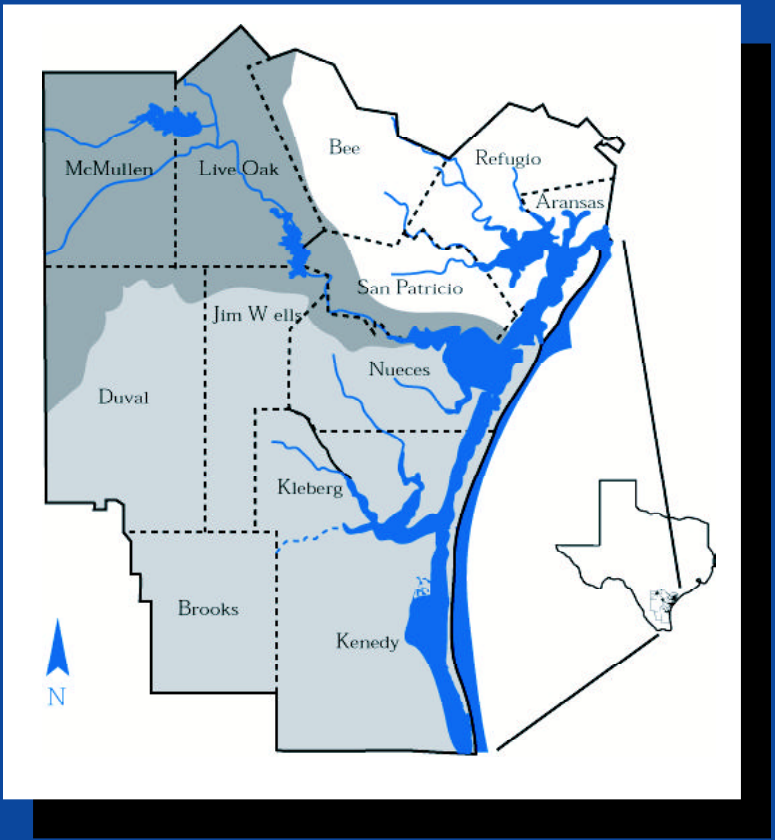
Current Status and Historical Trends of the Estuarine Living Resources within the Corpus Christi Bay National Estuary Program Study Area

Volume 2 of 4
Current Status and Historical Trends of Avian Resources in the CCBNEP Study Area



Corpus Christi Bay National Estuary Program
CCBNEP-06B • January 1996

This project has been funded in part by the United States Environmental Protection Agency under assistance agreement #CE-9963-01-2 to the Texas Natural Resource Conservation Commission. The contents of this document do not necessarily represent the views of the United States Environmental Protection Agency or the Texas Natural Resource Conservation Commission, nor do the contents of this document necessarily constitute the views or policy of the Corpus Christi Bay National Estuary Program Management Conference or its members. The information presented is intended to provide background information, including the professional opinion of the authors, for the Management Conference deliberations while drafting official policy in the Comprehensive Conservation and Management Plan (CCMP). The mention of trade names or commercial products does not in any way constitute an endorsement or recommendation for use.

Volume 2

Current Status and Historical Trends of Avian Resources in the Corpus Christi Bay National Estuary Program Study Area

(IV.C.3 Avian Resources)

by

Allan H. Chaney, Gene W. Blacklock, and Sharon G. Bartels
Ecoservices, Inc.
1208 W. Richard
Kingsville, Texas 78363

subcontract for

Current Status and Historical Trends of Estuarine Living Resources of the Corpus Christi Bay National Estuary Program Study Area

January 1996

Policy Committee

Commissioner John Baker
Policy Committee Chair
Texas Natural Resource Conservation Commission

Ms. Jane Saginaw
Policy Committee Vice-Chair
Regional Administrator, EPA Region 6

Mr. Ray Allen
Coastal Citizen

Commissioner John Clymer
Texas Parks and Wildlife Department

The Honorable Vilma Luna
Texas Representative

Commissioner Garry Mauro
Texas General Land Office

The Honorable Josephine Miller
County Judge, San Patricio County

Mr. Bernard Paulson
Coastal Citizen

The Honorable Mary Rhodes
Mayor, City of Corpus Christi

The Honorable Carlos Truan
Texas Senator

Management Committee

Mr. Dean Robbins, Co-Chair

Mr. William H. Hathaway, Co-Chair

Local Governments Advisory Committee

Mr. James Dodson, Chair

Commissioner Gordon Porter, Vice-Chair

Scientific/Technical Advisory Committee

Dr. Terry Whitledge, Chair

Dr. Wes Tunnell, Vice-Chair

Citizens Advisory Committee

Mr. William Goldston, Co-Chair

Mr. John Hendricks, Co-Chair

Financial Planning Advisory Committee

Dr. Joe Moseley, Chair

Program Director

Mr. Richard Volk

TAMU-CC • Campus Box 290 • 6300 Ocean Drive • Corpus Christi, TX 78412 • 512/985-6767 • FAX 512/985-6301

CCBNEP home page: //www.sci.tamucc.edu/ccbnep

Barry R. McBee, *Chairman*
R. B. Ralph Marquez, *Commissioner*
John M. Baker, *Commissioner*

Dan Pearson, *Executive Director*

Authorization for use or reproduction of any original material contained in this publication, i.e., not obtained from other sources, is freely granted. The Commission would appreciate acknowledgment.

Published and distributed
by the
Texas Natural Resource Conservation Commission
Post Office Box 13087
Austin, Texas 78711-3087

The TNRCC is an equal opportunity/affirmative action employer. The agency does not allow discrimination on the basis of race, color, religion, national origin, sex, disability, age, sexual orientation or veteran status. In compliance with the Americans with Disabilities Act, this document may be requested in alternate formats by contacting the TNRCC at (512) 239-0010, Fax 239-0055 or 1-800-RELAY-TX (TDD), or by writing P.O. Box 13087, Austin, TX 78711- 3087.

CORPUS CHRISTI BAY NATIONAL ESTUARY PROGRAM

The Corpus Christi Bay National Estuary Program (CCBNEP) is a four-year, community based effort to identify the problems facing the bays and estuaries of the Coastal Bend, and to develop a long-range, Comprehensive Conservation and Management Plan. The Program's fundamental purpose is to protect, restore, or enhance the quality of water, sediments, and living resources found within the 600 square mile estuarine portion of the study area.

The Coastal Bend bay system is one of 28 estuaries that have been designated as an **Estuary of National Significance** under a program established by the United States Congress through the Water Quality Act of 1987. This bay system was so designated in 1992 because of its benefits to Texas and the nation. For example:

- Corpus Christi Bay is the gateway to the nation's sixth largest port, and home to the third largest refinery and petrochemical complex. The Port generates over $1 billion of revenue for related businesses, more than $60 million in state and local taxes, and more than 31,000 jobs for Coastal Bend residents.
- The bays and estuaries are famous for their recreational and commercial fisheries production. A study by Texas Agricultural Experiment Station in 1987 found that these industries, along with other recreational activities, contributed nearly $760 million to the local economy, with a statewide impact of $1.3 billion, that year.
- Of the approximately 100 estuaries around the nation, the Coastal Bend ranks fourth in agricultural acreage. Row crops -- cotton, sorghum, and corn -- and livestock generated $480 million in 1994 with a statewide economic impact of $1.6 billion.
- There are over 2600 documented species of plants and animals in the Coastal Bend, including several species that are classified as endangered or threatened. Over 400 bird species live in or pass through the region every year, making the Coastal Bend one of the premier bird watching spots in the world.

The CCBNEP is gathering new and historical data to understand environmental status and trends in the bay ecosystem, determine sources of pollution, causes of habitat declines and risks to human health, and to identify specific management actions to be implemented over the course of several years. The 'priority issues' under investigation include:

- altered freshwater inflow
- declines in living resources
- loss of wetlands and other habitats
- bay debris
- degradation of water quality
- altered estuarine circulation
- selected public health issues

The **COASTAL BEND BAYS PLAN** that will result from these efforts will be the beginning of a well-coordinated and goal-directed future for this regional resource.

STUDY AREA DESCRIPTION

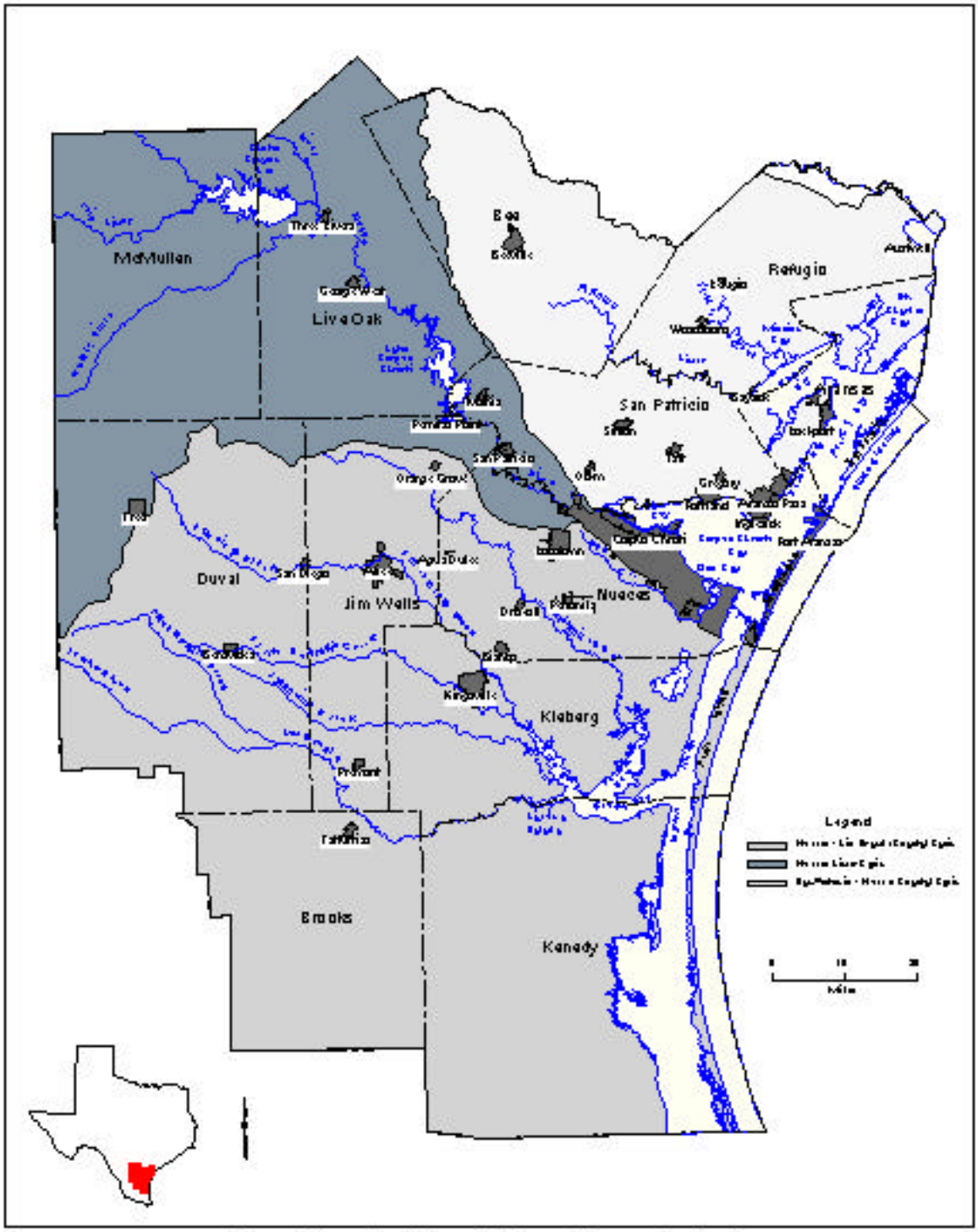
The CCBNEP study area includes three of the seven major estuary systems of the Texas Gulf Coast. These estuaries, the Aransas, Corpus Christi, and Upper Laguna Madre are shallow and biologically productive. Although connected, the estuaries are biogeographically distinct and increase in salinity from north to south. The Laguna Madre is unusual in being only one of three hypersaline lagoon systems in the world. The study area is bounded on its eastern edge by a series of barrier islands, including the world's longest -- Padre Island.

Recognizing that successful management of coastal waters requires an ecosystems approach and careful consideration of all sources of pollutants, the CCBNEP study area includes the 12 counties of the Coastal Bend: Refugio, Aransas, Nueces, San Patricio, Kleberg, Kenedy, Bee, Live Oak, McMullen, Duval, Jim Wells, and Brooks.

This region is part of the Gulf Coast and South Texas Plain, which are characterized by gently sloping plains. Soils are generally clay to sandy loams. There are three major rivers (Aransas, Mission, and Nueces), few natural lakes, and two reservoirs (Lake Corpus Christi and Choke Canyon Reservoir) in the region. The natural vegetation is a mixture of coastal prairie and mesquite chaparral savanna. Land use is largely devoted to rangeland (61%), with cropland and pastureland (27%) and other mixed uses (12%).

The region is semi-arid with a subtropical climate (average annual rainfall varies from 25 to 38 inches, and is highly variable from year to year). Summers are hot and humid, while winters are generally mild with occasional freezes. Hurricanes and tropical storms periodically affect the region.

On the following page is a regional map showing the three bay systems that comprise the CCBNEP study area.



Corpus Christi Bay National Estuary Program Study Area

This page intentionally left blank.

PREFACE

The Center for Coastal Studies was fortunate to gain the expertise of Ecoservices, Inc. for determining the status and trends of avian resources within the Corpus Christi Bay National Estuary Program study area. As one of only two groups of organisms, birds and fish, that met the strict criteria for trends analysis, we knew that experts in the field should perform the necessary studies. With over 70 combined years of local avian experience, Ecoservice's Dr. Allan Chaney, Genen Blacklock, and Sharon Bartels were the only choice. Their commitment to this project, as with all their projects, was thorough and complete. We gratefully acknowledge their participation in the living resources project.

John W. Tunnell, Jr.
January 1996

Table of Contents

TABLE OF CONTENTS

I. Introduction

A. History

The Coastal Bend of Texas has long been a mecca for birds, and for those who wish to eat them, use their feathers for decorations, study them, admire their beauty, add them to their life list, collect their eggs, or hunt them for sport or commercial sales. Paleo-American man was probably the first human to make use of the birds of the Coastal Bend, using them for food and their feathers as fletching for their short spears equipped with chert dart points and cast with their atlatl. However, there is no evidence that Paleo-American man ventured this far into south Texas. Nomadic tribes making up the Texas Archaic culture left their style of dart points as evidence of their existence in the area beginning around 7,000 YBP (years before present). The historical record begins with Cabeza de Vaca and his life among the Coahuiltecan and Karankawa Indian tribes of coastal and south Texas (Newcomb, 1984). De Vaca kept a journal that describes his experiences as a captive, trader, and medicine man during his eight years (1528-36) of living with various groups of Native Americans. He related that few living creatures were overlooked as food: mussels, oysters, turtles, porpoises, a variety of fish, ducks, other birds and their eggs, as well as a variety of plants and their fruits (Newcomb, 1984).

Very little information concerning Texas birds was recorded until after the Civil War, when plume hunters and early explorers, who ventured into Texas to collect birds, their feathers, and eggs, listed the species they encountered on trips from Houston to Brownsville. Frequently, Corpus Christi was a major stopping places. Some of these early explorers and historians were H. E. Dresser, Charles W. Beckham, George B. Sennett, J. L. Hancock, S. N. Rhoads, and Frank M. Chapman. Dresser (1865), on a trip from Brownsville to Victoria, writes; “I found lots of ... White-winged and Carolina-Doves (*Melopelia leucoptera* and *Zenaidura carolinensis*), a few Curlews (*Numenius longirostris*) and Bartram’s Sandpiper or Field-Plover (*Actiturus bartramius*); so we did not starve. I found the Field-Plover very common and excellent eating; indeed we did not willingly eat anything else so long as we could get them. The Buff-breasts (*Tringa rufescens*) were common, and also proved good eating; only they were too small.”

Sennett (1879) described the birds on South Bird Island in the Laguna Madre: “... on March 27, thirty or forty White Pelicans lifted from the point farthest from us, soon followed by a hundred or more Brown Pelicans, ... while great numbers of Herons were standing and flying about and above the island in every direction. The glass brought to view great numbers of Gulls and Terns on the shores, and heads and necks of Herons stretching up from every bush on the island.” He found nests of Reddish Egrets everywhere around the low cactus in the center of the island. “Great numbers” of Laughing Gulls, Caspian, Gull-billed and Forster’s Terns occupied the northern end of the island.

Chapman (1891) found the marshes of Nueces Bay with its numerous small ponds to be “excellent resorts for many species of water and marsh birds”. He found birds to be abundant both in species and individuals, and of the 190 odd species observed, at least 85 were common. He did lament the fact that the demand for birds for millinery purposes had sadly thinned the ranks of many species of water birds, especially terns and egrets.

By the turn of the century James J. Carroll (1900) had developed a list of birds inhabiting Refugio County and W. W. Cooke (1904, 1905, 1910) was concerned with the migration of birds along the coast of Texas as opposed to a route that crossed the Gulf of Mexico. In 1925 Ludlow Griscom described the coastal prairies of southern Texas as "an ornithological paradise".

However, it was Connie Hagar (Rockport, Texas) who really brought national attention to the area by writing letters to ornithologists describing the riot of color and number of species that passed through her yard every spring. She was not believed until she forced them to visit her and see for themselves. The area is now recognized as a migration route for many avian species that breed in the more northern latitudes and an excellent location to watch and study a great variety of birds.

The number of species and individuals that live in, or pass through the area is enormous. To date, 494 species have been reported in or over the six counties included in this report. However, 38 others that have been reported have not been verified for one reason or another. The scientific and common name of these 532 birds are given in the following checklist. There are several reasons for this large number of reported species: 1) the variety of available habitats and diverse food supply; 2) a good stopover point for rest and rejuvenation during migration; 3) a place for nesting, removed from predators and disturbance; 4) a haven for pelagic species during storms at sea; 5) a place for more southern species to relocate because of loss of habitat in Mexico due to their "Green Revolution"; 6) an area for western species to extend their range during favorable weather conditions; and, 7) new breeding grounds for northern species who seek a warmer climate in which to rear their young.

B. Economic Value

Economic experts agree that, in the near future, tourism may be the largest industry in Texas (State Task Force on Texas Nature Tourism, 1995). Today, it is a $23 billion business and is the third largest industry in Texas. Nature tourism is the aspect of this industry that includes those travelers who spend their time and money enjoying a wide range of outdoor activities. Hunting is one of the traditional mainstays of nature tourism, however, Texas, in recent years, has become the premier bird watching destination in the US. Therefore, bird hunting and watching are important dollar resources for Texas and the Coastal Bend.

Game Species - A report in a recent *Field and Stream* magazine placed Texas first in the nation in retail spending for hunting of all game species, $1.07 billion. In 1991, 1,059,600 hunters spent $282,938,300; 178,900 were hunting Wild Turkey, 205,200 were hunting quail, 470,500 were hunting migratory birds and 411,900 were hunting dove. (USFWS and US Dept. of Commerce, 1993). Hunting expenditures generated $474.5 million in salaries and wages, 23,370 jobs and $104.9 million in state and federal taxes in 1991 (State Task Force on Texas Nature Tourism, 1995).

Although there is abundant information on the economic impact of the coastal fisheries, publications dealing with the economy of bird hunting in the Coastal Bend are lacking. Guthery (1986) stated quail hunting provided a $7 million boost to the economy of Falfurrias in Brooks

County which joins Kenedy and Kleberg county to the west. The cost for a seasonal hunting lease can vary from $0.50/acre to $6.50/acre; the cost of one bird in the bag can vary from $14.12 to $19.41; and the cost of one hour of hunting from $20.58 to $30.88. These costs can probably be applied to any of the following species that are hunted each year as game birds and commonly are killed in the six counties included in this study: Greater White-fronted Goose, Snow Goose, Canada Goose, Wood Duck, Green-winged Teal, Mottled Duck, Mallard, Northern Pintail, Blue-winged Teal, Cinnamon Teal, Northern Shoveler, Gadwall, American Wigeon, Canvasback, Redhead, Ring-necked Duck, Lesser Scaup, Bufflehead, Ruddy Duck, Wild Turkey, Northern Bobwhite, Scaled Quail, Common Snipe, and Mourning Dove.

Nongame or Nonconsumptive Species -Nonconsumptive recreational uses of wildlife have, in recent years, changed the course of wildlife management and have brought about increases in funding and research on nongame animals. The importance of these nongame animals have been revealed through the investigations of Kellert (1980), Shaw and Mangun (1984), Thomas and Adams (1989), and Wiedner and Kerlinger (1990). Shaw and Mangun (1984) reported that songbirds, squirrels, and chipmunks were the most popular types of observable wildlife. They estimated that equipment and materials expenditures (e.g., field guides, binoculars, bird seed) used only for nongame species exceeded $600 million. In 1974, DeGraaf and Payne (1975) estimated that $500 million was spent in the US on nonconsumptive wildlife, much of it associated with bird-watching.

"Birding" is probably the most important nonconsumptive wildlife-related activity. Kellert (1980) reported that approximately 25% of US adults are birdwatchers. Wiedner and Kerlinger (1990) estimated approximately 61 million birdwatchers in the US spent 20 billion dollars as of 1980. The average birder surveyed spent $1,852 per year on birdwatching. Wauer (1991) reported the results of a survey of members of the American Birding Association (ABA), 1485 or 44% responded. In 1989, these birders spent a total of 5 billion dollars. Birding trips accounted for $3,374/birder or a total of $3,731,196. They also participated in about 1,000 guided bird trips to various parts of the world during 1989.

Just up the Texas coast from the Coastal Bend, Eubanks et al. (1993) reported about 6,000 birdwatchers visited High Island during a six-week period in spring 1992 spending $2.5 million on lodging and other travel-related activities. The total impact was between $4 and $6 million. There are similar sites in the Coastal Bend where these same birds can be observed during their spring migration. Publicity is needed!

Between 75,000-100,000 tourists visit the Aransas National Wildlife Refuge (ANWR) and the Rockport-Fulton area each year to see Whooping Cranes and vast flocks of migratory waterfowl during winter and neotropical migrants in spring. According to the Rockport Chamber of Commerce, the Hummingbird Celebration, inaugurated in 1989, attracted over 4,000 visitors who spent over $1 million in 1994. The event was just as in 1995.

In addition to the importance of birds for their aesthetic value and as game species, they are important to the area as controllers of arthropod pests, primarily insects. One needs to look only at the following to understand this value: 1) the hordes of colorful migrating warblers and vireos

that glean every bush and tree for caterpillars and adult insects; 2) various flycatchers, Loggerhead Shrikes, American Kestrels flying to and from their perches catching flying insects; 3) Cattle Egrets following livestock and catching whatever is disturbed; 4) Black Terns and Laughing Gulls flying over grain fields catching adult insects as they hatch and fly away; 5) Laughing Gulls, Ring-billed Gulls, and Cattle Egrets following farmers plowing to eat insect larvae and other arthropods exposed in furrows; 6) "gangs" of meadowlarks working open grasslands for insects; 7) swallows during daylight and nighthawks during twilight scooping mosquitoes, gnats, flies, and termites from the air as they fly over open areas; 8) groups of White-tailed Hawks catching grasshoppers from thermals caused by annual burning of grasslands by ranchers; 9) Piping Plover and other shorebirds catching flies in the air or probing for their larvae on mudflats; and, 10) multitudes of grackles feeding on insects in lawns, fields, and feedlots.

II. Area Surveyed

Birds have access to all of bay and estuary systems encompassed in the CCBNEP study area. Therefore, they cannot be treated in the same fashion as more sedentary organisms. The species listed in the habitats that follow have been reported from the counties that border the Mission/Aransas Estuary, Nueces Estuary, and the Baffin Bay - upper Laguna Madre System. Those counties are: Aransas, Kenedy, Kleberg, Nueces, Refugio, and San Patricio.

A. Habitats and/or Communities

Many of the habitats have been described, previously, but are further broken down here to fit them to the needs and locations of the birds. Some species are restricted to, or prefer certain habitats over others.

Inshore Gulf Waters (IGW) - This community includes those waters of the Gulf of Mexico that border barrier island beaches within the CCBNEP study area. The area is more or less restricted to that portion of the Gulf visible, with the naked eye, from the beach. It is devoid of vegetation except during periods when sargassum (*Sargassum* spp.) is washed ashore. Within this area, migrating species are readily visible and Brown Pelicans and various terns can be seen diving for their food. (*Scientific and common names of all Coastal Bend birds can be found in the species checklist, Table 1)*

Gulf Beach (GB) - The dynamic area of barrier islands marking the transition between land and sea is included in this very diverse and changing community. The shore or beach encompasses the region from the zone of wave impact (swash zone) to the foredune ridge and may be divided into three ecological regions: the foreshore, berm, and backshore (Chapman, 1984). The foreshore includes the area from the swash zone to the high tide drift line. Willet, Black-bellied Plover, Red Knot, and Sanderling among others feed in this zone. Gulls, terns and cormorants rest here between excursions into the IGW to feed. The berm includes the area above the foreshore that is dry on the surface and damp below. It is usually littered with debris deposited during storm tides. Ruddy Turnstone, Snowy Plover, and Wilson's Plover can be found sorting through the debris of the berm. The backshore is usually the drier portion of the beach extending

from the berm to the foredune ridge. This area may contain railroad vine (*Ipomea pes-caprae*) and sea oats (*Uniola paniculata*). It is used by a variety of species for loafing or as a retreat from high tides, strong winds, or storms.

Dunes (D) - Both sand and clay dunes are included in this category. The former are composed of sand sediments from the Gulf, carried by prevailing winds and formed into small to large hillocks. These dunes are found on the barrier island or in some locations on the mainland. Sea oats, bitter panicum (*Panicum amarum*), seacoast bluestem (*Schizachyrium scoparium* var. *littoralis*), beach evening primrose (*Oenothera drummondii*), Gulfdune grass (*Paspalum monostachyum*) and gulf tea (*Croton punctatus*) are commonly found on the sand dunes (Britton and Morton, 1989). Many falcons and hawks can be found perched on these dunes. Clay dunes are usually found inland associated with sand and mudflats. They are formed by wind-blown clay particles in a similar fashion to sand dunes. The vegetation is usually thorn-scrub, inhabited by resident bird species such as Cardinals, Northern Mockingbirds, White-eyed Vireos, and Long-billed Thrashers.

Prairies (P) - Four distinct prairie communities exist in the Coastal Bend each exemplified by dominant grasses: (1) cordgrass prairie with Gulf cordgrass (*Spartina spartinae*) and marshhay cordgrass (*Spartina patens*); (2) sand mid-grass prairie with seacoast bluestem and panamerican balsalmscale (*Elyonurus tripsacoides)*; (3) clay mid-grass prairie with little bluestem (*Schizachyrium scoparium*) and trichloris (*Chloris pluriflora*); and, (4) short-grass prairie with silver bluestem (*Bothriochloa saccharoides*), buffalograss (*Buchloe dactyloides*), and trichloris as dominants. Often, clumps of mesquite (*Prosopis glandulosa*), oak (*Quercus* sp.), huisache (*Acacia farnesiana*), and prickly pear (*Opuntia lindheimeri*) may be found in any or all of these communities (McLendon, 1991). Birds commonly found are Upland Sandpiper, Dickcissel, Buff-breasted Sandpiper, Northern Bobwhite, Greater Prairie-Chicken, meadowlarks, and various sparrows and hawks.

Oak Mottes (M) - Isolated groves of live oaks (*Quercus virginiana*) are remnants of an oak forest that once occurred on sand sheets and barrier islands. Today they are found in patches within the sand mid-grass prairie or savannas. The understory is poorly developed, but may consist of little bluestem, Yaupon (*Ilex vomitoria*), beautyberry (*Callicarpa americana*), greenbriar (*Smilax* sp.) mustang grape (*Vitis mustangensis*), muscadine (*Vitis rotundifolia*). These coastal mottes are especially important as a landfall site for forest-related neotropical migrating birds and a retreat for doves, cuckoos and pauraques.

Flats (F) - This term refers to sand, mud, and algal flat areas on western sides of barrier islands and the eastern margin of the mainland. Included are washover channels on barrier islands. Vegetation is sparse, consisting of patches of glasswort (*Salicornia* spp.), saltwort (*Batis maritima*), and marginal vegetation such as Gulf cordgrass, sea oxeye daisy (*Borrichia frutescens*), camphor daisy (*Haplopappus phyllocephala*), and camphor weed (*Heterotheca subaxillaris*). This area is very important to most migrating shorebirds such as Dunlin, Western Sandpiper, Least Sandpiper, Snowy Plover, and Piping Plover.

Salt Marsh (MS) - This community is found adjacent to the waters of bays and estuaries, at margins of flats, or around the edges of some islands. It is an ecosystem of waterlogged saline soil with emergent grasses and herbaceous plants. The primary grass is Gulf cordgrass and the herbaceous plants are those listed above as forming the border for flats. Numbers of marine associated birds use this habitat for feeding and loafing, such as ducks and geese, Clapper Rail, American Bittern and Seaside Sparrow.

Fresh Water Marsh (MF) - This is not a common community in the Coastal Bend, but is important to many wildlife species because of the availability of non-saline water. It is found in rain-filled depressions or around ponds on barrier islands and mainland. As for the salt marsh, the soil is waterlogged, but with tall dense emergent plants such as cattail (*Typha* spp.) and bulrush (*Scirpus* spp.). Least Bittern, Red-winged Blackbird, Common Moorhen, American Coot, various waterfowl, Marsh Wren and Common Yellowthroat frequent this community.

Bays and Estuaries (BE) - The open bays and areas where rivers and streams enter bays constitute this community. Only swimming birds are able to use the deeper waters of this ecosystem. The vegetation that occurs here is discussed in the following habitat. This ecosystem is an important concentration, staging, and feeding area for pelicans cormorants, loons, and ducks.

Seagrass Beds (SG) - There are five species of sea grasses that constitute the variously scattered beds within the CCBNEP study area. They are: (1) manatee grass (*Syringodium filiforme*); (2) wigeongrass (*Ruppia maritima*); (3)shoalgrass (*Halodule wrightii*); (4) clover grass (*Halophila engelmannii*); (5) turtlegrass (*Thalassia testudinum*). These grasses provide shelter and food for a multitude of fishes and invertebrate organisms that are fed upon by pelicans, cormorants, herons, egrets, terns, ducks, and grebes.

Bay Islands (BI) - Natural and dredged spoil islands that are located throughout the bays and the Laguna Madre form an ideal haven and nesting ground for many species of gulls, herons, egrets, terns, pelicans, spoonbills, ibis, and ducks. They are all in varying stages of succession and support similar vegetation. Shores are usually covered with the same plants listed for flats. The higher ground may support a variety of bushes and trees, e.g., mesquite, salt cedar (*Tamarix* spp.), popinac (*Leucaena leucocephala*), granjeno (*Celtis laevigata*), and oleander (*Oleander* spp.).

Rivers (R) - Rivers, creeks and streams that flow into estuaries of the Coastal Bend include the Nueces River, Aransas River, Mission River, and Los Olmos Creek. The waters of these streams are important for nutrients, silt load, and freshwater that they bring to the bay systems. The Nueces is the largest, but its contribution of fresh water is controlled by releases from Lake Corpus Christi. The others add little except during flood periods. Streams are not as important to birds as the riparian woods associated with them .

Lakes (L) - With the exception of Laguna Larga, a few impoundments, and some oxbow lakes, there are no large bodies of water that fit this category. The study area does not include Lake Corpus Christi that supplies water to much of the area. Birds that use these large water areas are

mostly ducks and geese, coots, moorhens, Anhinga, Little Blue Heron, Snowy Egret, and Cattle Egret.

Ponds (P) - This category includes all ponds both fresh, brackish, and salt. Each may have its own unique surrounding vegetation surrounding, but freshwater ponds contain the greatest variety of submerged vegetation. Many ponds are either precipitation or windmill-dependent. Any type of pond may supply food, a resting place, or water for a variety of birds, often the same species as those that inhabit lakes. Birds using this habitat are not particular about the type of pond they frequent.

Fresh Ponds (POF) - Freshwater ponds have been separated from the above to indicate the preference of certain birds this habitat. These ponds are basins or low swales that permanently or intermittently contain non-saline waters. Water sources include rain runoff, artesian springs, windmill overflow water, or the water table when it is near the surface. Surrounding vegetation will vary according to location. The dominant and indicator species is cattail (*Typha* spp.). Certain species of bulrush (*Scirpus* spp.) and reed grass (*Arundo donax*) may be found around pond margins. Submergent or emergent vegetation of various species may be present. Some birds that specifically prefer this habitat include Least Grebe, Neotropic Cormorant, Anhinga, Green Heron, Yellow-crowned Night-heron, Blue-winged Teal, Masked Duck, Sora, Common Moorhen, American Coot, Solitary Sandpiper, and Pectoral Sandpiper.

Riparian Woodlands (RW) - This is a community of tall trees with a dense to sparse understory found along rivers and streams. Since there are few streams, very little of this community is present. Common trees are: anaqua (*Ehretia anacua*), cedar elm (*Ulmus crassifolia*), live oak, sugar hackberry (*Celtis laevigata*), net-leaf hackberry (*Celtis reticulata*), Mexican ash (*Fraxinus berlandieriana*), and black willow (*Salix nigra*). The understory is most often dwarf palmetto (*Sabal minor*). Despite their small areal extent, riparian woodlands are important stopovers during migration for hawks (especially Broadwing Hawk), warblers, vireos, flycatchers, and many other neotropical species.

Oak Woodlands (OW) -

These strips of dense stands of live oak are found along the mainland coast and extend into the interior along bands of light sandy soil. The vegetation is similar to that of the oak mottes and the understory may contain a variety of grasses. The birds that prefer this habitat include those listed under oak mottes and Wild Turkey, Tufted Titmouse, woodpeckers, and Green Jay.

Thorn Scrub (TS) - This is a brush community found in the xeric areas of the Coastal Bend. The vegetation is low and dense and occurs on a variety of soil types, even saline. Components of the community are: mesquite, granjeno, guajillo (*Acacia berlandieri*), prickly pear, colima (*Zanthoxylum fagara*), white brush (*Aloysia lyciodes*), blackbrush (*Acacia rigidula*), wolfberry (*Lycium berlandieri*), brasil (*Condalia hookeri*), Texas persimmon (*Diospyros texana*), and lotebush (*Ziziphus obtusifolia*). Important understory species include agarito (*Berberis trifoliolata*), guayacan (*Porlieria angustifolia*), tasajillo (*Opuntia leptocaulis*), and various grasses (McLendon, 1991). Birds frequenting this community include Pyrrhuloxia, Curve-billed

Thrasher, White-eyed Vireo, Verdin. Ash-throated Flycatcher, Bewick's Wren, and Northern Mockingbird.

Savannah (SA) - These are wide open lands containing a variety of grasses, many of the same species as those found in prairies. The overstory plants, primarily mesquite or huisache in the damper areas, vary from scattered individuals to small stands. Common understory plants are Gulf cordgrass, prickly pear, silver bluestem, and little bluestem. Many savannas are man-made through clearing native vegetation and introduction of non-native grasses and herbs. Scissortail Flycatcher, Loggerhead Shrike, Northern Bobwhite, White-tailed Hawk, Savannah Sparrows, Eastern Bluebird, and meadowlarks are commonly found in this habitat.

Arable Lands (AL) - These are fields, cleared and plowed crop production. During some years, various fields are allowed to remain dormant and will develop weeds and short grasses. The common crops are corn, sorghum, and cotton. When fields lie fallow during winter are they are used as feeding and loafing grounds for a variety of birds: geese, ducks, Sandhill Crane, Killdeer, Mountain Plover, Laughing Gull, Cattle Egret, and several sparrow species. When fields are being tilled for planting, Laughing Gulls, Ring-billed Gulls, and Cattle Egrets are commonly seen following plows and feeding on exposed organisms. Just prior to and shortly after harvesting sorghum, Laughing Gulls, Gull-billed Terns, and Black Terns may be seen aerially feeding over the fields.

Urban (U) - This habitat includes lawns, trees and lots within city limits of towns in the six counties of the CCBNEP study area. Found within this community are a variety of native and foreign species of trees, bushes, herbs, and grasses. Various components are used for a variety of purposes by both resident and migrating birds. Food material is abundant although not always of high quality; found in feeders as grain or sugar water, under streetlights where insects congregate, in sewage ponds where submerged vegetation grows profusely, or among the limbs and leaves of trees where caterpillars develop into adults. Protected nesting sites are available beneath eaves of houses or in shrubs and trees. A sample of common birds found in this setting include Cave and Barn swallows, White-winged Dove, Rock Dove, Inca Dove, Great-tailed Grackle, Purple Martin, Eastern Screech Owl, House Sparrow and many neotropical migrants.

III. Methods

Analysis of Avian resources within the CCBNEP study area involved two major projects, checklist preparation and trend analyses while addressing the four following objectives:

(1) Determine the species of birds, their habitats, relative abundance and seasonal occurrence in those counties considered for this portion of the CCBNEP Study. Include in a checklist this information and the authors responsible for the information about each species;

(2) Identify and examine available data sets and select those which have sufficient data for trend analysis;

(3) Analyze selected data sets to determine current status and population trends for each species of interest; and,

(4) Initiate an investigation of probable causes for described trends.

A. Checklist Preparation

Exhaustive literature searches of international, national and regional journals, as well as books, theses, dissertations and technical reports were conducted to produce the most complete list of birds to date for the study area. From these references, the seasonal presence of a species was recorded as well as its habitats, distribution, and relative abundance.

B. Time Series and Trend Analysis

The time series has four components: Trend, Season, Cycle, and Irregular (Dilworth, 1979). For this project the Trend component was estimated using data from standard bird surveys. The Season component was eliminated since most bird surveys are designed to be conducted at the same season each year, i. e., breeding, wintering, or migrating. The Cycle component is weather-related; rainfall amounts in the area are known to follow multi-year cycles of "wet" or "dry". The Irregular component is also weather-related. Examples could include heavy rainfall during or immediately before the count day, or freezing conditions on or before count day. For this initial investigation of population trends, the Cycle and Irregular components are not included.

C. Identifying Data Sets

There are many North American bird monitoring programs that have been shown to accurately reflect trends in avian populations (Sauer and Droege, 1990). These programs include Breeding Bird Surveys, Breeding Bird Atlases, Breeding Bird Censuses, Nesting Bald Eagle Counts, Colonial Waterbird Surveys, Bird Banding Records, Christmas Bird Counts, North American Nest Records Program, International Shorebird Surveys, Hawk Migration Surveys, Winter Bird Population Studies, Mid-winter Waterfowl Surveys, Mid-winter Waterfowl Transect Reports, International Migratory Bird Day Records, Lunar Migration Counts, and Radar Migration Counts.

