

FOCUS QUESTION 4:

Are fish and wildlife populations stable, increasing or decreasing?

What was measured: recreationally important species abundance, ecologically important species abundance, commercially important species abundance, colonial waterbird populations



Answer: An overall view of the Coastal Bend area fish populations for spotted seatrout and red drum have an upward trend line due to management of the fisheries by TPWD starting back in the 1980s. Flounder populations have stabilized since TPWD implemented management changes in 1995. In the Coastal Bend region, the trend for Atlantic croaker in TPWD gill net data shows a slight increase in the relative abundance which is also true for the entire Texas coast.

Analysis of data from 1973-2000 show that of 14 bird species in the Coastal Bend, seven showed significant decreases (great blue heron, tricolored heron, reddish egret, snowy egret, black-crowned night-heron, black skimmer, gull-billed tern), while two showed significant increases (American white pelican, brown pelican).

INDICATOR #10: Recreationally important species abundance (red drum, spotted seatrout, southern flounder).

Improving, except for the flounder which is leveling off.

Condition/Trend: Good/Improving

Good



I. BACKGROUND

Catching and eating fish is fun and rewarding, but can also have a negative effect on fish population. Fortunately, fish populations have a remarkable ability to replenish themselves, so that, within limits, they can be harvested on a continuing basis without being eliminated.

Harvest not only affects the number of fish in a population, but also the size and age structure of the population. A lightly harvested population will have a greater number of older fish than one that is heavily harvested. Also, since older fish are bigger than younger fish, a lightly harvested population will have more large fish than one that is heavily harvested.

II. CONCERNS

A fish population can be fished so hard that the number of mature females can be reduced below the level needed to produce enough young to replace the number of fish that are dying - potentially causing a collapse of the population. TPWD has created guidelines for catching fish using size and bag limits. These catch limits are important in order to sustain the number of females needed to produce a healthy group of young individuals for future generations.

Bag and Length Limits for Saltwater Fish

Species	Min. Size Limit	Max. Size Limit	Daily Bag Limit
Black Drum	14"	30"	5
Flounder	14"	NA	5 (two during November)*
Red Drum	20"	28"	3
Sheepshead	15"	NA	5
Spotted Seatrout	15"	NA	10 (no more than one >25")**

* During the month of November, no gigging is allowed for flounder.

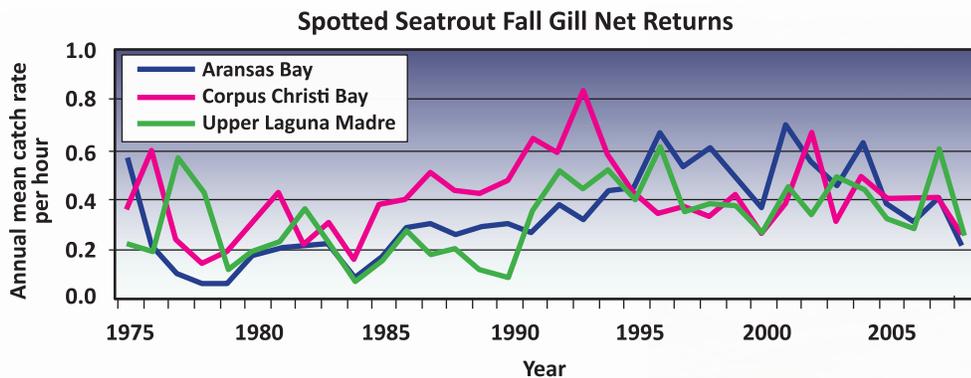
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** For the lower Laguna Madre, the bag limit for spotted seatrout is five.

