

WHOOPING CRANE RECOVERY ACTIVITIES

October, 2009 – September, 2010

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HIGHLIGHTS

The Aransas-Wood Buffalo population (AWBP) of whooping cranes rebounded from 247 present in the spring of 2009 to 263 in the spring, 2010. With 46 chicks fledging from a record 74 nests in August, 2010 the flock size should reach record levels this fall expected somewhere around 290. Threats to the flock including land and water development in Texas, the spread of black mangrove on the wintering grounds, the long-term decline of blue crab populations in Texas, sea level rise / land subsidence, and wind farm and power line construction in the migration corridor all continued to be important issues.

Two whooping cranes captured at Aransas and nine in Wood Buffalo National Park (WBNP) were fitted with GPS transmitters and tracked by satellite. Crews visited migration stopover sites after the birds were present to gather habitat use data. This project is being carried out by The Crane Trust headed up by Dr. Felipe Chavez-Ramirez. It is funded by the Platte River Recovery Implementation Program, The Crane Trust, and the USGS Northern Prairie Wildlife Research Center. The tracking is the first done on the AWBP in 25 years and is a top research priority of the Whooping Crane Recovery Team! Since the 1950s, 474 AWBP whooping cranes have died, with 37 carcasses recovered, and cause of death determined in only 17 instances. With the loss of 21.4% of the flock in the 12 months following April 2008, it is imperative that we learn more about whooping crane mortality.

Based on opportunistic sightings, the Cooperative Whooping Crane Tracking Project documented 103 confirmed sightings of whooping cranes in the U.S. Central Flyway during fall, 2009 and 52 sightings in spring, 2010.

A study by Dr. Ken Jones at the University of Georgia genomics lab to better describe the genetic composition of the captive flock got underway in September, 2010. The new genomics technology will derive genetic information from 454 single nucleotide polymorphisms, a substantial increase from the 12 loci used in the past on which most of our genetic decisions involving whooping crane pairings are currently based.

Planning efforts continued for the proposed reintroduction of a nonmigratory flock of whooping cranes at White Lake, Louisiana. White Lake is where the last whooping crane nest in Louisiana had been found in 1939.

Production in the wild from reintroduced flocks in 2010 was somewhat disappointing, though better than last year. In Florida with improved water conditions, 8 of the 9 remaining pairs nested and hatched 4 chicks, but only 1 chick survived to fledge. In Wisconsin, 12 pairs nested, with 3 first nests and 3 re-nests incubated full term and hatching 7 chicks. Two chicks fledged.

Nest abandonment consistent with the presence of black flies continued to be a major hurdle for the reintroduction at Necedah National Wildlife Refuge (NWR).

The captive flocks had a very good production season in 2010. Twenty-four chicks entered the migratory reintroduction program in Wisconsin, and 11 chicks are being formed into a cohort for a possible nonmigratory release in Louisiana in February, 2011. Three chicks of high genetic value were held back for the captive flocks.

Flock sizes are estimated at 263 for the AWBP, 119 for the WI to FL flock, and 25 nonmigratory birds in Florida. With 167 cranes in captivity, the world total (all located in North America) of whooping cranes is 574, up 38 from one year ago.

ARANSAS – WOOD BUFFALO POPULATION (AWBP)

2009 Fall Migration in the Central Flyway

Between September 22 and December 13, 103 sightings were confirmed by the U.S. Fish and Wildlife Service (USFWS) Whooping Crane Cooperative Project Tracking Office in Grand Island, Nebraska as compiled by Jeanine Lackey. Sightings were located in North Dakota (n=25), South Dakota (2), Nebraska (16), Kansas (23), Oklahoma (30), and Texas (7). The largest group size was 31 adults and 5 juveniles sighted near Salt Plains NWR in Oklahoma on November 13.

The migration in the U.S. got underway the first two weeks in October as Canada experienced freezing weather. Two whooping cranes were confirmed in Nebraska on October 14, the first fall sighting south of North Dakota. Given that the average first arrival for whooping cranes at Aransas is October 16th, the migration seemed about a week late. During the last week in October, migrating cranes were located all the way from Saskatchewan to Texas.

A storm system October 29-30 that dropped snow in western Nebraska helped push birds south, with an explosive movement throughout the flyway the first week in November. On November 9, there were at least 50 whooping cranes in central Kansas, including 32 at Cheyenne Bottoms State Wildlife Area. Two pools the birds were using at Cheyenne Bottoms and all of Quivira NWR were closed to hunting until the cranes moved south. USFWS's Pete Meggers documented 112 different whooping cranes using Quivira during the fall. The previous record at Quivira had been 62 birds in one season..

The first week in November, some whooping cranes were still as far north as Canada and North Dakota. On November 6, crane participants of the whooping crane Conservation Action Plan workshop held in Saskatoon sighted 19 whooping cranes during a field trip. An injured whooping crane unable to fly was reported in Saskatoon near the middle of November.

Conservation officers attempted to re-locate the injured crane after the initial report, but were unable to. This was considered a probable mortality.

The second week in November, many additional reports were received from Kansas and Oklahoma, including 53 whooping cranes in multiple groups reported in Oklahoma. By November 11, numbers had built up in and around Salt Plains NWR until a very large group of 36, including 6 juveniles, was observed 5 miles ESE of Salt Plains NWR on November 10. Note the group size present was more than double the size of the entire flock (15 birds) in 1941. On November 20, Salt Plains NWR reported that a cumulative 44 whooping cranes had been seen on the refuge or in nearby areas.

In December, sightings were made on only 9 birds in 4 separate groups in Kansas, Oklahoma, and Texas. On December 7 with Quivira NWR wetlands about 90% frozen over and 4 whooping cranes observed standing on ice, the cranes apparently resumed their migration. They had been at Quivira since November 16, having foraged extensively in corn fields off the refuge. The last bird reported in migration was a lone juvenile December 13-25 near Medford, Oklahoma located 30 miles east of Salt Plains NWR. During the fall, 7 reports were confirmed in Texas, including 4 birds in the vicinity of Mad Island Preserve located up the coast from Aransas, where one crane may have wintered.

