Biological Opinion for TE-151746-0

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (BO) regarding entering into a Safe Harbor Agreement (Agreement) with the Coastal Prairie Coalition, Grazing Lands Conservation Initiative (GLCI) and issuance of an Endangered Species Act of 1973 (Act), as amended, section 10(a)(1)(A) Enhancement of Survival permit (TE-151746-0). The Federal action under consideration is the issuance of a permit authorizing incidental take of Attwater's prairie chicken (*Tympanuchus cupido attwateri*), northern aplomado falcon (*Falco femoralis septentrionalis*), whooping crane (*Grus americana*), and black lace cactus (*Echinocereus reichenbachii var. albertii*) during habitat restoration, reclamation, conservation, and management of native coastal prairie on private lands in Aransas, Austin, Calhoun, Colorado, Galveston, Goliad, Refugio, and Victoria counties, Texas. This action is authorized by sections 10(a)(1)(A), 7(a)(1), and 7(a)(2) of the Act and the Service's Safe Harbor Agreement final policy (64 FR 32717) and final regulations (64 FR 32706). Section 10(d) of the Act provides that the Service may grant permits authorizing the incidental taking of endangered species under section 10(a)(1)(A) only if it finds that [they] (1) were applied for in good faith, (2) will not operate to the disadvantage of such endangered species, and (3) will be consistent with the purposes and policy set forth in section 2 of the Act.

Other listed species that may occur in the eight counties listed above include: American alligator (*Alligator mississippiensis*), West Indian manatee (*Trichechus manatus*), brown pelican (*Pelecanus occidentalis*), Eskimo curlew (*Numenius borealis*), hawksbill sea turtle (*Eretmochelys imbricate*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), bald eagle (*Haliaeetus leucocephalus*) and piping plover (*Charadrius melodus*) ocelot (*Felis pardalis*), Gulf Coast jaguarundi (*Herpailurs yagouaroundi cacmitli*), Houston toad (*Bufo houstonensis*), and sharpnose shiner (*Notropis oxyrhynchus*), a candidate species.

The proposed habitat management activities for the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus are not expected to have any impact on alligators, brown pelicans, sea turtles, piping plovers, jaguarundi, ocelots, Houston toads, or sharpnose shiners because they do not occur on coastal prairies. The Eskimo curlew and the bald eagle may occur on coastal prairies, however; activities will not occur in bald eagle habitat and the last sighting of the Eskimo curlew in Texas was in 1987 and its occurrence is highly unlikely. Therefore, these species will not be discussed further in this BO, and no take of these species is authorized.

This biological opinion is based on information provided in the Private Lands Agreement, site visits, the developed Agreement, telephone conversations and meetings between the Service and the GLCI, and other sources of information. A complete administrative record of this consultation is on file at the Corpus Christi Ecological Services Field Office.

Consultation History
On September 16, 2003, GLCI entered into a Cooperative Agreement with the Service, The Nature Conservancy, Natural Resources Conservation Service and Texas Parks and Wildlife Department. On August 3, 2004, GLCI entered into a Prairie Management Agreement with private landowners. Currently the GLCI and the Service are working on their second Cooperative Agreement and GLCI has submitted an application for an Enhancement of Survival Permit under section 10(a)(1)(A) of the Act. The availability of this final application was published in the *Federal Register* on April 30, 2007. The 30-day public comment period closed on May 30, 2007. The Service received two written comments on the application during the public comment period, which are available along with the Service's Findings in the Administrative Record at the Corpus Christi Ecological Services Office.

BIOLOGICAL OPINION

I. Description of Proposed Action
One action is signature of the Cooperative Prairie Management Agreement which will be in effect for 99 years and will commence upon issuance of the permit. The second action, also in effect for 99 years, is issuance of the permit to GLCI for implementation of the Safe Harbor Program. The primary objective of the Agreement and Permit is to conserve the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus on all or portions of privately owned lands in Aransas, Austin, Calhoun, Colorado, Galveston, Goliad, Refugio, and Victoria counties, Texas (Figure A1-2). The Safe Harbor program is designed to promote the recovery of covered species on enrolled private lands in those eight counties. As described in the Cooperative Prairie Management Agreement, the conservation measures will improve and maintain healthy productive grasslands, reduce brush canopy, modify plant composition, promote growth of or enhance the detection and/or palatability of desired foods, increase prey base, facilitate the accumulation of fine fuels for prescription burning, provide additional habitat, provide upland freshwater supplies, and aid in dispersal of covered species among various protected habitats, providing a measure of insurance against losses due to demographic or genetic factors and catastrophic events.

The GLCI will issue Certificates of Inclusion (CIs) to non-federal landowners who volunteer to carry out conservation efforts for species covered under the Agreement and agree to abide by the terms and conditions of the Permit. The Service and/or GLCI's representative will determine baseline conditions for properties to be enrolled. The baseline conditions will be described in terms appropriate for each covered species. Baseline conditions may be expressed as use of the enrolled property by the covered species (e.g., number of individuals, occupied breeding territories). Where there are no listed species using a property or there is no suitable habitat on the property, a zero baseline will be assigned for the enrolled property. Baseline conditions will be described in the CIs and Cooperative Prairie Management Agreement, and detailed descriptions or maps of the areas will be attached to the CI and Cooperative Prairie Management Agreement.

In the case of Attwater's prairie chicken, the baseline for any participating landowner will be the number of "booming" males. The baseline for Attwater's prairie chicken will be the number of active Attwater's prairie chicken nesting territories on the property. For whooping crane, the baseline for any participating landowner will be the number of wintering whooping cranes and the species territorial area on the property. In the case of black lace cactus, the baseline for any participating landowner will be the number of individual plants on the property. The Act does not prohibit destruction, damage, or moving federally listed plants unless it occurs on lands under Federal jurisdiction or in violation of any Federal or State laws. If a person wishes to develop private land with no Federal jurisdiction involved, and in accordance with State laws, then destruction, damage, or movement of listed plants is allowed. However, federally listed plants may not be sold or traded without a valid permit from the Service and may not be removed from another person's property in violation of trespass laws. So long as a participating landowner maintains the baseline for each covered species established at the time the CI and Cooperative Prairie Management Agreement were signed, any subsequent incidental taking of the covered species by the landowner will be authorized by GLCIs section 10(a)(1)(A) Permit.

