

WHOOPING CRANE RECOVERY ACTIVITIES

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HIGHLIGHTS

A record 194 whooping cranes arrived at Aransas in fall, 2003. The total included 25 juveniles arriving safely at Aransas from the 28 that had fledged. This excellent production in Wood Buffalo allowed the population to increase by 9 birds over last winter.

Captive breeding facilities had an excellent production season in 2003 and fledged 41 chicks. Chicks were provided for the nonmigratory flock in Florida (16), the ultralight project (17), five held back for genetic purposes as future breeders, one held back as a display bird, and two held back with health problems.

Sixteen captive whooping crane juveniles were released in central Florida with a high rate of survival. Sixteen more juveniles successfully completed flight training and followed ultralight aircraft to Florida. The migration was beset by bad weather with many delays, but the migration team persevered and completed the 1,191-mile migration in 54 days.

Whooping crane numbers at the end of February, 2004, both captive (119) and wild (312), totaled 431.

ARANSAS – WOOD BUFFALO FLOCK

SUMMER, 2003

Two subadult whooping cranes made history by summering in British Columbia, just west of Jasper National Park along the Fraser River by Prince George. The two cranes were 560 miles southwest of the nesting area and 522 miles west of the western edge of the usual migration corridor. The spread of birds summering in Canada now spans 1075 miles east to west (southcentral Manitoba in 1999 to east central B.C. in 2003). Given this instance of straying from a migration corridor, it should not have been so surprising that three Wisconsin whooping cranes continued their migration and summered in South Dakota.

FALL MIGRATION, 2003

The fall migration was the 57^d migration monitored since tracking began in the fall of 1975. It is a cooperative effort by private organizations, state and federal conservation agencies, and CWS. U.S. records are compiled by Wally Jobman of USFWS-ES in Grand Island, Nebraska, who provided the following information (Jobman 2004, Cooperative Whooping Crane Tracking Project (August 2003-January 2004).

“The first dates for confirmed observations of migrating whooping cranes were August 26 in Canada and October 1 in the U. S. The latest sighting date was October 29th in Canada and December 19th in the U.S. Sightings were reported from Saskatchewan (24), Montana (1), North Dakota (7), South Dakota (4), Nebraska (6), Kansas (13), Oklahoma (14) and Texas (14). Weather during September and October, 2003, was unseasonably mild and dry in the northern Great Plains. The first major storm system of the fall, which moved through Nebraska on October 30, brought colder weather and snow to Saskatchewan and the Dakotas. No whooper sightings were reported north of Kansas after November 5, an indication that the storm system had pushed most cranes into Kansas, Oklahoma, and Texas. This storm system stalled in northern Texas and did not reach the Texas coast until November 6-7. As a result, 41 of the 59 fall sightings confirmed in the U.S. were from Kansas, Oklahoma, and Texas. Approximately 24 whooping cranes were sighted at Salt Plains NWR in Oklahoma. Five color-marked cranes were reported out of 25 banded cranes.

The 14 sightings in Texas was unusually high, a state through which whooping cranes usually migrate rapidly. A pair with two chicks was first observed at Aransas on October 25, only 8 days after leaving Saskatchewan. A lone juvenile whooping crane, confirmed in Saskatchewan in early October, was reported in Young County, Texas on November 2 and may have wintered in an unknown location with sandhill cranes. One crane was shot by a hunter in Texas on November 14. The first 2 whooping cranes arrived at Aransas on October 18th. About 86 % of all arrivals (i.e. 167 birds) occurred between October 23 and November 19, very similar to the previous fall.”

An adult whooping crane was shot and killed November 14th south of Dallas, Texas. A suspect was apprehended by a TPWD game warden and the case turned over to USFWS.

Four whooping cranes had been present for several days feeding in a cornfield during the day and presumably roosting at night on Lake Bardwell. One crane was shot about 15 minutes before sunset apparently as it flew to roost. Locals heard shots coming from Waxahachie Creek, a part of Lake Bardwell near Ennis, Texas. With waterfowl season closed, the local warden was called. TPWD Warden James Powell responded and apprehended the hunter with 3 ducks plus 1 whooping crane hidden in a bag tucked under the bow of his boat. The hunter indicated he had shot a white crane. The necropsy showed bird to be an adult female with about 20 shot pellets in her. The 3 remaining cranes resumed migration 2 days after the shooting incident. In early February, the suspect pleaded guilty. Sentencing is not expected until at least April.

