

# California Coastal Bottlenose Dolphin Population in Santa Barbara Relative to Monterey Bay: Preliminary Findings

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## ABSTRACT

This initial research is a component of the first comprehensive study on the occurrence, movement patterns, and behavioral ecology of bottlenose dolphins (*Tursiops truncatus gilli*) in the coastal waters of the Santa Barbara Channel; specifically off the coast of Santa Barbara County extending into Ventura County, California. This marine environment is unique in that it contains the world's largest natural oil seepage area, twenty offshore oil platforms, and the site of what remains to be one of the largest oil spills in the U.S. (1969). Yet the use of habitat by coastal bottlenose dolphins here is relatively unknown, as are the potential impacts that these distinctive environmental features may have on them. Further, this research fills in data gaps for this area by contributing to what is a much more extensive project on coastal bottlenose dolphins in California. Six boat-based photo-identification surveys were conducted between July 2009 and 2010 in Santa Barbara County. Dolphins photo-identified were matched to an existing catalogue for Monterey Bay (400 Km north of Santa Barbara). Of the 67 dolphins photo-identified, 31 (46%) matched with animals seen in Monterey Bay between 1990 and 2009. Understanding temporal changes in the distribution of specific individuals along the California coast is critical to determining habitat use patterns and social structure for this coastal dolphin population. With estimates at less than 500 individuals and high risk of terrestrial and locally distinctive underwater sources of hydrocarbon contaminants, this research offers invaluable contributions to coastal habitat and human health.



Figure 1 - California coastal bottlenose dolphins travel in herds as large as 60 animals and individual animals move throughout the population range, over 1,000 km of coastline.

## INTRODUCTION

It is common to see California coastal bottlenose dolphins (*Tursiops truncatus*) between 0-500 m from shore from Santa Barbara to Monterey (Figure 1). Empirical data on trends in abundance, movement patterns, social structure and habitat use of these individuals is minimal and limited to specific study areas. The known range of this population extends from San Quentin, Mexico to San Francisco (Figure 2). Preliminary research suggests that there are fewer than 500 individuals in the entire population. This small population size implies that further research is necessary to ensure proper management.

The study we are conducting in Santa Barbara integrates with studies along the California coastline to provide a comprehensive look of the entire California coastal dolphin population range and understand the frequency, extent and social significance of movement patterns among study areas. **This poster presents preliminary information and is the beginning of a more comprehensive study also incorporating the psychology and behavioral ecology of this population.**



Figure 3 - Female dolphin Deuce was seen in Santa Barbara with her calf on 25 July 2009 and was re-sighted in Monterey Bay on 18 August 2009, a maximum transit time between the two study areas of 24 days covering on average 16 km/day.