Each of the covered species has been documented to use the coastal prairie grasslands of Texas. The Service anticipates that implementation of these conservation measures and management activities will produce a net conservation benefit for the covered species by increasing the habitat available to covered species for the term of the Agreement. No work will begin until an archeological evaluation is completed, if required by the State Historical Preservation Office, and the landowner will provide an annual maintenance of works completed to ensure that they are in good condition and function as agreed upon for the life of the Cooperative Prairie Management Agreement.

To assess the results of the SHA, GLCI will monitor management activities to assess compliance and results. To assess compliance, GLCI will annually contact Cooperators holding CIs to determine the status of their habitat restoration or creation efforts. In addition, necessary site visits will be conducted to verify that major commitments to habitat restoration have been fulfilled. Additional information about how the Safe Harbor program will be carried out is provided in the Cooperative Prairie Management Agreement and SHA.

II. Status of the Species/Critical Habitat

Four federally listed endangered species that occur or could occur if management actions are successful in the proposed project area may be affected by the Agreement activities: the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus.

Attwater's Prairie Chicken (*Tympanuchus cupido attwateri*)

The Attwater's prairie chicken was listed as endangered by the Service on March 11, 1967 (32 FR 4001) without critical habitat.

Description
The Attwater's prairie chicken is a brownish, chunky, hen-like bird with dark bars above and below. Males have short rounded black tails and female's tails are barred. Males have yellow-orange eye combs and both sexes have elongated dark neck feathers, which in males are longer and erected during courtship. Males have large orange air sacs on the sides of their necks and during mating season, they make a "booming" sound, amplified by inflating the air sacs on their necks that can be heard 1/2 mile away.

Habitat
The Attwater's prairie chicken uses different areas of coastal prairie grassland, preferring a variety of short, mid and tall grass prairie. The habitat is usually dominated by tall dropseed (*Sporobolus asper*), little bluestem (*Schizachyrium scoparium*), sumpweed (*Iva frutescens*), broomweed (*Xanthocephalum texanum*), ragweed (*Ambrosia psilostachya*) and big bluestem (*Andropogon gerardii*) (Service 1983). They may use grass areas less than 10 inches in height for courtship, feeding, and to avoid moisture. Grass up to 10-16 inches tall is used for roosting and feeding, whereas 16-24 inches of grass (maximum height) are used for nesting, loafing, feeding, and escape. Interspaces between grass clumps should be relatively open to facilitate movement. Densely vegetated areas over 24 inches in height are generally avoided, but may be used occasionally for protection from inclement weather and predators, and as fall feeding grounds (Service 1983).

Life History
Males gather for communal courtship (10-30 birds) called leks. Breeding begins early April. Clutch size averages about 12. Incubation lasts 23-24 days. Young leave the nest a few hours after hatching; tended by female. Nests are usually located on average 1.6 km from the booming grounds and more than 60% are lost to predation. The APC diet consists mostly of insects, especially grasshoppers during the summer and at other times eats fruit, leaves, flowers, shoots, seeds, or grain (Campbell 1995).

Population Dynamics
In Goliad County, the population peaked in 1974 at 486 birds and declined to 62 by 1982. The 1980 estimate for Refugio County was 726 individuals; declined to 438 by 1982 (Service 1983). The 1982 populations in Austin and Colorado counties were 250 and 200, respectively. Aransas County population in 1982 was estimated at 20. As of 1991, over 2/3 of the wild population (318 birds) occurred in a contiguous area of primarily private land (O'Conner Ranch) in Aransas, Goliad, and Refugio counties. Birds previously occurring on the Tatton Unit of Aransas National Wildlife Refuge have since disappeared. About 1/4 (126 birds) of the remaining population occurred in Austin and Colorado counties, mostly on Attwater's Prairie Chicken National Wildlife Refuge. About 30 birds survived on a 120-ha island of prairie habitat in Galveston County, and another 18 birds occurred in Victoria County. In 1999, fewer than 50 birds remained in the wild despite the introduction of 167 birds from a captive breeding program in 1995-1998 on the Attwater's Prairie-Chicken National Wildlife Refuge, Colorado County and The Nature Conservancy of Texas' Galveston Bay Prairie Preserve, Galveston County (NatureServe website 2007). Currently, a total of 44 birds are estimated at the last two

remaining wild populations, Attwater's Prairie Chicken National Wildlife Refuge (2007 estimate of 38 birds) and at the Texas City Prairie Preserve in Galveston County (2007 estimate of 6 birds) (personal communication, T. Rossignol, Attwater's Prairie Chicken National Wildlife Refuge, June 2007).

Range

The Attwater's prairie chicken was formerly found throughout Gulf Coast prairies of southwestern Louisiana and Texas, south to the Rio Grande. Presently, less than 200,000 fragmented acres of coastal prairie habitat remain and it is restricted to a narrow band along the Texas coast, some offshore islands, and remnant inland populations (NatureServe website 2007). Currently only two APC populations exist in the wild, one at the Attwater's Prairie Chicken National Wildlife Refuge in Colorado County and one at the Texas City Prairie Preserve in Galveston County, Texas. There are no known populations of APCs in Aransas, Austin, Calhoun, Goliad, Refugio, and Victoria counties (personal communication, T. Rossignol, Attwater's Prairie Chicken National Wildlife Refuge, June, 2007).

