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 11, 2008

CRUISE INSTRUCTIONS

NOAA Ship: NOAA Ship *David Starr Jordan*

Cruise Number: DS-08-04

Cruise Dates: June 30 – August 20, 2008

Cruise Title: California Current Ecosystem (CCE) Survey.

Study Area: US/Mexican border to Cape Flattery with variable transect lengths.

Itinerary:

Fueling		
Ship loading and gear preparation:	25 - 27 JUN	
Transit to Cape Flattery:	30 JUN – 6 JUL	
Staff loading	4 JUL – Newport, OR	
Leg 1: 6 JUL - Station 11.6 /-2.6	16 JUL - Arrive Newport, OR	11 DAS
Leg 2: 18 JUL - Station 34.5/30.7	04 AUG - Arrive San Francisco, CA	18 DAS
Leg 3: 06 AUG- Station 66.7/50.0	20 AUG - Arrive San Diego, CA	15 DAS
Total		50 DAS

Tracklines and station positions are included at the end of this document in Appendix1.

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 will be automatically logged by computer with the output from the GPS navigational unit.

2. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler.

3. To continue an ongoing assessment of pelagic fish stocks between Cape Flattery, Washington and San Diego, California.

4. To collect information on sardine reproductive parameters, spatial distribution of size, age and abundance of sardine, and acoustics ground truth information using trawling.

5. To monitor environmental conditions within the CCE survey area.

6. To record continuous acoustic targets obtained with a multifrequency Simrad EK-60 scientific sounder.

Chief Scientist: Sam McClatchie, SWFSC (858) 546-7083, Sam.McClatchie@noaa.gov

PLAN OF OPERATIONS

1.0 OPERATIONS

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

1.1.1 Stations on lines including and south of line 78 will only include Pairovets and Trawling since the *New Horizon* will be conducting a CalCOFI cruise at the same time. All other standard CCE station will include the following:

1.1.1.1 CTD/Rosette - consisting of 12 2.5-liter hydrographic bottles will be lowered to 500 meters (depth permitting) at each station to measure physical parameters and collect water at discrete depths for analysis of salinity. Casts conducted on line 66.7 will be to a depth of 1000 meters.

1.1.1.2 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 and an ascent 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. The port side sample will be preserved in buffered ethanol at every station.

1.1.1.3 Manta net (neuston) tow - using a 505 µm mesh net on a frame with a mouth area of 0.1333 m². Tows are 15 minutes in duration at a towing speed of approximately 1.5 - 2.0 knots. Wire angles should be kept between 15° and 25°.

1.1.1.4 Weather observations.

1.1.1.5 Pairovet net - will be fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150 µm mesh nets at all stations. If sardine eggs are present beyond the westernmost station we will continue Pairovet sampling at each station as long as more than one egg per minute is counted in the CUFES sample (or to the end of the line). 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 will be repeated.

1.1.2 Thermosalinometer sampling - The ship will provide and maintain a thermosalinometer (TSG), which is calibrated and in working order, for continuous measurement of surface water temperature and salinity. A backup unit (calibrated and in working order) will also be provided by the vessel and remain aboard during the cruise. The Scientific Computing System (SCS) will serve as the main data collection system.. All SCS data will be provided to SWFSC personnel at the completion of the cruise.

1.1.3 Acoustics – Calibration of the Simrad EK-60 echosounder will be performed at the end of the cruise (requiring 6-12 hours). The EK-60 echosounder will be operated at 38, 70, 120 and 200 kHz and interfaced to a data acquisition system to estimate small pelagic and krill biomass between 10 and 250 m. The vessel's EQ-50, ES-60 or Skipper depth sounder may be used minimally at the discretion of the Commanding Officer, but will normally remain off while underway. The ship shall inform the Cruise Leader of any use of the vessel's sounders, as it interferes with the signals received on the scientific EK-60 that will be used continuously.

1.1.4 ADCP – The ship's ADCP should run continuously and be logged to a data acquisition system. Complete system settings will be provided by the oceanographer, but will include 5-minute averaging of currents, AGC and 4 beam returns in 60 8-meter bins. The ADCP will be set to receive an external trigger from the EK-60 to avoid cross talk.

