

Bottlenose Dolphins of San Luis Texas: Occurrence Patterns, Site-Fidelity and Habitat Use

BOTTLENOSE DOLPHINS OF SAN LUIS PASS, TEXAS: OCCURRENCE PATTERNS, SITE-FIDELITY, AND HABITAT USE

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Bottlenose dolphins (*Tursiops truncatus*) in the Galveston Bay estuary, Texas, have been continuously studied since 1990. Most of this research has taken place in the "Galveston Bay" area at the northeastern end of Galveston Island. In September 1995 we began a project to examine occurrence patterns, habitat use, site fidelity, and movements in the San Luis Pass area, a relatively undisturbed area at the southwestern end of Galveston Bay Estuary; and to compare findings to previous work in Galveston Bay, approximately 48 km away, as well as a brief study near San Luis Pass in 1990.

The first author conducted boat-based photo-identification surveys during 12 months in 1995-96, and the second author conducted surveys for 12 months during 1997-98. In the initial survey, thirty-seven dolphins were identified, by natural markings on their dorsal fins, utilizing the West Bay, Chocolate Bay, San Luis Pass, and nearshore Gulf of Mexico portions of the study area. During the second survey year, 21 of these animals were frequently identified utilizing the same area.

The study area was divided into four sections based upon habitat characteristics. Season and study area section were not independent with regard to group sightings. During summer, dolphins were most frequently sighted in Chocolate Bay, a shallow bay furthest inland; whereas during winter, they were most frequently sighted at San Luis Pass and in the Gulf of Mexico (Figure 1).

Individuals identified during the 1995-96 and 1997-98 studies were compared with individuals identified in the study area in 1990. Of the 37 "resident" animals identified in 1995-96, 12 were present in 1990, suggesting that some dolphins exhibit long-term site fidelity to the area. This was further supported by sightings of all twelve animals again during the 1997-98 study. Nine additional dolphins were identified regularly in both of the recent survey years. In 1997-98 there were four newly identifiable juveniles who thus far have been sighted consistently with the resident animals (Figure 2). Therefore, at the present time we have identified 25 dolphins (21 adults and 4 juveniles) with site fidelity for the San Luis Pass study area. In addition, there are several calves that do not yet have identifiable fins, and possibly 2 animals with unidentifiable smooth fins. It was noted that there were 14 more dolphins sighted regularly with the core resident animals for at least two seasons, and then not sighted for at least two seasons.

To investigate movement patterns, dolphins identified in the San Luis Pass area during 1995-96 were compared to photographs taken during 1995 weekly surveys of Galveston Bay. Of the fourteen animals that moved into and out of the San Luis Pass area, three animals were sighted in both study

areas, indicating that coastal movements between sites do occur. Furthermore, one additional animal was sighted in the fall 1998 in the Galveston Ship Channel as well as at San Luis Pass.

Part of the impetus for these studies included concern over the state of the Galveston Bay System. Commercial and recreational fishing, fertilizer and pesticide runoff, local petrochemical companies, and the local ports have heavily impacted the bay. The area in this study is crossed by the Intracoastal Waterway where dredging is common for shipping purposes and may result in resuspension of toxins from the sediment. Additionally, two large chemical plants operate in the Chocolate Bay area.

A recent Fish and Wildlife Service report notes that many studies have been done on the effects of pollutants on estuaries, but few provide cause and effect relationships. The report states that "there is a definite need for the development of realistic monitoring strategies that are integrative, sensitive, and recognize subtle warning signs. It is not economically feasible to study an entire ecosystem" and study designs must "emphasize system components that represent a 'barometer' of environmental events". Dolphins are an appropriate indicator species since they are at the top of the food web in this area and they are known to bioaccumulate toxins. Pathological studies on any stranded known resident could be very valuable in assessing the state of the bay. Long term variations in abundance and behavior of this population could serve as a warning if the bay is experiencing adverse changes, and thus contribute to ongoing efforts to balance human use of the coastal area with the health of the ecosystem.

Summary:

The combined findings of these studies indicate that there is a small population of dolphins with site fidelity for the far West Bay portion of the Galveston Bay Estuary. There are additional animals that join these resident dolphins, but also travel to other areas and may not be seen in the San Luis pass area for prolonged periods. The data obtained during these two years provide valuable baseline information identifying individuals that appear to be resident. This is a good population for long-term study since it is small in size and somewhat isolated from other populations. As well, West Bay is relatively pristine compared to other parts of the Galveston Bay System, so evidence of habitat degradation in this area would be particularly important. Future studies of the San Luis Pass dolphin population may provide direct or indirect data pertinent to environmental conditions in the bay, including food sources that are common to human consumption.