Shrimp Boats: A Galveston Dolphin's Smorgasbord

by Dagmar Fertl and Bernd Würsig

The bottlenose dolphin, *Tursiops truncatus*, is a familiar sight along the shores of Texas. It occurs in the open Gulf of Mexico, in large and small bays, and even in many of the channels which reach deep into coastal Texas. This large-brained, highly social mammal is well-known to the public, originally as a star of the 1960's "Flipper" television series and since then as a performer at oceanaria and marine parks worldwide. But we prefer to see the remarkable mammal in nature, and learn how it makes a daily living as it refuses to shun human traffic and industry in the Galveston and Galveston Bay area.

Although others before us have written about dolphins around Galveston Island, since 1990 the Marine Mammal Research Group of Texas A & M University at Galveston has concentrated research on the behavior, group sizes, movement patterns, site preferences, and — above all — the interactions between humans and dolphins.

We have learned about the lives of dolphins by what is termed "benign research" — by watching and photographing and describing, without catching or bothering the animals. One very important tool has helped tremendously: Many bottlenose dolphins have nicks and scars in the thin, easily-tattered, trailing edge of their dorsal, or top, fins. Since no two scar patterns are exactly alike, we can identify individuals.

We photograph (and also use high-resolution videos) to recognize animals, with dorsal fins being as individual to the trained eye as faces are to humans. Some dolphins also have scars on their backs, at times from unhappy encounters with boat propellers, and such markings also aid in identification. While one of us can visually tell more than 50 dolphins apart by sight in the field, extensive photography, sometimes with more than 100 photos taken of a group of only 6 to 10 dolphins, helps to verify who is or is not present in an area on a particular day.

By this photographic identification technique, graduate student Thomas Henningsen identified more than 1,000 different dolphins using the Galveston Bay-Galveston Island area in a 7-month period in 1990. While this area includes the nearshore open-ocean environment, 240 individuals were identified in the Houston and Galveston Ship Channels.

Of course, not all these dolphins use the area at the same time. Most are simply passing though, spending only weeks in the channels on their migratory paths north and south of our study area. Perhaps they can be compared to the human "snowbirds" who travel south in the winter. These are the transients of the population. Around 100 individuals are truly resident, sightable year-round, but with minor fluctuations in movement patterns, probably to take best advantage of the occurrence and abundance patterns of the various fish species on which they feed.

Texas A&M researchers use benign research to study dolphin behavior around Galveston Bay.

At the same time that we carefully approach schools of dolphins to photograph them, generally with a 17-foot outboard vessel moving at slow speed, we also describe behavior. Dolphin behavior is classified into the main categories of travelling, feeding, socializing, resting and milling. Bottlenose dolphins display an amazing diversity of feeding patterns as they capture fish and invertebrates. They feed alone, feed cooperatively in groups, use natural and man-made barriers to corral fish, kick fish with their flukes to stun them, and feed in association with human fishing activity. This latter behavior is particularly widespread in Texas bays, and the author of this article is developing her master's thesis studying it.

Bottlenose dolphins interact with fisheries all over the world, sometimes pulling fish from nets and lines and greatly angering the human fisherman as a result. But, on the coast of Texas, bottlenose dol-

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photo by Dagmar Fertl

Dolphins can be identified by the individual patterns of their tattered dorsal fins.

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phins follow shrimp boats to get a meal, and they appear not to be bothering the fishermen.

The main reason for the lack of competition between dolphins and shrimpers is their different interest — the fishermen rake the bottom with trawl nets to catch the shrimp, but the dolphins are mainly after the fish unwittingly caught in these nets. These fish compose from 5 to 15 pounds per pound of shrimp. They represent "trash" to the shrimpers and are thrown away. Stomach content analyses of dead dolphins washed up on shore indicate that, indeed, fish are their main staple, with only occasional taking of shrimp and other invertebrates.