Threats

Threats to the Attwater's prairie chicken include habitat loss, fragmentation, and degradation of coastal prairie habitat due to agricultural practices, development, brush invasion, overgrazing; and competition with introduced exotic species (pheasants) (*Phasianus colchicus*). Losses may also be attributed to fire ants (*Solenopsis invicta*), wild and feral mammals, and raptors. Areas that are no longer suitable due to overgrazing or habitat succession potentially can be restored by reducing livestock numbers or by instituting a program of prescribed burning (Service 1983).

Analysis of the Species Likely to be Affected

The intended effect of the Agreement is to benefit the Attwater's prairie chicken by creating, restoring, and/or enhancing habitat on private lands in an effort to increase their numbers and distribution. Good range management could produce good patchy, open cover and a diversity of forbes that provide the bulk of adult Attwater's prairie chickens diet. Prescribed burning, which should be completed by late February keeps woody plant invasion under control, reduces growth of vegetation that is too dense for Attwater's prairie chickens, improves plant diversity, improves availability of food, and provides nesting sites and booming grounds for Attwater's prairie chickens. Mechanical or chemical management techniques (dozing, roller chopping, or shredding followed by prescribed burn or herbicide application) helps control of large, dense brush and provide feeding areas and brood habitat and control undesirable plant growth. Shredding during the nesting and brooding season (March through June 15) could result in the destruction of nests and incidental take of young chicks unable to fly.

Habitat improvements may result in occupancy by Attwater's prairie chickens. If such occupancy does occur, the landowner can return the restored habitat to baseline conditions and incidental take of the species may occur in the future. Improvements of currently unsuitable habitat adjacent to habitat occupied by Attwater's prairie chickens could also cause the movement of Attwater's prairie chickens from the occupied habitat to the improved habitat. Lack of management may result in the loss of Attwater's prairie chickens with or without this

Agreement. However, if newly created habitat functions as successful nesting habitat for the Attwater's prairie chicken it will provide a source for dispersing young to occupy other nearby suitable habitats.

Whooping Crane (*Grus americana*)

The whooping crane was listed as endangered on June 2, 1970 (35 FR 8495) and critical habitat was designated on May 15, 1978 (43 FR 20938).

Description

The whooping crane is approximately 5 feet tall. It is a very large, snowy white, long-necked bird with long legs that trail behind in flight, black primary feathers (at wing tip), a crimson crown, and a wedged-shaped patch of black feathers behind the eye. The male is generally larger than female. Chicks are reddish cinnamon in color. At four months of age, white feathers begin to appear on the neck and back (Service 1994).

Habitat

Whooping cranes use a variety of habitats during their long migrations between northern Canada and the Texas coast. Croplands are used for feeding, and large wetland areas are used for feeding and roosting. In Texas, the principal wintering habitat consists of about 22,500 acres of marshes and salt flats on Aransas National Wildlife Refuge and adjacent publicly and privately owned lands. Plants such as salt grass (*Distichlis spicata*), saltwort (*Batis maritime*), smooth cordgrass (*Spartina alterniflora*), wolfberry (*Lycium carolinianum*), and sea ox-eye (*Borrichia frutescens*) dominate the outer marshes. Further inland, Gulf cordgrass (*Spartina spartinae*) is more common. The interior portions of the refuge are characterized by oak mottes, grassland, swales, and ponds on gently rolling sand soils. Live oak *(Quercus fusiformis)*, redbay (*Persea borbonia*), and bluestems (*Bothriochloa spp.*) are typical plants found on the upland sites. During the last 20 years, upland sites have been managed using grazing, mowing, and controlled burning. About 14,250 acres of grassland are managed for cranes, waterfowl, and other wildlife (Campbell 1995).

Critical Habitat

Aransas National Wildlife Refuge and vicinity have been designated by the Service (43 CFR 20938-20942) as critical wintering grounds for conservation of the species. The critical habitat for Texas as described in the Federal Register is as follows:

> *An area of land, water, and airspace in Aransas, Calhoun, and Refugio Counties with the following boundaries: Beginning at the point where the north boundary of the Aransas National Wildlife Refuge intersects the shore of San Antonio Bay at Webb Point; thence, from this point along a straight line across San Antonio Bay through the westernmost tip of Mosquito Point and inland to a point of intersection with surfaced road; thence eastward along a straight line across Espiritu Santo Bay to the intersection of the bay shore an a road at the east end of Pringle Lake on Matagorda Island; thence sought along this road to the intersection with the main Matagorda Island Road; southwestward along this main road to Cedar Bayou; thence due west across Cedar Bayou, Vinson*

Slough, and Isla San Jose to Gulf Intracoastal Waterway platform channel 49 marker No. 25; thence north to the southwest corner of he proclamation boundary into S. Charles Bay to a line drawn as an eastward extension of Twelfth Street on Lamar Peninsula; thence westward along this line to intersection with Palmetto Avenue; thence northward along a straight line to the southwest corner of the Aransas National Wildlife Refuge at Texas State Highway 35 and the north shore of Cavasso Creek; thence northeast on a straight line to the corner of the Aransas National Wildlife Refuge north boundary adjacent to triangulation station "Twin"; thence along the north boundary of said refuge to the starting point Webb Point.

Wintering habitat for whooping cranes consists primarily of marshes and salt flats, and whooping cranes use about 22,500 acres of the Aransas National Wildlife Refuge and adjacent privately and publicly owned wetlands. Salt grass, saltwort, smooth cordgrass, glasswort, and sea ox-eye daisy dominate the marshes preferred by whooping cranes. Inland margins of the flats used by whooping cranes are often fringed by Gulf cordgrass. Whooping cranes also use uplands areas containing oak mottes, grasslands, swales, and ponds. Within the critical habitat unit in Texas, the upland vegetation includes live oak, redbay, and bluestem. Whooping crane diets during the wintering season include crabs, clams, fish, frogs, acorns, and berries.