Aransas National Wildlife Refuge, Texas – Winter of 2009-2010

The number and distribution of whooping cranes were studied on the wintering grounds at Aransas during the 2009-10 winter. The peak population equaled 242 white-plumaged birds and 22 juveniles totaling 264 cranes. This was 6 birds lower than the 270 cranes present the previous winter, but a notable increase from the 247 cranes present in the spring, 2009. Mortality between spring and fall, 2009 was estimated at 5 cranes, quite a contrast from the estimate of 34 lost during the same period the previous year. Mortality of only 1 crane was documented at Aransas during the 2009-10 winter, a welcome contrast from the 23 cranes lost at Aransas during the 2008-09 winter. Thus, only 6 cranes (2.4% of the flock of 247), died between spring 2009 and spring 2010. Again, this was a huge improvement over the 57 cranes (21.4% of the flock of 266) that died between spring 2008 and spring 2009.

The peak population of 264 consisted of 140 adults, 102 subadults, and 22 juveniles. At most, 18 cranes were color-marked, including the 2 cranes marked in December, 2009, representing 6.8% of the peak 2009-10 winter population. The estimate of 70 pairs occupying territories was the same as the previous winter. Territories and/or use areas were located on the Refuge (17), Lamar (4), San Jose (18), Matagorda (24), and Welder Flats (7). Cranes generally were found on the refuge (51), Lamar (17), San Jose Island (63), Matagorda Island (100), Welder Flats (30), Hynes Bay (2), and Oklahoma (1). Matagorda Island that held 38% of the flock has continued in recent years to hold more and more cranes.

Quality food resources were considered to be below average during the 2009-2010 winter. The food shortages were related to the extreme drought in South Texas. However, increased inflows that started in September, 2009 may have helped the fall wolfberry crop that was utilized heavily by whooping cranes and provided important sustenance for the flock. Although some blue crabs were present initially in the fall, the cranes quickly consumed the crabs and numbers dropped and stayed low. Large blue crabs in the bays were at very low levels, and commercial crabbing came to a halt. No traps were seen during census flights throughout the winter. However, blue crabs were never totally unavailable to the cranes and were a part of the diet much of the winter and early spring. Thus, the 2009-10 winter was apparently less severe in regards to food availability than the previous winter. Cranes used open bay habitats during winter low tide periods foraging on clams and/or invertebrates such as mud shrimp or bloodworms. Cranes also used uplands on both burned and unburned areas as well as flooded freshwater swales to a much greater extent than usual, with more upland use occurring on Matagorda Island than on Aransas. The abundant rains in the fall, 2009 that continued into 2010 provided numerous flooded upland swales for the cranes to utilize. These swales provided additional food resources for the cranes which apparently helped make up for the low crab population. Bay and marsh salinities were moderate throughout the winter so that cranes could drink directly from the salt marsh and did not frequent freshwater dugouts to drink. This was notably different compared to the 2008-09 winter. The potential extra food resources connected with flooded swales in the uplands, as well as the favorable low salinities, apparently helped to hold crane mortality to only 1 bird during the winter. The rains that dramatically lowered bay salinities to around 10 ppt should boost blue crab production and survival in 2010 and should provide crabs for the cranes to forage on next winter.

Sightings in the Migration Corridor – spring, 2010

Between February 24 and June 2, fifty-two sightings were confirmed by the USFWS Whooping Crane Cooperative Project Tracking Office in Grand Island, Nebraska compiled by Jeanine Lackey. Sightings were located in Texas (n=3), Oklahoma (2), Kansas (10), Nebraska (n=16), South Dakota (7), North Dakota (12) and Minnesota (2). These locations included telemetry data from the 2 radio-tagged cranes.

The spring migration got off to an early start in 2010. A solitary white-plumaged whooping crane was confirmed present at Salt Plains NWR in northern Oklahoma on February 24th and 26th. By March 5, this crane had apparently moved north to the Platte River amidst thousands of sandhill cranes, where it remained until April 3. Since we did not know of any other white-plumaged whooping cranes in the Flyway this winter, this must have been a case of a whooper on the Texas coast getting influenced by sandhill cranes and starting the journey ahead of the normal time for whooping cranes. Except for birds that had a history of separating from their parents as juveniles, I think this was the earliest migration start on record. This could have been

the crane that was last seen January 17th up the coast from Aransas near Mad Island Preserve in Matagorda County, an area of coastal salt marsh about 20 miles northeast of Port O'Connor, Texas. Port O'Connor is the northernmost point of the winter range of the Aransas flock.

Other early migration sightings were a single crane flying over Wichita Mountains NWR in Oklahoma on March 16th, and a single crane (possibly the same bird) March 18th at Quivira NWR in Kansas. Both of the radioed cranes at Aransas departed separately on March 19 and crossed nearly all of Texas to spend their first night near Wichita Falls. Both were in north Kansas on March 23rd. Other "early" departures were 2 whooping cranes seen flying with sandhills over Wilson Reservoir in Kansas on March 18, and 3 subadults at Fort Hood, Texas on March 19. Two cranes were seen near Kearney, Nebraska on March 20 where they remained through April 5. An additional subadult was seen on the Platte River on March 22 near the Wood River Bridge. In all, there were 16 confirmed sightings in the flyway by March 25. Four of those sightings were GPS locations of the radioed cranes. However, there were still a lot of whooping cranes at Aransas, probably more than 200. I can only guess why some of these cranes left Aransas a bit early. I think food resources were not very good at Aransas this winter and spring, so there were no scrumptious meals holding the cranes at their winter home. So some of them were on their way north, but the number of cranes that departed "early" seemed unusual. Prior to this spring, the general "rule" was that very few whooping cranes ever started the migration before March 25. This year just seemed to be different with the cranes leaving earlier.