Any shooting of a whooping crane is an unfortunate situation. In this case, the shooting was done by a hunter during a closed waterfowl season and closed sandhill crane season and without the required reservoir hunting permit from the Corps of Engineers. This was the 7th known whooping crane to be shot in North America dating back to 1989, an average of nearly one loss every other year. Shootings have been located in Texas (3), Florida (3), and Canada (1). Only three of the shootings were connected with hunting seasons. Efforts need to be continued to implement the Federal-State contingency plan, and to inform hunters about whooping cranes, including annual press releases, brochures, web pages, hunter education classes, and law enforcement presence. This was discussed at the Central Flyway Technical meetings held in Texas on March 1, 2004.

WINTER, 2003-2004

The Aransas-Wood Buffalo population in 2003 made a significant increase of 9 cranes above the peak count of 185 in the 2002-03 winter. This was the second straight year where the population increased by exactly nine cranes. The peak population at Aransas during the winter of 2003-04 was estimated at 194, breaking the previous all-time high of 188 set in the 1999-2000 winter. Twenty-five juveniles arrived at Aransas in the fall. This included one set of twins that made the migration from Saskatchewan to Aransas in 8 days. Adult mortality between spring and fall, 2003 was above average and equaled 15 birds ($184 + 25 - 194 = 15$).

In the fall, a whooping crane juvenile separated from its parents was confirmed in Saskatchewan with sandhills. This juvenile may have been seen in North Texas in early November, but no subsequent reports were ever received. In addition to the 194 cranes, a report of 3 more cranes was made about 100 miles north of Aransas in mid-November. However, this report never materialized into 3 more cranes ever being counted at Aransas.

Conditions were excellent in the fall when the whooping cranes arrived. Summer and fall rains kept salinities moderate, the refuge acorn crop was abundant, and wolfberries and blue crabs sustained the cranes through the end of 2003. Fall rains really benefited the bays, with 29 inches recorded at the refuge in the last 4 months of 2003. January and February were tougher months for the cranes. The wolfberry crop was over, and blue crabs declined to very low levels by the end of February. Only 2 blue crabs were found

during an hour of walking the marsh on February 9th. An influx of blue crabs is needed to provide the cranes needed energy reserves for the migration and breeding season.

One whooping crane juvenile may have died during the 2003-04 winter. After being seen two times on their territory in the fall and then moving about 8 miles north the following week, the chick was never seen again. I also lost track of the unbanded adult pair that apparently did not return to their territory. It was hoped the family had left the wintering area intact, but it is much more likely the chick died and is the only listed mortality of the 2003-04 winter.

Hurricane Claudette that hit whooping crane critical habitat in mid-July, 2003 played a part in re-opening Cedar Bayou, the natural pass between the Texas bay system and the Gulf of Mexico in the whooping crane area. Tidal action subsequent to the hurricane re-opened Cedar Bayou by September 23 and it has remained open throughout the fall and winter. This opening into the Gulf is extremely important to allow many marine organisms, including the blue crab, to travel between the bays and the Gulf to complete their life cycles.

USFWS and other agencies were sued by Friends of Texas Coastal Passes and the Recreational Fishing Alliance over the placement of dredge material at the mouth of Cedar Bayou when the natural pass had silted shut and was last dredged in 1995. The law suit contends the material was illegally placed and damages whooping crane marshes on San Jose Island. This matter is been heard by a Federal judge in Corpus Christi.

A 3-D geophysical seismic exploration was completed on November 13th just prior to the arrival of a significant number of cranes. The project involved exploding 5,177 dynamite charges 60+ feet underground located over 21,537 acres on the south end of Matagorda Island and surrounding bays. Very strict operating procedures were put into place with satisfactory protection of the environment achieved. Most of the marsh access was done by airboat only with minimal use of tracked vehicles in dry marsh.

