

Ecological History of Rockfish Exploitation in Puget Sound

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Impetus for Study

Outgrowth of ESA review process for 5 species of rockfish in Puget Sound

Key factors

- Species life history
- Exploitation history

and alert them to approach with caution if the description does not match the

6. What are the estimated reductions in investigatory expenditures?

SUMMARY: On October 29, 2007, we, NMFS, received new information and a request to reconsider our “not warranted” finding on a petition submitted in April 2007 to list bocaccio (*Sebastes paucispinis*), canary rockfish (*S. pinniger*), yelloweye rockfish (*S. ruberrimus*), greenstripe rockfish (*S. elongatus*) and redstripe rockfish (*S. proriger*) in Puget Sound (Washington) as endangered or threatened species under the Endangered Species Act (ESA). We consider this a new petition and find that this new petition presents substantial scientific or commercial information indicating that the petitioned actions may be warranted. Accordingly, we are initiating a status review of these five rockfish species. To ensure that the status review is complete and based upon the best available scientific and commercial information, we are soliciting

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 080229341–8367–01]

RIN 0648–XF89

Listing Endangered and Threatened Species and Designating Critical Habitat: Notice of Finding on a Petition to List Five Rockfish Species in Puget Sound (Washington) as Endangered or Threatened Species Under the Endangered Species Act

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of finding; request for information, and initiation of status review.

SUMMARY: On October 29, 2007, we, NMFS, received new information and a request to reconsider our “not warranted” finding on a petition submitted in April 2007 to list bocaccio (*Sebastes paucispinis*), canary rockfish (*S. pinniger*), yelloweye rockfish (*S. ruberrimus*), greenstripe rockfish (*S. elongatus*) and redstripe rockfish (*S. proriger*) in Puget Sound (Washington) as endangered or threatened species under the Endangered Species Act (ESA). We consider this a new petition and find that this new petition presents substantial scientific or commercial information indicating that the petitioned actions may be warranted. Accordingly, we are initiating a status review of these five rockfish species. To ensure that the status review is complete and based upon the best available scientific and commercial information, we are soliciting information regarding the population structure and status of these rockfish species.

DATES: Information and comments on the subject action must be received by May 16, 2008.

ADDRESSES: You may submit comments, identified by the code 0648–XF89, addressed to: Chief, NMFS, Protected



History of exploitation / management is particularly important for long-lived, low productivity species:

Rockfish life history:

- Long-lived (>50y)
- Delayed maturity
- Highly variable recruitment to juvenile stage
- Very low 1st year survival



Impact or
Mgt Action

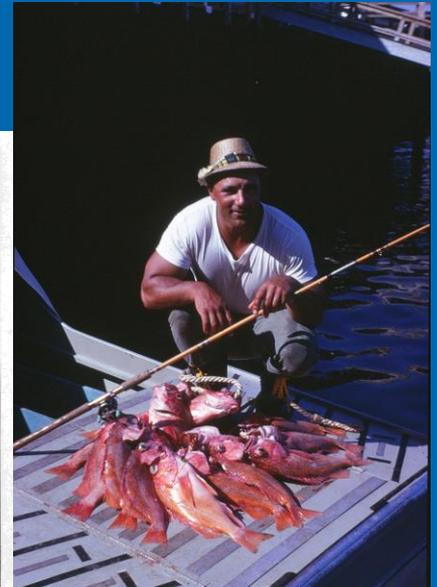


Population
Response

Exploitation history:

- Highly variable in time and space
- Poorly documented

We cannot understand the current state of the Puget Sound ecosystem without understanding historic levels of exploitation and the socioeconomic and institutional forces that affected that exploitation



Research Questions

- What were the historical exploitation levels of rockfish in Puget Sound?
- What are the socioeconomic and institutional forces that affected that exploitation?
- How has historical exploitation shaped the current ecosystem?



Pre-Euroamerican Rockfish Harvest

- Evidence from oral histories, ethnographers, & archaeological record
- Rockfish primarily opportunistic subsistence resource, harvested for immediate consumption



