

Summary of human disturbance issue relative to colonial nesting waterbirds

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This information is provided as a candid review and assimilation of field observations, discussions with researchers and biologists, and data collected by the Texas Colonial Waterbird Society's annual census. It is not an exhaustive statistical analysis, but I believe the comments and data presented represent a fair assessment of waterbird populations in two bay systems of the Texas coast.

Summary:

- Approximately 25 species of waterbirds depend on rookery islands for reproduction. Many of them nest **ONLY** on these islands. They are known as "colonial" waterbirds due to their habit of nesting in high densities.
- Most waterbird populations in Texas have been declining over the last thirty-five years that data has been consistently collected.
- Disturbance of rookeries causes death of eggs and chicks (from predation and heat stress), and abandonment of colonies. A short and inadvertent disturbance can have severe consequences for the colony.
- Habitat issues are addressed by CBBEP, Audubon, and others, but the disturbance issue can only be effectively mitigated by bay users themselves (by being aware of nesting birds and keeping a comfortable distance), or by law enforcement.

Without the ability to successfully reproduce and feed, waterbird populations will continue to decline. Feeding habitat is essentially provided for by healthy bays and nearshore environments which are the focus of many wide-ranging coastal conservation and restoration efforts. In order to address the essential reproductive component, Coastal Bend Bays & Estuaries Program and Audubon Texas actively manage islands and work with others to address the habitat issues, such as erosion/subsidence, loss of nesting vegetation, fire ants, and mammal predators. Audubon has also had an active warden program for over 80 years on the Texas coast, whose goal is to educate and inform people of the importance of keeping a comfortable distance from nesting waterbirds. Disturbance can have major negative impacts at each stage of the nesting process.

During the pre-nesting and nest-building phases, waterbirds are extremely sensitive. Courtship displays and nest site selection are critical for the establishment of colonies. Disturbance during this phase can cause waterbirds to abandon the island for the nesting season.

During incubation and chick-rearing stages, disturbance may cause losses of eggs and chicks. When incubating adults are induced to leave the nest, eggs and chicks immediately become vulnerable to: predation from grackles (which crack the eggs and sip from them); predation from gulls and other opportunistic predators (which consume eggs and chicks whole); and heat stress which can kill eggs and chicks in a matter of minutes during the heat of the day.

The likelihood of destruction of nesting effort essentially increases exponentially with the duration of disturbance. Extensive and/or repeated disturbance may result in abandonment of the entire colony (a 100% loss of a year's nesting effort). The result of successive years of 0% reproductive success is obvious.

Disturbance and disruption of nesting can occur at a distance from an island. This is especially critical for ground-nesting species such as skimmers and terns, since the bare ground areas they choose

for nesting are typically found near the edges of the islands, they nest in close proximity, and they respond to approach as a group (the entire colony leaves the ground).

The most common occurrences of disturbance are associated with boaters and fishermen (the largest group of bay users). Approach and anchoring of watercraft, wadefishing, castnetting and kitesurfing are examples of activities that cause rookery disturbance. Allowing dogs to run free on islands can decimate a colony.

The problem has been documented throughout the coast, but is probably most acute in Redfish Bay and the Upper Laguna Madre. Major losses and shifts in waterbird colonies in these bays have coincided with exponential increases in the numbers of bay users.

Redfish Bay

In the 1970s Redfish Bay supported several very large waterbird rookeries. By the mid-1980s most of the large colonies such as Danger Island, Ransom Spoil, and the Hog Island Complex had been for the most part abandoned. Dredging activity expanded the size of many islands, and connected some to others making predator management impractical. By this time, most of the remaining birds had moved to smaller islands such as Big Bayou Spoil, and especially the Causeway Island Platforms. There was also a reduction in the amount of feeding area available in the vicinity due to development of coastal lands between Ingleside and Rockport, which may have had some impact on the area's carrying capacity. Since the mid-1980s, the populations of most colonial waterbird species have continued to decline. Some species that were once abundant in the system are now rarely encountered nesting and some are completely absent from the bay. Though the Causeway Island Platforms chain continues to erode, there are some substantial remnants that could support nesting birds, though numbers of occupied sites has been declining rapidly in the last five to ten years. In 2009, the best island in the Causeway Island Platforms chain was abandoned, as was Big Bayou Spoil. Essentially no substantial colonial waterbird colonies persist in the entire bay system.

