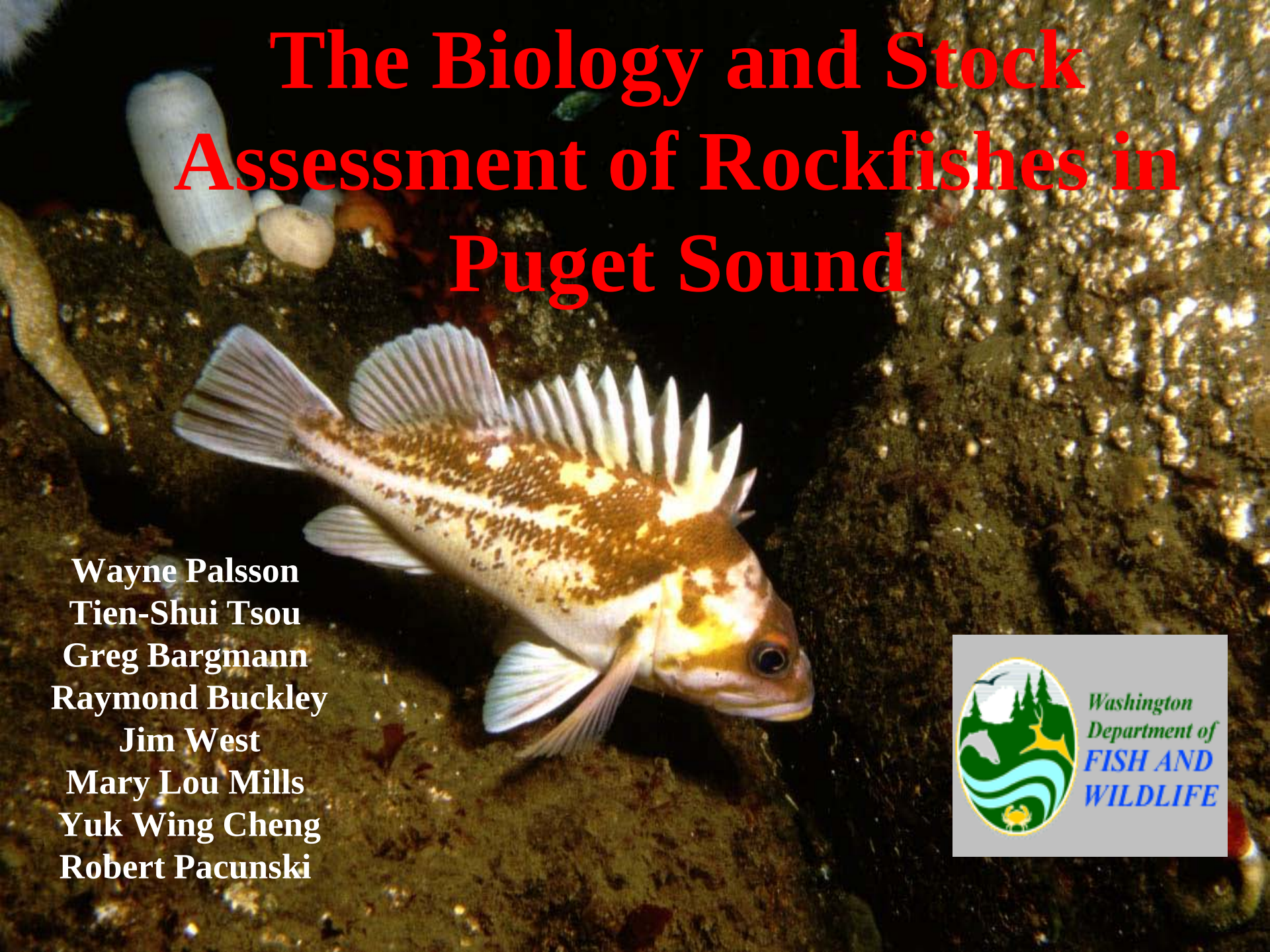
The Biology and Stock Assessment of Rockfishes in Puget Sound



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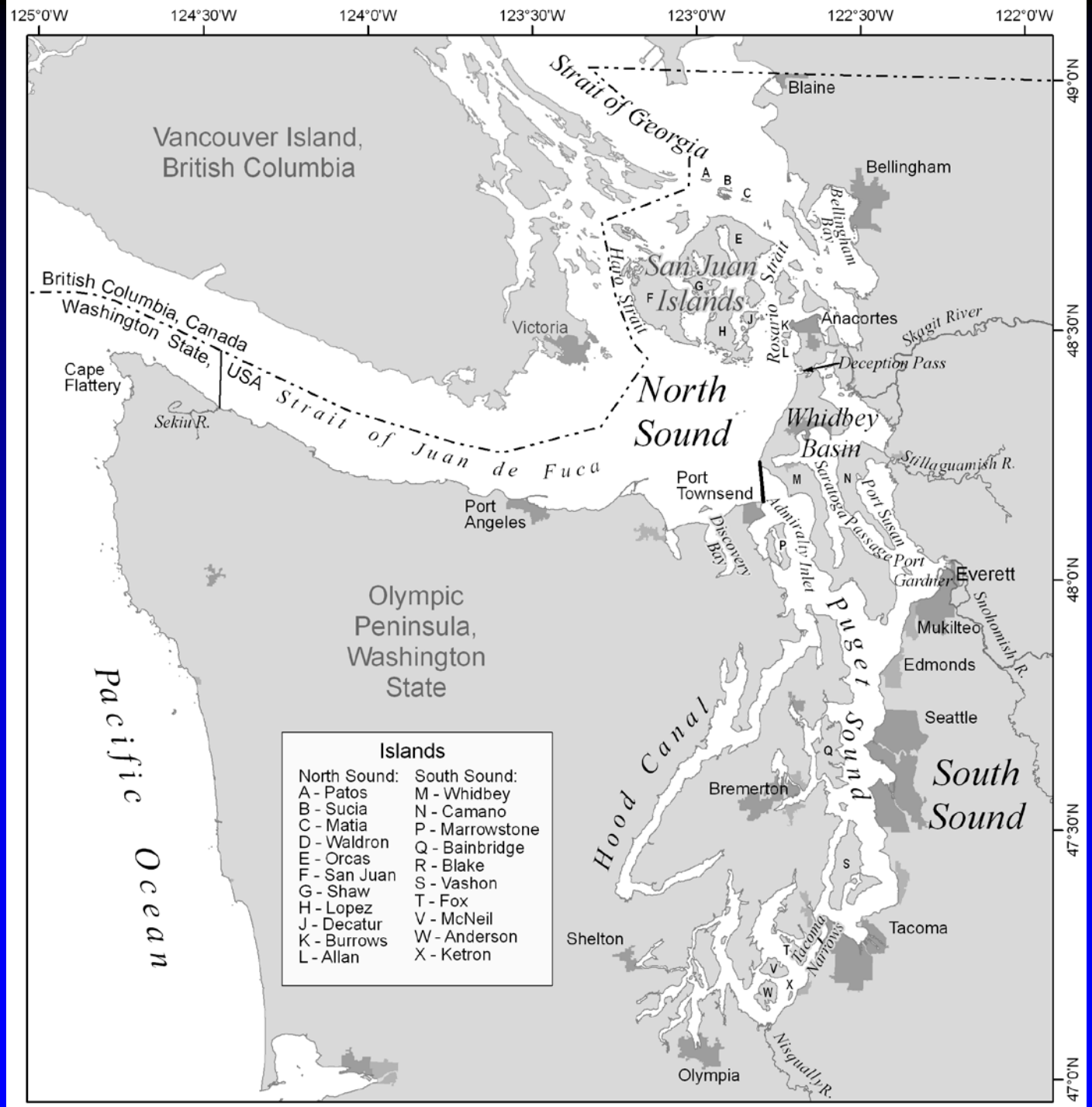
Washington Department of FISH AND WILDLIFE