Most of these surveys were immediately eliminated from consideration either because participation levels by observers in this area were too low, number of years of data collection was too short, or data acquisition was too labor-intensive. A detailed explanation for excluding specific surveys follows:

(1) Breeding Bird Surveys - only two routes in the CCBNEP area, both at some distance from the coast, one has only sporadic coverage;

(2) Breeding Bird Atlas - field records do not record numbers of individuals, only their presence and presumed breeding status. The Texas atlas is not yet published, data were requested but not received;

(3) Breeding Bird Census - none exists for this area;

(4) Nesting Bald Eagle Counts - no records for the area, although Bald Eagles are present in adjacent counties and could be considered in future analysis;

(5) Bird Banding Records - only one year of data from spring migration at Padre Island exists. A second year of data was being collected concurrently with this project;

(6) North American Nest Records Program - Since these records are not amenable to the kind of analysis presented here, the presence of records for this area was not investigated;

(7) International Shorebird Surveys - no records for the area;

(8) Hawk Migration Surveys - Data are available, but because these species are not using the bay resources directly, they were a low priority for the project. Future analysis could include these data;

(9) Winter Bird Population Studies - no records exist for the study area;

(10) Mid-winter Waterfowl and Mid-winter Waterfowl Transect Reports - data were not received during the short time available for initial analysis. Future analysis is planned;

(11) International Migratory counts - a program in existence for only three years, data are collected on a county-wide basis. Some counties in the CCBNEP area may have no data;

(12) Lunar Migration Counts - data acquired during the 1950's, handwritten records are presumed to be stored at Louisiana State University. Level of participation by residents of the study area is unknown. Data acquisition would entail traveling to the storage site, locating the stored documents, and separating those that specifically apply to the study area;

(13) Radar Migration Counts - films from weather radar also document bird migration. Approximately 35 years of these films are available but they are stored in government archives and must be viewed on site. This would necessitate travel and long hours of viewing extraneous film to select those that are applicable; and,

(14) Christmas Bird Counts (CBC) and the Texas Colonial Waterbird Surveys (TCWS) - the only surveys with sufficient and moderately accurate data that were available for analysis;

The Texas Colonial Waterbird Society reports annual counts of nesting pairs of twenty-five species of waterbirds including American White Pelican, Brown Pelican, Neotropic Cormorant, Anhinga, Great Blue Heron, Great Egret, Snowy Egret, Little Blue Heron, Tricolored Heron, Reddish Egret, Cattle Egret, Black-crowned Night Heron, Yellow-crowned Night Heron, White Ibis, White-faced Ibis, Roseate Spoonbill, Laughing Gull, Gull-billed Tern, Caspian Tern, Royal Tern, Sandwich Tern, Forster's Tern, Least Tern, Sooty Tern, Black Skimmer.

Data from ninety-one coastal colonies from 1973 through 1990 were used. The colonies were located in Aransas, San Patricio, Nueces, Kleberg and Kenedy counties. All twenty-five species were reported during those eighteen years, but three lacked sufficient data for analysis. Anhinga and Yellow-crowned Night Heron were each reported only once; Neotropic Cormorant three times.

The National Audubon Society reports Christmas Bird Count (CBC) results from discrete count circles, each within a well-described center point and a ~12km (7.5 mile) radius. A two week count period spanning late December and early January is established, and each count circle is surveyed during one day of that count period. The CCBNEP study area has eight CBC circles: Aransas National Wildlife Refuge, Rockport/Connie Hagar, Welder Wildlife Refuge, Port Aransas, Corpus Christi, Corpus Christi-Flour Bluff, Padre Island National Seashore, Alice, and Kingsville.

Initially three representative CBC's were used for the trend analysis: Aransas National Wildlife Refuge (ANWR), 1955-1993, Corpus Christi (CCW), 1962-1993 and Padre Island National Seashore (PINS), 1974-1989. These three counts supply representative coverage of geographic areas, habitat types and bird species of the central Texas coast. A total of 333 species were represented on the three counts during these years. The others were eliminated for the following reasons: 1) ability to access and analyze the data within the time constraints; 2) the Rockport/Connie Hagar count was begun in 1993 and contains only two years of data; 3) the Welder Wildlife Refuge count is in the western half of San Patricio county and does not cover any bay areas; 4) the Port Aransas count is a reliable count with coverage of bay and Gulf waters, but no upland habitats. It is clustered with ANWR and CCW in the northern portion of the study area, and gives no geographic balance; 5) Corpus Christi-Flour Bluff is adjacent to both CCW and PINS counts, and for many years, access was denied to private ranch properties that were once included in the circle; 6) the Alice count, located in Jim Wells county, is the furthest west of the Coastal Bend counts, and it covers no bay areas; and, 7) the Kingsville count is the most southern count, but it is in western Kleberg county and covers marginal bay habitat at the extreme edge of the circle. For many years, access to private ranch properties that fell within the count circle was denied. Recently, access has been granted.

Analysis was performed on each of the three selected CBC's as an individual unit. Upon review of individual counts the PINS data were found to be erratic and often in conflict with the other CBC's. Investigation showed that the compiler had difficulty obtaining regular access to large parts of the count circle, thus was unable to establish a reproducible count. Logistics, participation and participant competency were a problem in the years just prior to its abandonment. In addition the duration of the count (16 yrs) was considerably shorter than ANWR & CCW (38 yrs and 31 yrs respectively). As a result, PINS data were eliminated. Because of the time constraints and the lack of an acceptable substitute for PINS, the ANWR and CCW counts were the only two included in the trend analysis.

D. Individual Count Analysis

Christmas Bird Counts have shown good correlation with other types of surveys when determining population trends (Butcher, 1990), and are, therefore, a good choice for trend analysis in the CCBNEP study area. While the CBC results provide useful data for trend analysis, some corrections are necessary to accurately assess these population trends.

Dunn (1995) reported that a high level of feeder-watching efforts can affect CBC totals for some species. She noted, however, "The problem is likely to be most severe in northern areas...", conversely the problem is likely to be minimal in the southern counts. Feeders were not maintained at Aransas National Wildlife Refuge (ANWR) and were not a problem there. The only change due to feeder-watching at CCW was an increase in the number of hummingbird sightings, although these data were very limited.

CBC's do not have a standard for the amount of effort applied during the count day. If count totals are used for trend analysis without examining the effort involved, spurious trends may arise. Butcher and McCulloch (1990) was used as a guide for the CBC trend analyses, but their comparison of values **between** CBC circles was changed to compare values **within** a CBC circle.

The nature of these datasets requires that all count values are integers, equal to or greater than one, because counters report whole birds, starting with the first one they encounter. There are no zeroes in the datasets, although there are blanks. A zero cannot be substituted for a blank since they have two different meanings. A blank indicates no individuals of a particular species were reported; a zero indicates that the counters searched for a species known to occur within the count circle but found none. During the regression analysis, a zero is treated as a valid data point, while a blank is ignored. The importance of this distinction is evident when access to part of the CBC circle is sometimes denied, possibly eliminating some species from the count (exemplified by the Padre Island and Flour Bluff counts described earlier), or when dealing with a species near extinction where a special effort is made to count all remaining individuals, indicated by a zero if none are found.

Butcher & McCulloch (1990) substituted a small decimal value for a blank, but experimentation demonstrated this method to be unsatisfactory for this report. The substitution of even small decimal values for blanks altered the trend slopes of created "perfect" datasets. A more accurate trend slope is developed if blanks are eliminated and the calculation is performed only on the subset of positive integers. This is the procedure used in this report. Verification of its accuracy is provided by submitting party hours (PH) to the same calculation as count value (CV). This should result in B=1, C=0 (see below for definition of these terms). Having solved the problem of blanks in the dataset, a non-linear regression of count (CT) versus effort (party hours) was performed using the formula supplied by Butcher & McCulloch:

$$CT = e^{A} X^{B} YR^{C}$$

where CT = count (number of individuals)
A = intercept on the log-log scale

X = effort (total party-hours)
B = slope on the log-log scale (a measure of the degree of influence of party hours on count value)
YR = year
C = slope on the log-log scale for the year effect (a measure of the degree of influence of improved observer skill and effort on count value.

The value of B is important to the analysis since it behaves similar to a correlation coefficient, measuring the degree of influence of party hours on the reported count value. Values of B beyond the range of $0 \leq B \leq 1$ indicate that the equation does not adequately describe all possible variables of correlation, including variables such as weather conditions or habitat changes. In such cases, no correction for party hours is made since that portion of B which may relate to party hours cannot be determined. If B = 0, there is no correlation between party hours and count, and no correction is needed. If B = 1, the correlation between party hours and count is linear, and reported count values must be corrected to reflect the strong influence of increased/decreased effort. As the value of B decreases from 1, the influence of party hours on count decreases, but must still be considered.

Since Butcher and McCulloch were comparing values between CBC circles, they normalized all count values to one standard. The goal for this analysis was to compare values within a CBC circle. Therefore, the count values were corrected, but normalization was unnecessary.

To correct count values for the influence of party hours, the calculated values of B must be considered. If the count value is merely divided by party hours, regardless of the value of B, then the correction becomes too great as the value of B declines. This would result in an over-correction for all B's except those values very nearly equal to one. Raising party hours (PH) to the power B, and then dividing this value into count (CT) corrects the variation in count values for only that portion attributable to party hours. For these datasets, the values determined experimentally of $B<0.20$ had so little influence on count and on the slope of the trend line that the correction was unnecessary. Therefore, in this analysis , count (CT) was corrected for effort if $0.20 \leq B \leq 1.00$ and the following formula was applied:

$$\text{Corrected Count} = CT/PH^{B}$$

where PH = total party-hours

This calculation alters the Y-values shown on plots, but corrects the **slope** of the trend line to more accurately reflect the population trend.

Values of B change from species to species and from one CBC to another. These changes reflect the different habitats, foods, etc., exploited by each species, and the variety and extent of habitat types available within each CBC circle. Since no two species use resources in exactly the same way, they should not be expected to have the same B values. Likewise, since no two CBC circles contain exactly the same resources, no two B values for a species should be expected to be equal between CBC's.

Outliers were identified and removed where appropriate. Hogg and Ledolters' (1987) definition of an outlier as a value greater than $3\sqrt{MSR}$, where MSR is the Mean Square of the Residual, was used (in many cases , a zero substituted for a blank would qualify as an outlier, and would be removed in this step). If outliers are not removed, these points exert undo influence on the regression line. Removing these values is a more conservative estimate of the population trend.

Potential identification problems were corrected and applied to the counts:

(1) reported Rough-legged Hawks were assumed to be misidentified immature White-tailed Hawks; Rough-legged Hawk values were added to White-tailed Hawk values thus eliminating Rough-legged Hawk;

(2) reported Semipalmated Sandpiper were assumed to be misidentified Western Sandpiper; Semipalmated Sandpiper values were added to Western Sandpiper values, and Semipalmated Sandpiper was eliminated;

(3) all Long-billed, Short-billed and Dowitcher sp. values were added together and represented as Dowitcher spp;

(4) all Myrtle, Audubon's and Yellow-rumped Warbler values were added together and represented as Yellow-rumped Warbler;

(5) all Eastern, Western and Meadowlark sp. values were added together and represented as Meadowlark spp.; and,

(6) all Starling, Grackle, Cowbird, and Blackbird sp. were added together and represented as Blackbird spp.

For TCWS's, party hours are not recorded so a constant effort was assumed. Any small differences in observer effort are not likely to affect the count data. No potential identification problems were anticipated, based on the experience of the counters. To calculate the trend slope for the colonial nesting species, the counts were summed for each species from all colonies for each year.

Initially, any species with less than four occurrences in any dataset was eliminated from the analysis, resulting in 121 species analyzed for one or more counts. After a thorough review of the reported trends and their probable causes, reliable trends could not be calculated for some of the 121 species without additional information, such as weather events. Therefore, they have been eliminated from this report for lack of information. Migratory waterfowl, shorebirds, colonial nesters, passerine migrants, and species listed as Endangered, Threatened or candidate for listing were reviewed, and analyzed if sufficient data were available.

After correcting CBC data as needed, a regression analysis and analysis of variance for count (CT) versus year (YR) on each species from each count circle was run. The count data were

plotted on a scatter diagram with the linear regression line. Outliers were identified, removed if appropriate, and the linear regression was recalculated. The count data and regression line were replotted.

E. Composite Count Analysis

All of the recorded species that were represented on both the ANWR and CCW counts were included in the composite analysis, totaling 101 species. Again, some of those species were later eliminated from this report for lack of adequate information. For the composite analysis, the count values and party hours from each individual CBC were added together. There are many choices for this step in the analysis, usually made from personal preference as no single selection stands out from the others. In the preparation of the Galveston Bay National Estuary Program report, the researchers added all TCWS data for a species for each year, thus treating the entire study area as one large colony. The same approach was followed for this study, enabling comparisons of results from the two studies.

In a parallel fashion, the data from the two CBC's for a species for each year, 1963-1993 were added. Party hours from the two counts were added and the summed data effectively represented a large composite CBC circle. After calculating composite totals in a similar fashion, winter trends from CBC's were compared to breeding trends from TCWS's.

All analytical procedures described above were then repeated on the composite CBC data, i.e., elimination of blank values, non-linear regression of CT vs. PH, examination of the values of B, correction of CT due to PH if necessary, linear regression of CT vs. YR, removal of outliers if necessary, recalculation of linear regression of CT vs. YR, plotting of count data vs. year with linear regression line plotted, calculation of Trend Slope as Percent of Average. This yielded a summary trend, describing the population trend in general, while the individual count trends are specific to their count circle and the encompassed population.

IV. Results

A. Species Checklist

Over 450 pieces of literature were reviewed to produce the bird checklist which includes 494 species representing 19 orders and 55 families (Appendix).

B. Species Trend Accounts

The following report presents 101 selected species or groups, i.e., yellowlegs (*Tringa* spp.), dowitcher spp. (*Limnodromus* spp.), hummingbird spp., meadowlark spp. (*Sterna* spp.) in taxonomic order, using the AOU Checklist of North American Birds, 6th edition, as a guide. Each species discussion includes the current status and historical trends of those within the CCBNEP study area, and are often compared to trends in their broader range. Potential reasons for positive and negative trends, as well as recommendations for future research are also

presented. The trend analyses found in Appendix A are also arranged in phylogenetic order in the following sequence: Composite (ANWR & CCW), ANWR, CCW, TCWS (when applicable).

American White Pelican - A common species found year-round in the bays and estuaries of the Coastal Bend. There is a small resident population that breeds and nests on islands in the Laguna Madre. This is the only breeding population of this species in the United States east of the Rockies. Others migrate through the area in fall and spring. Analysis of the Christmas Bird Counts (CBC's) indicates a slight increase in numbers which could reflect an increase in the inland North American population. Trend analysis of TCWS counts for the local breeding population indicates a slow decline (-1.08%), however, the population may be more stable than the trend reflects. Count data from the early 1970's may have included many young of the year and were, thus, misreported. Recent counts, from the mid 1980's to date, have varied little from the approximately 300 breeding pairs. Careful attention and management are needed to maintain this breeding population. Their original nesting island (South Bird) was invaded by predators and parasites in 1975 driving the birds to other islands to nest. Several later breeding seasons were disrupted and are reflected in low TCWS counts. Subsequently, they have settled on a single island near the mouth of Baffin Bay under the jurisdiction of the Padre Island National Seashore. This island is slowly eroding and the birds may have to move again in the future. Research is needed to determine whether this population mixes with individuals from other breeding colonies, i.e., in Mexico. DNA analysis may be needed to determine if this could be a separate subspecies. Evans and Knopf (1993) reported that the continental population is stable.

Brown Pelican - A species once seriously endangered, even extirpated from most of its Gulf of Mexico range due to intake of DDT. They are once again breeding on two islands in the Coastal Bend and are recovering their former range. Individuals are seen perched on pilings throughout the bays, flying overhead or diving in the ship channels and inshore Gulf waters for fish during any month of the year. All trends show marked increases; an excellent example of a species increasing their population by addition of young as breeders. An additional trend line, showing exponential regression, has been plotted for the TCWS data which very accurately reflects the species recovery. Future research is needed to determine the degree of exchange with the Mexican population and the movements of the Texas population when breeding is concluded. Additional treatment of this species can be found in Volume I of this report.

Double-crested Cormorant - A common winter and rare summer resident of bays, estuaries, inshore gulf waters, gulf beaches, lakes and ponds of the Coastal Bend. It is considered a nuisance species by some because of opportunistic feeding at fish hatcheries and shrimp farms. The species, once declining due to human disturbance and chemical contaminants, is now recovering. All trends are positive. They may be increasing their range beyond historical boundaries by using habitat created with the formation of reservoirs and other artificial water impoundments (Ehrlich et al., 1988)

Neotropic Cormorant - A year-round resident primarily found in fresh water ponds, lakes and rivers but may be seen in local bays and estuaries. In the Coastal Bend it replaces the Double-crested Cormorant in the summer and can be found nesting in trees in fresh water impoundments and on duck blinds in the bays. It was once included on the watch-list for Texas because of the

same factors that affected the Brown Pelican. The population is recovering as exhibited by the trends. Slack et al. (1992) found an increase in total numbers per year based on both the CBC and TCWS counts and an increase in total number of colonies based on TCWS counts in their Galveston study. It appears that this species is moving to the north and east reoccupying their historical range. The small negative trend for Aransas National Wildlife Refuge (ANWR) probably reflects the lack of suitable habitat in recent years. Lack of suitable nesting sites may be a limiting factor for this species. Telfair and Morrison (1995) reported that this species needs study because the coastal breeding colonies are subject to many adverse factors; erosion, starvation, egg/chick predation, human disturbance, contaminants, and maritime storms.

Anhinga - This is another fresh water species found in ponds, lakes and rivers. It is an uncommon year-round resident, nesting in trees associated with its feeding areas. The reported trends should be used with caution because the few data are insufficient for a good analysis.

American Bittern - A very secretive species found in fresh and salt marshes, estuaries, and ponds. They are uncommon summer and fall transients, common winter residents, and irregular summer breeders. Because they are so secretive, they are not adequately represented on CBC's; other data sets should be used or initiated to secure reliable counts. Gibbs et al. (1992) reported that various publications indicate a decline in population numbers.

Great Blue Heron - A ubiquitous species found in all types of habitats and is commonly seen during all seasons. They regularly breed and nest on the islands in the bays. Trends indicate that the winter population is fairly stable, but the breeding population is declining. This species nests early, so TCWS counts from early years may include erroneous counts of young of the year. Therefore the declining trend may be less severe than the graph indicates. Nesting habitat has decreased in many of the area bays, including Aransas, Nueces and the upper Laguna Madre. Predators that were prevalent on many of the old nesting sites are just now being removed. Most of the other U. S. colonies appear to be stable (Butler, 1992). Seasonal movements are poorly understood and should be investigated.

Great Egret - This is another common species found throughout the year in a variety of habitats including fresh, brackish and saline waters. They also nest on islands in bays and lagoons, as well as trees along river mouths. The winter population appears to be stable, but the breeding population is declining. Positive trends on CBC's. may be due to better habitat coverage in later years and more informed observers or, for this and other species with opposite trends on both counts, it may indicate two distinct populations, one wintering and the other breeding. Negative trends shown by TCWS data are similar to those for the preceding species, due to degradation of habitat, or loss of nesting sites because of disturbance by humans and predators. Seasonal movements and origin of the wintering population are not known.

Snowy Egret - This species is also found in most aquatic habitats, both fresh and salt, in the area. They are commonly seen throughout the year and breed and nest on islands in bays and estuaries. TCWS counts show a disturbingly large population decline. Lack of nesting habitat is not a limiting factor, although they may be unable to compete with earlier nesting herons and egrets for prime nesting sites. Predators and human disturbance have forced many of these species

from their traditional nesting sites to remote islands resulting in fierce competition for space. The least disturbed and least contaminated available habitats, during winter, are found at ANWR and may be the reason for the increase of this species there. Slack et al. (1992) indicated a decrease in the total number of birds and average number per colony in the Galveston area. Future investigations should monitor this species closely and include studies of their movements, site tenacity and conditions in the area during winter.

Little Blue Heron - This species is uncommon in the marine environment of the Coastal Bend, since they prefer fresh waters of inland lakes, rivers, and streams. In recent years there is an increase in the numbers nesting on some dredged material islands in the Laguna Madre. Their inland rookeries may be in danger. This would account for the slight increase shown by TCWS data. There is a significant positive trend at ANWR which could be due to the recent wet years that have rejuvenated fresh water ponds there.

Tricolored Heron - This is a common heron seen during all seasons in a variety of habitats but mostly those associated with saline or brackish waters. It also nests on islands in bays and lagoons, usually in low vegetation on island peripheries. A downward trend is indicated by TCWS data probably due to concentration of so many species and numbers of nesting pairs on so few islands in recent years. These conditions are caused by the previously indicated factors - predators, human disturbance, and loss of habitat. Slack et al.(1992) also found a decrease in the number of birds per year based on TCWS data from the Galveston area. They indicated that this was not necessarily a population decline, but possibly a redistribution to other and new nesting sites. In any event, this species should be closely monitored in future years. Further management of nesting habitat on islands is recommended.

Reddish Egret - This is a species commonly seen all year in bays and estuaries of the Coastal Bend. Rarely, can it be found associated with fresh water. It is listed in Texas as a Threatened species and its Federal status is C2. The trend from TCWS data indicates a strong decline, but the more recent data (1991-1994) show stabilization of population numbers. The same problems exist with this species as with other herons and egrets, at least in the Coastal Bend, i.e. movement from traditional nesting sites to crowded sites or even out of the area. Some exchange is possible with populations along the lower coast of Texas and the upper coast of Mexico. Positive trends shown by CBC counts are partly explained by improved habitat coverage over previous years, better identification abilities of observers, a more diligent search for species listed as Threatened or Endangered, and mild winters in recent years. Movements of populations are unknown. Some reports speculate that young birds from southern colonies disperse northward through winter, contributing to populations counted on central coast CBC's. This species was reported infrequently in the Galveston area by Slack et al. (1992).

Cattle Egret - This invader species is a common resident of the area throughout most of the year, but with fewer numbers in winter. They are found in a variety of habitats, more commonly in savannas or arable lands, shying away from salt water areas except during migration and nesting. They are late nesters, joining other egrets and herons on isolated islands in bays and lagoon. In recent years, because of excessive rainfall, they have taken advantage of ponds with emergent trees in which to build their nests. This could explain the negative trend shown by the TCWS

data. Also, since they are late nesters, some of the population may be missed on the count date, if some had not begun to nest. Mild winters in recent years may hold more individuals through the season, resulting in larger CBC values. On the national level, this species is increasing in numbers and expanding its range at an alarming rate (Telfair, 1994).

Green Heron- An uncommon summer resident and a rare winter resident. It is associated with freshwater ponds, lakes and marshes while nesting in more inland areas. It is not a colonial nester so are not included in TCWS counts and CBC's. have too little data for analysis. Davis and Kushlan (1994) reported no indication of population decreases, although poor data are available because of their solitary nesting.

Black-crowned Night-Heron - A common permanent resident found in habitats associated with fresh or salt water. TCWS data indicate a strong negative trend, but reports from early years may have over-reported them by counting birds at day roosts, rather than number of breeding pairs. Also, this species nests in dense understory making it difficult to see and count them accurately without causing undue disturbance. A loss of feeding habitat and lack of suitable nesting sites could have contributed to this decline, if it is a legitimate one. Possibly, the composite trend from the CBC's. (-0.37%) accurately reflects the population decline. TCWS counts show an increase in number of colonies and CBC's. show an increase in number of species for the Upper Texas Coast (Slack et al. 1992). Davis (1993) reported that national populations are stable or increasing despite the lack of early census data.

Yellow-crowned Night-Heron - A common fall and spring migrant through the area, often encountered resting on Gulf beaches. They are rare winter and summer residents, although a few have nested in the area. They associate with fresh waters, the opposite of the preceding species, usually in vegetation around ponds, lakes, and marshes. Both CBC's. indicate a negative trend because of high numbers in the mid-1970's and few sightings and low numbers in later years, especially during the 1980's. This could be due to the absence of rains and lack of fresh water ponds during those years.

White Ibis - An uncommon permanent resident that is more abundant to the north. The majority that are found here occur during breeding season on nesting islands or may be seen flying overhead during migration. Both CBC's. and the composite indicate a very pronounced positive trend. TCWS has too few data for a reliable trend analysis. The positive trend shown by all three counts may reflect an expanded range along the central coast. Studies of movement, especially related to weather and relationship to the following species, are needed. Although numbers fluctuate annually, overall numbers for this species remain high (Kushlan and Bildstein, 1992).

White-faced Ibis - An uncommon winter but common summer resident and nesting species on bay and lagoon islands. They may be found feeding in marshes, flooded fields, and around the margins of ponds or nesting in low, thick vegetation on islands. It is listed as a Texas Threatened species; Federal status is C2. TCWS counts indicate a major decline for the central coast. Some causes may include reduced habitat for nesting, competition with Laughing Gulls for nesting sites, or destruction of their nests by Laughing Gulls when outside disturbances take place (usually human). This species is the first to fly from and last to return to their nest because of the

slightest provocation in a nesting colony of birds. Research is needed to adequately explain this serious decline in numbers. What is their nesting success in these mixed colonies of birds? The positive trend shown at CCW may be due to improved coverage of appropriate habitat or the species preference for freshwater sites, rather than an increase in population. Breeding range and populations have expanded in the last two decades, but accurate numbers are difficult to assess because of lack of census data (Ryder and Manry, 1994).

Roseate Spoonbill - An uncommon winter resident but common in summer, nesting on islands with other colonial nesting waterbirds. They were once very common in the area, but suffered a decline in the era of plume hunters, another during the period of DDT poisoning, and are presently suffering a third decline that cannot adequately be explained. The strong downward trend may be somewhat exaggerated due to erroneous counts in early years. Loss of nesting habitat in some of the area may be responsible for part of the decline since there are increased numbers on some islands. The positive trends shown on CBC counts may be the result of better coverage or more individuals remaining in the area because of mild winters. Movements within and without the area should be studied. Slack et al. (1992) found the same results in the Galveston populations, an increasing trend based on CBC's. and decreasing one based on TCWS counts.

Fulvous Whistling Duck - A common migrant throughout the area, rare in the winter and uncommon in the summer, although some nest here. They are found more often in fresh water habitats than marine ones. The species is listed as threatened by TOES. The majority of the population winters south of the U. S. and as a result few are seen on CBC's. - thus no trends.

Black-bellied Whistling Duck - a common, permanent resident whose numbers increase after CBC counts are made. They occupy a variety of diverse habitats, and within the last five years some have begun to nest with colonial waterbirds on islands in bays and lagoons. The species may be reclaiming its historic range but CBC data are inadequate for a reliable analysis. Counts during the breeding season are needed to accurately track population trends. Future investigation should include studies on those birds nesting on the dredged material islands to determine the success rate of those nests.

Greater White-fronted Goose - A common winter resident of the area seen feeding on the arable lands, around ponds, and along the shores of bays and estuaries. National trends show an increased population, as do these CBC's., despite some decrease in habitat quality and food supply. Local wintering populations may be over-counted as a result of overflight of several different observers within a count circle. The actual trend may be less pronounced as a result. Both Pacific flyway and mid-continent populations appear to be increasing (Ely and Dzubin, 1994).

Snow Goose - Identical to the preceding species in all aspects including trends.

Canada Goose - Similar to the preceding geese. Some fluctuations are expected; mild winters may keep this species farther north or the majority of the population may not arrive until after the CBC counts are completed.

Wood Duck - A freshwater species not found in bays and estuaries. It is uncommon in winter and rare in summer, but has been known to nest in some of more northern counties of the area. The size of the winter population is dependent on weather conditions farther north. When conditions are dry to the north and wet in the south, this species will increase in numbers in freshwater ponds, rivers and lakes. The negative trends in all of the analyses could be the result of dry years in the Coastal Bend. The 17 encounters are insufficient data to assess reliable population trends.

Green-winged Teal - Another freshwater species commonly seen during spring and fall migrations and in fewer numbers during winter. The downward national trend is not reflected by the local composite trend or for those in the Galveston area; both indicate a more stable population.

Mottled Duck - A common permanent resident occupying a variety of coastal habitats. All local counts show a definite positive trend as did those in the Galveston area. This is opposite national trends as reflected by Mid-Winter Transect (MWT) counts. Additional useful habitats have been created by small tank-type ponds and flooding of borrow pits due to increased rainfall in recent years throughout the local area. In Texas, Mottled Duck numbers decreased by 58% from 1986-1990, but recovered to former levels by 1993 (Moorman and Gray, 1994). The decrease was during drought years and the increase after resumption of rainfall.

Mallard - An uncommon winter and a rare summer resident with a few known to nest in the area. This species is more abundant along the upper coast. Numbers are so few that a thorough analysis cannot be made. Their presence here is dependent on mild, wet winters. ANWR and the composite indicate a significant negative trend, which could be the result of dry years during the 1980's in the Aransas area. The small number of individuals in the CCW count resulted in a non-significant trend because of low numbers and increased rainfall in later years.

Northern Pintail - A common fall and spring migrant and winter resident. The Coastal Bend is the center of its winter range. The slightly positive trend at CCW is due to increased freshwater inflow to Nueces Bay, better observer coverage, and recent warm winters. The CBC's. in Galveston also showed a slightly positive trend. The ANWR and composite trends reflect the national negative trend based on MWT counts.

Blue-winged Teal - A common winter resident and migrant with a few remaining as summer residents and breeders. It prefers fresh water habitats but is often seen in slightly saline areas of some of local bays. It is an early migrant, whose wintering grounds are farther south, although large numbers may remain in wet years. Most have vacated the area by the time the CBC's. are run. The positive trend at CCW is due to increased freshwater flow into Nueces Bay, better observer coverage, and recent warm winters. The national trend for this species has been a decline in numbers which is in agreement with ANWR data. This does not agree with Galveston CBC's or CCW results. The slight 0.6% positive slope for the combined CBC's. is probably more indicative of the actual trend in the Coastal Bend.

Cinnamon Teal - An uncommon winter and irregular summer resident in the fresh water habitats of the Coastal Bend. At times they may be seen during migration over inshore Gulf waters. Because of their low numbers, the data are insufficient to accurately determine trends. Those that were calculated indicate different but insignificant trends.

Northern Shoveler - A common migrant and early winter resident that inhabits fresh and slightly saline waters. A few will remain infrequently into the summer. The Coastal Bend is the center of its winter range and the combined CBC's. indicate a 1.5% positive trend which could be due to the recent mild winters. The national trend is basically stable.

Gadwall - Very similar to the preceding duck in numbers and habitats occupied. The trends indicate a stable population.

American Wigeon - Similar to the preceding species but more inclined to inhabit bays, estuaries, and seagrass beds. They are common transients and winter residents. A few will remain into the summer. The composite trend indicates a -1.4% decline in populations which reflects the national trend. The positive trend in the CCW count is probably a local phenomenon brought about by warm winters and increased coverage.

Canvasback - An uncommon winter visitor found in bays, estuaries, lakes, and ponds. Too few data are available from CBC's. to determine a trend for this species. More appear to occupy the Aransas count area than Corpus Christi area. The trend there indicates a fairly stable population.

Redhead - One of the two common winter resident ducks that occupy the bays, estuaries and seagrass beds in the Coastal Bend; some remain into early summer. Although all three trends are not significant, the slightly negative trends (combined =-2.8%) agree with those shown nationally. These declines could be due to changes in their breeding grounds, but some negative effects are possible in this major wintering area, and are deserving of study. The persistent brown tide could be having some effect.

Ring-necked Duck - An uncommon winter and infrequent summer resident. They are more partial to lakes and freshwater ponds. Despite the small numbers of observations and numbers of individuals, the trends reflect a stable population for the composite, a negative one for ANWR and a positive one for CCW. Only the CCW trend is significant, which could be due to the availability of more fresh water ponds in recent years.

Lesser Scaup - The other common winter resident duck that occupies bays, estuaries and seagrass beds in the Coastal Bend. Nonetheless, they can be found in almost any type of aquatic habitat. Some do remain into summer before leaving. The composite analysis may be a good indicator of the actual population trend, a relatively stable population. However, many factors affect their numbers on CBC's. and need investigation. Some elements contributing to fluctuating populations include severity of winter weather farther north before count day, local wind conditions on count day, and ease of access for counters to the duck's preferred habitat. During certain years, this species has been completely absent from Corpus Christi Bay and the upper Laguna Madre, but very abundant in the Aransas Estuary and farther north. This could be

due to the condition of grass beds and bay bottoms in affected areas. These local movements should be investigated to determine their causes. Slack et al. (1992) felt that trends shown for this and the preceding species should be viewed with caution because of the very large numbers recorded on some CBC's..

Common Goldeneye - An uncommon winter resident that prefers the deeper bays. Since this optimum habitat was not present in CBC circles, numbers are too few for reliable trends. Those that were calculated appear to be insignificant, but indicate a stable population.

Bufflehead - A common winter resident but also preferring areas outside the count circles. From the few data, there appears to be an increasing population trend. Counts should be made that include deeper bay areas. Gauthier (1993) reported this species has recovered from overshooting at the turn of the century and their numbers are still increasing.

Red-breasted Merganser - A common winter resident in bays and estuaries, but not overly abundant in the count circles. The trends indicate a population increase of approximately 4%. This could be exaggerated because of improvements associated with more recent counts. Additional counts should be made in more optimum habitat.

Hooded Merganser - An uncommon winter resident of ponds, lakes, bays and estuaries of the Coastal Bend, usually preferring lower salinity areas. The population appears to be on the increase as indicated by all three trend analyses. Again this increase could be due to availability of more ponds during recent years in the CCW count area.

Ruddy Duck - A common winter resident and rare summer resident. A few nest in the area. Numbers from CBC's are too small for dependable analysis. All three trends indicate an increasing population but not at a significant level.

Masked Duck - An irregular permanent resident of the more southerly portion of the Coastal Bend. There are breeding records for this species within this area during wet cycles. They prefer freshwater ponds, lakes and marshes of the area. Because of their irregular occurrence, there are insufficient numbers to plot trend lines.

Osprey - A common winter and rare summer resident of bays, estuaries, lakes rivers, and barrier islands. They are often seen perched on poles near bodies of water or flying over them searching for fish. The number of individuals that frequent the area during winter are too few for a reliable analysis.

Mississippi Kite - A common fall and spring migrant, but rare winter resident that can be found in riparian woodlands, mottes and oak woodlands. Like the preceding species, observations are too few for a reliable analysis. Counts of this species should be made during its migration.

Bald Eagle - A rare winter resident with a few nesting inland in some of the northern counties of the Coastal Bend. It is listed as Threatened nationally and Endangered statewide. Evidently the population is declining, since the two at ANWR have been reduced to either one or none in

recent years. Prior to 1850, a breeding population was known in the Corpus Christi area, but with the growth of agriculture this population disappeared. A single individual, or sometimes two, were reported every year for many years in counts along the northern shores of Alazan Bay, but they have not been seen in recent years. They were extremely vulnerable to any type of disturbance and possibly left the area when disturbances increased with leasing of land for hunting.

White-tailed Hawk - An uncommon permanent resident often seen soaring over grass prairies and savannas of the area. They are listed as Threatened in Texas, the population having declined due to chemical contamination, habitat loss, and unlawful shooting. It now appears to be recovering as indicated by the positive trends on all counts. The trends could be slightly exaggerated due to improved observer skills in identification of immatures as this species. However, there could be movement into the area because of increased controlled burning in their preferred habitats. Although there are no reliable estimates of numbers, the population in Texas appears to be increasing (Farquhar, 1992).

Ferruginous Hawk - A very uncommon migrant and winter resident usually found associated with prairies and savannas of the area. It is federally listed as C2. Trends from CBC's should be used cautiously since count totals are low. Territory size in winter is unknown; a 25 km diameter circle may be too small to support more individuals than the few that are currently counted. Surveys on breeding grounds should more accurately reflect population trends.

Merlin - a small falcon that occupies a variety of habitats, and is an uncommon migrant and winter resident. It is listed as threatened by TOES because of the population decline during the DDT years. Apparently populations are stable since none of the trends are significant, but the slightly positive trends may indicate a slow recovery from those DDT years. Breeding populations are listed as increasing by Sodhi et al. (1993).

Peregrine Falcon - Another uncommon falcon during migration and during its winter stay in the area. It favors the Gulf beaches, barrier dunes and prairies, but can be seen in a variety of other habitats. It is listed as Threatened (formerly Endangered) by State and Federal agencies; the population is recovering from pesticide contamination. The numbers recorded on the CBC's. are too low for a good analysis, but the trends are in agreement with those reported nationally for the Arctic Peregrine Falcon. In recent years hundreds have been caught and banded on Padre Island around Mansfield Channel.

Greater Prairie Chicken - The southern race, Attwater's, once numbered over one million birds but has been reduced to less than 70 birds. It is listed as a rare permanent resident and lives on prairies and savannas of the more northern counties of the Coastal Bend. It is classified as Endangered by State and Federal agencies. The positive trend for ANWR counts are for the few years prior to the early 1980's that it was found. Lack of individuals after 1983 is indicative of the fate of this species in that area. Long periods of wet weather that flood their nesting and leking grounds, feral pigs, and other predators may have contributed to their population crash.

Sandhill Crane - A common winter resident of the prairies, savannas, fields, lakes, and ponds of the entire area. Analysis of this species is complicated by their concentration at roost sites along the Nueces River. As the birds leave or return to their roosts, some overcounting occurs. This overcounting is reflected in the CCW and composite trend as a positive one. Winter feeding areas have declined over the last 20 years due to plowing and herbicide treatment of fields in early winter. The slight negative trend shown for ANWR probably gives a truer picture of local populations. Annual mid-winter counts along established road routes would be a more accurate method to determine numbers of this species in this area.

Whooping Crane - A rare, Endangered winter resident of the marshes, bays and estuaries of the Aransas National Wildlife Refuge. The actual counts from the refuge indicate the slow trend toward recovery of the population. The CBC's. from the refuge indicate only a slightly positive, (not significant) trend, caused by the restriction of the count circle and the tendency of the same birds to occupy and defend the same territory year after year. See Volume I of this report for more detailed information on this species.

Black-bellied Plover - A common migrant and winter resident, but uncommon during the summer. They are found on Gulf beaches and flats and shores of bays and estuaries. A positive trend is shown on all counts with the 0.81% slope of the CCW count being the most accurate. The trends at Galveston were more similar to the composite one here (3.56%).

Snowy Plover - A common migrant and an uncommon permanent resident with a few remaining in the area to breed. They are more often found on the sand, mud, and algal flats of the barrier islands and less often on Gulf beaches. The southeastern race, represented here, is Federally listed as C2. The trend from the CCW counts may be the more accurate one, indicating a stable or slightly declining population. High count totals from ANWR may be the result of some misidentification and erroneous inclusion of sandpipers. Research in this area on this species is needed, especially during the breeding season. Nothing is known of their requirements for breeding or of their success at it here.

