Marine Biology: Don Croll Lab Summary of Activities During CIMT Ship Surveys

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Don Croll's lab started the Wind to Whales surveys back in 1996 with Scott Benson and Jim Harvey from Moss Landing Marine Laboratories.


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The Croll lab is trying to establish the relationship between physical oceanographic processes and top-level consumers including fish, seabirds, and marine mammals. To do this the lab has two focuses on each CIMT cruise. The first is to collect marine mammal, sea turtle and seabird abundance and distribution information. The second focus is to determine the abundance and distribution of zooplankton and schooling fish using hydroacoustics.

Six different types of data are ce CIMT ship surveys including:


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- Marine mammal abundance and distribution,
- Seabird abundance and distribution,
- Sea turtle abundance and distribution,
- Zooplankton abundance and distribution,
- Krill abundance and distribution, and
- Schooling fish abundance and distribution.

At least five people are needed on each cruise to collect all the data listed above. There needs to be at least three marine mammal observers (alternates are always good to have), one seabird observer, and one data recorder. In addition usually one of the observers/data recorders is responsible for running the echosounder (described below). The Croll lab offers an opportunity for volunteer marine mammal observers. This opportunity allows individuals interested in learning more about marine mammal observation techniques to gain hands on experience.


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All four observers and the recorder are located on the upper observation deck while motoring along each of the seven transect lines at a speed of 10 knots. The observers use Fujinon 7x50 reticle binoculars and for marine mammals and sea turtles a method called "Line Transect". For this method two seated observers scan the water continuously with binoculars, and the third observer stands and searches with the naked eye. The seated observers scan from abeam of the boat to just past the transect line. The standing observer is responsible for looking straight ahead along the transect line and close to the ship. For seabirds the method is called "Strip Transect." During this method one seabird observer stands on one side of the ship and counts all seabirds out to 100 m. Custom data recording software from the National Marine Fisheries Service is used to record all observations. For marine mammals and sea turtles the data recorder enters in date and time of sighting, who observed the sighting, species name, number of species, observed behavior when sighted, the method used to observe the species (binoculars or naked eye) and location of sighting (bearing, reticle & GPS). For seabirds date, time, location, species, behavior, age of individual, and number are recorded. Other information that is recorded for all sightings include the sea state (beaufort, swell height & direction) and weather conditions (sun, rain, or fog) and viewing conditions (height of sun and miles of visibility) for observers.


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For the zooplankton and schooling fish information the Croll Lab uses a SIMRAD EK60 digital scientific echosounder operating at 38, 120, and 200 kHz. The SIMRAD EK60 is located inside the main seating area on the R/V John Martin. To collect the zooplankton and schooling fish data the echosounder operates at a pulse length of 1024 us pinging every two seconds along the transect line while the ship travels at a speed of 10 knots.

Once a CIMT ship survey is complete, the Croll lab uses specialized computer software to post process and analyze the marine mammal and seabird data as well as the echosounder data. Post processing includes error checking and creating visualizations to help researchers and managers monitor the Monterey Bay.

Key to Pictures: A) Marine mammal and seabird observers on board the R/V John Martin; B) Marine mammal observer, Lisa Wertz; C) Seabird observer, Sophie Webb; D) Data recorder, Rondi Robison; E) Orcas sighted during May 2005 cruise. Pictures by: Atma Roberts, Rondi Robison and David Revell.