125°0'W
124°30'W
124°0'W
123°30'W
123°0'W
122°30'W
122°0'W
49°0'N
48°30'N
48°0'N
47°30'N
47°0'N
Strait of Georgia
Blaine
Vancouver Island, British Columbia
Bellingham
Bellingham Bay
San Juan Islands
Haro Strait
Rosario Strait
Victoria
Anacortes
Skagit River
Deception Pass
British Columbia, Canada
Washington State, USA
Strait of Juan de Fuca
Cape Flattery
Sekiu R.
North Sound
Whidbey Basin
Stillaguamish R.
Port Townsend
Saratoga Passage
Port Susan
Port Angeles
Discovery Bay
Admiralty Inlet
Port Gardner
Everett
Olympic Peninsula, Washington State
Puget Sound
Snohomish R.
Mukilteo
Edmonds
Pacific Ocean
Hood Canal
Seattle
South Sound
Bremerton
Shelton
Tacoma
Tacoma Narrows
Olympia
Nisqually R.
Islands
North Sound:
A - Patos
B - Sucia
C - Matia
D - Waldron
E - Orcas
F - San Juan
G - Shaw
H - Lopez
J - Decatur
K - Burrows
L - Allan
South Sound:
M - Whidbey
N - Camano
P - Marrowstone
Q - Bainbridge
R - Blake
S - Vashon
T - Fox
V - McNeil
W - Anderson
X - Ketron

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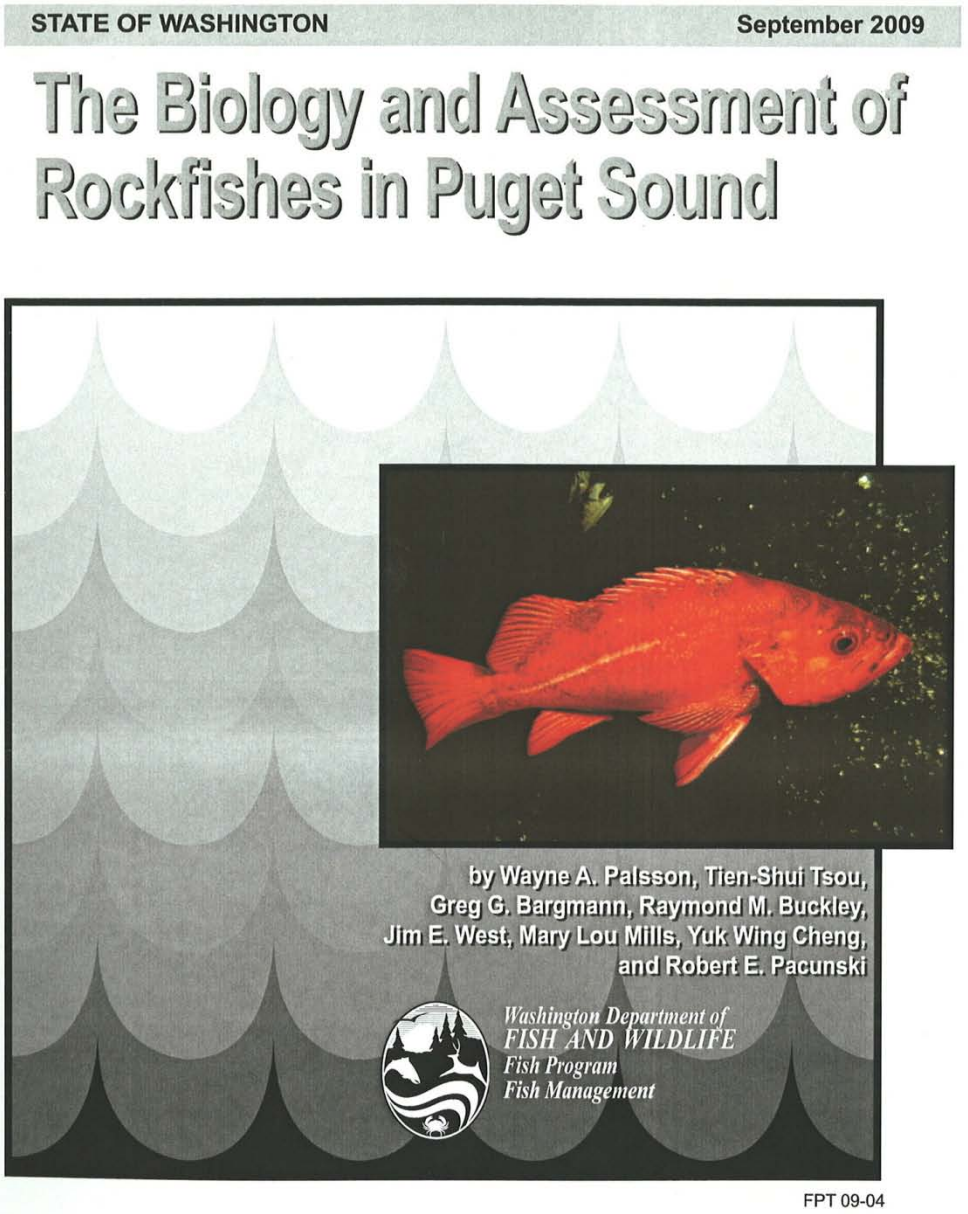
-Management
-Biology
-Habitat
-Fisheries
-Stock Evaluation
-Stressors
-Research Needs



Diversity!