Semipalmated Plover - An uncommon migrant and winter resident found in habitats similar to the preceding species. The actual trend for this species is likely to be much less dramatic than those graphed, although a stable or slightly increasing population is expected. The strong positive trends are partly due to better coverage of habitat used by this species and may include some misidentified birds; at times a difficult bird to distinguish from a Piping Plover. Additional research is needed on the relationship among all four of the small plovers while they are in the Coastal Bend.

Piping Plover - Another uncommon winter resident, but common fall and spring migrant especially on the Gulf beaches and to a lesser extent on the sand, mud, and algal flats of the barrier islands. Those winter residents are more often found on the flats. A few may remain through summer. This species is listed as Threatened nationally and in Texas. The two count circles do not cover the optimum habitat for this species and as a result the numbers are low. The three trends are negative which agrees with those nationwide. Populations are being studied intensively on the breeding grounds, but supplemental work is needed in their wintering areas.

Haig (1992) indicated that some of the populations in the breeding range continue to decline despite increased management efforts.

Killdeer - A common permanent resident that can be found in a variety of habitats. A stable population is indicated, although some movement between areas is indicated.

Mountain Plover - A rare winter resident and uncommon migrant. They are most often found in arable fields, prairies, and savannas. Its Federal status is C1. Their occurrence in the area is erratic, related to weather and habitat availability. The count totals depend heavily on observers being in the appropriate habitat at the right time. Thus, data are insufficient for analysis of reliable trends.

American Oystercatcher - An uncommon permanent resident of shores and flats of bays, estuaries, islands, and Gulf beach. Evidently more individuals are found in the northern part of the Coastal Bend. As a result, the stable population of a few individuals in the south is elevated to a 1.65% increasing population on the composite trend. The bivalves in the ANWR area are probably more abundant and more readily available. Most oyster reefs in the Nueces Estuary have been eliminated or greatly reduced by salinity fluctuations and/or pollutants. However, more nests are being found. East coast and Florida populations appear to be declining because of disturbance and loss of habitat (Nol and Humphrey, 1994). There could be some movement occurring within this species but this is not confirmed. Many aspects of the natural history and migration for this species are unknown and need investigation.

Black-necked Stilt - A common permanent resident found in similar habitats as the preceding species, but is mainly associated with margins and shallow waters of ponds. In addition to positive trends indicated by CBC's, there appears to be an increase in the summer nesting population. Evidently the Nueces Estuary is preferred to that of the Aransas National Wildlife Refuge. The recent mild winters may have contributed to larger numbers of wintering individuals in the Corpus Christi area.

American Avocet - A common winter and an uncommon summer resident. A few breed in the area. They may be found wading in or standing on the shores of the same habitats as the preceding species. Apparently this species is increasing in numbers during the winter at a 6.6% rate. Numbers in the Galveston area were also increasing during this same period. Mild winters and an increase in amount and number of sewage outfalls may concentrate the population where they are easily observed. Recent mild winters may have also contributed to this increase.

Yellowlegs spp. - Both Greater and Lesser Yellowlegs are common migrants and winter residents of the area. Some remain as summer residents. They are most often seen on shores or in shallow waters of bays, estuaries, and ponds. They have been combined because of difficulty that some observers have separating the two species. Galveston and ANWR counts indicate an increase in population numbers, while those at CCW indicate a sharp negative trend. The latter is probably due to loss of habitat caused by filling large portions of Nueces Bay and subsequent industrial development.

Willet - A common permanent resident, some of whom breed here in summer. Their preferred habitat appears to be Gulf beach or flats and shores of bays and estuaries. They are very abundant at both locations and seem to be on the increase. Slack et al. (1992) found the same trends. This is a species in need of investigation; differences between breeding and migrant populations, movement, territoriality, habitat preference, etc.

Spotted Sandpiper - An uncommon migrant and winter resident found along the banks of rivers, ponds, lakes, estuaries, and occasionally on Gulf beaches. The trends indicate a slowly declining population (0.5%) in spite of improved coverage of habitat and increased observer awareness.

Long-billed Curlew - A common migrant and winter resident, but uncommon summer resident. They occupy a variety of habitats both marine and inland. Slight positive trends are shown on both count areas. Breeding populations are declining, suggesting that further study is needed even on wintering grounds.

Marbled Godwit - Similar in occurrence to the preceding but rare in summer. They tend to occupy shores and flats of the marine environment, but can occasionally be found in wet arable lands during migration. The population appears to be stable or increasing slightly. Influences on the wintering population are the same as for the Black-necked Stilt and the American Avocet.

Ruddy Turnstone - Common during most of the year except for summer when it is uncommon. It is most often seen on the Gulf beach sorting through debris on the berm, but can also be found on more inland shores and flats. The composite trend indicates a slight increase in the population and is probably an accurate representation of events in this area. The CCW area does not include the optimum habitat for this species.

Red Knot - A common species during migrations, but rare in summer and uncommon in winter. It prefers the Gulf beaches, but may be found in fewer numbers on estuary shores and flats. Neither CBC count includes Gulf beaches and the counts are made when fewer numbers are present. Therefore, data are too few for accurate analysis.

Sanderling - A common permanent resident of the area having similar habits and found in the same areas as the Red Knot. Even though counts do not cover optimum habitat, the trends are all positive as was the one at Galveston.

Western Sandpiper - One of the three sandpipers commonly found throughout most of the year, except summer. They tend to feed at the edge of or in waters of estuaries, flats, ponds, islands, and Gulf beaches. The trends are positive but could be influenced by large fluctuations in numbers due to weather on count days. Slack et al. (1992) found positive trends on Bolivar Flats counts and CBC's.. Wilson (1994) listed population numbers in the millions, but offered no information on trends.

Least Sandpiper - Very similar to the preceding species in occurrence and habitat. It prefers slightly drier areas than the Western Sandpiper. Both counts indicate a slight positive trend. The national trend is a stable (Cooper, 1994).

Dunlin - A slightly larger sandpiper than the preceding two, commonly found in the same areas, exclusive of Gulf beaches. It is common in winter and during migrations, but absent in summer. The counts here and at Galveston indicate an increasing population which is not true nationally.

Stilt Sandpiper - A common migrant through the area remaining as a rare winter and summer resident. It is usually found in shallow waters of flats and along shores of estuaries. The wintering grounds for this species is south of the US. The positive trend from CCW should be used with caution, as data are too few for accurate analysis. This species was seldom reported in early count years due to identification problems and confusion with both yellowlegs species.

Dowitcher spp. - The long and short-billed species have been combined because of the difficulty in separating the two; often in counts they are listed as dowitcher spp. by counters. Both occupy the shallow waters of flats, estuaries, and ponds of the Coastal Bend. Long-billed Dowitchers commonly and Short-billed Dowitchers uncommonly, can be found throughout the year as migrants or winter residents, the former is uncommon in summer and the latter is rare. The trends are very positive, 6.5% on the composite. The large fluctuations in reported totals are due to weather on count day. Although trends are positive, they may be influenced by improved coverage, improved identification ability, and/or recent mild winters.

Common Snipe - A common winter resident and uncommon migrant. They are found in the vegetated areas around the waters of estuaries, ponds, lakes, flooded prairies, and fields. The composite trend indicates a slight decline in population and is probably accurate for the area due to loss of habitat in the Nueces Estuary. The positive trend of ANWR counts is probably a result of having optimum habitat.

Laughing Gull - The most common gull of the area, a year-round resident that breeds and nests on islands of estuaries and lagoons. They occupy all types of habitats, marine and far inland. The TCWS data from the breeding grounds show stable populations and accurately depict the most likely scenario. CCW negative trend is due to closure of the westside landfill and opening of a new one removed from the count area.. The effect of this species on the productivity of its fellow ground nesters on islands should be investigated.

Franklin's Gull - A common fall and spring migrant, but rare winter resident. They occupy much the same habitat as the preceding species and tend to migrate in close proximity to Gulf waters. A census could be easily designed to count them during migration that would give an accurate estimate of their numbers. Since so few are present during winter, the indicated trends are not to be trusted. Although there is controversy concerning recent population trends, a negative trend is not consistent with reports from breeding colonies (Burger and Gochfeld, 1994).

Ring-billed Gull - A common migrant and winter resident of the area, found in the same habitats as the Laughing Gull. They are uncommon during summer since most have returned north to breed. The positive trend shown at ANWR reflects the reported national trends. The negative trend at CCW is due to the closure of the westside landfill. Results of the Breeding Bird Survey (BBS) indicate a significant increase in numbers (Ryder, 1993).

Herring Gull - Similar in occurrence and habitat preference to Ring-billed Gull, but is not as abundant. The trends are the same, also for the same reasons. National trends indicate a declining population (Pierotti and Good, 1994).

Gull-billed Tern - A common migrant and summer resident nesting on islands in bays and lagoon. A few may stay through winter. Although preferred habitats are marine-oriented, they can be found inland catching insects over arable lands. TCWS counts made during the breeding season are the best indicators of the health of the population, a stable or slightly declining one. This downward trend may be more accelerated since 1990, as indicated by later counts not included in the analysis. Both CBC's. indicate a declining population but should be viewed cautiously since so few overwinter here. This species, and all of the other tern species, require private areas that are relatively free of vegetation. Since vegetational growth is fairly rapid, they are forced to move from island to island seeking exposed ground that is free from predators and disturbance. Breeding population inventories are erratic, but indicate stable populations or slightly declining ones (Parnell et al., 1995).

Caspian Tern - A common permanent resident that nests on bay and lagoon islands. They prefer inshore Gulf waters for feeding and Gulf beaches for loafing. TCWS counts indicate a sharp decline in the population, however, early counts may have misreported some Royal Tern nests as this species, hence the decline is probably less dramatic. As explained for Gull-billed Tern, adequate nesting sites are at a premium. The CBC's. show a positive trend which may indicate that more are remaining in the area due to the mild winters. Nothing is known of their movements, breeding success, or other natural history facets for the populations in the Coastal Bend.

Royal Tern - A species that is commonly seen during migration, but uncommonly present during winter months. It occupies many of the same habitats as the preceding species and feeds in the inshore waters of the Gulf. It also nests on islands, usually on dredged material, in the Corpus Christi area. The same problems are applicable for this species as those for the preceding one. All counts show a positive trend. TCWS counts made after 1990 indicate smaller numbers nesting on many overgrown islands. Since this species nests in large numbers and usually in company with Sandwich Terns, the reduced nesting area is a critical problem.

Sandwich Tern - Identical to Royal Tern in every respect, even nesting next to or surrounded by them. TCWS counts show a positive trend like the Royal Tern, and later counts (after 1990) are also lower because of loss of nesting sites and area.

Forster's Tern - Another common permanent resident tern that nests on islands. This species prefers to nest away from others, usually on the berm. TCWS trend shows a decline, due in part to high water levels and inundation of their nests the last few years. Since 1990, water levels have been even higher. The contrasting positive trend for CBC's. documents need for studies of movements between seasons.

Sooty Tern - A rare migrant and summer nester in the area, strictly associated with marine water. It is listed as Threatened statewide. It is a tropical species whose optimum habitat is south of the

US. It is in a long-term decline from historical populations levels and is now almost extirpated from the state. The few numbers and negative trend from TCWS counts shows this clearly. Predators and human disturbance have probably driven them from the Coastal Bend.

Least Tern - A common migrant and summer nester in the area, found only accidentally during winter. They may be found in a greater variety of habitats than any of the other terns. They commonly use the Gulf beaches for breeding and select various barren sand and shell areas for nesting, from flats of Padre Island to new dredged materials placed on islands. The Coastal Least Tern is listed as Threatened by TOES and interior Least Tern is listed as Endangered by TPWD and USFWS. The TCWS counts indicate a severe decline, but this must be cautiously used since this census is not the best design for this often solitary-nesting species. The unique requirements of this species (i.e., fresh dredged material, completely unvegetated, with little or no human disturbance) requires a census designed just for them to adequately determine population trends. High waters in recent years could have also affected their nesting success.

Black Skimmer - Similar in many respects to the Least Tern, especially in breeding requirements and habitats occupied. It is present year-round but uncommon during winter. TOES lists it as Threatened. Both CBC's. and TCWS counts show a sharply declining trend. Loss and degradation of nesting habitat has contributed to the decline. In addition, hatching success also appears down. Individuals have a tendency to scoop out their sand nests on or near the high water line. Any unusually high tide can and has in recent years ended many of their efforts. This species, like all of the colonial nesters, needs management of nesting areas as well as studies to determine hatching success and processes involved in seasonal movement. In most states, populations are stable or showing slight increases (Gochfeld and Burger, 1994).

Pauraque - An uncommon permanent resident found in and near the margins of mottes, oak woods, thorn scrub, and riparian woods. This is the only wintering nightjar with sufficient data for a trend analysis. The positive trend at CCW is due to better recent coverage rather than an increasing population. The actual trend is probably a stable one. Very little is known of this secretive species so it is a good candidate for an in-depth study.

Hummingbird spp. - Since most of the hummingbirds are not present during CBC's., the only two for which there are sufficient numbers to analyze are the Rufous and Buff-bellied, but these data are too few for serious consideration. The trend for the former is declining and rising for the latter. Both are influenced by the severity of the winter and the number of feeders that are being watched. However, the trends at CCW are probably accurate. BBS data show a slight decline in numbers of Buff-bellied Hummingbirds (Calder, 1993).

House Wren - A common migrant and winter resident, found in riparian woodlands, oak woods, mottes, thorn scrub, and urban areas. Both CBC's. and the composite show a rising trend, although in very recent years numbers have decreased.

Ruby-crowned Kinglet - Very similar to the preceding species in occurrence and habitat preference. All trends are positive, but the actual trend is probably smaller. Factors not corrected for in the analysis include mild winters, better coverage, and an increase in suburban

settings that provide acceptable habitats. Information on a national trend is lacking for this species (Ingold and Wallace, 1994).

Blue-gray Gnatcatcher - A traveling companion to the kinglet that infrequently remains during the summer and nests in the area. It occupies the same habitats as its companion and the trends for it are also positive, but under the same constraints as the above. Nationally, the breeding range has expanded northward, but there seems to be an insignificant decrease in the central US. population (Ellison, 1992).

Loggerhead Shrike - A common fall and spring migrant, but uncommon winter and summer resident, though some do nest in the area. They are most often seen on exposed perches in savannas, prairies, mottes, fields, and even in towns. It is listed as C2 by USFWS. The national trend has been negative for several years unlike those from local CBC's. which are slightly positive. This may be due to an increase in nesting, formerly very sparse and erratic, but now reported as an annual event from an increasing number of Coastal Bend locations. Movements of the species is poorly understood, but an investigation might determine the actual cause of these trends.

White-eyed Vireo - A common year-round resident and breeder in the area. They are most often found in riparian woodlands, oak woodlands or mottes, and thorn scrub. The population appears to be increasing as shown by the CBC's.. The increase may be due to better habitat coverage, better recognition of call notes, and mild winters in recent years. The species may be adapting to fragmented habitats caused by increasing urbanization. Its life history is poorly documented and should be further researched. Information on seasonal movements is absent.

Solitary Vireo - An uncommon migrant and winter resident found in the same habitats as the preceding species. The trends are positive from both areas, but probably less than the 4% rise indicated by the combined trend. The same factors that influenced the trends for the preceding species are applicable here.

Orange-crowned Warbler - A common fall and spring migrant and winter resident, found in oak woods and mottes, thorn scrub, riparian woods, savannas, and cities. This is one of the few warblers that is present during CBC's. in enough numbers to warrant a trend analysis. The calculated trends are similar to those of the White-eyed Vireo and are influenced by the same factors. National trends vary dramatically, but there appear to be no extended positive or negative ones (Sogge et al., 1994).

Yellow-rumped Warbler - A common species during migration and as a winter resident but, like all of the warblers, absent in summer. Habitat preference is the same as the preceding species. The combined trend is positive, around 6%, which is similar to the White-eyed Vireo and Orange-crowned Warbler. Again, this positive trend could be influenced by more thorough coverage and warmer winters in recent years.

Common Yellowthroat - A common species during migration and winter, but rarely seen during summer, although a few have bred in the area. This species prefers thick vegetation growing in

fresh and salt marshes or around margins of ponds, lakes and drainage ditches. The positive trend (around 3%) is partly due to improved observer coverage and awareness of habits of this species. Some increased habitat is available due to increased precipitation in recent years that flooded low areas and drainage ditches along roads and fields, thus providing the proper conditions for growth of cattails and other emergent vegetation.

Olive Sparrow - An uncommon permanent resident and breeding species. They are most likely encountered in thorn scrub, oak woods and mottes, and riparian woodlands. This species is listed as C2 by USFWS. Although the trends shown by the CCW data are positive, there could be a slight decline due to destruction of habitat. This species resides in dense understory where it is wary and secretive. Increased awareness of the habitat, habits, and call of this species could account for the positive trend.

Rufous-sided Towhee - A common transient and winter resident preferring oak woods, riparian woodlands, oak mottes, and thorn scrub in that order. Although trends differ at the two locations, one positive and the other negative, the CCW is probably more indicative of the population because of the greater numbers. Their occurrence here is largely dependent on weather. The slope of the trend at CCW is probably high because of improved observer abilities and use of calls in recent years. The population may be a stable one rather than one on the increase.

Cassin's Sparrow - An uncommon winter resident, but common during summer, some of whom nest in the area. Their preferred habitats are thorn scrub, savannas, and prairies in that order. This secretive species is difficult to accurately census in a CBC. The trends are negative and in addition, appropriate habitat has been lost. Surveys of singing males during breeding season should be conducted to determine the status of the population.

Chipping Sparrow - A common winter resident whose presence depends heavily on weather conditions outside the Coastal Bend. They are most likely to be found in riparian woods, oak woods, mottes, and savannas. Trends are positive with large numbers being present in recent years. Improved coverage and better qualified observers could account for some of the indicated positive trend.

Clay-colored Sparrow - A common transient but rare winter resident found in the same habitats as Cassin's Sparrow. The CCW trend is negative which is similar to some trends in other areas of their breeding range (Knapton 1994). Local data are limited and not suitable for a valid analysis.

Field Sparrow - A common winter resident, but rare summer resident and breeder. They prefer the wooded areas of the Coastal Bend, but can be found in thorn scrub and savannas. Trends are positive even though habitat has been lost. There could be a southward and westward extension of their breeding and wintering ranges, which could possibly explain the negative national trends. Carey et al.(1994) reported the causative factor as changes in their breeding habitat.

Vesper Sparrow - A common winter resident found among grasses of prairies and savannas. They may also occur in oak mottes and thorn scrub. The 1% rise in the population at CCW is probable indicative of the status of this species in the Coastal Bend. The large and small numbers during certain years at both locations are weather related and tend to skew results. Surveys on breeding grounds should give a more accurate picture.

Lark Sparrow - A common summer resident and breeder, but uncommon winter resident. They are found in thorn scrub and short grass areas of savannas and prairies. All trends are negative, probably due to loss of habitat, changes in farming practices, and increased use of chemical defoliants. Seasonal movements are unknown and need to be investigated.

Savannah Sparrow - A very common sparrow during winter in tall and short-grass prairies, savannas, thorn scrub, fields, and cities. The trends are strongly positive, but numbers widely fluctuate from year to year. For this reason, the positive trend may be exaggerated. However, this species will accept overgrazed pastures and farm fields, so the increase may be due to increased acceptable habitat. Nationally, populations fluctuate from year to year with no definite trend (Wheelright and Rising, 1993). They also state protection of coastal habitats, which are major migratory stopover sites providing food and cover, is an important management measure for this species,

Grasshopper Sparrow - A common winter and rare summer resident. A few nest in the area and can be found in much the same habitats as the preceding species. CCW and composite trends are positive while ANWR is negative; the latter because numbers are low. This species prefers short- grass areas and will accept overgrazed pastures, which are on the increase area-wide, but decreasing at ANWR.

Le Conte's Sparrow - Another common winter resident found in mid-length grasses of local prairies and savanna's. In recent years, range conditions have improved in this area because of mild winters and wet springs. Although counts are small, numbers have increased at CCW but decreased at ANWR. The wide fluctuation in numbers is due to weather conditions on count days.

Sharp-tailed Sparrow - A rare winter resident of marshes, and grasses around bays, estuaries and islands of the Coastal Bend. All three graphs indicate a declining population which agrees with national trends for eastern populations. Greenlaw and Rising (1994) found that populations are locally concentrated in their specific habitats, but widely distributed in count areas. Therefore, population numbers are inadequately known.

Seaside Sparrow - A common year-round resident found in the same habitats as the preceding species. They breed and nest here. Counts for this species are heavily dependent on count day weather. Foul weather lowers chances for examining preferred habitat. Data provided by these counts are too few for good analysis. Counts made during the breeding season would be more accurate. This species is poorly understood and is a good candidate for study. According to Post and Greenlaw (1994) the overall population is secure and may be increasing in some areas of the United States.

Lincoln's Sparrow - A common winter resident found in a variety of habitats from savanna's and prairies to woods and thorn scrub. All trends are very positive. Increased habitat is available since this species uses edge habitats, but some of the positive trend is due to better coverage of count circles.

Swamp Sparrow - Another common winter resident. Its primary habitats are freshwater marshes, secondarily salt marshes and/or thick vegetation around ponds. Trends are positive, but this may be short-term, due largely to recent wet years, especially at ANWR. Populations of this species are subject to fluctuations, as their habitat improves or declines with wet and dry cycles.

White-throated Sparrow - Commonly found during winter in riparian woodlands, oak woods and mottes, thorn scrub, and savanna's. The negative trend at CCW may be due to loss of riparian habitat in the count zone. The positive trend at ANWR could be due to recent wet years. According to BBS's, the species is declining throughout much of its breeding range (Falls and Kopachena, 1994). This species warrants special study.

White-crowned Sparrow - This species prefers thorn scrub, followed by oak woods and mottes. They are common here during winter. Trends are positive, but some part of this upward trend may be due to better coverage and observer ability.

Meadowlark spp. - Both species are present, but difficult to separate during winter on a CBC. The eastern species is a permanent resident and breeds locally; the western one is only present during winter. The trends from CBC's. indicate a stable or slightly increasing population. The Eastern Meadowlark (the majority in this area) has been listed by various agencies as declining since 1980, and has recently been at the forefront of concern over the decline of grassland species. Lanyon (1994) reported that breeding populations of the Western Meadowlark were slowly declining. Mowing of grassland or cultivation of cropland destroys nests and improved insecticides destroy the food supply. Seasonal movements of populations in the area are poorly understood and winter relationships between the two species should be investigated.

Blackbird spp. - As indicated previously, blackbirds, cowbirds and grackles have been combined into a single unit, since they are usually counted in large mixed flocks as they fly to and from their roosting sites. A positive trend is indicated on both CBC's.. In recent years in certain parts of the Coastal Bend, they have become a nuisance, roosting by the thousands in trees in the center of some of the cities. These areas are not included in the two CBC's.. Causes of this increase have been development of cattle feedlots and clearing more land for planting grain crops. Nesting by Great-tailed Grackles in protected areas within city limits and on dredged material islands has increased in recent years which also adds to their numbers.

V. Summary

As discussed earlier, an estimation of the Trend component of the Time Series using data from CBC's. and TCWS's was used. There has been no attempt to include Cycle or Irregular components, both weather related. However, it is believed that these components may have a

strong impact on the Trend. Future analysis of correlating annual and daily rainfall totals and annual degree-days with count totals and species encountered would be useful.

Other factors that could be investigated include weather patterns, location of jet stream, frontal passages, correlation to party miles and habitat covered, habitat conditions, observer ability and confidence, amount of night effort, and use of taped calls by all observers (playback only, record & playback, species calls, owl calls or imitations).

While this report appears voluminous and could imply that avian resources in the CCBNEP study area have been thoroughly studied, such an impression is false. In fact, there is a dearth of knowledge about bird populations here.

Many of the literature citations included in this report are merely lists of species seen in the area. Others are preliminary studies documenting seasonal occurrence or habitat use by a species or group of species. Very little work has been done on other topics, such as food requirements, food availability, competition, partitioning, nest site selection, nest-building materials, nest success, territory size, post-breeding movements, intermixing with other breeding populations, susceptibility to brood parasites, predation rates, disturbance factors, timing of arrival and departure of migrants, effects of dramatic weather events, effects of weather cycles, etc., etc., etc.

One group of birds intended for review here was “neotropical migrants”. Only a partial review of this group was completed because there is no 5-year dataset available for most of these species. Until PINS/ECOSERVICES began banding projects in 1994, no scientifically organized studies had proven what every knowledgeable birder in the area knew - the central coast region of Texas is a major migration stopover for neotropical birds.

International Shorebird Surveys (ISS) are conducted worldwide to document, track, and protect shorebird breeding, wintering and migration sites. There are no ISS records from the Coastal Bend, yet this area is a major migration site for shorebirds, just as it is for songbirds.

While CBC’s. provide a wealth of information, the trend components calculated from them should be considered only preliminary. CBC’s. are not designed to thoroughly account for the range of factors that affect the hundreds of species observed. To achieve a better understanding of the population dynamics of birds in the Coastal Bend, other types of studies should be initiated and continued long enough to provide comparable datasets.

There is no doubt that the habitats and/or communities listed in this study are important to the livelihood of the birds that reside or pass through the six counties of the Coastal Bend. Consider the following data gathered from the Padre Island National Seashore in recent years by the authors: (1) On only 21 days, during the Spring of 1994, 1057 birds were banded representing 8 orders, 15 families and 81 species. For 1995, approximately 400 have been banded in only 4 days, 208 during one day. Most of these birds are passerines falling into the category of neotropical migrants, many of whom are in low numbers on their northern breeding grounds. Nets were not set to catch the multitude of shorebirds migrating at the same time or thousands more could have been banded. (2) A total of 281,045 ducks, shore and wading birds of 97

species was counted on the western side of Padre Island on 10 days of 1993-94. Of these, 4,000 were "protected" species. (3) During the same period, 51,205 birds (11.1/km) were counted on the Gulf beach; 9,184 (2/km) were "protected" species. (4) Although gulls and most terns were not counted during these projects, the 333,707 birds of 186 species seen or banded is very impressive and indicates the importance of this island and the entire Coastal Bend to, at least, the birds.

It is obvious from the foregoing trends that our methods for monitoring various bird species that reside or migrate through the Coastal Bend are inadequate. The Christmas Bird Counts are only good for those species that reside here or those that take up winter residence here. As a result , those species that migrate through the area in the fall or spring are overlooked. This is the reason for numerous mentions of insufficient data when dealing with warblers, sparrows, and many shorebirds. Based on these poor data, most of the species that fall into these categories showed stable or slightly increasing populations. The exceptions are Cassin's Sparrow, Clay-colored Sparrow, Snowy Plover, Piping Plover, Spotted Sandpiper, and Common Snipe.

Several species, although present during the count period, were not adequately covered because the count circle did not include their prime habitat; Wood Duck, Mallard, Canvasback, Common Goldeneye, Bufflehead, Red-breasted Merganser, Red Knot and Sanderling.

Herons and egrets are also a problem during the CBC's., because we may be dealing with juveniles from the last summer's nesting on dredged material islands. Adults may have migrated south. This is reflected in contrasting results from TCWS's and CBC's. for several species; Great Blue Heron, Great Egret, Snowy Egret, Reddish Egret, White-faced Ibis, and Roseate Spoonbill.

The TCWS's are the most accurate counts that are available for analysis. Indicated trends should be closely examined and each species that is indicated as declining should be studied in detail. Those that show the greatest negative trend are; White-faced Ibis, Tricolored Heron, Reddish Egret, Snowy Egret, Great Egret, Great Blue Heron, Black-crowned Night-Heron, Roseate Spoonbill, Gull-billed Tern, Caspian Tern, Forster's Tern, Least Tern, and Black Skimmer. As indicated in species accounts, some reduction in numbers is due to a lack of protected nesting sites.

Several threatened or endangered species nest in the area: White Pelican, Brown Pelican, Neotropic Cormorant, Reddish Egret, White-faced Ibis, Roseate Spoonbill, Fulvous Whistling Duck, Black-bellied Whistling Duck, Bald Eagle, White-tailed Hawk, Greater Prairie Chicken, Snowy Plover, Sooty Tern, Least Tern, Black Skimmer, Loggerhead Shrike, and Olive Sparrow. As indicated in species accounts, populations of some of these "protected" species show negative trends. Several other "protected" species are here as migrants and/or winter residents, including Ferruginous Hawk, Merlin, Peregrine Falcon, Piping Plover, and Mountain Plover. Detailed information for most of these species while they are in the Coastal Bend, is lacking. Specific studies outlining their needs should be initiated.

Other species whose numbers are seriously declining (CBC and TCWS) and in need of study and assistance are: Great Egret, Snowy Egret, Tricolored Heron, Redhead, Gull-billed Tern, Forster's Tern, Lark Sparrow, Lincoln's Sparrow, and White-throated Sparrow.

From the trend analyses of the representative birds and the missing citations on certain species in the checklist, it is obvious that we the populace are not doing enough to monitor and manage for these birds. Funds and/or programs should be provided for the following:

(1) Establish surveys that would cover the various inland habitats during the breeding season, i.e., additional routes to be added to the Breeding Bird Survey. Insure adequate staffing (i.e, volunteers) and conduct counts at the same time each year.

(2) Conduct mid-winter surveys over prescribed routes through various habitats included in this report; these surveys to take place yearly. They would be similar to the preceding one, but would census those birds that winter in the Coastal Bend.

(3) Improve the quality of the CBC's, if needed, by standardizing methods by which volunteers survey their area. For example, all or no one use artificial means to attract birds, birds flying to and from roosts counted only once, standardize routes and times spent in any part of a count circle. Have a local repository for results from each count, rather than waiting for results to appear in *American Birds* or its successor.

(4) Make periodic checks of birds using Gulf beaches, inshore waters, and sand, mud, and algal flats of the barrier islands (similar to those conducted by Tony Amos and ECOSERVICES for PINS). Several trips over a prescribed distance during each season should be sufficient.

(5) Since barrier islands are a migration route for many neotropical species, begin a banding program similar to the one conducted by PINS for the last two years. Mist nets do not catch all bird species and give only vague ideas about numbers of individuals of each species passing through (too many variables). Walking transects could be established to use in conjunction with nets.

(6) Initiate in-depth, long-term studies on various aspects of the life history of those species currently listed as "protected", those whose populations are declining, and those migrants who spend any season of the year here as residents. Types of studies are indicated for some of the species in the species accounts. Many studies could be conducted by graduate students from nearby universities, if funding were available.

(7) Develop a central agency that would coordinate and serve as a repository for all research and survey results made within the counties included in the CCBNEP study area. This agency would promote an increase in the involvement of federal and state agencies in all monitoring programs.

LITERATURE CITED

Allen, J. A. 1888. Description of two new subspecies of the Seaside Sparrow (*Ammodromus maritimus*). Auk 5: 284-287.

Allen, R. P. 1935a . Notes on the Roseate Spoonbill on the Gulf Coast. Auk 52: 77-78.

Allen, R. P. 1935b. Notes on some bird colonies on the Gulf Coast. Auk 52: 198-200.

Allen, R. P. 1942. The Roseate Spoonbill. Dover Publ. New York, New York. 142 pages.

Allen, R. P. 1947. The flame birds. Dodd, Mead & Co. New York, New York. 232 pages.

Aldrich, J. W. 1946. The United States races of the bobwhite. Auk. 63:493-507.

Aldrich, J. W. 1952. The Whooping Crane. Natl. Audubon Soc. Res. Rept. 3.

Aldrich, J. W. 1954. Additional data on the food of the Whooping Crane. Auk 9: 198.

Amadon, D. J., J. Bull, J. T. Marshall and B. F. King. 1988. Hawks and owls of the world: a distributional and taxonomic list. Proc. West. Found. Vert. Zoo. 3: 293-357.

AOU. 1983. Checklist of North American birds, 6th edition. American Ornithologists' Union. Lawrence, Kansas.

AOU. 1985. Thirty-fifth supplement to the American Ornithologists' Union checklist of North American birds. Auk 102: 680-686.

AOU. 1987. Thirty-sixth supplement to the American Ornithologists' Union checklist of North American birds. Auk 104: 591-596.

AOU. 1989. Thirty-seventh supplement to the American Ornithologists' Union check list of North American birds. Auk 106: 532-538.

AOU. 1991. Thirty-eighth supplement to the American Ornithologists' Union checklist of North American birds. Auk 108: 750-754.

AOU. 1993. Thirty-ninth supplement to the American Ornithologists' Union checklist of North American birds. Auk 110: 675-682.

Anderson, B. J. 1993. Masked Booby (*Sula dactylatra*). The Birds of North America, No. 73. 16 pages.

Anderson, J. T. 1994. Wetland use and selection by waterfowl wintering in coastal Texas. M.S. Thesis, Texas A&M Univ.- Kingsville. Kingsville, Texas. 291 pages.

Angell, T. 1978. Ravens, crows, magpies and jays. Univ. Washington Press. Seattle, Washington. 122 pages.

Arnold, K. A. and J. C. Henderson. 1973. First specimen of Arctic Loon from Texas. Auk 90: 420-421.

Arvin, J., J. Arvin, C. Cottam and G. Unland. 1975. Mexican Crow invades south Texas. Auk 92:3 87-390.

Audubon, J. J. 1946. The birds of North America. Macmillan Co. New York, New York. 435 pages.

Audubon Society. 1977. Field guide to North American birds. Alfred A. Knopf. New York, New York.

Austin, O. L., Jr., (ed.). 1968. Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows and their allies (parts 1 and 2). US Natl. Mus. Bull. 237. 1799 pages.

Austin, O. L., Jr., (ed.). 1968. Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows and allies (part 3). U. S. Natl. Mus. Bull. No. 237.

Bailey, F. M. 1902. The Scissor-tailed Flycatcher in Texas. Condor 6: 30-31.

Bailey, F. M. 1903. The Harris Hawk on his nesting ground. Condor 5: 66-68.

Bailey, F. M. 1916. Meeting spring halfway. Condor 18: 151-155, 183-190, 214-219.

Baker, B. W. 1979. Habitat use, productivity, and nest predation of Rio Grande Turkeys. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas. 46 pages.

Baker, B. W. 1980. Commensal foraging of Scissor-tailed Flycatcher with Rio Grande Turkeys. Wilson Bull. 92: 248.

Baker, D. 1988. Responses of bobwhites, eastern meadowlarks, mourning doves and their habitat to two intensities of continuous grazing. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 47 pages.

Baker, R. W. 1991. Mammalian prey of the common Barn-Owl (*Tyto alba*) along the Texas Coast. Southwestern Nat. 36: 343-347.

Balph, D. F., G. S. Innis, and M. H. Balph. 1980. Kin selection in Rio Grande turkeys: a critical assessment. Auk 97: 854-860.

Bangs, O. 1908. A new name for the Texan Barred Owl. Auk 25: 316.

Bareiss, L. J. 1985. Response of Bobwhites to short duration and continuous grazing in south Texas. M.S. Thesis, Texas Tech Univ. Lubbock, Texas. 37 pages.

Baskin, C. 1989. Vertebrate populations in an ungrazed and a grazed south Texas oak motte. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 123 pages.

Bauer, D. W. 1993. Avian use of wetlands in southern Texas during non-breeding seasons. M.S. Thesis, Texas A&M Univ.-Kingsville. Kingsville, Texas. 156 pages.

Beckham, C. W. 1887. Observations on the birds of southwestern Texas. Proc. US Natl. Mus. 10: 633-696.

Bednarz, J. C. 1995. Harris' Hawk (*Parabuteo unicinctus*). The Birds of North America No. 146. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Bell, M. W. 1975. Bobwhite quail production and habitat in the Texas Coastal Bend. M.S. Thesis, Texas Tech Univ. Lubbock, Texas. 50 pages.

Bell, M. W. and D. A. Klebenow. 1973. Hurricane impact on bobwhite cover. SouthwesterNat. 17: 433-435.

Bellrose, F. C. 1976. Ducks, geese and swans of North America. Stackpole Books. Harrisburg, Pennsylvania. 543 pages.

Bellrose, F. C. and D. J. Holm. 1994. Ecology and management of the Wood Duck. Stackpole Books. Mechanicsburg, Pennsylvania. 239 pages.

Bendire, C. E. 1892. Life histories of North American birds. US Natl. Mus. Spec. Bull. 1.

Benners, G. B. 1887. A collecting trip in Texas. Ornithologist & Oologist. 12(4): 49-52, 12(5):65-69, 12(6): 81-84.

Bent, A. C. 1919. Life histories of North American diving birds. US Natl. Mus. Bull. 107. 239 pages.

Bent, A. C. 1921. Life histories of North American gulls and terns. US Natl. Mus. Bull. 113. 345 pages.

Bent, A. C. 1922. Life histories of North American petrels and pelicans, and their allies. US Natl. Mus. Bull. 1121 pages.

Bent, A. C. 1925. Life histories of North American wild fowl (part 1). US Natl. Mus. Bull. 130. 376 pages.

Bent, A. C. 1926. Life histories of North American wild fowl (part 2). US Natl. Mus. Bull. 126.

Bent, A. C. 1926. Life histories of North American marsh birds. US Natl. Mus. Bull. 135. 490 pages.

Bent, A. C. 1927. Life histories of North American shore birds (part 1). US Natl. Mus. Bull. 142. 420 pages.

Bent, A. C. 1929. Life histories of North American shore birds (part 2). US Natl. Mus. Bull. 146. 411 pages.

Bent, A. C. 1932. Life histories of North American gallinaceous birds. US Natl. Mus. Bull. 162. 490 pages.

Bent, A. C. 1937. Life histories of North American birds of prey (part 1). US Natl. Mus. Bull. 167. 409 pages.

Bent, A. C. 1938. Life histories of North American birds of prey (part 2). US Natl. Mus. Bull. 170. 482 pages.

Bent, A. C. 1939. Life histories of North American woodpeckers. US Natl. Mus. Bull. 174. 334 pages.

Bent, A. C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds and their allies. US Natl. Mus. Bull. 176. 506 pages.

Bent, A. C. 1942. Life histories of North American flycatchers, larks, swallows, and their allies. US Natl. Mus. Bull. 179. 555 pages.

Bent, A. C. 1946. Life histories of North American jays, crows, and titmice. US Natl. Mus. Bull. 191. 495 pages.

Bent, A. C. 1948. Life histories of North American nuthatches, wrens, thrashers and their allies. US Natl. Mus. Bull. 195. 475 pages.

Bent, A. C. 1949. Life histories of North American thrushes, kinglets and their allies. US Natl. Mus. Bull. 196. 455 pages.

Bent, A. C. 1950. Life histories of North American wagtails, shrikes, vireos, and their allies. US Natl. Mus. Bull. 197. 411 pages.