Commercial crabbing continues as a major activity in whooping crane critical habitat. A total of 1,136 crab traps were noted in or near crane areas on an aerial census at the end of October. Texas Parks and Wildlife Department once again passed a 10-day closure in February of commercial crabbing. A coast-wide volunteer effort collected 3,571 abandoned traps. An estimated 15,500 traps have been gathered since the program began three years ago. A considerable number of abandoned crab traps still remained on Matagorda Island due to the remote location. Tom Stehn and Dennis Pridgen of TPWD organized an additional pickup operation on February 27th that removed 310 more traps. Thanks go to all the 18 agency personnel and 8 boats that helped. Aerial surveys later found some 50+ traps still needing to be picked up on Matagorda, but the marshes look one thousand percent better than they did several years ago before the annual closure and volunteer pickup was organized by TPWD.

Colleen Satyshur, a technician working for the Platte River Whooping Crane Habitat Trust in Nebraska, spent December to February at Aransas recording crane unison calls. She recorded approximately 46 of the estimated 69 wintering adult pairs. Dr. Felipe Chavez-Ramirez, the new Executive Director of the Platte River Trust, visited Aransas

twice to get Colleen started with the voice printing project, and also did some work trying to document crab movements in the marshes with video cameras.

The Texas Nature Conservancy closed on the 734-acre Johnson Ranch that borders the Lamar Unit of Aransas NWR. The salt marsh area was purchased and a conservation easement obtained over the oak uplands. The marsh portions will be transferred over to the refuge in the coming months.

On March 5th, Texas Governor Perry signed the site nomination document for the Texas National Estuarine Research Reserve. This is an important initial step, which will be followed, in the coming year with writing an EIS and management plan. The proposed research reserve, approximately 240,000 acres in size, would be the third largest in the nation and include the southern portions of whooping crane critical habitat.

FRESHWATER INFLOWS

Water issues are huge in Texas, making headlines on a weekly basis throughout the state. Water issues specifically affect whooping cranes in management of river inflows from the Guadalupe and San Antonio Rivers that enter whooping crane critical habitat and keep the bays productive. Reduced inflows mean a reduction in crab populations and less food for whooping cranes. With the human population of Texas projected to double in the next 50 years, there has been much talk about creating a mechanism to provide conservation flows for Texas rivers as the pressure to grant more water permits grows. Texas law is all aimed at granting water rights to take water out of rivers, but there is currently no means being used to ensure adequate flows remain in the rivers. Many river segments are already over-appropriated.

The Texas Legislature placed a 2-year moratorium on granting any conservation flows and created a Study Commission on Environmental Flows to examine options for protecting instream flows and freshwater inflows to bays and estuaries. Members were appointed to the Commission by the end of 2003, and hearings commenced in mid-February. Unfortunately, applications for consumptive water rights continue to be processed. The more permits TCEQ issues over the next two years to take water out of rivers, the harder it will be to ensure adequate flows in the future. Tom Stehn and Felipe Chavez-Ramirez wrote articles on water issues that appeared in publications of various crane groups. The Texas A & M University study at Aransas on inflows, crabs, and cranes became operational in the fall with observation blinds built and graduate students starting fieldwork.

WHOOPING CRANE CAPTIVE MANAGEMENT AND RECOVERY TEAMS

The Whooping Crane Captive Management and Recovery Teams met in Calgary, Alberta January 29-31, facing temperatures of -20 degrees F below zero whenever any of the 38 participants were brave enough to leave the hotel. This annual meeting is important for exchanging ideas, troubleshooting propagation and health issues, coordinating joint recovery projects, incorporating genetic considerations into all aspects of recovery, allocating captive production, formulating reintroduction plans for 2004 and beyond, and approving captive sites for display of whooping cranes. Whooping crane recovery

involves many different organizations in different states and provinces, and keeping it all running smoothly is a task that all participate in.

WHOOPING CRANE RECOVERY PLAN

Work continued on updating the Whooping Crane Recovery Plan and writing it as one international document. A final draft was turned in to USFWS-Region II in early March 2004. This draft will need to go out for public review. A draft listing package was prepared in November 2003. Brian Johns modified the draft plan to fit the new Species at Risk Act (SARA) in Canada. SARA will also require an “action plan and recovery strategy” document to be written which Brian completed.

ADMINISTRATION

Tom Stehn edited materials prepared by Nicole Tadano of the National Wildlife Federation in Washington, D.C., for an on-line course on endangered species issues. The one lesson plan on the whooping crane, part of the Endangered Species Series of Wildlife University, the National Wildlife Federation's online training program, is designed to advance endangered species protection. Tom also recorded an audio segment for the course.

Lobbying coordinated by the International Crane Foundation continued for the Crane Conservation Act, but will most likely have to be delayed during the election year.

