

Tools for Fisheries Management

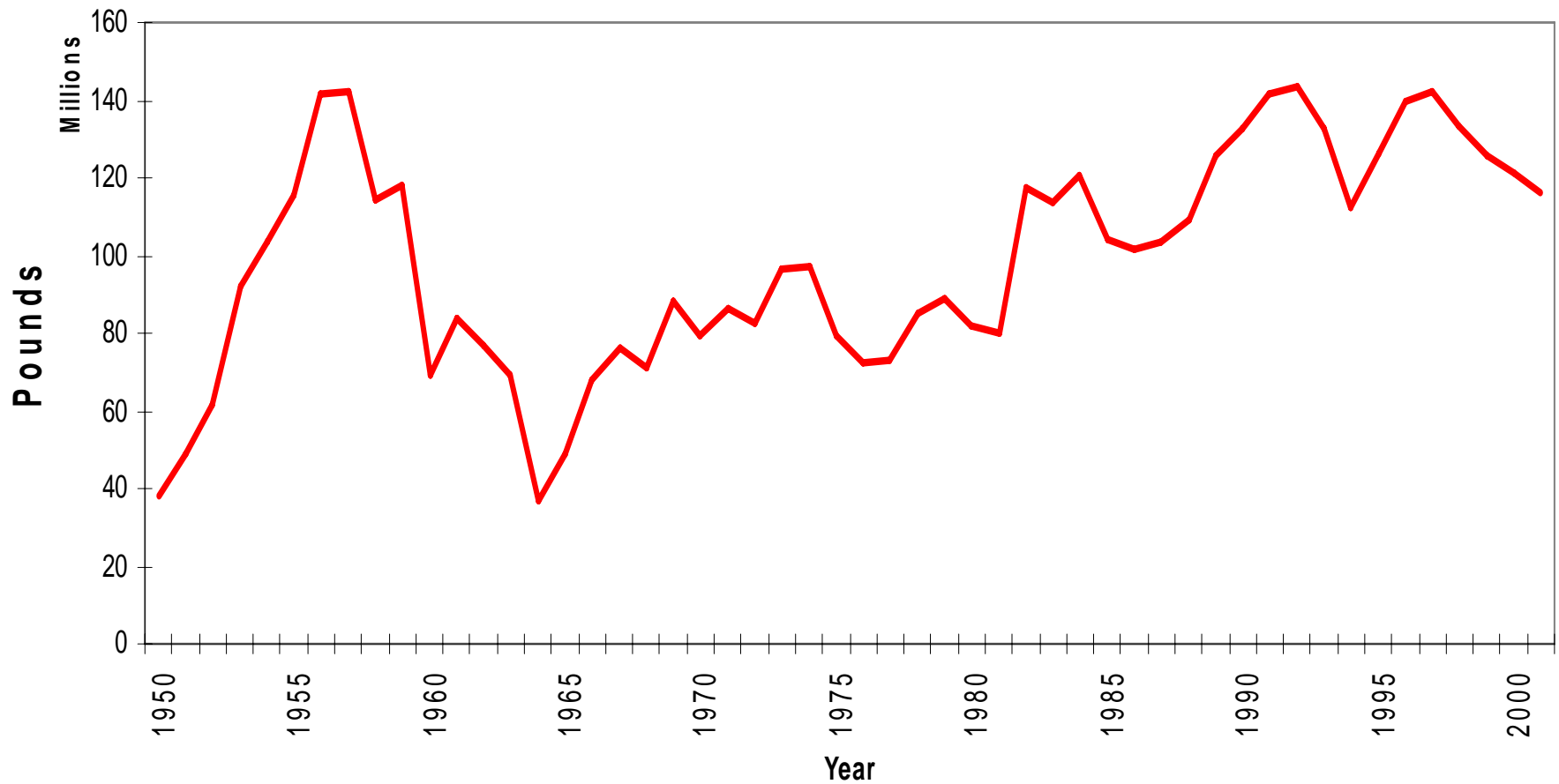
Jon G. Sutinen

Department of Environmental & Natural
Resource Economics

University of Rhode Island

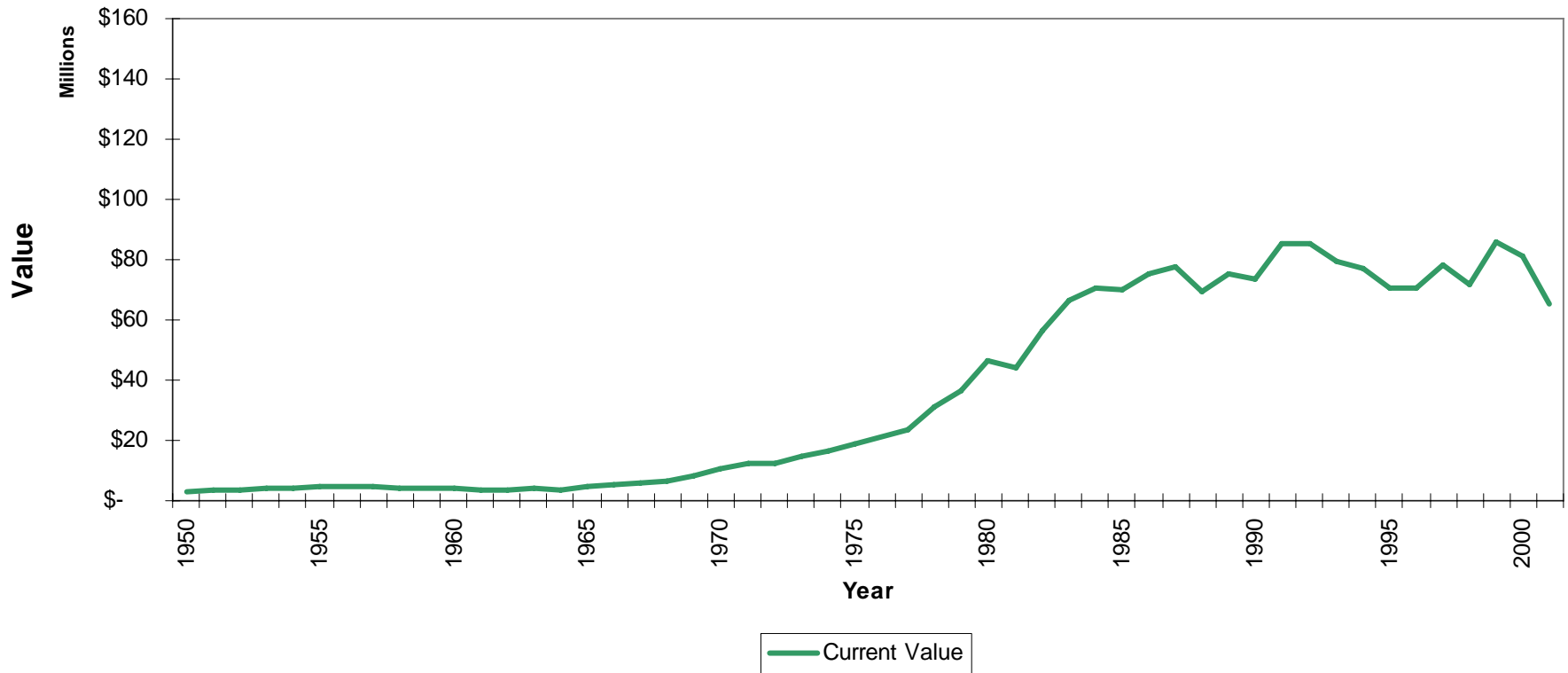
Trends & Status of Rhode Island Fisheries