Life History

Whooping cranes breed in the wetlands of Wood Buffalo National Park in northern Canada and spend winters on the Texas coast at Aransas National Wildlife Refuge, Austwell, Calhoun County Texas, and surrounding areas. Whooping cranes migrate more than 2,400 miles a year from northern Canada to the Texas Gulf Coast and begin their fall migration south to Texas in mid-September and begin the spring migration north to Canada

Whooping cranes are most often seen in flocks of two to as many as 10-15, although sometimes they migrate with sandhill cranes *(Grus canadensis)*. Whooping cranes usually mate for life. They mature at 3 to 4 years of age and most females are capable of producing eggs by 4 years of age. It is estimated that whooping cranes can live up to 22 to 24 years in the wild. Nesting territories vary considerably in size ranging from 0.5 to 18 square miles. Eggs are laid in late April to mid May and hatch in one month. Most nests contain 2 eggs. During their wintering period on the Texas coast they eat a variety of plant and animal foods. Blue crabs (*Callinectes sapidus*), clams (*Tagelus plebius, Ensis minor, Rangia cuneata, Cyrtopleura costada, Phacoides pectinata, Macoma constricta*), and wolfberries are the main winter diet obtained in the brackish bays, marshes, and salt flats. Occasionally they fly to upland sites for foods such as acorns, snails, crayfish, and insects, returning to the marshes in the evening to roost. Family groups and pairs usually depart the Texas coast between March 25 and April 15. The last birds are usually gone by May 1, but occasional stragglers may stay into mid-May (Service 1994, Campbell 1995, Canadian Wildlife Service 2005).

Population Dynamics

The whooping crane population in Texas reached a low of only 15 birds in 1941 before efforts were taken to protect the species and its habitat. The population has been growing at four percent

annually and reached 100 birds in December 1986. The wild breeding population increased from 15 pairs in 1970 to 47 pairs in 1993. The wintering population at Aransas National Wildlife Refuge numbered 96 in 1986 and 138 in 1989. In the winter of 1993-1994, the peak count of cranes wintering in Texas was 143 (NatureServe website 2007).

There are currently three wild populations of whooping cranes. There are nine captivity sites. The only self-sustaining wild population is the one that winters on the Texas coast and nests primarily within the Wood Buffalo National Park. In 2003, 81 adult pairs and 312 young and adult WCs were reported to occur in the wild. That total included Aransas National Wildlife Refuge/Wood Buffalo National Park, Rocky Mountains, Florida non-migratory and Wisconsin/Florida migratory whooping cranes. A census flight on December 1, 2004, tallied 216 whooping cranes, including 183 adults and 33 young. In February 2006, total wild population was estimated at 338. This included 215 individuals in the Aransas National Wildlife Refuge/Wood Buffalo National Park that nests in Wood Buffalo National Park and adjacent areas in Canada and winters in coastal marshes in Texas; 59 captive-raised individuals released in an effort to establish a non-migratory Florida population in central Florida; and 64 individuals introduced between 2001 and 2005 that migrate between Wisconsin and Florida in an eastern migratory population. The last remaining wild bird in the reintroduced Rocky Mountan population died in the spring of 2002. The captive population contained 135 birds in February 2006 (Canadian Wildlife Service 2005). An April 19, 2007, whooping crane census update posted on the Aransas National Wildlife Refuge web site reported that on March 7, 2007, a total of 237 whooping cranes were counted at Aransas National Wildlife Refuge. Of the 237, 192 were adults, 45 were young, and 72 were adult pairs. All but seven of the 237 whooping cranes (3%) had started the migration from Aransas National Wildlife Refuge at that time (Service 2007).

The whooping crane has a long-term recruitment rate of 13.9%. Annual growth of the whooping cranepopulation during the past 65 years has averaged 4.5% per year. From 1983 to 1989, Aransas National Wildlife Refuge/Wood Buffalo National Park population increased from 75 to 146 birds because of suitable nesting habitat conditions, then dropped to a 10-year low of 132 by the 1991-92 winter. Then again, the population declined to 180 in 2001 and 176 in 2001-02 and rebounded to 185 in 2002-03, 194 in 2003-04 and 217 in 2004-05. The Aransas National Wildlife Refuge/Wood Buffalo National Park growth up to the year 2000 seems to have resulted primarily from a decline in mortality rate instead of an increase in recruitment (Canadian Wildlife Service 2005).

Range

Fall migration begins in mid-September from Wood Buffalo National Park in Canada at the border of Alberta and Northwest Territories. Whooping cranes arrive on the Texas coast in Aransas, Calhoun and Refugio counties between late-October and mid-November. They spend almost 6 months on the wintering grounds at and near Aransas National Wildlife Refuge (Campbell 1995).

Threats
Whooping cranes gradually disappeared as agriculture claimed much of the northern Great Plains of the United States and Canada. The conversion of native prairies and potholes to pasture and crop production made much of the original habitat unsuitable for whooping cranes. Rural electrification also resulted in many whooping cranes being killed or seriously injured as they collided with powerlines. Whooping cranes also do not tolerate human intrusion for long periods of time. The Aransas National Wildlife Refuge population remains vulnerable to accidental oil and chemical spills that could occur from barge traffic along the Gulf Intercoastal Waterway. Whooping cranes are also known to have died from gunshots. Other biological factors such as delayed sexual maturity and small clutch size prevent rapid population recovery. Natural events such as snow, drought, reduction in freshwater inflows, red tide, and low temperatures can make navigation hazardous or reduce food supplies. Predators and diseases are also another hazard (Canadian Wildlife Service 2005).

Analysis of the Species/Critical Habitat Likely to be Affected
Prescribed burning is anticipated to reduce height and density of grasses, topkill brush, and modify plant composition and make the habitat more attractive to whooping cranes. Although burns will take place while whooping cranes are present, they are likely to benefit from the burns because whooping cranes are known to immediately use such burned areas. Mechanical cutting, grazing by livestock, and burns have been used resulting in approximately 14,250 acres of grassland managed for whooping cranes, waterfowl, and other wildlife. Freshwater ponds surrounded by low vegetation and sparse aquatic emergent vegetation are also beneficial as they provide a source of fresh water when coastal waters are highly saline above 23 parts per thousand and may encourage cranes to utilize upland food resources (Canadian Wildlife Service 2005).