1.1.5 CUFES - The egg pump will be mounted inside the ship's hull drawing water from a depth of three meters. During the grid occupation, the pump will run 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 will vary in length, depending on the number of fish eggs seen, from five to 30 minutes. At any time during the survey when the CUFES detects sardine egg concentrations of one egg per minute or higher in two consecutive samples, the ship will begin conducting pairovet tows at four mile intervals until the egg concentration falls below a density of 0.5 eggs per minute in two consecutive samples.

This information will be relayed to the bridge by scientists monitoring the CUFES system.

1.1.6 Surface trawling - During all 3 legs, a Nordic 264 surface trawl will be deployed between the hours of approximately 1800 and 0600 PST within the Southern California Bight and north up to Cape Flattery at positions indicated in appendix 1. The positions may be changed at the discretion of the Chief Scientist or Cruise Leader depending on information gained and occurrence of sardines

A marine mammal watch will be initiated 30 minutes before trawling. Trawling will be the first activity on arrival at a trawling station, or will be located away from a previously occupied station to avoid any mammals that may have been attracted to the vessel. The trawl will be fitted with a 162 dB source level, variable frequency pinger rated to discourage mammals. If any mammals are detected, the trawl position will be moved to a new area and the mammal watch reinitiated. Any mammal capture will trigger immediate cessation of trawling and telephone contact to the Division Director of FRD (Roger Hewitt), SWFSC, who will contact the Director of SWFSC. Trawling will only be reinitiated on instructions from NMFS Chief Scientist Steve Murawski.

Any adult salmon caught in a 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 Bob Emmett at NWFSC for further study.

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

Additional trawls may be targeted on acoustic marks as time and opportunity permit.

1.1.7 Bird Observations – During daylight hours a bird observer will be posted on the flying bridge to identify and count birds while the ship is 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.

The Cruise Leader or Chief Scientist is authorized to alter the scientific portion of this cruise plan with the concurrence of the Commanding Officer, provided that the proposed changes will not: (1) jeopardize the safety of personnel or the ship, (2) exceed the time allotted for the cruise, (3) result in undue additional expense, or (4) change the general intent of the project.

2.2 Participating Scientists
Please see Appendix 3.

2.3 Medical Forms - All scientific personnel will complete a NOAA Health Services Questionnaire (NHSQ) prior to embarking, as per NC Instruction 6000. This form will be routed through MOP Health Services for approval 30 days prior to the cruise.

3.0 EQUIPMENT

3.1 Supplied by scientific party:

1. -80°C Freezer (SWFSC)
2. 37% Formalin (SWFSC)
3. Ethanol (SWFSC)
4. Tris buffer (SWFSC)
5. Sodium borate (SWFSC)
6. 30 cc and 50 cc syringes (SWFSC)
7. Canulas (SWFSC)
8. Pint, quart and gallon jars (SWFSC)
9. Jars for ovaries (SWFSC)
10. Inside and outside labels (SWFSC)
11. CalCOFI net tow data sheets (SWFSC)
12. 71 cm CalCOFI Bongo frames (SWFSC)
13. 71 cm CalCOFI 505 µm mesh nets (SWFSC)
14. CalCOFI 150 µm Calvet nets and codends (SWFSC)
15. CalCOFI Pairovet frames (SWFSC)
16. 333 µm mesh codends (SWFSC)
17. Inclinometer for bongo tows (SWFSC)
18. Digital flowmeters (SWFSC)
19. 75 lb Bongo weight (SWFSC)
20. 100 lb hydro weights (SWFSC)
21. CalCOFI Manta net frames (SWFSC)
22. 60 cm CalCOFI 505 µm mesh Manta nets (SWFSC)