III. LOCAL LEVELS

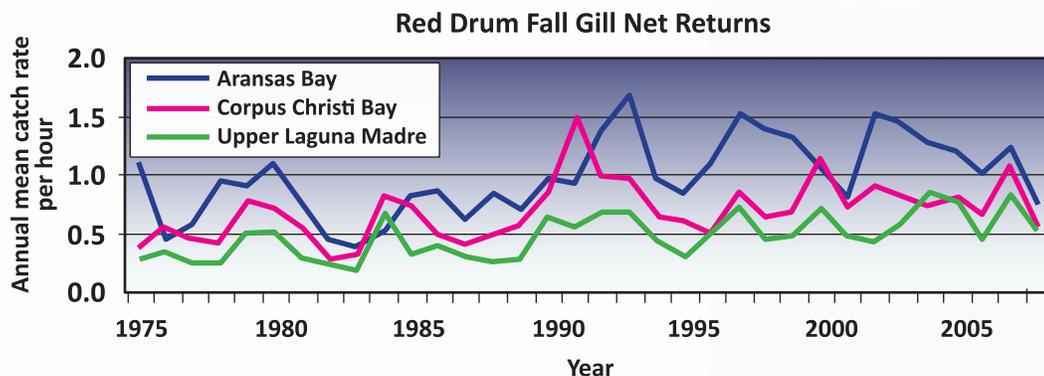
Spotted Seatrout

Spotted seatrout provides a good example of the effect of harvest. Spotted seatrout have a maximum lifespan of 9 years, females grow larger and faster than males, and reach maturity between one and two years of age, which is about a 12-inch fish. Over 6 million spotted seatrout fingerlings are now stocked annually into our bays from fish hatcheries in Corpus Christi and Lake Jackson. All Texas bays are seeing an increase in spotted seatrout populations except for the Lower Laguna Madre, which has seen a steady downward trend since the 1980s due to elevated fishing pressures.



Red Drum

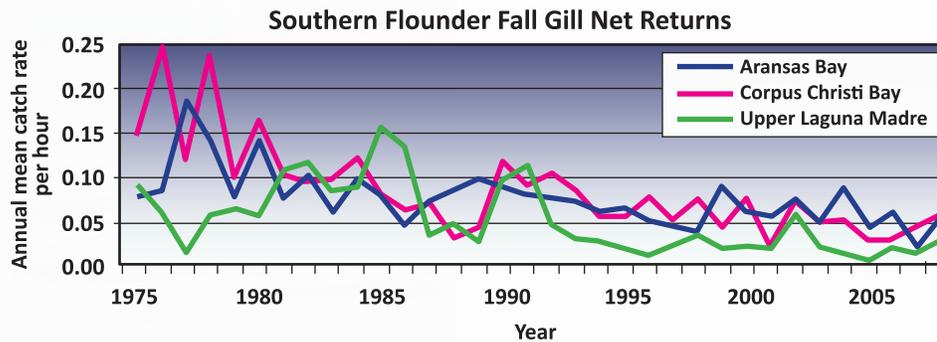
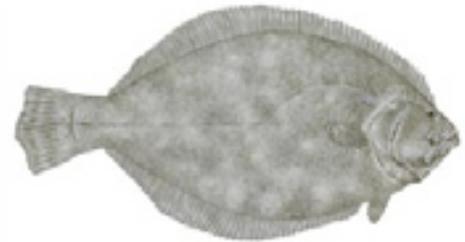
Revered for its power, speed and delectable flavor, red drum have become one of the most popular game fish in Texas marine waters. Many will remember in the late 1970s and early 1980s when red drum all but disappeared from our bays. Management measures were adopted in the late 1980s. In addition to implementing management measures, a stocking program to enhance the wild population of red drum was established. The fishery has recovered to arguably one of the best in the nation. For Corpus Christi Bay, the 2007 red drum annual catch rate was the highest observed since record highs recorded in 1991 and 2000.



Flounder

Southern flounder is one of the top three fish targeted by anglers in Texas bays. Flounder populations have decreased since the late 1970s measured by the catch per hour of flounder collected in TPWD gill net surveys. In order to try to counter declines in the flounder population, TPWD has implemented a number of management changes, including flounder size and bag limits. Flounder populations have stabilized since these changes. While this is a good indication that flounder populations might be improving, TPWD will continue to assess flounder status.

Overall views of the Coastal Bend area fish populations for spotted seatrout and red drum have an upward trend line due to management of the fisheries by TPWD since the 1980s. Flounder populations have stabilized since TPWD implemented management changes in 1995. It is hoped that flounder populations will soon begin an upward trend to follow the other successful sport fish.



