



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Marine Fisheries Service  
Southwest Fisheries Science Center  
8604 La Jolla Shores Drive  
La Jolla, CA 92037

June 7, 2006

F/SWC1:DAG

### CRUISE REPORT

VESSEL: NOAA Vessel *Oscar Dyson*, 0604-OD, OD-06-04.

CRUISE DATES: April 6 - May 8, 2006.

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

ITINERARY: Leg I: The ship was originally scheduled to depart on April 6 but due to the ship's obligation to occupy the acoustic range at SEAFAC and scheduling changes, the *Dyson* departed Ketchikan, AK on April 10, 2006. Canadian scientists embarked in Port Hardy, BC, Canada on the morning of the 11<sup>th</sup> and the ship transited to the first station (50° 15.0'N; 127° 51.0'W) to begin occupation of the survey grid (see attached cruise track). Once the survey off of Vancouver Island was completed, Canadian scientists disembarked in Ucluelet, BC on April 16. The vessel continued occupying stations until April 21 at which time the *Dyson* completed leg I of the coast-wide survey in Coos Bay, Oregon.

Leg II: The *Dyson* was scheduled to depart Coos Bay, Oregon on April 22 after a personnel exchange, but due to high offshore winds the ship delayed sailing until April 23. The ship completed the survey and docked in San Francisco, California on May 8, 2006.

- OBJECTIVES:
1. To describe the spatial distribution of eggs, larvae and adult Pacific 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: The original intent of the coast wide survey was to conduct a multi-vessel survey using the *Oscar Dyson* and the *David Starr Jordan* to sample adult coastal pelagic fish, ichthyoplankton and several oceanographic parameters of the northern and southern survey regions, respectively, while the Scripps' research vessel *New Horizon*



concentrated on the oceanography of the Southern California bight. Early in the survey it was learned that, due to mechanical failures, the *Jordan* would be unable to trawl for coastal pelagic adults. Since the *New Horizon* does not have trawling capabilities, all of the adult sampling was assigned to the *Dyson*. This extended the north - south range of the *Dyson* from the original Vancouver Island to just north of Point Reyes coverage, to Vancouver Island down to the Mexican - U.S. border. An addition of approximately 550 nautical miles. In order to accommodate the additional coverage the transect line spacing was increased from 40 miles to 80 miles and all net tows and oceanography were cancelled south of CalCOFI line 53.3.

1. Each coast-wide survey station included the following down to and including CalCOFI line 53.3:
  - a. A CTD/Rosette consisting of twelve 1.7-liter hydrographic bottles 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 a 505  $\mu\text{m}$  mesh net on the starboard ring and a 333  $\mu\text{m}$  mesh net on the port side with 71 cm diameter openings. The starboard side samples were preserved in buffered formalin and the port side samples were preserved in buffered alcohol. The technical requirements for this tow were: Descent wire rate of 50 meters per minute; 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  $38^\circ$  or higher than  $51^\circ$  in the final 100 meters of wire were repeated. Additionally, a  $45^\circ$  wire angle was closely maintained during the ascent and descent of the net frame.
  - c. A Manta net (neuston) tow, using a 505  $\mu\text{m}$  mesh net on a frame with a mouth area of 0.1333  $\text{m}^2$ . The frame was towed for 15 minutes at a target speed of 60 - 70 cm/sec or an angle of stray between 20 - 25 degrees. Due to the increased work load imposed on the *Dyson*, Manta tows were cancelled on April 14.
  - d. Weather observations (these observations were conducted over the entire survey region).
  - e. A Pairovet (vertical) plankton tow was taken at all stations out to 80 nautical miles. The Pairovet net was fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150  $\mu\text{m}$  mesh nets. The technical requirements for Pairovet tows were: 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  $15^\circ$  during the ascent were repeated.
2. Over the entire west coast survey range, a surface tow using a Nordic 264 pelagic trawl was conducted on station during nighttime operations. During the second leg additional tows were conducted during daylight hours but proved to be unsuccessful therefore discontinued. Each tow was fished for a 30 minute duration at a towing speed of approximately 3.5 knots. The catch of each tow was processed in the following manner: Sardines collected in each trawl were randomly subsampled. Standard length and body weight was measured, otoliths were collected and ovaries were preserved in buffered formalin. These fish were assigned a maturity code based on a four stage system developed during a previous

3. While underway during the coast-wide sardine survey, the following operations were conducted:
  - a. The *Dyson* conducted directed adaptive sampling of pelagic fish eggs using the following protocol: Water was 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 was collected and identified. All fish eggs were identified to lowest taxa, counted and entered into the data acquisition software. Each sample entry was coupled with sea surface temperature, geographical position, wind speed and direction, date and time, and surface salinity.
 

Sampling intervals varied in length, depending on the number of fish eggs seen, from ten to sixty minutes. If two consecutive samples had a concentration of Pacific sardine eggs equal to or greater than 1 egg per minute, the ship stopped to conduct a Pairovet tow. Pairovet tows continued at four mile intervals until a concentration of less than one egg per minute was observed in two consecutive samples. All Pairovet samples were taken concurrently with CUFES samples in addition to sampling continuously between Pairovet samples.
  - b. The *Dyson's* Acoustic Doppler Current Profiler (ADCP, RDI 75 kHz model Ocean Surveyor) was sampling at all times. Data was periodically backed up to a writable DVD.
  - c. The *Dyson's* scientific sounder (Simrad EK-60: 18, 38, 70, 120 and 200 kHz split beam transducer) were sampling at all times. Data was periodically backed up to a writable DVD.