RI Landings Volume, 1950-2001



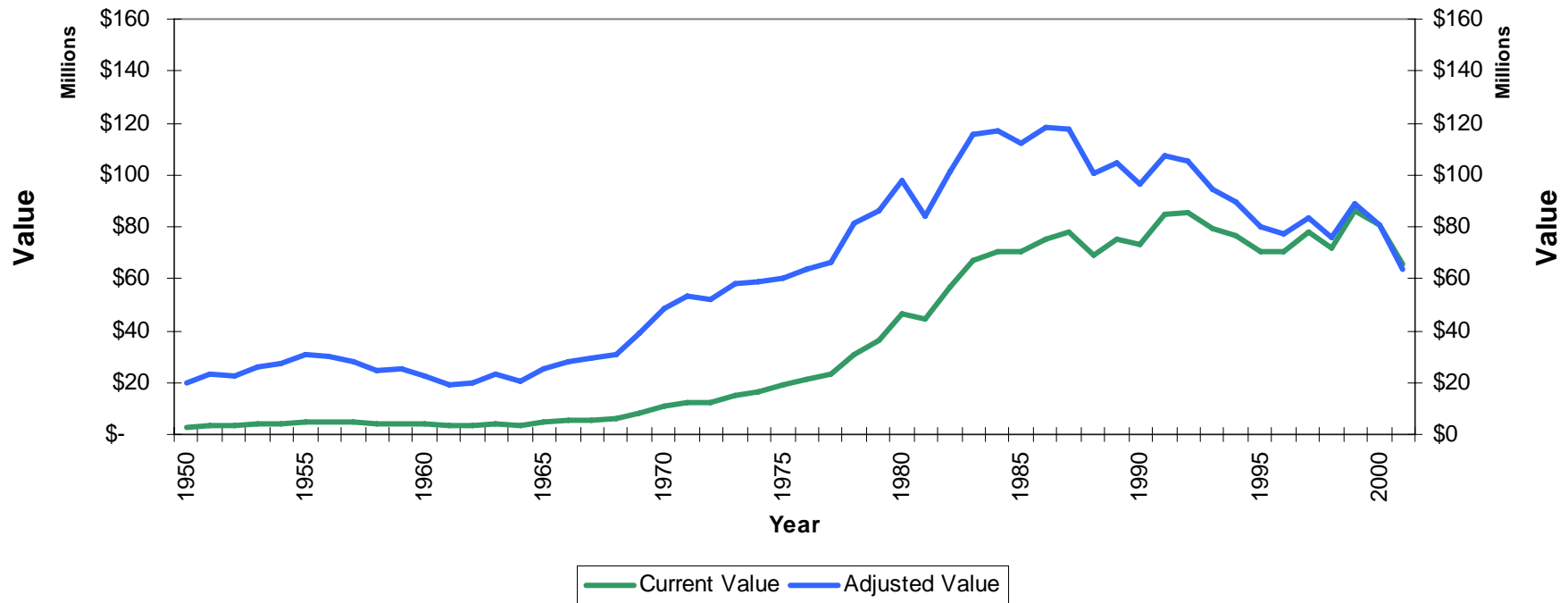
Trends & Status of Rhode Island Fisheries

RI Landings Current Value, 1950-2001



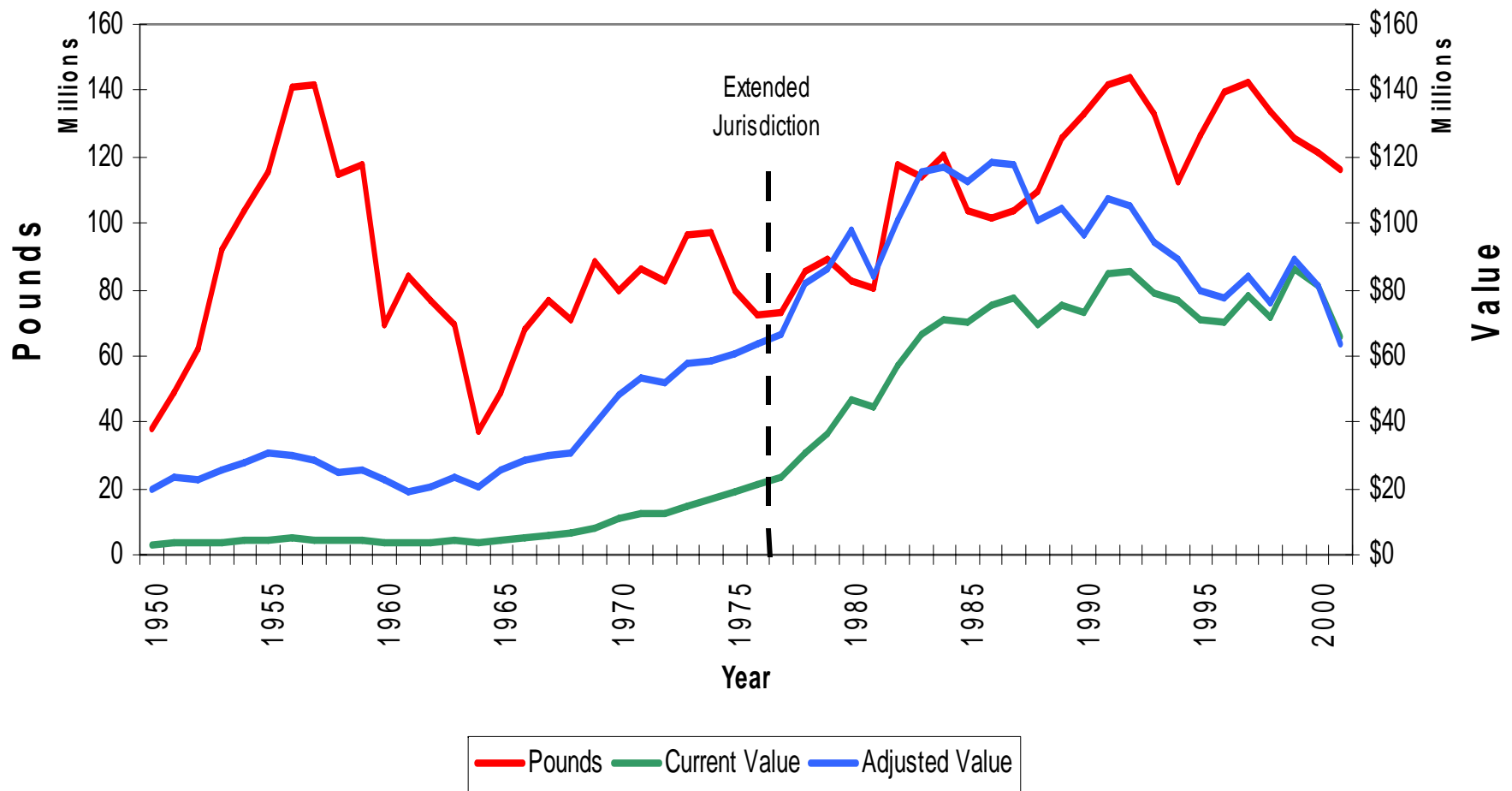
Trends & Status of Rhode Island Fisheries