Rockfish are Evolved for Long Life

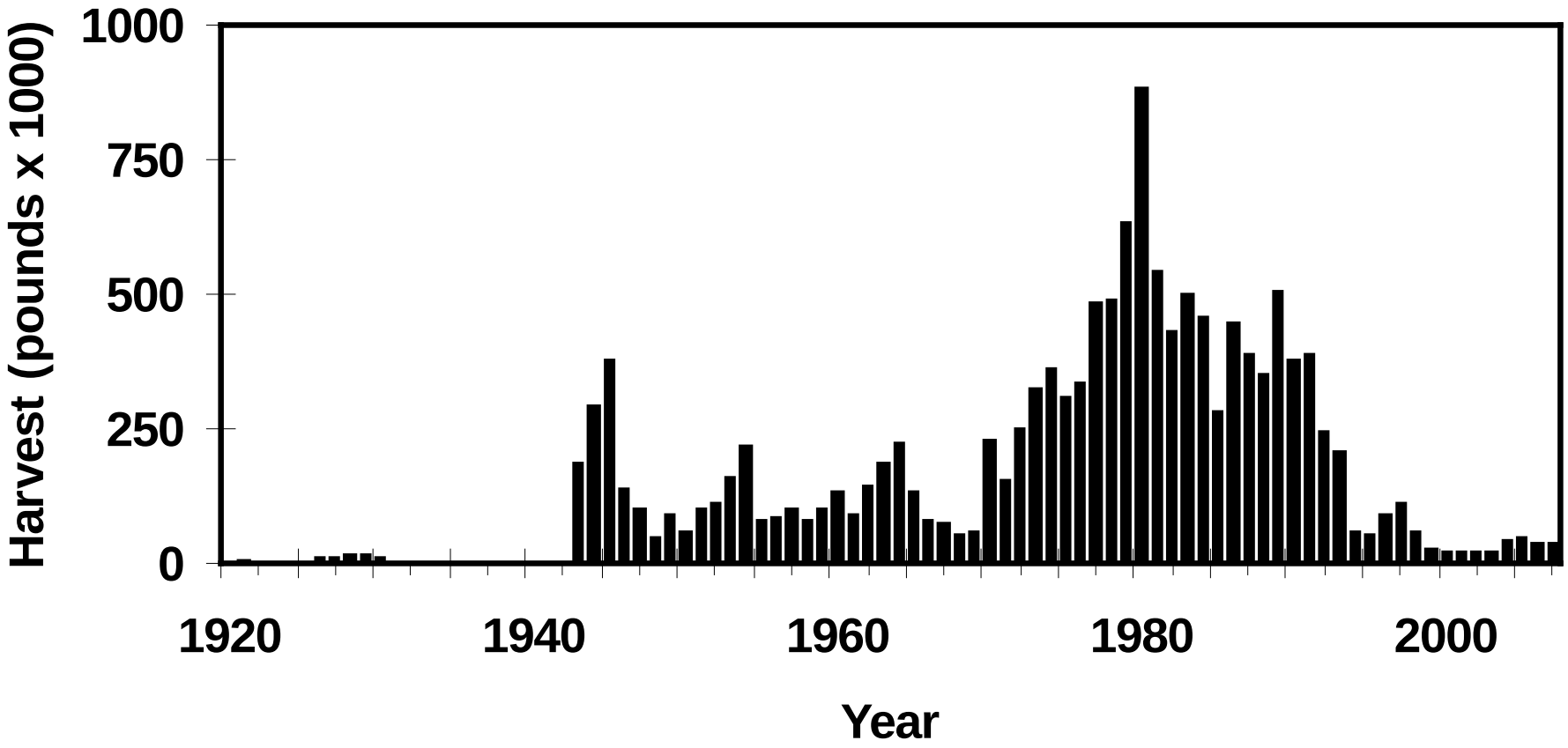
- Live over 100 years
- Maturity 5 to 20 yrs
- Successful spawning once per decade
- Slow growth
- Habitat specific

Rockfish Fisheries in Puget Sound

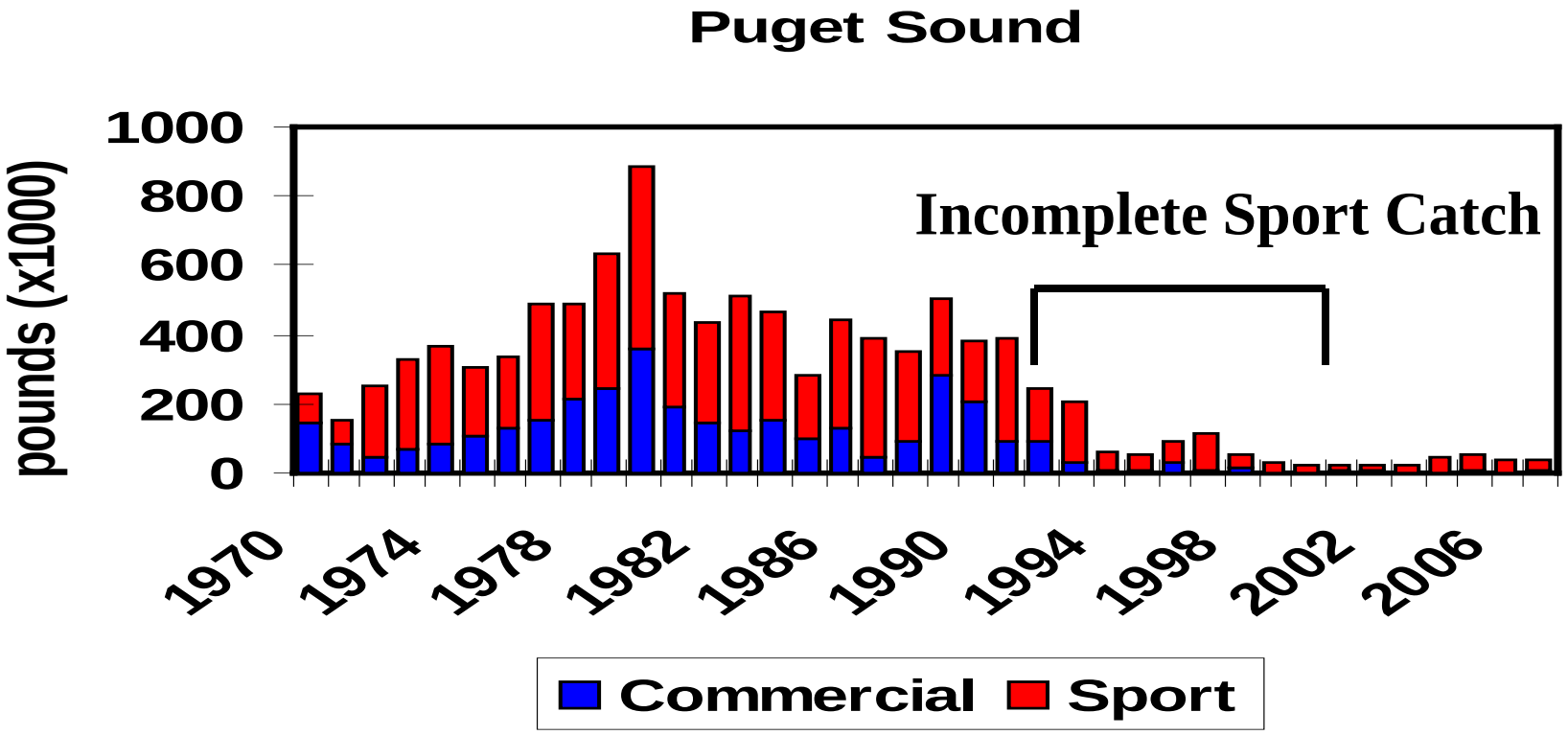
- **Commercial**
  - **Historic troll and jig fisheries.**
  - **Targeted eliminated by 1994**
  - **Bycatch: Trawling, longlines, set nets (bycatch)**