Dolphins in open waters of the Gulf of Mexico often follow behind shrimpers in groups of a dozen or more. Inside the channels, groups tend to be smaller, and quite a few lone animals work with the shrimpers as well. About three-quarters of all identifiable dolphins encountered in the Galveston Ship Channel are associated with these shrimp boats during all stages of operation: trawling, raising nets, culling bycatch, and dropping nets.

About 100 dolphins live year-round in the Galveston-Galveston Bay area.

Dolphins most often feed on organisms stirred up by the trawl, but they probably are also picking out fish entangled in the nets or even feeding on fish which pass through the mesh. We assume that the prey are usually dead, injured or at least disoriented, and are therefore easier for the predators to catch than organisms which are healthy and actively avoiding capture. In direct observations of occasional feeding on "trash" fish at the surface, dolphins have been found to prefer some species, for example trout and croaker, over others.

But dolphins do more than feed around shrimp boats. Dolphins often switch boats to join other dolphins, and much social and sexual activity occurs near the boats. Playful leaps and other aerial acrobatics are common.

Dolphins young and old, male and female alike enjoy dining around shrimp boats. What was surprising to us was the frequent occurrence of mother-calf pairs. This sight seems especially strange in an area heavily trafficked by commercial and recreational boats and littered with trash. Why would mothers bring their tender young to such a degraded habitat? It would appear that the opportunity for easier prey draws them, through other factors such as predators and sociality must also be considered. The concentrated food resource that shrimp boats provide may help females meet the increased demands of lactation. Studies of captive dolphins have shown that caloric consumption jumps 129 to 204% during lactation as compared to non-pregnant animals.

Dolphins have come up with many solutions to the problems of feeding with a calf near a potentially dangerous net. Mothers will sometimes take care of each other's calves so that one female may feed unhindered by the responsibility of the calf. Adult and juvenile females are also frequently seen babysitting a calf. This type of care has been described for other species, including scrub jays and coyotes. Evidence indicates that in dolphins, mothering skills are based on learned as well as innate behavioral patterns, and that babysitting provides an opportunity for young females to learn how to be competent mothers.

Calves are frequently observed socializing with one another while their mothers feed, with and without adult supervision. It has been speculated that the calves are learning this foraging behavior by observation and participation. Studies of other marine mammals, such as sea otters and killer whales, have suggested that youngsters develop feeding skills though imitation of the mother's feeding behaviors, not unlike many terrestrial mammals.

Dolphins are attracted to the inshore waters by easy pray.

How do the shrimpers feel about dolphins getting a free lunch? Shrimpers generally agree that seagulls are more annoying than the dolphins. It appears that in Texas, especially around Galveston, the dolphins and shrimpers enjoy a relatively friendly relationship. The shrimpers enjoy watching the dolphins, often recognizing individuals and saying that the dolphins

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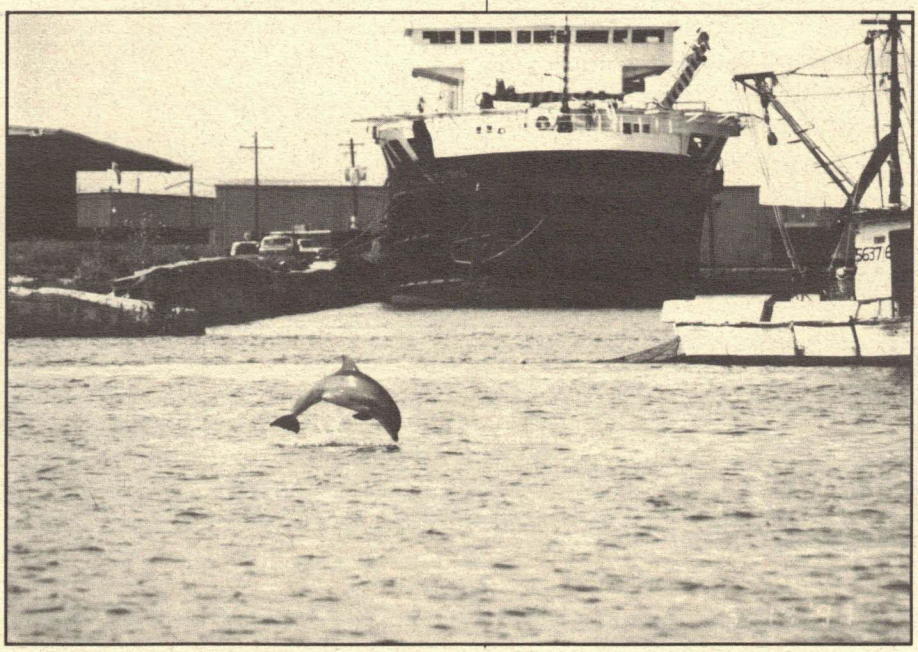