TCWS data for Redfish Bay are essentially complete since 1973.

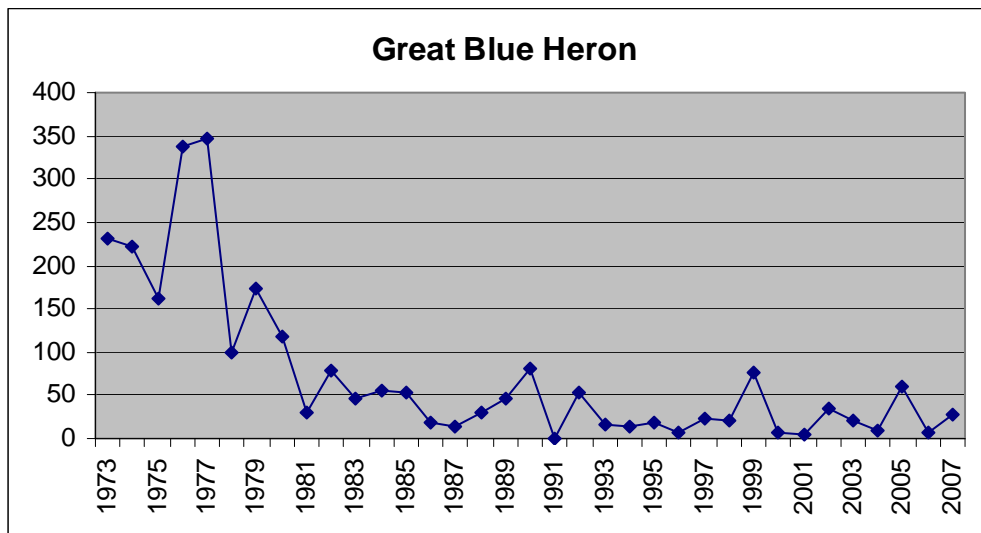


Fig. 1. Great Blue Heron nesting pairs by year in Redfish Bay. After the initial collapse in the 1970s, Great Blue Herons have struggled to find islands with adequate brush for nesting.

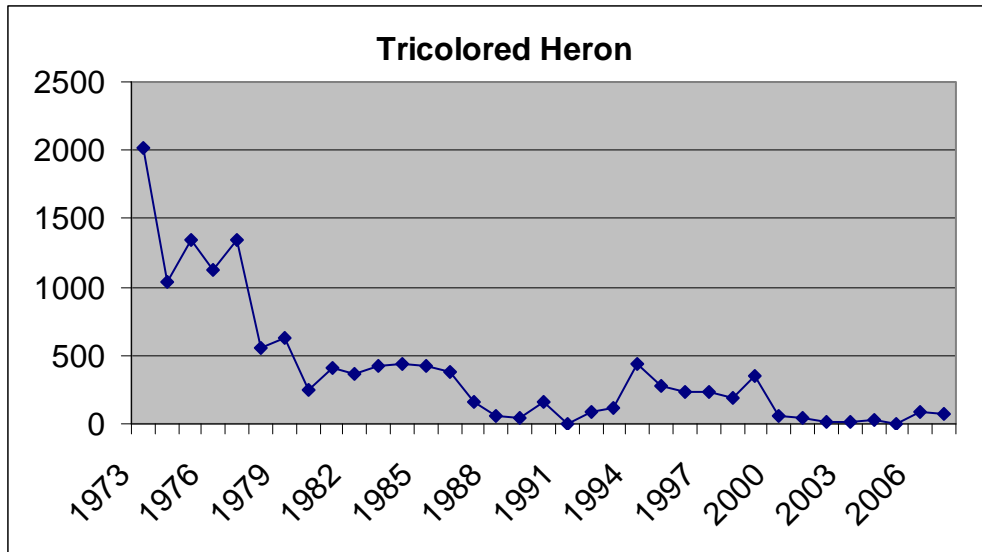


Fig. 2. Tricolored Heron nesting pairs by year in Redfish Bay. Throughout the 1980s and 1990s Tricolored Herons nested on most of the small islets of the Causeway Island Platforms colony. Over time they have abandoned many of these sites.