A birder named Paul Lehman posted an account of his crane hat trick (observing 3 species of cranes) that he got in Nebraska approximately March 22.

"Greetings. Currently at the Omaha airport, heading home. My Platte River tour recorded three species of cranes. After we missed the Common Crane in western Nebraska all day Sunday (March 21), it was re-found March 24, so we dashed back westward and had fine looks (new for me in North America). On Monday (March 22) we had a Whooping Crane near our hotel outside Grand Island (my second in Nebraska). And of course we saw some 500,000+ Sandhill Cranes. Also had Sharp-tailed Grouse displaying to Greater Prairie-Chickens at a prairie-chicken lek. The weather changed hourly from very nice to truly awful."

The highlight of the spring migration was the presence of 76 whooping cranes in 5 separate groups on the Quivira NWR on April 1. This was not an April Fool's joke! Most of the cranes had arrived during late afternoon on March 31, spent the night, and all 76 took advantage of strong southeast winds to continue the migration the following day. Ironically, former Aransas staffer Barry Jones now works at Quivira and took part in making the record count. This is a record for the most whooping cranes at any stopover in North America. Quivira is one of four

migration areas in the U.S. designated as whooping crane Critical Habitat that receive special protection under the Endangered Species Act (ESA). Due to its location with few other marshes nearby, Quivira hosts more whooping crane stopovers than any other location in North America. When tracking radioed whooping cranes back in 1984, Aransas biologist Tom Stehn remembers the migrating cranes at a high altitude making an abrupt course change about 60 miles from Quivira when the refuge marshes first became visible, and spent the night at Quivira.

Another interesting report from the migration was the presence April 3-5 of five whooping cranes two miles from a 10-turbine wind project in South Dakota called Titan One. With the presence of a biological monitor hired during the spring specifically to watch for whooping cranes, the turbines were shut down during expected migration times, and were actually ordered shut down by a biological monitor as the birds began their migration flight. The birds never got closer than 1.2 miles from the turbines, and then seemed to veer to the side of the turbine array when they started their migration flight.

A single adult whooping crane was first confirmed in Saskatchewan on April 6th. The two cranes radioed at Aransas migrated in separate groups. Both had reached South Dakota by April 8, and were in Saskatchewan by April 18. One ended up nesting, and the radioed juvenile after being located south of the park on April 22, was located in May north of Wood Buffalo National Park and across Great Slave Lake where it summered. Reports had been received previously from this same area north of the lake, but had never been confirmed.

There was one indication of probable mortality during the spring migration, 2010. A banded bird identified as the former R-YbY (or possibly the former r-r) was sighted in Nebraska as a single on April 6. A second whooping crane was located about a mile away on two separate days before the two cranes got together. I felt this was a probable indication that the mate of the red-banded bird had died.

On May 21, a single whooping crane was sighted by a USFWS aircraft and later by biologists on the ground at Agassiz NWR in northwestern Minnesota in Marshall County. The crane was in a drawn-down pool about 6 inches deep, a management action done about once a decade to make pools more productive. An additional report was received of presumably the same crane on June 1-2 near Lake Bronson, Minnesota, also in Marshall County.

Two cranes reported May 22 near Fort Ransom in Barnes County, North Dakota turned out to have radios and were from the eastern migratory flock; cranes that had over-shot Wisconsin in their migration from the southeast.

A single crane with a bit of juvenal plumage was confirmed at Lake Saskatoon, Alberta approximately July 1. A single whooping crane was confirmed near Huron, SD about 20 miles

south of Fargo on July 6. It is known that occasional subadults summer in the Dakotas or southern Canadian prairies and don't make it all the way to Wood Buffalo National Park.

SUMMER, 2010 – WOOD BUFFALO NATIONAL PARK

In May, Lea Craig-Moore and Kathy St. Laurent of the Canadian Wildlife Service (CWS) on aerial surveys found a record 74 nests. Water levels looked excellent and hopes were high for an excellent production year. June production surveys were not carried out due to aircraft availability, personal conflicts of survey team members, and limited budgets. August surveys located 46 fledged chicks, including 5 sets of twins. This total was the second largest total ever, behind only the record 49 chicks that fledged in 2006. In August, nine whooping crane juveniles not quite old enough to fly were captured and radioed by personnel from The Crane Trust, the International Crane Foundation, and CWS.

Resource Issues that Threaten the AWBP

Freshwater Inflows

Water issues continued to receive a tremendous amount of attention in Texas and are of great concern for whooping cranes. Data show that the health and survival of the endangered whooping crane flock is directly related to freshwater inflows from the Guadalupe and San Antonio rivers. The two rivers emerge from underground springs near San Antonio and run 250 miles southeast where they join before entering San Antonio Bay and flow into whooping crane critical habitat north of Aransas. Inflows carry sediments and nutrients which increase bay productivity and boost crab populations. When inflows are high, blue crabs, the primary food of the whooping crane, are usually abundant. Inflows also maintain salinity levels below 23 parts per thousand needed for drinking water by whooping cranes.

Unfortunately, inflows are reduced over historic levels and may already be insufficient in times of drought. The Texas Water Development Board projects in 40 years an 8% reduction in blue crab populations due to reduced inflows as the human population grows and takes more water from the Guadalupe and San Antonio Rivers. Some climate change models predict inflows will be reduced further by about 20% if temperatures increase by 2 degrees centigrade and precipitation is reduced 5%.

Without implementation of effective legislation, the bays and whooping cranes will suffer from insufficient inflows, particularly in drought years. An analysis by Dr. Norman Johns of the National Wildlife Federation found that if a repeat of the 1950's worst year drought occurs and current water rights are fully utilized, that because of all the water permits issued since that time, there would only be 28% of river water reaching the bays compared to the drastic low flows that

occurred during the 1950s. Recent research based on tree rings has shown several historic droughts even worse than in the 1950s.

Highlights of current water issues are briefly described below.

