



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

September 24, 2008

F/SWC1:RCD

## CRUISE REPORT

NOAA Ship: NOAA Ship *David Starr Jordan*  
Cruise Number: DS-08-04  
Cruise Dates: June 30 – August 20, 2008  
Project: California Current Ecosystem (CCE) Survey.  
Study Area: US/Mexican border to Cape Flattery with variable transect lengths.

### Itinerary:

Transit to Cape Flattery, WA:	30 JUN – 5 JUL
Leg 1: 5 JUL - Station 11.7 /-2.6	16 JUL - Arrive Newport, OR
Leg 2: 18 JUL – Depart Newport, OR	04 AUG - Arrive San Francisco, CA
Leg 3: 06 AUG- Depart San Francisco, CA	19 AUG - Arrive San Diego, CA
Total	49 DAS

Track lines and trawl locations are included at the end of this document in Appendix 1.

Sponsoring Institution: NOAA/NMFS, Southwest Fisheries Science Center (SWFSC)  
Fisheries Resources Division (FRD)

### Cruise Description and Objectives:

1. To conduct continuous underway sampling of surface waters. Temperature and salinity were automatically logged by computer with the output from the GPS navigational unit.
2. To continue an ongoing assessment of pelagic fish stocks between Cape Flattery, Washington and San Diego, California.
3. To collect information on sardine reproductive parameters, spatial distribution of size, age and abundance of sardine, and acoustics



ground truth information using trawling.

4. To monitor environmental conditions within the CCE survey area.
5. To record continuous acoustic targets obtained with a multi-frequency Simrad EK-60 scientific sounder.
6. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler (ADCP).

## PROCEDURES

### 1.0 OPERATIONS

1.1 The *Jordan* conducted operations from north to south along the west coast from Cape Flattery, WA to San Diego, CA. The previous April CCE Survey was conducted as a two ship synoptic survey of the western US coast of North America. The current July survey extended the survey into the summer season, repeating most of the transect lines of the April survey, and applying the same methodologies.

1.1.1 Each standard CCE station included the following:

1.1.1.1 CTD/Rosette - consisting of three 2.5-liter hydrographic bottles lowered to 500 meters (depth permitting) at each station to measure physical parameters and collect water at discrete depths for salinity check samples.

1.1.1.2 CalBOBL (CalCOFI Bongo) - standard oblique plankton tow with 300 meters of wire out, depth permitting, using paired 505  $\mu\text{m}$  mesh nets with 71 cm diameter openings. The technical requirements for this tow are: Descent wire rate of 50 meters per minute and an ascent 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. The port side sample was preserved in buffered ethanol at every station.

1.1.1.3 Manta net (neuston) tow - using a 505  $\mu\text{m}$  mesh net on a frame with a mouth area of  $0.1333\text{ m}^2$ . Tows were 15 minutes in duration at a towing speed of approximately 1.5 - 2.0 knots. Wire angles were kept between  $15^\circ$  and  $25^\circ$ .

1.1.1.4 Weather observations.

1.1.1.5 Pairovet net - was fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150  $\mu\text{m}$  mesh nets at all stations. The technical requirements for Pairovet tows are: Descent rate of 70 meters per minute, a

terminal depth time of 10 seconds and an ascent rate of 70 meters per minute. All tows with wire angles exceeding 15° during the ascent were repeated.

1.2 Thermosalinometer sampling - The ship provided and maintained a thermosalinograph (TSG), which was calibrated and in working order, for continuous measurement of surface water temperature and salinity. The Scientific Computing System (SCS) served as the main data collection system. All SCS data was provided to SWFSC personnel at the completion of the cruise.

1.3 Acoustics – Calibration of the Simrad EK-60 echosounder was performed at the end of the cruise (which required about 4 hours). The EK-60 echosounder was operated at 38, 70, 120 and 200 kHz and interfaced to a data acquisition system to estimate small pelagic fish and krill biomass between 10 and 250 m.