Checking Gill Nets

IV. REFERENCES

- Martinez-Andrade, F. and P. Campbell. 2009. Trends in Relative Abundance and Size of Selected Finfishes and Shellfishes along the Texas Coast: November 1975-December 2008. In Prep. Texas Parks & Wildlife Department, Coastal Fisheries Division, Austin, Texas.
- McKinney, L. 2007. Spotted Seatrout in the Lower Laguna Madre: A Regional Approach to Restoring a World Class Fishery. Texas Parks and Wildlife. <http://www.tpwd.state.tx.us/fishboat/fish/didyouknow/troutinllm1.phtml>
- Texas Parks & Wildlife Department. 2009. Spotted Seatrout. <http://www.tpwd.state.tx.us/huntwild/wild/species/strout/>
- Williams, L. 2007. Flounder Fishing in Texas. Texas Parks and Wildlife <http://www.tpwd.state.tx.us/fishboat/fish/didyouknow/flounderfishing.phtml>

INDICATOR #11: Ecologically important species (anchovy and Atlantic croaker abundance). Condition/Trend: Good/Improving

Good



I. BACKGROUND

Anchovy and croaker are not typical game fish but they do play a very important role in whether the more common game fish, like red drum and spotted seatrout, will be plentiful and healthy in the coming years. These lower food chain fish are good indicators of estuary pollution stress and form an important trophic link in the Coastal Bend waters. For example, the bay anchovy consumes zooplankton and small invertebrates and, in turn, is prey base for several species of fish including the spotted seatrout.



The croaker is also an important food source for some of the major sports fish. Both spotted seatrout and red drum feed on the croaker at some point in their life cycle and depend on the fish for a source of nutrients to survive.

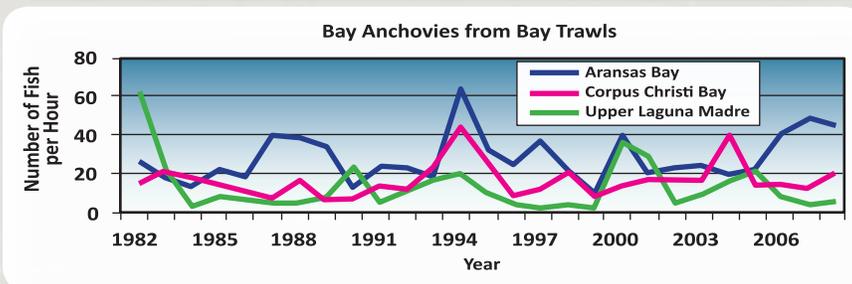
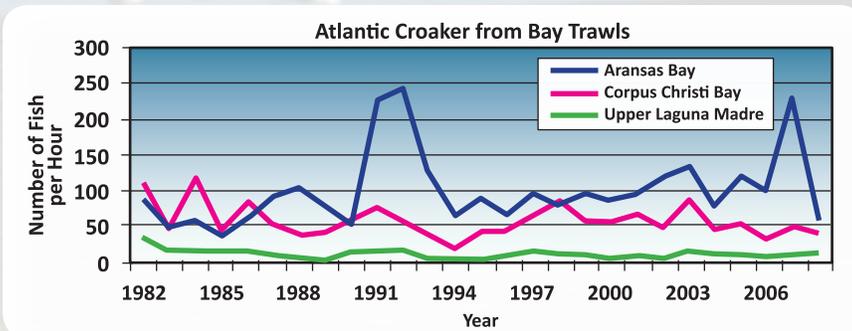
TPWD gathers information and data on these fish species since they are indicators of how healthy the bays and estuaries might be in terms of game fish. Without the food source on the lower end of the chain, the larger recreationally important fish would have little to eat.

II. CONCERNS

Historically, the unintentional capture (bycatch) of juvenile croaker in shrimp nets was a concern. During 1995 and 1996, TPWD instituted a “limited entry” and “buy back” of commercial shrimp licenses program which relieved this concern. Over fishing is a potential problem for Atlantic croaker stocks. At this time, there are no conclusive stock assessment data to suggest the species is over fished in Texas. Because the species remains very common in coastal waters and it matures at a relatively small size, there appear to be adequate numbers able to reproduce to sustain the local stocks.