Environmental Flows Allocation Process

The Environmental Flows Allocation Process, created by Texas Senate Bill 3 for establishing conservation flows for Texas rivers, got started for the watershed that impacts the whooping crane winter range. Stakeholder groups, appointed in the fall of 2009, formed committees and held regular meetings to study different aspects of the issue. Federal entities cannot be voting stakeholders, but can be scientific advisors to the process.

Edwards Aquifer Recovery Implementation Plan (EARIP)

In the 2007 Texas Water Act, the annual pumping cap from the Edwards Aquifer located under San Antonio and surrounding counties was raised from 400,000 acre-feet to 572,000 acre-feet. As part of this legislation, lawmakers required a process be completed called the Edwards Aquifer Recovery Implementation Program (EARIP) for determining the sustainable levels of pumping from the aquifer. RIPS are voluntary, multi-stakeholder initiatives developed by USFWS that seek to balance water use and development with the recovery of federally listed species. Excessive water withdrawals from the aquifer threaten the habitat of 8 endangered species including cave invertebrates, fish and wild rice that suffer loss of habitat when spring flows are reduced and were at the heart of a 1991 federal lawsuit that forced the region to start moving toward controlling Edwards Aquifer use. About 70 stakeholders, scientists and other interests held numerous meetings in 2010 to work on the EARIP. Stakeholders included water utilities, cities, groundwater conservation districts, agricultural users, industrial users, environmental organizations, individuals, river authorities, downstream and coastal communities, and state and federal agencies. The EARIP will try, based on sound science, to determine the sustainable levels of pumping from the aquifer and formulate drought management strategies. Successful completion of the plan will help ensure a stable water supply, implement measures that will contribute to the recovery of endangered species, and minimize the likelihood of continued federal court litigation regarding the use of the Edwards Aquifer.

The Edwards Aquifer currently serves 1.7 million people in South Central Texas, providing San Antonio with 95% of the city's water. The population over the aquifer is expected to triple in 50 years, increasing the demand for water. Although the Edwards Aquifer is a long way from the coast, spring flow can be a major component up to 80% of river inflows into whooping crane critical habitat in times of drought. Sufficient inflows are essential to support abundant blue crab populations, the primary food of whooping cranes during winter. However, the EARIP has not yet determined if the whooping crane will be included in the plan. Regardless, the HCP must be

reviewed under Section 7 of the Endangered Species Act before USFWS can approve it. The EARIP hired consultant Roy Frye of Hicks and Company to assemble all relevant literature on the relationship between cranes, inflows, and blue crabs who submitted a report in March, 2010. His report, in my opinion, lists numerous scientific works supporting these relationships, with only the San Antonio - Guadalupe Estuary Study in dissension.

Water Development Projects

While groups worked on environmental flows and the EARIP, water developers continued trying to get more water. A proposed project called the Lower Guadalupe Water Supply Project (LGWSP) would construct off-channel reservoirs to impound water near the mouth of the Guadalupe River and pump it back to the growing population in a 10-county area in the upper end of the Texas hill country watershed. New projects proposed by the Guadalupe-Blanco River Authority included application for a new junior priority water right in Calhoun County for up to 189,484 acre-feet, off-channel storage of up to 200,000 acre feet in the Lower Basin at a site or sites yet to be determined, and a desalination project.

Excelon Nuclear Power Plant and The Aransas Project (TAP)

In response to a proposal to build two nuclear reactors near Victoria, Texas, a multi-party group was formed called The Aransas Project (TAP). Numerous conservation groups (International Crane Foundation, Whooping Crane Conservation Association, American Bird Conservancy, three Texas chapters of the Audubon Society, Texas Conservation Alliance and Environment Texas) joined TAP, as did Aransas County and the town of Rockport. TAP was concerned that the 75,000 acre-feet of water needed to cool the reactors, more than 7 times the amount of water used annually by the city of Victoria, would cause a water shortage that would forever change the Guadalupe River. After a 60-day notice of intent to sue, The Aransas Project filed the law suit in Federal Court in March, 2010 against the Texas Council on Environmental Quality (TCEQ). TAP claimed that mismanagement of water by the TCEQ resulted in the “take” of 23 whooping cranes during the 2008-09 winter at Aransas, a violation of Section 9 of the ESA. They further stated that the mandated process to provide environmental flows cannot work because the state specifically exempted existing water permits from the process, and many claim the river is already over appropriated.

The immediate goals of TAP are to seek to correct the mismanagement of the Guadalupe River Basin, especially its impact that reduces inflows to the bays and estuaries. TAP is asking that the TCEQ write and implement a Habitat Conservation Plan that:

- requires a full accounting of all water use throughout the basin now and in the future;
- requires an analysis of existing water commitments and pending water permits to develop a

- plan to rollback the use of existing water rights during low flow conditions; and
- ensures inflows to the San Antonio Bay system, especially during low flow conditions.

Following the filing, the TCEQ declined to comment on specifics of the lawsuit. But agency spokesman Terry Clawson said it's far from certain how low freshwater inflows caused by drought affected the cranes. The agency has worked over the years to preserve the habitat, Clawson said, and is reviewing studies that "indicate that there are a number of factors that affect the dominant food resources of the whooping crane, including freshwater inflows, salinity, tides and temperature." Critics of the lawsuit point out that the State Legislature in Senate Bill 3 has already started a process to provide conservation flows for the bays. They also point out that Texas water law has already granted numerous permits that cannot be changed.

Numerous groups have petitioned the court to be a party to the law suit, and most have been denied. However, those rulings have been appealed and may delay the trial originally scheduled to start in March, 2011. In the meantime, the USFWS is deciding whether there is merit in a petition to list as endangered or threatened 4 species of mussels found in the Guadalupe/San Antonio watershed.