Bent, A. C. 1953. Life histories of North American wood warblers. US Natl. Mus. Bull. 203. 734 pages.

Bent, A. C. 1958. Life histories of North American blackbirds, orioles, tanagers, and allies. US Natl. Mus. Bull. 211. 549 pages.

Bergstrom, P. W. 1985. Male incubation in Wilson's Plover (*Charadrius wilsonia*). Auk 98: 835-838.

Bergstrom, P. W. 1986. Daylight incubation sex roles in Wilson's Plover. Condor 88: 113-115.

Binkley, C. S. and R. S. Miller. 1980. Survivorship of the Whooping Crane, *Grus americana*. Ecology 61: 434-437.

Bishop, M. A. 1984. The dynamics of subadult flocks of Whooping Cranes wintering in Texas, 1978-79 through 1982-83. M.S. Thesis, Texas A&M Univ. College Station, Texas. 128 pages.

Blacklock, G. W. 1976. The 1976 cooperative census of fish-eating birds middle coast of Texas (Region II). Proc. 4th Ann. Meet. Texas Fish Eating Bird Conf. TPWD. Austin, Texas. 107 pages.

Blacklock, G. W. and J. Peabody. 1983. Two specimen records of Leach's Storm-Petrel (*Oceanodroma leucorhoa*) for Texas. Bull. Texas Ornith. Soc. 16: 34.

Blacklock, G. W., D. B. Blankinship, S. Kennedy, K. A. King, R. T. Paul, R. D. Slack, J. Smith, and R. Telfair II. 1978. The Texas colonial waterbird census, 1973-1976. TPWD FA Rept. 15. Austin, Texas. 108 pages.

Bolen, E. G. 1964. Weights and linear measurements of Black-bellied Tree Ducks. Texas J. Sci. 16: 257-260.

Bolen, E. G. 1967. The ecology of the black-bellied tree duck in southern Texas. Ph.D. Dissertation, Utah State Univ. Logan, Utah.

Bolen, E. G. 1978. Long-distance displacement of two southern barn owls. Bird Banding 49: 277-290.

Bolen, E. G.. 1980. Winter returns of American Kestrels. J. Field Ornithol. 51(2).

Bolen, E. G. and J. J. Beecham. 1970. Notes on the foods of juvenile black-bellied tree ducks. Wilson Bull. 82: 325-326.

Bolen, E. G. and B. R. Chapman . 1981. Estimating winter sex ratios of buffleheads. Southwestern Nat. 6: 49-52.

Bolen, E. G. and C. Cottam. 1967. Wood Duck nesting record from south Texas. Southwestern Nat. 12:189-205.

Bolen, E. G. and C. Cottam. 1973. Notes on the color phases of the Reddish Egret (*Dichromanassa rufescens*) in Texas. Southwestern Nat. 20: 133-136.

Bolen, E. G. and B. MacDaniel and C. Cottam. 1964. Natural history of the Black-bellied Tree Duck (*Dendrocygna autumnalis*) in southern Texas. Southwestern Nat. 9: 78-88.

Bolen, E. G. and B. J. Forsyth. 1967. Foods of the Black-bellied Tree Duck in south Texas. Wilson Bull. 79: 43-49.

Bookhout, T. A. 1995. Yellow Rail (*Coturnicops noveboracensis*). The birds of North America No. 139. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Boyce, M. S. and R. S. Miller. 1985. Ten-year periodicity in Whooping Crane census. Auk 102: 658-660.

Boydstun, C. P. and C. A. DeYoung. 1985. Distribution and relative abundance of White-tipped Doves in south Texas. Southwestern Nat. 30: 567-571.

Briskie, J. V. 1994. Least Flycatcher (*Empidonax minimus*). The Birds of North America No. 99. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Britton, J. C. and B. Morton. 1989. Shore ecology of the Gulf of Mexico. Univ. of Texas Press. Austin, Texas. 387 pages.

Brown, B. T. 1993. Bell's vireo (*Vireo bellii*). The Birds of North America No. 35. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Brown, C. R. & M. B. Brown. 1995. Cliff Swallow (*Hirundo pyrrhonota*). The Birds of North America No. 149. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 32 pages.

Brown, L. and D. Amadon. 1968. Eagles hawks, and falcons of the world. McGraw-Hill Book Co. New York, New York.

Brown, R. E. & J. G. Dickson. 1994. Swainson's Warbler (*Limnothlypis swainsonii*). The Birds of North America No. 126. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Brown, S. L. 1988. The maintenance and consequences of polygyny in Eastern Meadowlarks *Sturnella magna*. Ph.D. dissertation, Purdue Univ. West Lafayette, Indiana.

Brown, W. H. 1971. Winter population trends in the Red-shouldered Hawk. Amer. Birds: 813-819.

Bryan, K., T. Gallucci, G. Lasley and D. Riskind. 1991. A checklist of Texas birds. TPWD Tech. Ser. No. 32. Austin, Texas.

Burger, J. and M. Gochfeld. 1994. Franklin's Gull (*Larus pipixcan*). The Birds of North America No. 116. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Burger, J. and L. M. Miller. 1977. Colony and nest site selection in White-faced and Glossy Ibises. Auk 94: 664-676.

Burrows, D. B. 1917. White-tailed Hawk. Oologist 34:78-81.

Burton, J. A., (ed.). 1984. Owls of the world. Tanager Books. Dover, New Hampshire.

Butcher, G. S. 1990. Audubon Christmas bird counts. Pages 5-13 i*n* Sauer, J. R. and S. Droege, (eds.), Survey designs and statistical methods for the estimation of avian population trends. USFWS Biol. Rept. 90(1). Washington, D. C.

Butcher, G. S. and C. E. McCulloch. 1990. Influence of observer effort on the number of individual birds recorded on Christmas bird counts. Pages 120-129 i*n* Sauer, J. R. and S. Droege, (eds.), Survey designs and statistical methods for the estimation of avian populations. USFWS Biol. Rept. 90(1). Washington, D. C.

Butler, R. W. 1992. Great Blue Heron (*Ardea herodias*). The Birds of North America No. 25. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Byrd, C. L. 1982. Home range, habitat and prey utilization of the Barn Owl (*Tyto alba*) in south Texas. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 88 pages.

Cabe, P. R. 1993. European Starling (*Sturnus vulgaris*). The Birds of North America No. 48. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Cahn, A. R. 1922. Notes on the summer avifauna of Bird Island, Texas and vicinity. Condor 24: 169-180.

Cahn, A. R. 1923. Corrections as to the summer avifauna of Bird Island, Texas. Condor 25: 82-184.

Cain, B. W. 1970. Growth and plumage development of the Black-bellied Tree Duck, *Dendrocygna autumnalis* (Linnaeus). TAIUS 3: 25-48.

Cain, B. W. 1976. Energetics of growth for Black-bellied Tree Ducks. Condor 78: 124- 127.

Cain, B. W. 1988. Wintering waterfowl habitat in Texas. Pages 583-597 i*n* Weller, M. W. (ed.), Waterfowl in winter. Univ. of Minn. Press. Minneapolis, Minnesota.

Cain, B. W., R. W. Whyte, and P. M. Picks. 1977. Southern nesting record of the American Woodcock. Bull. Texas Ornith. Soc. 10: 46.

Calder, W. A. 1993. Rufous Hummingbird (*Selasphorus rufus*). The Birds of North America No. 53. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Calder, W. A. and L. L. Calder. 1994. Calliope Hummingbird (*Stellula calliope)*. The Birds of North America No. 135. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Capen, D. E. 1977. The impact of pesticides on the White-faced Ibis. Ph.D. Dissertation, Utah State Univ. Logan, Utah. 85 pages.

Carey, M., D. E. Burhans and D. A. Nelson. 1994. Field Sparrow (*Spizella pusilla*). The Birds of North America No. 103. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Carroll, J. J. 1900. Notes on the birds of Refugio county, Texas. Auk 17: 337-348.

Carroll, J. J. 1927. Down bird island way. Wilson Bull. 34: 195-207.

Carter, M. D. 1986. The parasitic behavior of the bronzed cowbirds in Texas. Condor 88:11-25.

Chaney, A. H., G. W. Blacklock, and S. G. Bartels. 1993. Bird use of Padre Island National Seashore Gulf beach from September 1992 - August 1993. Padre Island National Seashore Contract No. 1443PX749092188. Corpus Christi, Texas. 85 pages

Chaney, A. H., G. W. Blacklock, and S. G. Bartels. 1994. Results of banding birds during spring and fall migration on the Padre Island National Seashore. Padre Island National Seashore Contract No. 1443PX749094105. Corpus Christi, Texas.

Chaney, A. H., B. R. Chapman, J. P. Karges, O. A. Nelson, R. R. Schmidt, and L. C. Thebeau. 1976. Use of dredged material islands by colonial seabirds and wading birds in Texas. Tech. Rept. D-78-8, Office, Chief of Engineers, US Army. Washington, D. C. 317 pages.

Chapman, B. R. 1982. An apparent instance of communal nesting by American Oystercatchers. Wilson Bull. 94: 584.

Chapman, B. R. 1984. Seasonal abundance and habitat-use patterns of coastal bird populations on Padre and Mustang Island barrier beaches [following the *Ixtoc I* oil spill]. FWS/OBS-83/31. Washington, D.C. 73 pages.

Chapman, B. R. 1988. History of the White Pelican colonies in south Texas and northern Tamaulipas. Colonial Waterbirds 11: 275-283

Chapman, B. R. and S. D. Castro. 1972. Additional vertebrate prey of the Loggerhead Shrike. Wilson Bull. 84: 496-497.

Chapman, F. M. 1891. On the birds observed near Corpus Christi, Texas during March and April, 1891. Bull. Am. Mus. Natl. Hist. 3: 315-328.

Chapman, F. M. 1907. The warblers of North America. Appleton & Co. New York, New York.

Chronister, C. D. 1985. Egg laying and incubation behavior of Black-bellied Whistling Ducks. M.S. Thesis, Univ. of Minnesota. Duluth, Minnesota. 95 pages.

Clapp, R. B., R. C. Banks, D. Morgan-Jacobs, and W. A. Hoffman. 1982. Marine birds of the southeastern United States and the Gulf of Mexico part I: Gaviiformes through Pelecaniformes. USFWS and US Natl. Mus. Nat. Hist. Washington, D. C. 638 pages.

Clapp, R. B., R. C. Banks, D. Morgan-Jacobs, and W. A. Hoffman. 1982. Marine birds of the southeastern United States and the Gulf of Mexico part II: Anseriformes. USFWS and US Natl. Mus. Nat. Hist. Washington, D. C. 492 pages.

Clapp, R. B., R. C. Banks, and D. Morgan-Jacobs. 1983. . Marine birds of the southeastern United States and the Gulf of Mexico part III: Charadriiformes. FWS/OBS-83/30. Washington, D. C. 854 pages.

Clark, W. S. and B. K. Wheeler. 1987. A field guide to hawks of North America. Houghton Mifflin Co. Boston, Massachusetts. 418 pages.

Colwell, M. A. and J. R. Jehl, Jr. 1994. Wilson's Phalarope (*Phalaropus tricolor*). The Birds of North America No. 83. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Confer, J. L. 1992. Golden-winged Warbler (*Vermivora chrysoptera)*. The Birds of North America No. 20. Phil. Acad. Nat. Sci and AOU. Washington, D.C. 16 pages.

Conway, D. K., and K. L. Benson. 1990. A range extension for nesting Botteri's Sparrow *Aimophila botterii* in southern Texas. Southwestern Nat. 35: 348-349.

Cooke, W. W. 1904. Distribution and migration of North American warblers. USDA Biol. Survey, Bull. 18.

Cooke, W. W. 1905. Routes of bird migration. Auk 22: 1-11.

Cooke, W. W. 1908. The migration of flycatchers. Bird Lore 10(1): 16-17.

Cooke, W. W. 1910. The migratory movements of birds in relation to the weather. USDA Yearbook. Washington, D.C. 1911 pages.

Cooper, J. M. 1994. Least Sandpiper (*Calidris minutilla*). The birds of North America, No. 115. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Cornelius, S. E. 1977. Food and resource utilization by wintering redheads on lower Laguna Madre. J. Wildl. Manage. 41: 374-385.

Cornelius, S. E. 1982. Wetland salinity and salt gland size in the Redhead *Aythya americana*. Auk 99: 774-778.

Cottam, C., E. G. Bolen and R. Zink. 1975. Sabine's Gull on south Texas coast. Southwestern Nat. 20: 135-135.

Cottam, C. and P. Knappen. 1939. Food of some uncommon North American birds. Auk 56:138-169.

Craven, E. 1946. The status of the Whooping Crane on the Aransas Refuge, Texas. Condor 49: 37-39.

Crocoll, S. T. 1994. Red-shouldered Hawk (*Buteo lineatus*). The Birds of North America No. 107. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Csada, R. D. and R. M. Brigham. 1992. Common Poorwill (*Phalaenoptilus nuttallii*). The Birds of North America No. 32. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Curson, J., D. Quinax and D. Beadle. 1994. Warblers of the Americas. Houghton Mifflin Co. Boston, Massachusetts.

Davis, V. 1969. Effects of diet on the development of the digestive system of the English Sparrow (*Passer domesticus* L.). M. S. Thesis, Texas A&I Univ. Kingsville, Texas. 49 pages.

Davis, W. E., Jr. 1993. Black-crowned Night-Heron (*Nycticorax nycticorax*). The Birds of North America No. 74. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Davis, W. E., Jr. and J. A. Kushlan. 1994. Green Heron (*Butorides virescens*). The Birds of North America No. 129. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

DeGraaf, R. M. and B. R. Payne. 1975. Economic values of non-game birds and some urban wildlife research needs. Trans. North Amer. Wildland Nat. Resource Conf. 40:281-287.

Delnicki, D., E. G. Bolen and C. Cottam. 1976. An unusual clutch size of the Black-bellied Whistling Duck. Wilson Bull. 88: 347-348.

DePue, J. 1974. Nesting and reproduction of the Black Skimmer (*Rhynchops niger niger* Linnaeus) on four spoil islands in the Laguna Madre, Texas. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 190 pages.

Derden, D. S. 1982. Winter territoriality and population dynamics of the American Kestrel, (*Falco sparverius*) in south central Texas. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 85 pages.

Derrickson, K. C. and R. Breitwisch. 1992. Northern Mockingbird (*Mimus polyglottos*). The Birds of North America No. 7. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 26 pages.

Dilworth, E. H. 1995. Production and operations management. Random House. New York, New York.

Ditto, L. R. 1983. Observations on nesting White-tailed Hawks. Raptor Res. 17:91

Dixon, K. L. 1955. An ecological analysis of the interbreeding of crested titmice in Texas. Univ. Calif. Press. Berkeley, California. 201 pages.

Dixon, K. L. 1978. A distributional history of the Black-crested Titmouse. Amer. Midl. Nat. 100:29-42.

Dixon, K. L. 1990. Constancy of margins of the hybrid zone in titmice of the *Parus bicolor* complex in coastal Texas. Auk 107: 184-188.

Doerr, T. B. 1988. Effects of supplemental feeding on Northern Bobwhite populations in south Texas. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas. 56 pages.

Doughty, R. W. 1988. The mockingbird. Univ. Texas Press. Austin, Texas. 88 pages.

Dugger, B. D., K. M. Dugger, and L. H. Fredrickson. 1994. Hooded Merganser (*Lophodytes cucullatus)*. The Birds of North America No. 98. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Dumont, P. A. 1933. Old specimen of the Blue-faced Booby from Texas. Auk. 50: 92.

Duncan, C. D. and R. W. Havard. 1980. Pelagic birds of the northern Gulf of Mexico. Amer. Birds 4: 122-132.

Dunn, E. H. 1995. Bias in Christmas bird counts for species that visit feeders. Wilson Bull. 107: 122-130.

Dunn, E. H. and D. J. Agro. 1995. Black Tern (*Chlidonias niger*). The Birds of North America No. 147. Phil. Acad. Nat. Sci. and AOU. Washington, D. C. 24 pages.

Eaton, S. W. 1992. Wild Turkey (*Meleagris gallopavo*). The Birds of North America No. 22. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Ecoservices. 1993a. Laguna Madre bird project from Yarborough Pass to Mansfield Channel during July 1992 through April 1993. Padre Island National Seashore Contract No. 1443PX7000092582. Corpus Christi, Texas. 82 pages.

Ecoservices. 1993b. Piping Plovers and other protected bird species on TGLO property "The Village", Corpus Christi, Nueces County, Texas. Rept. to TGLO. Austin, Texas. 104 pages.

Eddleman, W. R., R. E. Flores and M. L. Legare. 1994. Black Rail (*Laterallus jamaicensis*). The Birds of North America, No. 123. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Ehrlich, P. R., D. S. Dobkin and D. Wheye. 1988. The birder's handbook. Simon and Schuster. New York, New York. 785 pages.

Ehrlich, P. R. and D. S. Dobkin. 1992. Birds in jeopardy. Stanford Univ. Press. Stanford, California. 259 pages.

Eifrig, C. W. G. 1929. Texan bird habitats. Auk 46: 70-78.

Ellison, W. G. 1992. Blue-gray Gnatcatcher (*Polioptila caerulea*). The Birds of North America No. 23. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Ely, C. R. and A. X. Dzubin. 1994. Greater White-fronted Goose (*Anser albifrons*). The Birds f North America No. 131. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 32 pages.

Emlen, J. T. 1972. Size and structure of a wintering avian community in southern Texas. Ecology 53: 317-329.

Espey, Huston, and Assoc. 1993. Piping Plover habitat survey of dredged_material disposal areas along the Gulf Intracoastal Waterway from Corpus Christi Bay to the mudflats. Rept. to USACOE. Galveston, Texas.

Eubanks, T. L., P. Kerlinger and R. H. Payne. 1993. High Island: a case study in avitourism. Birding 25: 415-420.

Evans, R. M. and F. L. Knopf. 1993. American White Pelican (*Pelecanus erythrorhynchos*). The Birds of North America No. 57. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Evans-Ogden, L. J. and B. J. Stutchbury. 1994. Hooded Warbler (*Wilsonia citrina*). The Birds of North America No. 110. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Fall, B. A. 1973. Noteworthy bird records from south Texas (Kenedy county). Southwestern Nat. 18: 244-247.

Falls, J. B. and J. G. Kopachena. 1994. White-throated Sparrow (*Zonotrichia albicollis*). The Birds of North America No. 128. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 32 pages.

Farquhar, C. C. 1992. White-tailed Hawk (*Buteo albicaudatus*). The Birds of North America No. 2. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Fischer, D. H. 1979. Black-billed Cuckoo (*Coccyzus erythropthalmus*) breeding in south Texas. Bull. Texas Ornith. Soc. 12: 25-26.

Fischer, D. H. 1981. Wintering ecology of thrashers in southern Texas. Condor 83: 340-346.

Fitch, F. W., Jr. 1950. Life history of Scissor-tailed Flycatcher. Auk 67: 145-168.

Flickinger, E. L. and C. M. Bunck. 1987. Numbers of oil-killed bird carcasses at crude oil pits in Texas. Southwestern Nat. 32: 377-381.

Folse, L. J., Jr. 1974. Population ecology of Roadrunners (*Geococcyx californianus*) in south Texas. M.S. Thesis, Texas A&M Univ. College Station, Texas. 126 pages.

Folse, L. J., Jr. and K. A. Arnold. 1976. Secondary sex characteristics in roadrunners. Bird Banding 47: 115-118.

Folse, L. J., Jr. and K. A. Arnold. 1978. Population ecology of roadrunners (*Geococcyx californianus*) in south Texas. Southwestern Nat. 23: 1-27.

Forsyth, B. J. and D. James. 1971. Springtime movements of transient nocturnally migrating landbirds in the Gulf Coastal Bend region of Texas. Condor 73: 193-207.

Frentriss, C. D. 1976. Nesting Brown Pelican response to low flying fixed-wing aircraft. Proc. 4th Ann. Meet. Texas Fish-eating Bird Conf. TPWD. Austin, Texas. 107 pages.

Gauthier, G. 1993. Bufflehead (*Bucephala albeola*). The Birds of North America No. 67. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Gehlbach, F. R. 1967. New records of warblers in Texas. Southwestern Nat. 12: 109-110.

Gibbs, J. P., S. Melvin and F. A. Reid. 1992a. American Bittern (*Botaurus lentiginosus*). The Birds of North America No. 18. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 12 pages.

Gibbs, J. P., S. Melvin and F. A. Reid. 1992b. Least Bittern (*Ixobrychus exilis)*. The Birds of North America No. 17. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 12 pages.

Glazener, W. C. 1964. Note on the feeding habits of Caracara in south Texas. Condor 66: 162.

Glazener, W. C. 1967. Management of the Rio Grande Turkey. Pages 453-492 *in* Hewitt, O. H. (ed.), The Wild Turkey and it's management. The Wildlife Society. Washington D.C.

Glazener, W. C., D. Ransom Jr., J. R. Cary, and O. J. Rongstad. 1990. Demographic analysis of a Rio Grande Turkey population. Southwestern Nat. 35: 23-27.

Gochfeld, M. and J. Burger. 1994. Black Skimmer (*Rynchops niger*). The Birds of North America No. 108. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Godfrey, W. E. 1946. A new Carolina Wren. Auk 63: 564-568.

Goering, D. K. 1974. Organochlorine residues and eggshell characteristics in three species of ciconiiform birds. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas. 49 pages.

Goering, D. K. and R. Cherry. 1971. Nesting mortality in a Texas heronry. Wilson Bull. 83: 303-305.

Goodwin, D. 1970. Pigeons and doves of the world. Cornell Univ. Press. Ithaca, New York. 466 pages.

Gratto-Trevor, C. L. 1992. Semipalmated Sandpiper (*Calidris pusilla)*. The Birds of North America No. 6. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Greenlaw, J. S. and J. D. Rising. 1994. Sharp-tailed Sparrow (*Ammodramus caudacutus*). The Birds of North America No. 112. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Greenwalt, C. H. 1960. Hummingbirds. Doubleday & Co. Inc. New York, New York. 250 pages.

Greenway, J. C., Jr. 1967. Extinct and vanishing birds of the world. Dover Publ. New York, New York.

Griscom, L. 1921. The coastal prairies of southern Texas, an ornithological paradise. Amer. Mus. Nat. Hist. 25: 70-75.

Griscom, L. and A. Sprunt, Jr. 1957. The warblers of America. Devin-Adair Co. New York, New York. 356 pages.

Grubb, T. C., Jr. and B. V. Pravosudov. 1994. Tufted Titmouse (*Parus bicolor*). The Birds of North America No. 86. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Gunter, G. 1945. A record of the Gannet from the Texas coast. Auk 62: 311-312.

Guthery, F. 1986. Beef, brush and bobwhites. Caesar Kleberg Wild. Res. Inst. Kingsville, Texas. 182 pages.

Hagar, C. N. 1944. Flamingo on the Texas coast. Auk 61: 301-302.

Haig, S. M. 1992. Piping Plover (*Charadrius melodus*). The Birds of North America No. 2. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 18 pages.

Haig, S. M. and L. W. Oring. 1985. Distribution and status of the Piping Plover throughout the annual cycle. J. Field Ornith. 56: 334-345.

Haig, S. M. and J. Plissner. 1993. Distribution and abundance of Piping Plovers: results and implications of the 1991 international census. Condor 95: 145-156.

Haigh, S. 1984. Habitat selection of nesting birds on two lakes in south Texas. M. S. Thesis, Texas A&I Univ. Kingsville, Texas. 84 pages.

Hall, G. A. 1994. Magnolia Warbler (*Dendroica magnolia*). The Birds of North America No. 136. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Hamas, M. J. 1994. Belted Kingfisher (*Ceryle alcyon*). The Birds of North America No. 84. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Hamilton, K. L. 1981. Caracara kleptoparasitizes Marsh Hawk. Southwestern Nat. 26: 440.

Hamilton, K. L. 1982. The energetic cost of incubation and bioenergetics of the Barn Owl. Ph.D. Dissertation, Utah State Univ. Logan, Utah. 122 pages.

Hancock, J. and J. Kushlan. 1984. The herons handbook. Harper and Row New York, New York. 288 pages.

Hancock, J. L. 1887. Notes on observations on the ornithology of Corpus Christi and vicinity, Texas. Ridgeway Ornithological Club 2: 11-23.

Harrison, P. 1983. Seabirds: an identification guide. Houghton Mifflin. Boston, Massachusetts. 448 pages.

Haucke, H. H. 1971. Predation of White-tailed and a Harris' Hawk on a wild turkey polt. Condor 73: 475

Haucke, H. H. and W. H. Kiel, Jr. 1973. Jabiru in south Texas. Auk 90: 675-676.

Haug, E. A., B. A. Milsap and M. S. Martell. 1993. Burrowing Owl (*Speotyto cunicularia*). The Birds of North America No. 61. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Hayman, P., J. Marchant and T. Prater. 1951. Shorebirds: an identification guide to the waders of the world. Houghton Mifflin. Boston, Massachusetts. 412 pages.

Haynie, C. H. 1992a. Texas bird records report for 1991. Bull. Texas Ornith. Soc. 25:2-12.

Haynie, C. H. 1992b. Texas bird records report for 1992. Bull. Texas Ornith. Soc. 25:30-41.

Haynie, C. H. 1993. Texas bird records report for 1993. Bull. Texas Ornith. Soc. 26:2-13.

Hector, D. P. 1987. The decline of the Aplomado Falcon in the United States. Amer. Birds 41: 381-389.

Heins, M. N. 1984. Ecology and behavior of Black-bellied Whistling Ducks broods in south Texas. M.S. Thesis, Texas Tech Univ. Lubbock, Texas. 84 pages.

Heins-Loy, M. 1986. Fall age ratios of the Black-bellied Whistling Duck. Southwestern Nat. 31: 107-109.

Henshaw, H. W. 1884. The shore larks of the United States and adjacent territories. Auk 1: 254-268.

Hensley, T. S. 1977. Prevalence of certain disease antibodies and blood parasites in Wild Turkeys in Texas. M.S. Thesis, Texas A&M Univ. College Station, Texas. 33 pages.

Hill, G. E. 1993. House Finch (*Carpodacus mexicanus*). The Birds of North America No. 46. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Hill, G. E. 1995. Black-headed Grosbeak (*Pheucticus melanocephalus*). The Birds of North America No. 143. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Hingtgen, T. M., R. Mulholland, and R. W. Reppening. 1985. Habitat suitability index models: White Ibis. USFWS Biol. Rept. 82(10.93). 18 pages.

Hingtgen, T. M., R. Mulholland, and A. V. Zale. 1985. Habitat suitability index models: Eastern Brown Pelican. USFWS Biol. Rept. 82(10.90). 20 pages.

Hogg, R. V. and J. Ledolter. 1987. Engineering statistics. Macmillan Publ. Co. New York, New York.

Holmes, R. T. 1994. Black-throated Blue Warbler (*Dendroica caerulescens*). The Birds of North America No. 87. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Holt, D. W. and S. M. Leasure. 1993. Short-eared Owl (*Asio flammeus*). The Birds of North America No. 62. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Holt, H. R. 1993. A birder's guide to the Texas coast. American Birding Assoc., Inc. 214 pages.

Holt, S. and W. H. Neel. 1981. South Texas region - Flammulated Owl record. Amer. Birds 35:203.

Ingold, J. L. 1993. Blue Grosbeak (*Guiraca caerulea*). The Birds of North America No. 79. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Ingold, J. L. and G. E. Wallace. 1994. Ruby-crowned Kinglet (*Regulus calendula*). The Birds of North America No. 119. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

James, P. 1956. Destruction of warblers on Padre Island, Texas in May, 1951. Wilson Bull. 68: 224-227.

Johnsgard, P. A. 1973. Grouse and quail of North America. Univ. Nebraska Press. Lincoln, Nebraska. 553 pages.

Johnsgard, P. A. 1978. Ducks, geese and swans of the world. Univ. Nebraska Press. Lincoln, Nebraska. 404 pages.

Johnsgard, P. A. 1981. The plovers, sandpipers and snipes of the world. Univ. Nebraska Press. Lincoln, Nebraska. 493 pages.

Johnsgard, P. A. 1988. North American owls. Smithsonian Inst. Press. Washington, D.C. 295 pages.

Johnsgard, P. A. 1990. Hawks eagles and falcons of North America. Smithsonian Inst. Press. Washington, D. C.

Johnsgard, P. A. and D. Hagemeyer. 1969. The Masked Duck in the United States. Auk 86: 691-695.

Johnston, R. F. 1959. The Green Jay (*Cyanocorax yncas*) in Kennedy (sic.) County, Texas. Tex. J. Sci. 11: 320.

Johnston, R. F. 1964. Remarks on the behavior of the Ground Dove. Condor 66: 65-69.

Johnston, R. F. 1992. Rock Dove (*Columba livia*). The Birds of North America No. 13. Phil. Acad. Sci. and AOU. Washington, D.C. 16 pages.

Kassinis, N. I. 1994. Bobwhite flight. M.S. Thesis. Texas A&M Univ.-Kingsville. Kingsville, Texas. 42 pages.

Kaufman, K. 1990. A field guide to advanced birding: birding challenges and how to approach them. Houghton Mifflin Co. Boston, Massachusetts. 299 pages.

Kellert, S. R. 1980. Activities of the American public relating to animals: phase II report. USFWS. Washington, D.C. 49 pages.

Keppie, D. M. and R. M. Whiting, Jr. 1994. American Woodcock (*Scolopax minor*). The Birds of North America No. 100. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Kessler, W. B. 1979. The Attwater's Greater Prairie Chicken: endangered grouse of the Texas coastal prairie. *In* Drawe, D. L. (ed.), Proc. 1st Welder Wildlife Foundation Symp. Welder Wildlife Foundation. Sinton, Texas.

King, K. A., D. R. Blankenship, and R. T. Paul. 1977. Ticks as a factor in the 1975 nesting failure of Texas Brown Pelicans. Wilson Bull. 89: 156-158.

King, K. A., E. L. Flickinger, and H. H. Hildebrand. 1977. The decline of Brown Pelicans on the Louisiana and Texas Gulf Coast. Southwestern Nat. 21:417-431.

King, K. A., S. Macko, P. L. Parker, and E. Payne. 1979. Resuspension of oil: probable cause of Brown Pelican fatality. Bull. Environ. Contam. Toxicol. 23: 800-805.

Knapten, R. W. 1994. Clay-colored Sparrow (*Spizella pallida*). The Birds of North America No. 120. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Koenig, R. L. 1969. A comparison of the winter food habits of three species of waterfowl from the upper Laguna Madre of Texas. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 59 pages.

Kohlhass, A. K. 1985. An analysis of four census techniques used on colonial nesting waterbirds in the Laguna Madre, Texas. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 134 pages.

Kopeny, M. T. 1988. Effect of thorn brush on distribution and nest site selection of White-tailed Hawks (*Buteo albicaudatus*) in Texas. Ph.D. dissertation, North Dakota State Univ. Fargo, North Dakota.

Kortwright, F. H. 1942. The ducks, geese and swans of North America. The Stackpole Co. Harrisburg, Pennsylvania. 476 pages.

Krajewski, C. 1989. Phylogenetic relationships among cranes (Gruiformes: Gruidae) based on DNA hybridization. Auk 106: 603-618.

Krajewski, C. and J. W. Fetzner, Jr. 1994 Phylogeny of cranes (Gruiformes: Gruidae) based on cytochrome-B DNA sequences. Auk 111:351-365.

Kricher, J. C. 1995. Black-and-white Warbler (*Miniotilta varia*). The Birds of North America No. 158. Phil. Nat. Acad. Sci. and AOU. Washington, D.C. 20 pages.

Kushlan, J. A. and K. L. Bildstein. 1992. White Ibis (*Eudocimus albus*). The Birds of North America No. 9. Phil. Nat. Acad. Sci. and AOU. Washington, D.C. 20 pages.

Kutac, E. A. 1982. Texas birds: where they are and how to find them. Gulf Publ. Co. Houston, Texas.

Labuda, S. 1968. South Texas region - Jacana breeding record. Audubon Field Notes 22: 625.

Lamont, T. and W. Reichel. 1970. Organochlorine pesticide residues in Whooping Cranes and Everglade Kite. Auk 87: 158-159.

Lanctot, R. B. and C.D. Laredo. 1994. Buff-breasted Sandpiper (*Tryngites subruficollis*). The Birds of North America No. 91. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Langschied, T. M. 1994. Temporal variation in avian communities in southern Texas. M.S. Thesis, Texas A&M Univ.-Kingsville. Kingsville, Texas. 120 pages.

Lanyon, W. E. 1994. Western Meadowlark (*Sturnella neglecta*). The Birds of North America No. 104. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Lanyon, W. E. 1995. Eastern Meadowlark (*Sturnella magna*). The Birds of North America No. 160. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Lasley, G. W. 1981. South Texas region - Brown Booby record. Amer. Birds 35: 202.

Lasley, G. W. 1983. The winter season - South Texas region. Amer. Birds 37: 317-318.

Lasley, G. W. 1988. Texas bird records report for 1987. Bull Texas Ornith. Soc. 21: 25-32

Lasley, G. W. 1989. Texas bird records report for 1988. Bull. Texas Ornith. Soc. 22:2-14.

Lasley, G. W. 1991. Texas bird records report for 1990. Bull. Texas Ornith. Soc. 26:2-13.

Lawrence, R. B. 1927. Masked Duck (*Nomonyx dominicus*) in Texas. Auk 44: 415.

Layton, R. B. 1969. The Purple Martin. Nature Books. Jackson, Mississippi. 191 pages.

Lehman, V. W. 1941. Attwater's Prairie Chicken, its life history and management. North Amer. Fauna 57:1-65.

Lehman, V. W. 1984. Bobwhites in the Rio Grande Plain of Texas. Texas A&M Univ. Press. College Station, Texas. 371 pages.

Lemon, R. E. and A. Herzog. 1969. The vocal behavior of cardinals and pyrrhuloxias in Texas. Condor 71: 1-15.

Leslie, J. C. and P. J. Zwank. 1985. Habitat suitability index models: Lesser Snow Goose (wintering). USFWS Biol. Rept. 82(10.97). Washington, D. C. 16 pages.

Lewis, J. C. 1983. Habitat suitability index models: Roseate Spoonbill. FWS/OBS-82/10.50. Washington, D. C. 16 pages.

Lewis, J. C. 1995. Whooping Crane (*Grus americana*). The Birds of North America No. 153. Phil. Acad. Nat. Sci. and AOU. Washington D.C. 28 pages.

Lies, M. F. and W . H. Behle. 1966. Status of the White Pelican in United States and Canada through 1964. Condor 68: 279-292.

Limpert, R. J. and S. L. Earnst. 1994. Tundra Swan (*Cygnus columbianus*). The Birds of North America No .89. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Loven, J. S. 1978. Blood parasites of waterfowl in South Texas with reference to *Leucocytozoon simondi*. M.S. Thesis, Texas A&M Univ. College Station, Texas. 30 pages.

Loven, J. S., E. G. Bolen, and B. W. Cain. 1980. Blood parasitema in a South Texas wintering waterfowl population. J. Wildl. Dis. 16: 25-28.

Lowther, P. E. 1993. Brown-headed Cowbird (*Molothrus ater*). The Birds of North America No. 47. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Lowther, P. E. 1995. Bronzed Cowbird (*Molothrus aeneus*). The Birds of North America No. 144. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Lowther, P. E. and C. L. Cink. 1992. House Sparrow (*Passer domesticus*) The Birds of North America No. 12. Phil. Acad. Nat. Sci. and AOU. Washington D.C. 20 pages.

MacInnes, C. D. and E. B. Chamberlain. 1963. The first record of the Double-striped Thick-knee in the United States. Auk 80: 79.

Marks, J. S., D. L. Evans, and D. W. Holt. 1994. Long-eared Owl (*Asio otus*). The Birds of North America No. 133. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Marti, C. D. 1992. Barn Owl (*Tyto alba*). The Birds of North America No. 1. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Martin, C. 1991. Texas colonial waterbird census summary - 1990. TPWD Spec. Admin. Rept. Austin, Texas. 82 pages.

May, J. R. 1935. The hawks of North America. Natl. Assoc. Audubon Soc. New York, New York. 140 pages.

McAdams, M. S. 1987. Classification and waterfowl use of ponds in south Texas. M.S. Thesis. Texas A&M Univ. College Station, Texas. 112 pages.

McCamant, R. E. 1976. Nesting box usage and mate loss behavior in the Black-bellied Whistling Duck (*Dendrocygna autumnalis*). M.S. Thesis, Texas A&I Univ.-Corpus Christi. Corpus Christi, Texas. 80 pages.

McCamant, R. E. and B. A. Fall. 1974. South Texas region - Surfbird sighting. Amer. Birds 28: 823

McCracken, K. 1967. South Texas region - Brown Thrasher breeding. Audubon Field Notes 21: 586.

McDaniel. B. and S. McDaniel. 1963a. Feeding of Least Tern over land. Auk 80: 544.

McDaniel. B. and S. McDaniel. 1963b. Migration patterns of *Muscivora forficata* (Scissor-tailed Flycatcher) in Kleberg County, Texas. Tex. J. Sci. 11: 320.

McDaniel. B. and S. McDaniel. 1967. A new distribution record of *Speleogna thopsis benoiti* Fain collected from the Black-bellied Plover in Texas. Tex. J. Sci., 19: 94-98.

McDaniel, B. and I. Patterson. 1966. Nematode infestation of a White Pelican found along the Gulf Coast of Texas. Southwestern Nat. 11: 312.

McLendon, T. 1991. Vegetation of southern Texas. Tex. J. Sci. 43: 13-32.

McMurray, S. N. 1971. Nesting development of the Reddish Egret (*Dichromanessa rufescens*) on a spoil bank chain in the Laguna Madre. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 78 pages.

McNair, D. B. 1984. Reuse of other species nest by Lark Sparrows. Southwestern Nat. 29(4): 506.

Meanley, B. 1992. King Rail (*Rallus elegans*). The Birds of North America No. 3. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 12 pages.

Mendoza, C. H. 1974. Anatomical and vegetational features of spoil banks vs. their utilization by birds: upper Laguna Madre of Texas. M. S. Thesis, Texas A&I Univ. Kingsville, Texas.

Merrit, A., Jr. 1940. Nesting notes from Nueces County, Texas. Oologist 57: 45-46, 141-142.

Meyer, K. D. 1995. Swallow-tailed Kite (*Elanoides forficatus*). The Birds of North America No. 138. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Middleton, A. L. A. 1993. American Goldfinch (*Carduelis tristis*). The Birds of North America No. 80. Phil. Acad. Sci. and AOU. Washington, D.C.

Mirarchi, R. E. and T. S. Baskett. 1994. Mourning Dove (*Zenaida macroura*). The Birds of North America No. 117. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 32 pages.

