

ANNUAL REPORT TO THE  
NATIONAL UNDERSEA RESEARCH PROGRAM (NURP)  
FOR 1989



By

Victoria M. O'Connell  
and  
David W. Carlile

Regional Information Report<sup>1</sup> No. 1J91-17

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Juneau, Alaska

September 1991

---

<sup>1</sup> The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

# STATE OF ALASKA

## DEPARTMENT OF FISH AND GAME

### SITKA AREA OFFICE DIVISION OF COMMERCIAL FISHERIES

STEVE COWPER, GOVERNOR

304 LAKE ST. ROOM 103  
SITKA, ALASKA 99835-7563  
PHONE: (907) 747-6688  
FAX: (907) 747-6239

December 26, 1989

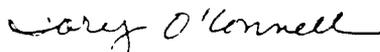
Michael DeLuca  
Program Scientist  
NOAA's Office of Undersea Research  
6010 Executive Blvd., Suite 805 WSC-5  
Rockville, MD 20852

Dear Mike:

Enclosed is our 1989 Annual Report as required under the specifications of our contract with the National Undersea Research Program. At your approval we have not completed a final report since we have submitted a preproposal and plan to apply for continuing funding for our rockfish assessment project. If we do not receive funding to continue our work in 1990 we will then submit a final report to your office.

Thank you for support of our 1989 project. Our initial results look promising and we are very interested in pursuing **this approach**.

Best Regards:



Tory O'Connell  
Groundfish Biologist

cc D.W. Carlile

## ANNUAL REPORT TO NURP FOR 1989

### EVALUATION OF SUBMERSIBLES AND ROVs AS TOOLS FOR ESTIMATING ABUNDANCE OF ROCKFISH AND INVENTORYING ROCKFISH HABITAT IN THE GULF OF ALASKA

#### Principle Investigators:

Victoria M. O'Connell  
Alaska Department of Fish and Game  
304 Lake Street, Rm 103  
Sitka, Alaska 99835  
(907) 747-6688

David W. Carlile  
Alaska Department of Fish and Game  
Box 3-2000  
Juneau, Alaska 99802-2000  
(907) 465-4210

**Objectives:** Demersal Shelf Rockfish (DSR) is one of the few groups of commercially important fish in the Gulf of Alaska for which no estimate of biomass is available. The Alaska Department of Fish and Game (ADFG) is currently involved in a 5 year research program to develop a stock assessment method for this group of species. The most promising approach for stock assessment method is a habitat-based biomass estimate. This involves estimation of rockfish density per unit of habitat, coupled with an areal estimate of suitable rockfish habitat, to yield estimates of rockfish density and biomass. To investigate the usefulness of submersibles and ROVs in achieving the primary objective, specific objectives are: 1) to determine if DSR can be adequately detected, enumerated, and their density estimated using a submersible and/or ROV, and evaluate performance of each tool for this task, 2) to determine if juvenile shelf rockfish co-occur spatially with adults at the time of year the dives are conducted, 3) to determine if line transect methods can be used in the uneven terrain occupied by DSR, and 4) to evaluate the usefulness of a submersible and/or a ROV for delineating habitat of DSR in the Gulf of Alaska.

**Approach/methods:** Line transects were run to determine the relative effectiveness of the submersible and ROV for counting rockfish over different hard bottom terrains. Where possible transects were run using each tool with video recordings made of transects. Both video and audio counts were recorded from the submersible. Initially reference lines were placed to allow exact duplication of transect, however this proved untenable. Subsequent transects were run from a starting buoy using gyro and compass headings. Results from 1989 confirm the usefulness of the submersible for transect counts and habitat characterization in rocky terrain. The ROV proved unworkable for quantitative sampling in this type of terrain and will not be used in the continuation of this project.

**Current Status:** We have applied for continuing funding for 1990 and 1991. Our 1989 results indicate that the submersible is the appropriate tool for enumerating DSR by habitat type. Our methods have improved given our first years' experience and we will be using strip transect rather than line transect methods to determine abundance. Knowledge of the capabilities and limitations of the *Delta* submersible allows us to develop a standardized sampling design which will yield quantitative results to meet our primary objective.

**Benefits:** We have found that, although less expensive to operate, an ROV is not an appropriate tool for use in areas inhabited by DSR. Further it appears that line transect methods can not be used to estimate abundance of DSR. For future work we intend to use strip transect methods. We have also begun to describe the relationship between yelloweye abundance (the dominant DSR species in the commercial landings) and habitat character and are continuing the analysis of our 1989 data. Initial results suggest an increase in abundance of DSR with habitat complexity. Once this relationship is described, the development of a stock assessment method may be accomplished by combining the use of available bathymetry data and the defined relationship between DSR and habitat complexity.

In preparation for publication:

O'Connell, V.M. and D.W. Carlile. Evaluation of a Remotely Operated Vehicle versus a Manned Submersible for estimating Abundance of Demersal Shelf Rockfish. (will be submitted to Fishery Bulletin).

O'Connell, V. M. Notes on the occurrence and behavior of prowfish, Zaproproa silenus as observed from a submersible. (will be submitted to Fishery Bulletin)

Carlile, D. W. "Eye to Eye with Rockfish". (in preparation for publication in Alaska Department of Fish and Game Magazine).

Dive system used Delta Cost per day \$6,150/day x 5 days  
Additional OUR science support, i.e. personnel, supplies,  
equipment etc. Total \$ ROV: \$15,000

Match, i.e. investigator/institution costs:

Total \$ 37,100

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

**If you believe you have been discriminated against in any program, activity, or facility please write:**

ADF&G ADA Coordinator, P.O. Box 115526, Juneau AK 99811-5526

U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, Washington DC 20240

**The department's ADA Coordinator can be reached via phone at the following numbers:**

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648, (Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

**For information on alternative formats and questions on this publication, please contact:**

ADF&G, Division of Commercial Fisheries, P.O. Box 115526, Juneau AK 99811-5526 (907)465-4210.