

Protocol for Conditioning Costume-reared Whooping Cranes to Follow an Ultralight Aircraft in Migration

Since its inception, Operation Migration (OM) has endeavored to improve a technique it first developed in 1988, designed to teach a migratory route to endangered, precocial birds. To date, the OM team has conducted or participated in ten migration studies with three species. Operation Migration and USGS Patuxent Wildlife Research Center with assistance from the International Crane Foundation, the Wisconsin Department of Natural Resources, The US Fish and Wildlife Service and other members of the Bird Team offer the following to the Whooping Crane Eastern Partnership (WCEP) as a protocol for costume-rearing, aircraft conditioning, translocation, flight conditioning, migration and subsequent release of Whooping cranes as required in Phase II of the reintroduction program. Extensive records will be kept on the treatment and response of the birds and the results will be evaluated so that this protocol may be revised as appropriate.



Training young whooping cranes to follow ultralight aircraft at Necedah National Wildlife Refuge.

This protocol will guide activities for the initial release of Whooping cranes into eastern North America, however it is not feasible to use ultralight aircraft to introduce a flock large enough to be considered self-sustaining. It is expected that after enough birds have been shown a route south to establish a core group of migratory whooping cranes, other methods will be employed to augment the population.

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Wildness:

Whooping cranes introduced into Wisconsin will not have the benefit of wild birds of the same species to teach them wild behaviour; particularly human avoidance. Without this advantage it becomes more difficult to produce birds that will follow the aircraft, yet behave like wild birds once released. Past studies indicate that to rear birds that are not tame we must minimize human influence and provide as natural an experience as possible. We must replicate the natural rearing process by providing them with proper sexual imprint models and raising them in small groups. The birds we raise are neither tame nor wild. Like any creature they have a natural fear of the unknown but the rest is a learned response and our ability to teach them is severely limited. Just when to take to the air to avoid a threat or how large a buffer zone is needed is learned from the actions of the adult. Acting as surrogates, we are unable to take-off immediately at the first sign of trouble or even to properly convey the message that there is reason for concern. If, while caring for the birds, we were approached by a curious farmer or hunter we have no option but to accept the intrusion, where a wild parent would fly off to a safer distance. The actions of the wild bird teach its young to maintain a distance, while ours encourages tolerance. Because we can only teach the bare minimum in human avoidance, we need to rely on their natural fear of the unknown and ensure that all things human remain foreign. Ideally, the birds should be released on the wintering grounds without having encountered un-costumed people and/or human voices. Efforts should be made to improve the efficiency of the flight conditioning and to reduce even costumed human contact during the training period.

* Human contact is defined as the presence of the human form, including costumed handlers; the sounds of human activity, including voices and the presence of man-made environments and equipment.

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Facilities and Caretaking:

Isolation rearing will be performed in accordance to the USGS Patuxent WRC Protocol for Hand-rearing Crane Chicks. Specific details relevant to ultralight conditioned cranes are included in this document.

* Conspecific (conspecific means "of the same species") adults will be penned in the aviary and will have access to the sand runs that are perpendicular to the aviary runs used by the chicks. These adults will act as imprinting models. While the chicks are being exposed to the running aircraft, these adults will be locked inside and observed for tolerance to the disturbance.

* Costumes, designed to disguise the human form, will be supplied by OM and used in conjunction with hand held puppets of adult cranes and recordings of crane calls. Sleeve cuffs or gloves will cover the handler's hands when working with the cranes. When necessary, the medical staff may remove their gloves and work barehanded in order to properly treat or examine the chicks.

* Absolutely NO TALKING will be tolerated within earshot of the birds.

* No human avoidance conditioning (HAC) will be attempted prior to the release of these birds. The birds will be handled and examined in costume. If medical or other procedures require the removal of the facemask, the chicks will be hooded or protected from seeing the handlers.

* Absolutely no feeding will be done from hand. All food used as an incentive will be dispensed by methods other than hand tossing. Mealworms or other treats will be pointed out using a puppet to encourage foraging.

* The colts will be shielded from observing caretaking activities such as pen cleaning and food/water changes as much as practical.

* As much as practical the birds will be visually shielded from manmade structures and equipment. Efforts will be made to disguise the propagation building and surrounding areas in order to provide a more natural environment.