Mitchell, C. A. 1981. Reproductive success of Great Blue Herons at Nueces Bay, Corpus Christi, Texas. Bull. Texas Ornith. Soc. 14: 18-21.

Mitchell, C. D. 1994. Trumpeter Swan (*Cygnus buccinator*). The Birds of North America No. 105. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Mock, D. W. 1974. Aerial hunting by Little Blue Herons. Wilson Bull. 86: 280-283.

Mock, D. W. 1976. Pair-formation displays of the Great Blue Heron. Wilson Bull. 88: 185-230.

Mock, D. W. 1978. Pair-formation displays of the Great Egret. Condor 80: 159-172.

Montgomery, T. H. 1907. English Sparrow in Texas. Auk 24: 341.

Moore, F. R., P. Kerlinger and T. R. Simons. 1990. Stopover on a Gulf Coast barrier island by spring trans-Gulf migrants. Wilson Bull. 102: 487-500.

Moorman, T. E. and P. N. Gray. 1994. Mottled Duck (*Anas fulvigula*). The Birds of North America No. 81. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Morrison, M. L. 1977, Life history and status of the Olivaceous Cormorant. M.S. Thesis, Texas A&M Univ. College Station, Texas. 84 pages.

Morrison, M. L. 1978. Breeding characteristics, egg shell thinning, and population trends of White-tailed Hawks in Texas. Bull. Texas Ornith. Soc. 11: 35-40.

Morrison, M. L. and R. D. Slack. 1976. Status of the Olivaceous Cormorant in Texas. Proc. 4th ann. meet. Texas Fish-eating Bird Conf. TPWD. Austin, Texas. 107 pages.

Morse, D. H. 1993. Black-throated Green warbler (*Dendroica virens*). The Birds of North America No. 55. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Morse, D. H. 1994. Blackburnian Warbler (*Dendroica fusca*). The Birds of North America No. 102. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Moskoff, W. 1995a. Veery (*Catharus fuscescens*). The Birds of North America No. 142. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Moskoff, W. 1995b. Solitary Sandpiper (*Tringa solitaria*). The Birds of North America No. 156. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Mrazek, R. W. 1974. The relationship of the fire ant *Solenopsis geminata* (Fabricus) to the young of birds nesting on two spoil islands in the Laguna Madre. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 122 pages.

Muehl, G. T. 1994. Distribution and abundance of waterbirds and wetland in coastal Texas. M.S. Thesis, Texas A&M Univ.-Kingsville. Kingsville, Texas. 130 pages.

Mueller, A. J. 1992. Inca Dove (*Columbina inca*). The Birds of North America No. 28. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 12 pages.

Mulholland, R. 1985. Habitat suitability index models: Lesser Scaup (wintering). USFWS Biol. Rept. 82(10.91). Washington, D.C. 15 pages.

Mullins H. L. and P. Cox. 1984. The 1984 Texas colonial waterbird census. TGLO Rept. Aransas Pass, Texas. 40 pages.

Mullins H. L. and P. Cox. 1985. The 1985 Texas colonial waterbird census. TGLO Rept. Aransas Pass, Texas. 40 pages.

Mullins, H. L. and T. Roberts. 1981. The 1981 Texas colonial waterbird census. TGLO Rept. Aransas Pass, Texas. 40 pages.

Mullins, H. L. and T. Roberts. 1982. The 1982 Texas colonial waterbird census. TGLO Rept. Aransas Pass, Texas. 44 pages.

Mullins, H. L. and T. Roberts. 1983. The 1983 Texas colonial waterbird census. TGLO Rept. Aransas Pass, Texas. 48 pages.

National Geographic Society. 1983. Field guide to the birds of North America. National Geographic Society. Washington, D. C.

Nelson, J. B. 1978. The Sulidae: gannets and boobies. Oxford Univ. Press. Edinburgh, Scotland. 1012 pages.

Newcomb, W. W., Jr. 1961. The Indians of Texas. Univ. Texas Press. Austin, Texas. 404 pages.

Nichols, J. L. and G. D. Baldassare. 1990a. Winter distribution of Piping Plovers along the Atlantic and Gulf Coasts of the United States. Wilson Bull. 102: 400-412.

Nichols, J. L. and G. D. Baldassare. 1990b. Habitat associations of Piping Plovers wintering in the United States. Wilson Bull. 102: 581-590.

Nol, E. and R. C. Humphrey 1994. American Oystercatcher (*Haematopus palliatus*). The Birds of North America No. 82. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Norment, C. J. and S. A. Shackleton. 1993. Harris' Sparrow (*Zonotrichia querula*). The Birds of North America No. 64. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Norris, J. P. 1890a. A series of eggs of the Great-tailed Grackle. Ornithologist and Oologist 15(7): 97-98.

Norris, J. P. 1890b. A series of eggs of Harris's hawk. Ornithologist and Oologist 15(7): 105.

Oberholser, H. C. 1925. The migration of North American birds XXXII: Pauraque and Poorwill. Bird Lore 27: 392-393.

Oberholser, H. C . 1974. The bird life of Texas. Univ. Texas Press. Austin, Texas.

O'Reilly, R. A., Jr. 1946. Northern waterbirds summering on the gulf coast of Texas. Wilson Bull. 58: 216-217.

Osborne, J. 1992. The Cardinal. Univ. Texas Press. Austin, Texas. 108 pages.

Otteni, L. C., E. G. Bolen and C. Cottam. 1972. Predator-prey relationships and reproduction of the Barn Owl in southern Texas. Wilson Bull. 84: 434-448.

Packard, F. M. 1951. Birds of the central coast of Texas. Privately Printed. 504 pages.

Page, J. S., J. C. Warner & P. W. C. Payton. 1995. Snowy Plover (*Charadrius alexandrinus*). The Birds of North America No. 154. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Palmer, P. C. 1986. Great Kiskadees observed feeding on reptiles. Bull. Texas Ornith. Soc. 19: 31-32.

Palmer, P. C. 1987. Combined feeding groups of Bonaparte's Gulls, Lesser Scaup and Bufflehead. Bull. Texas Ornith. Soc. 20: 28.

Palmer, P. C. 1988. Cave Swallow range continues to expand. Amer. Birds 42: 174-176.

Palmer, P. C. 1990. Observation of a White-tailed Hawk pirating from and talon-grappling with a Swainson's Hawk. Bull. Texas Ornith. Soc. 23: 28-29.

Palmer, P. C. 1991. Cave Swallows, Kingsville, Texas. Winging It. 3:9-10.

Palmer, R. S., (ed.). 1962. Loons through flamingos. Handbook of North American birds, vol. 1. Yale Univ. Press. New Haven, Connecticut.

Palmer, R. S., (ed.). 1976a. Waterfowl (first part). Handbook of North American birds. vol. 2. Yale Univ. Press. New Haven, Connecticut.

Palmer, R. S., (ed.). 1976b. Waterfowl (concluded). Handbook of North American birds. vol. 3. Yale Univ. Press. New Haven, Connecticut.

Palmer, R. S., (ed.). 1988a. Family Cathartidae and family Accipitridae (first part). Handbook of North American birds. vol. 4. Yale Univ. Press. New Haven, Connecticut.

Palmer, R. S., (ed.). 1988b. Family Accipitridae (concluded). Handbook of North American birds. vol. 5. Yale Univ. Press. New Haven, Connecticut.

Parmelee, D. F. 1992. White-rumped Sandpiper (*Calidris fuscicollis*). The Birds of North America No. 29. Phil. Acad. Nat. Sci. and AOU. Washington D.C. 16 pages.

Parnell, J. F., R. M. Erwin, and K. C. Molina. 1995. Gull-billed Tern (*Sterna nilotica*). The Birds of North America No. 140. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Passmore, M. F. 1980. Blockage of Mourning Dove esophagus by an impacted sandbur. Southwestern Nat. 25: 428.

Passmore, M. F. 1981. Population biology of the Common Ground Dove and ecological relationships with Mourning and White-winged Doves in South Texas. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas. 96 pages.

Paul, R. T. 1976. Status of Brown Pelicans in Texas, 1976. Proc. 4th Ann. Meet. Texas Fish-eating Bird Conf. TPWD. Austin, Texas. 107 pages.

Paul, R. T. 1991. Status report - *Egretta rufescens* (Gmelin) Reddish Egret. USFWS. Houston, Texas. 73 pages.

Payne, R. B. 1992. Indigo Bunting (*Passerina cyanea*). The Birds of North America No. 4. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Pearson, G. T. 1921. Notes on the bird life of southeastern Texas. Auk 39: 513-523.

Pearson, G. T. 1922. Whooping Cranes (*Grus americana*) in Texas. Auk 39: 412-413.

Peterson, R. T. 1961. A field guide to western birds. Houghton Mifflin Co. Boston, Massachusetts.

Peterson, R. T.. 1963. A field guide to the birds of Texas and adjacent states. Houghton Mifflin Co. Boston, Massachusetts.

Peterson, R. T. 1980. Eastern Birds. Houghton Mifflin Co. Boston, Massachusetts.

Philips, J. C. 1986. A natural history of the ducks vol. 1-4. Dover Publ., Inc. New York, New York.

Phillips, A. R. 1975. Semipalmated Sandpiper identification, migration, summer and winter ranges. Amer. Birds 29: 799-806

Pierotti, R. J. and T. P. Good. 1994. Herring Gull (*Larus argentatus*). The Birds of North America No. 124. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Pitocchelli, J. 1993. Mourning Warbler (*Oporornis philadelphia*). The Birds of North America No. 72. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Pitocchelli, J. 1995. Macgillivray's Warbler (*Oporornis tolmiei*). The Birds of North America No. 159. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Post, W. and J. S. Greenlaw. 1994. Seaside Sparrow (*Ammodramus maritimus*). The Birds of North America No. 127. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Pough, R. H. 1946. Audubon land bird guide. Doubleday & Co. Garden City, New York. 312 pages.

Pough, R. H. 1951. Audubon water bird guide. Doubleday & Co. Garden City, New York. 352 pages.

Prasad, N. L. and F. S. Guthrie. 1986. Drinking by Northern Bobwhites in Texas. Wilson Bull. 98: 485-486.

Pravosudov, V. V. and T. C. Grubb, Jr. 1993. White-breasted Nuthatch (*Sitta carolinensis*). The Birds of North America No. 54. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Preston, C. R. and R. D. Beane. 1993. Red-tailed Hawk (*Buteo jamaicensis*). The Birds of North America No. 52. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Pulich, W. M. 1980. A Thayer's Gull specimen from Texas: a problem in identification. Southwestern Nat. 25: 257-258.

Pulich, W., Jr. 1982. Documentation and status of Cory's Shearwater in the western Gulf of Mexico. Wilson Bull. 94: 381-385.

Ramsey, J. J. 1971. Status of Cattle Egret in Texas. Bull. Texas Ornith. Soc. 4: 6-7.

Ransom, D., Jr., O. J. Ronstad, and D. H. Rusch. 1987. Nesting ecology of Rio Grande Turkeys. J. Wildl. Manage. 51: 435-439.

Rappole, J. H. 1976. A study of evolutionary tactics in populations of solitary avian migrants. Ph.D. Dissertation, Univ. of Minnesota. Duluth, Minnesota. 236 pages.

Rappole, J. H. and G. W. Blacklock. 1985. Birds of the Texas coastal bend. Texas A&M Univ. Press. College Station, Texas. 126 pages.

Rappole, J. H. and G. W. Blacklock. 1994. Birds of Texas. Texas A&M University Press. College Station, Texas. 280 pages.

Rappole, J. H. and D. W. Warner. 1976. Relationships between behavior, physiology and weather in avian transients at a migration stopover site. Oecologia 26: 193-212.

Reagan, W. W. 1977. Resource partitioning in the North American gallinules in southern Texas. M.S. Thesis, Utah State Univ. Logan, Utah. 72 pages.

Rhoads, S. N. 1892. The birds of southeastern Texas and southern Arizona observed during May, June and July, 1891. Proc. Phil. Acad. Nat. Sci. 43:98-126.

Ridgway, R. 1901-1919. The birds of North and Middle America parts 1-8. US Natl. Mus. Bull. No. 50.

Robbins, C. S., B. Bruun, and H. S. Zim. 1966 Birds of North America. Golden Press. New York, New York.

Robbins, C. S. and D. Geishler. 1986. Texas breeding bird survey: first 15 years, 1965-1979. USFWS Res. Publ. 157.

Robertson, R. J., B. J. Stutchbury, and R. R. Cohen. 1992. Tree Swallow (*Tachycineta bicolor*). The birds of North America No. 11. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Robinson, W. D. 1995. Louisiana Waterthrush (*Seiurus motacilla*). The Birds of North America No. 151. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Rocke, T. E. 1985. Mycoplasmosis in Wild Turkeys. Ph.D. Dissertation, Univ. of Wisconsin. Madison, Wisconsin. 107 pages.

Rodgers, J. A. & H. T. Smith. 1995. Little Blue Heron (*Egretta caerulea*). The Birds of North America No. 145. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 32 pages.

Rogers, R. R. and G. Hunt. 1975. Peregrines on South Padre Island: recent years. Raptor Res. Rep. 3: 61-65.

Root, T. 1988. Analysis of Christmas bird count data. Univ. Chicago Press. Chicago, Illinois.

Rosen, W. 1969. The bobwhite quail: its life and management. Rutgers Univ. Press. Rutgers, New Jersey. 418 pages.

Rosenfield, R. N. and J. Bielefeldt. 1993. Cooper's Hawk (*Acccipiter cooperii*). The Birds of North America No. 75. Phil. Acad. Sci. and AOU. Washington, D.C. 24 pages.

Roth, R. R. 1977. The composition of four bird communities in south Texas brush-grasslands. Condor 79: 417-425.

Ryder, J. P. 1993. Ring-billed Gull (*Larus delawarensis*). The Birds of North America No. 33. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

Ryder, R. A. 1967. Distribution, migration, and mortality of the White-faced Ibis (*Plegadis chihi*) in North America. Bird-Banding 38: 257-277.

Ryder, R. R. and D. E. Manry. 1994. White-faced Ibis (*Plegadis chihi)*. The Birds of North America No. 75. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Rylander, K. M. and E. G. Bolen. 1970. Ecological and anatomical adaptations of North American tree ducks. Auk 87: 72-90.

Rylander, K. M., E. G. Bolen, and R. E. McCamant. 1980. Evidence of incubation patches in whistling ducks. Southwestern Nat. 25: 126-128.

Sauer, J. R. and S. Droege, (eds.). 1990. Survey designs and statistical methods for the estimation of avian population trends. USFWS Biol. Rept. 90(1). 166 pages.

Schemnitz, S. D. 1994. Scaled Quail (*Callipepla squamata*). The Birds of North America No. 106. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 16 pages.

Schorger, A. W. 1966. Wild Turkey: its history and domestication. Univ. of Oklahoma Press. Norman, Oklahoma. 626 pages.

Schreiber, R. W. and R. W. Risebrough. 1972. Studies of the Brown Pelican. Wilson Bull. 84: 119-135.

Schroeder, M. A. and L. A. Robb. 1993. Greater Prairie-Chicken (*Tympanuchus cupido*). The Birds of North America No. 11. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Scott, P. E. 1994. Lucifer Hummingbird (*Calothorax lucifer*). The Birds of North America No. 11. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Sennet, G. B. 1879. Notes on the ornithology of the lower Rio Grande of Texas, from observations made during spring of 1878. Bull. U. S. Geol. Survey. 5(3): 371-440.

Sennet, G. B. 1888a. Descriptions of a new species and two new sub-species from Texas. Auk 5: 43- 46.

Sennet, G. B. 1888b. Unexpected occurrence of certain shorebirds in Texas in mid summer and in breeding plumage. Auk 5: 110.

Sennet, G. B. 1889. A new species of duck from Texas. Auk 6:263-265.

Sennet, G. B. 1892. List of birds observed at Corpus Christi and on the lower Rio Grande. Pages 364-375 *in* Fourth Ann. Rept. Geol. Survey of Texas..

Shaw, W. W. and W. R. Mangun. 1984. Nonconsumptive use of wildlife in the United States. USFWS Res. Publ. 154. 20 pages.

Sheilds, R. H. and E. L. Benham. 1968. Migratory behavior of Whooping Cranes. Auk 85: 318.

Shew, D. M., R. M. Bauman, T. H. Fritts, and L. S. Dunn. 1981. Texas barrier islands region ecological characterization: environmental synthesis papers. FWS/OBS-81/32. Washington, D.C. 413 pages.

Sidle, J. G., W. H. Koonz ,and K. Roney. 1985. Status of the American White Pelican: an update. Amer. Birds 39: 859-864.

Simersky, B. L. 1971. Competition and nesting success of four species of herons on four spoil islands in the Laguna Madre. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 92 pages.

Simmons, G. F. 1914. Notes on the Louisiana Clapper Rail (*Rallus crepitans saturatus*) in Texas. Auk 31: 363-384.

Slack, D. R., D. Gawlik, D. Harpole and J. Thomas. 1992. Status and trends of selected vertebrate resources in the Galveston estuary; birds and alligators. Pages 265-346 i*n* Loeffler, C. and A. Walton (eds.), Status and trends of selected living resources in the Galveston Bay System. GBNEP-19. Galveston, Texas.

Sloan, D. L. 1987. Northern Bobwhite nesting, activity patterns and habitat use in two grazing systems in the Texas Coastal Bend. M.S. Thesis, Stephen F. Austin Univ. Nacogdoches, Texas. 82 pages.

Smith, D. M. 1977. The social organization of Rio Grande Turkeys in a declining population. Ph.D. Dissertation, Utah State Univ. Logan, Utah.

Smith, J. C. and D. A. Swepston. 1976. Fish-eating bird movement study in Texas May 1974 to present. Proc. 4th. Ann. Meet. Texas Fish-eating Bird Conf. TPWD. Austin, Texas. 107 pages.

Snyder, D. E. 1950. Texas bird diary. Bull. Mass. Audubon Soc. 34: 275-285.

Sodhi, N. S., L. W. Oliphant, P. C. James, and I. G. Warkentin. 1993. Merlin (*Falco columbarius*). The Birds of North America No. 44. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Sogge, M. K., W. M. Gilbert, and C. Van Riper, III. 1994. Orange-crowned Warbler (*Vermivora celata*). The Birds of North America No. 101. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Sooter, C. A. 1945. Starlings wintering in southern Texas. Condor 47: 219.

Spears, G. S. 1991. Optimum seral stages for northern bobwhites as influenced by site productivity. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 89 pages.

Sprunt, A., Jr. 1935. Increase of the roseate spoonbills on the coast of Texas. Auk 52: 443.

Sprunt, A., Jr. 1956. The Cattle Egret in North America. Audubon Magazine 58(6): 274-277.

Sprunt, A., Jr., J. C. Ogden, and S. Wincler, (eds.) 1978. Wading birds. Audubon Res. Rept. No. 7. New York, New York. 381 pages.

State Task Force on Texas Nature Tourism. 1995. Nature tourism in the Lone Star State. TPWD. Austin, Texas. 24 pages.

Stevenson, H. M. 1957. The relative magnitude of the trans-gulf migration and circum-Gulf spring migrations. Wilson Bull. 69: 39-77.

Stevenson, J. O. 1942. Whooping Cranes in Texas in Summer. Condor 44: 40-41.

Stevenson, J. O. 1946. Migration of the Anhinga in Texas. Wilson Bull. 58: 184-185.

Stevenson, J. O. 1953. Bird notes from the Texas coast. Wilson Bull. 65: 42-43.

Stevenson, J. O. and R. E. Griffith. 1946. Winter life of the Whooping Crane. Condor 48: 160-178.

Stevenson, J. O. and L. H. Meitzen. 1946. Behavior and food habits of Sennett's White-tailed Hawk in Texas. Wilson Bull. 58: 198-205.

Storer, R. W. 1992. Least Grebe (*Tachybaptus dominicus*). The Birds of North America No. 24. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 12 pages.

Storer, R. W. and G. L. Nuechterlein. 1992. Western Grebe (*Aechmophorus occidentalis*). The Birds of North America No. 26. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Strecker, J. K. 1912. The birds of Texas; an annotated checklist. Baylor Univ. Bull. 15: 1-69.

Stutzenbaker, C. D. 1988. The Mottled Duck: its life history, ecology and management. TPWD. Austin, Texas. 209 pages.

Swann, K. H. 1930. A monograph of the birds of prey. Wheldon & Wesley, LTD. London, England. Vol. I (487 pages), Vol. II (538 pages).

Swanson, D. W. 1988. Effects of cattle grazing systems on shrub-grassland birds in South Texas. M.S. Thesis, Texas A&M Univ. College Station, Texas. 88 pages.

Tacha, T. C., S. A. Nesbitt, and P. A. Vohs. 1992. Sandhill Crane (*Grus canadensis*). The Birds of North America No. 31. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Tate, J. R. 1986. The blue list for 1986. Amer. Birds 40: 227-236.

Teather, K. L. 1989. Sex and eggs size in Great-tailed grackles. Condor 91: 203-205.

Telfair, R. C. 1979. The African Cattle Egret in Texas and its relation to the Little Blue Heron, Snowy Egret, and Louisiana Heron. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas.

Telfair, R. C. 1994. Cattle Egret (*Bubulcus ibis*). The Birds of North America No. 113. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 32 pages.

Telfair, R. C. and M. L. Morrison. 1995. Neotropic Cormorant (*Phalacrocorax brasilianus*). The Birds of North America No. 137. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Telfair, R. C. and D. A. Swepston. 1987. Analysis of banding and marking nestling anhingas, olivaceous cormorants, roseate spoonbills, ibises, bitterns, herons and egrets in Texas. TPWD. Austin, Texas. 51 pages.

Terres, J. K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf. New York, New York. 1109 pages.

Tewes, M. E. 1984. Opportunistic feeding by White-tailed Hawk at prescribed burns. Wilson Bull. 96: 135-136.

Tewes, M. E. 1984. Ground nesting by barn owls. Welder Wildl. Found. Contrib. No. 155. Sinton, Texas.

Texas Colonial Waterbird Society. 1982. An atlas and census of Texas waterbird colonies 1973-1980. Caesar Kleberg Wild. Res. Inst. Kingsville, Texas. 358 pages.

Thomas, J. K. and C. E. Adams. 1989. The public and Texas wildlife. TAES Texas A&M Univ. College Station, Texas. 82 pages.

Thompson, B. C. 1982. Distribution, colony characteristics, and population status of Least Terns breeding on the Texas coast. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas. 124 pages.

Thompson, B. C. and R. D. Slack. 1982. Physical aspects of colony selection by Least Terns on the Texas coast. Colonial Waterbirds 5:161-168.

Thompson, B. C. and R. D. Slack. 1984. Post-fledging departure from colonies by juvenile Least Terns in Texas: implications for estimating production. Wilson Bull. 96: 309-313.

Thompson, B. C., M. E. Schmidt, S. W. Calhoun, D. W. Morizot, and R. D. Slack. 1992. Subspecific status of Least Tern populations in Texas: North American implications. Wilson Bull. 194: 244-262.

Thompson, B. H. 1932. History and present status of the breeding colonies of White Pelicans (*Pelecanus erythrorynchos*) in the United States. NPS Contrib. Wildl. Div. Occas. Pap. 1:1-82.

Thompson, M. 1958. Record of the Knot in Texas. Wilson Bull. 70: 197.

Tietje, W. D. 1986. Aspects of the wintering ecology of Northern Shovelers on freshwater and saline habitats. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas. 94 pages.

TPWD and Texas Colonial Waterbird Society. 1987. Texas colonial waterbird summary - 1986. TPWD Spec. Admin. Rept. Austin, Texas. 86 pages.

TPWD and Texas Colonial Waterbird Society. 1988. Texas colonial waterbird summary - 1987. TPWD Spec. Admin. Rept. Austin, Texas. 81 pages.

TPWD and Texas Colonial Waterbird Society. 1989. Texas colonial waterbird summary - 1988. TPWD Spec. Admin. Rept. Austin, Texas. 90 pages.

TPWD and Texas Colonial Waterbird Society. 1990. Texas colonial waterbird summary - 1989. TPWD Spec. Admin. Rept. Austin, Texas. 82 pages.

Tveten, J. L. 1993. The birds of Texas. Shearer Publishing. Fredricksburg, Texas. 384 pages.

Uhler, F. M. and L. N. Locke. 1970. A note on the stomach contents of two Whooping Cranes. Condor 72: 246.

USFWS and US Department of Commerce. 1993. 1991 national survey of fishing, hunting and wildlife-associated recreation, Texas. Washington, DC. 41 pages.

Van Horn, M. A. and T. M. Donovan. 1994. Ovenbird (*Seiurus aurocapillus*). The Birds of North America No. 88. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Vega, J. H. and J. H. Rappole. 1994. Effects of scrub mechanical treatment on the nongame bird community in the Rio Grande Plain of Texas. Wildl. Soc. Bull. 22: 165-171.

Verbeek, N. A. M. and P. Hendricks. 1994. American Pipit (*Anthus rubescens*). The Birds of North America No. 95. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 24 pages.

Voous, K. H. 1968. Distribution and geographical variation of the White-tailed Hawk (*Buteo albicaudatus*). Beaufortia 15: 195-208.

Wagner, M. and M. L. Lange. 1993. Texas colonial waterbird census summary. TPWD Spec. Admin. Rept. Austin, Texas. 34 pages.

Watts, C. R. 1968. Rio Grande Turkeys in the mating season. Trans. North Amer. Wildl. Conf. 33: 205-210.

Watts, C. R. 1969. The social organization of wild turkeys on the Welder Wildlife Refuge, Texas. Ph.D. Dissertation, Utah State Univ. Logan, Utah.

Watts, C. R. and A. W. Stokes. 1971. The social order of turkeys. Sci. Amer. 224: 112-118.

Wauer, R. 1991. Profile of an ABA birder. Birding 23: 146-154.

Wauer, R., P. C. Palmer, and A. Windham. 1993. The Ferruginous Pygmy Owl in south Texas. Amer. Birds 47: 1071-1076.

Webster, F. S., Jr. 1983. The autumn migration: south Texas region. Amer. Birds 37: 199-201.

Weeks, H. P., Jr. 1994. Eastern Phoebe (*Sayornis phoebe*). The Birds of North America No. 94. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Weller, M. W. 1964. Distribution and migration of the Redhead. J. Wildl. Manage. 28: 64-103.

West, S. 1995. Cave Swallow (*Hirundo fulva*). The Birds of North America No. 141. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Weston, F. M. 1965. Recent records of the Eskimo Curlew. Auk 82: 493-496.

Wheelright, N. T. and J. D. Rising. 1993. Savannah Sparrow (*Passerculus sandwichensis*). The Birds of North America No. 45. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 28 pages.

White, D. H. and D. James. 1978. Differential use of fresh water environments by wintering waterfowl of coastal Texas. Wilson Bull. 90: 99-111.

White, D. H., C. A. Mitchell, and E. Cromartie. 1982. Nesting ecology of Roseate Spoonbill at Nueces Bay, Texas. Hawk 99: 275-284.

White, D. H., C. A. Mitchell, and R. M. Prouty. 1983. Nesting biology of Laughing Gulls in relation to agricultural chemicals in south Texas. Wilson Bull. 95: 540-551.

White, D. H., C. A. Mitchell, and D. M. Swineford. 1984. Reproductive success of Black Skimmers in Texas relative to environmental pollutants. J. Field. Ornithol. 55: 18-30.

Whyte, R. E. and B. W. Cain. 1979. The effect of grazing on nesting marshbird habitat at the Welder Refuge, San Patricio County, Texas. Bull. Texas Ornithol. Soc. 12: 432-46.

Wiedner, D. and P. Kerlinger. 1990. Economics of birding: a national survey of active birders. Am. Birds 44:209-213.

Widman, O. 1922. European Widgeon (*Mareca penelope*) at Corpus Christ, Texas. Auk 39: 250.

Williams, G. G. 1932. Migration in Texas. Bird Lore 34(5): 332.

1938. Notes on the waterbirds of the upper Texas coast. Auk 55: 62-70.

Williams, G. G. 1945. Do birds cross the Gulf of Mexico in spring? Auk 62: 98-110.

Williams, G. G. 1947. Lowry on trans-Gulf migrations. Auk 64: 217-238.

Williams, G. G. 1950. The nature and causes of the 'coastal hiatus'. Wilson Bull. 62: 175-182.

Williges, K. 1989. The avian fauna of two oak mottes on the sand sheet of south Texas. M.S. Thesis, Texas A&I Univ. Kingsville, Texas. 95 pages.

Wilkinson, P. M., S. A. Nesbitt, and J. F. Parnell. 1994. Recent history and status of the eastern Brown Pelican. Wildl. Soc. Bull. 22: 420-430.

Wilson, M. H. 1984. Comparative ecology of Bobwhite and Scaled Quail in southern Texas. Ph.D. Dissertation, Oregon State Univ. Corvallis, Oregon. 85 pages.

Wilson, M. M. 1978. The effects of rotational grazing and prescribed burning on Bobwhite populations in South Texas. M.S. Thesis, Utah State Univ. Logan, Utah. 44 pages.

Wilson, W. H. 1994. Western Sandpiper (*Calidris mauri*). The Birds of North America No. 90. Phil. Acad. Nat. Sci. and AOU. Washington, D.C. 20 pages.

Winker, K. and J. H. Rappole. 1992. The Autumn passage of Yellow-bellied Flycatchers in south Texas. Condor 94: 526-529.

Withers, K. 1994. The relationship of macrobenthic prey availability to shorebird use of blue-green algal flats in the upper Laguna Madre. Ph.D. Dissertation, Texas A&M Univ. College Station, Texas. 117 pages.

Withers, K. and B. R. Chapman. 1993. Seasonal abundance and habitat use of shorebirds on an Oso Bay mudflat in the upper Laguna Madre. J. Field Ornithol. 64: 382-392.

Wolfe, L. R. 1956. Checklist of the birds of Texas. Intelligencer Printing Co. Lancaster, Pennsylvania. 89 pages.

Wolfe, L. R., W. M. Pulich, and J. A. Tucker. 1975. Checklist of the birds of Texas. Texas Ornith. Soc. Waco, Texas.

Woodard, D. W. 1975. Breeding bird communities in terrestrial habitats in the Coastal Bend region of Texas. Ph.D. Dissertation, Univ. of Arkansas. Fayetteville, Arkansas. 68 pages.

Zale, A. V. and R. Mulholland. 1985. Habitat suitability index models: Laughing Gull. USFWS Biol. Rept. 82(10.94). Washington, D.C. 23 pages.

APPENDIX I

Checklist of birds within the CCBNEP study area

Table of Contents

BIRDS

Phylogenetic order / classification follows: AOU Check-list (1983) through the 39th supplement

Habitat and / or location acronyms, preferred habitats are listed first:

IGW	inshore gulf waters	R	rivers
GB	gulf beach	L	lakes
D	dunes - clay or sand	PO	ponds
P	prairie	POF	fresh ponds
M	mottes	RW	riparian woodlands
F	flats - sand, mud, algal	OW	oak woodlands
MS	salt marsh	TS	thorn scrub
MF	fresh water marsh	SA	savannahs
BE	bays and estuaries	AL	arable lands
SG	sea grass beds	UR	urban
BI	bay islands		

Relative abundance and seasonal acronyms:

C	common - see >5 a day in habitat	PR	permanent resident
U	uncommon - see <5 a day in habitat	SR	spring and summer resident
R	rare - not likely seen in habitat	WR	winter resident
I	irregular - few per decade	FT	fall transient
A	accidental - usually not recurring	ST	spring transient
*	breeding	MI	missing information

Comments:

Several references are applicable to most of the birds in the checklist. They are: Ridgway (1901-1919); Bent (1919-1968); Oberholser (1974); Packard (1951); Rappole & Blacklock (1985, 1994). Other pertinent books are: Audubon (1946); Bendire (1892); Ehrlich et.al. (1988); Terres (1980); Holt (1993); Tveten (1993). Information concerning local arrival and departure times can be found in Rappole & Blacklock (1994).

A number of checklists of local significance have been published and are available: Aransas National Wildlife Refuge; Audubon Outdoor Club of Corpus Christi; Carroll (1900); Bryan et. al. (1991); Corpus Christi Museum Guild; Corpus Christi Naval Air Station; Fulton Area Chamber of Commerce; Golden Crescent Bird Club of Victoria; Kingsville Bird and Wildlife Club; Main Group Bird Club of Sinton; Padre Island National Seashore; Strecker (1912); Welder Wildlife Foundation at Sinton; Wolfe (1956); Wolfe et.al. (1975).

Christmas bird counts that are applicable to many of the listed species include: Aransas Refuge; Port Aransas; Rockport; Corpus Christi; Corpus Christi-Flourbluff; Welder; Padre Island; Kingsville. Results from these counts may be found in Audubon Magazine, Bird Lore, Audubon Field Notes, American Birds and Root (1988); seasonal sightings in the southern and coastal zone of Texas can be found in these same periodicals. The first 15 years of the Texas breeding bird survey have been summarized by Robbins and Geishler (1986).

Important field guides include: Audubon Society (1977); Kaufman (1990); Kutac (1982); National Geographic Society (1983); Peterson (1961, 1963, 1980); Pough (1946, 1951); Robbins et.al. (1966).

The Texas Colonial Waterbird Society has been monitoring the number of breeding pairs of Coastal Bend cormorants, anhingas, pelicans, herons, egrets, ibis, roseate spoonbills, gulls, terns and skimmers since 1973. Publication of those data include: Blacklock et. al. (1978); Texas Colonial Waterbird Soc.(1982); Mullins and Roberts (1981-1983); Mullins and Cox (1984-1985);Texas Parks and Wildlife Dept. (1987-1990); Martin (1991); and Wagner and Lange (1993).