23. Standard CalCOFI tool boxes (SWFSC)
24. Bucket thermometers and holders (SWFSC)
25. Hand held inclinometer for Pairovet tows(SWFSC)
26. Guildline Portasal (SWFSC)
27. Salinity bottles (SWFSC)
28. Standard sea water (SWFSC)
29. Data sheets for scheduled hydrographic work (SWFSC)
30. Weather observation sheets (SWFSC)
31. CTD and rosette (SWFSC)
32. 2.5 liter hydrographic bottles (SWFSC)
33. Simrad EK-60 GPTs and software (SWFSC)
34. CUFES (SWFSC)
35. Dissecting microscopes (SWFSC)
36. Nordic 264 rope trawl (SWFSC)
37. Trawl rigging (SWFSC)
38. 3.0 m² XL-Lite foam core trawl doors (SWFSC)
39. Motion compensated balances (SWFSC)
40. Fish measuring boards (SWFSC)
41. Dissection equipment (SWFSC)
42. 200 dB Acoustic pinger for trawl net (SWFSC)
43. Observer chairs on the flying bridge to be used by bird and/or mammal observers.

3.2 Supplied by ship - We request the following systems and their associated support services, sufficient consumables, back-up units, and on-site spares. All measurement instruments are assumed to have current calibrations and we request that all pertinent calibration information be included in the data package.

1. Starboard hydro winch with ¼" cable for standard Bongo, Pairovet and Manta tows.
2. Port winch with .322" conductive cable
3. Port and starboard combo trawl winch with e" trawl cable
4. Port and starboard gantries with trawl blocks for e" trawl cable
5. Net reel to accommodate Nordic 264 trawl
6. J-frame w/block to accommodate .322" cable
7. Constant temperature room set at $22^{o}C \pm 1^{o}C$ ($71.5^{o}F \pm 2^{o}F$)
8. Winch monitoring system
9. Seabird thermosalinometer
10. Knudsen 12 kHz depth recorder
11. Acoustic Doppler Current Profiler
12. Multifrequency transducers providing 38, 70, 120 kHz frequencies for the EK-60

3.3 Installation and Maintenance - Prior to departure from San Diego the Cruise Leader or Chief Scientist and members of the scientific party may board the vessel, with permission of the Commanding Officer, to test survey equipment and environmental sensors. It is also requested that the constant temperature room be set at $22^{o}C \pm 1^{o}C$

($71.5^{o}F \pm 2^{o}F$) prior to departure.

3.4 Hazardous Materials - The Cruise Leader or Chief Scientist shall be responsible for complying with NC Instruction 6280a, Hazardous Materials and Hazardous Waste; policy, guidance, and training, dated February 4, 1991, paragraph 7.g and paragraph 9. By Federal Law, the ship may not sail without a complete inventory of Material Safety Data Sheets (MSDS's) and appropriating neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemicals brought on board. The Cruise Leader or Chief Scientist will provide the Commanding Officer with a copy of all MSDS's prior to the cruise.

4.0 DATA RESPONSIBILITIES

4.1 Collection of Data - The Chief Scientist will receive all original data related to the project. The Chief Scientist will in turn furnish the Commanding Officer with a complete inventory listing of all data gathered by the scientific party, detailing types of operations and quantities of data prior to departing the ship. All data gathered by the vessel's personnel that are desired by the Chief Scientist will be released to him, including supplementary data specimens and photos gathered by the scientific crew.

4.2 Dissemination of Data - The Cruise Leader or Chief Scientist is responsible for the quality assurance, disposition and archiving of data and specimens collected aboard the ship. The Chief Scientist is also responsible for the dissemination of copies of these data to cruise participants and to any other requesters. The SWFSC cruise report will be submitted according to SWFSC procedures to appropriate persons and groups.

4.3 Evaluation Form - The Cruise Leader or Chief Scientist will complete the Ship Operations Evaluation Form and forward it to the Office of Marine and Aviation Operations. The Commanding Officer will provide this form.

5.0 ADDITIONAL INVESTIGATIONS AND PROJECTS

5.1 Ancillary Projects - Ancillary projects are secondary to the objectives of the cruise, should be treated as additional investigations, do not have representation aboard, and are accomplished by the ship's force. Ancillary tasks will be accomplished in accordance with the NOAA Fleet Standing Ancillary Instructions. Any additional work will be conducted so as not to interfere with operations as outlined in these instructions. The Cruise Leader or Chief Scientist will be responsible for determining the priority of additional work relative to the primary project with approval from the Commanding Officer.