- * The number of handlers will be kept to a minimum during conditioning to reduce the amount of human contact, improve handler safety and to minimize distractions.
- * Recorded wetland sounds will be played inside the aviary to create a natural environment and mask outside human noise.
- * The colts will be moved from the propagation building to the large pond pens known as the "White Series" when the caretaking staff agrees that weather conditions, socialization and ages are appropriate. Heat lamps and additional shelter may be provided as needed.
- * The birds will be socialized in small cohorts based on age and compatibility.
- * The duration and frequency of aircraft training will be based on the response of the chicks. Each training session will be evaluated for success and if the chicks are responding positively, additional training will be curtailed temporarily to limit unnecessary human contact.
- * To reinforce the "follow the aircraft" response, efforts will be made to minimize the number of times a chick is led by a walking handler. However, during early conditioning, it may be safer to lead chicks to the aircraft rather than to carry them.
- * The aircraft used for this training are registered in Canada but are too large to be considered ultralights in the U.S. Through a cooperative agreement between Transport Canada and the Federal Aviation Administration; we are allowed to operate these aircraft within the U.S. providing we abide by Canadian regulations. With the wing removed to conduct this training they are not capable of flight but still must be operated properly and only by qualified persons.
- * Dr. Bernhard Wessling has provided the project with digital crane call vocalizers. Each unit is capable of reproducing up to six adult crane calls that handlers can use to communicate with the colts. Only pilots and qualified handlers will use the vocalizers to broadcast any calls other than the brood/contact call.
- * As a precaution, the primary handlers will familiarize the cranes to the sound of their human imitations of brood calls. This will be done sparingly to afford some control over the birds in the event of equipment failure in the field. Only the handlers that will accompany the birds after they leave Patuxent should conduct this exercise and it should be done from a distance so as to not attract the chick's attention to the handler's head.

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Conditioning Colts to Follow Aircraft:

Phase 1

Tape recordings of the aircraft engine sounds and recorded brood calls will be played several times daily to pre-hatching eggs and newly hatched chicks.

Phase 2

When chicks are old enough to go outdoors, they will be introduced to the real aircraft for the first time. The wing will be removed, allowing the trike to be parked outside their sand runs and the engine will be revved periodically during the day. The duration of the exercise and the chick's response to the aircraft will be recorded on data forms.

Phase 3

A small portable pen (ca 2-3 ft. in diameter and 2 ft. high) will be used to provide the chicks with their next level of exposure to the aircraft. This enclosure will be placed beside the trike and the chicks will be encouraged to forage for mealworms, pointed out using the puppet head, while the engine is revved. Time and responses will be recorded on data forms.

Note: Phase 2 and Phase 3 procedures may be combined, used in reverse orders or one or the other may be eliminated based on the development of the chick, at the discretion of the handlers.

Phase 4

When the chicks show little anxiety at the sound of the engine or the movement of the aircraft, they will advance to this level of conditioning, which will be conducted in a circular pen (ca 30 ft. in diameter and 2 ft. high). The colts will be carried or led to and placed in the pen. One handler will taxi the wingless aircraft around the outside perimeter, stopping periodically to point out mealworms using the puppet head mounted to an extension arm. The pilot will extend the puppet head over the chick fencing from the cockpit to interact with the colts. A few colts may be worked together if they will tolerate each other and the trainer can safely handle them. Multiple colts need close observation for possible anxiety. e.g. a colt may not follow because it is afraid of another colt, rather than the trike. A smaller circle pen, in which to temporarily place problem colts during training, will be constructed in the center of the 30 ft. pen. This may function as a "jealousy pen" allowing reluctant colts the opportunity to observe others foraging for treats with the aircraft parent. The duration of confinement is discretionary and based on behaviour. Observations and times will be recorded on data forms.

Phase 5

As the cranes grow tall enough to be protected by the propeller guard fitted to the aircraft, they will begin to follow the trike directly from the aviary or from the White Series pen to the adjacent field. Birds who tolerate each other may be worked together in small groups. The trips will progress in length and include rewards such as mealworms, crickets or pond exposure to reinforce a positive response. During the advanced ground training if weather permits, the chicks may be exposed to the aircraft with the wing refitted to familiarize them to the final shape. The duration of each exposure and the chicks' response to the aircraft will be recorded on data sheets.

Shipping:

Prior to fledging, the birds will be transported to the introduction site in Wisconsin. They will be shipped in accordance with Patuxent Wildlife Research Center's Protocol For Transporting Cranes, in individual containers supplied by OM. These containers will be modified to prevent the birds from viewing un-costumed handlers through the ventilation holes. The shipment will be conducted by private aircraft from Suburban Airport in Laurel, Maryland to the Necedah Airport in Necedah, Wisconsin to reduce the amount of ground travel needed.

