



Dear Earthwatchers:

A huge thank you to all the Earthwatch crews who braved rain, sun and wildlife to help the Macaws of the Peruvian Amazon. Earthwatch teams helped take the first video data on the nesting habits of the Scarlet macaws at the Tambopata Research Center and also got involved in our diet study. The continued involvement of Earthwatch in the research on the Tambopata has allowed the expansion of the project to new study sites, created new opportunities, and helped broaden our understanding of parrot ecology while enjoying some historic moments along the way.

Some momentous moments occurred during the monitoring. The first Scarlet macaw chick reared by the chicos (handreared macaws) fledged while we were conducting monitoring. Almost every day now around the dining area at the Tambopata Research Center the proud parents can be seen with the first ever successfully raised chick from chico parents.

We also monitored many days at the claylick, with everyone getting a chance to observe the spectacular macaw activity and observe the capture of Blue-and-yellow Macaws to be fitted with satellite collars. Preliminary results show that the macaws are ranging well beyond the boundaries of the Tambopata National Reserve, even across the route of the Interoceanic Highway. This raises some serious questions about the future status of populations across the region in the face of increased colonisation along the road and associated development and deforestation. Hopefully with information Earthwatch teams have helped collect, we will be able to move forward in mitigating some of the potential negative impacts by influencing policy decisions in the region.

Some of our best memories come from sharing space and time with those of you who left such a lasting impression on both us and the chicos. Each team member brought a special something to the mix and recorded some of the most exciting events so far in the history of the project. We are privileged to have been able to work with all the remarkable people that we have been fortunate to meet and share such fabulous and humbling experiences with. Thank you for being part of something special that has managed to incorporate, educate and hopefully inspire so many around us. We hope to keep in touch and in the meantime extend our best wishes to you!

Alan Lee and Donald Brightsmith



EARTHWATCH INSTITUTE ANNUAL FIELD REPORT

Project title: Macaws of the Peruvian Amazon

Date completed: November 2008

Completed by: Alan Lee and Donald Brightsmith

Period covered by this report: December 2007 to August 2008

Reporting on research objectives

Objective 1: Aid chick survival through supplemental feeding

Since the beginning of the project, we have intervened and fed 9 chicks that were obviously dying of starvation. During interventions, we fed chicks up to two times per day. Five of these were second chicks and four of these were third chicks. Of the second chicks, 4 of the 5 (80%) survived the critical period and began to gain weight again. This was due to the fact that after these young were given the supplemental food, the parents began to feed them again. However none of the four third chicks that were fed survived. In fact none ever gained weight, and the parents did not continue to feed them. In conclusion we feel that second chicks can be fed through this supplemental feeding regime. However third (and probably fourth) chicks cannot be saved in this way, at least at Tambopata. We do not plan to collect additional data on this objective.

Objective 2: Document Scarlet Macaw chick growth and understand why chicks die of starvation

We now have a data set on the growth and survival of 90 Scarlet Macaw chicks from 47 nests over 7 field seasons. Gabriela Vigo completed a professional thesis which quantifies and analyzes chick growth, development, and survival. This provides the background for analyzing the effects of weather on chick growth rates and starvation probability. An aging guide has been produced that can use digital photos of Scarlet Macaw chicks to determine their age ± 2 days. This will allow us to continue our studies of Scarlet Macaw chick survival without having to climb the nest daily to determine the exact hatching dates. We will not continue intense monitoring of chick growth as we have a sufficiently large sample right now. We will however continue to monitor nestling survival and chick starvation as our sample sizes are still too small to fully understand why second chicks starve (N = 6 second chicks starving since 1999). The use of video cameras in the nests to document the interactions between siblings and among siblings and parents has been a big step forward to understanding how sibling rivalry and parental decisions affect chick starvation.

Objective 3: Compare Scarlet Macaw hatching success among different nest types and across years.

We have monitored 222 Scarlet Macaw eggs in 85 nests for hatching success since November 1999. Of that total, 43% hatched. The median hatching success for psittacines

(parrots) from the literature is 81% (range 29% to 94%) making ours the second lowest hatching success documented for parrots (Masello & Quillfeldt, 2002). Our data up to 2003 suggested that the cause for low hatching success might be the elevated temperatures in PVC pipe nest boxes. However, our more recent analyses show that hatching success was 41% in PVC, 46% in natural nests and 50% in wooden artificial nests and these do not differ significantly. From 1999 – 2002 we climbed to check the status of the nest during incubation. However in an attempt to determine if human disturbance was influencing hatching success, we stopped all climbs during incubation. We found that years when we climbed during incubation hatching success was 33% and in the years we did not climb during incubation hatching success was 53%. We will continue to monitor hatching success as the years progress to look for interannual variation (changes from year to year) in hatching success.