RI Landings Current & Adjusted Values, 1950-2001



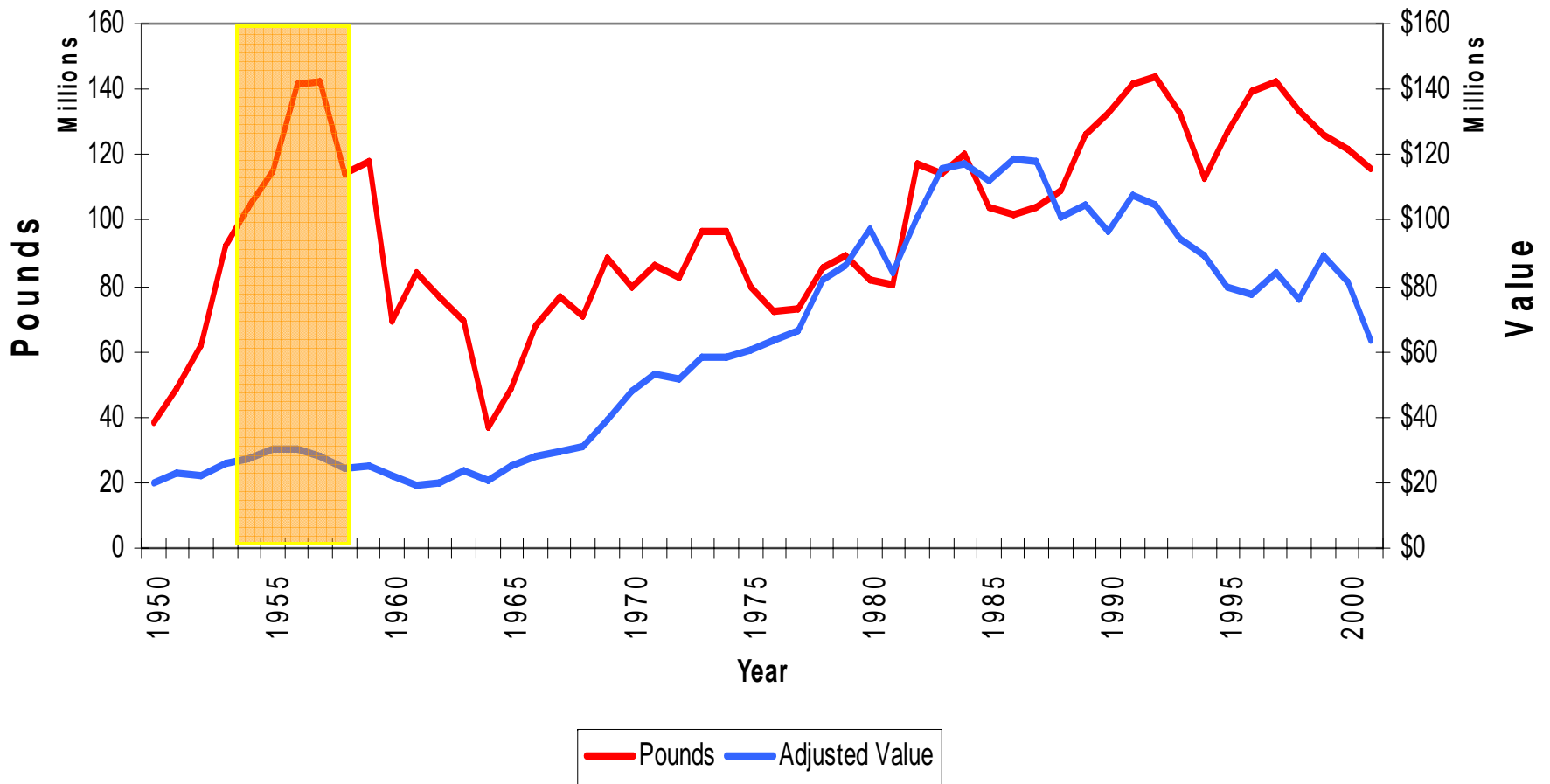
Trends & Status of Rhode Island Fisheries

RI Landings Volume, Current & Adjusted Values, 1950-2001



Trends & Status of Rhode Island Fisheries

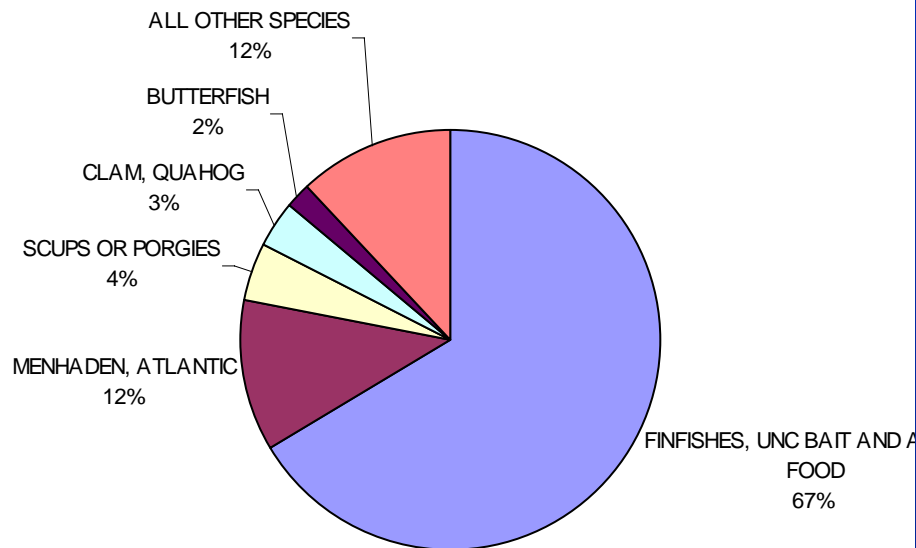
RI Landings Volume, Current & Adjusted Values, 1950-2001



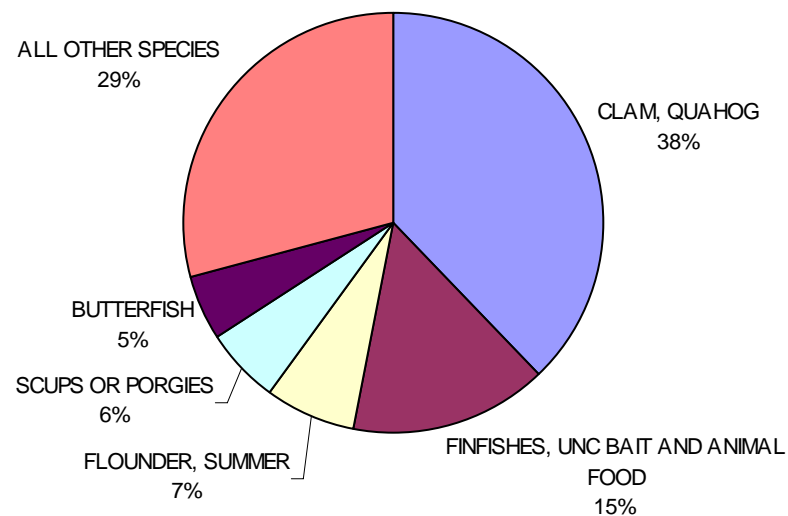
Trends & Status of Rhode Island Fisheries

