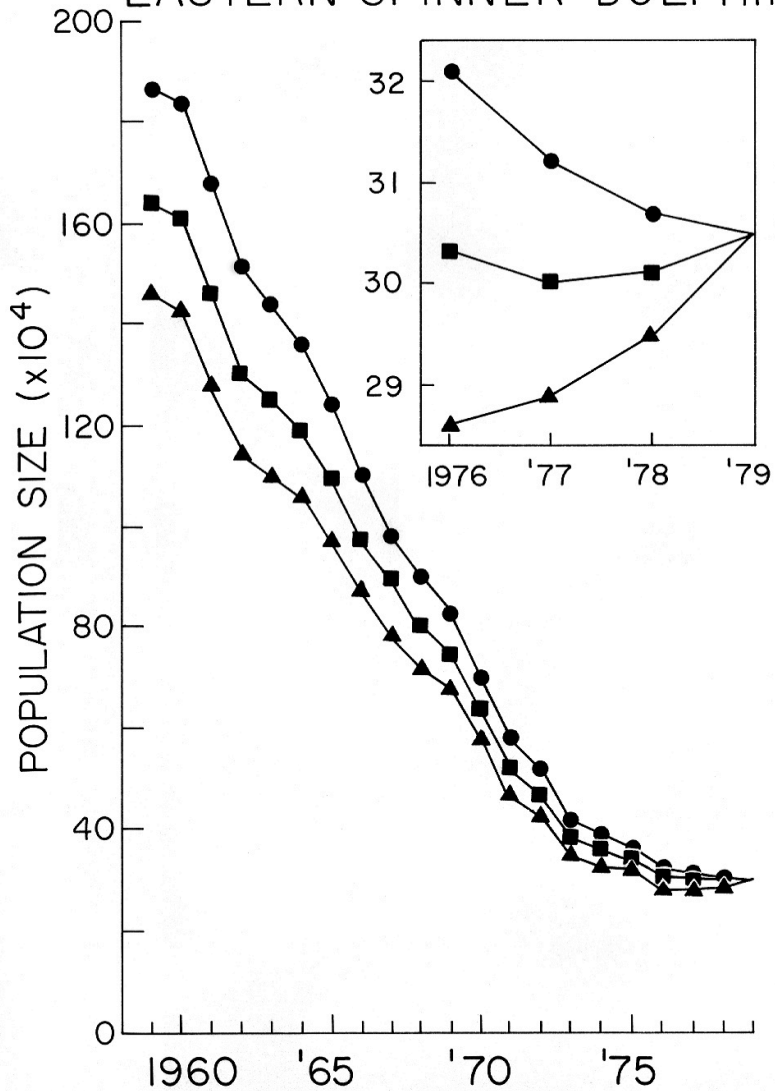
“In any event it shall be the immediate goal that the incidental kill or incidental serious injury of marine mammals permitted in the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality and serious injury rate.”

Optimum sustainable population defined to be any stock size between 65% and 80% of the virgin stock

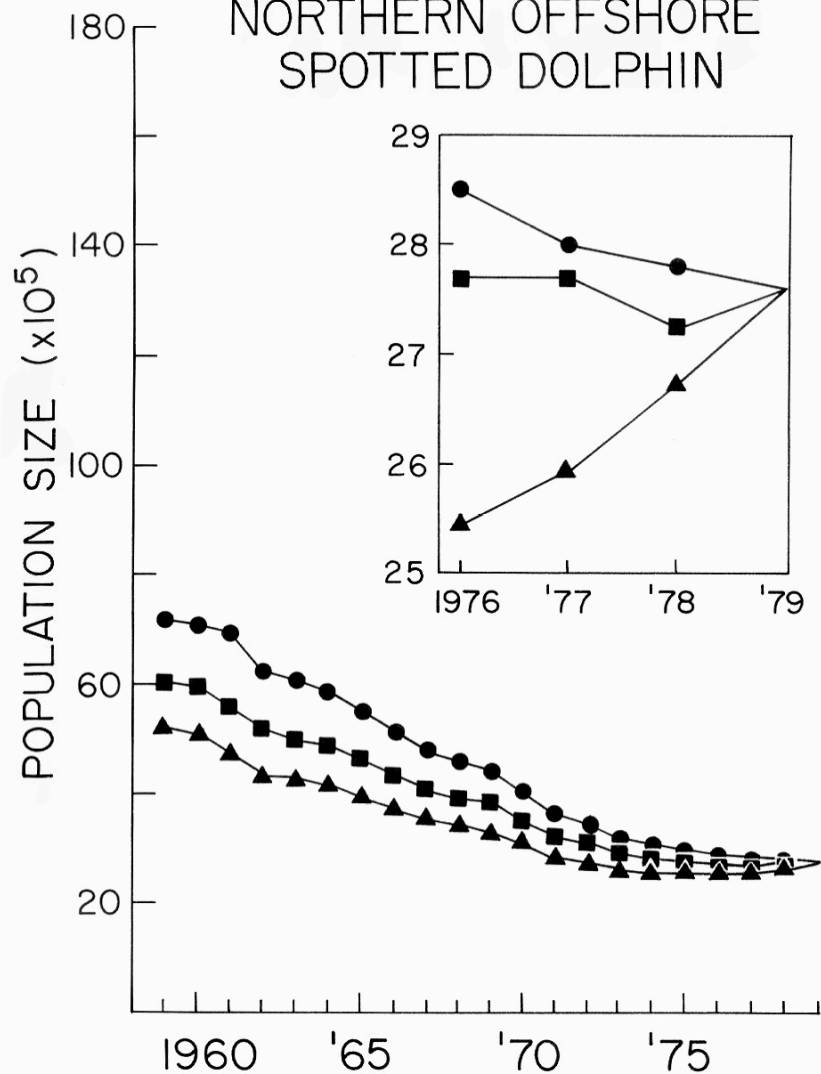
Geographical extent
of the CYRA.