1.4 CUFES - The egg pump was mounted inside the ship's hull drawing water from a depth of three meters. During the grid occupation, the pump ran continuously between stations to sample any pelagic fish eggs. Approximately 640 liters/minute is sent through a concentrator which filters all material larger than 505µm. 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 varied in length, depending on the number of fish eggs seen, from five to 30 minutes. At any time during the survey when the CUFES detected sardine egg concentrations of one egg per minute or higher in two consecutive samples, the ship began conducting pair-ovet tows at four mile intervals until the egg concentration fell below a density of one egg per minute in two consecutive samples. This information was relayed to the bridge by scientists monitoring the CUFES system.

1.5 Surface trawling - During all 3 legs, a Nordic 264 surface trawl was deployed between the hours of approximately 1800 and 0600 PST. Any adult salmon caught in the trawl were immediately returned to the sea and assumed to have survived. Any juvenile salmon caught incidentally were frozen and turned over to Bob Emmett at NWFSC for further study.

Each tow was fished for 30 minutes in duration at a towing speed of approximately 3.5 knots. The catch of each tow was processed in the following manner: The fish were sorted to species, if possible, and the catch weighed. Sardines collected in each trawl were randomly sub-sampled. Standard length and body weight were measured, fish were sexed and maturity graded, otoliths were collected, ovaries preserved in buffered formalin and tails preserved in ethanol vials for genetics. Standard length and body weight were also measured for Northern anchovy, Jack and Pacific mackerels, hake and other species as time permitted.

1.6 Bird Observations – During daylight hours two bird observers were posted on the flying bridge to identify and count birds while the ship was underway during cruise transects.

## 2.0 SCIENTIFIC PERSONNEL

2.1 Chief Scientist - The Chief Scientist is Sam McClatchie, SWFSC, at phone (858) 546-7083.

Cruise leader - The cruise leader is Dave Griffith, SWFSC, at phone (858) 546-7155.

### 2.2 Participating Scientists

Please see Appendix 2.

## 3.0 RESULTS

<u>Activity</u>	<u>Requested</u>	<u>Completed</u>	<u>Aborted</u>
Bongo Tows	122	99	23
Manta	122	86	36
Paironet	122	87	35
CTD	122	103	19
Salinity	320	240	80
Weather	122	174	0
Surface Temp.	122	174	0
EK-60 (hours)	1080	1080	0
Mid-Water Trawl	69	69	0
CUFES Samples	1091	1091	0
Bird Obs. (hours)	360	360	0
ADCP (hours)	1080	0	1080

## 4.0 DISPOSITION OF DATA

4.1 CalBOBL, Paironet, Manta tow data sheets and formalin preserved samples – Richard Charter, FRD (SWFSC)

4.2 Station activity logs, weather data and surface temperature data – Richard Charter, FRD (SWFSC)

4.3 EK-60 data – Sam McClatchie & Dave Demer, FRD (SWFSC)

4.4 CTD data – Sam McClatchie, FRD (SWFSC)

4.5 Alcohol preserved bongo samples – Russ Vetter, FRD (SWFSC)

4.6 Mid-water trawl samples – Beverly Macewicz, FRD (SWFSC)

4.7 CUFES samples – Richard Charter, FRD (SWFSC)

## 5.0 ADDITIONAL INVESTIGATIONS AND PROJECTS

### Ancillary Projects –

5.1 Albacore tuna carcasses were saved for Suzanne Kohin, NOAA-NMFS-SWFSC, La Jolla, CA.

5.2 Juvenile rockfish caught in the trawl were saved for Steve Ralston, NOAA-NMFS-SWFSC, Santa Cruz, CA.

5.3 Juvenile salmonids caught in the trawl were saved for Robert Emmett, NOAA-NMFS-NWFSC, Newport, OR.

## 6.0 INCIDENTS AND MALFUNCTIONS

6.1 On Leg I, the CTD signal was giving erroneous readings so the ET re-terminated the CTD cable. Lost one CTD cast.

6.2 On Legs I and II, the starboard hydro winch controls malfunctioned and required work by the engineering staff. Four stations were occupied with no Pairvet, Manta, or Bongo tows during repairs.