Rockfish Bones in the Zooarchaeological Record

66%

10%

<1%

15%

<1%

<1%

Image U.S. Geological Survey

Image © 2010 DigitalGlobe

Image © 2010 IMTCAN

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

lat 48.013079° lon -123.698125° elev 0 ft

©2009 Google

Imagery Date: Jun 30, 2006

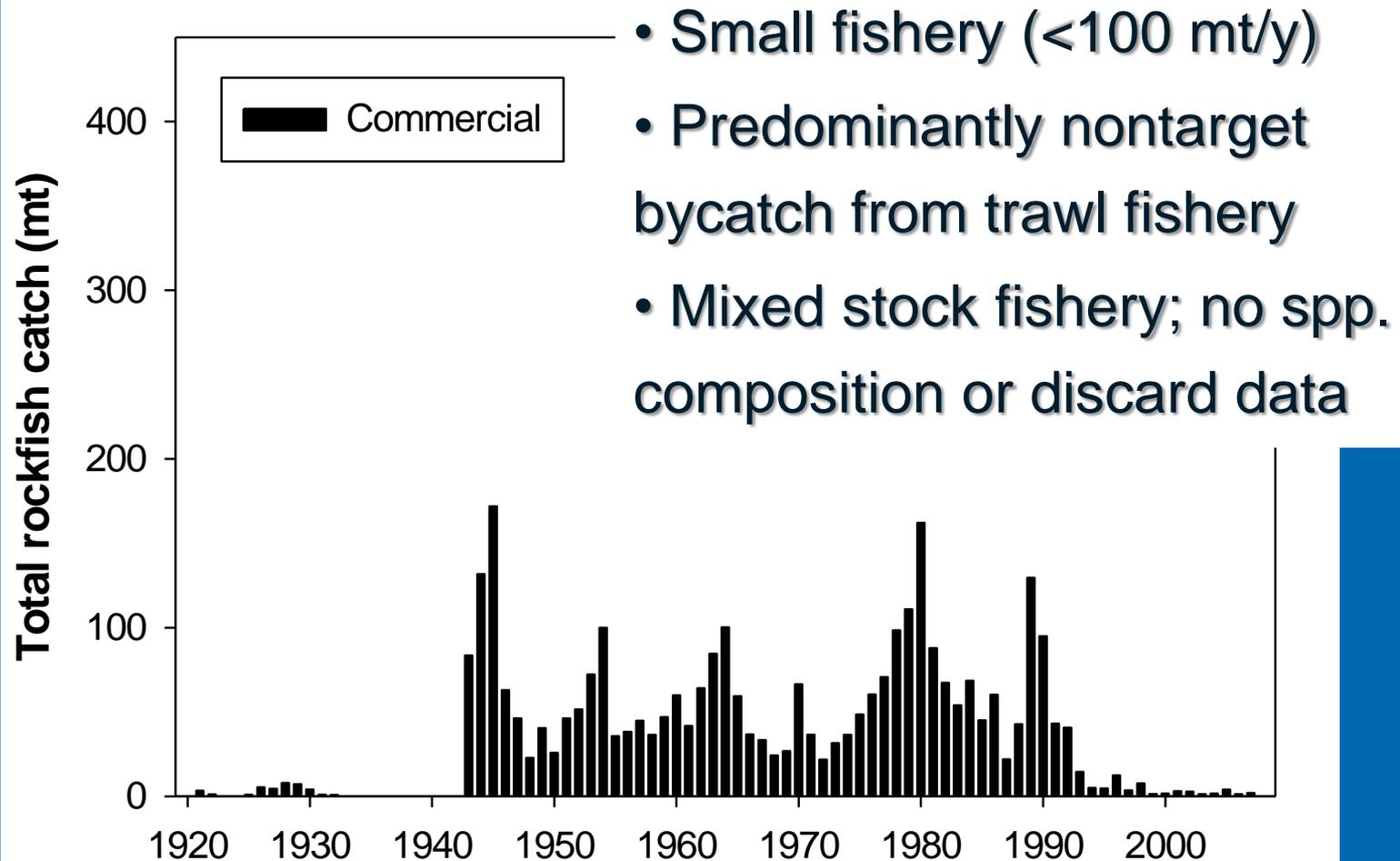
Eye alt 179.02 mi