6.0 COMMUNICATIONS

6.1 Radios - The Cruise Leader or designee may request, from the Commanding Officer,

the use of radio transceivers aboard the ship to communicate with other vessels and aircraft, if necessary.

6.2 Telephone - The Cruise Leader or designee may require access to the ship's INMARSAT or cellular telephone systems with permission from the Commanding Officer. The Commanding Officer will provide the Cruise Leader with a log of all INMARSAT calls made from the ship for SWFSC business at the end of each leg. In accordance with the Communications Reimbursement Policy, SWFSC will pay these charges via a transfer of funds from SWFSC to the ship.

6.3 Electronic Mail - All members of the scientific party will have access to e-mail for communications with persons not aboard the ship. The amount of such communication traffic will be determined by the Cruise Leader or Chief Scientist.

6.4 Routine Reports - The Cruise Leader will submit a weekly cruise report, along with time and attendance for the scientific party, to the Survey Coordinator each Thursday during the cruise via e-mail or, if e-mail is not functioning properly, via fax. Richard Charter at SWFSC will be on the distribution list for the ship's noon position reports.

7.0 MISCELLANEOUS

7.1 Pre-cruise Meeting - A pre-cruise meeting between the Cruise Leader or Chief Scientist and the Commanding Officer (and his staff) will be held prior to the start of the cruise to identify operational requirements (i.e., overtime, modifications, repairs or procurement). The date and time for this meeting is yet to be scheduled.

7.2 Underway Meetings - Meetings between the Commanding Officer (and other officers) and the Cruise Leader should occur at the beginning and end of each leg to discuss and solve any problems or changes that may arise. Additional meetings should occur as needed.

7.3 Debrief - A post-cruise debriefing will be held between the Cruise Leader or Chief Scientist and the Commanding Officer. If serious problems are identified, the Commanding Officer shall notify the Marine Operations Center, Pacific, in the most direct means available. The Cruise Leader or Chief Scientist shall document identified problems in the Ship Operations Evaluation Form. The time and date for the debriefing will be determined toward the end of the cruise.

7.4 Time and Attendance - Time and Attendance will be filled out by the SWFSC timekeeper while the ship is at sea, based on information transmitted by the Cruise Leader to the Survey Coordinator. Scheduled overtime is authorized for Saturdays, Sundays, holidays and any hours over a standard eight hour week day. Irregular overtime will be authorized by the Cruise Leader as required. SWFSC personnel are authorized per diem at the rate of $3.00 per day to be paid via a travel voucher at the termination of the cruise. Task Number F8LAF28-PCS will pay for per diem and overtime for any

SWFSC permanent, term or temporary employees.

7.5 Navigation - Primary control will be GPS, also dead reckoning based on visual bearings and radar ranges when possible.

7.6 Scientific Spaces - The Cruise Leader shall be responsible for the proper upkeep and cleaning of all spaces assigned to the scientific party, both laboratory and living spaces, throughout the cruise. The Cruise Leader or Chief Scientist will make berthing assignments for scientific personnel on a per-leg basis, with approval of the Commanding Officer.

7.7 Foreign Nationals Access to NMAO Vessels -
Please see Appendix 4.

For further information contact:

Sam McClatchie, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 8604 La Jolla Shores Drive, La Jolla, CA 92037; Sam.McClatchie@noaa.gov, Phone (858) 546-7083.

Richard Charter, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 8604 La Jolla Shores Drive, La Jolla, CA 92037; Richard.Charter@noaa.gov, Phone (858) 546-7157.