A whooping crane festival the last week in February in Port Aransas, Texas continues to grow annually. Recovery Team members George Archibald and Tom Stehn were speakers at the Festival. Information booths were run by the refuge and by ICF.

SPECIMENS

The whooping crane CANUS that died last year at the Patuxent Wildlife Research Center at age 38 and who sired many offspring, was originally captured with an injured wing in Wood Buffalo National Park. CANUS was shipped back to Canada at the end of October and will be a prominent feature at the Northern Lights Museum in Fort Smith, N.W.T. Patuxent also shipped two specimens to the Crane Meadows Nature Center, Wood River, Nebraska in mid-October, and 1 specimen to Mascatatuck NWR in Indiana in February.

PLATTE RIVER

In November, Dr. Felipe Chavez-Ramirez was named the new Executive Director of the Platte River Whooping Crane Habitat Trust following the sudden and tragic death of Dr. Paul Currier. Felipe had originally joined the Trust staff as Avian Ecologist in November of 2001.

Work was nearly completed on the National Academy of Science's one year review of Critical Habitat designation for 4 endangered species on the Platte River to see if the designation is based on sound science. A report is due out this spring. The Platte River is the third most used habitat in the whooping crane migration. However, crane habitat

has declined tremendously from past condition due to deepening and forest encroachment in the channel, and needs to be restored.

A draft Environmental Impact Statement (EIS) for the Platte River Implementation Program was circulated in February that provides four alternatives for managing endangered species on the Platte. In an unusual development, the EIS does not pick a preferred alternative. Public comments on the draft document are due in June. USFWS is also working on a Biological Opinion for the EIS.

CENTRAL FLORIDA

At the end of February, estimated numbers of nonmigratory whooping cranes in central Florida were 64 adults and 18 juveniles (16 from captivity and 2 fledged in the wild) for a total of 82 birds, including 17 adult pairs. This is a conservative figure since not all whooping cranes can be tracked due to failed radio transmitters. Between July and December 2003, the team documented the loss of 5 older birds and 1 juvenile. They also captured an impressive 19 cranes for health checks and transmitter replacement.

Sixteen juveniles arrived in central Florida in two separate cohorts of 8, one cohort from the International Crane Foundation and the other from Patuxent. One juvenile raised at the Calgary Zoo was shipped to Patuxent and socialized into a cohort. Both cohorts easily met the target size of between 6 and 9 that seem to lead to higher survival.

The role of infectious bursal disease virus in the health of whooping cranes in Florida continued. In conclusion, it appears that IBD is a major factor predisposing juvenile whooping cranes to mortality in Florida in certain winters. Over 300 samples were tested, including some from the captive centers prior to shipping birds to Florida. It turns out that the cranes are exposed to IBD in captivity, but also the prevalence of seropositive birds increases dramatically in the Florida release pen and post-release in Florida. This means the whooping cranes are likely exposed in Florida and continue to be re-exposed. Testing of samples continues, and samples collected from sentinel chickens, wild turkeys, quail and sandhill cranes will also be tested. Kristi Candelora will be starting her Master's project on IBD in Florida.

Survival of the birds released in the 2002-03 and 2003-04 winters continued to be excellent. Water levels at the end of 2003 were fair. Four nests were documented at the end of February, 2004.

Patuxent Wildlife Research Center is working on an adaptive management study for the Florida whooping crane population that should be an invaluable tool to assess the reintroduction. Patuxent met with Steve Nesbitt at Patuxent for 1-½ days to make progress on the adaptive management study. Clint Moore and Mike Runge met with the Recovery Team in January. They hope to have a draft report completed at the end of 2004.

THE WHOOPING CRANE EASTERN PARTNERSHIP (WCEP)

WCEP had an excellent third year of the eastern migratory whooping crane reintroduction. Since 2001, 36 whooping cranes have been reintroduced successfully and are migrating along a well-defined migration corridor between Wisconsin and Florida. Survival of whooping cranes after completion of their first fall migration behind ultralight aircraft has been 92%.