EASTERN SPINNER DOLPHIN



NORTHERN OFFSHORE SPOTTED DOLPHIN



MMRA Amended on many occasions:

Must be 100% observer coverage of U.S.-registered boats

With some exceptions, U.S. boats cannot use sundown sets

Nations intending to export tuna to the United States must do the following:

have a regulatory program comparable to that of the U.S.

(no sundown sets)

dolphin mortality must be no more than 1.25 the U.S. rate

no more than 15% of kill can be eastern spinners

participate in IATTC observer program

submit annual report concerning performance

(C) *Sundown sets prohibited.* On every set encircling porpoise, the back-down procedure must be completed and rolling of the net to sack-up must be begun before one-half hour after sundown, except as provided below. For the purpose of this section, "sundown" is defined as the time at which the upper edge of the sun disappears below the horizon or, if view of the sun is obscured, the local time of sunset calculated from tables developed by the U.S. Naval Observatory. A "sundown set" is a set in which the backdown procedure has not been completed and rolling the net to sack-up has not begun within one-half hour after sundown. Should a set extend beyond one-half hour after sundown, the operator must use the required marine mammal release procedures including the use of the high intensity lighting system.

Dolphin-safe tuna

1990 – Dolphin Protection Consumer Information Act establishes standards for “dolphin-safe”

April 12, 1990 – Star-Kist, Bumble Bee, and Chicken of the Sea announce that they will not buy tuna caught using porpoise sets

1991 – U.S. embargoes challenged by Mexico – General Agreement on Tariffs and Trade (GATT)

Avoid ‘laundering’ of tuna through third nations

Recent estimates of status of depleted dolphin stocks. Source: NMFS

Stock	Estimated population in 2000	% of virgin stock size
Northeastern offshore spotted	641,153	20%
Eastern spinner	448,608	35%

Lessons Learned?

Pluses

Consumers, via their government, pushed effectively for the implementation of management

Benefits to the fishery from accepting the management plan

- 1. Main markets didn't want to buy dead dolphin**
- 2. Spared dolphins live to help find tuna again**

Minuses

Expenses to the industry have forced much of the fishing fleet to jurisdictions where the management plan can be evaded

Issue 2

Race

for the last
bluefin



Capacity of the purse seine fleet targeting bluefin tuna in the Mediterranean Sea and estimated capacity reduction needs

Japanese demand for high-fat tuna; recreationally-caught Atlantic Bluefin worth many dollars a pound.