III. LOCAL LEVELS

Atlantic croaker abundance in Texas bays has almost doubled since 1994, and 2007 marked a record high catch in TPWD bay trawls. In the Coastal Bend region, the trend for Atlantic croaker in TPWD gill net data shows a slight increase in the relative abundance, which is also true for the entire Texas coast. For Corpus Christi Bay, the 2008 bay anchovy catch rate in TPWD bay trawls was higher than that of 2007. Overall Coastal Bend data for bay anchovies show a slight increase in TPWD bay trawls.



IV. REFERENCES

- Martinez-Andrade, F. and P. Campbell. 2009. Trends in Relative Abundance and Size of Selected Finfishes and Shellfishes along the Texas Coast: November 1975-December 2008. In Prep. Texas Parks & Wildlife Department, Coastal Fisheries Division, Austin, Texas.
- Texas Parks and Wildlife Department. May 2008. Donations, Angler Dollars Help Achieve Shrimp Buyback Goals. <http://www.tpwd.state.tx.us/newsmedia/releases/?req=20080523a>
- Texas Parks & Wildlife Dept. 2009. Unpublished data.

INDICATOR #12: Commercially important species abundance (brown shrimp, blue crab). Condition/Trend: Good/Decreasing

Improvement Needed



I. BACKGROUND

Many different species of shrimp are found in Texas coastal waters but the two most important commercially are the brown shrimp (*Penaeus aztecus*) and white shrimp (*Penaeus setiferus*). These two species are members of the family Penaeidae. The blue crab (*Callinectes sapidus*) is also a commercially important decapod found in Texas waters.

Texas Coastal Bend residents have always relied on the shrimp and crab bounty coming from the local bays and estuaries. Twenty-six million pounds of shrimp are annually harvested.

Adult shrimp migrate offshore to spawn. A female may lay between one half to one million eggs at a single spawning. Upon hatching, the larvae are totally reliant upon favorable currents to transport them to inshore waters. Once they move into brackish waters, the post larvae become part of the benthic community. Young shrimp remain in the estuary until they approach maturity when they migrate offshore, and the cycle is repeated.



Whooping Crane

The blue crab is the most commercially important crab species in Texas. The crabs are sold live to processors (who boil, pick, and can the meat), to fish houses, and to supermarkets for sale over the counter. Generally, production has been highest in the bays that receive the most fresh water and lowest in those that receive the least. In the blue crab life cycle, the female migrates to the saltier portions of the lower bays and Gulf, while the male remains in the estuary.

The Texas Parks and Wildlife Commission is charged with specifying opening and closing dates of shrimp and crab seasons. The TPWD records landings of crab and shrimp populations.

II. CONCERNS

Over fishing and loss of habitat are the biggest challenges for the Coastal Bend shrimp populations. Bottom trawling and other fishing activities that involve direct contact between fishing gear and the bottom environment in the bays, estuaries, and Gulf of Mexico can alter the structural character and function of shrimp habitats. In Texas waters, bottom trawling for shrimp is the dominant fishing activity. This method of fishing disrupts the habitat by scraping the substrate to depths of a few inches.

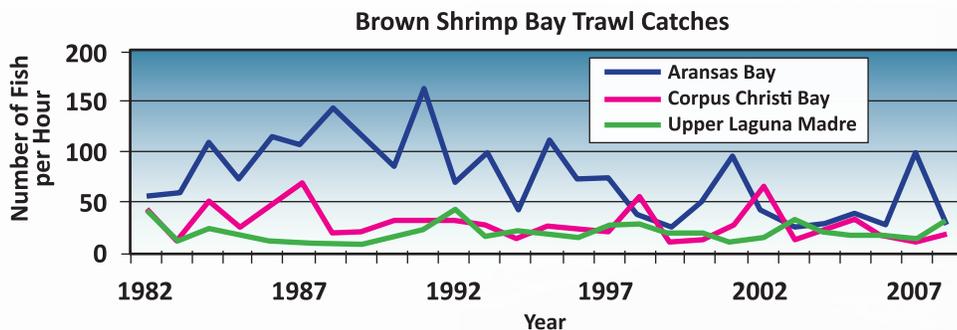
The recruitment, or number of juvenile crabs, is often dependent upon rainfall, both the quantity and the timing. Concerns about habitat loss are also key with this fishery. Marshes, seagrass meadows and muddy soft bottoms are critical habitat for juvenile blue crabs and are necessary for them to reach maturity. The loss of critical habitat for small crabs increases mortality from predation. Over harvesting is another concern.