6.3 Due to time constraints on Leg III the decision was made to stop collection of water samples during CTD casts. Resultant loss of 36 salinity check samples.

6.4 During Leg III, the MSD pump failed and the ship pulled into San Francisco for a replacement. Due to errors by the shipper, delivery of the pump was delayed by three days. Due to limited time constraints the cruise leader needed to re-configure the station pattern. Seventeen stations were cut from the pattern in order to make port in the allotted time.

6.5 The ADCP was not operable prior to the cruise so the requested ADCP data was not collected.

6.6 Due to mechanical problems, ship personnel requested that the survey be shortened by one day to address these issues. The ship returned to San Diego on August 19.

7.0 COMMENDATIONS

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

7.2 The deck department for their ability to meet the needs of all types of gear with speed and expertise.

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

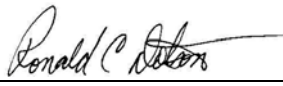
7.4 The engineering department for their performance and ability correcting major and minor malfunctions to allow the completion of the cruise.

7.5 The electronics specialist for his assistance with communications and for correcting any electronic malfunctions for both the ship and scientific gear.

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

7.7 The scientific staff personnel should be commended on their ability to continuously collect high quality data throughout the duration of the cruise.

More information and results from the survey can be found at the project's website:  
<http://swfsc.noaa.gov/textblock.aspx?Division=FRD&ParentMenuId=218&id=1340>

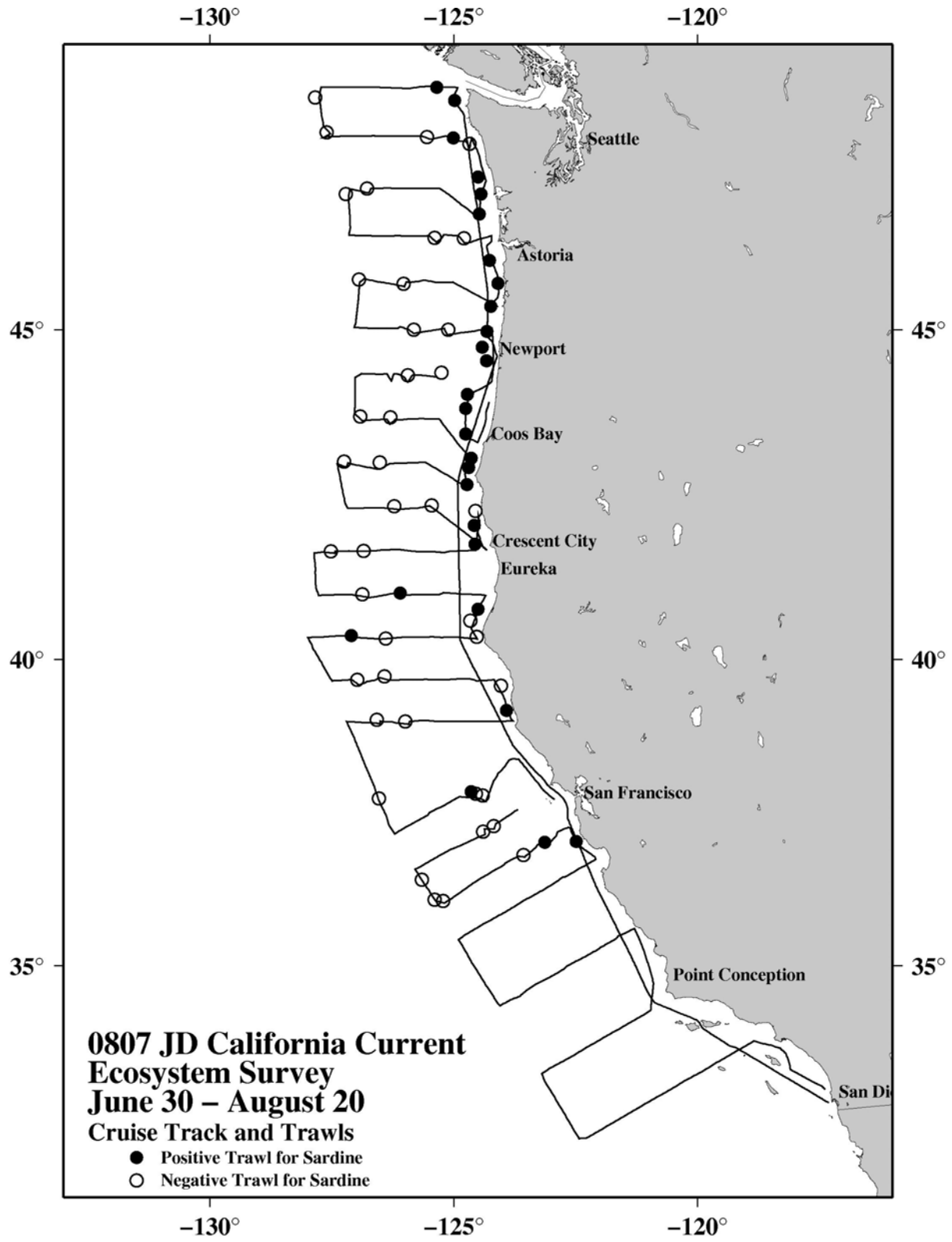
Prepared by:   
Ronald C. Dotson  
FRD, SWFSC