San Antonio Bay Partnership

In an effort to better protect the resources of San Antonio Bay, stakeholders at an initial meeting in January, 2010 agreed to establish a non-regulatory program to manage the estuary. Representatives from state and federal government agencies, municipalities, river authorities, chemical plants, environmental special interest groups and private citizens made up those who attended. Initiatives the program could push forward include preventing habitat loss and promoting marsh restoration projects. Several additional meetings have moved the process forward. The Coastal Bend Bays and Estuaries Program (CBBEP), a similar program based in Corpus Christi, put water consultant James Dodson in charge of researching the feasibility of establishing such a program for San Antonio Bay. The program would be modeled after the CBBEP that is funded through the Environmental Protection Agency's National Estuary Program. However, that source of funding would not be available.

Wind Energy Development

The development of wind farms is occurring at a rapid pace in the Central Flyway with many of the best wind resources located in the whooping crane migration corridor. Nearly 10,000 megawatts of wind-generating capacity came on-line in the U.S. in 2009, and the five-year annual growth rate for the industry has averaged 39 percent. The Department of the Interior has made the development of renewable energy a priority.

The impact of wind turbines to whooping cranes is unknown but could adversely impact the species. Wind farms may have the potential to kill whooping cranes by direct strike with the turbines themselves, as does the construction of power lines. If whooping cranes completely avoid wind farms, wind energy development could affect use of migration stopover habitat potentially used by the cranes. The National Academy of Science Report in 2004 on Platte River endangered species stated unequivocally the threat to whooping cranes if migration habitat is lost.

USFWS biologists met in Rockport in mid-January, 2010 to discuss what migration activities might rise to the level of “harm” under the Endangered Species Act (ESA). Issues included cranes having to fly further to find places to land due to loss of stopover habitat, and placement of new power lines. In September, 2010 USFWS Regions 2 and 6 funded a whooping crane energetics study by Dr. Aaron Pearse of the USGS to try to quantify impacts to whooping cranes if less stopover habitat is available in their migration corridor as wind energy is developed.

Twelve of the largest wind development companies joined together to work on whooping crane and lesser prairie chicken issues throughout the range of both species in the U.S. With the support of the State of Oklahoma, the industry group applied for and received a total of \$1,080,990 to develop a landscape level, multi-species Habitat Conservation Plan (HCP). Impacts need to be considered range-wide for both species which is exactly what the HCP will do. Work continued throughout 2010 with monthly conference calls and quarterly meetings. The industry plans to present a draft plan to USFWS in the first half of 2011.

Power Lines

Collision with power lines is the number one known source of mortality for fledged whooping cranes. Communications continued in 2010 between the Service and Avian Power Line Interaction Committee (APLIC) on measures that might be implemented to reduce the threat that continued power line expansion in the migration corridor poses for whooping cranes. A meeting was held in Denver in September, 2010 to see if the utility industry was interested in writing an HCP for utility construction and operations throughout the whooping crane corridor. That process may move forward.

Protocols for marking lines may be a major component of an HCP. USFWS-Region 6 adopted a set of guidelines for their Ecological Services offices about marking all new power lines that are located within 1 mile of wetlands in the whooping crane migration corridor. In addition, since whooping cranes can still collide with marked lines, an equal distance of existing lines need to be marked as well so that there is no net increase in the threat of collision. Emphasis would be placed on marking lines close to the center 80 miles of the migration corridor, as well as near known whooping crane stopover locations. In January, 2010 one wind energy company (Allete,

Inc.) agreed to implement these guidelines for a project in North Dakota and are marking 22 miles of new transmission line and an equal amount of existing power lines within the 75% whooping crane migration corridor.

A local power line issue at Aransas arose as a family of whooping cranes continued to use a game feeder located adjacent to Highway 35 just north of Holiday Beach on private property. After twice observing the cranes low in flight coming in to that feeder, I requested in March 2010 that the American Electric Power utility mark the distribution lines on both sides of Highway 35 close to the feeder. This project is expected to be completed in October, 2010.

Land Development

Real estate development pressures that have increased rapidly in Aransas and Calhoun counties make the need for habitat protection measures paramount for the recovery of the whooping crane. This growth of the Coastal Bend is illustrated by the fact that the population of Rockport has grown more than 38% since 1990. The population of Seadrift is expected to double in the next decade. A study by Stehn and Prieto (2010) calculated that for the species to reach the downlisting target of 1,000 cranes, the flock would have to expand into all available salt marsh between the Nueces and Colorado Rivers (Corpus Christi to Brazoria, Texas). In addition to protecting salt marsh, upland buffers are needed along all salt marsh areas to provide the cranes necessary upland foraging habitat, fresh water to drink, and a buffer from disturbance. Buffers will also allow the marsh to move inland as sea level rises. Without protecting these additional lands, whooping cranes will not have enough winter habitat to support flock expansion and recovery goals may never be reached.

Although the economic recession slowed down land development projects in the crane area, all was not quiet. Developments that have applied for permits or are in the process of applying included The Boardwalk and Reserve at St. Charles, Falcon Point Ranch, and the Shell Point Ranch. Whooping cranes have been sighted using all of these properties. The USFWS is recommending formal consultation under the ESA for all of these actions, and is continuing to assess impacts of all these proposed projects. Developers pulled away from the Big Tree Ranch, and Texas Parks and Wildlife Department and an adjacent landowner are trying to get grants to purchase the property as a conservation area. The property is located between the historic Big Tree, the largest live oak tree in Texas, and the Lamar Unit of the Aransas NWR.

Land Protection

The Texas Nature Conservancy (TNC) in partnership with other agencies continued work to protect key areas with conservation easements placed on buffer areas as a means for people and wildlife to coexist. However, no large pot of funds has been set aside for this urgent need. Instead, TNC has to apply for individual grants when a piece of property becomes available.

This slows the acquisition process and can discourage landowners not willing to wait several years before a transaction can be completed. However, working closely with foundations, corporations, and other NGO's, TNC did raise \$207,000 in private funding to help protect whooping crane habitat that will compliment future federal grants.