Objective 4: Compare Scarlet Macaw fledging success among different nest types and across years.

From 1999 – 2007 we have monitored the fate of 122 Scarlet Macaw chicks. Of these 1% were predated, 24% starved (see Objective 1 above for more on this), 4% died when the nest was taken over by rival pairs of macaws, 6% died from a mixture of other causes, 6% died from unknown causes and 59% of all chicks fledged. We will continue to monitor nesting success to document the interannual variation. We have heard that during El Niño years, the macaws fail to reproduce. We hope that through long term monitoring of nesting success we can document how climatic variation correlates with macaw nesting success.

During 2007, we monitored 29 chicks, the highest number to date. Fledging at 62% was similar to the 1999 – 2006 average of 61%. So while it was a record year for chick production, fledging rates were average.

Objective 5: Document macaw behavior at the nest

From 2001 – 2007 Earthwatch observers logged about 3600 hours of observations at the nests of Scarlet Macaws. This included about 900 hours during incubation and about 2600 hours during the chick rearing period. We found that rain greatly reduced the activity rates of the macaws: without rain the average time between adults entering the nest was 59 minutes, and with rain this average climbed to 124 minutes. With the completion of this data set and that of chick growth, we are now ready to conduct correlation analyses to see if these weather related reductions in adult activity rate translate in to a reduction in chick growth or an increase in chick starvation.

To investigate the effect of nest type on incubation and brooding we compared the amount of time with 0 adults in the nest among the three types of nests: natural nests, PVC nest boxes and wooden nest boxes. Preliminary analyses suggest that birds spend less time incubating and brooding in PVC nest boxes ($9.1\% \pm 9.0\%$, N = 74 observations), than in natural nests ($5.4\% \pm 5.2\%$, N = 23 observations) or wooden nest boxes ($4.6\% \pm 3.1\%$, N = 17 observations). However, the high standard deviations (\pm) among observations suggest that there may not be statistically significant differences among these values. The data will be further explored with techniques to evaluate multiple variables.

<p>Table 1: Time, in minutes, between entrances to the nest for adult Scarlet Macaws in Tambopata, Peru. The table compares nests with one chick versus nests with 2 chicks according to the age of the oldest chick in the nest. At less than 7 days the chicks are weak, prone to starvation, and cool quickly. The chicks cannot regulate their body temperature until after day 25. At day 67 the chicks are first seen sticking their heads out of the entrance to the nest. The chicks fledge between age 80 and 90 days. For 5 observations, there were three small chicks in the nest. However in all cases these third chicks died before they reached 25 days old. These nests with 3 chicks are lumped together with the nests with 2 chicks for the purpose of this table.</p>
<p>TABLE 1</p>
<p>1 chick 2 chicks</p>

Chick age	Mean	±	SD		Mean	±	SD
< 7 days	62	±	61		49	±	46
7 to 25 days	75	±	77		67	±	69
26 to 67 days	62	±	66		59	±	71
> 67 days	102	±	116		61	±	70

In general, macaw pairs with 1 chick entered the nest less frequently than pairs with 2 chicks (Table 1). As predicted, this tendency became more pronounced as the chicks aged

and their total food demands increased. However, large standard deviations in this data set obscure this trend. More detailed multivariate statistical analyses will be employed to explore these data.

These observations have provided us with valuable background data for understanding the growth, development, and survival of Scarlet Macaw chicks. We are just now beginning to explore in-depth the data on nest attendance, reproductive success, chick growth, and nest types. The interrelationships among these data sets will provide a great deal of novel insight in to the reproductive ecology of this species and psittacines (parrots and relatives) in general. We feel that we have a sufficiently large data set to publish on this topic so we will not continue to collect these sorts of nest observation data.