1954 – 1958

Top Species by weight, 1954-58

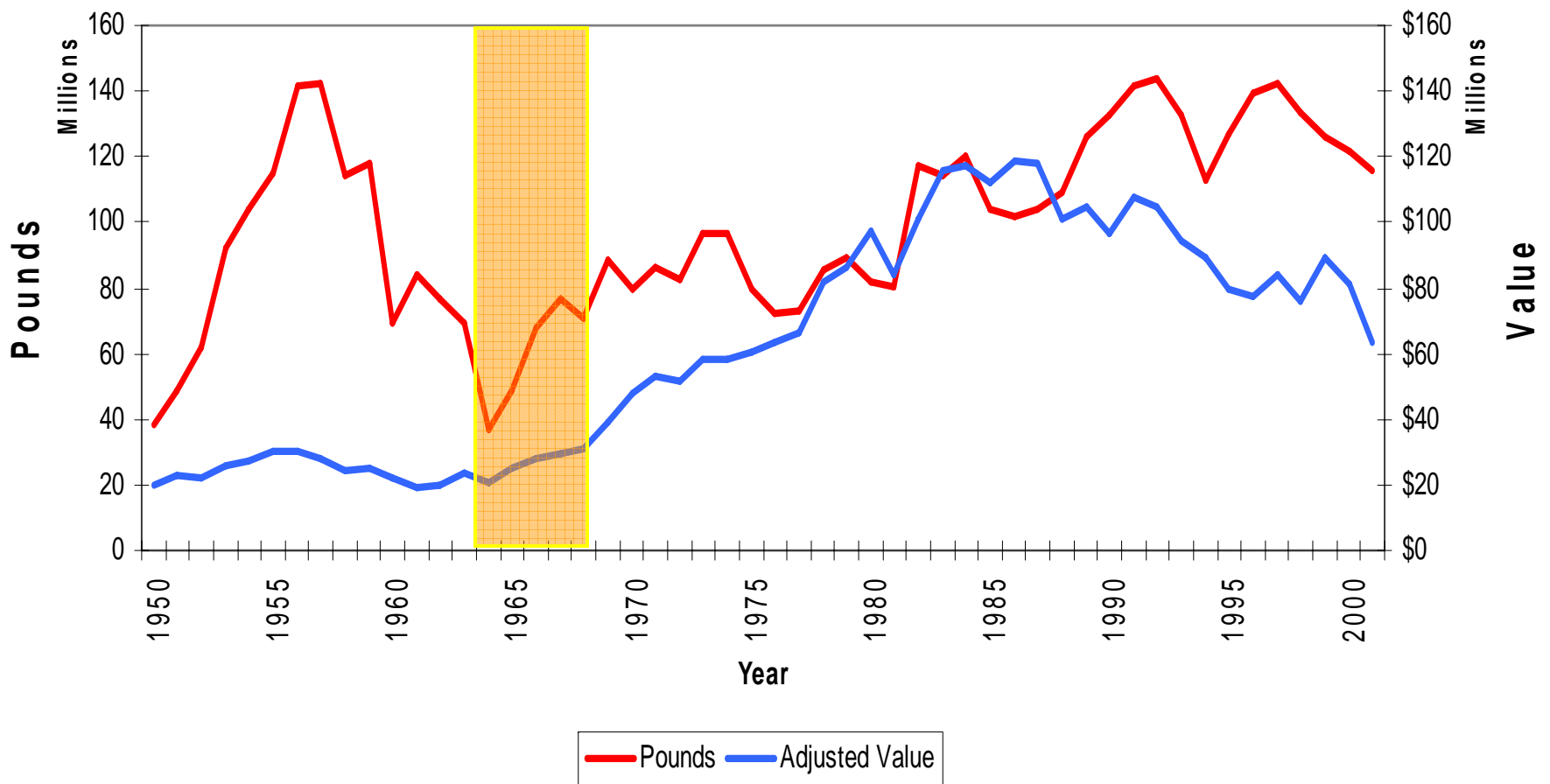


Top Species by value, 1954-58



Trends & Status of Rhode Island Fisheries

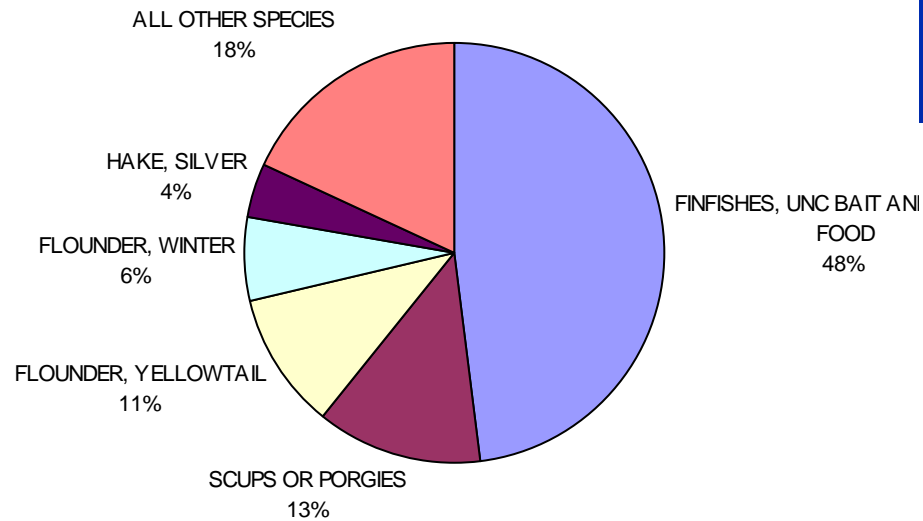
RI Landings Volume, Current & Adjusted Values, 1950-2001



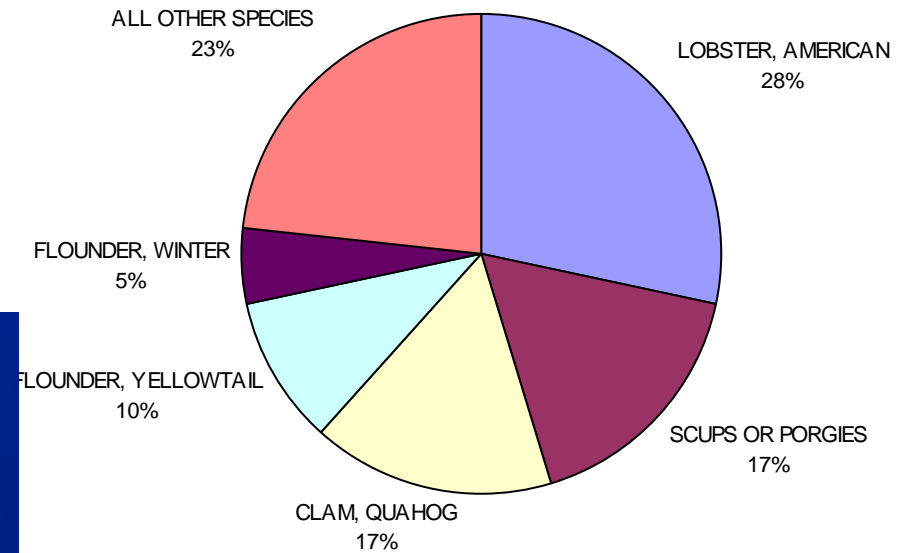
Trends & Status of Rhode Island Fisheries