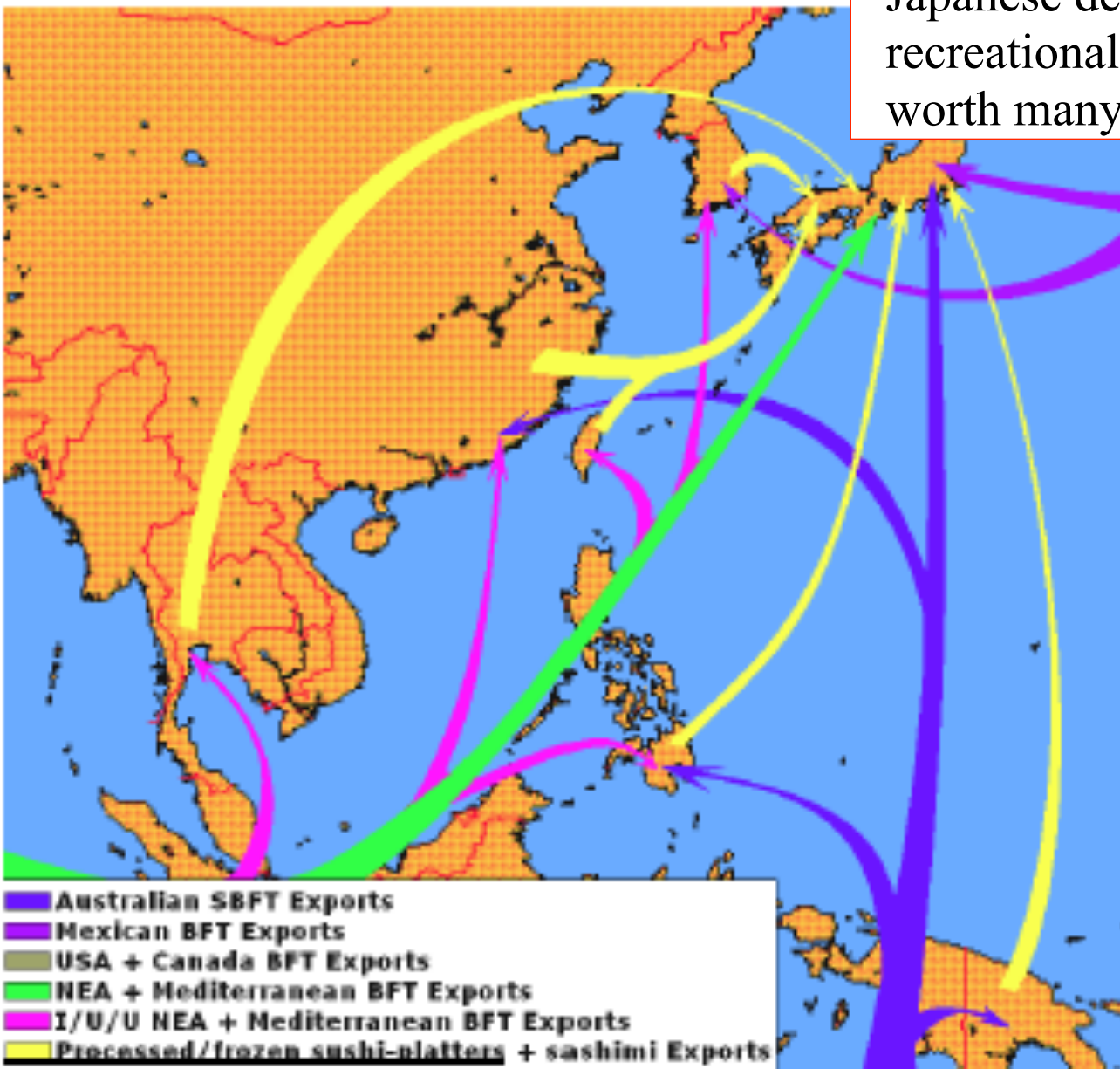
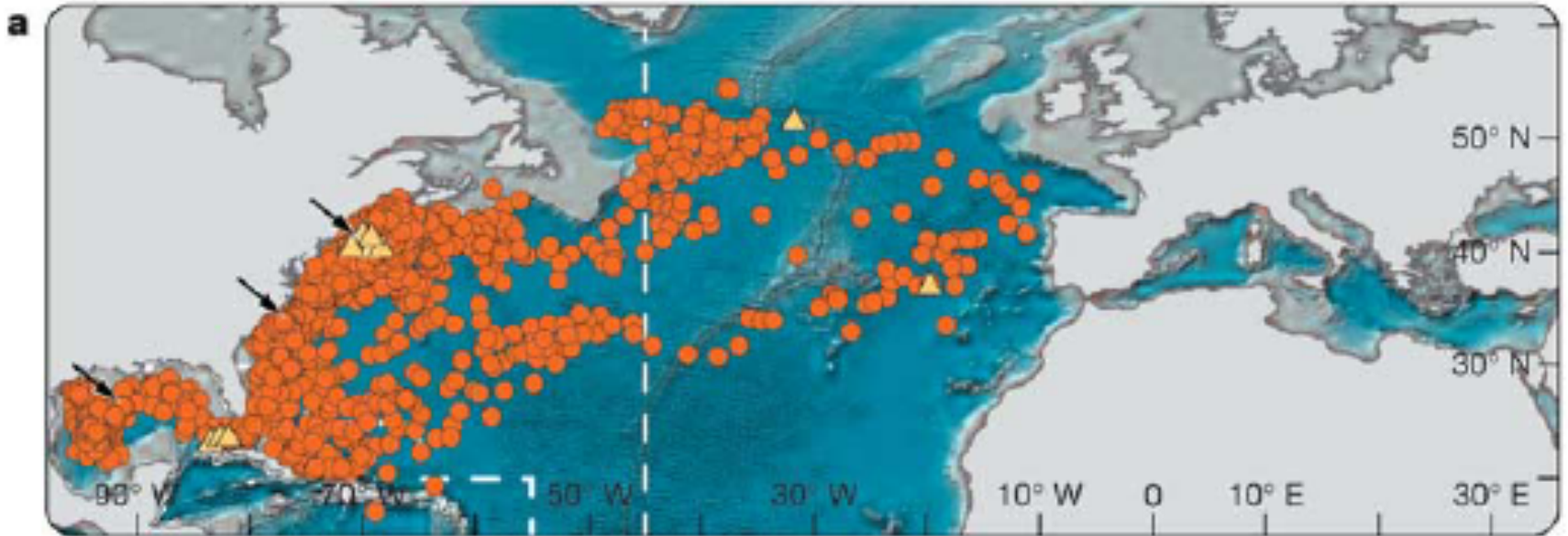


