UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES SCIENCE CENTER
P.O. BOX 271
LA JOLLA, CA 92038-0271

March 21, 2006 F/SWC1:DAG

CRUISE ANNOUNCEMENT

VESSEL: NOAA Vessel *David Starr Jordan*, 0604-JD, DS 06-02.

CRUISE DATES: April 1 - April 30, 2006.

PROJECT: Coast-wide sardine survey, Fisheries Resources Division.

ITINERARY: Leg I: Depart San Diego, California at 0800 on April 1, 2006. Proceed to first station (95.0/28.0; 32°37.11'N, 117°12.16'W) after calibration and begin occupation of the survey grid (see attached cruise track). The vessel will stop on April 16 to exchange scientific personnel in Avila Beach, California.

Leg II: Once personnel exchanges are complete, the *Jordan* will continue to occupy stations until about April 24. The *Jordan* will transit up to San Francisco, California to fuel and exchange personnel.

Leg III: Once fueling and personnel exchanges are complete, the *Jordan* will continue to occupy stations and finish in San Francisco on April 30, 2006.

OBJECTIVES:

1. To describe the spatial distribution of eggs, larvae and adult sardine (*Sardinops sagax*).
2. To obtain measurements of instantaneous egg production and adult fecundity required for an estimate of spawning biomass.
3. To collect environmental data to describe the coastal and offshore habitats.
4. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler.
5. To make continuous observations of sea birds and marine mammals.
6. To collect specimens throughout the survey pattern for genetics, micro chemistry, maturity, age and fecundity determination.
7. To acoustically identify and quantify pelagic fish schools during transit between stations with the Simrad EK-60 scientific sounder.

PROCEDURES:

1. Each coast-wide survey station will include the following:
   a. A CTD/Rosette consisting of twelve 2.5-liter hydrographic bottles will be lowered to 500 meters (depth permitting) to measure physical parameters and collect water at discrete depths for analysis of: salinity, nutrients and chlorophyll.
   b. A CalBOBL (CalCOFI Bongo) standard oblique plankton tow with 300 meters of wire out, depth permitting, using paired 505 µm mesh

nets with 71 cm diameter openings. The technical requirements for this tow are: Descent wire rate of 50 meters per minute, held at terminal depth for 30 seconds and retrieved at a wire rate of 20 meters per minute. All tows with ascending wire angles lower than 38° or higher than 51° in the final 100 meters of wire will be repeated. Additionally, a 45° wire angle should be closely maintained during the ascent and descent of the net frame.

c. A Manta net (neuston) tow, using a 505 µm mesh net on a frame with a mouth area of 0.133 m^2. The frame will be towed for 15 minutes at a target speed of 60 - 70 cm/sec or an angle of stray between 20 - 25 degrees.

d. Weather observations.

e. A Pairovet (vertical) plankton tow will be taken at all stations inshore of, and including station 70. The Pairovet net will be fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150 µm mesh nets. The technical requirements for Pairovet tows are: Descent rate of 70 meters per minute, held at depth for a 10 second duration then an ascent rate of 70 meters per minute. All tows with wire angles exceeding 15° during the ascent will be repeated.

f. A surface tow using a Nordic 264 pelagic trawl will be conducted during nighttime operations. Each tow will be fished for a 30 minute duration at a towing speed of approximately 3.5 knots. The catch of each tow will be processed in the following manner: Sardines collected in each trawl will be randomly subsampled. Standard length and body weight will be measured, otoliths will be collected, and ovaries preserved in buffered formalin. These fish are assigned a maturity code based on a four stage system developed during a previous Trinational Sardine Forum.

2. While underway during the coast-wide sardine survey, the following operations will be conducted:

a. The *Jordan* will conduct directed adaptive sampling of pelagic fish eggs using the following protocol: Water will be continuously sampled using the CUFES (Continuous Underway Fish Egg Sampler) from a depth of three meters. Approximately 640 liters/minute is sent through a concentrator which filters all material larger than 505 µm. The sieved material is then collected and identified. All fish eggs are identified to lowest taxa, counted and entered into the data acquisition software. Each sample entry is coupled with sea surface temperature, geographical position, wind speed and direction, date and time, and surface salinity.

Sampling intervals will vary in length, depending on the number of fish eggs seen, from five to 30 minutes. If two consecutive samples have a concentration of Pacific sardine eggs equal to or greater than 1 egg per minute, the ship will stop to conduct a Pairovet tow. Pairovet tows will continue at four mile intervals until a concentration of less than one egg per minute is observed in two consecutive samples. All Pairovet

samples will be taken concurrently with CUFES samples in addition to sampling continuously between Pairovet samples.

b. Once underway, the *Jordan's* Acoustic Doppler Current Profiler (ADCP, RDI 150 kHz model) will be sampling at all times. Data will be periodically backed up to a writable DVD.

c. Once underway, the scientific sounder (Simrad EK-60, 38, 120 and 200 kHz split beam transducer) will be sampling at all times. Data will be periodically backed up to a writable DVD.