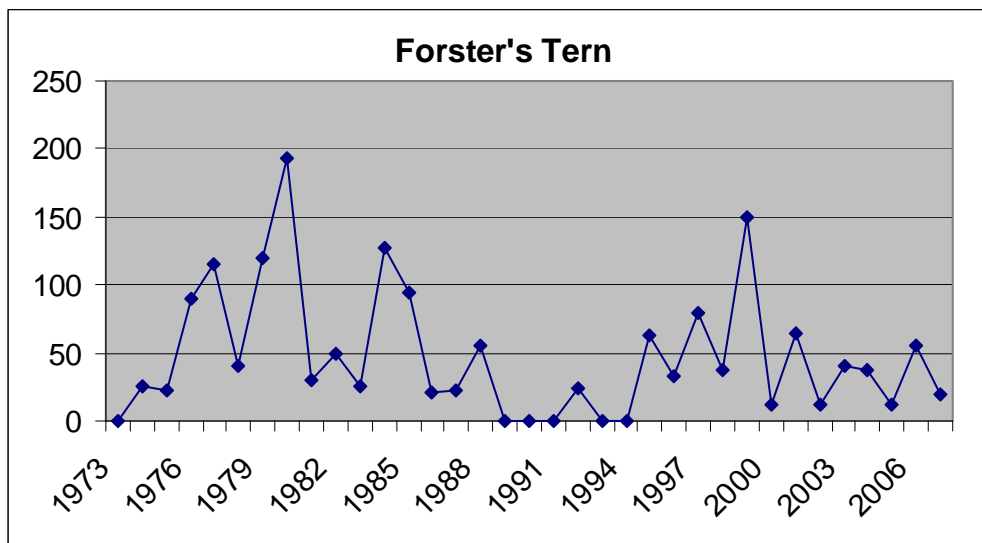


Fig. 3. Forster's Tern nesting pairs by year in Redfish Bay. Forster's Terns nest opportunistically on low vegetation and wrack near the high-tide line, and have moved around according to habitat availability and other pressures. In recent years they have nested on only one relatively isolated islet.

Upper Laguna Madre

For the Upper Laguna Madre, I looked specifically at the colonies in the northern part (north to Corpus Christi Bay, and south to Bird Island). Over the past thirty-eight years for which data is available, 135 islands have been active with nesting colonial waterbirds. As of 2007, 23 have eroded away completely, and 35 more are completely abandoned, probably mainly due to mammal predators. Of the remaining 77 islands that are active, only about 35 have NOT experienced drastic losses in overall numbers and diversity of nesting waterbirds. Forty-two of the 77 active islands are now used exclusively, or almost exclusively, by laughing gulls.

Declines in species diversity of islands are especially apparent in the past ten to fifteen years. Losses have been particularly acute for small wading bird species such as snowy egret, little blue heron, tricolored heron, black-crowned night-heron, roseate spoonbill, white ibis, and ground-nesting birds such as black skimmers. While some species that nest in well-protected areas have fluctuated but remained relatively constant, only Laughing Gulls have increased (more than doubled). To a point, gulls are most likely to benefit from disturbance, since they have come to rely on a diet largely composed of human refuse. Since this is not seasonal as would be the food source of the other waterbirds, they are more likely to reneest after disturbance, and have a greater toleration for human presence in general.

The following graphs show trends from 1996-2007 for several species common to the area. This includes all colonies in the Upper Laguna Madre north of Bird Island. For purposes of these graphs, "colony" equates to presence.