Puget Sound Commercial Fisheries 1880s - 1980

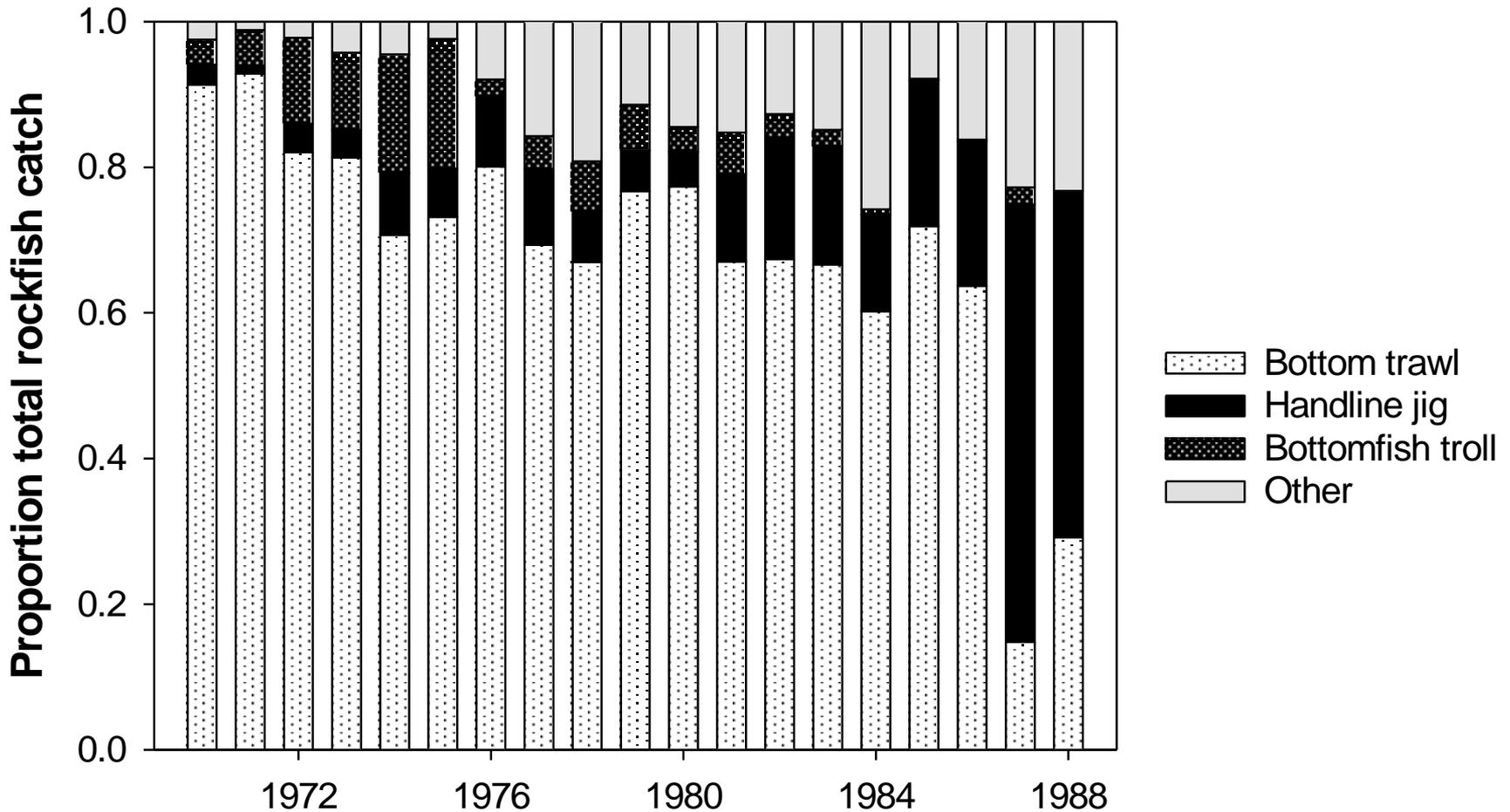


F/V Sunbeam, 1944; Courtesy Puget Sound Maritime Historical Society

Puget Sound Commercial Fisheries – Rockfish Catch



Transition to a Commercial Fishery Targeting Rockfish



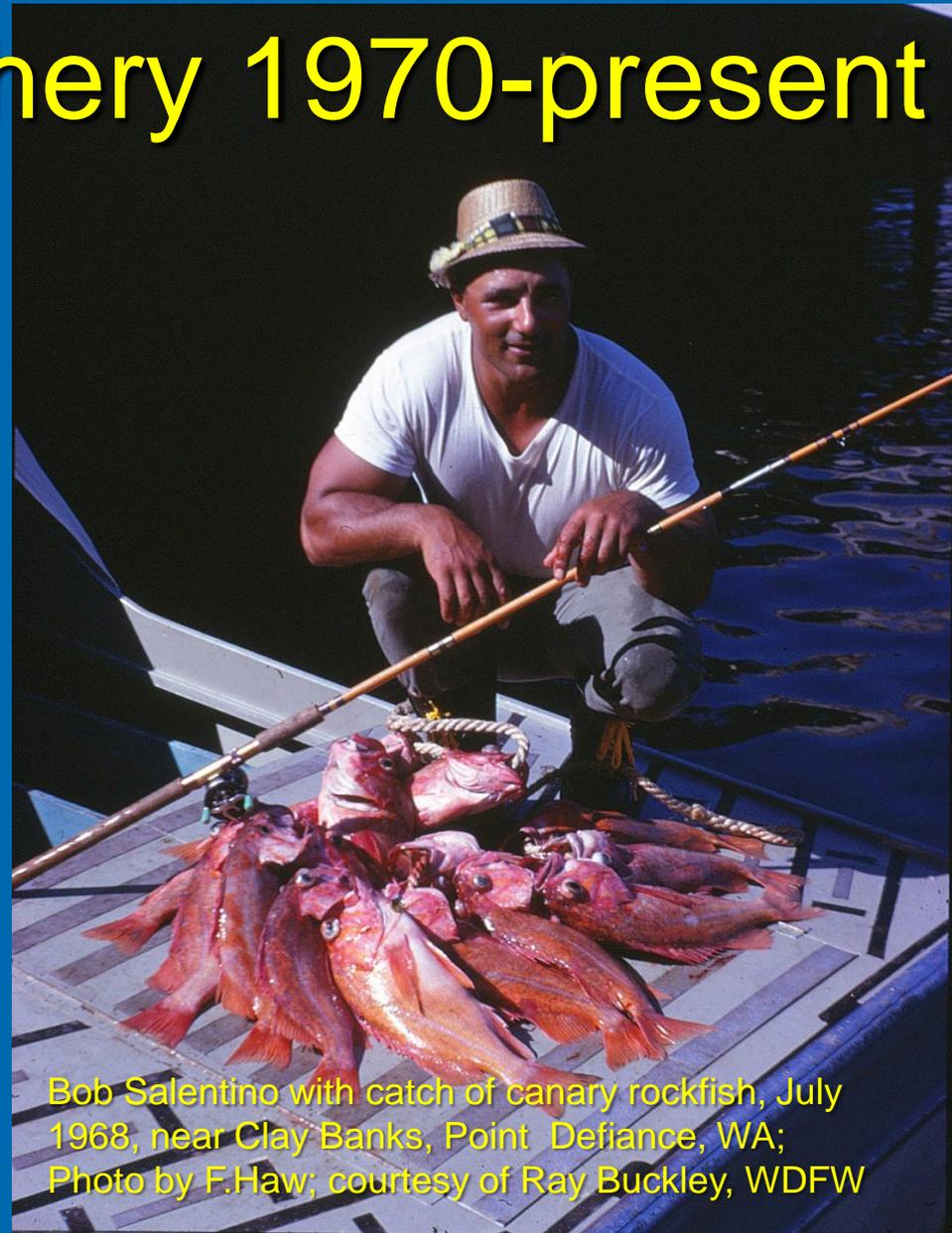
Transition to a Commercial Fishery Targeting Rockfish