Species	References	Habitat	Abundance (Season)
KINGDOM ANIMALIA			
PHYLUM CHORDATA			
Class Aves			
Order Gaviiformes	Palmer(1962);Clapp et.al. (1982);Harrison(1983)		
GAVIIDAE			
Gavia stellata (Pontoppidan) Red-throated Loon	Haynie(1993) Muehl(1994)	BE,L,IGW,GB	R(WR) I(SR)
Gavia arctica (Linnaeus) Arctic Loon	Lasley(1989);Arnold & Henderson(1973)	BE,L,IGW,GB	A(WR) I(SR)
Gavia pacifica (Lawrence) Pacific Loon	Lasley(1991);Haynie(1992a, 1993)	BE,L,IGW,GB	R(WR) I(SR)
Gavia immer (Brunnich) Common Loon	Sennett(1879,1892);Beckham; (1887)Muehl(1994)	BE,L,IGW,GB	C(WR) I(SR)
Order Podicipediformes	Palmer(1962);Clapp et.al. (1982a);Harrison(1983)		
PODICIPEDIDAE			
Tachybaptus dominicus (Linnaeus) Least Grebe	Sennett(1892);Snyder(1950); Haigh(1984);Storer(1992); Bauer(1993)	POF,L,MF,R	U(PR*)
Podilymbus podiceps (Linnaeus) Pied-billed Grebe	Cahn(1922);Chapman(1984); Haigh(1984);Bauer(1993)	POF,L,PO,BE, R	C(PR*)
Podiceps auritus (Linnaeus) Horned Grebe		BE,L,PO	R(WR)
Podiceps grisegena (Boddaert) Red-necked Grebe		BE,L,PO	I(WR)
Podiceps nigricollis Brehm Eared Grebe	Chapman(1984);Bauer(1993) Chaney et.al.(1993);Ecoservices (1993a)	IGW,BE,L,PO GB	C(WR), I(SR)
Aechmophorus occidentalis (Lawrence) Western Grebe	Storer & Nuechterlein(1992)	BE,L,PO	I(WR)
Order Procellariiformes	Palmer(1962); Clapp et.al. (1982);Harrison(1983)		
PROCELLARIIDAE			
Calonectris diomedea (Scopoli) Cory's Shearwater	Duncan & Havard(1980); Pulich(1982);Lasley(1989; 1991)	IGW,GB	I(MI)
Puffinus gravis (O'Reilly) Greater Shearwater	Duncan & Havard(1980); Haynie(1992b,1993)	IGW,GB	A(MI)
Puffinus griseus (Gmelin) Sooty Shearwater	Duncan & Havard(1980); McCracken(1976);Haynie (1992b)	IGW,GB	I(SR)
Puffinis puffinus (Brunnich) Manx Shearwater	Duncan & Havard(1980); Lasley(1989)	IGW,GB	I(MI)
Puffinus lherminieri Lesson Audubon's Shearwater	Duncan & Havard(1980); Haynie(1992a,b,1993)	IGW,GB	I(MI)

Species	References	Habitat	Abundance (Season)
HYDROBATIDAE			
Oceanites oceanicus (Kuhl) Wilson's Storm-Petrel		IGW,GB	I(MI)
Oceanodroma leucorhoa (Vieillot) Leach's Storm-Petrel	Beckham(1887);Blacklock & Peabody(1983);Haynie (1992b)	IGW,GB	I(MI)
Oceanodroma castro (Harcourt) Band-rumped Storm-Petrel	Duncan & Havard(1980); Lasley(1991); Haynie(1992b)	IGW,GB	I(MI)
Order Pelecaniformes	Palmer(1962);Clapp et.al. (1982a)		
PHAETHONTIDAE			
Phaethon lepturus Daudin White-tailed Tropicbird	Duncan & Havard(1980)	IGW,GB	A(MI)
SULIDAE	Nelson(1978)		
Sula dactylatra Lesson Masked Booby	Duncan & Havard(1980); Anderson(1993)	IGW,GB	R(SR)
Sula nebouxii Milne-Edwards Blue-footed Booby	Dumont(1933);Duncan & Havard(1980)	IGW,GB	A(MI)
Sula leucogaster (Boddaert) Brown Booby	Lasley(1981,1988,1989); Duncan & Havard(1980)	IGW,GB	I(MI)
Sula sula (Linnaeus) Red-footed Booby	Duncan & Havard(1980)	IGW,GB	A(MI)
Sula bassanus (Linnaeus) Northern Gannet	Gunter(1945);Duncan & Havard(1980);Chaney et al. (1993)	IGW,GB	U(PR)
PELECANIDAE			
Pelecanus erythrorhynchos Gmelin American White Pelican	Sennett(1879,1892);Beckham (1887);Benners(1887); Hancock(1887);Chapman 1891);Pearson(1921);Cahn (1922,1923);Thompson (1932,1933);Allen(1935b); Stevenson(1957);Lies & Behle (1966);McDaniel & Patterson (1966);Mendoza(1974);Ortiz (1974);Chaney et.al.(1976); Blacklock et.al.(1978);Shew et .al.(1981);Sidle et.al.(1985); Chapman(1988);Bauer(1993); Ecoservices(1993a);Evans & Knopf(1993);Muehl(1994)	BE,BI*,L,PO	C(PR*)
Pelecanus occidentalis Linnaeus Brown Pelican	Sennett(1879,1892);Beckham (1887);Benners(1887); Hancock(1887);Chapman (1891);Bailey(1916);Pearson (1921);Cahn(1922);Allen (1935b);Merrit(1940); Schreiber & Risebrough(1972); Blacklock(1976);Frentriss (1976);Paul(1976);King et.al.	IGW,GB,BE,BI*, L	C(PR*)

Species	References	Habitat	Abundance (Season)
	(1977a,b);Blacklock et.al (1978);King et.al.(1979);Shew et.al.(1981);Chapman(1984); Hingtgen et.al.(1985);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a,b);Muehl (1994);Wilkinson et.al.(1994)		
PHALOCROCORACIDAE			
Phalacrocorax auritus (Lesson) Double-crested Cormorant	Mendoza(1974);Ortiz(1974); Chapman(1984); Ecoservices(1993a);Chaney et.al.(1993);Muehl (1994);	BE,IGW,BI,L GB,PO,R.	C(WR) R(SR)
Phalacrocorax brasilianus (Gmelin) Neotropic Cormorant	Sennett (1879,1892);Beckham (1887);Hancock (1887); Chapman (1891);Rhoads;(1892) Cahn(1922);Snyder(1950); Morrison & Slack(1976);Telfair & Swepston(1987);Morrison (1977);Bauer(1993);Ecoservices (1993);Muehl(1994);Telfair & Morrison(1995)	POF,R,BE,L	C(PR*)
ANHINGIDAE			
Anhinga anhinga (Linnaeus) Anhinga	Benners(1887);Cahn(1922); Eifrig(1929);Stevenson(1946); Goering & Cherry(1971);Bauer (1993);Muehl(1994)	POF,L, R	U(PR*)
FREGATIDAE			
Fregata magnificens Mathews Magnificent Frigatebird	Benners(1887);Chaney et.al. (1993)	IGW,BE	U(SR*) R(WR)
Order Ciconiiformes	Palmer(1962);Sprunt et.al. (1978);Hancock & Kushlan (1984)		
ARDEIDAE			
Botaurus lentiginosus (Rackett) American Bittern	Tate(1986);Telfair& Swepston (1987);Gibbs et.al.(1992a); Bauer(1993);Muehl(1994)	MF,MS,BE,PO	U(ST,FT) I(SR*) C(WR)
Ixobrychus exilis (Gmelin) Least Bittern	Benners(1887);Rhoads (1892); Sennett(1892);Haigh(1984); Tate;(1986);Telfair& Swepston (1987);Gibbs et.al.(1992b); Bauer(1993);Ecoservices (1993a);Muehl(1994)	MF,MS,BE,PO, BI	C(SR*) I(WR)
Ardea herodias Linnaeus Great Blue Heron	Sennett(1879,1892);Beckham (1887);Benners(1887); Hancock(1887);Chapman (1891);Rhoads (1892);Bailey (1916);Cahn(1922);Merrit (1940);Stevenson(1957); Goering & Cherry(1971); Simersky(1971);Mendoza (1974);Ortiz(1974);Blacklock	BE,L,PO,BI,MS, MF,GB,IGW,SG, AL,UR	C(PR*)

Species	References	Habitat	Abundance (Season)
	(1976);Chaney et.al.(1976); Mock(1976);Smith & Swepston (1976);Blacklock et.al.(1978); Mitchell(1981);Shew et.al. (1981);Chapman(1984);Haigh (1984);Telfair & Swepston (1987);Butler(1992);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Langschied (1994);Muehl(1994)		
Casmerodius albus (Linnaeus) Great Egret	Sennett(1879,1892);Beckham (1887);Benners(1887); Chapman(1891);Rhoads(1892); Allen(1935b);Goering & Cherry (1971);Simersky(1971);Mendoza (1974);Ortiz(1974);Blacklock (1976);Chaney et.al.(1976); Smith & Swepston(1976); Mock(1978);Shew et.al.(1981); Kohlhaas(1985);Telfair & Swepston(1987);Ecoservices (1993a);Bauer(1993);Muehl (1994)	BE,L,PO,BI,MS, MF,GB,IGW,SG,	C(PR*)
Egretta thula (Molina) Snowy Egret	Sennett(1879,1892);Beckham (1887);Benners(1887); Chapman(1891);Bailey(1916); Cahn((1922);Allen(1935b); Goering & Cherry(1971); Simersky(1971);Mendoza (1974);Ortiz(1974);Blacklock (1976);Chaney et.al.(1976); Mock(1978);Shew et.al.(1981) Kohlhaas(1985);Telfair & Swepston(1987);Bauer(1993); Ecoservices(1993a);Muehl (1994)	BE,L,PO,BI,MS, MF,GB,IGW,SG, AL,UR	C(PR*)
Egretta caerulea (Linnaeus) Little Blue Heron	Sennett(1879,1892);Beckham (1887);Benners(1887);Cahn (1922);Stevenson(1957); Goering & Cherry(1971); Mock(1974);Blacklock(1976); Chaney et.al.(1976);Smith & Swepston(1976);Shew et.al. (1981);Telfair & Swepston (1987);Bauer(1993);Chaney et. al.(1993);Muehl(1994)	L,POF,BI,BE, IGW	U(PR*)
Egretta tricolor (Muller) Tricolored Heron	Sennett(1879);Beckham(1887); Hancock(1887);Rhoads(1892); Eifrig(1921);Cahn(1922);Snyder (1950);Stevenson(1957);Goering & Cherry(1971);Simersky	BE,L,PO,BI,MS, MF,GB,IGW,SG, AL,UR	C(PR*)

Species	References	Habitat	Abundance (Season)
	(1971);Mendoza(1974);Ortiz (1974);Blacklock(1976);Chaney et.al.(1976);Smith & Swepston (1976);Shew et.al.(1981); Kohlhaas(1985);Telfair & Swepston(1987);Bauer(1993); Muehl(1994)		
Egretta rufescens (Gmelin) Reddish Egret	Sennett(1879,1892);Beckham (1887);Benners(1887);Pearson (1921);Cahn(1922);Allen (1935b);Snyder(1950); McMurray(1971);Simersky (1971);Bolen & Cottam(1973); Mendoza(1974):Ortiz(1974); Blacklock(1976);Chaney et.al (1976);Smith & Swepston (1976);Paul(1977,1991); Blacklock et.al.(1978);Shew et al.(1981);Kohlhaas(1985);Tate (1986);Telfair & Swepston (1987);Bauer(1993);Chaney et. al.(1993);Ecoservices(1993a,b); Muehl(1994);	BE,BI,SG,PO,GB, IGW,L	C(PR*)
Bubulcus ibis (Linnaeus) Cattle Egret	Sprunt(1956);Goering & Cherry(1971);Ramsey(1971); Goering(1974);Mendoza(1974) Mrazek(1974);Ortiz(1974); Blacklock(1976);Chaney et.al. (1976);Smith & Swepston (1976);Telfair(1979,1994); Shew et.al.(1981);Chapman (1984);Kohlhaas(1985);Telfair & Swepston(1987);Williges (1989);Bauer(1993);Chaney et. al.(1993);Ecoservices(1993a); Langschied(1994);Muehl(1994)	SA,AL,BE,BI,P PO,D,IGW,GB, R,L,UR	C(PR*)
Butorides virescens (Linnaeus) Green Heron	Sennett(1879,1892);Beckham (1887);Rhoads(1892);Cahn (1922);Goering &Cherry(1971); Swanson(1988);Bauer(1993); Chaney et.al.(1994);Davis & Kushlan(1994);Muehl(1994);	POF,L,BI,BE UR	U(SR*) R(WR)
Nycticorax nycticorax (Linnaeus) Black-crowned Night-Heron	Sennett(1879,1892);Beckham (1887);Benners(1887); Hancock(1887);Rhoads 1892; Cahn(1922);Stevenson(1957); Goering & Cherry(1971); Blacklock(1976);Chaney et.al. (1976);Smith &Swepston (1976);Blacklock et.al.(1978); Shew et.al.(1981);Kohlhaas	BE,L,PO,BI,MS, MF,GB,IGW,SG, AL,UR	C(PR*)

Species	References	Habitat	Abundance (Season)
	(1985);Telfair & Swepston (1987);Bauer(1993);Davis (1993);Ecoservices(1993a); Muehl(1994)		
Nycticorax violaceus (Linnaeus) Yellow-crowned Night-Heron	Benners(1887);Shew et.al. (1981);Telfair & Swepstson (1987);Bauer(1993);Chaney et. al.(1993);Ecoservices(1993a); Langschied(1994);Muehl(1994)	POF,L,MF,MS, GB,IGW	C(FT,ST) R(SR*,WR)
THRESKIORNITHIDAE			
Eudocimus albus (Linnaeus) White Ibis	Benners(1887);Stevenson (1957);Goering & Cherry (1971);Blacklock(1976); Chaney et.al.(1976);Hingtgen et. al.(1985);Telfair & Swepston (1987);Kushlan & Bildstein (1992);Bauer(1993);Ecoservices (1993a);Muehl(1994)	BE,BI,MS,MF, PO,IGW	U(PR*)
Plegadis falcinellus (Linnaeus) Glossy Ibis	Snyder(1950);Burger & Miller(1977);Haynie(1993)	BE,BI,MS,MF, PO,IGW	R(ST)
Plegadis chihi (Vieillot) White-faced Ibis	Sennett(1879);Beckham (1887);Benners(1887); Snyder(1950);Ryder(1967); Mendoza(1974);Ortiz(1974); Blacklock(1976);Chaney et.al. (1976);Burger & Miller(1977); Capen(1977);Shew et.al. (1981);Kohlhaas(1985);Telfair & Swepston(1987);Bauer (1993);Langschied(1994); Muehl(1994);Ryder & Manry (1994)	B,BI,PO,MS,MF, IGW	U(WR) C (SR*)
Ajaia ajaja (Linnaeus) Roseate Spoonbill	Sennett(1879,1892);Beckham (1887);Benners(1887); Chapman(1891);Rhoads(1892); Bailey(1916);Pearson(1921); Cahn(1922);Allen(1935a,1942, 1947);Sprunt(1935);Cottam & Knappen(1939);Snyder(1950); Blacklock(1976);Chaney et.al. (1976);Smith & Swepston (1976);Shew et.al.(1981); White et.al.(1982);Lewis(1983); Telfair & Swepston(1987); Bauer(1993);Ecoservices (1993a);Muehl(1994)	BE,BI,PO,SG, MS,MF,L,IGW	U(WR) C(SR*)
CICONIDAE			
Jabiru mycteria (Lichtenstein) Jabiru	Haucke & Kiel(1973); Lasley(1988)	BE,PO	I(FT)
Mycteria americana Linnaeus Wood Stork	Benners(1887);Tate(1986); Bauer(1993);Ecoservices	BE,MS,MF,L,PO	C(FT) A(WR)

Species	References	Habitat	Abundance (Season)
	(1993);Muehl(1994)		
Order Phoenicopteriformes	Palmer(1962)		
PHOENICOPTERIDAE			
Phoenicopterus ruber Linnaeus Greater Flamingo	Hagar(1944)	BE,BI	I(SR,FT)
Order Anseriformes	Kortwright(1942);Bellrose (1976);Palmer(1976a,b); Johnsgard(1978);Clapp et.al. (1982);McAdams(1987); Phillips(1986);Cain(1988)		
ANATIDAE			
Dendrocygna bicolor (Vieillot) Fulvous Whistling-Duck	Snyder(1950);Rylander & Bolen(1970);Whyte & Cain (1979);Rylander et.al.(1980); Tate(1986);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Anderson(1994); Langschied(1994);Muehl(1994)	PO,L,BE,BI,MF, MS,IGW,GB	C(FT,ST) U(SR*) R(WR)
Dendrocygna autumnalis (Linnaeus) Black-bellied Whistling-Duck	Bolen(1964,1967);Bolen et.al. (1964);Bolen & Forsyth (1967);Bolen & Beechham (1970);Cain(1970,1976); Rylander & Bolen(1970); Delnicki et.al.(1976); McCamant(1976);Loven (1978);Rylander et.al.(1980); Heins(1984);Chronister(1985); Heins-Lay(1986);Swanson (1988);Williges(1989);Bauer (1993);Ecoservices(1993a); Anderson(1994);Langschied (1994);Muehl(1994)	POF,L,MF,RW, OW,AL,UR,BE, BI	C(PR*)
Cygnus columbianus (Ord) Tundra Swan	Limpert & Ernst(1994)	BE,L,POF	I(WR)
Cygnus buccinator Richardson Trumpeter Swan	Cottam & Knappen(1939); Mitchell(1994)	BE,L,POF	A(WR)
Anser albifrons (Scopoli) Greater White-fronted Goose	Bauer(1993);Ecoservices (1993a);Anderson(1994); Ely & Dzubin(1994);Muehl (1994)	AL,P,BE,L,PO	C(WR)
Chen caerulescens (Linnaeus) Snow Goose	Sennett(1879);Benners (1887);Pearson(1922); Webster(1983);Leslie & Swank(1985);Bauer(1993); Ecoservices(1993a); Anderson(1994);Muehl (1994)	AL,P,POF,BE, L,F	C(WR)
Chen rossii (Cassin) Ross' Goose		AL,P,POF,BE, L,F	R(WR)
Branta bernicla (Linnaeus) Brant	Snyder(1950);Lasley(1989)	BE,AL,SG	I(WR)

Species	References	Habitat	Abundance (Season)
Branta canadensis (Linnaeus) Canada Goose	Chapman(1891);Williams (1932);Bauer(1993); Anderson(1994);Muehl (1994)	AL,P,POF,BE,L, F	C(WR)
Aix sponsa (Linnaeus) Wood Duck	Beckham(1887);Bolen and Cottam(1967);Loven(1978); Anderson(1994);Belrose & Holm(1994);Muehl(1994)	R,L,POF,BE	U(WR) R(SR*)
Anas crecca Linnaeus Green-winged Teal	Beckham(1887);Sennett (1892);Loven(1978); Ecoservices(1993a);Anderson (1994);Muehl(1994)	POF,L,R,BE, AR,IGW	C(FT,WR, ST)
Anas rubripes Brewster American Black Duck	Swanson(1988);Muehl(1994);	PO,BE,L,BI,AL,	A
Anas fulvigula Ridgway Mottled Duck	Benners(1887);Sennett(1889; 1892);Chapman(1891); Rhoads(1892);Merrit(1940); Snyder(1950);Loven(1978); Stutzenbaker(1988);Bauer (1993);Ecoservices(1993a); Anderson(1994);Langschied (1994);Moorman & Gray(1994); Muehl(1994)	PO,BE,L,BI,AL, MF,R	C(PR*)
Anas platyrhynchos Linnaeus Mallard	Sennett(1879,1892);Beckham (1887);Hancock(1887);Bauer (1993);Anderson(1994); Muehl(1994)	POF,BE,L,BI, AL,MF,R	U(WR) R(SR*)
Anas acuta Linnaeus Northern Pintail	Beckham(1887);Benners (1887);Sennett(1892); O'Reilly(1946);Koenig(1969); Bauer(1993);Ecoservices (1993a);Anderson(1994); Muehl(1994)	BE,PO,AL,L,F	C(FT,WR, ST) I(SR)
Anas querquedula Linnaeus Garganey		POF	A(FT)
Anas discors Linnaeus Blue-winged Teal	Beckham(1887);Benners(1887); Sennett(1892);Snyder(1950); Stevenson(1957);Loven(1978); Lovenet.al.(1980);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Anderson(1994);Muehl (1994)	POF,L,R,BE, AR,IGW	C(WR) R(SR*)
Anas cyanoptera Vieillot Cinnamon Teal	Sennett(1892);Loven(1978); Bauer(1993);Anderson(1994); Muehl(1994)	POF,L,R,BE, AR,IGW	U(WR) I(SR)
Anas clypeata Linnaeus Northern Shoveler	Beckham(1887);Benners(1887); Hancock(1887);Chapman(1891); Rhoads(1892);Sennett(1892); Bailey(1916);Snyder(1950); Stevenson(1957);Tietje(1986); Bauer(1993);Chaney et.al.	POF,L,R,BE, AR,IGW	C(WR) I(SR)

Species	References	Habitat	Abundance (Season)
	(1993);Ecoservices(1993a); Anderson(1994);Muehl(1994)		
Anas strepera Linnaeus Gadwall	Sennett(1879,1892); Beckham(1887);Hancock (1887);O'Reilly(1946); Snyder(1950);Bauer(1993); Ecoservices(1993a);Anderson (1994);Muehl(1994)	POF,L,BE,R,AL	C(WR) A(SR)
Anas penelope Linnaeus Eurasian Wigeon	Widmann(1922);Cottam & Knappen(1939);Lasley(1989)	BE,SG,PO,BI,L	A(MI)
Anas americana Gmelin American Wigeon	Sennett(1879,1892);Beckham (1887);O'Reilly(1946); Koenig(1969);Bauer(1993); Ecoservices(1993a);Anderson (1994);Muehl(1994)	BE,SG,PO,BI,L	C(WR) I(SR)
Aythya valisineria (Wilson) Canvasback	Beckham(1887);Sennett (1892);O'Reilly(1946); Snyder(1950);Tate(1986); Bauer(1993);Anderson (1994);Muehl(1994)	BE,L,PO,IGW	U(WR)
Aythya americana (Eyton) Redhead	Sennett(1879,1892);Beckham (1887);Hancock(1887); Snyder(1950);Weller(1964); Koenig(1969);Cornelius(1977, 1982);Loven(1978);Haig & Oring(1985);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Anderson(1994);Muehl (1994)	BE,SG,PO,L, IGW,GB,BI	C(WR) I(SR)
Aythya collaris (Donovan) Ring-necked Duck	Loven(1978);Loven et.al.(1980); Bauer(1993)Anderson(1994); Muehl(1994)	L,POF,BE	U(WR) I(SR)
Aythya marila (Linnaeus) Greater Scaup		BE	R(WR)
Aythya affinis (Eyton) Lesser Scaup	Sennett(1879,1892); Beckham(1887);Benners(1887); Hancock(1887);Cahn(1922); O'Reilly(1946);Stevenson (1957);Loven et.al.(1980); Mulholland(1985);Palmer(1987); Bauer(1993);Ecosevices(1993a); Anderson(1994);Muehl(1994)	BE,PO,SG,L, IGW,BI,GB,R	C(WR) I(SR)
Clangula hyemalis (Linnaeus) Oldsquaw	Harrison(1983)	BE,SG,BI	R(WR) A(SR)
Melanitta nigra (Linnaeus) Black Scoter	Harrison(1983)	BE,SG,IGW	A(WR)
Melanitta perspicillata (Linnaeus) Surf Scoter	Harrison(1983)	BE,SG,IGW, PO,BI	I(WR)
Melanitta fusca (Linnaeus) White-winged Scoter	Stevenson(1953);Harrison (1983);Anderson(1994);	BE,SG,IGW, PO,BI	R(WR) I(SR)

Species	References	Habitat	Abundance (Season)
Bucephala clangula (Linnaeus) Common Goldeneye	Beckham(1887);Benners (1887);Harrison(1983) Ecoservices(1993a);Anderson (1994);Muehl(1994)	BE,SG,BI,POF, L,IGW	U(WR)
Bucephala albeola (Linnaeus) Bufflehead	Bolen & Chapman(1981); Harrison(1983);Bauer(1993); Ecoservices(1993a);Gauthier (1993);Anderson(1994); Muehl(1994)	BE,SG,PO,L, IGW,BI	C(WR)
Lophodytes cucullatus (Linnaeus) Hooded Merganser	Beckham(1887);Harrison (1983); Bauer(1993); Anderson(1994);Dugger et. al.(1994);Muehl(1994)	PO,L,BE	U(WR)
Mergus merganser Linnaeus Common Merganser	Harrison(1983);Anderson (1994);Muehl(1994)	BE,BI,SG,PO, L,IGW,GB	
Mergus serrator Linnaeus Red-breasted Merganser	O'Reilly(1946);Harrison (1983);Bauer(1993); Ecoservices(1993a);Anderson (1994);Muehl(1994)	BE,BI,SG,PO, L,IGW,GB	C(WR) I(SR)
Oxyura jamaicensis (Gmelin) Ruddy Duck	Benners(1887);Loven(1978); Flickinger & Bunck(1987); Palmer(1987);Bauer(1993); Anderson(1994);Muehl(1994)	BE,SG,L,PO, IGW	C(WR) R(SR*)
Oxyura dominica (Linnaeus) Masked Duck	Lawrence(1927);Johnsgard & Hagermeyer(1969);Fall (1973);Haynie(1993); Anderson(1994);Langscheid (1994)	POF,MF,L	I(PR*)
Order Falconiformes	Palmer(1988a,b);		
CATHARTIDAE			
Coragyps atratus (Bechstein) Black Vulture	Beckham(1887);Benners(1887); Hancock(1887);Rhoads(1892); Sennett(1892);Cahn(1922, 1923);Eifrig(1929);Merrit (1940);Woodard(1975);Williges (1989);Langscheid(1994)	RW,OW,M,P, AL,GB,BI	C(PR*)
Cathartes aura (Linnaeus) Turkey Vulture	Beckham(1887);Benners (1887);Hancock(1887);Rhoads (1892);Sennett(1892);Bailey (1916);Cahn(1922);Williges (1989);Merrit(1940);Bauer (1993);Ecoservices(1993a); Chaney et.al.(1994)	RW,OW,M,P, AL,GB,BI	C(PR*)
ACCIPITRIDAE	Swann(1930);Brown & Amadon(1968);Clark & Wheeler(1987);Amadon et.al. (1988);Johnsgard(1990)		
Pandion haliaetus (Linnaeus) Osprey	Beckham(1887);Rhoads(1892); Sennett(1892);May(1935);Tate (1986);Bauer(1993);Ecoservices (1993a,b)	BE,L,R,BI,POF	C(WR) R(SR)

Species	References	Habitat	Abundance (Season)
Elanoides forficatus (Linnaeus) American Swallow-tailed Kite	Sennett(1879,1892); Beckham(1887);Benners (1887);Hancock(1887); Stevenson(1953);Meyer (1995)	RW,OW,	R(FT,ST)
Elanus leucurus (Vieillot) White-tailed Kite	Chapman(1891);Stevenson (1953);Farquhar(1992); Ecoservices(1993a);Chaney et.al.(1994);Langschied (1994);	SA,P,M,RW, OW,TS,AL	U(PR*)
Ictinia mississippiensis (Wilson) Mississippi Kite	Chapman(1891);Webster (1983)	RW,OW,TS,M, P,SA	C(FT,ST) A(WR)
Haliaeetus leucocephalus (Linnaeus) Bald Eagle	Falls(1973)	RW,L,OW,M, P,BE,SA	R(WR) I(SR*)
Circus cyaneus (Linnaeus) Northern Harrier	Beckham(1887);Hancock (1887);Sennett(1892); Bailey(1916);Cahn(1922, 1923);Hamilton(1981); Chapman(1984);Swanson (1988);Bauer(1993);Ecoservices (1993a);Langschied(1994)	P,MS,MF,SA, D,F,AL	C(WR,FT, ST)
Accipiter striatus Vieillot Sharp-shinned Hawk	Beckham(1887);Hancock (1887);Williges(1989); Chaney et.al.(1994); Langschied(1994)	RW,OW,M,TS, P,D,SA,UR	U(WR,ST, FT)
Accipiter cooperii (Bonaparte) Cooper's Hawk	Williges(1989);Rosenfield & Bielefeldt(1993); Langschied(1994)	RW,OW,M,TS, P,D,SA,UR	U(WR,ST, FT) R(SR*)
Accipiter gentilis (Linnaeus) Northern Goshawk			
Parabuteo unicinctus (Temminck) Harris' Hawk	Beckham(1887);Benners (1887);Norris(1890b); Chapman(1891);Rhoads(1892); Bailey(1903,1916);Cahn(1922); Eifrig(1929);Haucke(1971);Tate (1986);Williges(1989); Langschied(1994)	TS,M,SA,RW,P, OW,UR,AL	U(PR*)
Buteo nitidus (Latham) Gray Hawk		RW,SA	A(WR)
Buteo lineatus (Gmelin) Red-shouldered Hawk	Beckham(1887);Chapman (1891);Rhoads(1892);Brown (1971);Woodard(1975); Swanson(1988);Williges (1989);Crocoll(1994)	RW,OW,M,SA, TS,UR	U(PR*)
Buteo platypterus (Vieillot) Broad-winged Hawk	Beckham(1887);Stevenson (1957);Swanson(1988); Langschied(1994)	RW,OW,UR	C(FT,ST) A(WR)
Buteo swainsoni Bonaparte Swainson's Hawk	Benners(1887);Bailey(1916); Snyder(1950);Langschied (1994)	P,AL,SA,M, OW,RW,TS	C(FT,ST) A(WR) R(SR*)

Species	References	Habitat	Abundance (Season)
Buteo albicaudatus Vieillot White-tailed Hawk	Sennett(1879);Beckham (1887);Benners(1887);Bailey (1916);Burrows(1917);Cottam & Knappen(1939);Stevenson & Maitzen(1946);Voous(1968); Haucke(1971);Morrison(1978); Ditto(1983);Tewes(1984); Kopeny(1988);Swanson(1988); Williges(1989);Palmer(1990); Farquhar(1992);Ecoservices (1993a);Langschied(1994)	P,SA,TS,D,M, OW	U(PR*)
Buteo jamaicensis (Gmelin) Red-tailed Hawk	Beckham(1887);Chapman (1891);Stevenson(1953): Swanson(1988);Williges(1989); Chaney et.al.(1993);Ecoservices (1993a);Preston & Beane(1993); Langschied(1994)	SA,TS,M,OW, RW,P,AL,UR,D	C(WR,FT, ST) U(SR*)
Buteo regalis (Gray) Ferruginous Hawk	Ecoservices(1993a); Langschied(1994)	P,M,SA,D,AL	U(WR)
Buteo lagopus (Pontoppidan) Rough-legged Hawk		P,M,SA,D,AL	I(WR)
Aquila chrysaetos (Linnaeus) Golden Eagle	Beckham(1887);Hancock (1887)	P,M,SA,D,AL	I(WR)
FALCONIDAE			
Caracara plancus (Miller) Crested Caracara	Beckham(1887);Benners (1887);Hancock(1887); Rhoads(1892);Sennett(1892); Bailey(1916);Cahn(1922);Eifrig (1929);Merrit(1940);Glazener (1964);Hamilton(1981);Williges (1989);Langscheid(1994)	SA,P,M,TS,D, AL	U(PR*)
Falco sparverius Linnaeus American Kestrel	Beckham(1887);Hancock (1887);Rhoads(1892);Cahn (1922);Bolen(1980);Derden (1982);Swanson(1988);Williges (1989);Bauer(1993);Chaney et.al. (1993);Ecoservices(1993a); Langschied(1994)	P,SA,M,AL,TS, OW,RW,UR,D	C(WR,FT, ST)
Falco columbarius Linnaeus Merlin	Bauer(1993);Chaney et al. (1993);Ecoservices(1993); Sodhi et.al.(1993);Langschied (1994)	RW,OW,M,SA, TS,P,D,GB,UR	U(WR,FT, ST)
Falco femoralis Temminck Aplomado Falcon	Hector(1987)	SA	A(ST)
Falco peregrinus Tunstall Peregrine Falcon	Sennett(1879);Beckham (1887);Benners(1887); Cottam & Knappen(1939); Stevenson(1953);Stevnson (1957);Rogers & Hunt(1975); Chapman(1984);Chaney et.al. (1993);Ecoservices(1993a,b)	GB,D,P,SA,BE, M,UR	U(WR,FT, ST)

Species	References	Habitat	Abundance (Season)
Falco mexicanus Schlegel Prairie Falcon	Beckham(1887);Stevenson (1953)	P,SA,AL	R(WR)
Order Galliformes			
PHASIANIDAE			
Tympanuchus cupido (Linnaeus) Greater Prairie-Chicken	Lehman(1941);Kessler(1979) Schroeder & Robb(1993)	SA,P	R(PR*)
Meleagris gallopavo Linnaeus Wild Turkey	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Sennett(1892); Bailey(1916);Griscom(1925); Snyder(1950);Schorger(1966); Glazener(1967);Watts(1968, 1969);Haucke(1971);Watts & Stoker(1971);Emlen(1972); Woodard(1975);Hensley(1977); Smith(1977);Baker(1979);Balph et.al.(1980);Baker(1980);Rocket (1985);Ransom et.al.(1987); Williges(1989);Glazener et.al. (1990);Eaton(1992);Langschied (1993)	RW,OW,M,SA, TS,P	U(PR*)
Colinus virginianus (Linnaeus) Northern Bobwhite	Beckham(1887);Benners (1887);Hancock(1887); Rhoads(1892);Sennett(1892); Bailey(1916);Cahn(1922); Aldrich(1946);Rosen(1969); Emlen(1972);Bell & Klebanow (1973);Johnsgard(1973);Bell (1975);Woodard(1975);Roth (1977);Wilson(1978);Lehman (1984);Wilson(1984);Bareiss (1985);Prasad & Guthrie(1986); Sloan(1987);Baker(1988);Doerr (1988);Swanson(1988)Williges (1989);Spears(1991);Chaney et. al.(1993);Kassinis(1994); Langschied(1994)	P,SA,M,D,AL, TS,UR	C(PR*)
Callipepla squamata (Vigors) Scaled Quail	Wilson(1984);Schemnitz(1994); Johnsgard(1973)	TS	R(PR*)
Order Gruiformes			
RALLIDAE			
Coturnicops noveboracensis (Gmelin) Yellow Rail	Bookhout(1995)	MS,MF	R(WR,FT, ST)
Laterallus jamaicensis (Gmelin) Black Rail	Eddleman et.al.(1994)	MS,MF	R(PR*)
Rallus longirostris Boddaert Clapper Rail	Benners(1887);Sennett(1892); Simmons(1914);Bauer (1993);Muehl(1994)	MS,BE	U(PR*)
Rallus elegans Audubon King Rail	Chapman(1891);Rhoads(1892); Sennett(1892);Meanley(1992); Bauer(1993);Muehl(1994)	MF,BE,POF	U(WR,FT, ST)

Species	References	Habitat	Abundance (Season)
Rallus limicola Vieillot Virginia Rail	Bauer(1993);Langschied (1994);Muehl(1994)		
Porzana carolina (Linnaeus) Sora	Sennett(1892);Bauer(1993); Langschied(1994);Muehl (1994)	POF,MF,MS	U(WR,FT, ST)
Porphyrula martinica (Linnaeus) Purple Gallinule	Benners(1887);Cahn(1922); Snyder(1950);Regan(1977); Whyte & Cain(1979);Haig (1984);Bauer(1993)	MF,POF,MS,GB	U(SR*,FT, ST) R(WR)
Gallinula chloropus (Linnaeus) Common Moorhen	Sennett(1879);Beckham (1887);Regan(1977);Whyte & Cain(1979);Haig(1984);Bauer (1993);Langschied(1994); Muehl(1994)	POF,MF,R,L, PO,BE,F	C(PR*)
Fulica americana Gmelin American Coot	Sennett(1879,1892);Cahn (1922);Whyte & Cain(1979); Haig(1984);Bauer(1993); Ecoservices(1993a); Langschied(1994);Muehl (1994)	POF, PO,BE,MF, MS,L,R	C(WR,FT, ST) U(SR*)
GRUIDAE	Krajewski(1989);Krajewski & Fetzner(1994)		
Grus canadensis (Linnaeus) Sandhill Crane	Beckham(1887);Hancock (1887);Swanson(1988); Tacha et.al(1992);Bauer(1993); Ecoservices(1993a);Langschied (1994);Muehl(1994)	P,SA,AL,L PO,D,MS	C(WR)
Grus americana (Linnaeus) Whooping Crane	Sennett(1879);Griscom (1925);Stevenson(1942); Craven(1946);Stevenson & Griffith(1946);Snyder(1950); Allen(1952,1954);Greenway (1967);Shield & Benham (1968);Lamont & Reichel (1970);Uhler & Locke(1970); Binkley & Miller(1980);Lasley (1983);Webster(1983);Bishop (1984);Boyce & Miller(1985); Muehl(1994)	BE,PO,P,SA MF,MS,BI	R(WR)
Order Charadriiformes	Johnsgard(1981);Clapp et.al. (1982)		
BURHINIDAE	Hayman et.al.(1986)		
Burhinus bistriatus (Wagler) Double-striped Thick-knee	MacInnes & Chamberlain (1963)	P,SA,AL	A(MI)
CHARADRIIDAE	Hayman et.al.(1986)		
Pluvialis squatarola (Linnaeus) Black-bellied Plover	Benners(1887);Sennett (1888b);Rhoads(1892);O'Reilly (1946);McDaniel & McDaniel (1967);Chapman(1984); Bauer(1993);Chaney et.al. (1993);Ecoservices(1993a);	BE,GB,F,PO, BI,AL	C(WS,FT,ST) U(SR)

Species	References	Habitat	Abundance (Season)
	Espy, Huston(1993);Withers & Chapman(1993);Muehl(1994); Withers(1994)		
Pluvialis dominica (Muller) American Golden-Plover	Beckham(1887);Benners (1887);Hancock(1887); Sennett(1892);Williams(1945); Stevenson(1953);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Muehl(1994)	P,SA,AL,POF, BE,GB,UR	C(ST)U(FT) A(WR)
Charadrius alexandrinus Linnaeus Snowy Plover	Sennett(1888b,1892);Cahn (1922);Snyder(1950);Chapman (1984);Bauer(1993);Chaney et. al.(1993);Ecoservices(1993a,b); Withers & Chapman(1993); Withers(1993);Muehl(1994)	F,GB,BE,PO, BI,D	U(PR*)
Charadrius wilsonia Ord Wilson's Plover	Benners(1887);Rhoads(1892); Sennett(1892);Cahn(1922); Bergstrom(1985,1986);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a,b);Espy, Huston(1993);Withers & Chapman(1994);Withers(1994)	F,GB,BE,PO, BI,D	C(SR*) R(WR)
Charadrius semipalmatus Bonaparte Semipalmated Plover	Beckham(1887);Rhoads(1892); Chapman(1984);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a,b);Espy,Huston(1993); Withers& Chapman(1993); Muehl(1994);Withers(1994)	F,GB,BE,PO, BI,D	C(WR,FT, ST)
Charadrius melodus Ord Piping Plover	Nicholls & Baldassare(1990a, b);Chapman(1984);Haig & Oring(1985);Haig & Plissner (1985);Haig(1992);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a,b);Espy, Huston(1993);Withers & Chapman(1993);Muehl(1994); Withers(1994)	GB,F,BE,BI,PO	U(WR) C(FT,ST) R(SR)
Charadrius vociferus Linnaeus Killdeer	Benners(1887);Hancock (1887);Rhoads(1892);Sennett (1892);Cahn(1922);Eifrig (1929);Merrit(1940);Swanson (1988);Bauer(1993);Ecoservices (1993a);Langschied(1994); Muehl(1994)	P,SA,AL,BE, UR,PO,BI,GB	C(PR*)
Charadrius montanus Townsend Mountain Plover	Bauer(1993);Muehl(1994)	AL,P,SA	R(WR) U(FT,ST)
HAEMATOPODIDAE	Hayman et. al.(1986)		
Haematopus palliatus Temminck American Oystercatcher	Beckham(1887);Benners (1887);Hancock(1887);Cahn (1922);Snyder(1950);Chapman (1982);Espy, Huston(1993);Nol	BE,BI,F,GB	U(PR*)

Species	References	Habitat	Abundance (Season)
	& Humphrey(1994);Withers (1994)		
RECURVIROSTRIDAE	Hayman et.al.(1986)		
Himantopus mexicanus (Muller) Black-necked Stilt	Beckham(1887);Benners (1887);Hancock(1887);Rhoads (1892);Bailey(1916);Cahn (1922);Haig(1984);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Withers & Chapman (1993);Muehl(1994);Withers (1994)	BE,F,BI,PO,GB	C(PR*)
Recurvirostra americana Gmelin American Avocet	Sennett(1879,1892);Beckham (1887);Benners(1887); Chapman(1891);Rhoads(1892); Bailey(1916);Eifrig(1929);Bauer (1993);Ecoservices(1993a);Espy, Huston(1993);Withers & Chapman(1993);Muehl(1994); Withers(1994)	BE,F,BI,PO,GB	C(WR) U(SR*)
JACANIDAE	Hayman et.al.(1986)		
Jacana spinosa (Linnaeus) Northern Jacana	Labuda(1968);Lasley(1989)	MF,POF,L	I(PR*)
SCOLOPACIDAE	Hayman et.al.(1986)		
Tringa melanoleuca (Gmelin) Greater Yellowlegs	Sennett(1888b,1892); Chapman(1891);Rhoads(1892); Bailey(1916);Cahn(1922); O'Reilly(1946);Bauer(1993); Ecoservices(1993a,b);Withers & Chapman(1993);Muehl (1994);Withers(1994)	BE,PO,F,BI, GB,	C(WR,FT, ST) U(SR)
Tringa flavipes (Gmelin) Lesser Yellowlegs	Chapman(1891);Sennett (1892);Bailey(1916);Cahn (1922);O'Reilly(1946);Swanson (1988);Bauer(1993);Chaney et. al.(1993);Ecoservices(1993a,b); Withers & Chapman(1993); Muehl(1994);Withers(1994)	BE,PO,F,BI, GB,	C(WR,FT, ST) R(SR)
Tringa solitaria Wilson Solitary Sandpiper	Chapman(1891);Sennett (1892);Bailey(1916);Bauer (1993);Ecoservices(1993a)	POF,R,F	U(FT,ST) I(WR)
Catoptrophorus semipalmatus (Gmelin) Willet	Sennett(1879,1992);Beckham (1887);Hancock(1887); Chapman(1891);Rhoads(1892); Bailey(1916);Eifrig(1929); Williams(1938);Merrit(1940); Chapman(1984);Swanson(1988); Bauer(1993);Chaney et.al.(1993); Ecoservices(1993a);Espy, Huston (1993);Muehl(1994);Withers (1994)	BE,GB,F,PO, SG,IGW	C(PR*)