Figure 2. Trade routes for bluefin tuna imported to Japan. SBFT=southern bluefin tuna, BFT=bluefin tuna, NEA=Northeast Atlantic, IUU=illegal, unreported and unregulated (Figure from WWF 2006).

³ Rancher bluefin tuna is not evaluated in this report, but will be evaluated in a separate Seafood Watch® report to be released at a later date. Please visit www.seafoodwatch.org for the most up-to-date information.

⁴ Sashimi consists of thinly sliced pieces of raw fish; sushi consists of raw fish combined with other ingredients.

Of Greater Concern: Western Bluefin



Western Stock Distribution

Block et al., 2005

ICCAT: International Convention for the
Conservation of **Atlantic** Tunas
AKA (Also Known As):
International Conspiracy to Catch All Tunas

Bottom Line:

1) Complete failure of ICCAT quota system

ICCAT's quota system has been highly dysfunctional for the BFT fishery for three main reasons:

- Quotas have never been matched to scientific advice;
- Quotas have been perversely adjusted for nations that claimed to have underfished their quotas in previous years, despite widely acknowledged illegal fishing and under-reporting of catches by some of these nations. Between 1996 and 2006, the increase in nominal fishing possibilities due to this adjustment of quotas has amounted to 39,366 Mt; and
- There has been significant non-compliance to quotas by most nations (irrespective of official reports to ICCAT).

Massive increases in Fleet Capacity and Lack of Fishery Control – based upon the myth of ‘two stocks’ (eastern and western) are wiping out the Bluefin

NOTE: PACIFIC BLUEFIN LESS PROBLEMATIC

TABLE 2 - ESTIMATED CAPACITY REDUCTIONS IN MEDIUM AND LARGE BLUEFIN TUNA PS FLEETS NECESSARY TO MATCH SCIENTIFICALLY ADVISED CATCH LEVELS

Under the conservative assumption that multispecies PS vessels would fully rely on other species

Contracting Party	Adjusted PS share of quotas to match scientifically advised catch levels ¹	No. of M & L PS vessels ²	Catch capacity of M & L PS vessels	% of capacity reduction required to match PS share of scientifically advised catch levels	Reduction in number of vessels required to match PS share of scientifically advised catch levels
Algeria	617.02	8	1,500	58.87	5
Croatia	429.87	19	1,153	62.71	12
France	2341.22	32	8,360	71.99	23
Italy	1,845.84	46	5,645	67.30	31
Lybia	610.42	38	2,834	78.46	30
Spain	1,182.34	6	3,498	66.20	4
Tunisia	1,218.85	14	2,134	42.88	6
Turkey	457.79	178	15,189	96.99	173
TOTAL		341			283
TOTAL NECESSARY REDUCTION IN CAPACITY				78.4%	
NECESSARY REDUCTION IN CAPACITY EXCLUDING TURKEY				67.2%	

PS = purse seine, Mt = metric tonnes, ICCAT = International Commission for the Conservation of Atlantic Tunas, M = medium, L = large

THE FUTURE FOR ATLANTIC BLUEFIN

CAPTURE FISHERIES: BLEAK

FARMED FROM WILD STOCK: WEAK

CLOSE THE LIFE CYCLE AND FARM: HARD
WORK

The Current Situation:

Vast Over-Capitalization in European and African fisheries.