- Resulted in a significant focus on rocky reef habitat
- Driven by marketplace demand
 - Demographic shifts in population?
 - Decline in availability of other preferred species
 - Regional population growth (+1.3 mill 1970-2000)
- Rockfish popularity reflected by regional cookbooks
(Levin and Dufault 2010)
 - Rockfish nearly absent in recipes <1970's
 - After 1980, >80% included rockfish recipes

Emerging Dominance of the Recreational Fishery 1970-present

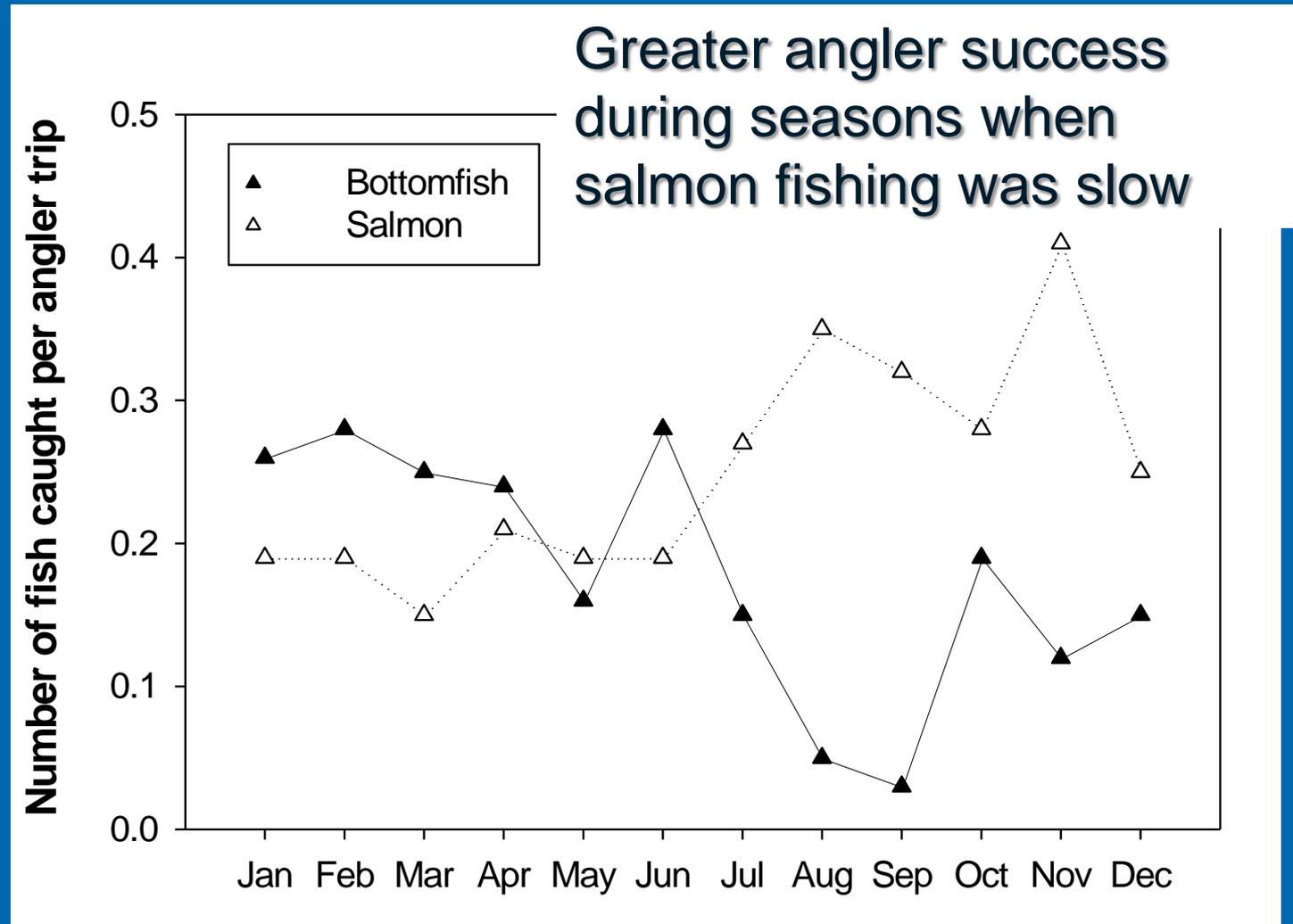
Changing attitudes of marine anglers toward bottomfish by 1965...