EQUIPMENT: 1. Supplied by scientific party:

- 37% Formalin (SWFSC)
- Ethanol (SWFSC)
- Tris buffer (SWFSC)
- Sodium borate (SWFSC)
- 30 cc and 50 cc syringes (SWFSC)
- Canulas (SWFSC)
- Pint, quart and gallon jars (SWFSC)
- Inside and outside labels (SWFSC)
- CalCOFI net tow data sheets (SWFSC)
- 71 cm CalCOFI Bongo frames (SWFSC)
- 71 cm CalCOFI 505 µm mesh nets (SWFSC)
- CalCOFI 150 µm Calvet nets and codends (SWFSC)
- CalCOFI Pairovet frames (SWFSC)
- 333 µm mesh codends (SWFSC)
- Inclinometer for bongo tows (SWFSC)
- Digital flowmeters (SWFSC)
- 75 lb Bongo weight (SWFSC)
- 100 lb hydro weights (SWFSC)
- CalCOFI Manta net frames (SWFSC)
- 60 cm CalCOFI 505 µm mesh Manta nets (SWFSC)
- -80°C scientific freezer (SWFSC)
- Simard EK-60 scientific sounder (SWFSC)
- Standard CalCOFI tool boxes (SWFSC)
- Bucket thermometers and holders (SWFSC)
- Hand held inclinometer (SWFSC)
- Guildline Portasal (SWFSC)
- Salinity bottles (SWFSC)
- Sling psychrometer (SWFSC)
- Standard sea water (SWFSC)
- Data sheets for scheduled hydrographic work (SWFSC)
- Weather observation sheets (SWFSC)
- Bigeye binoculars (25 x 150) (SWFSC)
- Observers chairs on flying bridge (SWFSC)
- Nordic 264 pelagic trawl (SWFSC)
- Motion compensated balance (SWFSC)
- 3.0 m² XL-Lite midwater trawl doors (SWFSC)
- Rigging for Nordic 264 trawls (SWFSC)
- CUFES (SWFSC)

2. Supplied by *David Starr Jordan*:

- Starboard hydro winch with ¼" cable for standard Bongo, Pairovet and Manta tows
- Starboard oceanographic winch with .322" conductive cable
- Combo winch with ⅝" cable on port and starboard drums
- Constant temperature room set at 22°C ±1°C (71.5°F ±2°F)
- Winch monitoring system
- Seabird thermosalinometer

- Knudsen 12 kHz depth recorder
- Acoustic Doppler Current Profiler w/writeable CD drive
- SCS with ability to send polled message to a serial output comprising position, SST, surface salinity, wind speed and wind direction.

MISCELLANEOUS:

1. The disposal of fish caught will be in accordance with NOAA Administrative order 202-735B dated January 25, 1989.

2. At the completion of the cruise an inspection will be made of scientific working and berthing spaces by the Commanding Officer or his designated representative. The Scientific party is responsible for the condition and cleanliness of spaces assigned to the scientific party.

3. The Cruise Leader will hold a pre-cruise meeting aboard the vessel before departure.

4. The Cruise Leader will hold a post-cruise meeting upon termination of the cruise.

5. NOAA Fleet Medical Policy requires that all scientific personnel embarking on NOAA vessels complete an SF-93 form, Report of Medical History.

6. All dates and times recorded will be in Pacific Standard Time.

7. It is requested that the constant temperature room be set at the required temperature prior to the installation of the Portasal unit.

8. Any adult salmon caught in the trawl will be immediately returned to the sea and assumed to have survived. Any juvenile salmon caught incidentally will be frozen and turned over to the NWFSC for further study.

9. On the morning of departure, personnel from the SWFSC will be on board to calibrate the Simrad EK-60 scientific sounder. They will be placed ashore prior to the ship heading for the first scheduled station.

HAZARDOUS MATERIALS:

The Chief Scientist shall be responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists, released July 2002. The MOCDOC web site address is:

http://205.156.48.106/

By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemicals brought aboard and a chemical hygiene plan. The amount of hazardous material arriving and leaving the vessel shall be accounted for by the Chief Scientist.

PERSONNEL: Leg I

Ron Dotson, Chief Scientist	SWFSC
Amy Hays	SWFSC

Beverly Macewicz	SWFSC
Kevin Hill	SWFSC
Eric Lynn	SWFSC
Bill Watson	SWFSC
Randy Cutter	SWFSC
Amy Betcher	AF
Motomitsu Takahashi	SIO
Peter Grønkjær	SIO
Sarah Zao	AF
Gary Friedrickson	PRBO
Mike Bentley	PRBO
Hannes Smit	STS

Leg II

Ron Dotson, Chief Scientist	SWFSC
Amy Hays	SWFSC
Beverly Macewicz	SWFSC
Chuck Oliver	SWFSC
Bill Watson	SWFSC
Sue Manion	SWFSC
Dimitry Abramenkoff	SWFSC
Christina Show	SWFSC
Marguerite Blum	MBARI
Motomitsu Takahashi	SIO
Hannes Smit	STS
Sarah Zao	AF
Gary Friedrickson	PRBO
Mike Bentley	PRBO

Leg III

Ron Dotson, Chief Scientist	SWFSC
Amy Hays	SWFSC
Beverly Macewicz	SWFSC
Chuck Oliver	SWFSC
Sue Manion	SWFSC
Dimitry Abramenkoff	SWFSC
Hannes Smit	STS
Sarah Zao	AF
Gary Friedrickson	PRBO
Mike Bentley	PRBO

SWFSC personnel authorized per diem at the rate of $3.00 per day to be paid via the Imprest Fund at the termination of the cruise.