A major threat to the whooping crane is the decrease in the suitability of the species' habitat due to accelerating development within and adjacent to the designated critical habitat in Texas. Habitat and critical habitat improvements increasing the availability of additional lands with suitable habitat/improved critical habitat may result in occupancy by whooping cranes and the establishment of additional territories. If such occupancy does occur, the landowner can return the restored habitat or critical habitat to baseline conditions and incidental take of the species may occur in the future. Lack of management may result in the loss of whooping cranes and degradation of critical habitat with or without this Agreement.

Northern Aplomado Falcon (*Falco femoralis septentrionalis*)
The northern aplomado falcon was listed as endangered on February 25, 1986 (51 FR 6690) without critical habitat.

Description
The northern aplomado falcon is a medium sized falcon that is larger than a kestrel or merlin but smaller than the peregrine. Its total length is about 15 to 18 inches with a wingspan of about 32 to 36 inches. Adults are characterized by rust colored underparts, a gray back, a long-banded tail, and a distinctive facial pattern (Campbell 1995).

Habitat
Habitat consists of open grassland with scattered trees or shrubs. Northern aplomado falcons found in Arizona, New Mexico, Trans-Pecos Texas, and central plateau of Mexico inhabit semi-desert grassland with scattered mesquite *(Prosopis glandulosa)* and yucca (*Yucca spp.*). In south Texas they inhabit coastal grasslands and savannah grasslands of eastern Mexico. Northern aplomado falcons have also inhabited coastal dunes and tidal flats, and margins of inland marshes and riparian woodlands (Campbell 1995).

Life History
The northern aplomado falcon diet consists primarily of birds, supplemented by insects, small snakes, lizards and rodents. They do not construct their own nests but instead use the stick platforms built by other birds and those nests generally average about 1 to 3 feet in diameter. Northern aplomado falcons lay eggs between January to June, mainly in March-May, peaking in April. They usually lay 2 to 3 eggs and both parents (mainly female) incubate, for about 31 to 32 days. Young can fly at 4 to 5 weeks of age and may remain in nest area for several weeks more. Outside the breeding season, northern aplomado falcons are often seen in pairs, hunting, perching, and even feeding together (Service 1990).

Population Dynamics
Once common to the southwest grasslands in the United States, the population dramatically declined in the early 1900's and then was extirpated by the 1950s. The Peregrine Fund, has taken the lead by establishing a captive breeding program and began releasing young birds into the wild on the Laguna Atascosa National Wildlife Refuge. Breeding pairs began to establish on the refuge and it was soon realized additional lands were required for future releases. In 1997, the Peregrine Fund and the Service entered into a Safe Harbor Agreement permitting releases on enrolled private lands over 57 counties in south and west Texas. Between 1985 and 2003, the Peregrine Fund has released approximately 812 young northern aplomado falcons on private lands, Matagorda National Wildlife Refuge, and Aransas National Wildlife Refuge and most of these birds are currently nesting and rearing young in the wild (NatureServe website 2007). There were approximately 26 Cis associated with the Safe Harbor issued between October 2005 and September 2006. Of the 45 known northern aplomado falcon pairs established in Texas, 15 were on those 26 properties (Service 2006).

Range
Their historic breeding range was southeastern Arizona, southern New Mexico, and southern Texas south through Mexico (Tamaulipas, Chiapas, Campeche, Tabasco, Chihuahua, Coahuila, Sinaloa, Jalisco, Guerrero, Veracruz, Yucatan, and San Luis Potosi) to Guatemala (Pacific slope of Central American cordillera). In Arizona, New Mexico, Trans-Pecos Texas, and the central plateau of Mexico, northern aplomado falcons inhabit semi-desert grassland, with scattered mesquite and yucca. In the past they were seen in the coastal grasslands of south Texas, coastal dunes, tidal flats, and margins of inland marshes and riparian woodlands. In eastern Mexico, northern aplomado falcons nest in savannah grasslands. Occupied habitat has been described as having tree densities of about 19 trees per 100 acres, an average distance between trees of about 100 feet and average tree height of 30 feet.

Threats
Habitat loss and pesticide contamination may have caused its disappearance from formerly occupied areas. Conversion of rangeland to cropland has also contributed to habitat loss. Brush encroachment resulting from uncontrolled livestock grazing and fire suppression altered grassland habitat. Continuous heavy grazing pressure reduces plant diversity and leads to declines in range condition and brush invasion reducing habitat for prey species.

Analysis of the Species Likely to be Affected
Brush management, grazing management practices, and periodic prescribed burns will maintain preferred northern aplomado falcon habitat such as open rangelands with scattered mottes of brush and trees. Much of this type of habitat has been altered in the past by brush encroachment and uncontrolled livestock grazing and fire suppression. The reduction of plant diversity, decline in range condition and brush invasion reduces habitat for prey species forcing the northern aplomado falcon to abandon nesting territories where grass ground cover gives way to brush.

Management activities under this Agreement should provide additional lands for reintroduction efforts and maintain productive rangelands able to support northern aplomado falcons, and future occupancy by the northern aplomado falcons already in adjacent occupied suitable habitat. If such occupancy does occur, the landowner can return the restored habitat to baseline conditions and incidental take of the species may occur in the future.

Black Lace Cactus (*Echinocereus reichenbachii var. albertii*)
The black lace cactus was listed as endangered on October 26, 1979 (44 FR 61918) without critical habitat.