- Rising nationwide interest in recreational angling
- Technological advances: monofilament, depth finders
- Decline in salmon fishing opportunities



Bob Salentino with catch of canary rockfish, July 1968, near Clay Banks, Point Defiance, WA; Photo by F.Haw; courtesy of Ray Buckley, WDFW

Puget Sound Recreational Fishery



from Buckley, 1965

Puget Sound Recreational Fishery

- Federal and state programs played a role in cultivating demand
- Possible attempt to alleviate effects of 1974 Boldt decision

Bottomfish: Overlooked Gems in Puget Sound



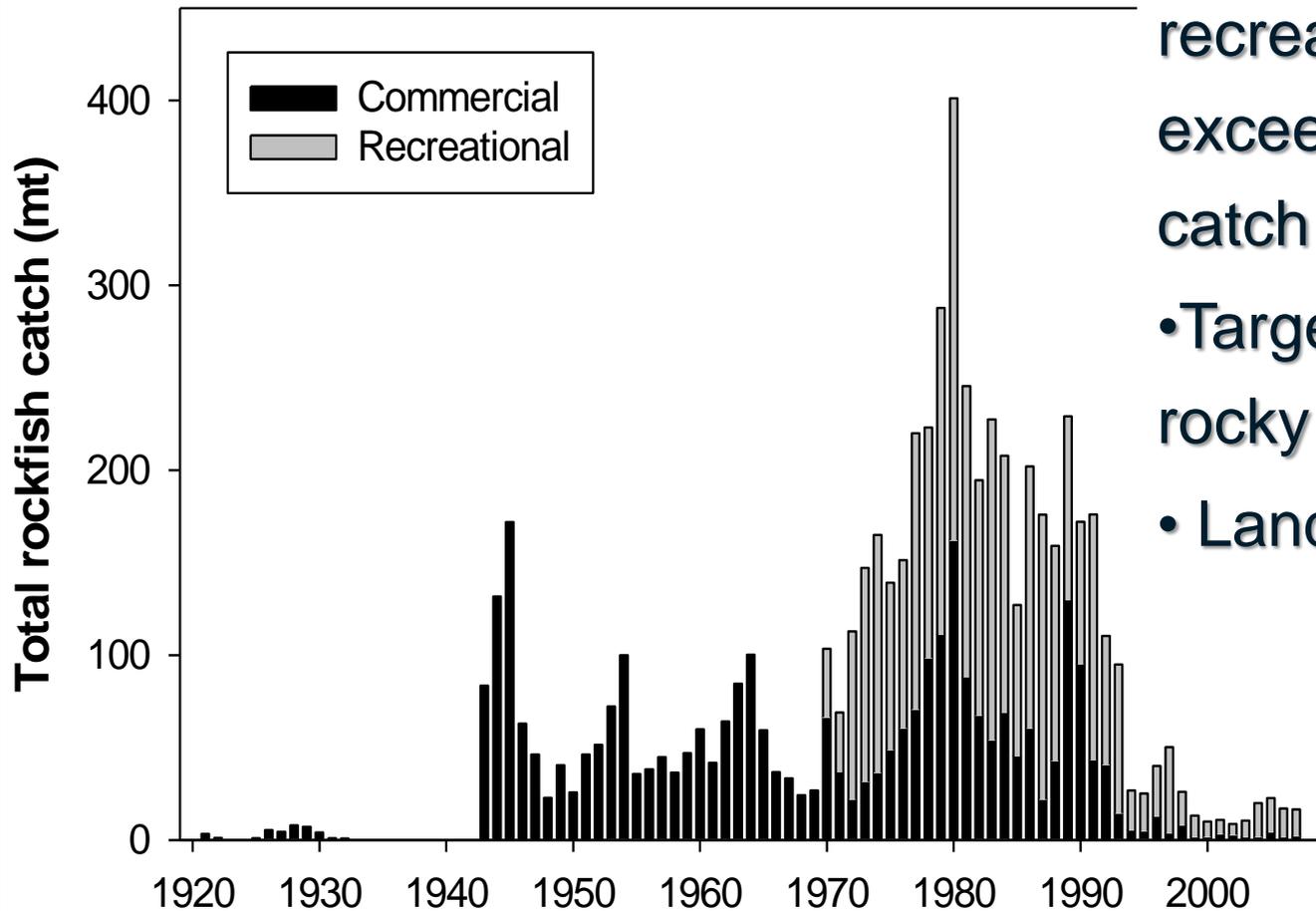
**DOUG OLANDER
AND FRIEND**

By DOUGLAS R. "DOUG" OLANDER

EDITOR'S NOTE: This is the first in a series of articles on bottom-fishing, particularly that of Puget Sound. It is authored by Douglas Olander, currently employed as a fisheries technician at the National Marine Fisheries Service. Olander also is working for his Master of Science degree at the University of Washington in Recreation Fisheries. His primary interest is Puget Sound. Those readers who would be willing to share their knowledge of Puget Sound bottom-fishing may contact him by phoning 442-4527. Information will be confidential if requested.