photo by Dagmar Fertl

"Playful leaps and other acrobatics are common."

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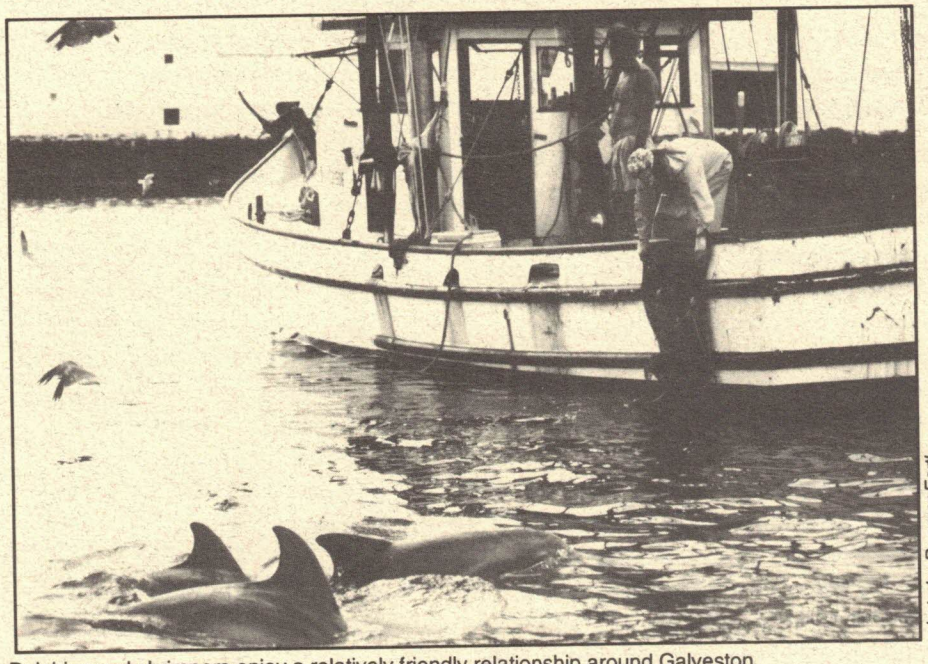

photo by Dagmar Fertl

Dolphins and shrimpers enjoy a relatively friendly relationship around Galveston.

recognize their boats. This is not always the case in other parts of the Gulf coast. Dolphins are sometimes blamed for damaging nets. Some shrimpers contend that dolphins tear nets while taking fish from them, while others are certain that only sharks tear nets and dolphins remove fish gingerly, without causing damage.

The level of entanglement of dolphins in shrimp nets is not known. Shrimpers have indicated that entanglement of animals, usually in the hanging line, occurs infrequently. Galveston dolphins have been observed to play with these lines, sometimes weaving through them, while the nets lie on the water surface. On one occasion, a dolphin was seen enjoying a free ride, hanging on the edge of the net, being towed, while the nets were dragging on the water surface to be cleaned.

We believe that healthy individuals should be able to avoid the nets. A higher percentage of juveniles may be caught. Juveniles are higher risk-takers, and may be unaware of the danger that these nets can represent. Mothers will often place themselves between nets and their calves when the nets are being raised, or will move away from the boat and mill in the vicinity.