Blue crab is also an important food source for the local whooping crane population. The lack of rainfall in 2009 reduced the freshwater inflows into the coastal marshes and bays, raising the salinity levels and threatening wildlife. The low water levels have decreased the number of blue crabs which has resulted in a decline in the whooping crane population.

III. LOCAL LEVELS

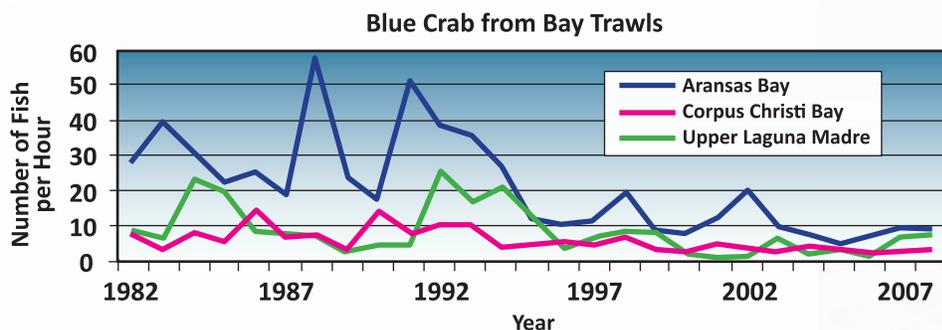
Shrimp

As technology improved and fishing pressure on shrimp increased over the last 75 years, TPWD has enacted more stringent regulations. Commercial shrimping is now restricted from certain “nursery” bays. There are regulations on the mesh and size of trawls, the time of day, and the allowable daily catch. Bay trawl catches for brown shrimp appear to be stable for the Corpus Christi Bay and the Upper Laguna Madre.



Blue Crab

Commercial landings of blue crabs in Texas are the lowest since 1969. With Limited Entry for crabbing established in 1998 (first license buyback in 2000), the number of crabbers has decreased 40% from 381 (1997) to 224 (2004). Since that time the number of pounds landed per crabber appears to have stabilized. The TPWD Coastal Bend region bay trawl catch rates trend for blue crabs, which has mirrored the commercial landings, had been declining, but indicates some stabilization since 1998. Only 3.1 million pounds were landed in 2005, an amount well below the historic average of 6.3 million and nowhere near the 11.9 million pounds landed in 1987. These landings generate around \$12 million annually for coastal economies: when landings decline not only do the crabbers suffer, but so do their communities.



IV. REFERENCES

- Martinez-Andrade. F. and P. Campbell. 2009. Trends in Relative Abundance and Size of Selected Finfishes and Shellfishes along the Texas Coast: November 1975 – December 2008. In Prep. Texas Parks and Wildlife Department, Coastal Fisheries, Austin, Texas.
- National Marine Fisheries Service. 2009. Brown Shrimp. http://www.nmfs.noaa.gov/fishwatch/species/brown_shrimp.htm
- Sutton, G. 2007. Fewer Crabs – Fewer Fish. <http://www.tpwd.state.tx.us/fishboat/fish/didyouknow/bluecrabdecline.phtml>
- Sutton, G. and T. Wagner. 2007. Stock Assessment of Blue Crab in Texas Coastal Waters. Texas Parks and Wildlife Department, Coastal Fisheries Division, Austin, Texas.
- Texas Parks and Wildlife Department. September 2002. The Texas Shrimp Industry: Executive Summary. http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_rp_v3400_857.pdf

INDICATOR #13: Colonial water bird nesting pairs.