Objective 6: Determine what drives seasonal variation in clay lick use

Clay lick use is strongly seasonal and documenting these patterns and their causes have been a major focus of the research and the papers and presentations produced (Brightsmith, 2004; Brightsmith, 2005; Brightsmith, 2006). For the first time, we have monitored multiple clay licks along the length of the Tambopata River to determine if the patterns identified at the Tambopata Research Center (TRC) are observed at other sites in the region. We have analysed data for a 10 month period from August 2006 to May 2007. As previously documented for TRC, monthly variation in parrot use is observed at three clay licks on the lower Tambopata River (Figure 1 below). These three clay licks are all located within 2km of each other as the parrot flies. Due to their proximity, the local parrot community has access to all of these licks, and so for the purposes of our analysis we refer to these three licks as a clay lick complex. Despite combining the monthly feeding for the complex, total feeding was still greatest at the Tambopata Research Center. The comparison of seasonal patterns shows that the season of lowest clay lick use in both areas is March – May and that highest lick use is in the period of December – January. However, the peaks during the “high season” are much greater at Tambopata Research Center than in the clay lick complex down river.

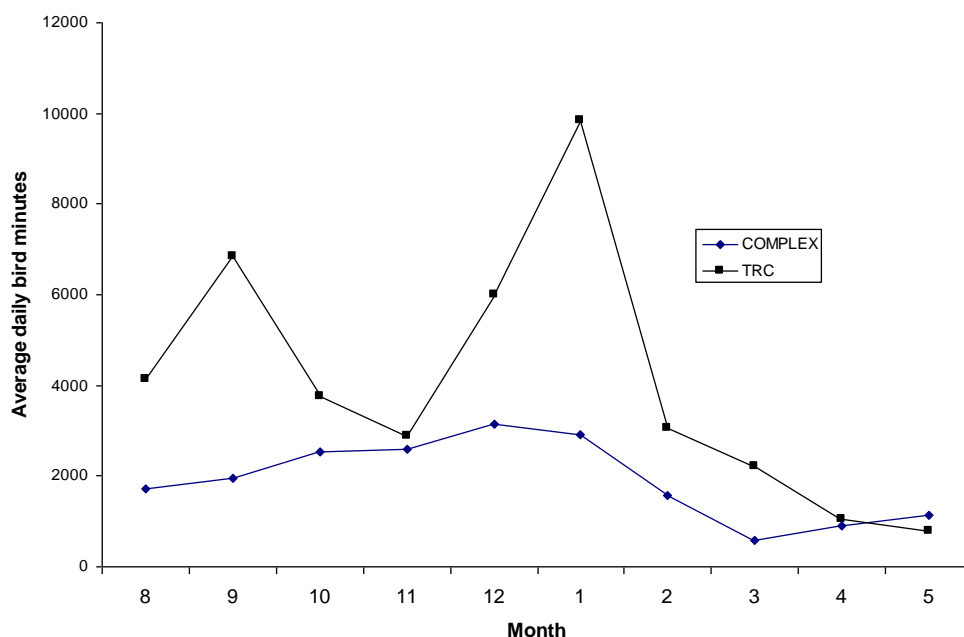


Figure 1: Seasonal changes in clay lick use at Tambopata Research Center (TRC) and a complex of three clay licks located along the lower Tambopata River.

Objective 7: Document between year variation in clay lick use

Extending observations beyond TRC, we have compared parrot use of the clay lick at Posada Amazonas between years for 2006 and 2007. There is no significant difference in overall parrot use. There was a 30% decline in total feeding for Dusky-headed parakeet *Aratinga weddelli*. It is not possible to draw ecological conclusions from this result since the clay lick at Posada forms part of the clay lick complex. We suspect that the change in feeding rate for this species simply represents a shift to another geophagy site as we have no reason to believe that the species is undergoing any changes in its local abundance – the species is one of the most common in secondary habitats associated with shifting agriculture and there are no changes in local practise that we are aware of.

Objective 8: Document the impacts of ecotourism

We correlated bird activity at the Posada claylick and tourist numbers for two periods – early morning activity (before 08:00am) and for activity for the rest of the day based on the activity of *Pyrrhura rupicola*, *Brotogeris cyanoptera* and *Ara chloropterus*. Although there is a trend for lower feeding for early morning activity in relation to increasing tourist numbers, this is not observed for activity later in the day. Since we have been unable to find a similar trend based on 190 mornings at the clay lick near Tambopata Research Center this impact may be due to the difference in observation distances. This is less than 60 meters at Posada (where it is conducted from a blind, but where tourists can be observed entering the blind by birds perched in the surrounding trees) and 150 meters at Tambopata Research Center, even though at the latter site no use is made of a blind and where analysis on all species combined shows that the number of tourists observing the lick does not negatively correlate with the number of birds on the lick.