There is a potential down-side to this dolphin-shrimper relationship, and we are hoping it is not as strong as presently suspected. The Galveston Bay shoreline is home to a huge array of petro and other chemical industries, and much agricultural runoff. These human activities introduce many toxins into the water and sediment, despite conscientious efforts by many humans to minimize pollution. Dolphins attracted to the inshore waters by easy prey are more subject to building up potentially harmful toxins in their systems than those dolphins which feed more on open-ocean prey.

Recent waves of dolphin deaths in various Texas nearshore areas have yet to be explained, and we are hoping that the very shrimp vessels which appear to be providing largesse to these magnificent marine mammals are not inadvertently luring them to feed on polluted prey.

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Bernd Würsig is Director of the Marine Mammal Research Program of Texas A&M University, and Ms. Fertl's advisor. He is also a Professor in the Departments of Marine Biology (Galveston) and Wildlife & Fisheries Sciences (College Station). His research on social behavior and human interactions of whales and dolphins takes him to many different parts of the world, but the bottlenose dolphins of Texas represent "home."

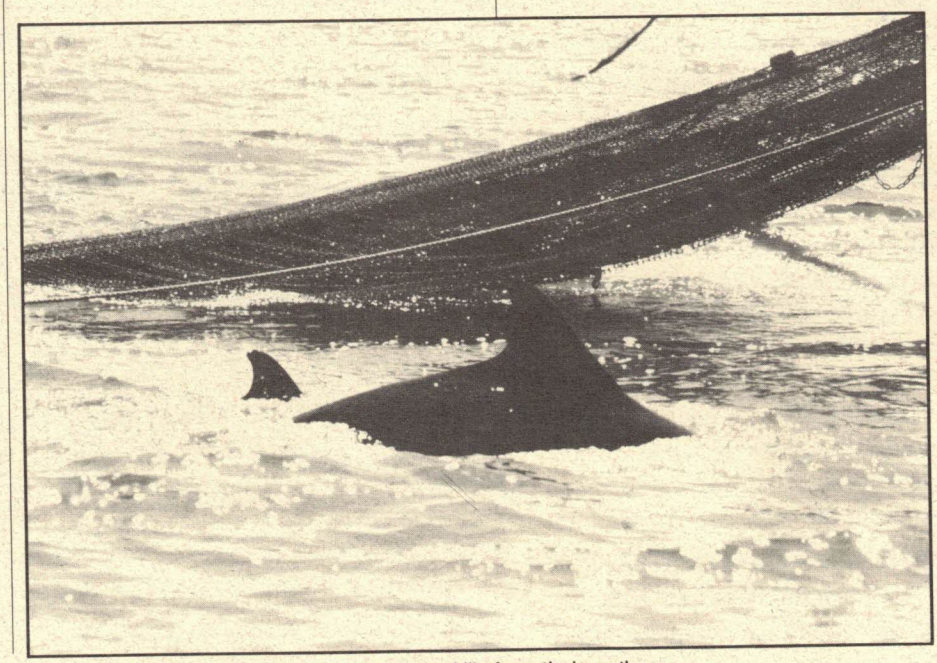

photo by Dagmar Fertl

Young dolphins learn feeding and net safety skills from their mothers.

GALVESTON BAY FOUNDATION

SOUNDINGS

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THE GALVESTON BAY SHORE ENVIRONMENT — WHERE WETLANDS MEET THE WAVES!

by Frederick T. Werner

What are Wetlands?

Wetlands are *wet lands*. They are essentially a feature of the bay shore where there is a gradual rise in the land, and currents or waves are not too severe. Wetland soils are soaked or covered with water for a long enough period of time that they lose all atmospheric oxygen and usually get dark or develop other characteristic "hydric soil" features. The vegetation has adaptions to life in this environment and thus out competes upland plants. Some wetland plants are better at this than others and characterize different degrees of soil saturation or flooding. A few of these plants are also unique in being able to tolerate high salt levels in the soil water. These in turn out compete other wetland plants.