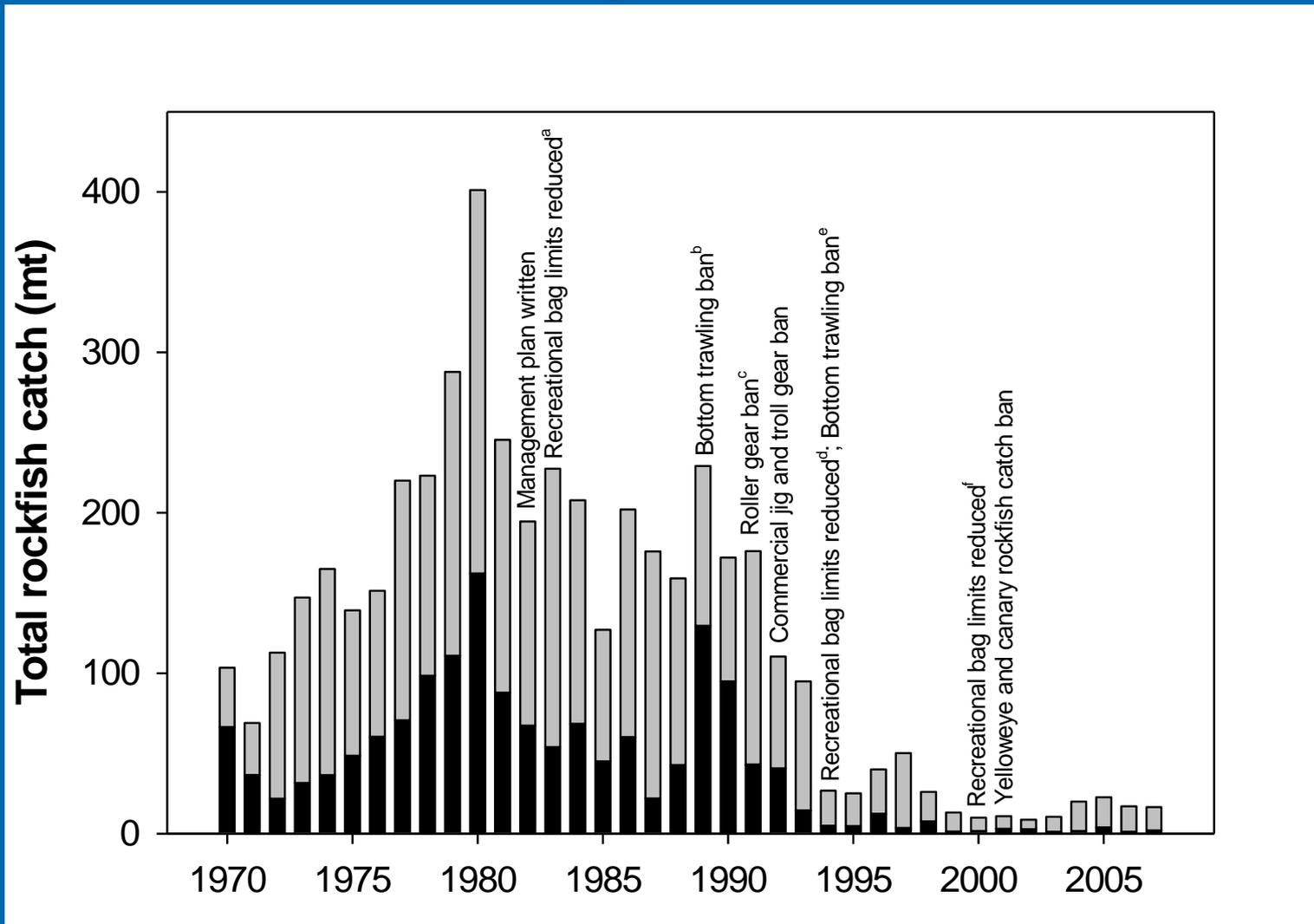
Fishing and Hunting News,
Western WA ed., Aug 1973

Puget Sound Recreational Fishery



- >1970, Annual recreational landings exceeded commercial catch in every region
- Targeted high-relief, rocky reef habitats
- Landings peak 1980

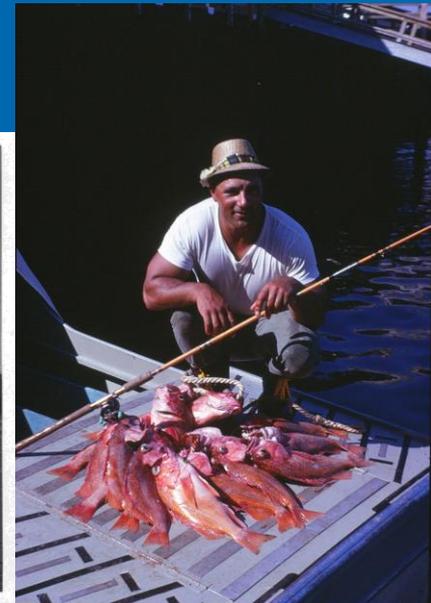
Management Response Coincides with Declining Catch Trends



Research Questions

What were the historical exploitation levels of rockfish in Puget Sound?

