

Brailing

A Flight Restraint Technique

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Since the ancient times people have been fascinated by and kept cranes in captivity (Derrickson and Carpenter 1987). Destruction of their habitat throughout most of Africa and Southern Asia has been brought about by ever increasing human populations in these particular areas (Archibald and Mirande 1985). Humans can, however, through proper husbandry of captive populations, improve the chances of survival for many species of cranes.

By continually improving techniques in management, zoological institutions will play a major role in the survival of these majestic creatures (Archibald and Lewis 1996). Usage of a variety of enclosures in conjunction with different techniques of flight restraint has made it possible for zoos to exhibit cranes while also minimizing stress. Stress reducing exhibit options include domed outdoor walk-through free-flight aviaries, indoor free flight aviaries, and open exhibits with no over head structure.

With most closed free flight aviaries, birds of various sizes are left the ability of full flight. In open exhibits, the ability to have free flight is not an option. There are several flight restraint techniques, but only a few are used in zoological institutions. Some of these methods include pinioning, tenectomy, tenotomy, functional ankylosis, and palagiectomy. Methods such as these require some form of surgery and will permanently keep the bird from flying.

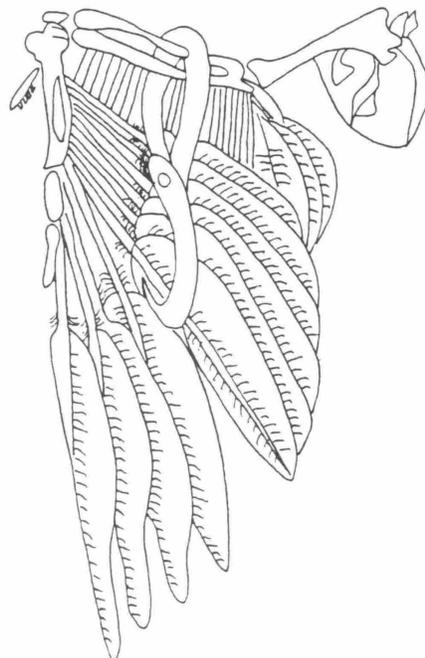
Feather clipping and vane clipping is another form of flight restraint. This technique involves cutting the primary and secondary flight feathers on one wing or removing a portion of the vanes of the primaries and secondary feathers. This does not harm the bird, but inhibits flight (Ellis and Dein 1996). After several weeks the feathers will

molt and new feathers will grow, therefore, regular monitoring is necessary. Clipped wings and vanes can also become irregular in appearance due to the growth of new blood feathers.

Another technique that is not well known is brailing. This type of flight restraint is accomplished by binding one of the bird's wings with the use of a plastic strip. It is a technique occasionally used in the shipment of large birds, to manipulate birds into pair bonding, or to prevent flight.

How does brailing work? The brail is a narrow piece of flexible plastic like clear strips of material you see holding the cold air in your grocer's freezer when the door is open. It is about 2 inches by 16 inches (depending on the size of the bird).

The strip has three holes – one at each end of the strip and the other in the center. Brailing a bird will require two people; one to hold the bird while the other will inspect the wing and situate the brail. The brail is placed



Brail placement - skeletal view
(wing fully extended)

between the 3rd and 4th outer-most primary feathers. The strap is then looped over the patagium. The wing is folded thus aligning the center and top holes. A clear plastic electrical tie is then placed through the holes. The tie is fitted between the feathers and pushed through the bottom hole of the strap. When the strap is pulled tight it will resemble a figure eight. It is then secured and the tie cut.

Check the fit before releasing the bird. It can be easily checked with three fingers. If three fingers slide easily and snugly in the upper loop, the brail has been properly fitted. If not, cut the tie and re-brail the bird. Several problems can occur if the brail is fitted improperly. A loose brail can allow the primary feathers to slide out and the bird can gain flight. A brail that is fitted too tightly can constrict into the wing thus stopping circulation.

When the procedure is completed and the bird is released, it may stumble and fall. This is normal. It is just because birds use their wings for balance. Most birds compensate for the brailed wing within minutes and regain a normal stride. Usually within an hour birds will preen the brail in between the feathers and it will become almost hidden (Ellis and Dein 1996).

A brailed wing is less conspicuous to the public's eye and is less stressful to the bird, making it one of the most contemporary and aesthetically pleasing flight restraint techniques.

This kind of technique is widely used on crane species. How about using it on other large bird species? What about using it as a permanent technique? Sure – why not?

Over the last two years, the Jacksonville Zoo has implemented this technique on two large African bird species: the Marabou Stork *Leptoptilos crumeniferus* and the Goliath Heron *Ardea goliath*.

Our rationale was that, should these pairs be chosen for a breeding program, they would be moved to a closed exhibit. With full flight capability and no modified breeding displays, successful copulation would be more likely. In addition, if the animals were ever moved from their open exhibit to a closed exhibit, it would be beneficial



A Pondicherry Vulture with a brailed wing.



Brail placement on a Goliath Heron (brail properly secured and tied).

for the birds to have full flight abilities.

Veterinarians at the Jacksonville Zoo felt that brailing should be done on a thirty-day schedule. Every 30 days the birds were caught up and the brail was changed to the opposite wing. Some institutions change brail every two weeks. The Bird Division believed that two weeks could cause a stress factor on the birds from the constant catches and possibly cause some behavioral changes. Jacksonville Zoo found that changing the brail every 30 days

allowed for minimal soft tissue changes and no arthodesis formation. With this kind of information gathered, the zoo made the 30-day changing a permanent policy. The bird staff had also found out that a bird, which has been brailed over a period of time, could regain flight in as little as a couple of hours.

Since the time of first brailing these birds, no behavioral changes have been observed in the Marabou Storks or Goliath Herons. From observations, it seems that the brail does not alter

birds' daily behaviors. No changes in feeding, aggression, preening, stretching, breeding, or social behavior have been noted.

With the exhibit being open and completely exposed to native birds, the brail did not seem to affect the Marabou or Goliath's aggressive behavior. During feedings, the adult pairs were still able to partially extend their wings and chase off native bird species from their food. One observation was that the Marabou Storks would never compete with our Lappet-Faced Vultures. This behavior is theorized not to be due to the brail, but due to the aggressive behavior and dominance a Lappet-Faced Vulture exhibits at a kill in the wild (Lappet-Faced Vultures have been known to take down young gazelles and adult flamingos).

Over the years, curators still decide on ways they want to exhibit birds in their collection. Depending on the species and exhibit design, flight restraint will always be a consideration. More and more decisions will be made on what is an option and what is not. Our success in brailing large bird species at the Jacksonville Zoo has suggested that brailing can be more than a temporary restraint technique. We regard it as a technique with great benefits if properly and wisely used.

Literature Cited

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