During 2007 monitoring was conducted at a clay lick on the lower Tambopata River to monitor the impacts of boat traffic from different lodges. Previously we have shown that large

macaws can become habituated to boat presence, however, since antipredatory responses (flush) continued to be observed, other factors such as boat distance, speed, color and noise were observed. A new lodge on the river was shown to cause more disturbance compared to lodges with a longer history on the river with boats passing faster and closer compared to other lodges, with 50% of boats causing a flush compared to the average across the lodges of 34%. This information was presented to this lodge along with guidelines on better boat behaviour and was accepted favourably.

Objective 9: Help government agencies and ecotourism operators to reduce tourism's impacts on large macaws

We have directly aided the Peruvian government by providing annual reports of tourist behavior and impact upon parrots in an area where large numbers of parrots and macaws congregate. The personnel of the macaw project have also maintained a year-round presence at the clay licks of Posada Amazonas, Refugio Amazonas, Tambopata Research Center, and have been charged by the ecotourism company Rainforest Expeditions to make sure that the company's actions have the minimum impact possible on the activity of the birds at the clay lick. This information is also provided free to most of the other lodges on the Tambopata River. The preliminary results show that the number of birds visiting the clay lick at the Tambopata Research Center is not less when there are more tourists.

Project development

The Tambopata Macaw project continues to grow from strength to strength with the aid and support of Earthwatch and Earthwatch volunteers. The project is now well established at the lower Tambopata lodges run by Rainforest Expeditions, of Posada Amazonas and Refugio Amazonas. At Posada Amazonas, we have established good relationships with staff and the local community that own half the lodge. Monthly reports are provided, informing interested parties of project activities, including observations of interesting sightings and recommendations. During 2007 this included advice on where and how to build a new blind for observing parrot behaviour at the local claylick after the long standing structure collapsed into the river after a period of extended rain and flooding. By extending the research to these sites we have been able to provide more work experience for Peruvians from Puerto Maldonado. Standard of education at the local institutions is traditionally very low and resulting opportunities, especially in the ecotourism industry, are few and far between. We are proud of our relationship with Rainforest Expeditions and the opportunities we have been able to provide.

Non-technical summary of results

1. Results and emerging trends for the non-scientist

Scarlet Macaw nesting ecology

We have monitored Scarlet Macaw eggs in nests for hatching success since November 1999. Of that total, 43% hatched, the second lowest hatching success documented for parrots for any comparable study. Our data up to 2003 suggested that the cause for low hatching success might be the higher temperatures in the artificial PVC nests, but there is no difference between hatching success between natural nests, wooden artificial nests or PVC nests. In an attempt to determine if human disturbance was influencing hatching success, we stopped all climbs during incubation and found that hatching success improved to 53%.

We will continue to monitor hatching success as the years progress to look for interannual variation in hatching success.

To investigate the effect of nest type on incubation and brooding we compared the amount of time with 0 adults in the nest among the three types of nests: natural nests, PVC nest boxes and wooden nest boxes. Preliminary analyses suggest that birds spend less time incubating and brooding in PVC nest boxes than in natural nests or wooden nest boxes. In general macaw pairs with 1 chick entered the nest less frequently than pairs with 2 chicks.

During the past year, work on nesting behaviour has been much enhanced by the use of video-cameras inside the nests. We are slowly building up a useful set of information on interactions between adults and their chicks within the nest and are especially interested in the role of cockroaches. Since adults do not remove fecal sacs, we suspect that these are eaten by cockroaches. However, we also suspect that when cockroach numbers get out of control they can end up killing newly hatched chicks.

Earthwatch observers have provided us with valuable background data for understanding the growth, development, and survival of Scarlet Macaw chicks. We are just now beginning to explore in depth the data on nest attendance, reproductive success, chick growth, and nest types. The interrelationships among these data sets will provide a great deal of novel insight in to the reproductive ecology of this species and psittacines (parrots) in general.

Clay lick research

Clay lick use is strongly seasonal and documenting these patterns and their causes has been a major focus of the research to date and is one of the most colourful and entertaining project activities. For the first time, we have monitored multiple clay licks along the length of the Tambopata River to determine if the patterns identified at the Tambopata Research Center are observed at other sites in the region. We have found that monthly variation in parrot use is also observed at three clay licks on the lower Tambopata River (Figure 1 above, p.5). These three clay licks are all located within 2km of each other as the parrot flies. Due to their proximity, the local parrot community has access to all of these licks, and so for the purposes of our analysis we refer to these three licks as a clay lick complex. Despite combining the monthly feeding for the complex, total feeding was still greatest at the clay lick associated with the Tambopata Research Center.