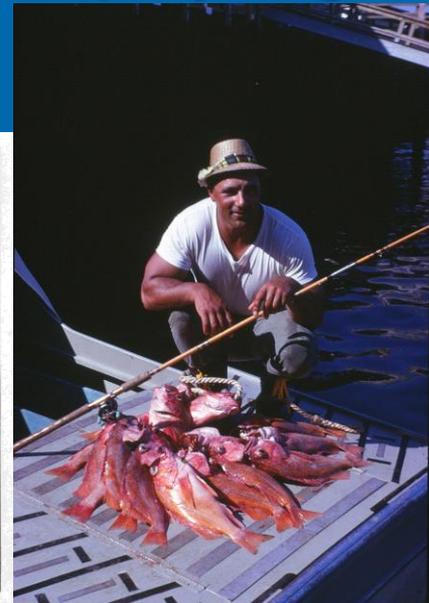
- Exploitation transitioned over time from subsistence-based and bycatch, to a targeted fishery
- Fishing impacts were most intensive during 1970-1990; focus on rocky reef assemblage



Research Questions

What are the socioeconomic and institutional forces that affected that exploitation?

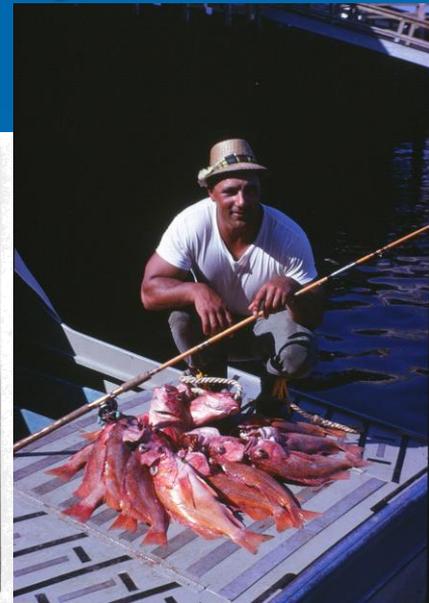
- **Society:** Population increase, demographic trends, and recreational pursuits
- **Economy:** Government incentives, allocation equity, legal and political decisions



Research Questions

How has historical exploitation shaped the current ecosystem?

- Legacy of fishing may remain for years to come
- Policy actions that cause vulnerable species to be harvested can have unintended effects on ecosystem



