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

October 9, 2003 F/SWC1:DAG

CRUISE REPORT

VESSEL: F/V *Frosti*, 0307-FR.

CRUISE DATES: July 6 - July 25, 2003.

PROJECT: Oregon - Washington Sardine Survey, Fisheries Resources Division.

ITINERARY: Leg I: Departed Newport, Oregon at 10:00 on July 6, 2003. Proceeded to first station of the proposed survey track and arrived at 04:00 on the 7th of July (see attached cruise track). Occupied all stations up to line 48 and broke pattern to arrive at Port Angeles, Washington at 09:30 on the 15th.

Leg II: Once personnel exchanges were complete, the *Frosti* returned to line 48 and completed the remaining stations. Once station work was complete, the ship returned to areas of observed high concentrations of fish schools and egg densities. The vessel returned to Astoria, Oregon on July 24, 2003.

OBJECTIVES:

1. Collect fishery independent adult sardines for spawning biomass estimates.
2. Map sardine egg distribution with CUFES (Continuous Underway Fish Egg Sampler) off of Oregon and Washington.
3. Collect oceanographic data over a fixed cruise track which covers the region 42°N to 48°N from inshore out to 127° W.
4. Collect acoustic data continuously throughout the survey using the vessel's ES-60 Simrad sounder.
5. Coordinate survey with airborne LIDAR (Light Detecting and Ranging) system operated by OAR.
6. Conduct quantitative plankton tows using a Pairovet net for calibration of the CUFES and attempt to quantify the sardine spawning biomass using an EPM (Egg Production Method).
8. Collect continuous underway temperature and conductivity measurements of surface waters. These measurements will be collected using NOAA's SCS software which is also interfaced with the CUFES software.

PROCEDURES:

1. Forty-two primary stations were occupied during the survey. At each station the following activities were performed:

   a. Deployment of a Seabird SeaCat down to 100 meters, bottom depth permitting. The self-contained CTD collected depth, temperature, conductivity and chlorophyll data.

   b. A standard Pairovet cast was deployed concurrently with the CUFES system. The Pairovet net was fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150 µm mesh nets. The technical requirements for the Pairovet tow was: 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.

c. Standard meteorological data including SST, wind speed and direction, wave height and direction, cloud cover, relative humidity, air temperature and barometric pressure.

d. During all transit between stations continuous measurements were made of pelagic fish eggs (CUFES) and acoustic targets using the ES-60. All acoustic targets and egg densities were recorded for reoccupation during the night portion of the survey.

2. Trawling Procedures

a. With the occupation of stations during the daylight hours, the less distance traveled made it easier to reoccupy the areas of high egg densities and strong acoustic targets. It was noted however, that the majority of the fish were seen well within 30 miles of the coast. The acoustic signatures seen in the evening were light at times and it was discovered that even blind tows were successful.

b. Trawling operations began just before sunset to maximize the amount of dark trawling time. Trawling operations continued until it was necessary to break off to arrive at the next transect start point by 08:00.

c. The airborne LIDAR system was used in coordination with the survey and trawling portion of the cruise. The first flight was performed on the morning of July 14.

RESULTS:

Activity	Requested	Completed	Aborted
Pairovet tows	54	54	0
CTD casts	42	42	0
Weather	42	42	0
Surface Temp.	42	42	0
EK-60 (hours)	300	300	0
CUFES samples	490	490	0
Trawls completed	48	48	0

DISPOSITION OF DATA:

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

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

CTD data - Christian Reiss, FRD (SWFSC).

EK-60 data - David Demer, FRD (SWFSC).

Trawl samples - Beverly Macewicz, FRD (SWFSC).

LIDAR data - James Churnside (OAR).

INCIDENTS & MALFUNCTIONS:

On the second day of the survey, an overflow of the CUFES system resulted in the SCS computer being flooded with sea water and rendering it inoperable. It was replaced once we arrived in Port Angeles, Washington.

COMMENDATIONS:

The personnel of the *F/V Frosti* should be recognized and commended for their dedication and professional manner, ensuring

the completion of the cruise.

PERSONNEL:

Leg I:

Dave Griffith	SWFSC
Elaine Acuña	SWFSC
Bev Macewicz	SWFSC
Todd Miller	OSU
Daniel Waldeck	PFMC

Leg II:

Dave Griffith	SWFSC
Elaine Acuña	SWFSC
Bev Macewicz	SWFSC
Jean McCrae	OFW
Amy Thurman	WDFW

SWFSC personnel authorized per diem at the rate of $2.00 per day to be paid via the Imprest Fund at the termination of the cruise.