  Recreational
  - **Now bycatch only.**
  - **Private and charter boats**
  - **Scuba spearfishing**
  - **Shore & dock fishing**
- **Tribal**

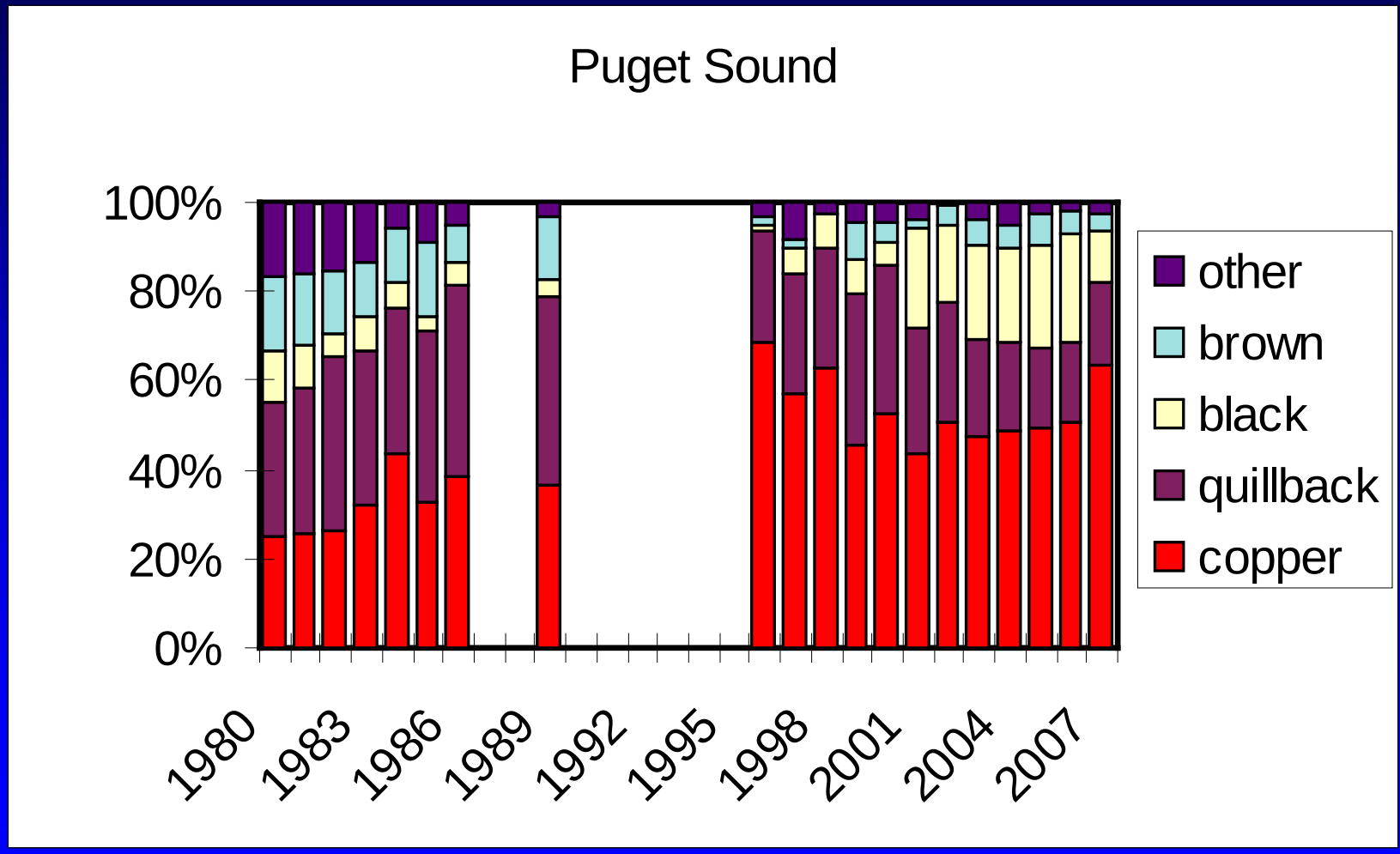
Historical Catch Records



Rockfish Harvest in Puget Sound



Recreational Composition



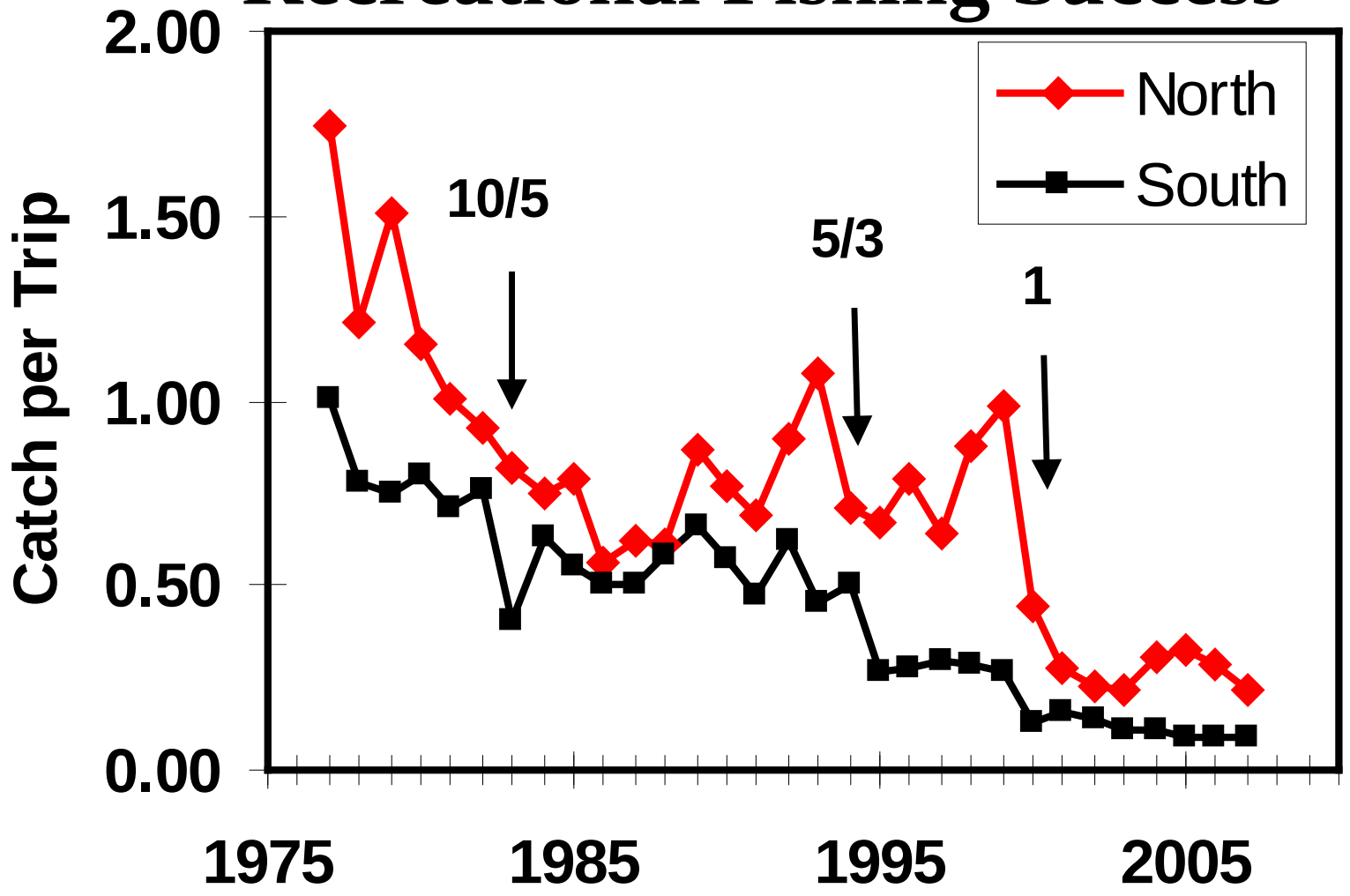
Stock Evaluation

- Data Limited
- Three approaches:
  - Fraction of Lifetime Egg Production