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Medical Examination:

The birds will be transported, in two air-conditioned vans from the Necedah Airport to the Annex facility of the Necedah National Wildlife Refuge. The vehicles will be parked in the shade and the birds will be off-loaded, two at a time. A costumed technician will open the containers and check the birds' eyes and mouths before they are hooded. The chicks will then be moved into an adjoining room where the Medical Team will conduct an examination of each bird. This will be performed without talking and as quickly as is practical. Once completed the birds will be returned to their containers and replaced in the vans. As soon as possible, the birds will be released into the appropriate cohort pens and monitored for signs of stress. The Medical Team will develop the protocol for the examination.

Pens and Enclosures:

Two isolated pens and training areas exist at Necedah NWR and both will be used to house the Whooping crane chicks. Site #1 will be modified to accommodate a larger number of birds, giving us more options when it is time to socialize the two cohorts. Additional trees will be planted in and around the pens to enhance the natural look and the training area at Site #1 will be widened and lengthened. Electric fencer units will be used to protect both pens.

Conditioning Fledglings to Follow Aircraft:

Flight conditioning will begin once the birds have had a day or two to recover from shipping. Initially, the training will continue using the trike only. Later the wing will be attached to the aircraft and several days will be spent familiarizing the birds to the new shape.

* Similar to the procedures at Patuxent, the duration and frequency of aircraft training will be based on the response of the chicks. Each training session will be evaluated for success and if the chicks are responding positively, additional training will be curtailed temporarily to limit unnecessary human contact.

* The number of handlers will be kept to a minimum during conditioning to reduce the human contact, improve handler safety, and to minimize distractions. Only authorized handlers will have access to the birds and training area.

* The birds will be released, as much as possible to forage on their own, which will allow them time away from human contact and give them a chance to establish their natural dominance structure. (It can be difficult to return the birds to the holding pen in the evening. The handlers will determine proper feeding levels to strike a balance between providing adequate nourishment and controlled food withholding so the birds will move into the pen on their own to gain access to their feeders. This method avoids unnecessary handling of the birds). Observations will be made by remote monitoring from a blind or by video camera to determine the dominance order.

* Once each group is able to follow the aircraft in the air as a cohesive unit, the two cohorts will be introduced. This will likely occur at Site #1 where the birds will be monitored for aggression, which will be prevented if necessary.

* The duration of each exercise, and the birds' response, will be recorded on data forms. Data will also be collected on flight order and weather conditions including temperature, barometric pressure, dew point, winds and density altitude.

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Medical Examination:

Prior to departing the introduction site, the Medical Team will again examine the birds. This procedure is unavoidably disruptive to the birds and temporarily affects their relationship with the handlers and aircraft. For this reason the Medical Team will conduct this examination well before the expected migration departure date to allow the handlers to regain the confidence of the birds. The Medical Team will provide the protocol for this examination and will conduct all work in silence with the birds hooded.

Radio Tracking:

While the birds are being handled for the medical examination, they will also be fitted with tracking devices and marked bands. This procedure will comply with the guidelines of the North American Bird Banding Manual and Animal Care and Use Committee guidelines. (see Monitoring Protocol)

Migration:

* The start of the migration will be dictated by the endurance of the birds, their social compatibility and the readiness of the crew. The field team will allow as much lead-time as possible before setting a target departure date. Thereafter, the team will be prepared and the start date will be dependant on the weather.

* We will use the same route that was identified last year (2000) with some modifications to the list of stopovers. Replacement areas have been found for those that did not provide adequate isolation.

* A new travel pen and travel pen trailer will be constructed to improve efficiency and bird safety. The improvements include a modified shade shelter, which will allow the removal of some of the hard structure within the pen. Additionally, an improved electric fencer system has been designed. All changes will be presented for approval from the Animal Care and Use Committee.

* There are times when it is not possible to find isolated areas that allow for an adequate distance between the bird pen and the migration crew camp. In this situation the field team will determine if it is necessary to move the majority of the camp to another location. Most of the landing sites are privately owned and the migration crew is large. We must make every effort to reduce the impact we have on the landowners so as to not abuse their hospitality.

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Proposed Staging Area:

Due to impending cold weather of the central Wisconsin autumn, our departure cannot be delayed too late in the season. However, as we head south we are soon into warmer air that erodes the birds' flight endurance. As well, our arrival in some of the southern states coincides with the beginning of deer hunting season, meaning that hunters occupy many of the areas we hope to use as landing sites. Most of the private landowners are very willing to accommodate us, with the exception of the opening days of the season. For these reasons, and also to provide a break for the migration crew, we are proposing to stage the birds at a refuge along the route for a period of one or two weeks. The Muscatatuck National Wildlife

Refuge, Indiana and Hiwassee Wildlife Refuge, Tennessee have been considered and appropriate areas are available at both locations, however, the Tennessee site is farther south and more suitable for our purposes. The Whooping Crane Recovery Team will make the final decision. Under the guidance of the Refuge Manager a predator safe holding pen will be constructed in an isolated area on the refuge. The birds will be monitored and exercised daily by a minimal crew, provided by the International Crane Foundation and/or USGS Patuxent Wildlife Research Center in the absence of the field team. Although the facilities will be in place, it is possible that the migration will continue without a prolonged stop at the staging area. This decision will be based on the progress to date, the weather forecast for the remainder of the trip, the condition of the birds and other factors.