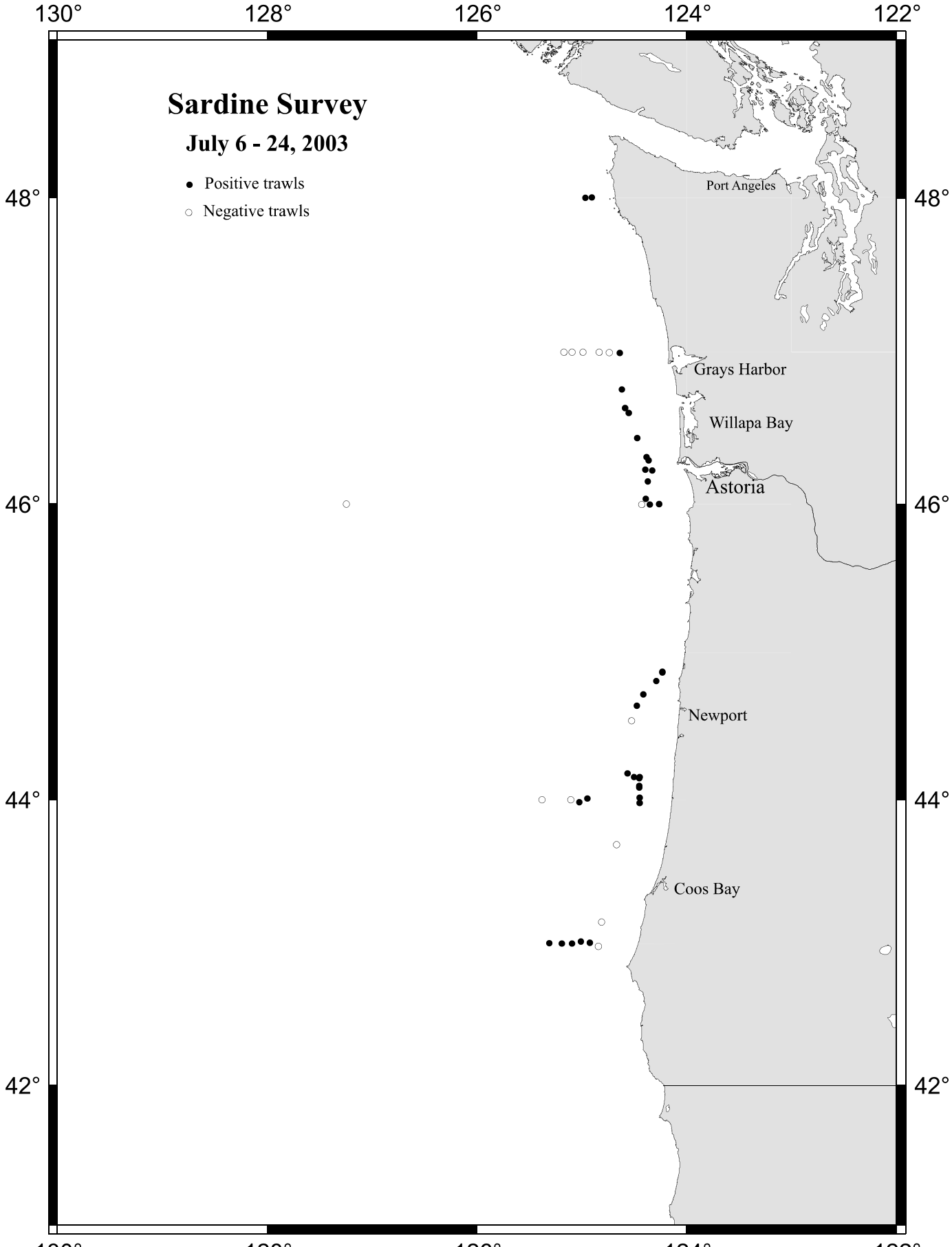
WATCH HOURS: 1200 - 2359
0000 - 1159

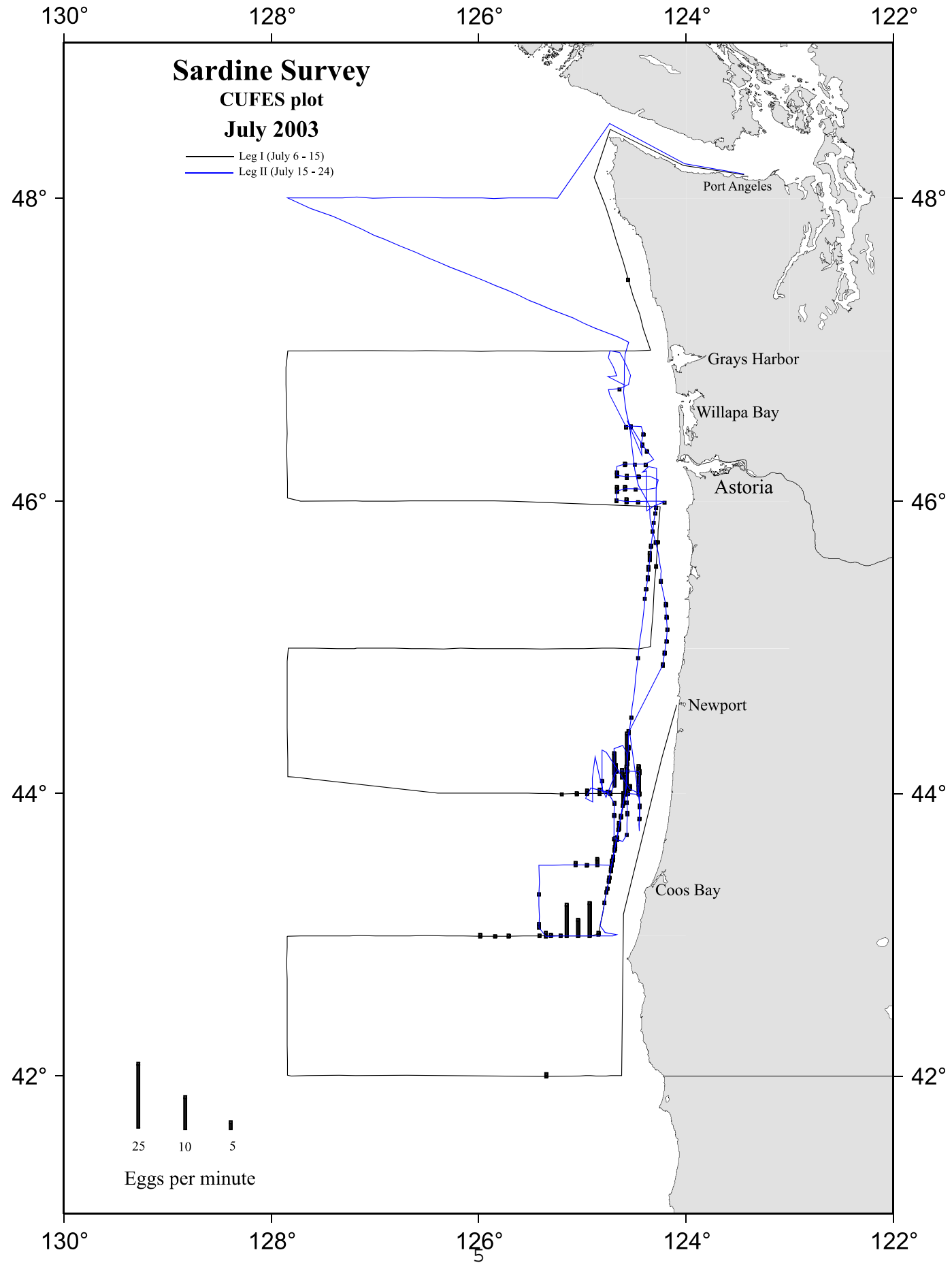
Charge to account #8L4S0D05

Date: _____

Prepared by: _____
David Griffith

Approved by: _____
Michael F. Tillman Ph.D.
Science & Research Director
Southwest Region


Sardine Survey
July 6 - 24, 2003
Positive trawls
Negative trawls
130°
128°
126°
124°
122°
48°
46°
44°
42°
Port Angeles
Grays Harbor
Willapa Bay
Astoria
Newport
Coos Bay


Sardine Survey
CUFES plot
July 2003
Leg I (July 6 - 15)
Leg II (July 15 - 24)
Port Angeles
Grays Harbor
Willapa Bay
Astoria
Newport
Coos Bay
130°
128°
126°
124°
122°
48°
46°
44°
42°
25
10
5
Eggs per minute