1964 – 1968

Top Species by weight, 1964-68

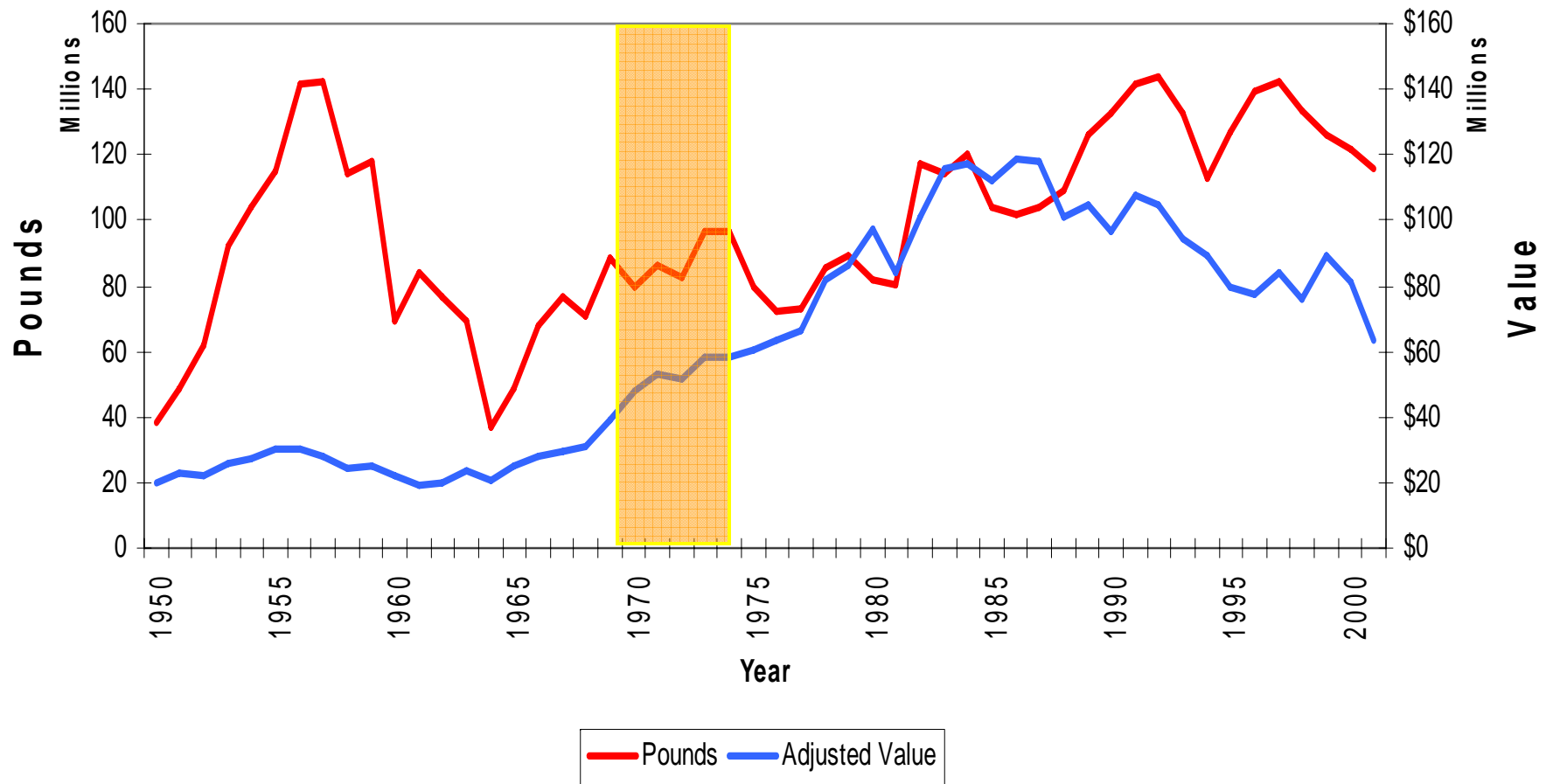


Top Species by value, 1964-68



Trends & Status of Rhode Island Fisheries

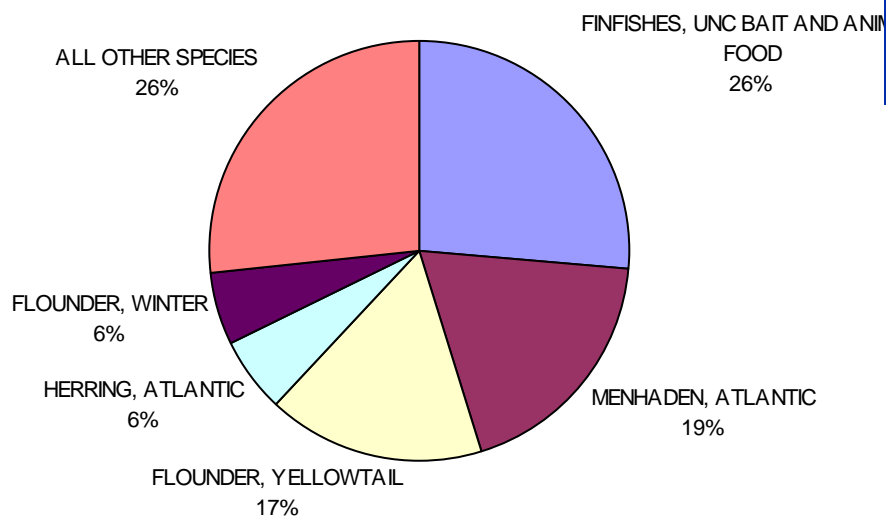
RI Landings Volume, Current & Adjusted Values, 1950-2001



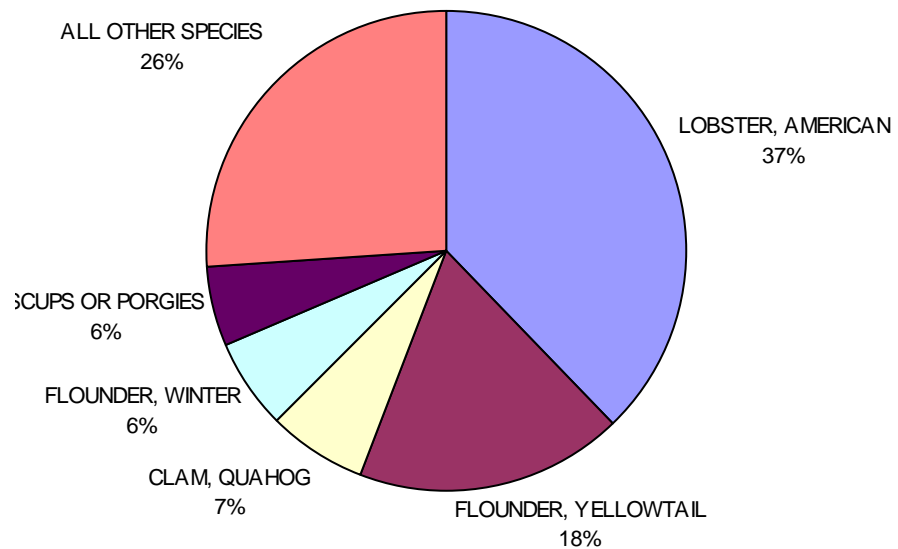
Trends & Status of Rhode Island Fisheries

1970 – 1974

Top Species by Weight, 1970-74

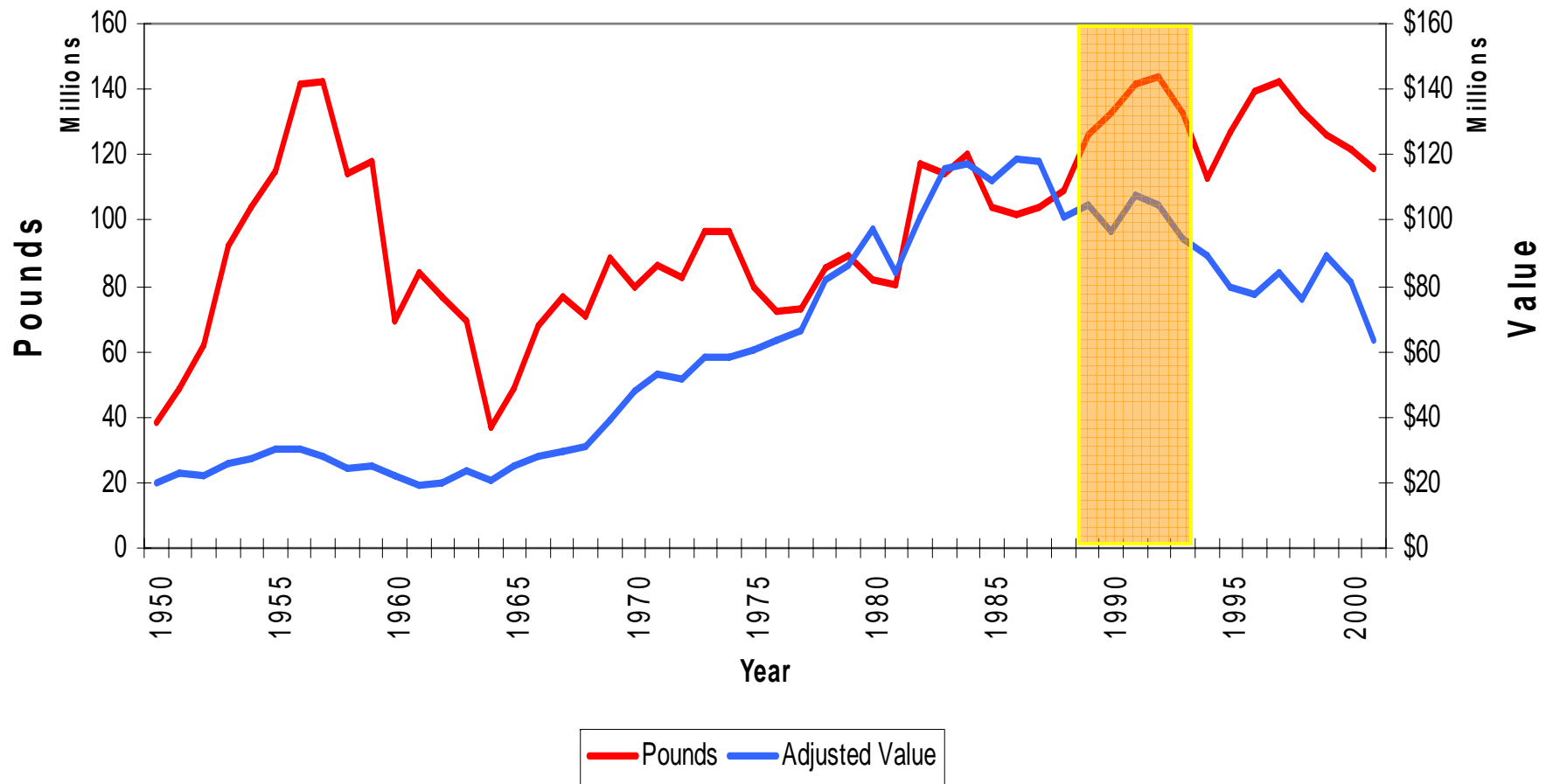


Top Species by value, 1970-74



Trends & Status of Rhode Island Fisheries

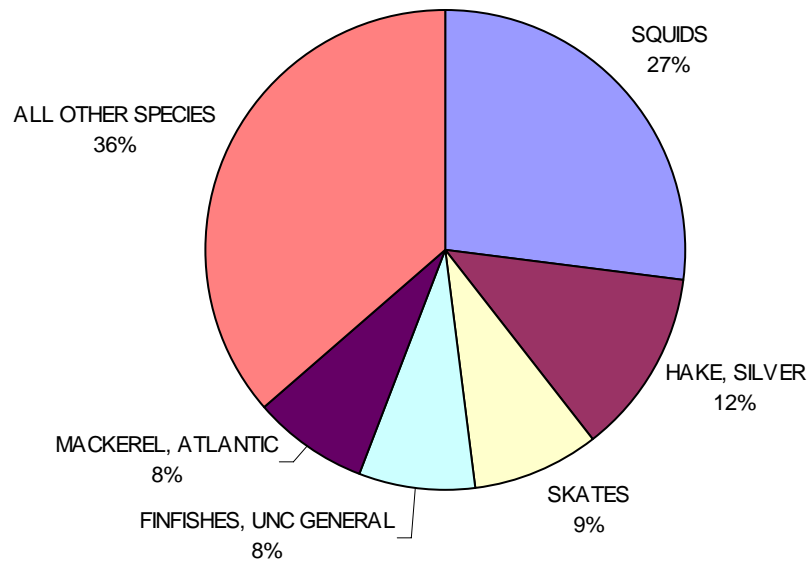
RI Landings Volume, Current & Adjusted Values, 1950-2001



