



the bar

our knowledge grows along with our goals for the highly endangered Blue-throated Macaw

Raising

By Toa Kyle



In six field seasons of watching various macaw nests, I've never actually seen a chick fledge. This season I was determined - I watched one nest for five consecutive days in hopes of seeing this special moment. The chick from this nest was quite the tease. It would climb to the top of the exposed cavity and exercise its wings in plain view. It reminded me a bit of a boy taking his first dive off the high diving board. It would teeter at the edge of the nest entrance, leaning forward and spreading its wings, all the while receiving light caws of encouragement from its parents perched nearby. When it reached that critical point where it would either fly or fall over, it would pull back, aborting its exit at the last moment. The camera batteries eventually died from filming this "almost fledging" ritual over the course of five days. On the morning of the sixth day I arrived at the nest tree to find no macaws present, adults or chick. And so the first flight of the macaw remains an elusive, mysterious event for me.

I'm pleased to report that the 2006 breeding season for Blue-throated Macaws (*Ara glaucogularis*) in Bolivia has been the most productive we've had in the past five years, with six chicks fledging from the four successful nests. Since we can account for about 80 birds total where we work in Bolivia, this seemingly small number of chicks actually represents a significant boost for the recovery of the species. Naturally, with each passing field season we tend to raise the bar with respect to what we can

achieve for the recovery of this species in the wild, so we're especially pleased that the birds' performance this year met with our heightened expectations. I was looking forward to the 2006 season to make amends for 2005 which was full of new challenges such as accessing fragile palm nest cavities (see *PsittaScene Vol 17.1*). In 2005, five of the six active nests we located failed in the late stages of incubation. Of the nests that failed, some were flooded due to heavy rainfall, some were predated by toucans. We also



observed that most of the nests were of low quality, being found in motacu palm snags ("snag" - dead tree). These nests are difficult to work with from a management perspective as they're harder to climb, having no branches to swing climbing ropes over. They are also prone to falling over in strong winds because they are dead and poorly rooted. This season I was also curious to see how the severe drought in 2005 might affect nesting attempts in the 2006 breeding season. In general fruit production is

lower the year after a drought. Since Blue-throats are primarily fruit eaters and not seed predators like most parrots, low fruit production can decrease the number of nesting attempts as scarcer food resources leave fewer nesting pairs capable of raising young. I was interested to see how the number of nesting attempts for 2006 compared to past seasons.

A good year

We found a total of 14 potential nests this season. We define a "potential nest" as any cavity entered by a Blue-throat. Seven of these pairs actually laid eggs, which has been a trend over the past 3 seasons. So, it appears that the 2005 drought did not adversely affect nesting attempts in 2006. Of these seven active nests, four pairs produced a total of six chicks and the remaining three nests suffered some form of predation. Consistent with previous breeding seasons, predation remains the main cause of nest failure. All of the known threats to these nesting pairs are very broadly distributed species, such as Toco Toucans or Great-horned Owls, and none are threatened with extinction. The big challenge then is that common species are effectively feeding on the young of critically endangered ones. This is an area we need to continue to manage aggressively by our persistent efforts to discourage these animals from visiting Blue-throat nest sites and protecting the adults and chicks from ongoing harassment. In the future, still more direct management may become essential, including the trapping and relocating of persistent individual predators.

Full house

One of the interesting things about this season was the number of nests with multiple nestlings. In previous seasons we'd only seen a single nestling hatch. The average number of nestlings per nest this season was 2.3. In two nests we even saw three nestlings hatch. The third hatched nestling in one of these nests was ignored by the nesting pair. We kept it alive for a couple of days via supplement feeding, but it died after a cold front came through one night. In the other nest



Three's a crowd. Although only 3-5 days younger than its siblings, the third chick (far right) was neglected by its parents or out-competed by its siblings. We fed it and kept it alive for 3 days before it died from exposure.

that had three nestlings both the second and third hatched chick were neglected and unfortunately in this case we arrived too late to save them from starvation. It appears that there is a limit to the number of nestlings Blue-throats are willing or able to nurture, and this appears to be consistent with other parrots as well. If so, this observation strongly suggests that for large clutches, fostering into another nest of the same species or long-term hand rearing may be the only way to aid the chicks through to fledging. We hope to gain permission in the future to remove neglected chicks from nests for fostering to other nests or for hand rearing and release. Obviously any Blue-throated Macaw chick that hatches and can fledge in the wild is important to the species' recovery.