Species	References	Habitat	Abundance (Season)
Actitis macularia (Linnaeus) Spotted Sandpiper	Chapman(1891);Swanson(1988); Chaney et.al.(1993);Ecoservices (1993a);Withers & Chapman (1993);Muehl(1994)	R,PO,BE,BI, L,GB	U(WR,FT, ST)
Bartramia longicauda (Bechstein) Upland Sandpiper	Benners(1887);Chapman (1891);Sennett(1892);Bailey (1916);Williams(1945); Stevenson(1957);Swanson (1988);Bauer(1993); Langschied(1994);Muehl (1994)	AL,P,SA,UR,PO	C(FT,ST)
Numenius borealis (Forster) Eskimo Curlew	Cottam & Knappen(1939); Weston(1965);Greenway (1967)	P,SA,AL,POF, BE,GB,UR	I(MI)
Numenius phaeopus (Linnaeus) Whimbrel	Weston(1965);Ecoservices (1993);Withers & Chapman (1993);Muehl(1994)	BE,F,GB,IGW, BI,PO,AL	U(FT,ST) I(WR)
Numenius americanus Bechstein Long-billed Curlew	Sennett(1879,1892);Beckham (1887);Benners(1887);Rhoads (1892);Cahn(1922);Eifrig (1929);Snyder(1950);Williams (1939);Weston(1965);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Espy, Huston(1993);Withers & Chapman(1993);Langschied (1994);Muehl(1994);Withers (1994)	P,SA,BE,GB,F, BI,L,PO,AL,UR	C(WR,FT, ST) U(SR)
Limosa haemastica (Linnaeus) Hudsonian Godwit	Benners(1887);Wiliiams (1945);Stevenson(1953); Bauer(1993);Ecoservices (1993a)	BE,F,GB,IGW, BI,PO,AL	U(FT,ST)
Limosa fedoa (Linnaeus) Marbled Godwit	Sennett(1979);Beckham (1887);Eifrig(1929);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Espy, Huston(1993);Withers & Chapman(1993);Muehl(1994); Withers(1994)	BE,F,PO,BI,AL, GB	C(WR,FT, ST) R(SR)
Arenaria interpres (Linnaeus) Ruddy Turnstone	Beckham(1887);Benners (1887);Sennett(1888b); Rhoads(1892);Bailey(1916); O'Reilly(1946);Chapman(1984); Bauer(1993);Chaney et.al. (1993);Ecoservices(1993a); Espy, Huston(1993);Withers & Chapman(1993);Muehl(1994); Withers(1994)	GB,BE,F,BI,PO	C(WR,FT, ST)) U(SR
Aphriza virgata (Gmelin) Surfbird	McCamant & Fall(1974)	GB	I(ST)

Species	References	Habitat	Abundance (Season)
Calidris canutus (Linnaeus) Red Knot	Thompson(1958);Chapman (1984);Chaney et.al.(1993); Ecoservices(1993a);Espy, Huston(1993);Muehl(1994); Withers(1994)	GB,F,BE,BI, IGW	U(WR)R(SR) C(FT,ST)
Calidris alba (Pallas) Sanderling	Sennett(1879,1892);Beckham (1887);Hancock(1887); Cahn(1922);O'Reilly(1946); Chapman(1984);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Espy, Huston(1993); Withers & Chapman(1993); Muehl(1994);Withers(1994)	GB,F,BE,BI, PO,IGW	C(PR)
Calidris pusilla (Linnaeus) Semipalmated Sandpiper	Chapman(1891);Rhoads(1892); Sennet(1892);O'Reilly(1946); Stevenson(1957);Phillips (1975);Gratto-Trevor(1992); Bauer(1993);Muehl(1994)	BE,F,PO,GB,BI	U(FT,ST)
Calidris mauri (Cabanis) Western Sandpiper	O'Reilly(1946);Swanson(1988); Bauer(1993);Chaney et.al. (1993);(Ecoservices(1993a); Espy, Huston(1993);Muehl (1994);Wilson(1994)	BE,F,PO,GB,BI	C(WR,FT, ST) U(SR)
Calidris minutilla (Vieillot) Least Sandpiper	Swanson(1988);Bauer(1993); Chaney et.al.(1993); Ecoservices(1993a);Espy, Huston(1993);Cooper (1994);Muehl(1994);Withers (1994)	BE,F,PO,GB,BI	C(WR,FT, ST) U(SR)
Calidris fuscicollis (Vieillot) White-rumped Sandpiper	Rhoads(1892);Williams(1945); O'Reilly(1946);Parmelee(1992); Bauer(1993);Ecoservices (1993a);Muehl(1994)	BE,F,PO,GB,BI	U(FT)C(ST) I(SR)
Calidris bairdii (Coues) Baird's Sandpiper	Williams(1945);Snyder (1950);Bauer(1993); Ecoservices(1993a);Withers & Chapman(1993);Withers (1994)	POF,AL,BE,P	U(FT,ST)
Calidris melanotos (Vieillot) Pectoral Sandpiper	Chapman(1891);Rhoads(1892); Eifrig(1929);Williams(1945); Bauer(1993);Ecoservices(1993a); Withers &Chapman(1993);Muehl(1994)	POF,AL,BE,P	C(FT,ST) I(WR,SR)
Calidris alpina (Linnaeus) Dunlin	Sennett(1892);Cahn(1922); Bauer(1993);Ecoservices (1993a);Espy, Huston(1993); Withers & Chapman(1993); Muehl(1994);Withers(1994)	F,BE,PO,GB, IGW,AL,BI,L	C(WR,FT, ST)
Calidris ferruginea (Pontoppidan) Curlew Sandpiper		GB,BE	I(WR)

Species	References	Habitat	Abundance (Season)
Calidris himantopus (Bonaparte) Stilt Sandpiper	Sennett(1888b);Williams (1945);Snyder(1950);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Muehl (1994)	F,BE,PO,AL	C(FT,ST) R(WR,SR)
Tryngites subruficollis (Vieillot) Buff-breasted Sandpiper	Williams(1945);Lanctot & Laredo(1994)	P,BE,POF,AL	C(FT,ST)
Philomachus pugnax (Linnaeus) Ruff		F,BE	I(WR)
Limnodromus griseus (Gmelin) Short-billed Dowitcher	Beckham(1887);Hancock (1887);Sennett(1888b,1892); O'Reilly(1946);Bauer(1993); Espy, Huston(1993);Muehl (1994)	F,BE,PO,L,AL	U(WR,FT, ST) R(SR)
Limnodromus scolopaceus (Say) Long-billed Dowitcher	Sennett(1888b);Cahn(1922); O'Reilly;(1946);Bauer(1946); Chaney et.al.(1993);Ecoservices (1993a);Muehl(1994)	F,BE,L,PO,AL	C(WR,FT, ST) U(SR)
Gallinago gallinago (Linnaeus) Common Snipe	Beckham(1887);Benners (1887);Williams(1938); Bauer(1993);Ecoservices (1993a);Langschied(1994); Muehl(1994)	BE,PO,L,P,AL	C(WR) U(FT,ST)
Scolopax minor Gmelin American Woodcock	Cain et.al.(1977);Keppie & Whiting(1994)	POF,RW,OW,TS	R(WR,SR*)
Phalaropus tricolor (Vieillot) Wilson's Phalarope	Snyder(1950);Stevenson (1953);Bauer(1993); Ecoservices(1993a);Colwell & Jehl(1994);Muehl(1994)	IGW,GB,P,F,BE, PO,AL	C(FT,ST) U(SR) I(WR)
Phalaropus lobatus (Linnaeus) Red-necked Phalarope	Duncan & Havard(1980)	GB,F,BE,PO	I(FT,ST)
Phalaropus fulicaria (Linnaeus) Red Phalarope	Duncan & Havard(1980)	IGW,GB,F,BE, PO	I(FT,ST)
LARIDAE	Harrison(1983)		
Stercorarius pomarinus (Temminck) Pomarine Jaeger	Duncan & Havard(1980); Lasley(1989,1991)	IGW,GB	R(MI)
Stercorarius parasiticus (Linnaeus) Parsasitic Jaeger	Duncan & Havard(1980); Lasley(1991)	IGW,GB	R(MI)
Stercorarius longicaudus Vieillot Long-tailed Jaeger	Duncan & Havard(1980); Lasley(1989);Haynie(1992a)	IGW,GB,BE	I(MI)
Larus atricilla Linnaeus Laughing Gull	Sennett(1879,1892);Beckham (1887);Benners(1887); Rhoads(1892);Pearson(1921); Cahn(1922,1923);Eifrig(1929); Simersky(1971);Mendoza(1974); Ortiz(1974);Mrazek(1974); Blacklock(1976);Chaney et.al. (1976);Blacklock et.al.(1978); Shew et.al.(1981);White et.al. (1983);Chapman(1984); Kohlhaas(1985);Zale &	IGW,GB,P,F, MS,MF,BE,SG, BI,R,L,PO,AL, UR	C(PR*)

Species	References	Habitat	Abundance (Season)
	Mulholland(1985);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Langschied (1994);Muehl(1994)		
Larus pipixcan Wagler Franklin's Gull	Benners(1887);Chapman(1891); Rhoads(1892);Ecoservices (1993a);Burger & Gochfeld (1994);Muehl(1994)	GB,P,F,BE,L,PO, AL,UR	C(FT,ST) R(WR)
Larus minutus Pallas Little Gull	Lasley(1989);Haynie(1993)	GB,IGW	A
Larus philadelphia (Ord) Bonaparte's Gull	Chapman(1984);Palmer (1987);Bauer(1993);Chaney (1993);Ecoservices(1993a); Muehl(1994);	IGW,GB,BE,L	U(WR)
Larus heermanni Cassin Heermann's Gull	Lasley(1989)	IGW,GB	A
Larus delawarensis Ord Ring-billed Gull	Sennett(1879,1892);Beckham (1887);Chapman(1891); Cahn(1922);Mendoza(1974); Ortiz(1974);Chapman(1984); Bauer(1993);Chaney et.al. (1993);Ecoservices(1993a); Ryder(1993)	IGW,GB,P,F,AL, MS,MF,BE,SG, BI,PO,UR	C(WR,FT, ST) U(SR)
Larus californicus Lawrence California Gull	Lasley(1991);Haynie(1993)	GB	R(MI)
Larus argentatus Pontoppidan Herring Gull	Sennett(1879);Beckham (1887);Hancock(1887); Chapman(1891);Cahn(1922); Mendoza(1974);Ortiz(1974); Chapman(1984);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Muehl(1994);Pierotti & Good(1994)	IGW,GB,F,MS, BE,BI,L,PO,AL	C(WR,FT, ST) U(SR)
Larus thayeri Brooks Thayer's Gull	Pulich(1980);Haynie(1992a)	GB,BE,UR	R(WR,MI)
Larus fuscus Linnaeus Lesser Black-backed Gull	Lasley(1983,1989);Haynie (1992a,b,1993);Chaney et.al.(1993)	IGW,GB,UR	R(WR)
Larus occidentalis Audubon Western Gull		GB,F,BE,UR	A(WR)
Larus hyperboreus Gunnerus Glaucous Gull	Haynie(1992a,b,1993)	IGW,GB,UR	I(WR)
Larus marinus Linnaeus Great Black-backed Gull	Haynie(1992b)	IGW,GB,BE,BI	I(WR)
Rissa tridactyla (Linnaeus) Black-legged Kittiwake	Duncan & Havard(1980); Haynie(1992b)	IGW,GB,BE,BI	I(WR)
Xema sabini (Sabine) Sabine's Gull	Cottam et.al.(1975);Duncan & Havard(1980);Lasley(1988, 1989)	IGW,GB	I(FT)(MI)

Species	References	Habitat	Abundance (Season)
Sterna nilotica Gmelin Gull-billed Tern	Sennett(1879,1892);Beckham (1887);Benners(1887); Hancock(1887);Chapman (1891);Rhoads(1892);Cahn (1922,1923);Merrit(1940); Snyder(1950);Simersky(1971); Mendoza(1974);Mrazek(1974); Ortiz(1974);Blacklock(1976); Chaney et.al.(1976);Blacklock et.al.(1978);Shew et.al.(1981); Kohlhaas(1985);Bauer(1993); Chaney et.al.(1993);Ecoservices (1993a);Langschied(1994); Muehl(1994);Parnell et.al.(1995)	IGW,GB,F,BE, BI,R,L,AL, MS,MF	C(SR*,FT, ST) U(WR)
Sterna caspia Pallas Caspian Tern	Sennett(1879,1892); Beckham(1887);Benners (1887);Hancock(1887); Chapman(1891);Rhoads(1892); Cahn(1922,1923);Snyder(1950); Mendoza(1974);Ortiz(1974); Blacklock(1976);Chaney et.al. (1976);Blacklock et.al.(1978); Shew et.al.(1981);Chapman (1984);Kohlhaas(1985);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Muehl(1994)	IGW,GB,F,BE, MS,MF,BI,SG, PO,R,L	C(PR*)
Sterna maxima Boddaert Royal Tern	Sennett(1879,1892); Beckham(1887);Benners (1887);Hancock(1887); Chapman(1891);Pearson(1921); Cahn(1922,1923);Snyder(1950); Mendoza(1974);Ortiz(1974); Blacklock(1976);Chaney et.al. (1976);Blacklock et.al.(1978); Shew et.al.(1981);Chapman (1984);Kohlhaas(1985);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Muehl(1994)	IGW,GB,F,BE, SG,BI,R,L	C(SR*,FT, ST) U(WR)
Sterna elegans Gambel Elegant Tern		IGW,GB,BE	A
Sterna sandvicensis Latham Sandwich Tern	Sennett(1879);Beckham (1887);Pearson(1921);Cahn (1922,1923);Snyder(1950); Mendoza(1974);Ortiz(1974); Blacklock(1976);Chaney et.al.(1976);Blacklock et.al. (1978);Chapman(1984); Kohlhaas(1985);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Muehl (1994)	IGW,GB,F,BE, SG,BI,L	C(SR*,FT, ST) U(WR)

Species	References	Habitat	Abundance (Season)
Sterna dougallii Montagu Roseate Tern	Duncan & Havard(1980);	IGW,GB,BE	A(WR,FT, ST)
Sterna hirundo Linnaeus Common Tern	Cahn(1922);O'Reilly(1946); Lasley(1983);Chaney et.al. (1993);Ecoservices(1993a); Muehl(1994)	IGW,GB,F,BE, BI,L	U(FT,ST) R(WR)
Sterna paradisaea Pontoppidan Arctic Tern		IGW,GB,BE	A(WR,FT, ST)
Sterna forsteri Nuttall Forster's Tern	Sennett(1879);Beckham (1887);Benners(1887); Hancock(1887);Chapman (1891);Rhoads(1892);Williams (1938);Snyder(1950);Blacklock (1976);Chaney et.al.(1976); Shew et.al.(1981);Chapman (1984);Kohlhaas(1985);Bauer (1993);Chaneyet.al.(1993); Ecoservices(1993a);Muehl(1994)	IGW,GB,F,BE, BI,SG,MS,MF, R,L	C(PR*)
Sterna antillarum (Lesson) Least Tern	Sennett(1879,1892); Benners(1887);Rhoads(1892); Eifrig(1920);Cahn(1922); Merrit(1940);Snyder(1950); McDaniel &McDaniel(1963a); Mendoza(1974);Ortiz(1974); Blacklock(1976);Chaney et.al. (1976);Blacklock et.al.(1978); Shew et.al.(1981);Thompson (1982);Thompson & Slack(1982, 1984);Chapman(1984);Kohlhaas (1985);Thompson et.al.(1992); Bauer(1993);Chaney et.al. (1993);Ecoservices(1993a,b); Muehl(1994)	IGW,GB,D,F, BE,BI,SG,MS, MF,R,L,PO,AL, UR	C(SR*,FT, ST) A(WR)
Sterna anaethetus Scopoli Bridled Tern	Duncan & Havard(1980); Haynie(1992b)	IGW,GB	A
Sterna fuscata Linnaeus Sooty Tern	Beckham(1887);Benners (1887);Mendoza(1974); Ortiz(1974);Blacklock(1976); Chaney et.al.(1976); Blacklock(1978);Duncan & Havard(1980);Shew et.al. (1981)	IGW,GB,BE,BI	R(SR*,FT, ST)
Chlidonias niger (Linnaeus) Black Tern	Rhoads(1892);Williams(1945); O'Reilly(1946);Chapman(1984); Bauer(1993);Chaney et.al. (1993);Ecoservices(1993a)	IGW,GB,F,MS, MF,BE,BI,PO, AL	C(SR,FT,ST) A(WR)
Anous stolidus (Linnaeus) Brown Noddy	Duncan & Havard(1980)	IGW,GB	A(SR,FT,ST) MI
Anous minutus Boie Black Noddy		IGW,GB	A(SR,FT,ST) MI

Species	References	Habitat	Abundance (Season)
Rynchops niger Linnaeus Black Skimmer	Sennett(1879,1892); Beckham(1887);Benners (1887);Hancock(1887); Chapman(1891);Rhoads(1892) Bailey(1916);Cahn(1922);Merrit (1940);Snyder(1950);Simersky (1971);DePue(1974);Mendoza (1974);Mrazek(1974);Ortiz (1974);Blacklock(1976);Chaney et.al.(1976);Smith & Swepston (1976);Blacklocket.al.(1978); Shew et.al.(1981);White et.al. (1984);Kohlhaas(1985);Bauer (1993);Chaney et.al.(1993); Ecoservices(1993a);Gochfeld & Burger(1994);Muehl(1994)	IGW,GB,F,BE, BI,MS,MF,L, PO	C(SR*,FT, ST) U(WR)
Order Columbiformes	Goodwin(1970)		
COLUMBIDAE			
Columba livia Gmelin Rock Dove	Johnston(1992)	UR,AL	C(PR*)
Colomba flavirostris Wagler Red-billed Pigeon	Falls(1973)	M,RW,OW,SA, TS	I(MI)
Zenaida asiatica (Linnaeus) White-winged Dove	Passmore(1981)	UR,AL,M,RW, SA,TS	U(PR*)
Zenaida macroura (Linnaeus) Mourning Dove	Beckham(1887);Benners (1887);Hancock(1887); Rhoads(1892);Sennett(1892); Bailey(1916)Cahn(1922,1923); Emlen(1972);Woodard(1975); Roth(1977);Passmore(1980, 1981);Swanson(1988);Bauer (1993);Chaney et.al.(1994); Langschied(1994);Mirarachi & Baskett(1994)	D,P,M,BI,RW, OW,SA,TS,AL, UR	C(PR*)
Columbina inca (Lesson) Inca Dove	Cahn(1922);Merrit(1940); Snyder(1950);Mueller(1992)	UR	C(PR*)
Columbina passerina (Linnaeus) Common Ground-Dove	Cahn(1922);Merrit(1940); Stevenson(1957);Johnston (1964);Emlen(1972);Roth (1977);Swanson(1988);Baskin (1989);Williges(1989);Bauer (1993);Langschied(1994);Vega & Rappole(1994)	D,P,M,TS,RW, OW,SA,AL	C(PR*)
Leptotila verreauxi Bonaparte White-tipped Dove	Cottam & Knappen(1939); Falls(1973);Boydston & DeYoung(1985)	RW,OW,SA,TS	R(PR*)
Order Cuculiformes			
CUCULIDAE			
Coccyzus erythropthalmus (Wilson) Black-billed Cuckoo	Williams(1945);James(1956); Forsyth & James(1971); Fischer(1979);Chaney et.al.	M,RW,OW,SA, TS	U(ST) R(FT,SR*)

Species	References	Habitat	Abundance (Season)
	(1994)		
Coccyzus americanus (Linnaeus) Yellow-billed Cuckoo	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Sennett(1892); Cahn(1922);Merrit(1940); Forsyth & James(1971); Woodard(1975);Swanson(1988); Williges(1989);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994);	M,RW,OW,UR, SA,TS	C(SR*,FT, ST)
Geococcyx californianus (Lesson) Greater Roadrunner	Beckham(1887);Hancock (1887);Chapman(1891);Rhoads (1892);Sennett(1892);Bailey (1916);Cahn(1922);Snyder (1950);Emlen(1972);Folse (1974);Woodard(1975);Folse & Arnold(1976,1978);Swanson (1988);Williges(1989);Langschied (1994)	TS,M,OW,SA	U(PR*)
Crotophaga sulcirostris Swainson Groove-billed Ani	Rhoads(1892);Swanson(1988); Williges(1989);Langschied (1994)	TS,SA,M,OW, RW,UR	U(SR*) R(WR)
Order Strigiformes	Burton(1984);Johnsgard(1988)		
TYTONIDAE			
Tyto alba (Scopoli) Barn Owl	Otteni et.al.(1972);Bolen (1978);Byrd(1982);Hamilton (1982);Tate(1986);Williges (1989);Marti(1992);Langschied (1994)	M,SA,TS,RW, AL,UR	U(PR*)
STRIGIDAE			
Otus flammeolus (Kaup) Flammulated Owl	Holt & Neel(1981)	M,OW,RW,TS	A(FT)
Otus asio (Linnaeus) Eastern Screech-Owl	Beckham(1887);Rhoads(1892); Tate(1986);Baskin(1989); Williges(1989);Langschied (1994)	UR,M,OW,TS, RW	U(PR*)
Bubo virginianus (Gmelin) Great Horned Owl	Beckham(1887);Benners (1887);Hancock(1887); Chapman(1891);Sennett (1892);Merrit(1940);Williges (1989);Langschied(1994)	M,OW,TS,RW, P,AL,UR	C(PR*)
Glaucidium brasilianum (Gmelin) Ferruginous Pygmy-Owl	Falls(1973);Wauer et.al.(1993)	OM	U(PR*)
Athene cunicularia (Molina) Burrowing Owl	Beckham(1887);Chapman (1891);Tate(1986);Haug et.al. (1993);Langschied(1994)	P,SA,M,AL,D	U(WR)
Strix varia Barton Barred Owl	Beckham(1887);Chapman (1891);Rhoads(1892);Bangs (1908);Woodard(1975)	RW,OW,M	C(PR*)
Asio otus (Linnaeus) Long-eared Owl	Marks et.al.(1994)	M,RW,OW,SA, UR	I(WR,FT,ST)

Species	References	Habitat	Abundance (Season)
Asio flammeus (Pontoppidan) Short-eared Owl	Beckham(1887);Tate(1986); Holt & Leasure(1993); Langschied(1994)	P,SA,AL,M,OW, TS	U(WR)
Order Caprimulgiformes			
CAPRIMULGIDAE			
Chordeiles acutipennis (Hermann) Lesser Nighthawk	Swanson(1988);Langschied (1994)	TS,M,SA,UR, AL,P	U(SR*) R(FT)I(WR)
Chordeiles minor (Forster) Common Nighthawk	Chapman(1891);Rhoads(1892); Sennett(1892);Bailey(1916); Cahn(1922);Eifrig(1929);Snyder (1950);James(1956);Roth (1977);Tate(1986);Swanson (1988);Williges(1989);Chaney et.al.(1994);Langschied(1994); Vega & Rappole(1994)	AL,P,SA,TS,UR, M,OW,RW	C(SR*,FT, ST) I(WR)
Nyctidromus albicollis (Gmelin) Pauraque	Beckham(1887);Hancock (1887);Sennett(1888a); Chapman(1891);Rhoads(1892); Oberholzer(1925);Cottam & Knappen(1939);Snyder(1950); Woodard(1975);Roth(1977) Baskin(1989);Williges(1989); Langschied(1994)	M,OW,TS,RW	U(PR*)
Phalaenoptilus nutttallii (Audubon) Common Poorwill	Bailey(1916);Oberholzer (1925);Baskin(1989);Williges (1989);Csada & Brigham (1992);Vega & Rappole(1994)	TS,SA,M,OW, RW,UR	R(SR*,FT, ST)
Caprimulgus carolinensis Gmelin Chuck-will's-widow	Beckham(1887);Rhoads(1892); Baskin(1989);Williges(1989); Chaney et.al.(1994)	RW,OW,M,SA, TS,UR,BI	C(FT,ST) I(SR*,WR)
Caprimulgus vociferus Wilson Whip-poor-will	Beckham(1887);Hancock (1887);Bailey(1916);Tate (1986);Williges(1989)	RW,OW,M,SA, TS,UR,BI	C(FT,ST) A(WR)
Order Apodiformes			
APODIDAE			
Streptoprocne zonaris (Shaw) White-collared Swift	Lasley(1989)	OW,SA,P,M,RW UR,	I(WR,MI)
Chaetura pelagica (Linnaeus) Chimney Swift	Chapman(1891);Rhoads(1892); Williges(1989);Langschied (1994)	UR,P,SA,AL, RW,M	C(SR*,FT, ST)
Aeronautes saxatalis (Woodhouse) White-throated Swift		OW,SA,P,M,RW	I(WR,MI)
TROCHILIDAE	Greenwalt(1960)		
Colibri thalassinus (Swainson) Green Violet-ear		UR,OW,M,RW,P	I(FT,SR,ST)
Anthracothorax prevostii (Lesson) Green-breasted Mango	Haynie(1993)		A(WR,FT, ST)
Amazilia yucatanensis (Cabot) Buff-bellied Hummingbird	Stevenson(1953);Baskin (1989);Williges(1989); Langschied(1994)	RW,OW,UR,M, SA,TS	U(PR*)

Species	References	Habitat	Abundance (Season)
Lampornis clemenciae (Lesson) Blue-throated Hummingbird		UR,RW,OW,TS, M,TA	I(FT,WR)
Cynanthus latirostris Swainson Broad-billed Hummingbird	Haynie(1983)	UR	R(WR)
Calothorax lucifer (Swainson) Lucifer Hummingbird	Scott(1994)	UR	A
Archilochus colubris (Linnaeus) Ruby-throated Hummingbird	Beckham(1887);Hancock (1887);Rhoads(1892);Cahn (1922,1923);Forsyth & James (1971);Tate(1986);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langschied(1994)	RW,OW,SA,M, UR,AL,GB,IGW	C(FT,ST) U(SR*) R(WR)
Archilochus alexandri (Bourcier & Mulsant) Black-chinned Hummingbird	Forsyth & James(1971)	OW,M,RW,TS, UR,P,AL	C(SR*, FT,ST) R(WR)
Calypte anna (Lesson) Anna's Hummingbird		UR	R(FT,ST, WR)
Calypte costae (Bourcier) Costa's Hummingbird	Lasley(1989)	UR	I(FT,WR)
Stellula calliope (Gould) Calliope Hummingbird	Calder & Calder (1994)	UR	I(FT,WR)
Selasphorus platycercus (Swainson) Broad-tailed Hummingbird	Snyder(1950)	RW,OW,SA,M, UR	U(FT,ST, WR)
Selasphorus rufus (Gmelin) Rufous Hummingbird	Calder(1993)	RW,OW,SA,M, UR	U(FT,ST, WR)
Selasphorus sasin (Lesson) Allen's Hummingbird		UR	R(WR)
Order Coraciiformes			
ALCEDINIDAE			
Ceryle torquata (Linnaeus) Ringed Kingfisher		R,L,POF	R(PR)
Ceryle alcyon (Linnaeus) Belted Kingfisher	Beckham(1887);Hancock (1887);Rhoads(1892);Sennett (1892);Cahn(1922);Bauer (1993);Hamas(1994)	R,L,POF,BE,BI	C(FT,ST, WR) R(SR)
Chloroceryle americana (Gmelin) Green Kingfisher	Beckham(1887);Hancock (1887)	R,L,POF	R(PR*)
Order Piciformes			
PICIDAE			
Melanerpes erythrocephalus (Linnaeus) Red-headed Woodpecker	Beckham(1887);Snyder(1950)	OW,M,RW,TS, SA,UR	R(WR)
Melanerpes aurifrons (Wagler) Golden-fronted Woodpecker	Beckham(1887);Benners (1887);Hancock(1887); Chapman(1891);Rhoads(1892); Emlen(1972);Swanson(1988); Baskin(1989);Williges(1989); Langschied(1994)	RW,OW,M,SA, TS,UR	C(PR*)
Melanerpes carolinus (Linnaeus) Red-bellied Woodpecker	Beckham(1887);Bailey(1916)	RW,OW,M,SA, UR	R(PR*)
Sphyrapicus varius (Linnaeus) Yellow-bellied Sapsucker	Beckham(1887);Merrit(1940); Emlen(1972);Woodard(1975);	RW,OW,M,SA, TS,UR	U(FT,ST, WR)

Species	References	Habitat	Abundance (Season)
	Williges(1989);Chaney et.al. (1994);Langschied(1994)		
Picoides scalaris (Wagler) Ladder-backed Woodpecker	Beckham(1887);Hancock (1887);Rhoads(1892);Snyder (1950);Emlen(1972);Swanson (1988);Baskin(1989);Williges (1989);Langschied(1994)	TS,OW,M,SA, RW,UR	C(PR*)
Picoides pubescens (Linnaeus) Downy Woodpecker		RW,OW,M,UR	R(FT,ST, WR)I(SR)
Colaptes auratus (Linnaeus) Northern Flicker	Chapman(1891);Emlen (1972);Swanson(1988); Williges(1989);Langschied (1994)	RW,OW,M,SA, TS,UR	C(WR)
Order Passeriformes			
TYRANNIDAE	Cooke(1908)		
Camptostoma imberbe Sclater Northern Beardless-Tyrannulet	Falls(1973)	OW,M,RW,TS	I(PR)
Contopus borealis (Swainson) Olive-sided Flycatcher	Williams(1945);Forsyth & Rhoads(1892);James(1971)		
Contopus sordidulus Sclater Western Wood-Pewee	James(1956)	RW,OW,M,SA, TS	I(FT,ST, WR)
Contopus virens (Linnaeus) Eastern Wood-Pewee	Chapman(1891);Rhoads(1892); James(1956);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Webster(1983); Swanson(1988);Williges(1989); Anderson(1994);Chaney et.al. (1994);Langschied(1994)	RW,OW,M,SA, TS,UR	C(FT,ST) A(SR*)
Empidonax flaviventris (Baird & Baird) Yellow-bellied Flycatcher	Sennett(1892);Williams(1945); Rappole & Warner(1976); Baskin(1989);Williges(1989); Winker & Rappole(1992); Anderson(1994);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994)	RW,OW,M,SA, TS,UR	C(FT,ST)
Empidonax virescens (Vieillot) Acadian Flycatcher	Cooke(1905);Williams(1945); James(1956);Rappole(1976); Rappole & Warner(1976); Baskin(1989);Williges(1989); Anderson(1994);Chaney et.al. (1994);Langschied(1994); Vega & Rappole(1994)	RW,OW,M,SA, TS,UR	U(FT,ST)
Empidonax alnorum Brewster Alder Flycatcher	Williams(1945);Chaney et.al. (1994);Langschied(1994); Vega & Rappole(1994)	RW,OW,M,SA, TS,UR	U(FT,ST)
Empidonax traillii (Audubon) Willow Flycatcher	James(1956);Rappole(1976); Rappole & Warner(1976);Tate (1986);Anderson(1994);Chaney et.al.(1994);Langschied(1994); Vega & Rappole(1994)	OW,M,RW,SA, TS,UR	C(FT,ST)

Species	References	Habitat	Abundance (Season)
Empidonax minimus (Baird & Baird) Least Flycatcher	Chapman(1891);Williams (1945);Rappole(1976); Rappole & Warner(1976); Anderson(1994);Briskie (1994);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)	RW,OW,M,SA, TS,UR	C(FT,ST) R(WR)
Sayornis nigricans (Swainson) Black Phoebe		R,L,POF	R(FT,WR, ST)
Sayornis phoebe (Latham) Eastern Phoebe	Beckham(1887);Sennett (1892);Cahn(1922,1923);Emlen (1972);Tate(1986);Swanson (1988);Baskin(1989); Langschied(1994);Vega & Rappole(1994);Weeks(1994	RW,OW,M,SA, TS,P	C(FT,ST, WR)
Sayornis saya (Bonaparte) Say's Phoebe	Beckham(1887);Hancock (1887);Stevenson(1953)	SA,TS,AL	R(WR)
Pyrocephalus rubinus (Boddaert) Vermilion Flycatcher	Beckham(1887);Chapman (1891);Rhoads(1892);Bailey (1916);Williges(1989); Langschied(1994)	L,POF,SA,TS, M,RW,UR	U(FT,ST, WR) R(SR*)
Myiarchus tuberculifer (d'Orbigny & Lafresnaye) Dusky-capped Flycatcher		RW,OW,M,SA, TS	A
Myiarchus cinerascens (Lawrence) Ash-throated Flycatcher	Merrit(1940);Snyder(1950); Lasley(1983);Swanson(1988); Langschied (1994);Vega & Rappole(1994)	TS,OW,M,RW, P,UR R(WR)	C(FT,ST, SR*)
Myiarchus crinitus (Linnaeus) Great Crested Flycatcher	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Swanson (1988);Williges(1989);Anderson (1994);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)	RW,OW,M,SA, TS,UR	C(FT,ST) A(WR,SR)
Myiarchus tyrannulus (Muller) Brown-crested Flycatcher	Woodard(1976);Baskin(1989); Swanson(1988); Williges(1989); Langschied(1994);Vega & Rappole(1994)	RW,OW,M,SA, TS,UR	U(FT,ST, SR*) I(WR)
Pitangus sulphuratus (Linnaeus) Great Kiskadee	Palmer(1986);Williges(1989); Langscheid(1994)	UR,RW,OW, M,SA,POF	U(PR*)
Tyrannus couchii Baird Couch's Kingbird	Williges(1989);Langschied (1994)	UR,RW,OW, M,SA,POF,L	U(SR*,FT, ST)R(WR)
Tyrannus verticalis Say Western Kingbird	Snyder(1950);Langschied (1994)	AL,OW,M,TS, SA,P,RW	C(FT,ST) U(SR*)I(WR)
Tyrannus tyrannus (Linnaeus) Eastern Kingbird	Chapman(1891);Rhoads(1892); Sennett(1892);Cooke(1905); Stevenson(1957);Forsyth & James(1971);Swanson(1988);	SA,M,RW,OW, TS,AL,UR	C(FT,ST)

Species	References	Habitat	Abundance (Season)
	Williges(1989);Chaney et.al. (1994);Langschied(1994)		
Tyrannus dominicensis (Gmelin) Gray Kingbird	Haynie(1993)	BI,M,OW	I(ST)
Tyrannus forficatus (Gmelin) Scissor-tailed Flycatcher	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Sennett(1892); Bailey(1902,1916);Cahn(1922); Merrit(1940);Williams(1945); Fitch(1950);Snyder(1950); McDaniel & McDaniel(1963b); Woodard(1976);Baker(1980); Swanson(1988);Williges(1989); Bauer(1993);Chaney et.al. (1994);Vega & Rappole(1994)	SA,P,M,OW, TS,RW,BI,AL, UR	C(FT,ST, SR*) I(WR)
Tyrannus savana Vieillot Fork-tailed Flycatcher	Haynie(1992a)	P,SA,M,BI	I(MI)
Pachyramphus aglaei (Lafresnaye) Rose-throated Becard	Haynie(1993)	RW,OW,SA	R(WR)
ALAUDIDAE			
Eremophila alpestris (Linnaeus) Horned Lark	Sennett(1879,1892);Henshaw (1884);Beckham(1887); Benners(1887);Hancock(1887); Rhoads(1892)Bailey(1916); Merrit(1940)Bauer(1993); Ecoservices(1993)	P,SA,F,GB,BI, AL	C(PR*)
HIRUNDINIDAE			
Progne subis (Linnaeus) Purple Martin	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Sennett(1892); Cahn(1922);Stevenson(1957); Layton(1969);Tate(1986);Bauer (1993);Langschied(1994)	UR,P,L,POF,AL	C(FT,ST, SR*) A(WR)
Tachycineta bicolor (Vieillot) Tree Swallow	Beckham(1887);Hancock (1887);Sennett(1892); Cahn(1922);Stevenson(1957); Williges(1989);Robertson et.al. (1992);Bauer(1993);Langschied (1994)	L,POF,MF,P, SA,BI,AL	C(FT,ST) R(WR)
Telgidopteryx serripennis (Audubon) Northern Rough-winged Swallow	Rhoads(1892);Williiam(1945); Stevenson(1957);Bauer (1993);Chaney et.al.(1994); Langschied(1994)	L,R,POF,P,SA, RW,AL,UR	C(FT,ST) I(WR)
Riparia riparia (Linnaeus) Bank Swallow	Beckham(1887);Hancock (1887);Rhoads(1892); Williams(1945);Stevenson (1957);Williges(1989) Langschied(1994)	L,R,POF,P,SA, RW,AL,UR	C(FT,ST) R(WR)
Hirundo pyrrhonota Vieillot Cliff Swallow	Rhoads(1892);Sennett(1892); Williams(1945);Stevenson (1957);Bauer(1993);	L,R,POF,P,SA, RW,AL,UR	C(FT,ST) I(WR)

Species	References	Habitat	Abundance (Season)
	Langschied(1994)		
Hirundo fulva Vieillott Cave Swallow	Palmer(1988,1991);Bauer (1993);West(1995)	R,POF,P,SA, RW,AL,UR	C(FT,ST, SR*)U(WR)
Hirundo rustica Linnaeus Barn Swallow	Chapman(1891);Rhoads(1892); Williams(1950);Bauer(1993); Chaney et.al.(1994); Langschied(1994)	R,POF,P,SA, RW,AL,UR	C(FT,ST, SR*) I(WR)
CORVIDAE	Angell(1978)		
Cyanocitta cristata (Linnaeus) Blue Jay	Beckham(1887);Cahn(1922, 1923);Emlen(1972);Baskin (1989);Williges(1989)	UR,RW,OW,M, TS,SA	R(FT,WR, ST) I(SR*)
Cyanocorax yncas (Boddaert) Green Jay	Cottam & Knappen(1939); Johnston(1959);Falls(1973); Williges(1989);Langschied (1994)	UR,RW,OW,M, TS,SA	U(PR*)
Corvus brachyrhynchos Brehm American Crow	Cahn(1923)	RW,OW,M,SA,P	I(MI)
Corvus imparatus (Peters) Mexican Crow	Falls(1973);Arvin et.al.(1975)	UR,SA,P,RW,M	R(MI)
Corvus cryptoleucus Couch Chihuahuan Raven	Eifrig(1929)	TS,SA,AL	I(MI)
PARIDAE			
Parus carolinensis Audubon Carolina Chickadee	Cahn(1922,1923)	RW,OW,M	R(PR*)
Parus bicolor Linnaeus Tufted Titmouse	Rhoads(1892);Snyder(1950); Dixon(1955,1978,1990); Emlen(1972);Swanson(1988); Baskin(1989);Williges(1989); Dickson(1990);Grubb & Pravosudov(1994);Langschied (1994); Vega & Rappole(1994)	RW,OW,M,UR	C(PR*)
REMIZIDAE			
Auriparus flaviceps (Sundevall) Verdin	Beckham(1887);Rhoads(1892); Merrit(1940);Emlen(1972); Woodard(1975);Roth(1977); Langschied(1994); Vega & Rappole(1994)	TS,SA	R(PR*)
Sitta canadensis Linnaeus Red-breasted Nuthatch	Stevenson(1953)	OW,RW	R(MI)
Sitta carolinensis Latham White-breasted Nuthatch	Pravosudov & Grubb(1993)	RW,OW,M,SA, UR	R(FT,ST, WR)
CERTHIIDAE			
Certhia americana Bonaparte Brown Creeper	Williges(1989)	RW,OW,M	R(WR)
TROGLODYTIDAE	Merrit(1940)		
Campylorhynchus brunneicapillus (Lafresnaye) Cactus Wren	Roth(1977);Swanson(1988); Langschied(1994);Vega & Rappole(1994)	TS,SA	U(PR*)
Salpinctes obsoletus (Say) Rock Wren			