Wintering Site:

At this writing, a shortlist of appropriate release pen sites has been identified at the Chassahowitzka National Wildlife Refuge. The Refuge Manager will make the final selection, with input from the selection committee.

Proposed Pen Design:

The following is a description of a release pen, similar to the ones used in earlier studies. (Material list diagrams and photos available).

This structure measures 250 X 150 ft. and is not top-netted. It is protected by three strands of electric fencer wire and erected entirely in water 3 to 18 inches deep. The fencing material is eight ft. high - plastic web fence (a natural colour would be preferable). One foot will be bent out at the bottom and held in place with earth staples. It is important that this pen be large enough so the birds can forage, unaware that they are contained. Because of the electric fencer and the water, ground predators cannot crawl under the barrier and are forced to jump over it. The resulting "splash" as they land, acts as a warning to the birds inside. A permanent shade shelter will be erected in the pen, on evaluated ground, to provide a feed station.

Release Methods

* When the birds arrive they will be housed in their travel pen at an isolated "last landfall site." During this time, the migration crew will build a temporary holding pen in the center of the release pen over the shade shelter and feeding station. It will be constructed of top netting, using one of the door panels from the travel pen with which the birds are familiar.

* Once this holding pen is complete, the birds will be led by aircraft to the release pen area and encouraged to land next to the costumed handlers that will be waiting

for them. They will be kept in the holding pen at night and released during the day to forage.

* The Medical Team will conduct the arrival examination at the release pen. This procedure could be difficult to perform due to the isolation of the area and a separate protocol will be established once the release site has been identified.

* Several early morning flights will be made over the refuge to familiarize the birds with their immediate surroundings.

* When appropriate, the temporary holding pen will be removed, leaving only the release pen and the feeding station and the birds will be free to fly. The birds will be led to another foraging location while the pen is removed. They will be encouraged to stay in the area of the release pen by means of a costumed dummy; regular visits by a costumed handler and an ample food supply.

* A costumed handler will visit, twice daily for the first two weeks and then, once each day for another two weeks. This will be reduced to once every third day for a further week and thereafter the handler will try to replace the feed only when the birds are elsewhere or by using an automatic feeder. From this point on, observations should be made from a blind, by video camera or by radio tracking. This release schedule is discretionary and based on the flock behaviour.

* A supply of food will be made available at all times up to and past the expected time of return migration.

* A video monitoring system will be used to for observation of the birds. (see Monitoring Protocol)

Behaviour Options:

We have several options to adjust the behaviour of the birds, should they become sedentary or will not leave the area of the release pen. These methods can be used to encourage the birds to seek new foraging area or find fresh water.

* The aircraft could be used to lead the birds to other areas where costumed handlers on the ground would encourage them to land

* The crane recordings can be used to call the birds to other foraging areas. In this scenario, a costumed handler would operate the loudspeaker system in the early morning, when the sound would carry over a longer distance. The handler would spend several hours showing them how to forage for blue crab and other foods. Later, the handler would return to the release pen to call the birds back.

- * If the birds will only move out of the pen when accompanied by a handler then we could consider removing the costumed dummy.
- * Temporary or permanent food withholding could be considered.
- * Another option would be to remove the pen entirely.

Human Avoidance:

Based on the behaviour of the birds, it may be necessary to perform Human Avoidance Conditioning to finally sever the association with people. This practice should be conducted just after the final release of the birds. It is important that this procedure be carried out with enthusiasm and caution. A less than ardent application could result in complacency in the birds. We believe human avoidance should only be attempted once and that it should involve enough energy to seriously frighten the birds. Possibilities for human avoidance could include shotguns, umbrellas, dogs and many human participants. This exercise should take place in an area away from their release pen. The costume could be used to lead the birds into a danger area such as a tree line that we would like them to learn to avoid and where the human avoidance participants would be hiding.

The procedures outlined above, combined with those from the Whooping Crane Recovery Team and Whooping Crane Eastern Partnership, should afford maximum control over all aspects of an attempted introduction of Whooping cranes.