In 2008, catch potential of E&A fisheries - > 54,000 tonnes.

In 2008, ICCAT catch limits of E&A fisheries – 28,500 tonnes.

In 2008, fisheries scientists recommended catch - 15,000 tonnes.

FIN

Race

for the last
bluefin



Capacity of the purse seine fleet targeting bluefin tuna in the Mediterranean Sea and estimated capacity reduction needs

Table 1. Worldwide catch of Atlantic, southern and Pacific bluefin tuna by flag and gear type.

Species	Region	Catch (2005)	Fishing Countries	Gears Used	Sources
Atlantic BFT ⁵	East Atlantic	7,376 mt (10% of total catch)	Spain (38%); Japan (27%); Morocco (27%); France (8%); China, Portugal, and Ireland (<1 % each)	Longline (28%); trap (27%); pole and line (24%); purse seine (15%); other surface gears (5%); sport (1%)	ICCAT 2006
	Mediterranean	25,190 mt (36% of total catch)	France (26%); Italy (19%); Libya (10%); Tunisia (9%); Spain (9%); Algeria (5%); Turkey (4%); Croatia (3%); Morocco (3%); NEI (3%); Korea (3%); Japan (3%); Greece (2%); Malta (1%); Cyprus, Taiwan (<1% each)	Purse seine (69%); other surface gears (15%); longline (10%); sport (5%); traps (<1%); pole and line (<1%)	ICCAT 2006
	West Atlantic	1,842 mt (3% of total catch)	U.S. (49%); Canada (29%); Japan (22%); Portugal (<1%)	Sport (62%); longline (29%); other surface gears (5%); purse seine (2%); traps (2%); pole and line (<1%)	ICCAT 2006
Southern BFT ⁶	Southern Ocean	13,507 mt (19% of total catch)	Japan (43%); Australia (37%); Taiwan (10%); Indonesia (5%); New Zealand (3%); Korea, Philippines, Other, South Africa, Misc (< 1% each)	Longline (64%); purse seine (36%); troll and handline (< 1% each)	CCSBT 2007a
Pacific BFT	Western Pacific	17,320 mt (25% of total catch)	Japan (87%); Taiwan (8%); Korea (5%)	Other (50%); purse seine (28%); longline (18%); pole and line (3%)	IATTC 2007b
	Eastern Pacific	4,827 mt (7% of total catch)	Mexico (94%); U.S. (6%)	Purse seine (98%); other (2%)	IATTC 2007b

Table 2. Life history characteristics of Atlantic, southern and Pacific bluefin tunas.

Species	Intrinsic Rate of Increase (<i>r</i>)	Age at First Maturity	Growth Rate	Max Age	Max Size	Fecundity	Species Range	Special Behaviors	Sources
Atlantic bluefin tuna	Unknown	East Atlantic: ages 4-5 West Atlantic: ages 8-12	$k = 0.05 - 0.06$	27 – 30 years	313 cm FL	5 – 45 million eggs varying with age	North Atlantic Ocean	Aggregate to spawn and forage; known migratory routes	Rodriguez-Roda 1967; Rivas 1977; Baglin 1982; Mather 1980; Teo et al. 2007
Southern bluefin tuna	Unknown	Ages 8-15	$k^7 = 0.14 - 0.15$	30+ years	225 cm FL; 260 kg	6 million eggs	Southern Ocean	Aggregate to spawn and forage; known migratory routes	Kalish et al. 1996; Farley & Davis 1998; Davis et al. 2001; CCSBT 2006a; FAO 2007
Pacific bluefin tuna	Unknown	Age 5 - 6	Unknown	15 years	300 cm FL; 550 kg	10 million eggs	North Pacific Ocean	Aggregate to spawn and forage; known migratory routes	Hirota et al. 1976; Inagake et al. 2001; Boustany et al. 2006; Chen et al. 2006; TAG 2007