Species	References	Habitat	Abundance (Season)
Thryothorus ludovicianus (Latham) Carolina Wren	Rhoads(1892);Godfrey(1946); Stevenson(1953);Emlen(1972); Tate(1986);Williges(1989); Langschied(1994)	TS,OW,M,UR	R(FT,ST, WR)
Thryomanes bewickii (Audubon) Bewick's Wren	Beckham(1887);Hancock (1887);Rhoads(1892);Snyder (1950);Emlen(1972);Woodard (1975);Tate(1986);Swanson (1988);Baskin(1989);Williges (1989);Langschied(1994);Vega & Rappole(1994)	TS,OW,M,SA, UR,RW	C(PR*)
Troglodytes aedon Vieillot House Wren	Beckham(1887);Hancock (1887);Emlen(1972);Swanson (1988);Williges(1989);Chaney et.al.(1994);Langschied(1994); Vega & Rappole(1994)	RW,OW,M,TS, SA,UR,P	C(FT,WR, ST)
Troglodytes troglodytes (Linnaeus) Winter Wren		RW,OW,M,TS, SA	R(WR)
Cistothorus platensis (Latham) Sedge Wren	Chapman(1891);Tate(1986); Swanson(1988);Bauer(1993); Chaney et.al.(1994);Langschied (1994)	MF,MS,P,SA,PO	C(WR)
Cistothorus palustris (Wilson) Marsh Wren	Benners(1887);Chapman (1891);Sennett(1892);Snyder (1950);Bauer(1993)	MF,MS,POF	C(WR)
MUSCICAPIDAE			
Regulus satrapa Lichtenstein Golden-crowned Kinglet	Sennett(1892);Swanson(1988); Williges(1989);Langschied (1994)	RW,OW,M,TS, SA	U(FT) R(WR,ST)
Regulus calendula (Linnaeus) Ruby-crowned Kinglet	Hancock(1887);Sennett(1892); Emelen(1972);Swanson(1988); Baskin(1989);Williges(1989); Chaney et.al(1994);Ingold & Wallace(1994);Langschied (1994);Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(FT,WR, ST)
Polioptila caerulea (Linnaeus) Blue-gray Gnatcatcher	Sennett(1879,1892);Hancock (1887);Rhoads(1892);Forsyth & James(1971);Emlen(1972); Rappole(1976);Rappole & Warner(1976);Swanson(1988); Baskin(1989);Williges(1989); Ellison(1992);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(FT,WR, ST) I(SR*)
Polioptila melanura Lawerence Black-tailed Gnatcatcher		TS	R(PR)
Sialia sialis (Linnaeus) Eastern Bluebird	Beckham(1887);Falls(1973); Tate(1986);Williges(1989); Langschied(1994)	SA,M,OW,RW, TS,UR	C(WR) U(SR*)

Species	References	Habitat	Abundance (Season)
Sialia currucoides (Bechstein) Mountain Bluebird	Beckham(1887);Stevenson (1953)	SA,OW,M,TS, RW	I(WR)
Myadestes townsendi (Audubon) Townsend's Solitaire		RW,OW,M	A(WR)
Catharus fuscescens (Stephens) Veery	Williams(1945);James(1956); Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Williges(1989); Chaney et.al.(1994);Langschied (1994);Moskoff(1995)	RW,OW,M,TS, SA	C(ST) R(FT)
Catharus minimus (Lafresnaye) Gray-cheeked Thrush	Williams(1945);James(1956); Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Chaney et.al. (1994);Langschied(1994);	RW,OW,M,TS, SA	C(ST) R(FT)
Catharus ustulatus (Nuttall) Swainson's Thrush	James(1956);Forsyth & James(1971);Rappole(1976); Rappole & Warner(1976); Baskin(1989);Williges(1989); Anderson(1994);Chaney et.al. (1994);Langschied(1994)	RW,OW,M,TS, SA	C(ST) R(FT)
Catharus guttatus (Pallas) Hermit Thrush	Emlen(1972);Baskin(1989); Williges(1989);Langschied (1994);Vega & Rappole(1994)	RW,OW,M,TS, SA	C(FT,ST) U(WR)
Hylocichla mustelina (Gmelin) Wood Thrush	Williams(1945,1950);Forsyth & James(1971);Rappole(1976); Rappole & Warner(1976); Chaney et.al.(1994);Langschied (1994)	RW,OW,M,TS, SA	C(ST) U(FT)
Turdus grayi Bonaparte Clay-colored Robin	Ransom et.al.(1987);Lasley (1989,1991)	RW,OW,M,TS, SA,UR	I(WR)
Turdus migratorius Linnaeus American Robin	Beckham(1887);Webster (1983);Swanson(1988); Williges(1989);Langschied (1994)	RW,OW,M,TS, SA	C(FT,WR, ST) I(SR*)
Ridgwayia pinicola (Sclater) Aztec Thrush	Lasley(1989)	OW,M,RW	I
MIMIDAE			
Dumetella carolinensis (Linnaeus) Gray Catbird	Sennett(1892);James(1956); Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Swanson(1988); Williges(1989);Chaney et.al. (1994);Langschied(1994)	OW,M,RW,TS, SA	C(FT,ST) U(WR)
Mimus polyglottos (Linnaeus) Northern Mockingbird	Beckham(1887);Benners (1887);Hancock(1887); Chapman(1891);Rhoads(1892); Sennett(1892);Bailey(1916);Cahn (1922);Merrit(1940);Snyder (1950);Emlen(1972);Woodard (1975);Roth(1977);Doudy	TS,SA,M,UR, OW,RW	C(PR*)

Species	References	Habitat	Abundance (Season)
	(1988);Swanson(1988);Baskin (1989);Williges(1989); Derrickson & Breitwisch (1992);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)		
Toxostoma rufum (Linnaeus) Brown Thrasher	Beckham(1887);McCracken (1967);Emlen(1972);Roth (1977);Fischer(1981); Swanson(1988)	OW,M,RW,TS, SA	C(WR)
Toxostoma longirostre (Lafresnaye) Long-billed Thrasher	Sennett(1879);Hancock (1887);Rhoads(1892);Cottam & Knappen(1939);Emlen(1972); Fischer(1981);Swanson(1988); Baskin(1989);Williges(1989); Langschied(1994);Vega & Rappole(1994)	TS,OW,M,RW, SA	C(WR) U(SR*)
Toxostoma curvirostre (Swainson) Curve-billed Thrasher	Cahn(1922);Merrit(1940); Emlen(1972);Woodard(1975); Roth(1977);Fischer(1981); Swanson(1988);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994	TS,SA,M,AL, UR	U(PR*)
MOTACILLIDAE			
Anthus rubescens (Tunstall) American Pipit	Beckham(1887);Emlen (1972);Verbeek & Hendricks (1994)	P,SA,AL,L,P, BE,D,GB,BI	C(WR)
Anthus spragueii (Audubon) Sprague's Pipit	Emlen(1972);Bauer(1993); Langschied(1994)	P,SA,D	C(WR)
BOMBYCILLIDAE			
Bombycilla cedrorum Vieillot Cedar Waxwing	Beckham(1887);Hancock (1887);Sennett(1892); James(1956);Swanson(1988); Williges(1989)	RW,OW,M,SA, UR	U(FT) C(WR,ST)
LANIIDAE			
Lanius ludovicianus Linnaeus Loggerhead Shrike	Sennett(1879,1892);Beckham (1887);Hancock(1887); Rhoads(1892);Bailey(1916); Chapman & Castro(1972); Emlen(1972);Tate(1986); Swanson(1988);Williges(1989); Chaney et.al.(1994);Langschied (1994);Vega & Rappole(1994)	SA,P,M,AL,UR, OW,RW	C(FT,ST) U(WR,SR*)
STURNIDAE			
Sturnus vulgaris Linnaeus European Starling	Sooter(1945);Swanson(1988); Cabe(1993);Langschied (1994)	UR,AL,SA,M,P, TS,RW	C(PR*)
VIREONIDAE			
Vireo griseus (Boddaert) White-eyed Vireo	Rhoads(1892);Sennett(1892); Eifrig(1929);Emlen(1972); Woodard(1975);Roth(1977);	RW,OW,TS,M, SA,UR	C(PR*)

Species	References	Habitat	Abundance (Season)
	Swanson(1988);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994)		
Vireo bellii Audubon Bell's Vireo	Sennett(1879);Beckham(1887); Hancock(1887);Chapman (1891);Rhoads(1892);Merrit (1940);Snyder(1950);Stevenson (1957);Swanson(1988);Brown (1993);Langschied(1994);Vega & Rappole(1994)	RW,OW,TS,M, SA,UR	R(SR)
Vireo solitarius (Wilson) Solitary Vireo	Forsyth & James(1971); Baskin(1989);WIlliges(1989); Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994);	RW,OW,TS,M, SA,UR	U(FT,ST, WR)
Vireo flavifrons Vieillot Yellow-throated Vireo	Forsyth & James(1971); Williges(1989);Chaney et.al. (1994)	RW,OW,TS,M, SA,UR	U(ST)I(WR) R(FT)
Vireo gilvus (Vieillot) Warbling Vireo	Williams(1945);Forsyth & James(1971);Williges(1989); Chaney et.al.(1994)	RW,OW,TS,M, SA,UR	C(ST) U(FT)
Vireo philadelphicus (Cassin) Philadelphia Vireo	Williams(1945);James(1956); Swanson(1988);Langschied (1994)	RW,OW,TS,M, SA,UR	C(ST) U(FT)
Vireo olivaceus (Linnaeus) Red-eyed Vireo	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Cooke(1905); James(1956);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Williges(1989); Chaney et.al.(1994);Langschied (1994)	RW,OW,TS,M, SA,UR	C(ST)U(FT) A(WR)
Vireo flavoviridis (Cassin) Yellow-green Vireo	Snyder(1950)	RW	I(ST,SR)
Vireo altiloquus (Vieillot) Black-whiskered Vireo	Haynie(1993)	OW,RW	I(ST)
EMBERIZIDAE	Cooke(1904,1905,1910); Chapman(1907);Bent(1953); Griscom & Sprunt(1957); Curson et.al.(1994)		
Vermivora pinus (Linnaeus) Blue-winged Warbler	Beckham(1887);Benners (1887);Hancock(1887); Chapman(1891);Williams(1945, 1950);James(1956);Forsyth & James(1971);Rappole(1976); Rappole & Warner(1976); Chaney et.al.(1994);Langschied (1994);Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(ST) R(FT)

Species	References	Habitat	Abundance (Season)
Vermivora chrysoptera (Linnaeus) Golden-winged Warbler	Williams(1945,1950);James (1956);Forsyth & James(1971); Tate(1986);Confer(1992); Chaney et.al.(1994); Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) R(FT)
Vermivora peregrina (Wilson) Tennessee Warbler	Chapman(1891);Williams (1945,1950);James(1956); Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) U(FT)
Vermivora celata (Say) Orange-crowned Warbler	Beckham(1887);Hancock(1887); Chapman(1891);Emlen(1972; Swanson(1988);Baskin(1989); Williges(1989);Langschied (1994);Sogge et.al.(1994);Vega & Rappole(1994)	OW,M,TS,RW, SA,UR	C(WR,FT, ST)
Vermivora ruficapilla (Wilson) Nashville Warbler	Benners(1887);Williams(1945); Forsyth & James(1971); Rappole & Warner(1976); Baskin(1989);Williges(1989); Anderson(1994);Chaney et.al. (1994);Langschied(1994); Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(ST) R(FT) I(WR)
Parula americana (Linnaeus) Northern Parula	Beckham(1887);Hancock (1887);Sennett(1892);Williams (1950);James(1956);Forsyth & James(1971);Fall(1973); Chaney et.al.(1994); Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) U(FT) A(WR)
Parula pitiayumi (Vieillot) Tropical Parula	Stevenson(1957);Fall(1973); Langscheid(1994)	RW,OW,M,TS, SA,UR	I(FT,WR,ST)
Dendroica petechia (Linnaeus) Yellow Warbler	Benners(1887);Chapman (1891);Rhoads(1892);James (1956);Stevenson(1957);Forsyth & James(1971);Webster(1983); Tate(1986);Swanson(1988); Williges(1989);Chaney et.al. (1994);Langschied(1994)	RW,OW,M,TS, SA,UR	I (FT,ST) A(WR)
Dendroica pensylvanica (Linnaeus) Chestnut-sided Warbler	Benners(1887);Chapman (1891);Cooke(1905); Williams(1945);James(1956); Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Swanson(1988); Williges(1989);Chaney et.al. (1994);Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) R(FT)
Dendroica magnolia (Wilson) Magnolia Warbler	Williams(1945);James(1956); Forsyth & James(1971); Rappole(1976);Rappole &	RW,OW,M,TS, SA,UR	C(ST,FT)

Species	References	Habitat	Abundance (Season)
	Warner(1976);Swanson(1988); Baskin(1989);Williges(1989); Chaney et.al.(1994);Hall(1994); Langschied(1994);Vega & Rappole(1994)		
Dendroica tigrina (Gmelin) Cape May Warble	Chaney et.al.(1994)	RW,OW,M,TS, SA,UR	R(ST)I(FT)
Dendroica caerulescens (Gmelin) Black-throated Blue Warbler	Forsyth & James(1971); Holmes(1994)	RW,OW,M,TS, SA,UR	R(ST)I(FT)
Dendroica coronata (Linnaeus) Yellow-rumped Warbler	Beckham(1887);Benners (1887);Hancock(1887); Snyder(1950);Stevenson (1956);Emlen(1972); Swanson(1988);Williges (1989);Chaney et.al.(1994); Langschied(1994)	RW,OW,M,TS, SA,UR	C(FT,WR, ST)
Dendroica nigrescens (Townsend) Black-throated Gray Warbler	Forsyth & James(1971)	OW,M,RW,SA, TS,UR	R(WR)
Dendroica townsendi (Townsend) Townsend's Warbler	Forsyth & James(1971)	RW,OW,M,TS, SA,UR	I(ST)
Dendroica occidentalis (Townsend) Hermit Warbler		OW	A(WR)
Dendroica virens (Gmelin) Black-throated Green Warbler	Sennett(1879,1892);Beckham (1887);Hancock(1887); Chapman(1891);Bailey(1916); Williams(1945);Snyder(1950); James(1956);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Williges (1989);Morse(1993);Chaney et. al.(1994);Langschied(1994); Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(ST) U(FT) I(WR)
Dendroica chrysoparia Sclater & Salvin Golden-cheeked Warbler	Gehlbach(1967)	OW,RW	A
Dendroica fusca (Muller) Blackburnian Warbler	Bailey(1916);Williams(1945, 1950);James(1956);Forsyth & James(1971);Rappole(1976); Swanson(1988)Williges(1989); Morse(1993);Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) R(FT)
Dendroica dominica (Linnaeus) Yellow-throated Warbler	Beckham(1887);Hancock (1887);Forsyth & James (1971);Chaney et.al.(1994)	RW,OW,M,TS, SA,UR	U(SR)R(FT) I(WR)
Dendroica pinus (Wilson) Pine Warbler		RW,OW,M,TS, SA,UR	U(WR)
Dendroica discolor (Vieillot) Prairie Warbler		RW,OW,M,TS, SA,UR	U(ST)R(FT) I(WR)
Dendroica palmarum (Gmelin) Palm Warbler	Fall(1973);Langschied(1994)	RW,OW,M,TS, SA,UR	R(WR)
Dendroica castanea (Wilson) Bay-breasted Warbler	Williams(1945,1950);James (1956);Forsyth & James (1971);Swanson(1988);	RW,OW,M,TS, SA,UR	C(ST) R(FT)

Species	References	Habitat	Abundance (Season)
	Chaney et.al.(1994);Langschied (1994);Vega & Rappole(1994)		
Dendroica striata (Forster) Blackpoll Warbler	Forsyth & James(1971); Chaney et.al.(1994)	RW,OW,M,TS, SA,UR	U(ST) I(FT)
Dendroica cerulea (Wilson) Cerulean Warbler	Williams(1945,1950);James (1956);Forsyth & James (1971);Chaney et.al.(1994); Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) I(FT)
Mniotilta varia (Linnaeus) Black-and-white Warbler	Beckham(1887);Benners (1887);Hancock(1887); Sennett(1892);Cooke(1905); James(1956);Stevenson (1957);Rappole(1976);Rappole & Warner(1976);Swanson (1978);Williges(1989);Chaney et.al.(1994);Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) U(FT) R(WR)
Setophaga ruticilla (Linnaeus) American Redstart	Beckham(1887);Hancock (1887);Chapman(1891); Bailey(1916);Williams(1945); James(1956);Stevenson (1957);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Swanson (1988);Baskin(1989);Williges (1989);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)	RW,OW,M,TS, SA.UR	C(ST) U(FT) I(WR)
Protonotaria citrea (Boddaert) Prothonotary Warbler	Forsyth & James(1971); Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST)R(FT) A(WR)
Helmitheros vermivorus (Gmelin) Worm-eating Warbler	Cooke(1905);Williams(1945, 1950);Stevenson(1957); Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Chaney et.al. (1994);Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) R(FT)
Limnothlypis swainsonii (Audubon) Swainson's Warbler	Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Brown & Dickson(1994)	RW,OW,M,TS, SA,UR	U(ST)R(FT) I(SR)
Seiurus aurocapillus (Linnaeus) Ovenbird	Chapman(1891);Bailey(1916); James(1956);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Williges (1989);Chaney et.al.(1994); Langshied(1994);Van Horn & Donovan(1994)	RW,OW,M,TS, SA,UR	C(ST,FT) R(WR)
Seiurus noveboracensis (Gmelin) Northern Waterthrush	Rhoads(1892);Sennett(1892); James(1956);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Chaney et.al. (1994);Langschied(1994)	L,POF,RW,OW, M,TS,SA	C(FT,ST) I(WR)

Species	References	Habitat	Abundance (Season)
Seiurus motacilla (Vieillot) Louisiana Waterthrush	Sennett(1892);Williams(1945, 1950);Forsyth & James(1971); Rappole & Warner(1976); Williges(1989);Chaney et.al. (1994)	L,POF,RW,OW, M,TS,SA	C(FT,ST) A(WR)
Oporornis formosus (Wilson) Kentucky Warbler	Chapman(1891);Sennett (1892);James(1956);Forsyth & James(1971);Williges (1989);Chaney et.al.(1994); Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST,FT)
Oporornis agilis (Wilson) Connecticut Warbler	Forsyth & James(1971)	RW,OW,M,TS, SA,UR	I(ST,FT)
Oporornis philadelphia (Wilson) Mourning Warbler	Cooke(1905);James(1956); Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Swanson(1988); Williges(1989);Pitocchelli (1993);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(ST,FT)
Oporornis tolmiei (Townsend) MacGillivray's Warbler		RW,OW,M,TS, SA,UR	I(ST)
Geothlypis trichas (Linnaeus) Common Yellowthroat	Beckham(1887);Hancock (1887);Rhoads(1892);Sennett (1892);Williams(1947,1950); James(1956);Swanson(1988); Williges(1989);Chaney et.al. (1994);Langshied(1994)	MF,SM,BE,BI, PO,RW,SA,TS,P	C(FT,ST, WR) R(SR*)
Wilsonia citrina (Boddaert) Hooded Warbler	Sennett(1992);Williams(1950); James(1956);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langshied(1994);Evans Ogden & Stutchbury(1994)	RW,OW,M,TS, SA,UR	C(ST) U(FT)
Wilsonia pusilla (Wilson) Wilson's Warbler	Forsyth & James(1971); Rappole(1976);Rappole & Warner(1976);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(FT,ST) R(WR)
Wilsonia canadensis (Linnaeus) Canada Warbler	Williams(1945,1950);Forsyth & James(1971);Rappole(1976); Rappole & Warner(1976); Swanson(1988);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langschied(1994)	RW,OW,M,TS, SA,UR	C(FT,ST)
Icteria virens (Linnaeus) Yellow-breasted Chat	Rhoads(1892);Bailey(1916); Williams(1945);Forsyth & James(1971);Rappole(1976); Rappole & Warner(1976);	RW,OW,M,TS, SA,UR	C(FT,ST) I(WR)

Species	References	Habitat	Abundance (Season)
	Swanson(1988);Williges(1989); Chaney et.al.(1994);Langschied (1994);Vega & Rappole(1994)		
Piranga flava (Vieillot) Hepatic Tanager		RW,OW,M,TS, SA,UR	I(ST)
Piranga rubra (Linnaeus) Summer Tanager	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Forsyth & James(1971);Williges(1989); Chaney et.al.(1994);Langschied (1994)	RW,OW,M,TS, SA,UR	C(ST)U(FT) I(SR,WR)
Piranga olivacea (Gmelin) Scarlet Tanager	Benners(1887);Williams (1950);Forsyth & James (1971);Swanson(1988);Chaney et.al.(1994);Langschied(1994)	RW,OW,M,TS, SA,UR	C(ST) R(FT)
Piranga ludoviciana (Wilson) Western Tanager	Chaney et.al.(1994)	RW,OW,M,TS, SA,UR	I(WR,ST)
Rhodothraupis celaeno (Deppe) Crimson-collared Grosbeak	Austin(1968);Lasley(1989)	RW,OW,M	I(MI)
Cardinalis cardinalis (Linnaeus) Northern Cardinal	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Sennett(1892); Bailey(1916);Cahn(1922,1923); Eifrig(1929);Merrit(1940;Snyder (1950);Austin(1968);Lemon & Herzog(1969);Emlen(1972); Woodard(1975);Roth(1977); Swanson(1988);Baskin(1989); Williges(1989);Osborne(1992); Langschied(1994);Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(PR*)
Cardinalis sinuatus Bonaparte Pyrrhuloxia	Beckham(1887);Rhoads(1892); Bailey(1916);Merrit(1940); Austin(1968);Lemon & Herzog (1969);Emlen(1972);Woodard (1975);Roth(1977);Swanson (1988);Baskin(1989);Williges (1989);Langschied(1994);Vega & Rappole(1994)	TS,SA,M,OW, RW	U(PR*)
Pheucticus ludovicianus (Linnaeus) Rose-breasted Grosbeak	Williams(1945);James(1956); Austin(1968);Forsyth & James (1971);Williges(1989); Chaney et.al.(1994);Langschied (1994)	RW,OW,M,TS, SA,UR	C(ST)R(FT) I(WR)
Pheucticus melanocephalus (Swainson) Black-headed Grosbeak	Austin(1968)	RW,OW,M,TS, SA,UR	U(WR)
Guiraca caerulea (Linnaeus) Blue Grosbeak	Chapman(1891);Eifrig(1929); Merrit(1940);Williams(1945); Snyder(1950);James(1956); Austin(1968);Forsyth & James (1971);Woodard(1975);Baskin	SA,P,M	C(ST)U(FT) R(SR*)

Species	References	Habitat	Abundance (Season)
	(1989);Williges(1989);Ingold (1993);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)		
Passerina amoena (Say) Lazuli Bunting	Austin(1968);Forsyth & James(1971)	SA,OW,M,TS	R(FT,ST, WR)
Passerina cyanea (Linnaeus) Indigo Bunting	Beckham(1887);Hancock (1887);Chapman(1891); Snyder(1950);James(1956); Stevenson(1957);Austin (1968);Forsyth & James (1971);Rappole(1976);Rappole & Warner(1976);Swanson (1988);Baskin(1989);Williges (1989);Payne(1992);Chaney et. al.(1994);Langschied(1994); Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(ST,FT) R(WR)
Passerina versicolor (Bonaparte) Varied Bunting	Stevenson(1953);Austin(1968)	OW,M,SA	I(ST)
Passerina ciris (Linnaeus) Painted Bunting	Benners(1887);Chapman (1891);Rhoads(1892);Sennett (1892);Cahn(1922,1923); Merrit(1940);Williams(1945); Snyder(1950);Austin(1968); Woodard(1975);Roth(1977); Swanson(1988);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994)	ST,SA,M,OW, RW,UR,P	C(ST,SR*) U(FT) A(WR)
Spiza americana (Gmelin) Dickcissel	Chapman(1891);Sennett (1892);Bailey(1916);Williams (1945);Snyder(1950);James (1956);Austin(1968);Forsyth & James(1971);Woodard (1975);Roth(1977);Tate (1986);Swanson(1988); Chaney et.al.(1994);Langschied (1994)	P,SA,UR,TS, OW,M	C(FT,ST) U(SR*) I(WR)
Arremonops rufivirgatus (Lawrence) Olive Sparrow	Rhoads(1892);Austin(1968); Emlen(1972);Woodard(1975); Swanson(1988);Baskin(1989); Williges(1989);Langschied (1994);Vega & Rappole(1994)	TS,OW,M,RW	U(PR*)
Pipilo chlorurus (Audubon) Green-tailed Towhee	Austin(1968);Emlen(1972); Langschied(1994);Vega & Rappole(1994)	TS,SA,OW,M	R(WR)
Pipilo erythrophthalmus (Linnaeus) Rufous-sided Towhee	Austin(1968);Emlen(1971); Langschied(1994)	OW,RW,M,TS, SA	C(WR)
Sporophila torqueola (Bonaparte) White-collared Seedeater	Austin(1968)	P,SA,TS	A

Species	References	Habitat	Abundance (Season)
Aimophila botterii (Sclater) Botteri's Sparrow	Cottam & Knappen(1939); Austin(1968);Fall(1973); Swanson(1988);Conway & Benson(1990);Langschied(1994)	P,SA,M	I(PR*)
Aimophila cassinii (Woodhouse) Cassin's Sparrow	Rhoads(1892);Bailey(1916); Eifrig(1929);Snyder(1950); Austin(1968);Emlen(1972); Woodard(1975);Swanson(1988); Langschied(1994);Vega & Rappole(1994)	TS,SA,P	C(SR*) U(WR)
Aimophila ruficeps (Cassin) Rufous-crowned Sparrow	Austin(1968)	TS	I(WR)
Spizella passerina (Bechstein) Chipping Sparrow	Beckham(1887);Austin(1968); Baskin(1989);Swanson(1988); Williges(1989);Chaney et.al. (1994);Langschied(1994)	RW,OW,SA, M,P	C(WR)
Spizella pallida (Swainson) Clay-colored Sparrow	Hancock(1887);Bailey(1916); Snyder(1950);Austin(1968); Swanson(1988);Knapten(1994); Langschied(1994)	TS,SA,M	C(ST,FT) R(WR)
Spizella pusilla (Wilson) Field Sparrow	Beckham(1887);Hancock (1887);Austin(1968);Emlen (1972);Swanson(1988);Williges (1989);Burhans & Nelson(1994); Carey et.al.(1994);Langschied (1994)	OW,RW,M, SA,TS	C(WR) R(SR*)
Pooecetes gramineus (Gmelin) Vesper Sparrow	Hancock(1887);Sennett (1892);Austin(1968);Emlen (1972);Swwanson(1988);Williges (1989);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)	P.SA,M,TS	C(WR)
Chondestes grammacus (Say) Lark Sparrow	Beckham(1887);Hancock (1887);Rhoads(1892);Merrit (1940);Snyder(1950);Austin (1968);Roth(1977);McNair (1984);SwansonWilliges(1989); Chaney et.al.(1994);Langschied (1994);Vega & Rappole(1994)	TS,SA,P,M	C(SR*) U(WR)
Amphispiza bilineata (Cassin) Black-throated Sparrow	Beckham(1887);Austin(1968); Emlen(1972);Woodard(1975); Roth(1977)	TS	R(PR*)
Calamospiza melanocorys Stejneger Lark Bunting	Sennett(1879);Beckham (1887);Benners(1887);Bailey (1916);Austin(1968); Langschied(1994)	P,SA,TS,D	C(WR)
Passerculus sandwichensis (Gmelin) Savannah Sparrow	Sennett(1879,1892); Beckham(1887);Hancock (1887);Austin(1968);Emlen (1972);Swanson(1988);Bauer (1993);Wheelright & Rising	P,SA,TS,AL,UR	C(WR)

Species	References	Habitat	Abundance (Season)
	(1993);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)		
Ammodramus savannarum (Gmelin) Grasshopper Sparrow	Beckham(1887);Hancock (1887);Sennet(1892);Bailey (1916);Austin(1968);Emlen (1972);Swanson(1988);Williges (1989);Bauer(1993);Langschied (1994);Vega & Rappole(1994)	P,AL,SA,UR	C(WR) R(SR*)
Ammodramus henslowii (Audubon) Henslow's Sparrow	Austin(1968);Swanson(1988); Haynie(1993)	P,SA	I(WR)
Ammodramus leconteii (Audubon) Le Conte's Sparrow	Chapman(1891);Sennett (1892);Austin(1968);Swanson (1988);Bauer(1993);Langschied (1994)	P,SA	C(WR)
Ammodramus caudacutus (Gmelin) Sharp-tailed Sparrow	Chapman(1891);Austin(1968); Greenlaw & Rising(1994)	MS,BE,BI	R(WR)
Ammodramus maritimus (Wilson) Seaside Sparrow	Allen(1888);Chapman(1891); Rhoads(1892);Austin(1968); Post & Greenlaw(1994)	MS,BE,BI	C(PR*)
Passerella iliaca (Merrem) Fox Sparrow	Austin(1968);Emlen(1972)	SA,OW,M, RW,TS	U(WR)
Melospiza melodia (Wilson) Song Sparrow	Rhoads(1892);Snyder(1950); Austin(1968);Emlen(1972); Swanson(1988)	POF,SA,MF	U(WR)
Melospiza lincolnii (Audubon) Lincoln's Sparrow	Beckham(1887);Hancock (1887);Bailey(1916);Snyder (1950);James(1956);Austin (1968);Emlen(1972);Swanson (1988);Baskin(1989);Williges (1989);Chaney et.al.(1994); Langschied(1994);Vega & Rappole(1994)	SA,P,RW,OW, M,TS	C(WR)
Melospiza georgiana (Latham) Swamp Sparrow	Austin(1968);Langschied (1994);Vega & Rappole(1994)	MF,SM,BI,POF	C(WR)
Zonotrichia albicollis (Gmelin) White-throated Sparrow	Beckham(1887);Bailey(1916); Emlen(1972);Baskin(1989); Williges(1989);Falls & Kopachena(1994);Langschied (1994)	RW,OW,M,TS, SA,UR	C(WR)
Zonotrichia leucophrys (Forster) White-crowned Sparrow	Bailey(1916);Austin(1968); Emlen(1972);Swanson(1988); Williges(1989);Langschied (1994);Vega & Rapppole(1994)	TS,OW,M	C(WR)
Zonotrichia querula (Nuttall) Harris' Sparrow	Austin(1968);Emlen(1972); Norment & Shackleton(1993)	SA,TS	R(WR)
Junco hyemalis (Linnaeus) Dark-eyed Junco	Austin(1968);Langschied (1994)	RW,OW,M, TS,P	R(WR)
Calcarius mccownii (Lawrence) McCown's Longspur	Austin(1968)	P,UR	A(WR)

Species	References	Habitat	Abundance (Season)
Calcarius ornatus (Townsend) Chestnut-collared Longspur	Austin(1968)	P,UR	A(WR)
Dolichonyx oryzivorus (Linnaeus) Bobolink	Austin(1968)	P,SA	R(ST)I(FT)
Agelaius phoeniceus (Linnaeus) Red-winged Blackbird	Beckham(1887);Hancock (1887);Rhoads(1892);Sennet t(1892);Eifrig(1929);Merrit (1940);Woodard(1975);Haigh (1984);Swanson(1988);Bauer (1993);Chaney et.al.(1994); Langschied(1994)	MF,POF,P,SA, RW,AL,UR	C(PR*)
Sturnella magna (Linnaeus) Eastern Meadowlark	Beckham(1887);Rhoads(1892); Sennett(1892);Eifrig(1929); Merrit(1940);Emlen(1972); Woodard(1975);Tate(1986); Baker(1988);Swanson(1988); Williges(1989);Bauer(1993); Langschied(1994)	P,SA,AL	C(PR*)
Sturnella neglecta Audubon Western Meadowlark	Beckham(1887);Hancock (1887);Swanson(1988); Langschied(1994);Lanyon(1994)	AL,P,SA	C(WR)
Xanthocephalus xanthocephalus (Bonaparte) Yellow-headed Blackbird	Benners(1887);Chapman (1891);Bailey(1916)	P,SA,MF	U(ST)R(FT) I(WR)
Euphagus carolinus (Muller) Rusty Blackbird		RW,POF	R(WR)
Euphagus cyanocephalus (Wagler) Brewer's Blackbird	Beckham(1887);Benners (1887);Swanson(1988); Langschied(1994)	P,SA,TS,AL	C(WR)
Quiscalus mexicanus (Gmelin) Great-tailed Grackle	Beckham(1887);Benners (1887);Hancock(1887); Norris(1890);Chapman(1891); Rhoads(1892);Sennett(1892); Pearson(1921);Cahn(1922);Eifrig (1929);Merrit(1940);Goering & Cherry(1971);Haigh(1984); Swanson(1988);Teather(1989); Bauer(1993);Chaney et.al.(1994); Langschied(1994)	UR,AL,MF,BI	C(PR*)
Quiscalus major Vieillot Boat-tailed Grackle		BE,RW,AL,UR	R(PR*)
Quiscalus quiscula (Linnaeus) Common Grackle		RW,P,SA,UR,AL	R(WR)I(SR*)
Molothrus aeneus (Wagler) Bronzed Cowbird	Beckham(1887);Roth(1977); Merrit(1940);Carter(1986); Swanson(1988);Williges(1989); Langschied(1994);Vega & Rappole(1994); Lowther(1995)	UR,AL,TS,P, SA,M,OW,RW	C(SR*) U(WR)

Species	References	Habitat	Abundance (Season)
Molothrus ater (Boddaert) Brown-headed Cowbird	Beckham(1887);Benners (1887);Hancock(1887); Rhoads(1892);Sennett(1892); Cahn(1922,1923);Emlen(1972); Roth(1977);Carter(1986); Swanson(1988);Baskin(1989); Williges(1989);Lowther(1993); Langschied(1994);Vega & Rappole(1994)	UR,AL,TS,P, SA,M,OW,RW	C(SR*) U(WR)
Icterus wagleri Sclater Black-vented Oriole	Lasley(1991)	TS,SA,UR	I(FT)
Icterus spurius (Linnaeus) Orchard Oriole	Beckham(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Sennett(1892); Bailey(1916);Merrit(1940); James(1956);Forsyth & James (1971);Tate(1986);Swanson (1988);Baskin(1989);Williges (1989);Chaney et.al.(1994);Vega & Rappole(1994)	SA,RW,OW, M,TS,UR	C(FT,ST) R(SR*) I(WR)
Icterus cucullatus Swainson Hooded Oriole	Benners(1887);Langschied (1994)	UR,TS,RW	R(SR*)
Icterus graduacauda Lesson Audubon's Oriole	Langschied(1994);Vega & Rappole(1994)	TS,SA,UR,RW	U(SR*)I(WR)
Icterus galbula (Linnaeus) Northern Oriole	Benners(1887);Hancock (1887);Chapman(1891); Rhoads(1892);Merrit(1940); Williams(1945,1947,1950); James(1956);Forsyth & James(1971);Webster(1983); Swanson(1988);Baskin(1989); Williges(1989);Chaney et.al. (1994);Langschied(1994);Vega & Rappole(1994)	RW,OW,M,TS, SA,UR	C(FT,ST) I(WR)
FRINGILLIDAE			
Carpodacus purpureus (Gmelin) Purple Finch		RW,OW	R(WR)
Carpodacus mexicanus (Muller) House Finch	Hill(1993)	TS,SA,UR	R(PR*)
Loxia curvirostra Linnaeus Red Crossbill		RW,OW,UR	I(WR)
Carduelis pinus (Wilson) Pine Siskin	Langschied(1994)	RW,OW,M,TS, SA,UR	U(WR)
Carduelis psaltria (Say) Lesser Goldfinch	Williges(1989);Langschied (1994)	TS,UR,RW	R(PR*)
Carduelis tristis (Linnaeus) American Goldfinch	Sennett(1892);Emlen(1972); Williges(1989);Middleton (1993);Langschied(1994)	RW,OW,M,TS, SA,P,UR	C(WR)

Species	References	Habitat	Abundance (Season)
PASSERIDAE			
Passer domesticus (Linnaeus) House Sparrow	Benners(1887);Montgomery (1907);Davis(1969);Lowther & Cink(1992)	UR,AL	C(PR*)

There are historical and/or recent sight records for the following species in the six counties of the Coastal Bend, but they either have not been submitted to or accepted by the verification committee of American Birds:

Eudocimus ruber (Linnaeus)
Scarlet Ibis
Chen canagica (Sevastianov)
Emperor Goose
Branta leucopsis (Bechstein)
Barnacle Goose
Anas rubripes Brewster
American Black Duck
Somateria spectablis (Linnaeus)
King Eider
Histrionicus histrionicus (Linnaeus)
Harlequin Duck
Bucephala islandica (Gmelin)
Barrow's Goldeneye
Mergus merganser Linnaeus
Common Merganser
Accipter gentilis (Linnaeus)
Northern Goshawk
Buteogallus anthracinus (Deppe)
Common Black-Hawk
Buteo brachyurus Viellot
Short-tailed Hawk
Buteo albonatus Kaup
Zone-tailed Hawk
Tringa erythropus (Pallas)
Spotted Redshank
Calidris maritima (Brunnich)
Purple Sandpiper
Columba fasciata Say
Band-tailed Pigeon
Columbina talpacoti (Temminck)
Ruddy Ground Dove
Cypseloides niger (Gmelin)
Black Swift
Chaetura vauxi (Townsend)
Vaux's Swift
Lophornis helenae (De Lattre)
Black-crested Coquette

Picoides villosus (Linnaeus)
Hairy Woodpecker
Tyrannus vociferans Swainson
Cassin's Kingbird
Tachycineta thalassina (Swainson)
Violet-green Swallow
Cyanocitta stelleri (Gmelin)
Steller's Jay
Nucifraga columbiana (Wilson)
Clark's Nutcracker
Stalia mexicana Swainson
Western Bluebird
Bombycilla garrulus (Linnaeus)
Bohemian Waxwing
Phainopepla nitens (Swainson)
Phainopepla
Lanius excubitor Linnaeus
Northern Shrike
Vermivora virginiae (Baird)
Virginia's Warbler
Dendroica chrysoparia Sclater & Salvin
Golden-cheeked Warbler
Pipilo fuscus Swainson
Canyon Towhee
Aimophila aestivalis (Lichtenstein)
Bachman's Sparrow
Spizella arborea (Wilson)
American Tree Sparrow
Spizella breweri Cassin
Brewer's Sparrow
Ammodramus bairdii (Audubon)
Baird's Sparrow
Zonotrichia atricapilla (Gmelin)
Golden-crowned Sparrow
Icterus parisorum Bonaparte
Scott's Oriole
Carduelis flammea (Linnaeus)
Common Redpoll

Next Page