The Extinction of the Glaucus Macaw

By Donald Brightsmith

Originally published in
Bird Talk Magazine December 1999

The Hyacinth Macaw *(Andorhynchus hyacinthinus*) is known to many because of its beautiful blue color and its status as the largest parrot in the world. People who know much about the world's parrots may also have heard of the close relative of the Hyacinth, the Lear's Macaw (*Andorhynchus leari)*. This extremely endangered resident of Brazil is slightly smaller than the Hyacinth but bears a strong family resemblance. Slightly smaller still and greener than the Lear's, there existed a third member of this genus, the Glaucus Macaw *(Andorhynchus glaucus*). At the end of the 18th century explorers reported seeing this large turquoise blue macaw as they traveled the Uruguay River in south-central South America. But today, extensive searches of northeastern Argentina and the nation of Uruguay reveal that this species is almost certainly extinct. In fact, there is very little hard evidence that this species even survived into this century. Which begs the question what happened to the third big blue macaw?

Understanding why species are decline is often very difficult and requires much detailed investigation. For this reason it is unlikely that we will ever know exactly why the Glaucus Macaw vanished. Many of the threats that face modern parrot populations were not likely as important at the end of the 18th century as they are today. For example collecting for the international pet trade that threatens modern populations of Hyacinth and Lear's Macaws would have been much less prevalence. The wide scale habitat clearing that is threatening so many parrots was also much less widespread. Similarly the well armed hunters that exterminated Eastern North America's only native parrot the Carolina Parakeet are not thought to have caused the demise. Yet the Glacucus Macaw is gone. The extinction of the Glaucus Macaw is even more remarkable when you realize that despite all of the recent declines in parrots caused by man's actions, no parrots have gone extinct on mainland South America in the last century, (although the Spix's Macaw may soon provide an exception to this statement.) What factors could have led to the extinction of the Glaucus Macaw on the frontier of South America in the late 1700's?

The detailed studies of Carlos Yamashita and others give us some valuable insight into this mystery. Many parrots suffer from shortage of nest sites. Could a reduction in nest sites have caused the demise of this species? Early accounts suggest that the Glaucus, like the Lear's and Hyacinth, could nest in tree cavities or river-edge cliffs. While a reduction in trees large enough to hold cavities could have occurred, the cliffs remain intact suggesting that the elimination of nest sites did not cause the disappearance.

Fortunately, the original accounts of explorers in the late 1700's provide some interesting clues. They talk not only of watching flocks of macaws along the river banks, but also of their food and daily lives. In particular they mention the boat passengers feasting on the meat of armadillos and

feral cattle. While many might gloss over such accounts, there is more information there than meets the eye. The information on location and the establishment of cattle may not seem overly important, but when this information is combined with studies of populations of Hyacinth and Lear's Macaws the mystery begins to unravel.

From an ecological point of view, the Andorhynchus macaws can be considered as just huge flying heads. These massive heads support enormous bills that are specially designed to quickly open the incredibly hard nuts of palms. This specialization and incredible ability has not come free, as both Hyacinth and Lear's Macaws are both dependent on these palms for their survival in the wild. In short no palms, no large blue macaws.

It turns out that these super-heads are not designed to open just any palm nuts, but like any specialized mechanical device they work best at opening nuts of a small range of sizes. Hyacinth macaws prefer to eat palm seeds that are slightly smaller than the width of the hard cutting surface of their lower mandibles. By measuring the chisel width of museum specimens of Glaucus Macaws, Yamashita predicted that they should have fed on palms less than about 19 mm in diameter. From studies of Hyacinth and Lear's Macaws it is known that these super-specialized parrots rely on palm species that fruit year round. The large body size of these macaws means that it takes a lot of energy for them to fly long distances in search of ripe fruits. As a result these birds also need palms that occur in large dense groves where there will be large, predictable crops of ripe palm fruits every year.

Armed with the knowledge that Glaucus Macaws probably fed on palms that occurred in large groves, that fruited year round and had fruits near to 19 mm in diameter, it was a simple matter to analyze the possible candidates. In the areas along the Uruguay river where the Glaucus Macaws were known to occur there are only four palm species that occurred in the types of groves used by Andorhynchus macaws. Of these four only one, the "Chatay" (*Butia yatay*) with its 15-16 mm fruits has the correct characteristics to support the Glaucus. Does this palm hold the key to the extinction of the macaw?

The Chatay palm, as it is called in South America, may have been common at one time, but today there are just remnants of the once healthy population. The groves of this species that do remain are estimated to be about 200 years old and young palms are nowhere to be found. The apparent cause for this complete lack of regeneration brings us back to cattle mentioned in the statements of the early naturalists. Where grazing is permitted in palm groves of this species there is little or no survival of young palms. As a result, the aging stands of palms decline in vigor and with time fruit production drops. Could the failure of the palms to regenerate have caused the extinction of this impressive macaw? The region where the macaws lived was colonized by Europeans with cattle as much as 400 years ago. It is obvious from the earliest accounts of the Glaucus Macaw in the wild that free-range grazing was well established in the area at least since the late 1700's. The hundred years of grazing was obviously not sufficient to drive the palm to extinction so why are the macaws gone? As mentioned above, the macaws likely required large groves of palms that could produce a fruit every month of the year in sufficient quantities to feed the wandering flocks of macaws. As a result, the dwindling palm stands likely became too small and too old and senescent to support the birds. And when the food ran out, so did the luck of the Glaucus Macaw.

While a bit of speculation is necessary to arrive at the conclusion that the decline of the Chatay palm has led to the extinction of the Glaucus Macaw, the evidence is very suggestive. More importantly, this scenario from the past may also hold a valuable lesson for the future. The Lear's and Hyacinth Macaws are also dependent on healthy palm populations. While it is uncertain if grazing is preventing palm recruitment in the ranges these other two blue macaws, the decline of palms may already be affecting both species. While illegal capture for pets is still considered the biggest threat, the future hopes for the remaining populations may ultimately rest in the seeds and seedlings of the palms that will feed the big blue macaws of tomorrow.

For more information see Yamashita, C. and M. de P. Valle. 1993. On the linkage between Andorhynchus macaws and palm nuts, and the extinction of the Glaucous macaw. Bulletin of the British Ornithological Club. 113:53-61.