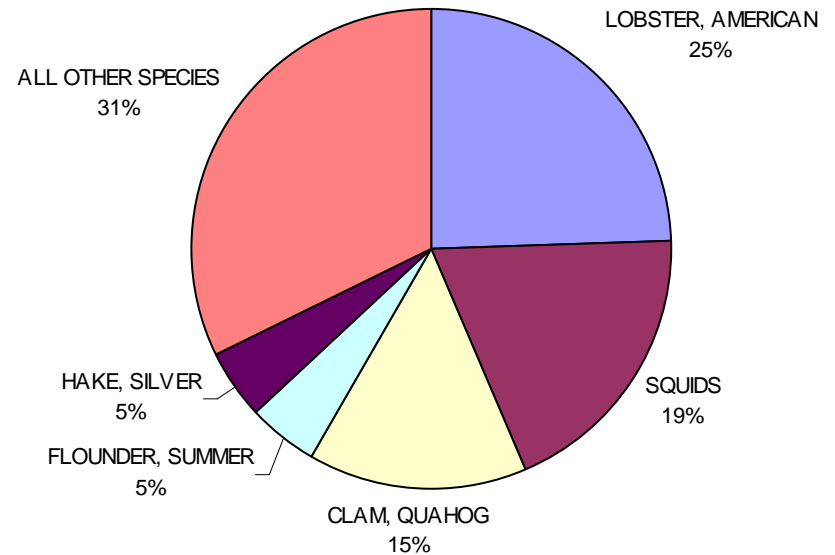
Trends & Status of Rhode Island Fisheries

1989 – 1993

Top Species by Weight, 1989-93



Top Species by Value, 1989-93



Economic Activity in RI Fisheries 1997-2001

- Dominant contributors to landings value
 - 60% of landed value
 - Lobster = 30%
 - Squid = 21%
 - Quahogs = 8%
 - Bottom trawls (48% of value)
 - Lobster pots (31%)
 - Rakes (6%)

Economic Activity in RI Fisheries 1997-2001

- Bottom trawl landings
 - Over 100 species
 - 90% of landings value
 - 11 species
 - Peak landings
 - March (*Loligo squid*, silver hake, summer flounder)
 - High proportion of ‘restricted species’
 - 81% of the value of these species, 1997-2001

Status of Rhode Island Fish Stocks, 2004

- Overfished 9
- Not overfished 12
- Unknown 5
- Overfishing 10
- No overfishing 11
- Unknown 5

57% of assessed stocks
are not overfished.

No overfishing is
occurring on 52% of
assessed fish stocks.

Status of US Fisheries, 2004

- 82% of assessed stocks are not subject to *overfishing*
- 72% are not *overfished*

Status of US Fisheries

- The status of few stocks is unknown
 - 34% are assessed for overfishing status
 - 29% are assessed for overfished status
- Performance
 - Overall is minimally satisfactory
 - Are not subject to *Overfishing* (82%)
 - Are not *Overfished* (72%)
 - Mixed across management councils
 - From excellent to very poor

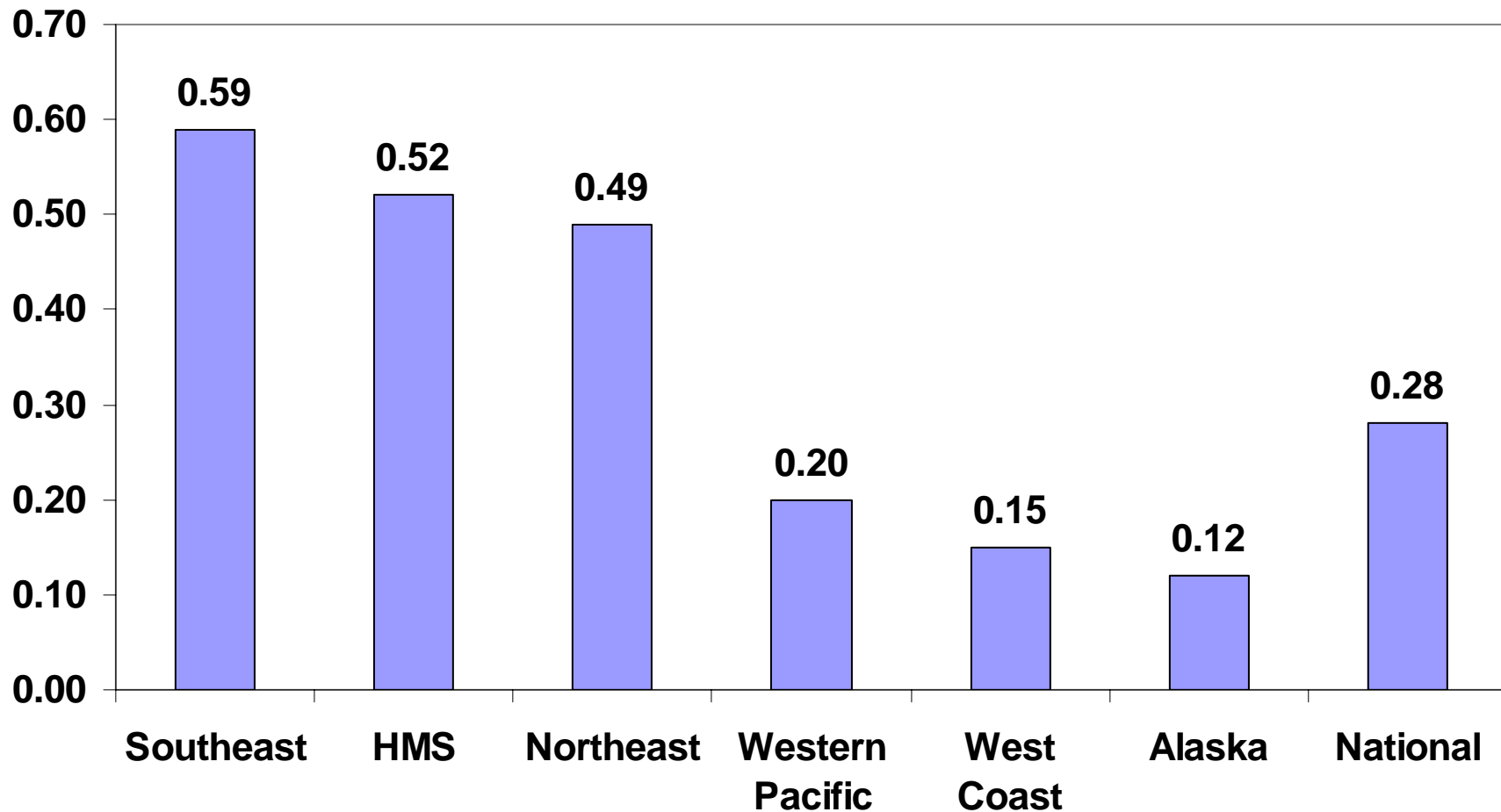
Status of US Fisheries by RFMC (2004)

RFMC	No Overfishing	Not Overfished	Grade
NPFMC	100%	89%	A
PFMC	96%	88%	A-
WPFMC	89%	88%	B+
MAFMC	71%	83%	C+
GMFMC	76%	68%	C-
SAFMC	73%	67%	D+
NEFMC	67%	58%	D-
CFMC	80%	0%	Inc

Based on data from NMFS's *Status of US Fisheries for 2004*.