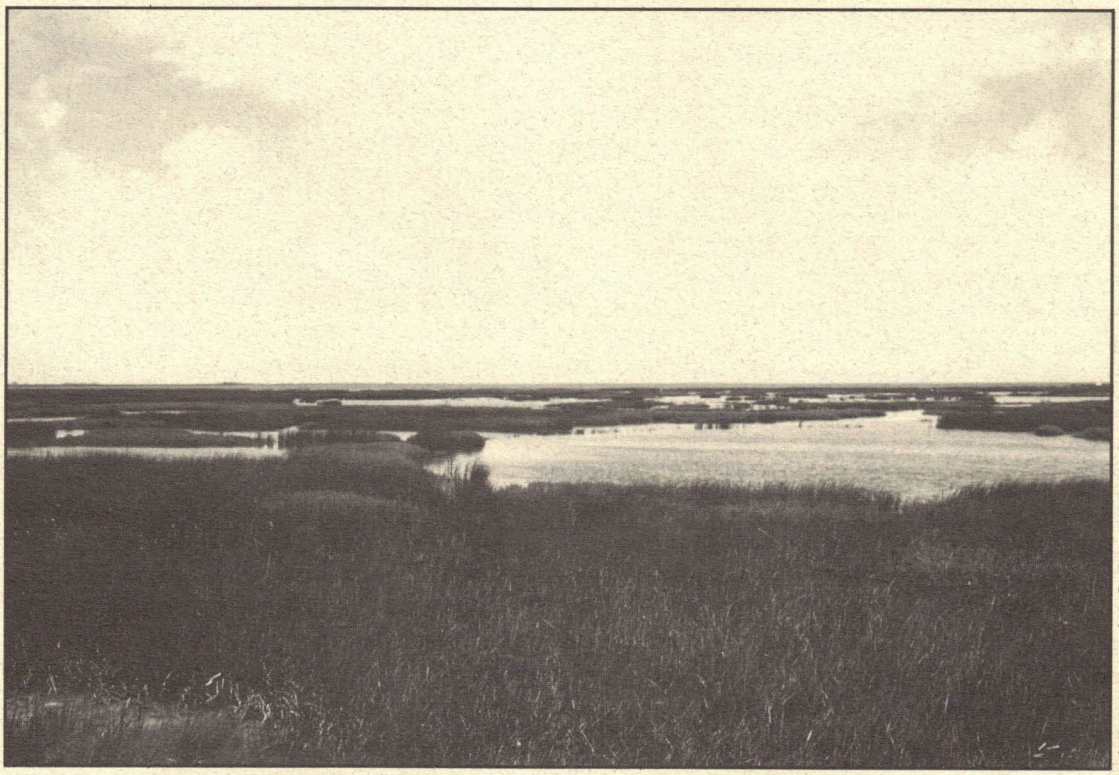

photo courtesy of U. S. Fish & Wildlife Service

Marsh at Jamaica Beach on Galveston Island before filling of wetlands for development.

Wetland plants may be herbs (grasses and leafy plants without woody tissue),

Wetland plants have adaptated to saturated conditions, outcompeting upland plants.

shrubs, or trees. Submerged wetlands—the seagrasses—are found in shallow water at a few secluded areas where the water is usually warm and clear. Emergent wetlands—the marshes—extend from the shore inland as a narrow band of fringing smooth cordgrass (*Spartina alterniflora*) salt marsh or as larger expanses of higher salt, brackish, or fresh marsh. Brackish marshes are normally saltmeadows of marshhay cordgrass (*Spartina patens*) with or without varying amounts of bulrushes (*Scirpus*), shortgrasses and flowering plants. Most forested wetlands are associated with tidally-influenced rivers. They include the swamps in the Trinity River alluvial valley and the riparian forests along coastal streams or in stands covering low lying areas on the coastal prairie.

What Are the Values of these Wetlands?

Wetlands are most valuable in storing excess water, taking excess organic material and nutrients out of low quality water (i.e. wastewater treatment) and incorporating these into plant growth, and meeting habitat requirements of fish and wildlife. The roots stabilize the soil and absorb nutrients. The shoots provide food for

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