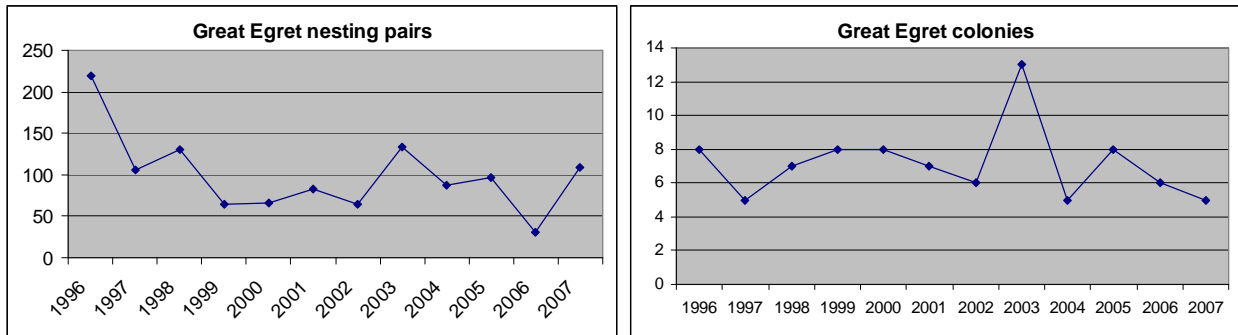


Fig. 4. Great Egret nesting pairs, and number of colonies where present in northern ULM. This species has shown a decrease in abundance, though still present in roughly the same number of colonies.

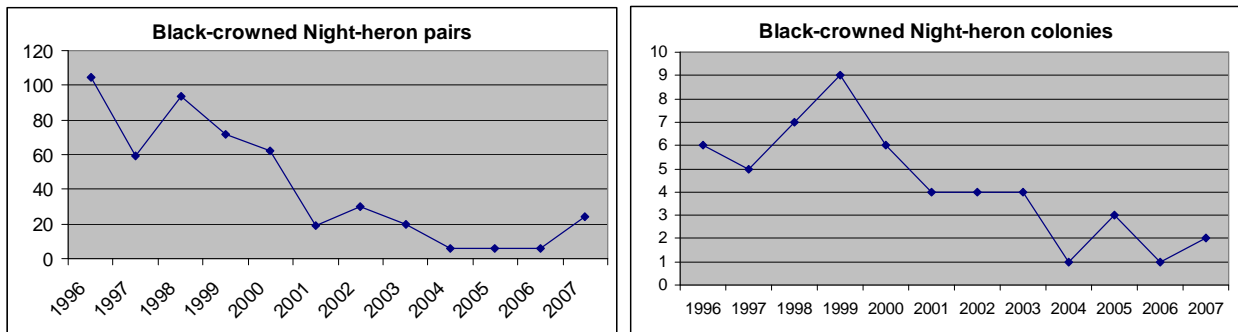


Fig. 5. Black-crowned Night-heron nesting pairs, and number of colonies where present in northern ULM. This secretive species shows declines in both abundance and number of colonies.

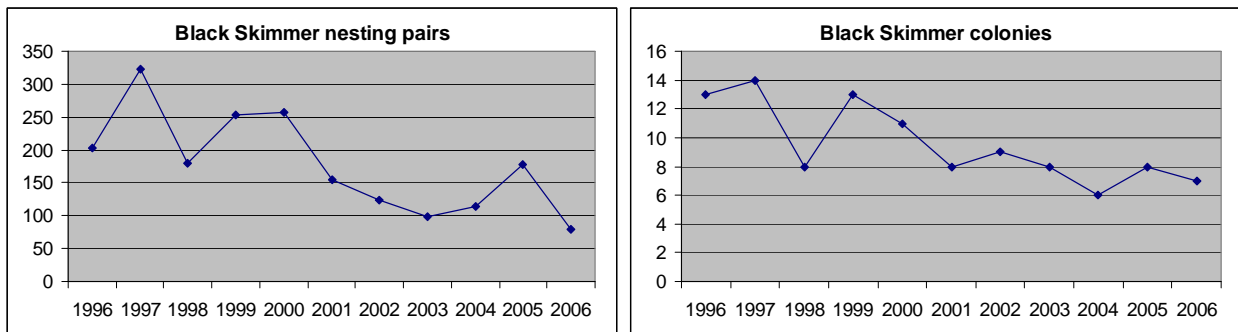


Fig. 6. Black Skimmer nesting pairs, and number of colonies where present in northern ULM. In many colonies, less than ten pairs are present, and surveys indicate that reproductive success (fledged birds) has been extremely low in recent years.

I feel that the dramatic decrease in diversity on many of these islands is related strongly with human disturbance. During almost every field visit in the past two nesting seasons, I have witnessed at least one occurrence of people engaged in activities proximate to rookeries, which were causing an obvious stress on the nesting colony. The problem is most prevalent on the small scattered rookeries which make up the bulk of the rookery areas in the Upper Laguna Madre and Redfish Bay. Short of creation and protection of new islands (very costly engineering projects, in many cases impossible under existing DMMPs), this is where the best potential exists for recovering some of these populations, but this can only be done if nesting birds are protected from human disturbance. Suitable nesting structure still exists on many of those previously diverse islands. This analysis suggests that diversity has plummeted severely on many islands, with most species occurring in approximately half of the total number of colonies they were in ten or fifteen years ago, and in decreased numbers.