Description
The black lace cactus is a small, deep green, cylindrical cactus with dark-tipped spines. The outer spines of the black lace cactus are straight and white with dark purple tips. The spines look like the teeth in a comb. Its stems are 1-6 inches tall and 1-2 inches wide (Service 1986).

Habitat
It occurs in grassy openings on south Texas rangeland invaded by mesquite and other shrubs in loam to sandy loam soils, where the Gulf coastal plain meets the inland mesquite shrubland. Some associated vegetation includes huisache (*Acacia farnesiana*), honey mesquite (*Prosopis glandulosa*), blackbrush (*A. rigidula*), granjeno (*Celtis pallida*), guayacan (*Porlieria angustifolia*), buffalo grass (*Buchloe dactyloides*), and Texas grama (*Bouteloua rigidiseta*). Other vegetation associated black lace cactus suggests a high saline content in the soil (Service 1995).

Life History
The black lace cactus produces pink to purple flowers, 2-3 inches wide that bloom from April to June. The flower is pollinated by bees and wasps. Once the blooms fall off, a fruit is produced (Service 1986).

Population Dynamics
In 1979, it was estimated less than 4,000 plants were known from the wild (44 FR 61918/61920). There has been a drastic decline in the known population, with several populations being destroyed by brush control (NatureServe 2007). The Refugio County, Rincon Bend (Bates Ranch) population is a large, patchy population of black lace cactus scattered over about 42 acres adjacent to the Aransas River. An all weather road transects the population. The site was surveyed in 1986 by Texas Parks and Wildlife and they reported a population of 82,500 individuals. A more recent census was undertaken in April 2004 by Texas Parks and Wildlife and The Nature Conservancy and 1,527 clumps (assumed to be distinct individuals) and 5,542 stems were counted. The owner of this site is very interested in conservation. The Kleberg County site, near Ricardo on Jaboncillos Creek, was found in 1983 and had three subpopulations containing 41, 303, and 2,138 individuals respectively. A 1985 survey by Texas Parks and Wildlife estimated approximately 19,250 individuals. In October 2001, approximately 1,160 plants were counted in about 2 hours. In September 2002, Texas Parks and Wildlife visited the site and had difficulty locating plants, numbering in the dozens rather than hundreds. No changes in land management had occurred. The population in Jim Wells County occurs on less than one half square mile in extreme southern Jim Wells County and has not been seen by botanists since about 1989 (personal communication Dana Price, Texas Parks and Wildlife Department, June 2007).

Range
Black lace cactus has a range extending from western Kansas to northern Mexico. (Service 1987). In Texas, known populations of BLC occur on private lands in Kleberg, Jim Wells, and Refugio counties. In the past five years (2002-2007), no new populations of this species have been reported. Five occurrences are recorded in the Texas Parks and Wildlife Natural Diversity Database. However, the record from around Kingsville is vague and may or may not represent a distinct site. Another site was a population that was introduced on Nature Conservancy land in Duval County, but it has not persisted (personal communication Dana Price, Texas Parks and Wildlife, June 2007).

Threats
The species is threatened by loss of habitat due to agricultural and urban development, oil and gas pipeline work, as well as collection and use of herbicides on row-crop agriculture (Service 1986).

Analysis of the species likely to be affected
Not much is known about the effects proposed management activities will have on black lace cactus due to lack of monitoring. However, excessive numbers of livestock and overgrazing can result in trampling, reduced ground cover, and increase erosion. Cattle do not appear to seek out black lace cactus as a food source. Populations of black lace cactus could potentially benefit from proper grazing management on enrolled lands by reducing overgrown areas and opening up more patchy areas thus reducing competition from other species. Prescribed burns done at improper times could potentially result in the cacti, flowers and fruits being burned. Effects may vary depending on severity of the burn and soil moisture. Prescribed burning may be beneficial to reduce woody species and open up patchy areas for black lace cactus. Although activities

could include mechanical brush clearing and herbicide use, these activities will not be used on black lace cactus populations.

If populations of black lace cactus are found on enrolled lands, the black lace cactus could potentially benefit by the protection, identification, mapping, management, and monitoring of any new populations. By cooperatively working with the landowner under this Agreement, not only could additional populations be found, but new data may be gathered on the effects of such management on black lace cactus.

III. Effects of the Action

The principal intended effect of the Agreement is to benefit the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus by creating, restoring, and/or enhancing habitat for these species. The benefits intended to accrue to these endangered species include active habitat management on private property, an increase in numbers and distribution of breeding pairs, and a slowing, if not reversal, of the decline of each of these species' habitat on private lands. Without proper management, existing habitat can rapidly become unsuitable to the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus. Therefore, since much of the species' habitat is found on private lands, it is vital that conservationists develop tools to encourage habitat management activities that benefit these four species.

The Agreement anticipates that the management measures to be undertaken on participating land will result in the use of some or most of that land by the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus and that without those measures such land would not otherwise be utilized. While the landowner would be permitted to carry out activities under this plan that could result in the incidental taking of covered species on his land, he may choose not to do so at all or to postpone any taking for many decades. However, if habitat improvements result in occupancy by the either of the four species and the landowner chooses to return the restored habitat to baseline conditions (e.g., through such activities as clearing for agricultural purposes, intensive grazing, or other activities), after the terms of the SHA have been met, incidental take of these endangered covered species will occur.

By improving currently unsuitable habitat or habitat occupied by the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus there could also be some movement of birds or extension of plants from the occupied habitat to the improved habitat, particularly if the currently occupied habitat suffers a degradation of quality due to lack of appropriate management. Loss of birds or plants from lack of appropriate management is likely to occur eventually with, or without, the restoration of habitat under this Agreement. If appropriately managed, however, currently occupied habitat is likely to remain occupied, and the newly created habitat will most likely be occupied by birds or plants from currently occupied sites. For as long as the restored habitat successfully functions for the birds or plants, it will provide a source for dispersal or expansion to nearby suitable habitats.