Flood insurance

We were able to encourage more nests past the incubation stage this year for several reasons. For one, the weather was more cooperative. In 2005 there were some really horrific "nest killer" storms that caused nests (snags) to collapse or flood. This season we purchased a 12m (35ft) extension ladder that was instrumental in accessing nest cavities in palm snags, something we couldn't reliably do in 2005 for fear of the snag collapsing if we attempted climbing with ropes. We were also more pro-active during the incubation stage. In 2005 we were always wary of causing abandonment by climbing to put in drain holes while a nest was being incubated. Still exercising utmost caution, we made a policy

of putting drain holes in all nests this season. With this more aggressive management and the benefit of fewer storms, no cavities flooded in 2006. Furthermore, we had only two motacu palm snag nests this season, compared to last season's four, and in our experience, motacu snags are low quality nests. That said, for the first time in four field seasons, we saw one of these nest types successfully fledge young.



Secured by 8 ropes to adjacent trees, our new light-weight extension ladder allowed us to access fragile palm snag nests without contacting the tree.

Head-shots

Continuing analysis of Blue-throat facial photos has yielded valuable information on the nesting habits of the species. WPT-Canada generously donated a digital camera with an optical zoom and an image stabilizer function which has allowed us to get good facial shots of Blue-throats. This digital technology is especially helpful because photos can be referenced in the field and compared to others taken in past years. To date we have 35 individuals photographed, which is nearly half of the known birds in our study area. By comparing photos taken over the past three field seasons we've determined that nesting trees are not always used by the same pair in consecutive years, and that pairs that fledged young in 2004 didn't attempt to do so in 2005 but then nested again in 2006. This suggests that with Blue-throats, chicks will stay with their parents for a full year, after which they will nest again. With clear photos we can learn the major features of each individual's face and track life histories on specific birds without having to trap and band them. If we can continue this study long term, we may be able to do for macaws what Jane Goodall did for chimpanzees (although I haven't gotten around



Unique facial line patterns allow researchers to individually identify adult Blue-throats. This technique can be used for other macaws but is more difficult in species such as Blue-and-Golds (3rd bird above) that have fewer lines.

to giving the birds names like 'David Bluebeard' yet). An advantage to studying Blue-throats is that their facial feather patterns are more complex (5-6 main lines behind the eye), compared to, for example, Blue and Gold Macaws (which only have 3 main lines) thus creating more distinct patterns for each individual. Blue-throats are also sexually dimorphic (males are larger at about 800g; females 600g), so we can generally determine individuals' gender in the field which is not something you can reliably do with other macaws. Our study is the first to confirm that, with wild Blue-throats at least, it's the female that incubates. This is likely predictable based on observations in captivity but has been difficult to demonstrate in previous studies of wild macaws.

Mortality

One disturbing trend this season was our observations of dead or injured Blue-throats. We found the remains of one predated bird, possibly a juvenile that fledged in 2004. We would regularly see this juvenile as it came to visit its parents as they tended to their nest in 2006. Following the discovery of the Blue-throat carcass and feathers we never saw the juvenile around its parents nest again. In another case we saw a female from a potential nesting pair bleeding in the head and neck area. We still don't know what is predated (or attempting to predate) the adults. Two possible culprits are Great-horned Owls and Crested Caracaras. The caracaras would seem unlikely as they are generally considered scavengers. However, I witnessed an unsuccessful attack by caracaras on a pair of Blue-and-Gold Macaws (*Ara ararauna*) one afternoon during the 2006 breeding season. Also this year, a four week old nestling was lost to predation when it was too large (450g) for a toucan or Crane Hawk to kill or extract from the cavity. The message from this observed mortality is that we need to get more chicks fledging into the wild, to offset the realities of predation, severe weather, disease and old age.