Parrot use of the clay lick at Posada Amazonas between 2006 and 2007 is little changed. For species where changes have been observed we suspect that the change in feeding rate represents a shift in to another geophagy (eating earth or clay for its nutrients) site as we have no reason to believe that the species is undergoing any changes in its local abundance. We have shown that tourist presence and numbers have little to no impact at any of the clay licks visited. However, boat traffic continues to have an impact. We have now approached some offending tourist companies and presented information on their boat behaviour. They have been happy to recognise the problem and commit to changes in their behaviour around the clay licks.

2. Conservation impacts

Information collected by the project has all been fed back directly to the tourist companies collaborating with our research, and to the Peruvian government. The personnel of the macaw project have also maintained a year-round presence at the clay licks of Posada Amazonas, Refugio Amazonas, Tambopata Research Center, and make sure that the company's actions have the minimum impact possible on the activity of the birds at the clay

lick. Through interaction and information dissemination to the local communities, the project presence continues to work towards the conservation of this very special family of birds.

3. Benefits of Earthwatch supported research

- Local (to the area of the research site)

The project offers placements to local students, and employment. Further local benefits include community work emphasizing the importance of clay licks and parrots to the tourism industry, education through talks and local reports. We have been in frequent contact with local communities (especially the Native Community of Infierno), government authorities and ecotourism companies to make sure they receive relevant results from our research and can apply this information to help them manage their wildlife resources.

- National / Regional

Annual reports are provided to INRENA by both Donald Brightsmith and Alan Lee, focusing on different aspects of the large volume of macaw project research. Most recent reports have documented the impacts of tourism and general boat movements on bird behaviour around tourist towers, visitation rates by birds to the clay lick at Posada, and a wide variety of themes including reproductive success, and satellite telemetry.

- International

Information collected in Peru as part of this project has been used extensively in the last few years to advise international projects on macaw and parrot conservation. During 2007 – 2008, Donald Brightsmith has attended meeting to advise conservation projects on Scarlet Macaws in Guatemala, Great-green Macaws in Central America, Scarlet Macaws in Belize, Spix's Macaws and Lear's Macaws in Brazil. The research from Peru and other parrot related research conducted by Donald Brightsmith and his collaborators have been increasingly published in the scientific literature where it has impacted parrot conservation research throughout the world.

Communication of results for the 2007 – 2008 period.

Printed:

Berger, E. 2007. Parrot Preservation at A&M: Threatened birds may find a shot at survival in Texas. Houston Chronicle Nov 26 2007: Pages B1, B3.

Brightsmith, D. J. 2007. The Blue-headed Macaw: beauty, science, and conservation in action. AFA Watchbird 34.

Brightsmith, D. J. 2008. Rainforest Expeditions and Earthwatch as funding partners for Macaw (*Ara* spp.) research in southeastern Peru. Neotropical Ornithology 19 (supplement):173-181.

Brightsmith, D. J. Submitted May 2008. Soil eating by parrots: the real dirt. Association of Avian Veterinarians Clinical Forum.

Brightsmith, D. J., K. M. Holle, and A. Stronza. 2008. Ecotourism, Conservation Biology, and Volunteer Tourism: a mutually beneficial triumvirate. Biological Conservation.

Brightsmith, D. J., C. Caillaux Araujo, A. Sánchez González, and G. Vigo Trauco. 2008. Ecología Reproductiva y uso de Colpas de Guacamayos en Madre de Dios. Report to INRENA. Schubot Center at Texas A&M, College Station, Texas.