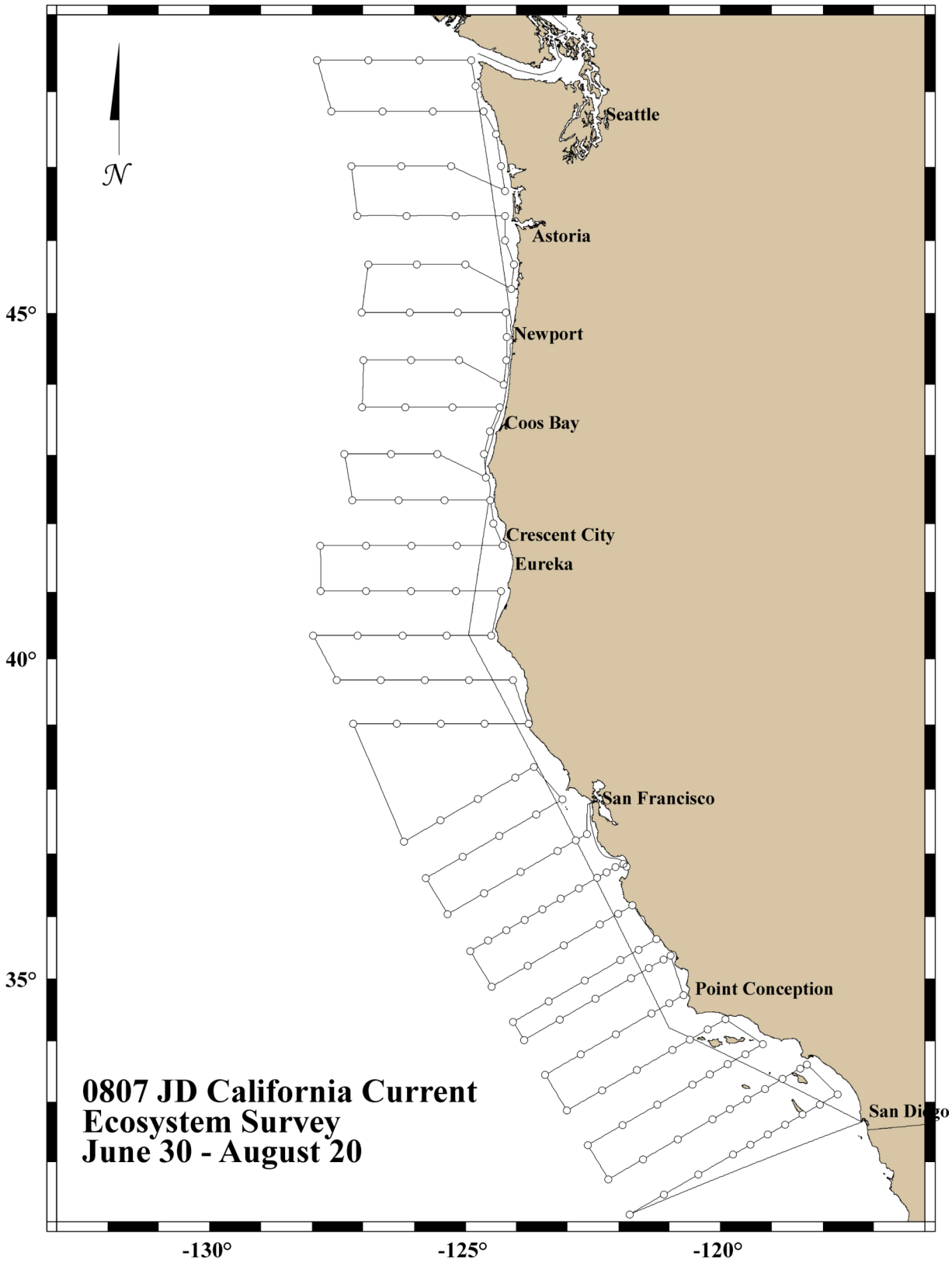
More information about the cruise and project can be found at the project's website: http://swfsc.nmfs.noaa.gov/frd/CalCOFI/CC1.htm

Prepared by: _____ Date: 6/11/08
Sam McClatchie
Chief Scientist, SWFSC

Approved by: _____ Date: 6/11/08
Norm Bartoo, PhD.
Acting Science & Research Director
Southwest Region

Approved by: _____ Date:
CAPT Michele G. Bullock
Commanding Officer

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


N
Seattle
Astoria
Newport
Coos Bay
Crescent City
Eureka
San Francisco
Point Conception
San Diego
45°
40°
35°
-130°
-125°
-120°
0807 JD California Current
Ecosystem Survey
June 30 - August 20