Condition/Trend: Poor/Degrading

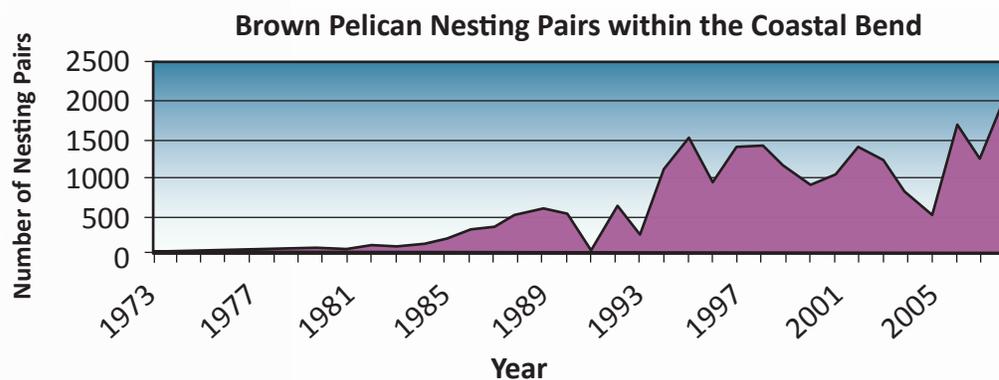
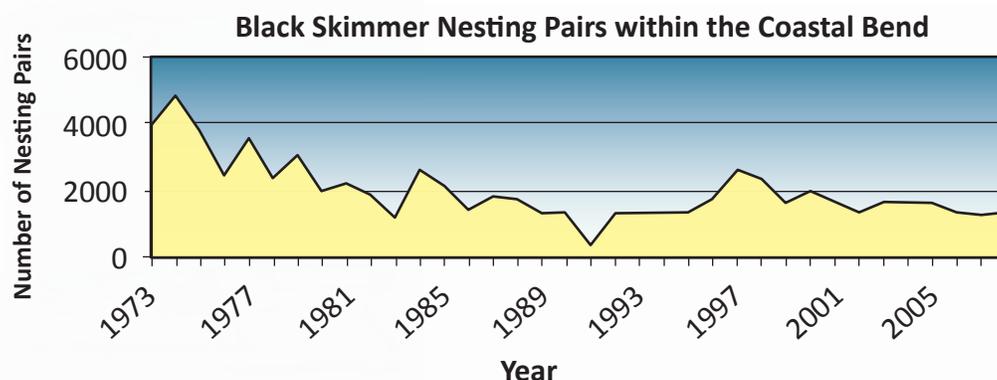
Improvement
Needed



I. BACKGROUND

Colonial waterbird populations are key environmental indicators of estuary health and productivity. They represent the top of the food chain and reflect the system's overall health. Additionally, communities along the Texas coast enjoy economic benefit from the increasing popularity of birding ecotourism.

The Coastal Bend area provides a relatively productive and diverse range of aquatic habitats favored by waterbird species. These include riparian fringes, riverine deltas and high marshes, cordgrass marshes, seagrass beds, wind-tidal flats, calm shallow waters and open bay waters. More than 20 species of migratory colonial waterbirds currently nest on islands between the mainland and barrier islands of the Texas Coastal Bend, and in various nearshore freshwater environments.



II. CONCERNS

Waterbird populations were decimated prior to the early 1900s, mainly for the plume trade. Some species suffered nearly to the point of extinction. Since then, populations have been struggling to rebound. Further coastal development and other human impacts have limited their ability to recover to pre-settlement abundance.

Current challenges to waterbird recovery include habitat loss – both of nesting and feeding areas -- proliferation of human-subsidized predatory mammals such as raccoons and coyotes, spread of the imported red fire ant, invasion of non-native trees and shrubs, increased human disturbance, pollution, scarcity of adequate nesting substrate, erosion and subsidence.