IV. Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The original character of the south Texas coastal prairie grassland has been greatly altered by more than a century of ranching practices, which in some areas has led to deterioration in range and wildlife habitat conditions. Invasive brush species and exotic grasses are now well established throughout much of the grasslands.

According to the Natural Resources Conservation Service's 1997 National Resources Inventory, Federal land totaled about 402 million acres in 1997. Non-Federal lands amounted to just under 1.5 billion acres, most rangeland (27 percent) and forest land (27 percent), followed by cropland (25 percent, pastureland (8 percent) and developed land, approximately 98 million acres (6.6 percent). In the 5-year period between 1992 and 1997, the pace of development (2.2 million acres a year) was more than 1-1/2 times that of the previous 10-year period 1982 to 1992 (1.4 million acres a year). Over a 15-year period 1982 to 1997, the total acreage of developed land increased by more than 25 million acres, or one-third (34 percent) (NRCS 2001).

The Natural Resources Inventory 2003 Annual National Resources Inventory (data collected 2000-2003) reported that of the 1.9 billion acres covered in the contiguous 48 states, approximately 1.4 billion acres was non-Federal, rural land use (71 percent). Non-Federal rural lands were predominately forest land at 405.6 million acres (21 percent), rangeland 405.1 million acres (21 percent), and cropland 367.9 million acres (19 percent). Developed land had increased from 98 million acres in 1997 to 108.1 million acres in 2003 (NRCS 2007).

In Texas, from 1992 to 1997 approximately 2.3 million acres of agricultural and rural land was converted to developed use (Farmland Information Center website, June 2007). Land development in Texas has been highly concentrated around a few major urban areas, such as Houston, Dallas-Fort Worth, and between San Antonio and Austin. Most land in Calhoun County, one of the counties in which the Agreement is to operate is still overwhelmingly rural. However, plans for a Trans-Texas highway corridor through south Texas and several large housing development plans for Calhoun County appear to be progressing.

Throughout Texas, changing economic conditions, a state financial structure that is heavily dependent on property taxes and the effects of estate and inheritance taxes have combined to contribute to the breakup of once extensive land tracts. Meanwhile, the fear of litigation and regulation has closed off lands whose owners once welcomed and cooperated with scientists and conservationists" (Schmidly 1998). Appropriately managed, much of this land use can be compatible with restoration of habitat for the endangered species.

Landowners are often reluctant to undertake activities that will benefit covered species for fear of the regulatory impacts of having endangered species present on their property. As a result, landowners in south Texas may refrain from undertaking management activities that would benefit these three species. Some landowners may be taking actions designed to reduce the likelihood that their land becomes suitable habitat for the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus. Reluctance on the part of private landowners to provide habitat for these endangered species through voluntary stewardship is a substantial impediment to their eventual recovery. By removing potential disincentives to implement the types of land management practices that could benefit these covered species, the Agreement would encourage management actions that would maintain, restore, and/or enhance habitat for these species.

V. Conclusion

After reviewing the current status of the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus, the baseline for the action area, the effects of the Agreement, and the cumulative effects, it is the Service's biological opinion that the issuance of a section 10(a)(1)(A) permit for fulfillment of TE-151746-0, as proposed, is not likely to jeopardize the continued existence of these species. We believe this because the principal intended effect of the proposed action is to provide a net conservation benefit to these species and critical habitat by creating and restoring habitat with good range management, prescribed burning, and dense brush control. The proposed action will facilitate enhancement of feeding habitat for Attwater's prairie chicken, whooping crane, and northern aplomado falcon and enhancement of feeding and breeding habitat for Attwater's prairie chicken and northern aplomado falcon. Habitat for black lace cactus will also be improved. There is no designated critical habitat for the Attwater's prairie chicken, northern aplomado falcon, or black lace cactus, therefore none will be affected. Critical habitat for the whooping crane has been designated on the Gulf of Mexico coast of Texas and it is anticipated that management activities would allow essential features of critical habitat to remain functional.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action (in this case granting a Permit to take the species in fulfillment of TE-151746-0) is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The GLCI SHA clearly identifies the conservation measures that will be implemented to provide a net conservation benefit to the affected listed species included in the permit by contributing to their recovery. The Agrrement also clearly identifies the anticipated impacts to affected listed species likely to result from the proposed taking should the Cooperator(s) return to the agreed upon baseline conditions. All conservation measures described in the Agreement and any section 10(a)(1)(A) permit or permits issued with respect to the Agreement, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within the Incidental Take Statement pursuant to 50 CFR §402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(A) and section 7(o)(2) of the Act to apply. If the Permittee or Cooperator(s) fails to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(A) permit and section 7(o)(2) may lapse. The amount or extent of incidental take anticipated under the Agreement, associated reporting requirements, and provisions for disposition of dead or injured animals are as described in the Agreement and its accompanying section 10(a)(1)(A) permit.

Extent of Take

It is anticipated all or a majority of all habitat restoration projects will be carried out in currently unoccupied, unsuitable habitat (zero baseline) for the all covered species. No incidental taking of any of these covered species is anticipated. However, if habitat improvements result in occupancy by the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus, and a landowner chooses to return the restored habitat to baseline conditions (e.g., through such activities as clearing for agricultural purposes, intensive grazing, discontinuing habitat enhancement, or other activities), incidental take of these endangered species will occur. The extent of incidental take that will result from such activities will depend on the extent to which the restored habitat is occupied by the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus. If at any time during the duration of the permit the Service determines that the cooperative agreements being entered into

pursuant to the Agreement are not yielding a net conservation benefit for these species, the Service may terminate the Agreement.

If during the tenure of this permit the project design and/or the extent of the habitat impact described in the Agreement is altered, such that there may be an increase in the anticipated take of the Attwater's prairie chicken, whooping crane, northern aplomado falcon, or black lace cactus; GLCI is required to contact the Service and obtain authorization and/or amendment of the permit before commencing any construction or other activities that might result in take beyond that described in the Agreement.