Status of US Fisheries: Discards

Ratio of Discards to Landings, 2002-03



Over Capacity of US Fishing Fleets 2001

- *Overall* **40 of 61 (66%)**
 - NEFMC 4 of the 5 fisheries assessed
 - MAFMC 2 of 4
 - SAFMC 2 of 7
 - GMFMC 5 of 9
 - CFMC 1 of 2
 - PFMC 4 of 5
 - WPFMC 5 of 12
 - NPFMC 5 of 5
 - HMS 12 of 14

Over Capacity of US Fishing Fleets 2001

<u>Fishery</u>	<u>% fleet over capacity</u>
New England Groundfish	63%
Gulf of Mexico Shrimp	41
Swordfish	51
Atlantic LC Sharks	89
West Coast Groundfish	75
Total	58

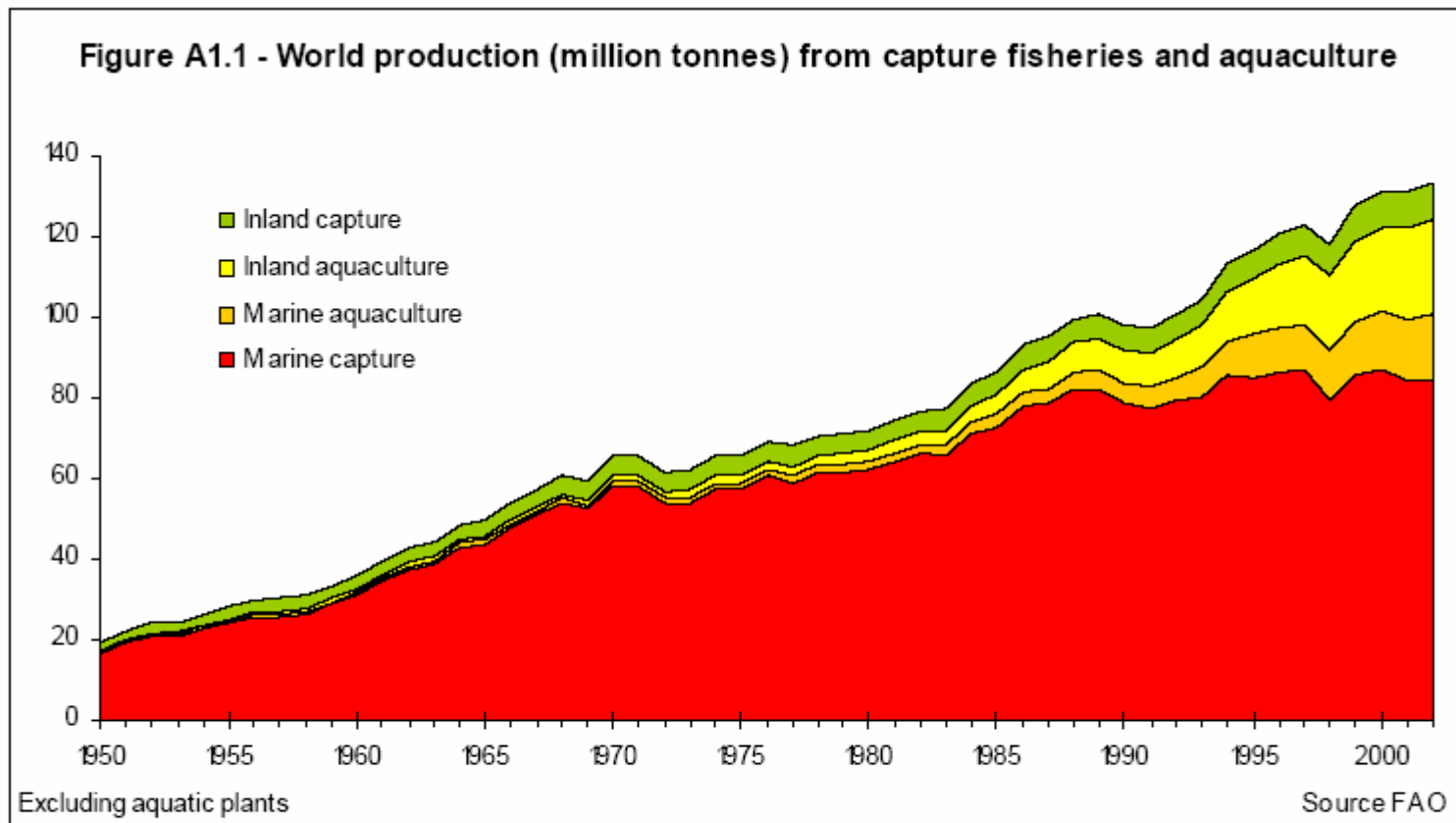
Over Capacity of US Fishing Fleets 2001

<u>Fishery</u>	<u>Est'd buyback costs</u>
New England Groundfish	\$ 450 million
Gulf of Mexico Shrimp	\$ 322
Swordfish	\$ 25
Atlantic LC Sharks	\$ 33
West Coast Groundfish	\$ 146
Total	\$ 976

US Government Expenditures

- Expenditures on fisheries management
 - Research, enforcement, & administration
 - \$661 million in 1997
 - (OECD, 2000)
 - Increased in recent years
 - 23% of commercial landed value
 - In federally managed fisheries
 - Highest among large fishing nations in OECD