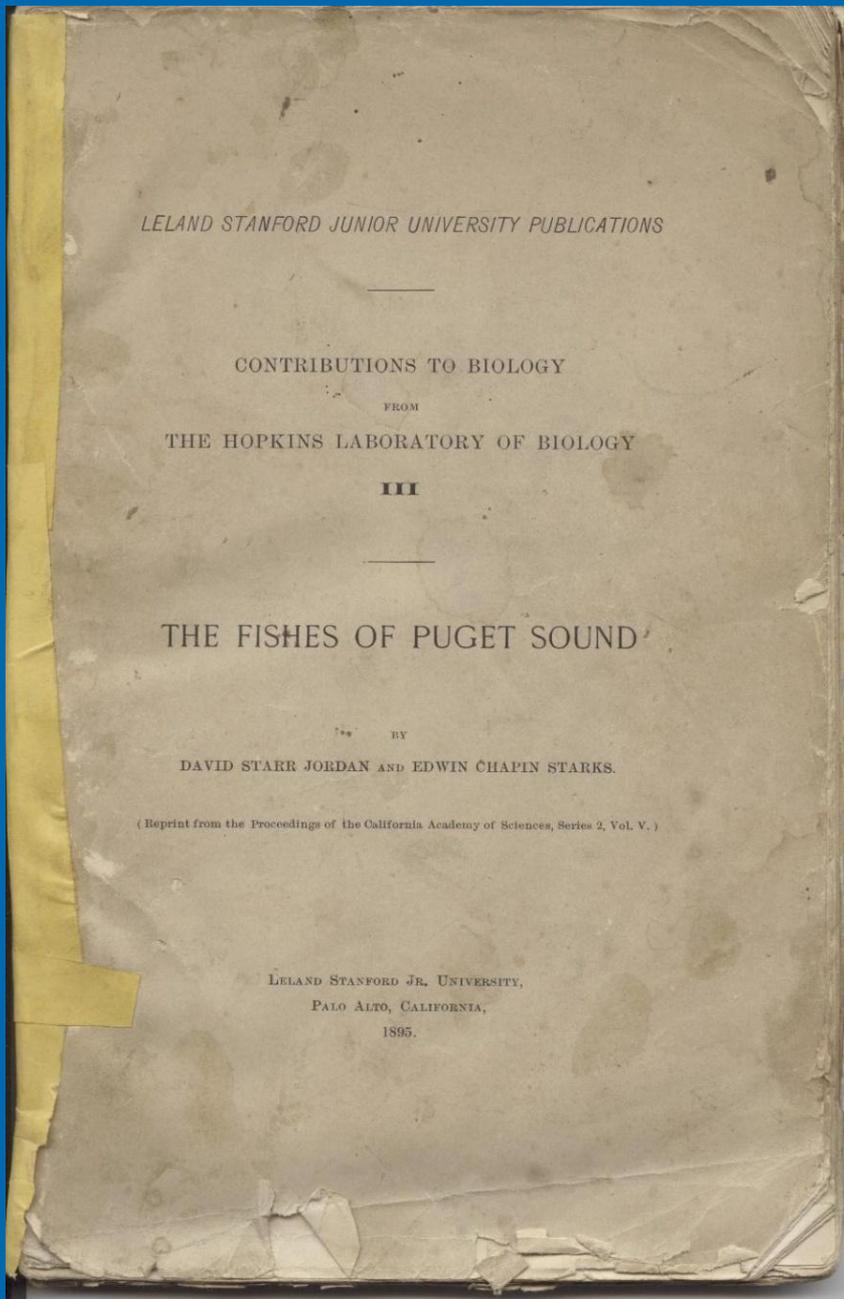
Final Thoughts

Future Directions

Puget Sound could serve as a model for examining the effects of ecosystem recovery:

- **Trawling ban for last 20 y**
- **Restrictive bag limits and area closures**





What is our reference point for ecosystem recovery?

Canary rockfish--
“abundant in rather deep water”

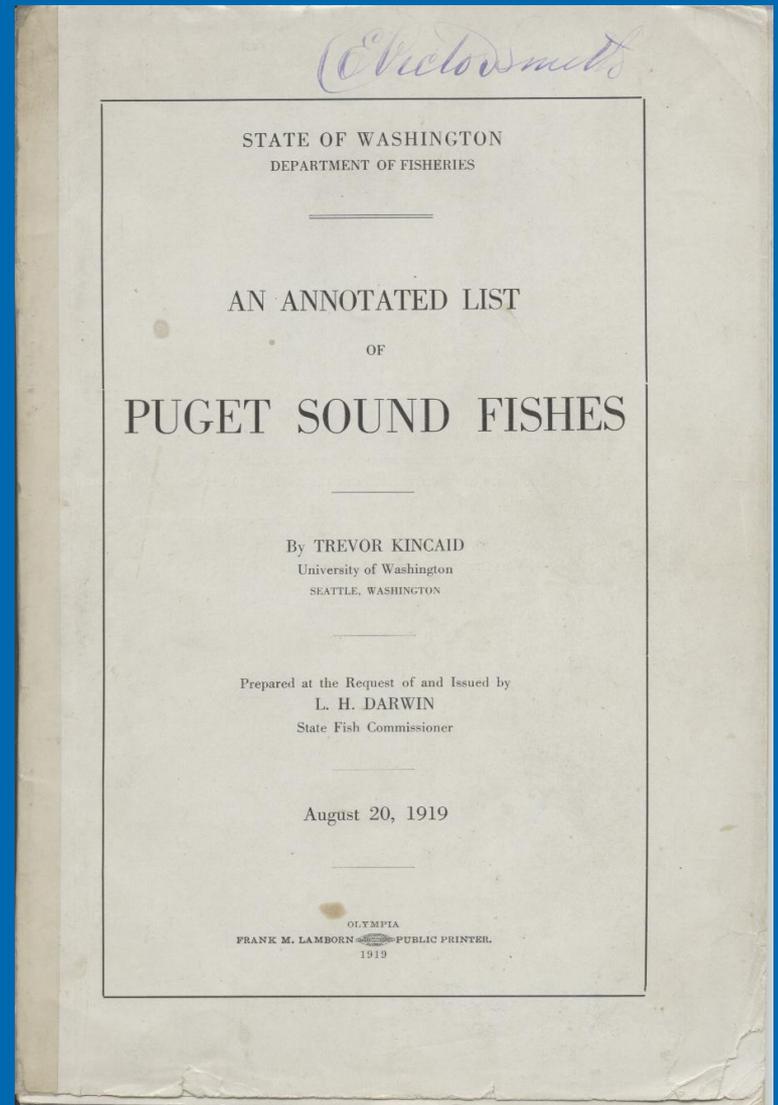
Yelloweye rockfish--
“taken with hook and line in some abundance in Puget Sound”

- Jordan and Starks 1895

Canary rockfish--
“abundant in deep
water”

Yelloweye rockfish--
“brought to market in
considerable
quantities”

-Kincaid, 1919



State of Washington
DEPARTMENT OF FISHERIES



PROGRESS REPORT
No. 170

**GROUND FISH MANAGEMENT PLAN FOR
WASHINGTON'S INSIDE WATERS**

26 NOV 1982

by
Mark Pedersen and Gene DiDonato
Marine Fish Program
Washington Department of Fisheries

October, 1982

Bocaccio - "...a
prized recreational
species"

-WDFW 1982