The migration with 16 juveniles in 2003 was beset by bad weather with many delays, but the migration team persevered and completed the 1,191-mile migration in 54 days. A highlight was a record 196-mile flight in three hours and four minutes over Georgia. It was the longest flight in one day ever made by an ultralight leading cranes. Nineteen of 20 older birds in the flyway all migrated back to Florida, with one bird in an unknown location because of a failed transmitter. Although many of the cranes returned to the release site at Chassahowitzka, they subsequently dispersed to freshwater marsh habitat in western and northern Florida. Several are within 10 miles of nonmigratory whooping cranes, but no interactions have been documented between the two flocks. Four older migratory cranes are currently wintering in the release site at Chassahowitzka with the cohort of 16 juveniles, kept there by the rations provided in the pen. It is becoming clear that although the saltmarsh at Chassahowitzka is not suitable crane habitat, it is excellent as a first-winter release site.

The WCEP Outreach Team continued to work with media, organizations, school children and the general public to provide information and educational opportunities about whooping cranes and the reintroduction. Media and public interest continued to be strong, with over 300 media inquiries handled. Websites for WCEP and project partners (especially Journey North) fielded over 6 million hits. The Outreach Team emphasized educational opportunities this year and made presentations to over 15,000 people. A very successful festival was held in the fall at the Necedah NWR in Wisconsin, and an emotional and well-attended arrival event was organized at Chassahowitzka NWR. Booths were staffed at the Midwest Birding Symposium in Green Bay (Sept. 9-11), the Florida Birding and Nature Festival in St. Petersburg, (Oct. 10-12), and the Colonial Coast Birding Festival in Jekyll Island, Georgia (Oct. 10-12). The team also assisted with the creation of a WCEP display for a new exhibit at the Smithsonian Institute's Museum of Natural History in Washington, D.C. "America's Wildest Places: Our National Wildlife Refuge System" which opened Nov. 7, 2003 to celebrate the refuge system's centennial.

The Monitoring Team did a remarkable job of knowing where almost all the birds were throughout the summer, fall migration, and winter, and helping the juveniles survive in the Florida release pen. The project budget (funds outside ordinary operating budgets) in 2003 was \$1.2 million, with nearly half coming from private organizations.

The Health team was involved in almost all facets of the reintroduction, providing health care before and after releases. In 2003, 16 of 19 whooping cranes (84%) allocated to the project made the migration and were released. Of particular note was a juvenile in Wisconsin with a small knee fracture that was surgically repaired. A hardware foreign body (a washer) was also removed from its gizzard during surgery. Recovery was accomplished in isolation at ICF, and the bird reunited with the migration cohort in

southern Wisconsin. The bird began flying with the cohort in northern Illinois and completed the migration with no problems. This is just one example of the numerous situations the health team deals with on a 24/7/365 basis.

A WCEP planning meeting was held February 18-20th in Crystal River, Florida. This is one of two annual meetings where 30+ participants from the various WCEP teams gather to discuss both short-term and long-term needs. The Wisconsin DNR is leading an effort to write a State management plan for whooping cranes that will be a useful tool in writing a similar plan for the entire flock.

For 2004, the Recovery team has approved allocation of up to 20 chicks for the ultralight migration. In addition, plans are proceeding for a possible supplemental release where captive whooping crane juveniles would be released into groups of older whooping cranes in the fall, 2005.

CAPTIVE FLOCKS

The captive flocks are the heart and soul of the whooping crane reintroduction program. An endless amount of work goes into propagating cranes, caring for the chicks, training them for reintroductions, and dealing with numerous health issues. I cannot begin to detail all the invaluable work that the captive centers carry out. Below are just a few of the highlights.

AUDUBON CENTER FOR RESEARCH ON ENDANGERED SPECIES (ACRES)

ACRES was allocated \$1.2 million in the Department of the Interior's appropriations bill for funding a new whooping crane captive propagation facility designed to hold 10 pairs. They deserve all the credit for making this happen and getting it funded. ACRES currently propagates Mississippi sandhill cranes and has 8 whooping cranes, including one pair that laid its first eggs in 2003. The new funding will expand the whooping crane program at ACRES, provide much better facilities separate from the sandhills, and eliminate the current conflict for space between the two species. Larger breeding pens with breeding ponds will be built, two factors that we think are limiting the captive propagation effort for whooping cranes. This new facility should help meet the recovery goal of an expansion of the captive flock needed to be able to retain 90% of the gene diversity in captivity for the next 100 years. It will hopefully be built and ready to shelter cranes in 2 years.