WATCH HOURS: 0000-1159
1200-2359
1800-0600

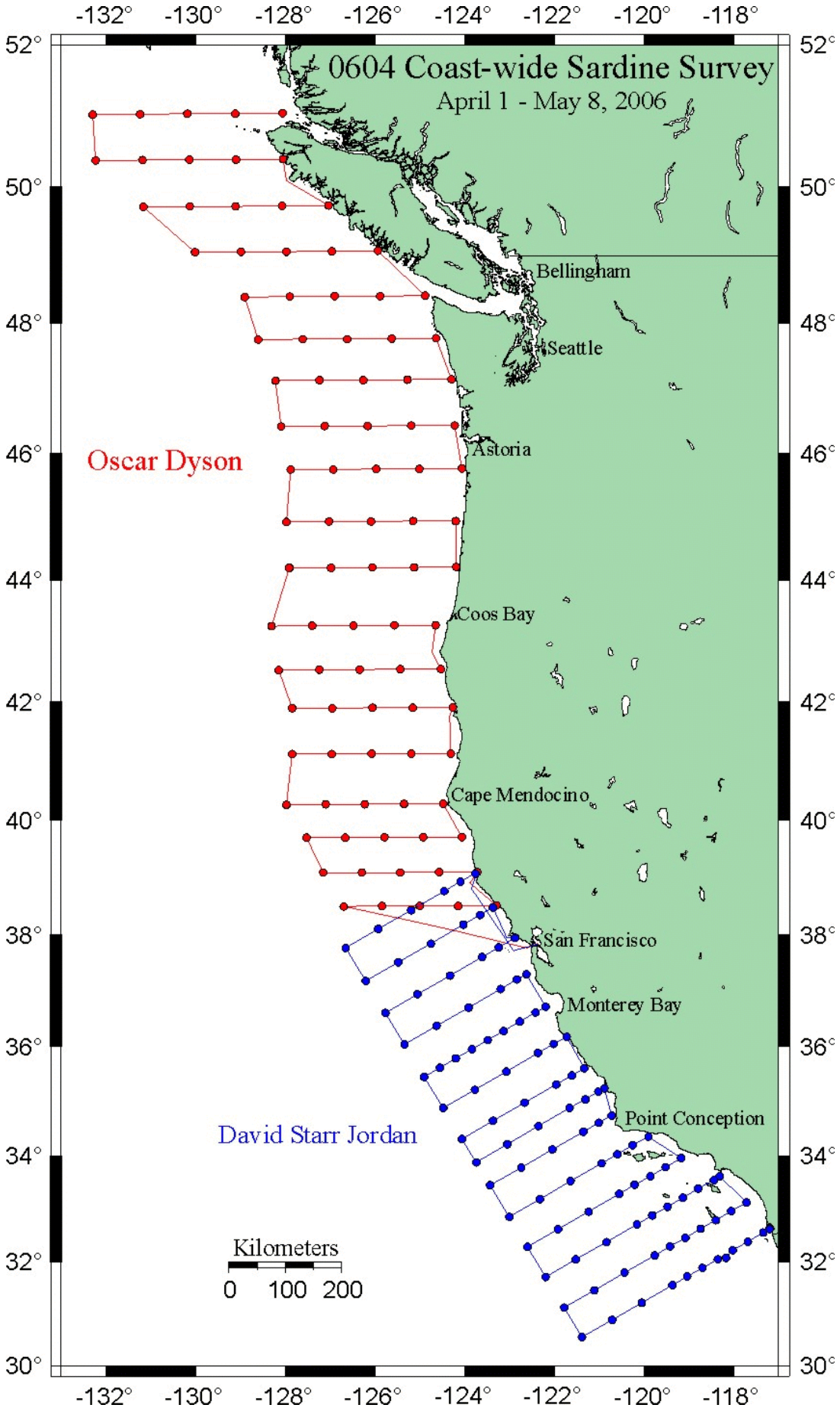
Charge to account 28LEF01-P15

OVERTIME: 1356 hours (Authorized total for NMFS personnel)
NIGHT DIFF: 1386 hours (Authorized total for NMFS personnel)

Date:_____

Prepared by:_____
D.A. Griffith

Approved by:_____
William W. Fox Ph.D
Science & Research Director
Southwest Region


0604 Coast-wide Sardine Survey
April 1 - May 8, 2006
Oscar Dyson
David Starr Jordan
Bellingham
Seattle
Astoria
Coos Bay
Cape Mendocino
San Francisco
Monterey Bay
Point Conception
Kilometers
0 100 200
-132° -130° -128° -126° -124° -122° -120° -118°
52° 50° 48° 46° 44° 42° 40° 38° 36° 34° 32° 30°