  - Coastal Age-structured Assessment
  - AFS Marine Fish Stocks at Risk (Musik 1999)
- Stock Status

Stock Status Criteria

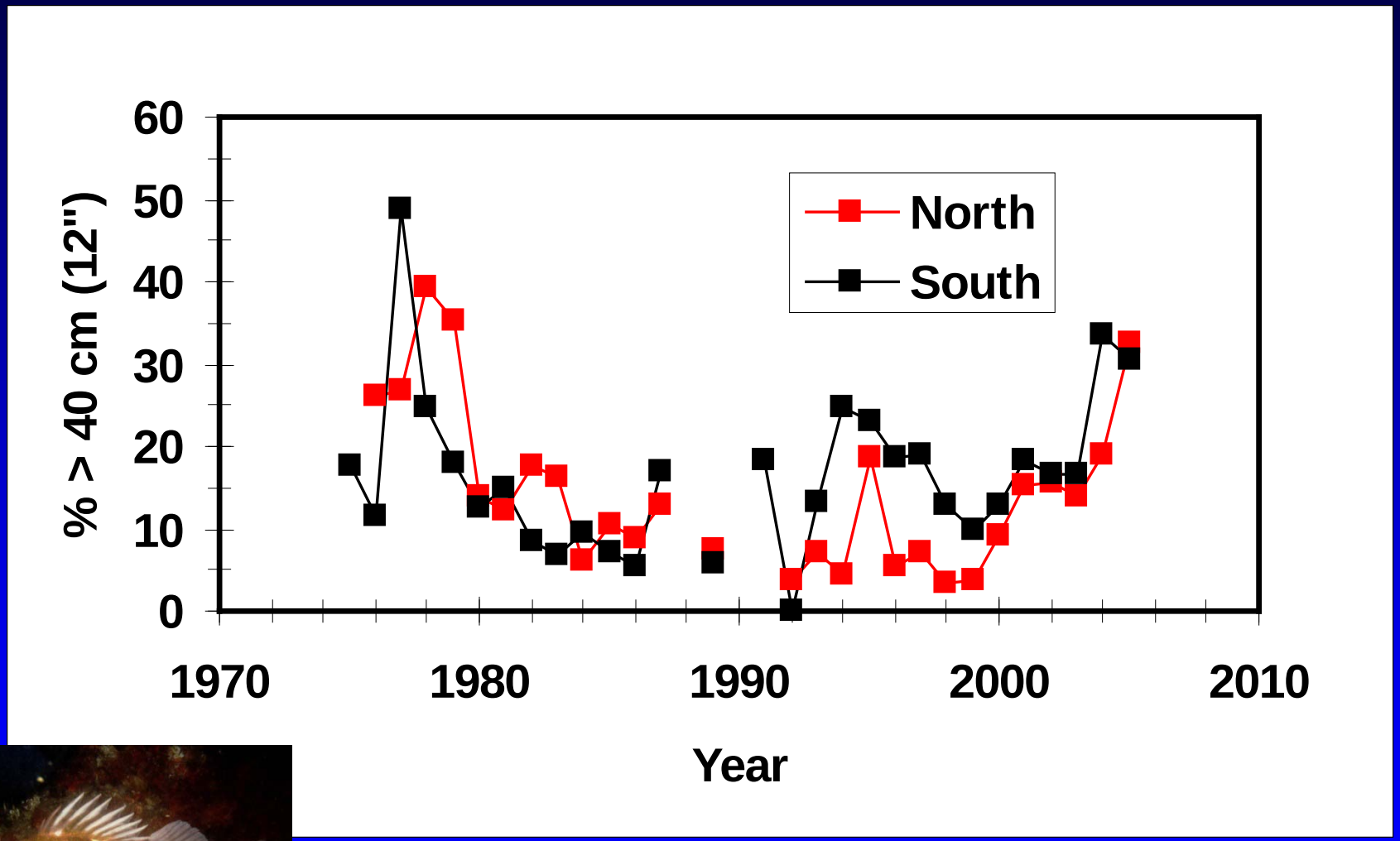
- **Healthy: Stable, Increasing Trends**
- **Precautionary: Declining Trends less than vulnerable threshold**
- **Vulnerable: At or near vulnerable threshold, mitigating conditions**
- **Depleted: Much below vulnerable threshold**
- **Unknown=Precautionary**