RESULTS:

<u>Activity</u>	<u>Requested</u>	<u>Completed</u>	<u>Aborted</u>
Bongo tows	95	41	54
Manta tows	95	9	86
Pairovet tows	57	50	7
CTD casts	95	41	54
Salinity	95	41	54
Nutrients	95	41	54
Chlorophyll	95	41	54
Weather	95	86	9
Surface Temp.	95	85	10
ADCP (hours)	590	590	0
Acoustics (hours)	590	590	0
CUFES samples	705	705	0
Surface trawls	41	40	1

In addition, 288 hours of bird and marine mammal observations were logged by Dawn Breese and Jim Cotton.

DISPOSITION OF DATA:

CalBOBL, Manta tow data sheets and formalin preserved samples - Richard Charter, FRD (SWFSC).

Station activity logs, weather data and surface temperature data - Richard Charter, FRD (SWFSC).

ADCP data - Richard Charter, FRD (SWFSC).

CTD data - Richard Charter, FRD (SWFSC) and Tim Pennington (MBARI).

Water analysis data (temperatures, salinities, nutrients and chlorophylls) - Tim Pennington (MBARI).

Underway data (TSG, fluorometry) - Richard Charter, FRD (SWFSC).

CUFES data and samples - Richard Charter, FRD (SWFSC).

Acoustics data - David Demer, FRD (SWFSC).

Alcohol preserved bongo samples - William Watson, FRD (SWFSC).

Trawl data and specimens - Beverly Macewicz, FRD (SWFSC).

INCIDENTS &  
MALFUNCTIONS:

The original departure date of April 6, 2006 was changed early on to accommodate an April 2 - 3 acoustic trials at SEAFAC and to perform gear trials. Last minute changes to the acoustic trial dates pushed the starting date of the coast-wide survey to April 10, 2006. A loss of 4 days. Accordingly, the schedule was changed to attempt to regain lost time by cutting the Coos Bay in port time down by a day from April 21 - 23 to April 21 - 22. Unfortunately weather on the 22<sup>nd</sup> of April delayed departure from Coos Bay until April 23.

During work off of Vancouver Island, the #2 generator blew out the oil seals on the turbo charger rendering it inoperable. Repair parts were sent to Coos Bay which were found to be damaged.

The #2 side sampling oceanographic winch developed problems in the beginning of the survey in which it would lock up mid-way through a plankton tow. It was decided to do all side station work off of the #1 oceanographic winch. The problem was corrected during the Coos Bay in port and the #2 winch was operable after Coos Bay.

The side sampling station blocks, due to their design, would repeatedly allow the conductive wire to jump off of the sheave and become jammed between the sheave and block cheek. The #1 block sheave was damaged during a jammed wire and was taken out of service. Block #2 was altered to reduce the problem by changing it's weight distribution and adding bungee cords to the wire roller guides. A new block was sent to Coos Bay and installed.

On several occasions, the #1 main propulsion motor would trip off at low speed during trawling operations. Restart usually took from 15 minutes to 1 hour.

At one point it was necessary to run into Bodega Bay to free up a jammed center board.

On May 5, it was discovered that the bow thruster room was flooded due to a leaking salt water pump. The pump was secured and the water was pumped out. There was no damage to the bow thruster.

While working out line 53.3 the weather worsened to the point that the ship pulled into Drakes Bay for shelter. The ship resumed operations after a delay of approximately 24 hours.

The CUFES system installed on the *Dyson* was constantly pulling

air into the system and at times would lose it's prime necessitating the need to shut the system down. Most likely this is due to the fact that no external scoop was installed over the intake for fear of creating radiated noise and the discharge lines are too small which creates a very strong siphon pulling the water out of the concentrator box. Until these problems are corrected data collected from CUFES is questionable.

COMMENDATIONS:

The fact that this survey was the first complete survey to be performed by the ship and it's crew the personnel of the *Oscar Dyson* should be recognized and commended for their dedication and professional manner, ensuring the completion of the cruise:

The deck department for their ability to meet the needs of all types of gear with speed and expertise. Adapting to specific trawling requests and last minute schedule changes was greatly appreciated.

The bridge officers for their assistance with all sampling operations as well as assuring the safety and well-being of all personnel aboard. Efforts to complete stations in a timely manner and meet specific time schedules for projects contributed to the completion of the scheduled work.

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 technical department for their assistance with communications, computer networking 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.

In addition, the scientific staff participating in this survey should be commended for their continuous ability to collect and process high quality data throughout the duration of the cruise.

PERSONNEL:

Leg I:

Dave Griffith, Chief Scientist	SWFSC
Noelle Bowlin	SWFSC
Sherri Charter	SWFSC
Roger Hewitt	SWFSC
Jim Cotton	SWFSC
Fernando Ramirez	SIO
Paul Bentley	NWFSC
Carrie Johnson	NWFSC
Dawn Breese	PRBO
Derek Needham	STS
Christa Hrabok*	DFO
Vanessa Hodes*	DFO

Leg II:

Dave Griffith, Chief Scientist	SWFSC
Noelle Bowlin	SWFSC
Sherri Charter	SWFSC
Beverly Macewicz	SWFSC
Jim Cotton	SWFSC
David Demer	SWFSC
Randy Cutter	SWFSC
Fernando Ramirez	SIO

Bob Emmett . . . . .	NWFSC
Paul Peterson . . . . .	NWFSC
Dawn Breese . . . . .	PRBO
Derek Needham . . . . .	STS
Barbara Javor . . . . .	AF
Jill Smith . . . . .	ODFW

\* Embarked in Port Hardy, BC and disembarked in Ucluelet, BC

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:	1200 - 2359	Charge to account #28LAF01 P-15
	0000 - 1159	
	1800 - 0600	

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

Prepared by: \_\_\_\_\_  
David Griffith

Approved by: \_\_\_\_\_  
William W. Fox, Jr. Ph.D.  
Science & Research Director  
Southwest Region