## ACKNOWLEDGEMENTS

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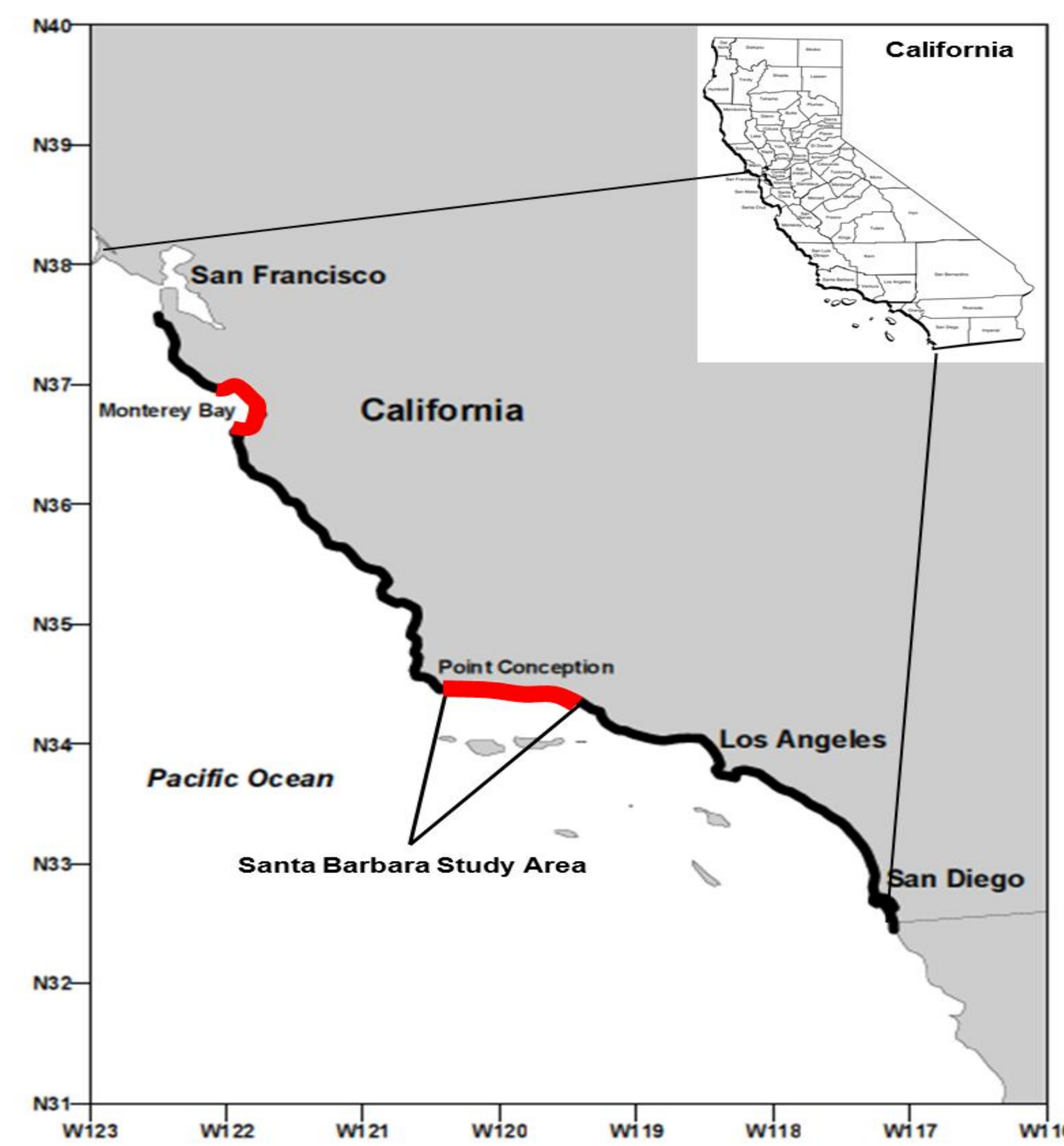


Figure 2 - Map of study area: red lines indicate the two study sites and largest sector marked with black lines indicates the known population range.

## METHODS

### Surveys

Six boat-based surveys were conducted between July 2009 and 2010 in Santa Barbara County using photo-identification techniques. The photos taken on each survey were then matched to an existing Monterey Bay coastal bottlenose dolphin catalogue containing over 300 dorsal fins and covering the period 1990-2010 to determine the amount of individual dolphin overlap between Santa Barbara and Monterey Bay.

### Photo Identification

Dolphin dorsal fins were photographed with a Canon 40D, 50D, or EOS REBEL T1i equipped with 100-400 mm lenses (Figure 3). Photos were saved as JPEG files and cropped and catalogues using ACDSee software.

### Matching

Matching was done by visual comparison of dorsal fins and careful evaluation of all historical data. Close communication between field crews in Santa Barbara and Monterey Bay was maintained at all times.

## RESULTS: SANTA BARBARA ONLY

Dolphins were encountered on all six surveys conducted in Santa Barbara. Group size was 11 on average and varied between 4 and 24. There were 5 groups with calves present (71%). Overall, 67 dolphins were individually photo identified. Eight of these were re-sighted during the study period. Excluding calves, 24% of the total number of dolphins encountered (including calves) were unidentifiable. On average, there was a 46% match among groups encountered in Santa Barbara. The rate of discovery of new identifiable individual dolphins (Figure 4) slowed down by the third survey suggesting the number of dolphins using the area during the study period was probably around 83 (67 identified and 24% unidentified, including calves).