Recreational Fishing Success

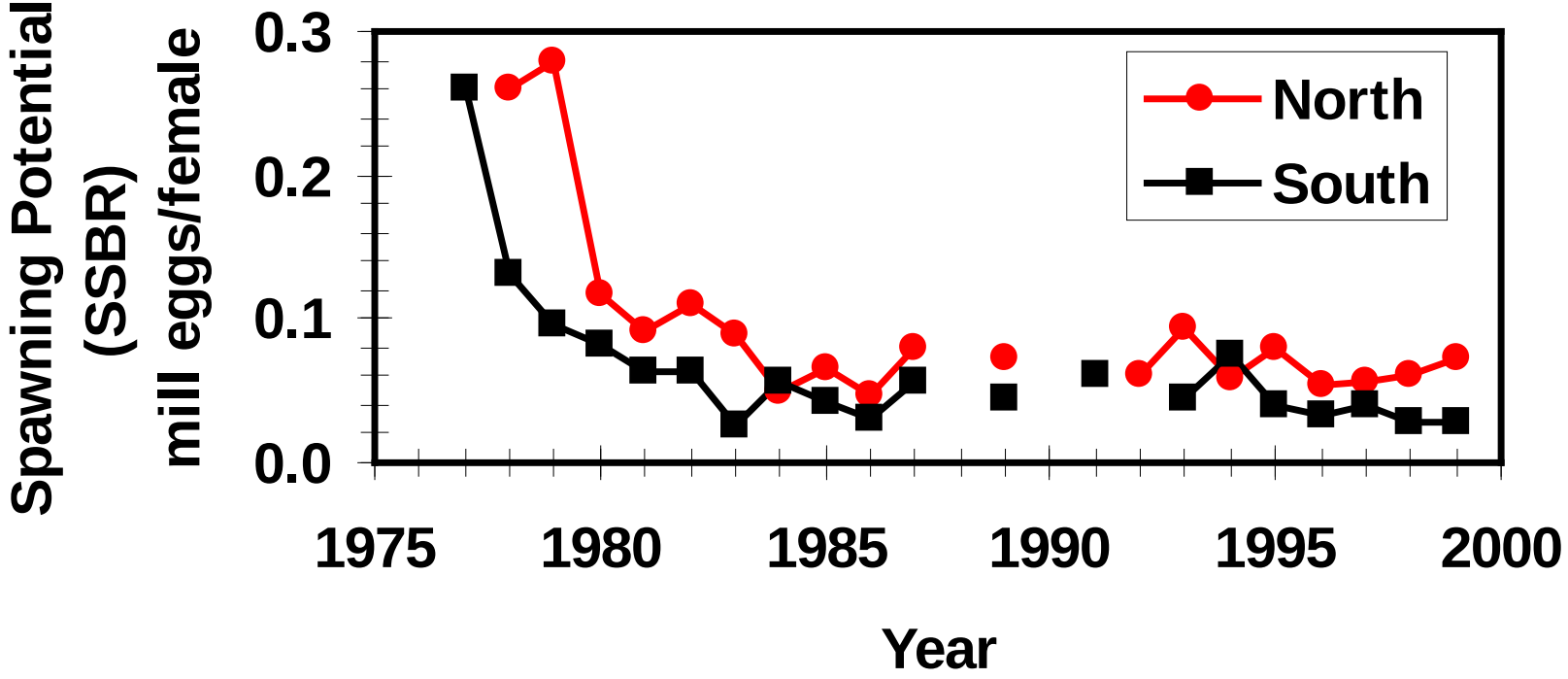


mirrors population trend assuming constant chance of catching a fish

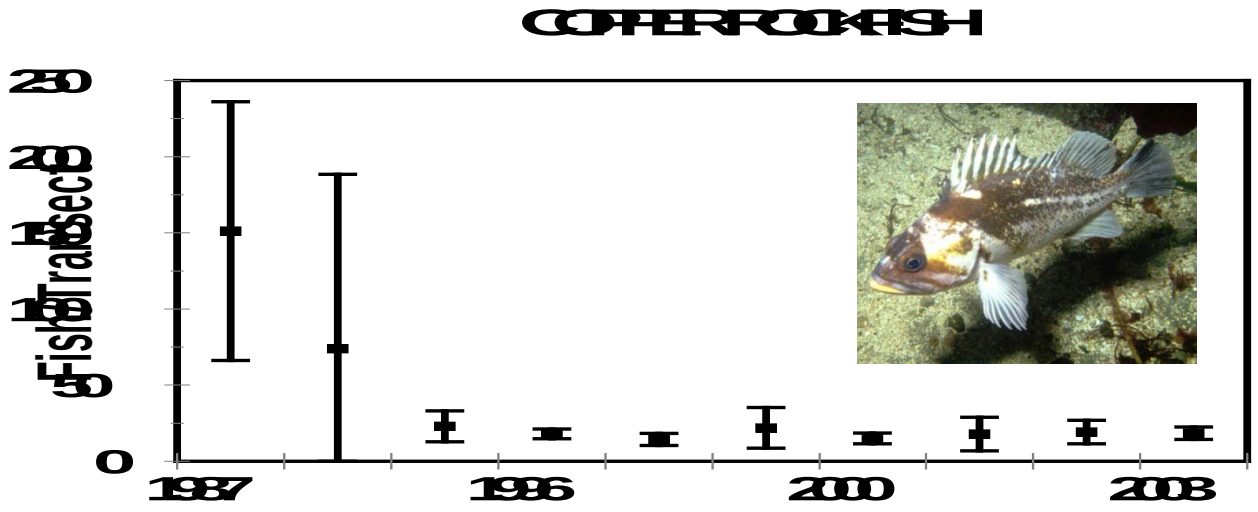
Decline in Copper Rockfish Size

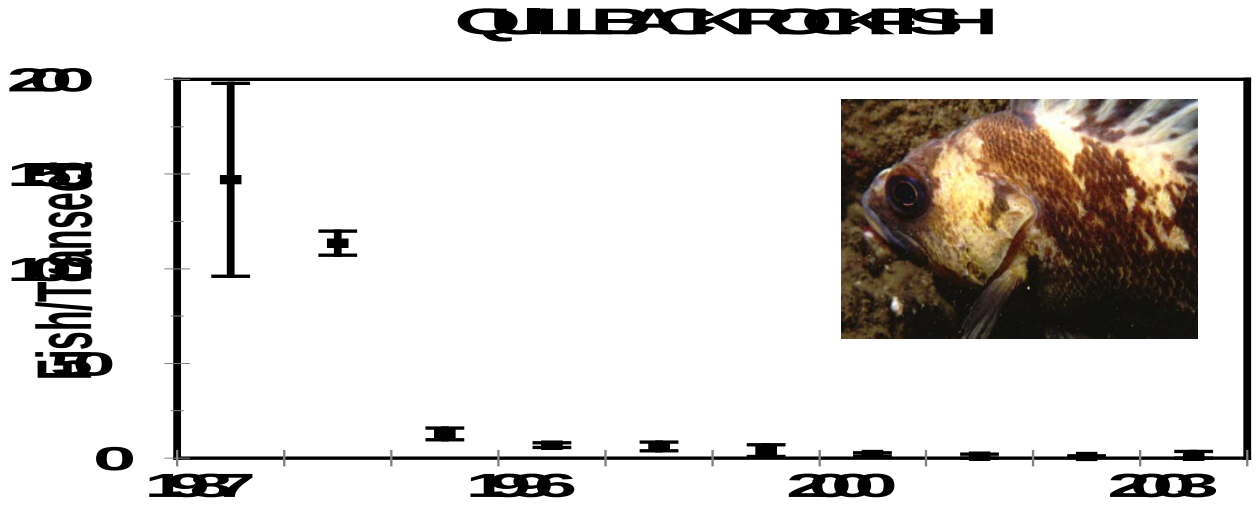


Change in Copper Rockfish Spawning Success



Central Sound Scuba Study

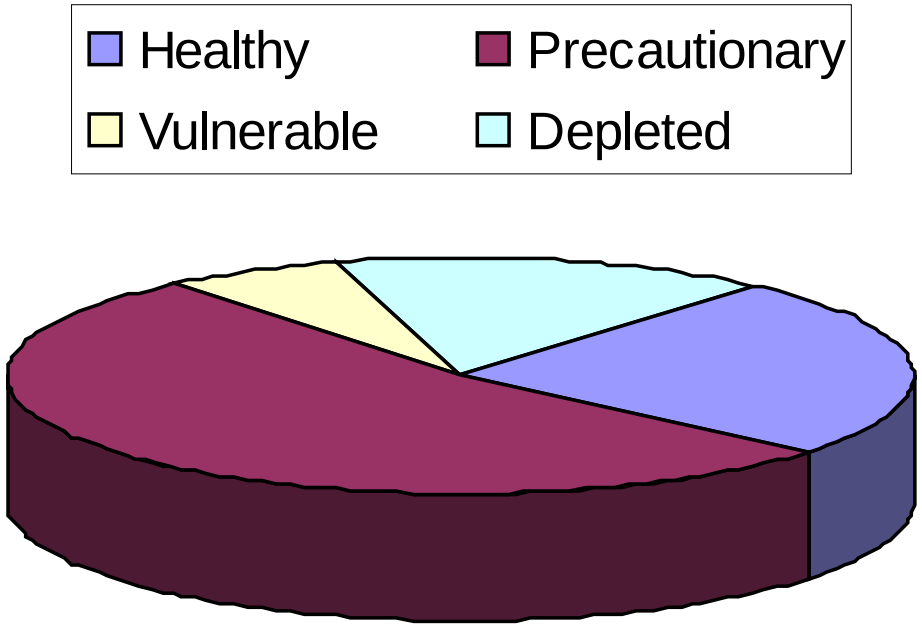




Trend Summary for Common Rockfishes			
	Copper	Quillback	Brown
North			
Spawning Potential	69% Decline	73% Decline	
Video	>50% Decline	No Trend	
South			
Spawning Potential	80% Decline	78% Decline	
Video	>50%-80% Decline		
Trawl	Decline	Decline	
Dive	70% Decline	90% Decline	Increasing

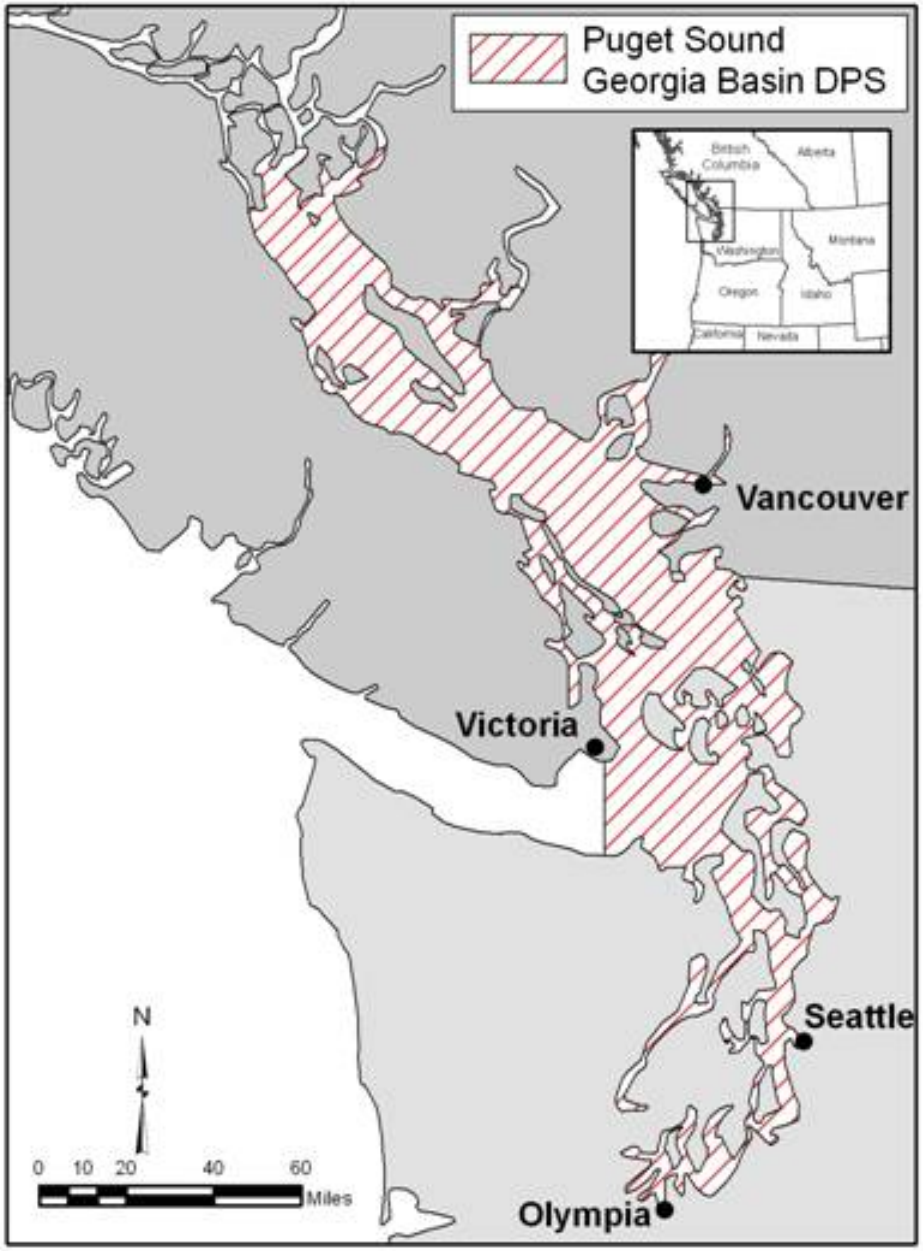
Status of Rockfish Populations in Puget Sound		
Species	**North Sound**	**South Sound**
Copper rockfish	Precautionary	Vulnerable
Quillback rockfish	Vulnerable	Depleted
Brown rockfish	Precautionary	Precautionary
Black rockfish	Precautionary	Precautionary
Yelloweye rockfish	Depleted	Depleted
Yellowtail rockfish	Precautionary	Precautionary
Canary rockfish	Depleted	Depleted
Bocaccio	Precautionary	Precautionary
Redstripe rockfish	Healthy	Healthy
Greenstriped rockfish	Healthy	Healthy
Splitnose rockfish	Precautionary	Precautionary
Shortspine thornyhead	Healthy	Healthy
Tiger rockfish	Precautionary	Precautionary
China rockfish	Precautionary	Not Present
Blue rockfish	Precautionary	Not Present
Vermilion rockfish	Precautionary	Precautionary
Puget Sound rockfish	Precautionary	Healthy