Increased human pressure

Disturbance on Texas rookery islands by many types of bay users has been observed. However, data are not systematically collected on activities other than fishing. TPWD’s Angler Effort Estimates based on creel surveys show increases in angler hours in both bay systems over time beginning in the early 1990s and fueled largely by guided fishing trips. These data do not account for a rising number of kayak fishermen and other recreationists that usually launch from points other than surveyed boat ramps.

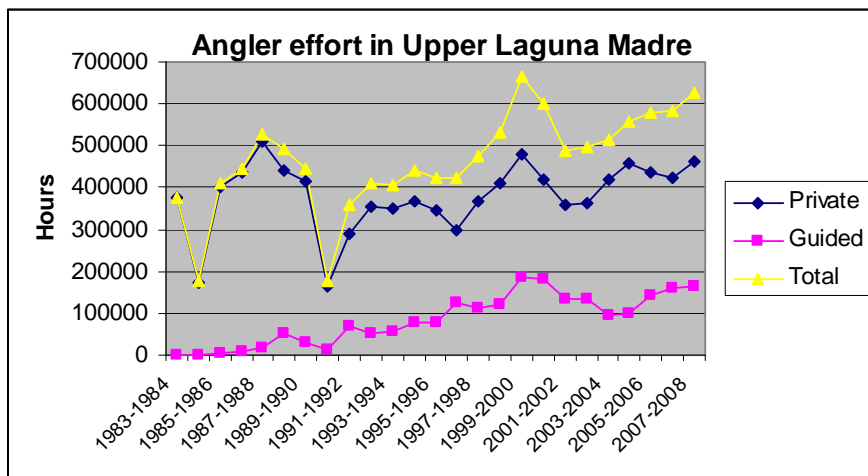


Fig. 7. Estimate of angler effort in Upper Laguna Madre Ecosystem (based on data from TPWD Creel Surveys).

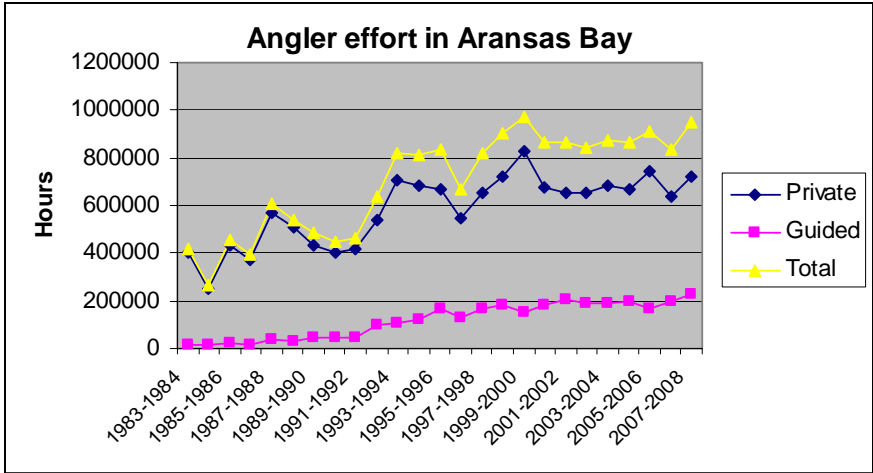


Fig. 8. Estimate of angler effort in Aransas Bay Ecosystem (based on data from TPWD Creel Surveys).

Summary

Declining waterbird species in conjunction with increasing numbers of bay users present a challenge for agencies charged with managing important coastal resources. With that increase in bay users, and no concurrent increase in the number of islands or acres available for nesting waterbirds, this is one of the most critical issues impeding the recovery of colonial nesting waterbirds in coastal Texas. Unrestricted access by the public is likely to continue to degrade waterbird populations and further limit the chances for recovery.

Adequate legal protection for waterbird resources is a critical step in addressing declines, and would provide a firm foundation for recovery.