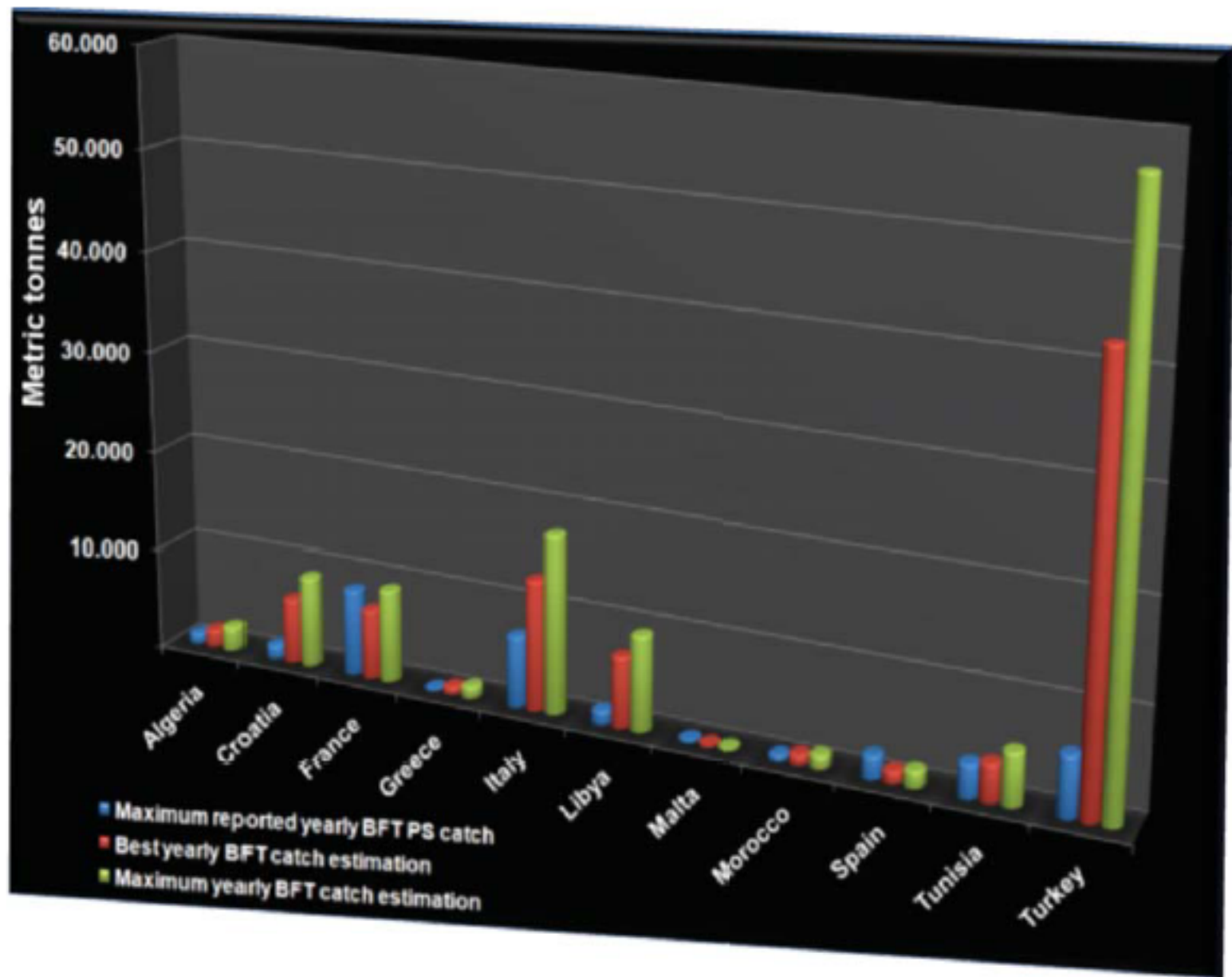


Figure 036: Disparities between maximum reported total BFT PS catches inside the Mediterranean Sea, by ICCAT Contracting Parties during the period 1996-2007 and best - maximum yearly BFT catch estimations by national PS fleets according to ICCAT-SCRS ratios.

1997 – International Dolphin Conservation Program Act – amends certain provisions of the MMPA.

Secretary of Commerce to make final finding concerning the dolphin-safe label and the impact of the fishery on dolphin stocks by 12/31/02.

12/31/02 – NMFS rules that use of porpoise sets is having “no significant adverse impact on dolphin populations in the Eastern Tropical Pacific Ocean.”

This finding effectively changes the definition of dolphin-safe to include tuna caught with porpoise sets as long as no dolphins were killed or seriously injured.