



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
SOUTHWEST FISHERIES SCIENCE CENTER  
P.O. BOX 271  
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July 24, 2000

F/SWC1:DA6

#### CRUISE REPORT

VESSEL: NOAA Vessel *David Starr Jordan*, 0006-JD, DS 00-03, (320).

CRUISE DATES: June 19 - July 16, 2000.

PROJECT: Shark/Rockfish Survey, Fisheries Resources Division.

ITINERARY: Leg I: Departed San Diego, California at 0900 on June 19, 2000. During daylight hours, the ship occupied 7 primary longline sites for mako sharks, *Isurus oxyrinchus*, and 21 sites for thresher sharks, *Alopias vulpinus*, (see station locations on the attached map). For mako sharks, each site was occupied twice, once on leg I and again on leg II. Once the primary sites were occupied, sets were performed at the secondary mako shark sites. During nighttime operations, the ship occupied 51 stations conducting single 10 m<sup>2</sup> MOCNESS (Multiple Opening-Closing Nets/Environmental Sampling System) tows down to 200 meters (depth permitting). The ship returned to San Diego on July 4, 2000.

Leg II: Departed San Diego on July 5, 2000 and re-occupied the original 7 primary longline sites and completed the remaining thresher shark sites. Night operations continued as before and an additional 39 MOCNESS stations were completed during the second leg. The ship returned to San Diego on July 16, 2000.

OBJECTIVES: 1. Evaluate a CPUE index based on previously existing fishery for shark abundance suitable for periodic population indexing.

2. Tag and release live and healthy sharks.

3. Collect biological samples which include reproductive, muscle and heart tissue, stomach contents and whole specimens.

4. Collect data on longline by-catch including swordfish (*Xiphias gladius*).

5. Evaluate the feasibility of an abundance index for pelagic juvenile rockfish (*Sebastes* spp.) Based on 10 m<sup>2</sup> MOCNESS tows down to 200 meters. The samples from each net will be live sorted, all rockfish (*Sebastes* spp.), sardine (*Sardinops sagax*) and anchovy (*Engraulis mordax*) larvae and juveniles will be picked out and preserved. Any market squid (*Loligo opalescens*) paralarvae will also be picked out and preserved. In addition, jack mackerel (*Trachurus symmetricus*), pacific mackerel (*Scomber japonicus*), Pacific hake (*Merluccius productus*), flatfish and thornyhead rockfish (*Sebastes altivelis* and *alascanus*) will be preserved.

PROCEDURES: 1. A test of set fishing procedures and operations of the longline gear was conducted in the early afternoon of departure day. At each mako site, two regularly scheduled fishing sets were conducted during day light hours throughout the cruise. The mako shark set line consisted of an average of 164 hooks attached to a stainless steel wire two miles in length. The soak time



for each mako set averaged 192 minutes. The thresher shark set line consisted of an average of 98 hooks attached to a monofilament line one mile in length. The soak time for the thresher longline averaged 134 minutes. Each hook was baited with mackerel. Sharks were tagged with spaghetti tags as well as oxytetracycline.

2. Once the daytime longline sets were retrieved, the ship moved to a predetermined location to begin MOCNESS tows. Each tow descended to a depth of 200 meters (depth permitting) and was retrieved obliquely. An attempt was made to fish each net for a duration of 10 minutes during retrieval. In addition to the juvenile rockfish index, primary scientific objectives were to obtain information on vertical distribution and population genetics of pelagic juvenile rockfishes. The depths which were sampled during the oblique ascent were as follows:

net 1= 0-200m  
net 2= 200-150m  
net 3= 150-100m  
net 4= 100-50m  
net 5= 50-25m  
net 6= 25-0m

For shallow tows where the bottom was a safety consideration the net was towed no closer than 25m from the bottom. Tows on the shelf and slope were run along constant isobaths when conditions (wind and swell) permitted.

It was possible to live sort all 6 of the nets for each tow. Rockfish, thornyhead, squid and octopus were preserved in ethanol. Other target species, which were sorted from the samples, were preserved in alcohol for potential aging and genetics or in buffered formalin for later identification verification. The remainder from the sorted samples was discarded.