Appendix 2. Station positions:

Schedule Order	Line	Station	Latitude	Longitude
1	11.7	-2.6	48.075	-124.796
2	10.0	-4.0	48.410	-124.886
3	8.2	5.0	48.410	-125.892
4	6.5	14.0	48.410	-126.895
5	4.8	22.9	48.410	-127.898
6	8.3	25.1	47.741	-127.617
7	10.0	16.1	47.741	-126.620
8	11.7	7.2	47.741	-125.630
9	13.4	-1.8	47.741	-124.641
10	15.2	-2.1	47.441	-124.396
11	17.3	-0.1	47.009	-124.301
12	18.9	1.4	46.677	-124.223
13	15.6	8.9	47.009	-125.279
14	13.9	17.9	47.009	-126.256
15	12.2	26.7	47.009	-127.233
16	15.3	30.4	46.342	-127.113
17	17.0	21.5	46.342	-126.150
18	18.7	12.6	46.342	-125.186
19	20.5	3.7	46.342	-124.222
20	21.9	5.9	46.007	-124.222
21	23.8	6.5	45.675	-124.045
22	25.2	9.3	45.338	-124.101
23	22.0	15.5	45.675	-124.998
24	20.3	24.3	45.675	-125.948
25	18.6	33.2	45.675	-126.901
26	21.3	39.1	45.015	-127.026
27	23.0	30.3	45.015	-126.085
28	24.7	21.4	45.015	-125.146
29	26.4	12.5	45.015	-124.202
30	28.0	14.7	44.672	-124.185
31	29.4	17.0	44.349	-124.191
32	30.8	20.0	44.003	-124.247
33	27.7	25.9	44.349	-125.123
34	26.0	34.8	44.349	-126.059
35	24.3	43.5	44.349	-126.990
36	27.1	48.7	43.683	-127.019
37	28.7	40.6	43.683	-126.171
38	30.4	31.8	43.683	-125.250
39	32.1	23.0	43.679	-124.327
40	33.2	27.2	43.341	-124.514
41	34.5	30.7	43.012	-124.633
42	36.0	32.8	42.674	-124.596
43	32.8	39.5	43.012	-125.544

Schedule Order	Line	Station	Latitude	Longitude
44	31.1	48.2	43.012	-126.454
45	29.4	57.0	43.012	-127.365
46	32.6	60.5	42.344	-127.207
47	34.3	51.7	42.344	-126.306
48	36.0	43.0	42.344	-125.407
49	37.7	34.2	42.344	-124.505
50	39.3	36.1	42.004	-124.447
51	41.0	36.7	41.678	-124.268
52	39.3	45.5	41.678	-125.160
53	37.6	54.2	41.678	-126.052
54	36.0	62.9	41.678	-126.944
55	34.3	71.6	41.678	-127.837
56	37.2	76.6	41.012	-127.827
57	38.9	67.9	41.012	-126.944
58	40.5	59.3	41.012	-126.062
59	42.2	50.6	41.012	-125.180
60	43.9	41.8	41.012	-124.297
61	46.4	48.6	40.345	-124.488
62	44.7	57.3	40.345	-125.360
63	43.1	66.0	40.345	-126.229
64	41.4	74.6	40.345	-127.103
65	39.8	83.2	40.345	-127.976
66	43.5	83.8	39.679	-127.517
67	45.1	75.3	39.679	-126.654
68	46.8	66.6	39.679	-125.789
69	48.5	58.0	39.679	-124.925
70	50.1	49.2	39.679	-124.060
71	53.6	51.2	39.013	-123.763
72	51.9	59.9	39.013	-124.622
73	50.3	68.6	39.013	-125.479
74	48.6	77.2	39.013	-126.336
75	47.0	85.8	39.013	-127.193
76	56.7	90.0	37.186	-126.204
77	56.7	80.0	37.519	-125.481
78	56.7	70.0	37.852	-124.754
79	56.7	60.0	38.186	-124.025
80	56.7	55.0	38.352	-123.659
81	60.0	53.0	37.847	-123.099
82	60.0	60.0	37.614	-123.608
83	60.0	70.0	37.281	-124.332
84	60.0	80.0	36.947	-125.053
85	60.0	90.0	36.614	-125.771
86	63.3	90.0	36.043	-125.342
87	63.3	80.0	36.376	-124.629
88	63.3	70.0	36.709	-123.914