A new federal land protection program by the National Resources Conservation Service (NRCS) is able to offer up to approximately \$1,700 an acre for conservation easements, a value normally greater than the appraised value. The NRCS is now recognizing salt marsh as habitat important for waterfowl, so can use funding to protect coastal marshes. Locally, the whooping crane is an emphasized species. Two of the largest landowners in the crane range at Welder Flats were approached by NRCS about possible conservation easements.

In 2009, the Coastal Bend Bays and Estuaries Program (CBBEP) moved to protect 168 acres of salt marsh just south of Holiday Beach that is occupied by whooping cranes. The Texas Parks and Wildlife Department (TPWD) working with CBBEP applied for and received in April, 2010 a Section 6 grant for \$260,250 to purchase the tract.

Marsh Clean-up Day

In both 2009 and 2010, the Mission-Aransas National Estuarine Research Reserve (NERR) partnered with the Aransas NWR and Rockport Birding and Kayak Adventures to sponsor a clean-up of whooping crane habitat along the Aransas NWR shoreline on one day in late September. Volunteers from Port Aransas, Rockport, Corpus Christi, and other near-by towns came out to lend a hand. The Mission-Aransas NERR coordinated the cleanup, staff from Aransas NWR and Texas A & M University-Corpus Christi hauled away the trash, and the Texas General Land Office's Adopt-A-Beach Cleanup program supplied trash bags and gloves. Members of the Texas Master Naturalists, the Texas Outdoors Woman Network, and staff from the University of Texas Marine Science Institute made up of a large portion of the volunteers. The volunteers trudged through mud, vegetation, and walls of mosquitoes to pick up trash along a 3.5-mile stretch of shoreline. They collected and removed approximately 2,100 pounds of bagged trash as well as discarded refrigerators, television sets, tires and building materials. Captain Tommy Moore volunteered to transport clean-up crews to, within, and from Aransas NWR on his tour boat. Thanks to the volunteers and sponsors, the whooping cranes will return to cleaner shores when they arrive in the Texas Coastal Bend.

Oil and Gas Activities / Gulf Oil Spill

Chaparral Energy in 2010 applied for and received a permit to work on a new gas well in Mesquite Bay. Dredge material excavated to reach the drill site was used to create a new marsh. The new marsh placed just off-shore of Roddy Island should produce potential habitat for

whooping cranes and other wetland species as well as stop erosion along the shoreline of Roddy Island. On two different field trips to the site in February, 2010, two whooping cranes were observed feeding on the Mitchell Energy created marsh, a site very similar to what is being planned to be constructed by Chaparral.

The April, 2010 British Petroleum Deepwater Horizon spill in the Gulf of Mexico off the Louisiana coast created a large response by USFWS and other resource agencies. At Aransas, 172 oiled brown pelicans rescued and cleaned in Louisiana were released at the refuge. Being the first birds released in Texas from the Gulf spill, it was quite a media event. The refuge was also heavily involved in coastal surveys for Natural Resource Damage Assessment purposes, as well as surveys looking for dead birds. Models had predicted less than a one per cent chance of oily waters reaching the central Texas coast, and the predictions held true. It appears that the whooping crane flock at Aransas dodged a bullet. However, tar balls did wash up on the Texas Mid-Coast NWR north of Aransas.

Black Mangrove

Whereas 15 years ago, only a few individual black mangrove (*Avicennia germinans*) were present at Aransas, mangrove has since then invaded portions of the crane range. Thousands of black mangrove shrubs are present, as well as a few red mangrove. Mangrove can be found on most of Matagorda Island, along the GIWW on Aransas NWR, and on the islands on either side of Shoalwater Bay at Welder Flats. To me, it looks like hundreds if not thousands of acres have already been impacted.

The mangrove is spread to new areas by floating seeds. Densities that are now mostly individual plants are expected to become solid monocultures that will crowd out the existing plants such as Carolina wolfberry that are so important for the cranes. It is doubtful the cranes will tolerate the presence of mangrove as it gets taller since it would greatly restrict visibility and could greatly increase the risk of predation from bobcats. Mangrove could theoretically be controlled with chemicals, but what a massive undertaking. Also, mangrove has always been a favored plant for wildlife habitat especially by fisheries biologists, so getting permits for mangrove control could be a difficult issue.

Mangrove in the past has been knocked back by periodic severe winter freezes which limit its range. Without having any severe freezes on the Texas coast for the past 15+ years, mangrove has gotten a foothold north of its traditional range located just south of the crane range. It may not be coincidental that the crane range used to start just north of the mangrove.

Winter freezes will control mangrove, but they have to be severe. I remember in 1983 when the bay edges froze and the manager's children went ice-skating on San Antonio Bay, with temperatures below 20 degrees Fahrenheit for multiple days. As a rule of thumb, freezing

temperatures must be present 5 consecutive days to kill mangrove. We have not had any weather like that in over 2 decades and average winter water temperatures have risen about 3 degrees coast-wide over the past 30 years. On the night of December 4, 2009, temperatures reached 27 degrees Fahrenheit on Matagorda Island and 4 nights later got down to 22 degrees in Corpus Christi as major cold fronts swept across the coast. There was some top-kill of mangrove, but most bushes I looked had wilted but were only partially killed back and were able to recover.

I believe the northward spread of mangrove is one of the most worrisome issues facing the cranes. Although its eventually distribution in the crane range may be limited by hydrological conditions, it currently is found over about one third the width of the salt marsh from the outer bay edges inwards towards the interior marshes. The density of the mangrove seems to be increasing exponentially. No one has formulated any plans on what to do about this situation.



Dark green mangrove bushes filling in the salt marsh in the whooping crane winter range.
USFWS

Loss of Migration Habitat

According to the Wildlife Management Institute, climate change, conversion of native prairie to cropland, and reduction of acreage enrolled in the USDA's Conservation Reserve Program (CRP) appear to be substantially impacting the numbers of wetland- and grassland-dependent wildlife in the country's prairie pothole region.