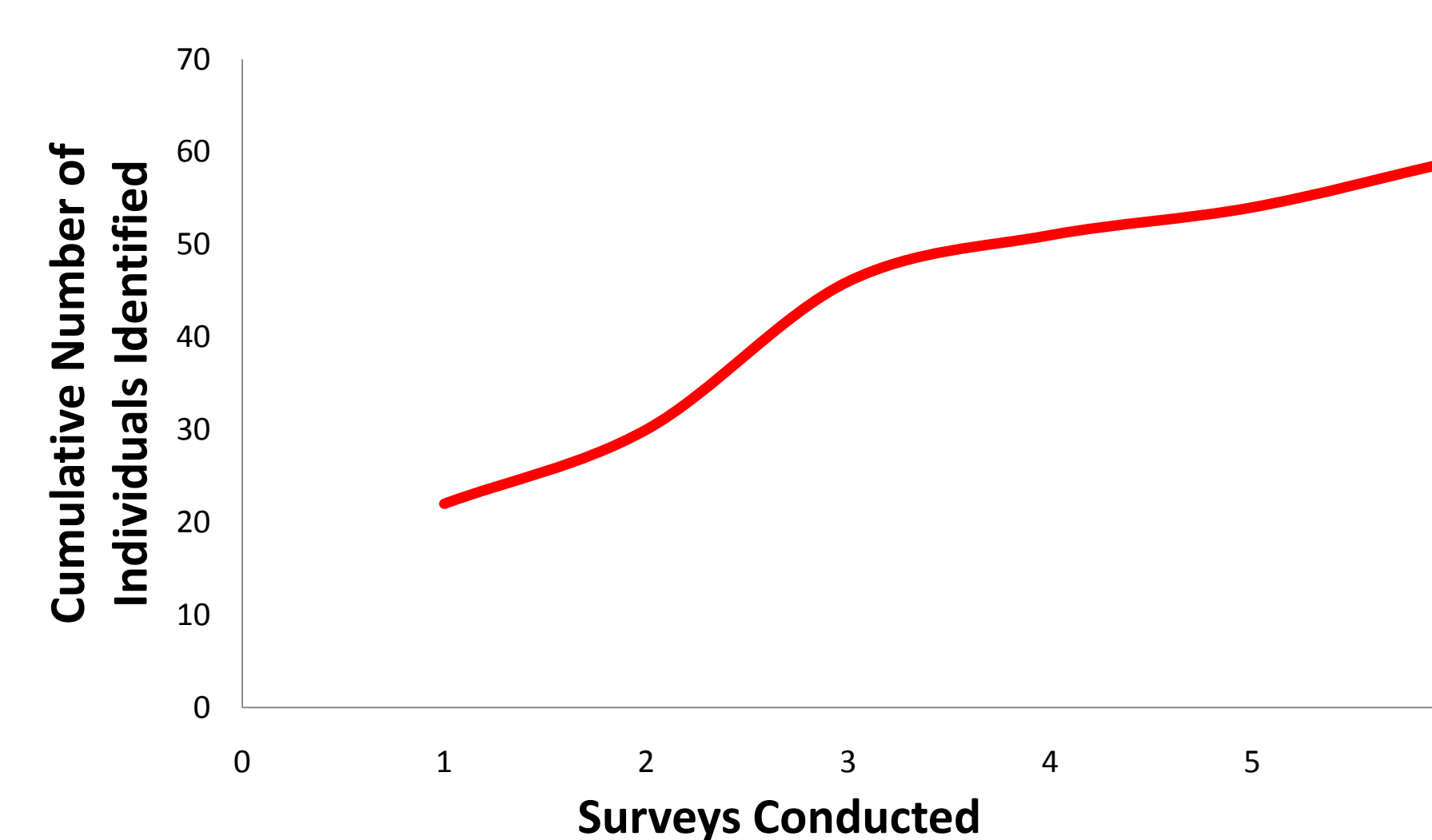
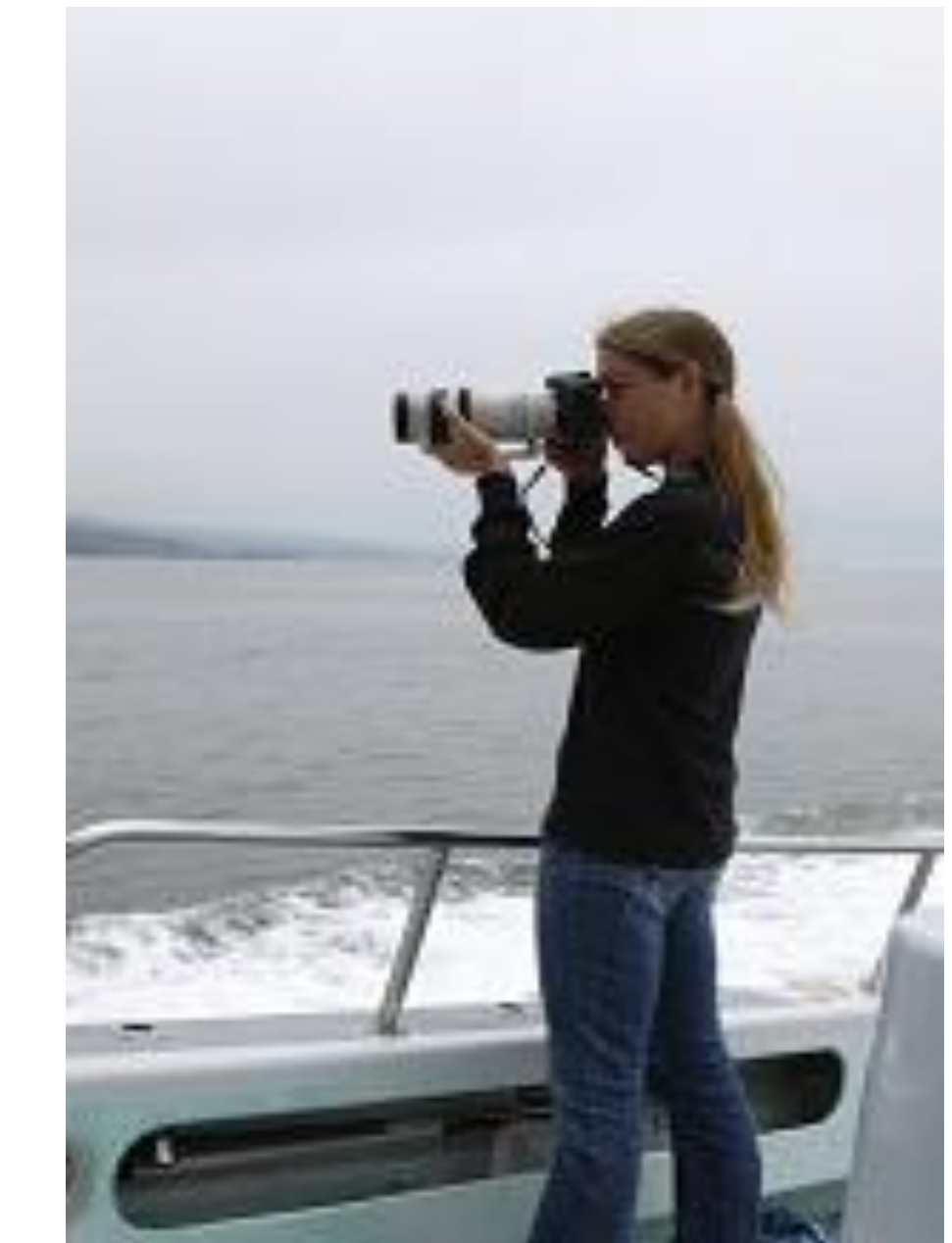