Date: 09/24/2008

Approved by: \_\_\_\_\_  
Norm Bartoo, PhD.  
Acting Science & Research Director  
Southwest Region

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

Appendix 1. NOAA vessel *David Starr Jordan* track lines for CalCOFI 0807JD



## Appendix 2. Personnel for the CalCOFI 0807JD Survey

30 JUN to 6 JUL Transit San Diego, CA to Cape Flattery, WA 7 DAS

### *David Starr Jordan Leg I:*

6 JUL – Depart Cape Flattery, WA 16 JUL - Arrive Newport, OR 10 DAS

<b>Position</b>	<b>Name</b>	<b>Affiliation</b>	<b>Citizenship</b>
Cruise Leader	Amy Hays	SWFSC	USA
Biologist	Debra Winter	private	USA
Biologist	Bev Macewicz	SWFSC	USA
Biologist	Sherry Charter	SWFSC	USA
Biologist	Noelle Bowlin	SWFSC	USA
Biologist	Bob Emmett	NWFSC	USA
Biologist	Marisa Litz	NWFSC	USA
Birder	Scott Mills	private	USA
Birder	Tim Shelmerdine	private	USA

### *David Starr Jordan Leg II:*

18 JUL – Depart Coos Bay, OR 4 AUG - Arrive San Francisco, CA 18 DAS

<b>Position</b>	<b>Name</b>	<b>Affiliation</b>	<b>Citizenship</b>
Cruise Leader	Ron Dotson	SWFSC	USA
Biologist	Mandy Lewis	CDFG	USA
Biologist	Sue Manion	SWFSC	USA
Biologist	Bill Watson	SWFSC	USA
Biologist	Dimitry Abramenkoff	SWFSC	USA
Biologist	Paul Ton	CDFG	USA
Biologist	Daniela Amezcua	volunteer	USA
Birder	Tim Shelmerdine	private	USA
Birder	Russ Namitz	private	USA

### *David Starr Jordan Leg III:*

6 AUG – Depart San Francisco, CA 19 AUG - Arrive San Diego, CA 14 DAS

<b>Position</b>	<b>Name</b>	<b>Affiliation</b>	<b>Citizenship</b>
Cruise Leader	Dave Griffith	SWFSC	USA
Biologist	Paul Ton	CDFG	USA
Biologist	Peter Goedert	volunteer	USA
Biologist	Todd Miller	NWFSC	USA
Biologist	Kevin Hill	SWFSC	USA
Biologist	Sarah Zao	SWFSC	USA
Biologist	Anne Allen	SWFSC	USA
Birder	Scott Mills	private	USA
Birder	Terry Hunefeld	private	USA