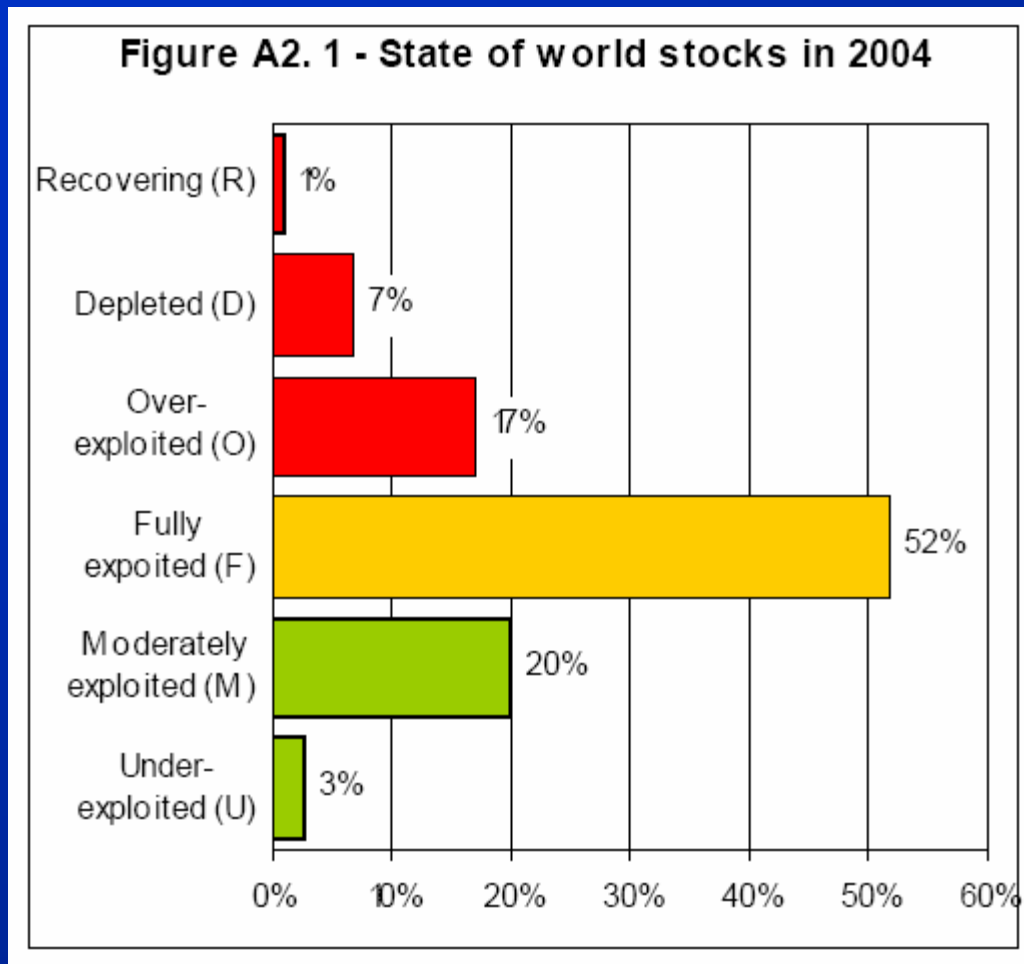
Status of World Fisheries



* FAO, Marine Resources Service, Fishery Resources Division

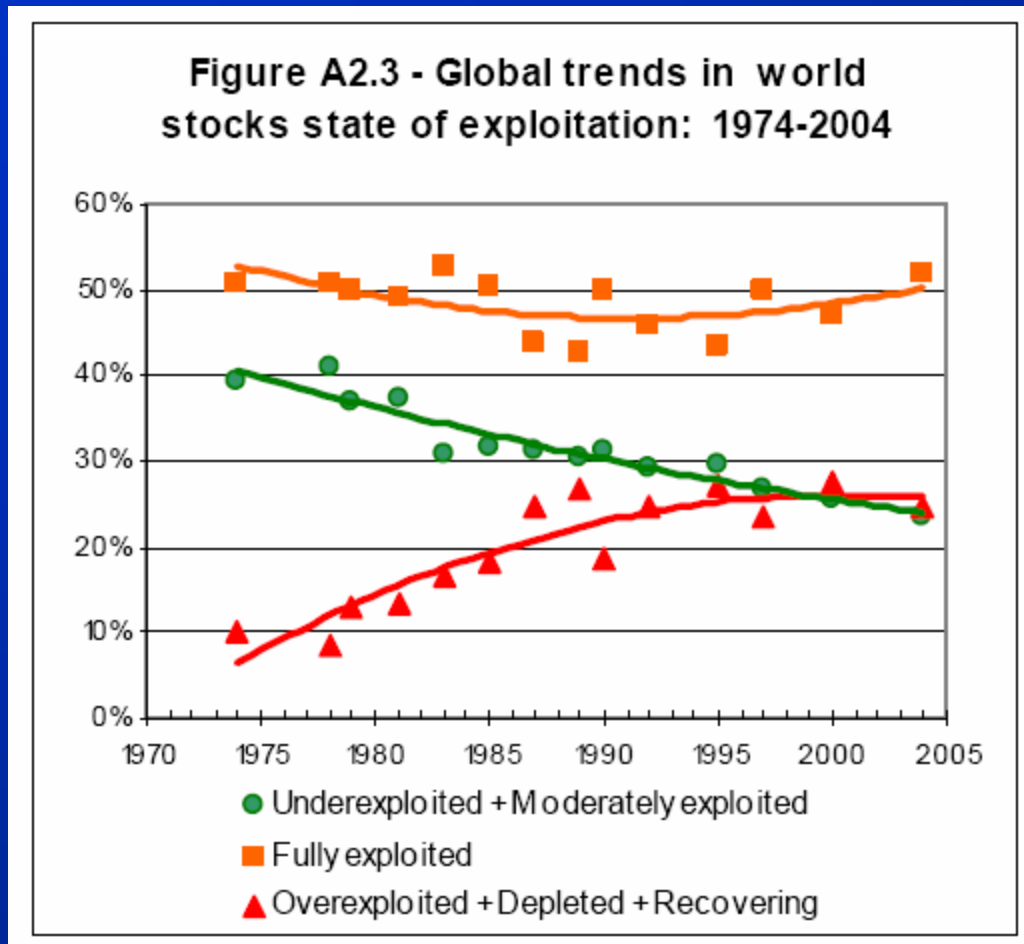
Source: FAO, Review of the state of world marine fishery resources (2005)

Status of World Fisheries



Source: FAO, Review of the state of world marine fishery resources (2005)

Status of World Fisheries



Source: FAO, Review of the state of world marine fishery resources (2005)

Status of World Fisheries

- Excessive overfishing and overfished stocks
- Excess fishing capacity
- Product waste
- Low incomes & tax revenues
- User conflicts

Factors Leading to Overfishing

- Inadequate fisheries management
- Illegal, unreported and unregulated (IUU) fishing
- Overcapacity
 - Subsidies



Management Measures

Output Controls

1. Total Allowable Catch
2. Individual Fishing Quotas (IFQs)
3. Trip and Bag Limits

Input Controls

4. Limited Licenses or Permits
5. Individual Effort Quotas (days-at-sea; trap limits)
6. Other Gear & Vessel Restrictions (HP, vessel length)

Technical Measures

7. Size & Sex Controls (fish & mesh size)
8. Time & Area Closures (MPAs)

How do they work?

The OECD Study

- OECD. 1997. Towards Sustainable Fisheries: Economic Aspects of the Management of Living Marine Resources. Paris
- Assembled evidence and expert analysis from
 - 24 OECD Member countries
 - more than 100 fisheries
- 4 years to complete
- Updated by Sutinen & Soboil (2001)

Evidence

- Management histories for each fishery
 - a chronological description of the management measures applied, and
 - corresponding outcomes observed in the fishery
 - biological
 - economic
 - social
 - administrative

Management Measures

Output Controls

- Total Allowable Catch (*42 cases*)
- Individual Fishing Quotas (*55*)
- Trip Limits (*19*)

Input Controls

- Limited Licenses (*40*)
- Individual Effort Quotas (*23*)
- Other Gear & Vessel Restrictions (*45*)

Technical Measures

- Size & Sex Controls (*49*)
- Time & Area Closures (*52*)

How well do they work?

Consequences

- Biological
 - exploitation status of resource stocks
- Economic
 - net benefits
 - producers
 - processors
 - distributors
 - consumers
- Social
 - perceived equity
 - life style
 - class divisions
- Administrative
 - research
 - data quality
 - industry cooperation
 - enforcement

Competitive Total Allowable Catch (OECD 1997)

- Not prevented over-exploitation
- Race-to-fish
 - shortened seasons
 - market gluts
- Over capacity
 - more & larger vessels
 - more HP, larger hull, etc.
- Increased costs
 - harvesting and processing

Update on TACs

- Supports findings of OECD (1997)
 - race-to-fish
 - over capacity
- Substantial reductions in TACs
- Applied to new species
 - Japan
 - European Union

Limited Licenses

OECD (1997)

- Did not control fishing capacity
- Did not stem over-exploitation
- Increased harvesting costs
- Some initial allocation problems

Time & Area Closures

- OECD (1997)
 - Closures not effective in assuring conservation
 - though evidence was weak
- Update
 - Several new & enlarged closures
 - e.g., Mediterranean bluefin tuna
 - U.S. closures on Georges Bank & Gulf of Maine
 - improved abundance of sea scallops
 - recovery of yellowtail flounder

Size & Sex restrictions

OECD (1997)

- Do not mitigate the race-to-fish
- Increased enforcement costs and/or problems
- Some evidence that
 - the average size of fish landed increases
 - discards increase

Individual Fishing Quotas

OECD (1997)

- IFQs
 - potent & valuable tool
 - controlling exploitation,
 - mitigating the race-to-fish
 - generating sustainable economic benefits
 - reducing the number of participants in a fishery
 - serious side effects
 - initial allocation of quota
 - economic and social disruption (real & imagined)
 - enforcement and compliance.

Individual Fishing Quotas

OECD (1997)

- IFQ management
 - more conservation and economic benefits than other management measures
 - more social & administrative problems than other measures
- non-IFQ management measures
 - far less conservation & economic benefits than IFQs
 - fewer social and administrative difficulties than IFQs

Why do IFQs perform so well?

- IFQs are ‘rights-based’
 - provide fishing rights (or *privileges*) that are exclusive
 - exclusive rights of use mitigate
 - race-to-fish
 - user conflicts
 - excess capacity
 - provide a claim on the future
 - a willingness to sacrifice to conserve stocks

Update on IFQs

- Results supported by NRC(1999) study
- Worldwide trends
 - towards the use of IFQs
 - especially in fisheries formerly under competitive TAC management
 - towards cost recovery
 - user fees
 - users pay in proportion to benefits received

Update on IFQs

- Worldwide trends
 - Solutions are being found for
 - initial allocation
 - enforcement
 - equity & disruptions
 - Collective rights (U.S., Canada)
 - Community Development Quotas
 - Conservation Cooperatives
 - Community-based organizations

Three take-home messages

- Rights-based management works well
 - Superior conservation & economic benefits
 - Outperforms traditional management
 - Ecosystem friendly
 - Less damage to habitat
 - Reduced interaction with marine mammals & sea birds
- Output controls
 - Superior to input controls & technical measures