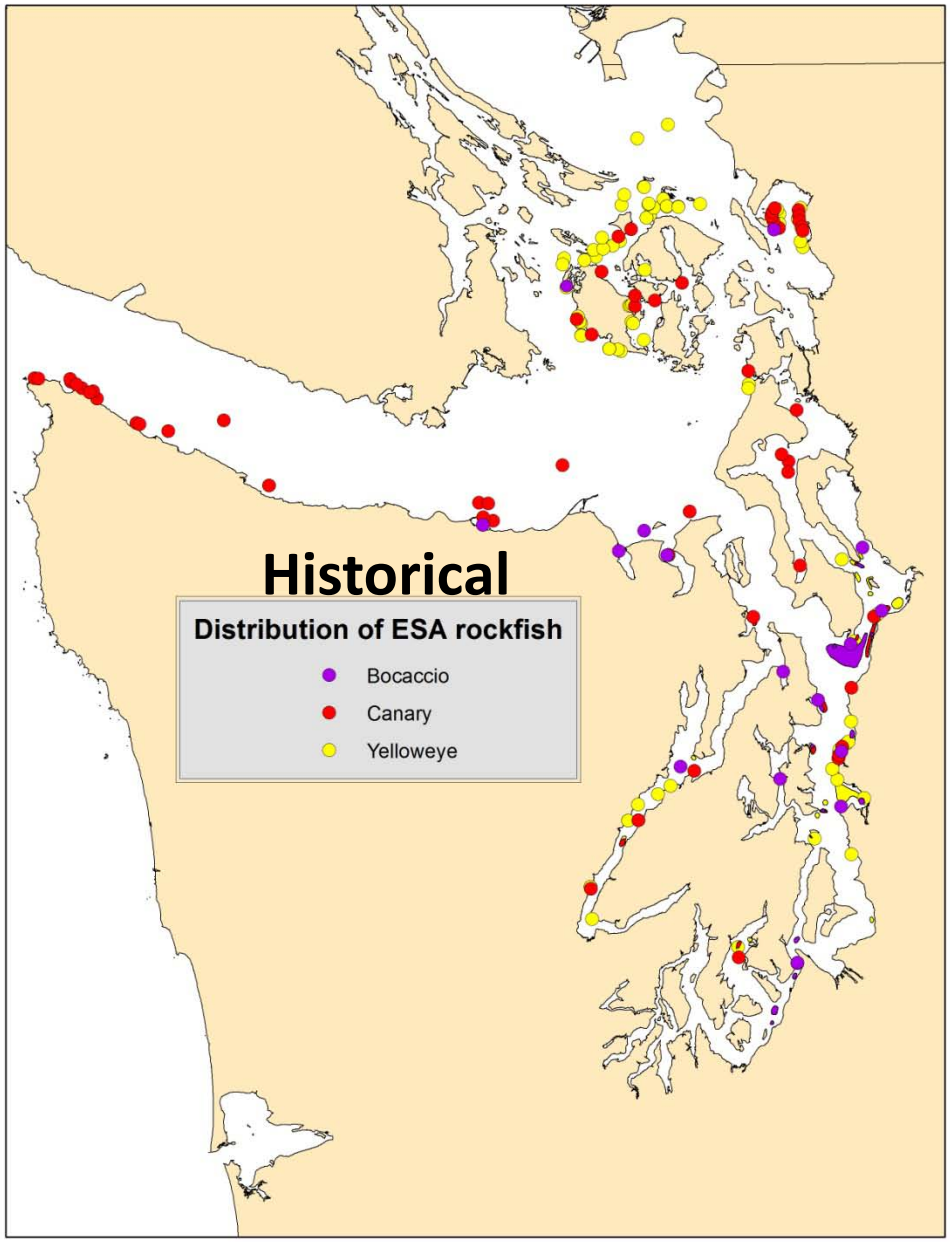
Rockfish Stock Status



Federal ESA Listing

- Bocaccio
- Canary Rockfish
- Yelloweye Rockfish


Puget Sound
Georgia Basin DPS
British Columbia
Alberta
Montana
Washington
Oregon
Idaho
California
Nevada
Vancouver
Victoria
Seattle
Olympia
N
0 10 20 40 60
Miles


Historical
Distribution of ESA rockfish
Bocaccio
Canary
Yelloweye

Rockfish Management in Puget Sound

- No retention of rockfish by non-tribal fisheries
- No retention east of Port Angeles
- 120 ft depth restriction for bottomfishing
- Closed most commercial fisheries for bottomfish
- No Spearfishing
- Closed for yelloweye and canary
- Marine reserves created
- Fishery-independent surveys
  - Video, scuba, trawl