Schedule Order	Line	Station	Latitude	Longitude
89	63.3	60.0	37.043	-123.195
90	63.3	55.0	37.209	-122.835
91	63.3	52.0	37.309	-122.618
92	66.8	48.0	36.836	-121.901
93	67.1	47.7	36.794	-121.842
94	66.7	50.0	36.787	-122.056
95	66.7	52.5	36.704	-122.236
96	66.7	55.0	36.620	-122.415
97	66.7	60.0	36.454	-122.773
98	66.7	65.0	36.287	-123.129
99	66.7	70.0	36.120	-123.486
100	66.7	75.0	35.954	-123.841
101	66.7	80.0	35.787	-124.196
102	66.7	85.0	35.620	-124.550
103	66.7	90.0	35.454	-124.903
104	70.0	90.0	34.882	-124.480
105	70.0	80.0	35.215	-123.778
106	70.0	70.0	35.549	-123.073
107	70.0	60.0	35.882	-122.366
108	70.0	55.0	36.049	-122.010
109	70.0	51.0	36.182	-121.726
110	73.3	50.0	35.644	-121.256
111	73.3	55.0	35.477	-121.609
112	73.3	60.0	35.310	-121.962
113	73.3	70.0	34.977	-122.664
114	73.3	80.0	34.644	-123.364
115	73.3	90.0	34.310	-124.062
116	75.0	90.0	34.016	-123.847
117	75.0	80.0	34.349	-123.152
118	75.0	70.0	34.683	-122.455
119	75.0	60.0	35.016	-121.755
120	75.0	55.0	35.183	-121.403
121	75.0	51.0	35.316	-121.122
122	75.0	49.0	35.383	-120.981
123	78.3	51.0	34.744	-120.727
124	78.3	55.0	34.611	-121.006
125	78.3	60.0	34.444	-121.355
126	78.3	70.0	34.111	-122.050
127	78.3	80.0	33.778	-122.743
128	78.3	90.0	33.444	-123.433
129	81.7	90.0	32.856	-123.010
130	81.7	80.0	33.189	-122.324
131	81.7	70.0	33.522	-121.637
132	81.7	60.0	33.856	-120.946
133	81.7	55.0	34.022	-120.600

Schedule Order	Line	Station	Latitude	Longitude
134	81.7	50.0	34.189	-120.253
135	81.7	45.0	34.356	-119.905
136	85.0	40.0	33.951	-119.172
137	85.0	45.0	33.784	-119.518
138	85.0	50.0	33.617	-119.863
139	85.0	55.0	33.451	-120.208
140	85.0	60.0	33.284	-120.552
141	85.0	70.0	32.951	-121.238
142	85.0	80.0	32.617	-121.921
143	85.0	90.0	32.284	-122.602
144	88.3	90.0	31.712	-122.197
145	88.3	80.0	32.046	-121.521
146	88.3	70.0	32.379	-120.842
147	88.3	60.0	32.712	-120.160
148	88.3	55.0	32.879	-119.818
149	88.3	50.0	33.046	-119.476
150	88.3	45.0	33.212	-119.133
151	88.3	40.0	33.379	-118.789
152	88.3	35.0	33.546	-118.445
153	88.3	33.0	33.612	-118.307
154	91.7	30.0	33.124	-117.713
155	91.7	35.0	32.957	-118.055
156	91.7	40.0	32.790	-118.397
157	91.7	45.0	32.624	-118.739
158	91.7	50.0	32.457	-119.080
159	91.7	55.0	32.290	-119.420
160	91.7	60.0	32.124	-119.759
161	91.7	70.0	31.790	-120.436
162	91.7	80.0	31.457	-121.111
163	91.7	90.0	31.124	-121.783

Appendix 3. Personnel for the CalCOFI 0807 Survey

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

David Starr Jordan Leg I:
6 JUL – Depart Cape Flattery 16 JUL - Arrive Newport, OR 11 DAS