RESULTS:

1. Fifty-five longline sampling stations were completed (see attached diagram). Of these stations, 21 were designed to sample common thresher sharks, and 34 sampled shortfin mako and blue sharks. Generally, CPUE for mako and thresher sharks were below previous levels while CPUE for blue sharks was higher than observed in previous years. In total, 51 mako, 34 thresher, and 1003 blue sharks were captured and sampled. Forty mako and 31 thresher sharks were tagged and injected with oxytetracycline for ongoing age and growth studies. Blue sharks (292) were tagged for movement and migration studies. In addition, blood was drawn from 24 threshers, 38 mako and 68 blue sharks for studies on condition at capture and post release survival of tagged fish. No recaptures of previously tagged sharks were taken. Additional animals caught during longlining included 14 pelagic rays (*Dasyatis violacea*), 2 soupfin sharks (*Galeorhinus galeus*), 1 opah (*Lampris guttatus*), 1 Ocean sunfish (*Mola mola*) and 1 bat ray (*Mylobatis californica*).
2. Of the 90 successful tows taken, a total of 1885 rockfish were collected (see attached diagram). These were sorted into two main categories based on the presence or absence of a tail spot or bar. Of the 1885 total count, 504 rockfish larvae did not possess the tail spot/bar pigment. These larvae will be further identified at the SWFSC's genetics lab. In addition, 98 Pacific sardine (*Sardinops sagax*), 518 northern anchovy (*Engraulis mordax*), 67 Jack mackerel (*Trachurus symmetricus*) and 96 hake (*Merluccius productus*) were measured and preserved in buffered formalin. A total of 245 market squid (*Loligo opalescens*) were preserved in buffered ethanol.

DISPOSITION  
OF DATA:

Shark catch data - Dave Holts, FRD (SWFSC).  
Shark blood samples and data - Chin Lai (VA).  
MOCNESS tow data - Richard Charter, FRD (SWFSC).  
ADCP and SCS data - Richard Charter, FRD (SWFSC).  
Rockfish specimens for genetics - Russ Vetter, FRD (SWFSC).  
Shipboard identification data - Geoff Moser, FRD (SWFSC).

INCIDENTS &  
MALFUNCTIONS:

Two temperature probes being used on the 10 m<sup>2</sup> MOCNESS became inoperable midway through the cruise. It was necessary to borrow a temperature sensor from the ship's CTD.

COMMENDATIONS:

The personnel of the *David Starr Jordan* should be recognized and commended for their dedication and professional manner, ensuring the success of the cruise:

The deck department for their ability to meet the needs of all types of gear with speed and expertise. Much of the success of this cruise was due to their hard work and effort.

The bridge officers for their assistance and flexibility with all sampling operations as well as assuring the safety and well-being of all personnel aboard.

The engineering department for their performance and ability correcting major and minor malfunctions to allow the completion of the cruise with little or no loss of time.

The electronics specialists for their assistance with communications and correcting any electronic malfunctions for both the ship and scientific gear.

The stewards department for providing excellent meals and accommodations in all weather conditions.

PERSONNEL: Leg I:

Dave Holts, chief scientist	SWFSC
Rand Rasmussen	SWFSC
Darlene Ramon	SWFSC
David Griffith, cruise leader	SWFSC
Sherri Charter	SWFSC
Dave Ambrose	SWFSC
Cindy Taylor	SWFSC
Josh Gregory	SIO
Juan Carlos-Perez	CICESE
Allen Crossland, teacher at sea program	
Richie Ellis, teacher at sea program	
Rebecca Leach, volunteer	

Leg II:

Dave Holts, chief scientist	SWFSC
Rand Rasmussen	SWFSC
Darlene Ramon	SWFSC
Dave Griffith, cruise leader	SWFSC
Bill Watson	SWFSC
Elaine Acuña	SWFSC
Cindy Taylor	SWFSC
Chin Lai	VA
Mary Nishimoto	UCSB
Arturo Ocampo-Torrez	CICESE
Barbara Ziegler	UCSB
Pam Peiper, volunteer	
Gary Patterson, teacher at sea program	
Frank Nielson, volunteer	

SWFSC personnel authorized per diem at the rate of \$2.00 per day to be paid via the Imprest Fund on a Travel Roll Voucher at the termination of the cruise.

WATCH HOURS: 0600-1759  
1800-0559

Charge to account #8L1A6A30

Date: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
D.A. Griffith

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Southwest Region