Figure 4 - Discovery curve for the Santa Barbara study site, showing the rate of discovery of new individuals in the study area.

Date	# Photo-Id in Santa Barbara	Monterey Bay Match (%)
July 24, 2009	22	41
July 25, 2009	8	25
May 26, 2010	17	59
June 30, 2010	8	63
July 29, 2010	5	40
September 6, 2010	7	43

Figure 5 - Number of dolphins identified in the Santa Barbara area and percentage of those also observed in Monterey Bay.



A Student Member of the Research Crew

## RESULTS: MATCH WITH MONTEREY BAY

There was an overall 46% match between the Santa Barbara catalogue and the Monterey Bay catalogue. and 46% ( $\pm 14\%$ ) on average (Figure 5). Of these, 5 dolphins moved between Santa Barbara and Monterey Bay within the same year. Female Deuce (Figure 3) moved between study areas in 24 days. Dolphins Tornado (female), Mattea (female), Fuji, Bagel (female) all moved between study areas (Figure 6) taking an average of 48 ( $\pm 7.3$  SE) days.



Figure 6 - Individuals sighted in both Monterey Bay and Santa Barbara study sites.

## CONCLUSIONS

- Approximately 83 dolphins used the Santa Barbara study area during our study period with a re-sight rate of 46%.
- There was at least a 46% match between the Santa Barbara and Monterey coastal bottlenose dolphin catalogues.
- Individual animals moved between areas within a month suggesting the population uses a wider range than any individual study can cover in a season.
- Collaborative studies covering the entire range of the population are critical to understanding social structure and protecting this small population inhabiting high-risk coastal habitats.