Effect of the Take

In the accompanying BO, the Service has determined that the level of anticipated take is not likely to result in jeopardy to the species affected by the Agreement.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize or avoid impacts of incidental take of the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus:

1) GLCI will comply with and implement the conservation measures outlined in the Agreement, Cooperative Prairie Management Agreement, and section 10(a)(1)(A) permit.

2) GLCI will report activities conducted under the section 10(a)(1)(A) permit to the Service annually.

3) The Service and GLCI will conduct five-year reviews to determine the effectiveness of the safe harbor program.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the Act, the following non-discretionary terms and conditions, which implement the reasonable and prudent measures described above must be complied with:

1) The authorization granted by the section 10(a)(1)(A) permit is subject to full and complete compliance with, and implementation of, the Agreement, Cooperative Prairie Management Agreement, and all specific terms and conditions contained in the permit.

2) By November 1st of each year for the duration of the 99-year section 10(a)(1)(A) permit, GLCI will provide the Service with a report that includes:

- A narrative explanation describing the number of participating Cooperators, the amount of Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus habitat potentially created, enhanced, or restored as a result of the specific management activities performed under each cooperative agreement.

- A summary of the location(s) and circumstance(s) where incidental take of Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus was anticipated. Identify the amount of habitat taken back to baseline, when the take occurred, and whether it was the result of a completed cooperative agreement or early termination.

1) At the end of each five-year period beginning on the date of permit issuance, the Service and GLCI will review the effectiveness of the Agreement. Depending on the results, the Service and GLCI may make modifications as needed to further enhance the program and increase benefits to the species described in this BO.

2) If at any time during the duration of the permit the Service determines that the cooperative agreements being entered into pursuant to the Agreement are not yielding a net conservation benefit for these species, the Service may terminate the Agreement.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize or avoid the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The GLCI must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following:

1. GLCI should make every effort to alert the Service of other rare and listed species found on enrolled lands, and undertake proactive conservation activities to protect these species;

2. GLCI should work with the Service and other entities to identify and implement conservation tools that will benefit the Attwater's prairie chicken, whooping crane, northern aplomado falcon, and black lace cactus.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation

of any conservation recommendations.

Reinitiation Notice

This concludes formal consultation on entering into a Safe Harbor Agreement for the Grazing Lands Conservation Initiative and issuing the associated Enhancement of Survival Permit pursuant to section 10(a)(1)(A) of the Act, for the benefit of Attwater's prairie chicken, northern aplomado flacon, whooping crane, and black lace cactus. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

In future correspondence concerning this project, refer to permit number TE-151746-0. Please contact Tim Anderson at the Service's Corpus Christi Ecological Services Field Office at (361) 994-9005, extension 261 if you have any questions.

Approved:

Allan M. Strand, Field Supervisor
Corpus Christi, Texas

07-06-07
Date

Concur:

C. Todd Jones, Deputy Regional Director
Albuquerque, New Mexico

7-24-07
Date

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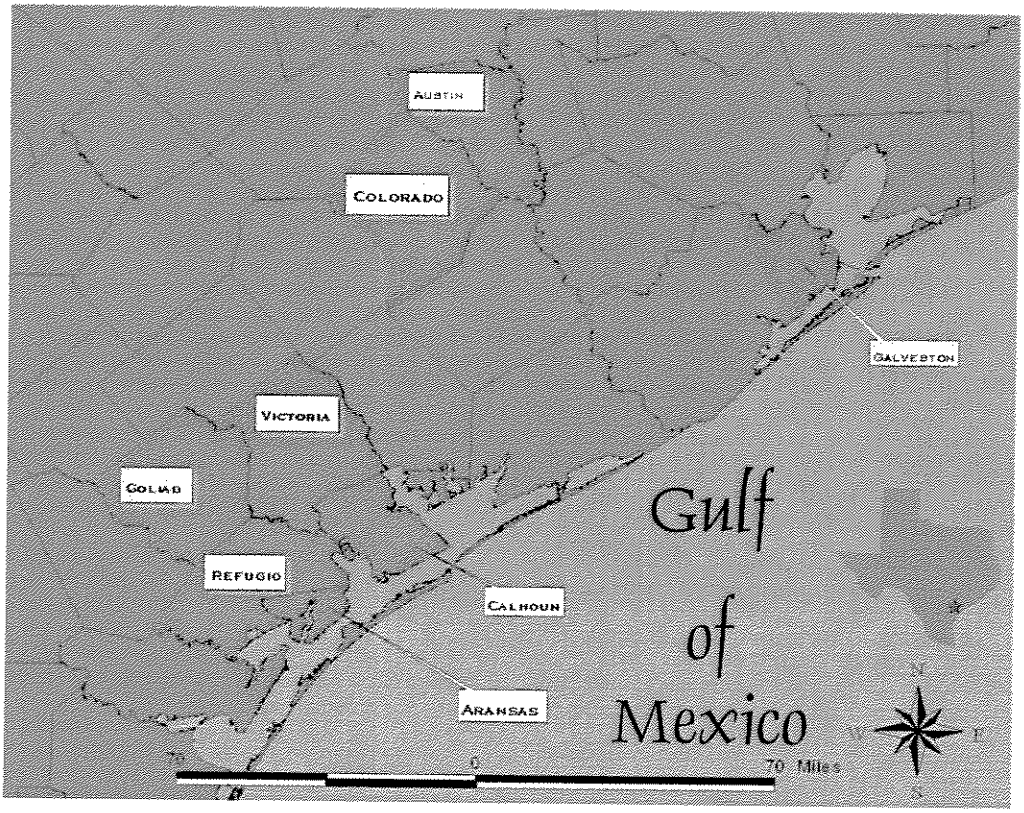
Attachment 1

Map of the Coastal Prairie Coalition, GLCI, Counties Addressed in the Safe Harbor Agreement