Position	**Name**	**Affiliation**	**Citizenship**	**Health**
Cruise Leader	Amy Hays	SWFSC	USA	y
Biologist	Debra Winter	private	USA	
Biologist	Bev Macewicz	SWFSC	USA	y
Biologist	Sherri Charter	SWFSC	USA	y
Biologist	Noelle Bowlin	SWFSC	USA	y
Biologist	Bob Emmet	NWFSC	USA	y
Biologist	Marisa Litz	NWFSC	USA	y
Birder	Scott Mills	private	USA	y
Birder	Tim Shelmerdine	private	USA	y

David Starr Jordan Leg II:
18 JULY – Depart Newport, OR 4 AUG - Arrive San Francisco, CA 18 DAS

Position	**Name**	**Affiliation**	**Citizenship**	
Cruise Leader	Ron Dotson	SWFSC	USA	y
Biologist	Mandy Lewis	CDFG	USA	y
Biologist	Sue Manion	SWFSC	USA	y
Biologist	Bill Watson	SWFSC	USA	y
Biologist	Dimitry Abramenkoff	SWFSC	USA	y
Biologist	TBD	SWFSC	USA	
Biologist	Daniela Amezquita	volunteer	USA	
Birder	Tim Shelmerdine	private	USA	
Birder	Russ Namitz	private	USA	

David Starr Jordan Leg III:
6 AUG – Depart San Francisco, CA 20 AUG - Arrive San Diego, CA 15 DAS

Position	**Name**	**Affiliation**	**Citizenship**	
Cruise Leader	Dave Griffith	SWFSC	USA	y
Biologist	Mandy Lewis	CDFG	USA	y
Biologist	Peter Goedert	volunteer	USA	
Biologist	Todd Miller	NWFSC	USA	
Biologist	Kevin Hill	SWFSC	USA	y
Biologist	Sarah Zao	SWFSC	USA	y
Biologist	Anne Allen	SWFSC	USA	
Birder	Scott Mills	private	USA	y
Birder	Terry Hunefeld	private	USA	y

Appendix 4. Foreign National Access

Foreign National Access and Deemed Export Controls on NMAO Vessels

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (http://deemedexports.noaa.gov). The foreign national's sponsor is responsible for obtaining clearances and export licenses required and for providing for required escorts by the NAO. Programs sponsoring foreign nationals should consult with their designated line office personnel to assist with the process (http://deemedexports.noaa.gov/contacts.html).

The following are basic requirements. Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

Ensure the following is provided to the Commanding Officer before any foreign national will be allowed on board for any reason:

1. Written notification identifying the NOAA Program individual who is responsible for ensuring compliance with NOAA and export regulations for the foreign national (see Foreign National Sponsor responsibilities below).

2. A copy of the DOC/OSY clearance authorization for access by the foreign national.

3. A copy of Appendix B of NAO 207-12 with NOAA Chief Administrative Officer concurrence endorsement.

4. Written notification that the foreign national has been cleared against the State, Commerce and Treasury departments' Lists to Check. http://www.bis.doc.gov/ComplianceAndEnforcement/ListsToCheck.htm

5. Provide the NOAA Foreign National List spreadsheet for each foreign national in the scientific party.

Escorts – The Chief Scientist is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer.

Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Export Control - The Chief Scientist is responsible for complying with NAO 207-12 and the development of Technology Access Control Plans for items they bring aboard. The Chief Scientist must notify the Commanding Officer of any export controlled items they bring aboard

and any access restrictions associated with these items.

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Responsibilities of the Commanding Officer:

Ensure only those foreign nationals with DOC/OSY clearance are granted access..

Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.

Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.

Ensure receipt from the Chief Scientist of the NOAA Foreign National List spreadsheet for each foreign national in the scientific party.

Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.

Export Control - 8 weeks in advance of the cruise, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology.

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor

Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.

The Departmental Sponsor/NOAA of the foreign national shall assign an on-board Program

individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA employee or be approved by the vessel's DOC Regional Security Officer homeport.

Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National Guest) as required by NAO 207-12 Section 5.03.h