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Ex-trapper stories

Due to wet road conditions we were forced to take a major detour on our way back to Trinidad after a month in the field. This longer route took us through a town I'd never been to, where we rested for a day in order to recover from all the toiling in the mud the previous day. Of course we drew attention driving around in a muddy white truck with a six-meter ladder attached to it. When I explained to a local what we were doing he recommended that I look up an ex-macaw trapper who was active in the area in the '70s and '80s. Sure enough I found him and he turned out to be a wealth of information on the historical status of Blue-throats where he had been active. Other ex-trappers had told me that Blue-throats in the Llanos de Moxos, where they are endemic, were always rarer than the



We're now banding nestlings at 10-15 days of age when the band still slides over the tarsus. Bands will help us monitor juvenile survival in the future.

two larger macaw species of Blue-and-Gold Macaws and Green-winged Macaws (*Ara chloroptera*). Not so, according to this guy. He told me of a clay lick where he'd see groups of Blue-throats, Blue-and-Golds and Green-wings visit in equal numbers of 20 individuals on average, usually exclusive from one another. This claim is fascinating as it is the first account I've heard of Blue-throats consuming clay and if his numbers are accurate, it means that the idea that Blue-throat numbers can be equal to those of Blue-and-Golds in a given site is not just a pipe dream. Turning the tide so that these numbers become more balanced over time is thus a realistic goal for this project. The trick once again is getting more Blue-throat chicks into the wild.

Nest boxes

In an attempt to provide the birds with alternatives to motacu snags we put up 15 nest boxes at the start of the field season. The design of the boxes included a metal plate at the entrance aimed at excluding larger macaw species, notably Blue-and-Gold Macaws which outnumber Blue-throats by a factor of six to one



where Blue-throats are found. Blue-and-Golds also compete with Blue-throats for resources and natural nest cavities, so nest boxes that aid their numbers are undesirable. Since toucans are responsible for the majority of the nest predation we inclined the entrance to the nestbox by 45 degrees. Toucans have weak perching feet (unlike macaws) and would be unable to perch at the entrance of the nest box and climb in at this angle. By late December only two of these boxes were used by macaws, alas by Blue-and-Golds. We made the entrance plates with the smallest entrance hole diameter we'd seen in a wild Blue-throat nest (9.8 cm or 4 inches) but obviously we need to make them even smaller. One new nest cavity this season was only 8.3 cm (3.3 in) wide so that the pair would enter sideways! In addition, we put up the boxes during the months of August and September. We saw that during these months most Blue-throat nesting pairs had already committed to natural nests. Hopefully some of these boxes will be used next year. If they are, we won't have to monitor them as intensely as we do natural nests (to prevent nest predation). Recall that in the Echo Parakeet (*Psittacula eques*) program they experimented with around 100 designs for nest boxes until the birds finally accepted one.



Nestbox entrance holes must exclude the larger and more common Blue-and-Gold Macaw. Generally the two species co-exist peacefully, but when a nest site is involved, competition can become violent. One solution is to find your own cavity with a tiny hole, like this pair that had to squeeze in sideways!

Politics & conservation

Finally, a discussion of 2006 would not be complete without mentioning the political situation in Bolivia. The current president, Evo Morales, is the first indigenous president Bolivia has ever elected. He is a socialist who is closely allied to Hugo Chavez of Venezuela and Fidel Castro of Cuba. He aims to repossess large tracks of land deemed as being unproductive or acquired illegally and redistribute them to the nation's poor. This worries cattle ranchers in the

Beni who essentially lay claim to all the land where Blue-throats are found. To further complicate matters, a large separatist movement is gaining momentum in Bolivia's eastern departments. Basically these departments want more regional autonomy. If the federal government doesn't grant autonomy in the near



We endured many bee stings removing a hive from this nest and were rewarded when the female laid and then successfully fledged two chicks (above at 8 weeks).

future, civil war is not out of the realm of possibilities. Although working in Bolivia is difficult in the best of times, an armed conflict could mean a suspension of field work with Blue-throats until safe conditions resume.

On the whole I believe this season has been a success. For the first time we've observed nests with multiple nestlings. We've also seen that these 2nd and 3rd nestlings that die in the early developmental stages from starvation due to parental neglect could possibly benefit from more intense management. I'll be recommending to the Bolivian government the need to manage these chicks more aggressively, including the possibility of fostering them into other Blue-throats nests, or even raising the nestlings in captivity. Ideally we can release these birds into the wild while taking maximum precautions in order to minimize the transmission of disease to other birds. Captive raised birds have their work cut out for them in terms of learning to locate food resources and avoid predation but I'd rather give them that chance at survival instead of leaving them in the nest where their prospects are poor at best. This type of undertaking will be complicated and require more funding and expertise, but we feel it could become an important component in future improvements in the number of fledged chicks each year, and ultimately the recovery of the species.