A pair of whooping cranes at the Audubon Park Zoo in New Orleans was recently put on public display. The zoo has received funding for a new whooping crane exhibit at the zoo's front entrance, which should allow the species and the history of whooping cranes in Louisiana to be highlighted.

CALGARY ZOO

The Calgary Zoo fledged 2 chicks in 2003. One was kept for exhibit at the main zoo, and 1 was shipped to Patuxent on October 15th for socialization into a cohort going to the Florida non-migratory flock. The zoo staff did an excellent job working through the

usual stress related to permitting issues whenever a CITES species has to cross an international border.

INTERNATIONAL CRANE FOUNDATION (ICF)

ICF in their best year ever raised 8 chicks and socialized them into a cohort shipped to Florida. One egg was transported to Patuxent for inclusion in the ultralight project, although the chick later showed health problems and died in February. Three chicks were kept back for genetic reasons as replacement birds for captivity.

ICF remained heavily involved supporting the Wisconsin to Florida whooping crane reintroduction. ICF personnel monitored the released birds throughout the year, including migration periods. They provided veterinary and crane keeper staff to Necedah NWR throughout the summer, were on the migration team, and cared for the cranes at the release pen in Florida throughout the winter.

LOWRY PARK ZOO

Lowry Park Zoo provides invaluable help to the whooping crane recovery program providing medical help for injured birds in Florida. One crane pulled from the wild undergoing rehabilitation from chronic respiratory problems underwent “cold” laser surgery at a cardiac unit in a local hospital to clear an obstruction in the trachea. Extraordinary innovation and effort went into this case. The laser procedure was a success, but the bird died 24 hours after the procedure from mycotic pneumonia. My thanks go out to all the medical personnel involved. The pair of whooping cranes on permanent exhibit at Lowry Park is doing fine.

PATUXENT WILDLIFE RESEARCH CENTER

In 2003, Patuxent successfully raised 17 chicks for the ultralight project, and 7 chicks for the Florida nonmigratory flock, to which they added one juvenile from the Calgary Zoo. Two additional chicks were held back for genetic reasons to become future breeders. Patuxent also raised 18 sandhill crane chicks for a West Nile Virus study. Operations are complex and require an extremely dedicated staff. Hurricane Isabel in the fall that knocked out power for several days added to an already difficult job.

Patuxent has several technician and scientist vacancies that need to be filled. Long-time crane behaviorist David Ellis is retiring. His contributions, innovations, and friendship will be missed.

SAN ANTONIO ZOO

The two pairs at the San Antonio Zoo produced 2 eggs that were transported to Patuxent where chicks hatched and were assigned to the ultralight project. This was the first year San Antonio contributed cranes to the Eastern Partnership, but it meant they did not costume-raise any chicks for the Florida nonmigratory flock this year.

WHOOPING CRANE NUMBERS / FEBRUARY 29, 2004

Wild Populations

	<u>Adult</u>	<u>Young</u>	<u>Total</u>	<u>Adult Pairs</u>
Aransas/Wood Buffalo NP	169	25	194	64
Rocky Mountains	0	0	0	0
Florida non-migratory	64	18	82 *	17
Wisconsin/Florida migratory	<u>20</u>	<u>16</u>	<u>36</u>	<u>0</u>
Subtotal in the Wild	253	59	312	81

* This number is a minimum estimate since not all whooping cranes in Florida can be located on a regular basis.

Captive Populations

	<u>Adult</u>	<u>Young**</u>	<u>Total</u>	<u>Breeding Pairs</u>
Patuxent WRC, Maryland	49	1	50	10
International Crane Foundation, WI	29	3***	32	10
Devonian Wildl. Cons.Cent./Calgary	17	1	18	6
ACRES, New Orleans	8	0	8	0
New Orleans Zoo	2	0	2	0
San Antonio Zoo, Texas	6	0***	6	2
Homosassa Springs Wildlife State Park	1	0	1	0
Lowry Park Zoo, Tampa, Florida	<u>2</u>	<u>0</u>	<u>2</u>	<u>0</u>
Subtotal in Captivity	114	5	119	28

** Young produced in 2003 that were kept in captivity because of valuable genetics. Other young not listed went to reintroductions in the eastern U.S.

*** ICF and the San Antonio Zoo both produced eggs in 2003 that were transported to Patuxent.

TOTALS (Wild + Captive) 312 + 119 = 431