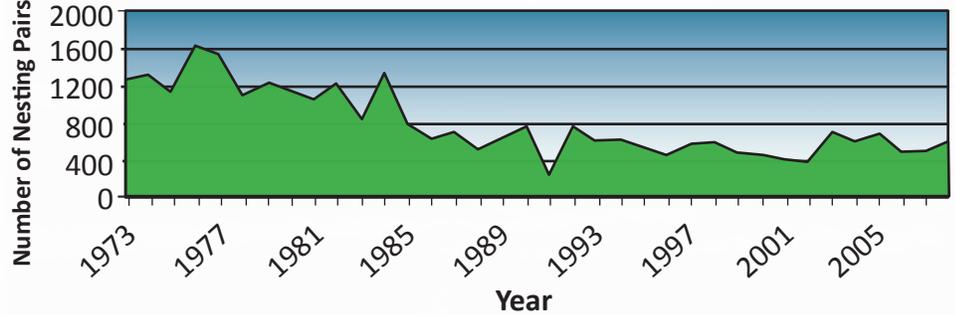
III. LOCAL LEVELS

The effort to obtain accurate estimates of nesting waterbird populations began in earnest in 1973 with the Texas Colonial Waterbird Survey, which continues today. This has provided a long-term database, which is helpful in determining trends at the state level, and the effects of specific management actions at the individual island level.

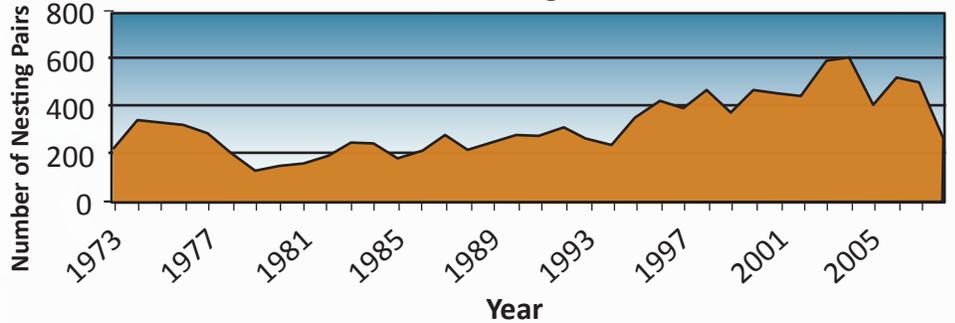
Analysis of data from 1973-2008 show that of 14 species for which the Coastal Bend hosts at least 25% of the state's coastal population, seven showed significant decreases (great blue heron, great egret, tricolored heron, snowy egret, black-crowned night-heron, black skimmer, gull-billed tern), while three showed significant increases (American white pelican, brown pelican, laughing gull). However, more recent short-term data shows that in the past 5 to 10 years, some of these trends may be reversing for some species.

It is thought that suitable nesting habitat is the most limiting factor for most of the waterbird species in the area. Increased and focused management efforts have been underway to improve that habitat over the past 5 to 10 years by US Fish & Wildlife Service, Texas Parks & Wildlife Department, Coastal Bend Bays & Estuaries Program, Audubon Texas, The Nature Conservancy, and local academic institutions.

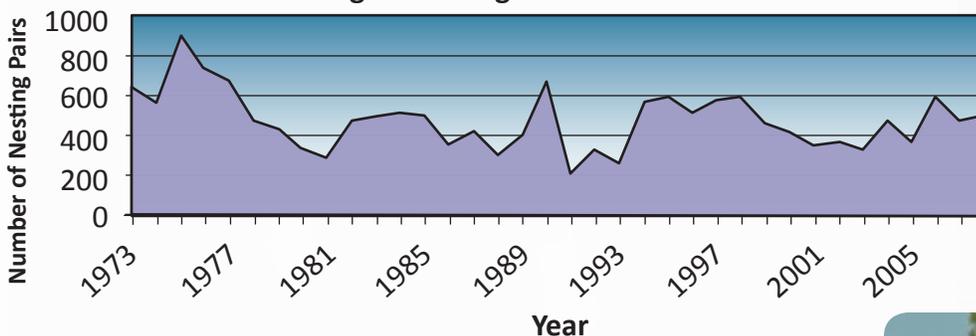
Great Blue Heron Nesting Pairs within the Coastal Bend



American White Pelican Nesting Pairs within the Coastal Bend



Reddish Egret Nesting Pairs within the Coastal Bend



IV. REFERENCES

- Lee Elliott, The Nature Conservancy of Texas.
- US Fish and Wildlife Service. 2009. Texas Colonial Waterbird Census. <http://www.fws.gov/texascoastalprogram/TCWC.htm>