Scientists published an analysis of impacts of climate change on hydrology and vegetation in the prairie potholes in *Bioscience* Vol. 60 (2). They predict that, as climate change advances, the region will not be able to support historical levels of waterfowl and other wetland-dependent species due to significantly drier conditions, and wetlands in the region will be less full and hold water for shorter periods.

These projections come on the heels of continuing losses of native prairie and CRP grassland habitat in the region. In addition to nature and legislative mandates, economics and advances in technology are helping to advance losses of wetland and grassland habitats in the region. The ethanol boom has led to more demand for corn for conversion to biofuel, which has led to more corn being planted at the expense of CRP lands. Genetically modified crop varieties now can be used to produce economically viable yields on lands that formerly were unsuitable for crop production. The merging of climate change, reduced acreage in CRP and the increase in biofuel production at the expense of uncultivated landscape could negatively impact whooping cranes.

Publicity and Planning

National Geographic magazine featured photos of the AWBP taken by Klaus Nigge in the June issue, 2010. A book entitled *Whooping Crane: Images from the Wild* with Mr. Nigge's photos and text by Krysta Schlyer was published in August, 2010. Mr. Nigge had obtained special permission from Wood Buffalo National Park to set up a blind close to a crane nest and got very good shots, including that of a raven carrying off an egg, having pecked into the egg and grabbed the un-hatched chick by one leg. In November, 2009 a book by Dr. Jane Goodall was published entitled *Hope for Animals and Their World, How Endangered Species Are Being Rescued from the Brink* included a short section on the whooping crane that features many different species around the planet, including the whooping crane.

Planning documents on the whooping crane worked on in the past year by USFWS include a Spotlight Species Action Plan, a Five-Year Status Review, and a Conservation Framework. The Nature Conservancy continued efforts to complete a Conservation Action Plan.

PERSONELL

A 2009 USFWS Recovery Champion award was given to Dr. George Archibald and staff of the International Crane Foundation for their long-term contribution to recovering the whooping crane. This award recognizes USFWS employees and their partners for contributions to the recovery of threatened and endangered species in the United States.

Retired Canadian Whooping Crane Coordinator Brian Johns received the Jerome Pratt award from the Whooping Crane Conservation Association for his many excellent years helping whooping cranes. Congratulations, Brian!

Long-time Canadian whooping crane biologist Ernie Kuyt passed away suddenly in May, 2010 at the age of 81. His accomplishments were many and he is missed by all who knew him. He had a remarkable career in wildlife conservation of which 25 years were dedicated to working with whooping cranes, culminating in his being awarded the Order of Canada. Ernie pioneered the pickup of eggs from Wood Buffalo that were used to start the captive flocks which safeguard the survival and genetic material of the whooping crane. He also for years carried out the banding of flightless whooping crane chicks, including having his son Jonathan as one of the lead crane capturers. He was an excellent field person, having started his career in the Arctic working on wolves before becoming a crane biologist. He learned a tremendous amount about whooping crane migration as he spent several migrations in the 1980s in a small aircraft observing radioed cranes in actual flight migrating between Canada and the U.S.

Mr. Gary "Pete" Meggers has retired. For years, he served as the assistant manager at the Quivira NWR in Kansas, and submitted numerous reports of whooping cranes that stopped at the refuge. My thanks go to Pete for his many contributions.

The Crane Trust located on the Platte River in Nebraska (former Platte River Whooping Crane Habitat Maintenance Trust) has named Mr. Charles Cooper as their new President. Former President Dr. Felipe Chavez-Ramirez is now The Crane Trust's Director of Science.

Dr. Rich Beilfuss is the new President and CEO of the International Crane Foundation (ICF) in Baraboo, Wisconsin. Dr. Beilfuss is a wetland ecologist and licensed hydrologist. He has a long history with ICF and extensive experience in conservation management. Rich first joined ICF in 1988 as a restoration intern, served for 13 years as ICF's Director of Africa Programs, and has played an instrumental role in ICF's successful conservation actions in more than 12 countries. Rich took the reins from Mr. Jim Hook who retired in March, 2010 after directing ICF since 2006. Jim accomplished much, including improving financial management and led ICF through the challenges related to the recent economic downturn. He also worked to enhance the physical infrastructure of ICF's headquarters including the development and construction of

Spirit of Africa, the first new live crane exhibit at ICF in 14 years. We wish Jim all the best and thank him for his contributions.

FLORIDA

Florida crane biologists monitoring the remaining 25 nonmigratory whooping cranes in Florida focused on nesting biology. In addition to collecting data on incubation behavior with video surveillance equipment, personnel deployed artificial data-logging eggs into nests of 5 whooping crane pairs and 1 Florida sandhill crane pair in a pilot study of incubation temperature. This is the first time this has ever been done on any crane species in the wild. One of their most important findings was that there were lapses in incubation by whooping crane pairs at night. That had not been documented previously because former video surveillance equipment had not been suitable for recording in darkness. Lapses in incubation could affect hatchability of eggs since large drops in egg temperature were recorded. Next year, deployment at nests of cameras with night-vision may allow identification of the reasons for these incubation lapses. A larger sample size of experimental nests of both whooping and sandhill cranes will accommodate comparisons of incubation behavior and temperature between successful and unsuccessful pairs.

Welcome rainfall added water to nesting marshes in the spring, 2010 to aid production. Eight of 9 of the remaining Florida nonmigratory pairs nested. Three pairs hatched 4 chicks, and 1 chick survived to fledge.

EASTERN MIGRATORY POPULATION (EMP)

In central Wisconsin, 12 pairs nested and incubated eggs. Two Direct Autumn Release females nested for the first time in 2010. All of the nests initiated the first week in April were unsuccessful, with most pairs deserting the nests in a synchronous pattern consistent with presence of black flies. However, 3 late nests and 3 re-nests were incubated full-term. Two infertile eggs at a nest in Wood County were replaced with one viable egg from captivity. In all, 7 chicks hatched from 5 nests. By the end of summer, two chicks had fledged; one on Necedah NWR and the one from Wood County where the egg-swap had occurred. The eastern migratory population (EMP) is estimated at 119 birds, although several of those are listed as “long-term missing”. Numbers include the 2 fledged chicks in the wild and 23 juveniles from captivity in the 2010 reintroduction program. Birds being trained for release in 2010 include 12 chicks for the ultralight program and 11 for DAR.

Releases into the EMP at Necedah NWR in central Wisconsin were carried out in 2009. Operation Migration (OM) led 20 chicks south, and the International Crane Foundation’s released 9 birds using the direct autumn release (DAR) technique that allows the young cranes to

follow other cranes south. One additional DAR bird developed a leg injury and was placed in captivity at Sylvan Heights Waterfowl Park in Scotland Neck, North Carolina.

Operation Migration persevered through several setbacks, including numerous weather delays that stretched the 2009 migration out over 89 days. Other issues that OM dealt with was a break-in and vandalism of their aircraft hangar at Necedah, and an engine failure and emergency landing of their Cessna 182 spotter aircraft that flipped over in a field in Illinois. The plane landed on its wheels, but the nose dipped down upon landing in a soft, freshly tilled soil and dug in, causing the plane to flip on to its top. The couple Donald and Paula Lounsbury of Ontario, Canada walked away unscathed.

One EMP crane was shot and killed in November, 2009 near Cayuga, Indiana. This was an act of vandalism not connected with waterfowl hunting. After months of investigation, the perpetrator was caught and legal proceedings initiated.

In addition to the regular February and September meetings of the Whooping Crane Eastern Partnership (WCEP), a special meeting was held in April, 2010 to re-structure the partnership. This effort resulted from a review team of noted conservation biologists that had analyzed the reintroduction and provided constructive criticism. In the new structure, more decision making will be delegated to field teams. A smaller Guidance Team will do project planning and make ultimate decisions as needed.

LOUISIANA

The Proposed Rule entitled *Establishment of a Nonessential Experimental Population of Endangered Whooping Cranes in Southwestern Louisiana* was published in the *Federal Register* on August 19, 2010. A tremendous amount of work goes into drafting a proposed rule, with much of the credit going to USFWS biologists Billy Brooks and Deborah Fuller and other folks in Region 4 and Washington, D.C. Two public hearings were held in Gueydan and Baton Rouge, Louisiana in September, 2010 and information was provided to the Atlantic, Central and Mississippi Flyway Councils. The Louisiana Department of Fish and Wildlife (LDWF) enthusiastically embraced all aspects of the project and did extensive planning and public relations work to explain the project to landowners and other interested groups.

Eleven chicks are currently being raised at the Patuxent Wildlife Research Center for possible release at White Lake, Louisiana in February, 2011. The 5 U.S. members of the Whooping Crane Recovery Team met at White Lake at the end of April, 2010 to further assess the project, coordinate fully with the LDWF, and look at additional habitat and approve a site for a release pen.

CAPTIVE FLOCKS

The captive flocks had a very good production season in 2010. Twenty-four chicks entered the migratory reintroduction program in Wisconsin, and 11 chicks are being formed into a cohort for a possible nonmigratory release in Louisiana in February, 2011. Three chicks of high genetic value were held back for the captive flocks.

The Audubon Species Survival Center in New Orleans received funding from Congress of \$500,000 to build 2 new whooping crane “double” pens. This will expand the overall capacity of the captive whooping crane flock that currently holds 34 breeding pairs.

Extremely heavy snow storms in February, 2010 damaged pens at the Patuxent Wildlife Research Center, but all the whooping cranes were safe and only one sandhill crane escaped. The captive owls and kestrels at Patuxent weren't so lucky with more pen damage and escapees. Patuxent received American Recovery and Reinvestment Act funds for construction projects that will construct a few new buildings associated with whooping crane recovery. Some cranes had to be moved around as old buildings were demolished.

WHOOPING CRANE NUMBERS IN NORTH AMERICA September 30, 2010

Wild Populations

	Adult	Young ^C	Total	Adult Pairs
Aransas/Wood Buffalo	242	21 ^B	263 ^A	78
Rocky Mountains	0	0	0	0
Florida non-migratory	24	1	25	9
Wisconsin/Florida migratory	94	25	119	12
Subtotal in the Wild	360	47	407	99

^A The Aransas-Wood Buffalo population is currently estimated at 263 birds. Young shown are from 2009 for the AWBP. In 2010, a record 74 pairs nested and fledged 46 chicks. These young are not added to the population until they reach Aransas and are not shown in the table.

^B In 2009, 52 chicks hatched in Canada but only 22 fledged. All 22 completed the migration, but one died at Aransas in January, 2010.

^C Two chicks hatched from wild nests in Wisconsin and 1 in Florida in 2010 are currently surviving. The other chicks shown are captive juveniles in reintroduction programs.

Captive Populations

	Adult	Young ^A	Total	Breeding Pairs
Patuxent WRC, Maryland	68	14 ^B	82	15
International Crane Foundation, WI	31	0	31	11
Devonian Wildl. Cons.Cent./Calgary	22	1	23	6
Species Survival Center, Louisiana	11	0	11	1
Calgary Zoo, Alberta	2	0	2	0
New Orleans Zoo, Louisiana	2	0	2	0
San Antonio Zoo, Texas	7	0	7	1
Homosassa Springs Wildl State Park	2	0	2	0
Lowry Park Zoo, Tampa, Florida	2	0	2	0
Jacksonville Zoo, Florida	2	0	2	0
Milwaukee County Zoo, Wisconsin	2	0	2	0
Sylvan Heights Waterfowl Park, NC	1	0	1	0
Subtotal in Captivity	152	15	167	34

^A Chicks raised in 2010 for the eastern migratory population are listed as wild birds.

^B Eleven chicks may be released in Louisiana in February, 2011.

TOTALS (Wild + Captive) 407 + 167 = 574