- Brightsmith, D. J., D. Matsufuji, D. McDonald, and C. A. Bailey. Submitted May 2008. Nutritional content of free-living Scarlet Macaw chick diets in southeastern Peru. *Journal of Animal Physiology and Animal Nutrition*.
- Brightsmith, D. J., P. Mendoza, and K. Quinteros León. 2007. *Ecología Alimenticia y Salud de Psitácidos en Madre de Dios - Perú. Informe Anual a INRENA*. Annual report to INRENA, Schubot Exotic Bird Health Center, Texas A&M University, College Station, Texas.
- Brightsmith, D. J., J. Taylor, and O. L. Phillips. 2008. The roles of soil characteristics and toxin adsorption in avian geophagy. *Biotropica* **40**:766-774.
- Butron, O. 2008. Evidencia de *Salmonella* spp. en psitácidos silvestres y aves domésticas de la Reserva Nacional Tambopata. Professional Thesis, Universidad Peruana Cayetano Heredia, Lima, Peru.
- Butron, O., and D. J. Brightsmith. Submitted May 2008. Prevalence of *Salmonella* spp. in released parrots, wild parrots and domestic fowl in lowland Peru *Journal of Wildlife Diseases*.
- Cáceres, A. and Brightsmith, D. J. 2007. Wild Discovery in Peru: Green-winged macaw pair treats scarlet chick as one of its own. *Bird Talk Magazine* Oct 2007:40 – 43.
- Gebhardt, K. J., D. J. Brightsmith, G. Powell, and L. P. Waits. Submitted Sep 2008. Maximizing DNA yield from molted feathers: a case study of parrots in the Peruvian Amazon. *Journal of Field Ornithology*.
- Lee, A. T. K. 2008. Censo de Loros y Guacamayos en el Río Tambopata, Annual report for INRENA.
- Lee, A. T. K. In press. Wild parrots and their feeding habits in the Peruvian rainforest. *Parrot Society UK*.
- Lee, A. T. K., S. Kumar, D. J. Brightsmith, and S. Marsden. Submitted Oct 08. Parrot claylick distribution in South America: do patterns of where help answer the question why? *Global Ecology and Biogeography*.
- Matuzak, G., B. Beazy, and D. J. Brightsmith. 2008. Foraging ecology of parrots in a modified landscape: seasonal trends and introduced species. *Wilson Journal of Ornithology* **120**:353-365.
- Matuzak, G., and D. J. Brightsmith. 2007. Roosting of Yellow-naped Parrots in Costa Rica: estimating the size and recruitment of threatened populations. *Journal of Field Ornithology* **78**:159-169.
- Renton, K., and D. J. Brightsmith. In press. Resource partitioning of cavities, nest success, and reproductive output of large macaws. *Journal of Field Ornithology*.
- Shwartz, D. February 2007. Donald Brightsmith: a new species of conservationist. *Parrots Magazine*, UK.
- Tobias, J. A., and D. J. Brightsmith. 2007. Distribution, ecology and conservation status of the Blue-headed Macaw *Primolius couloni*. *Biological Conservation* **139**:126-138.
- Vigo Trauco, G. 2007. Crecimiento de pichones de Guacamayo Escarlata, *Ara macao* (Linneus: 1758) en la Reserva Nacional Tambopata - Madre de Dios - Perú. Universidad Nacional Agraria La Molina, Lima, Peru.

Digital:

Links to Earthwatch volunteer created photos and videos have been placed on Rainforest Expeditions website News feed (<http://www.perunature.com/pages/blog.php>)

Creation of Tambopata Macaw Project group on Facebook (www.facebook.com)

Donald Brightsmith's publications are available at: vtpb-www2.cvm.tamu.edu/brightsmith

Alan Lee's reports and student work affiliated through the project are available at: www.macawmonitoring.com/researchreports.html

Mass media:

April 2008 A. Lee was interviewed for BBC radio4 program "World on the Move".

Talks and Scientific Presentations:

Brightsmith, D. J., R. Bjork, J. Boyd, R. B. McNab, G. Vigo, V. H. Ramos, R. Garcia. November 2008. Telemetría Satelital para Psitácidos Grandes: un recuento. Oral presentation to be presented at the Sociedad Mesoamericana para la Biología y Conservación y IV Simposio Mesoamericana de Conservación de Psittaciformes in El Salvador.

Brightsmith, D. J. November 2008. Aviculture and Conservation: a call to arms a cry for help. Oral presentation to be given to the Southwest Avian Symposium. Houston Texas.

Brightsmith, D. J. September 2008. Useful techniques in parrot conservation research. Oral presentation to the Population Habitat Viability Analysis seminar for the Great Green Macaw in La Selva, Costa Rica. 30 people.

Lee, A.T.K., Kumar, S., Marsden, S.J. & Brightsmith, D.J. September 2008. Parrot clay lick distribution in South America: Do patterns of where help answer the question why? Poster presented at the Manchester Metropolitan University Annual Student Conference.

Brightsmith, D. J. August 2008. The psittacine year: Natural history cycles in Peruvian parrots. Oral presentation to the annual meeting of the Association of Avian Veterinarians. Savannah, Georgia. 70 people.

Mendoza, A. P., R. Elias, and D. J. Brightsmith. August 2008. Infectious diseases in the live bird trade in Peru: Monitoring global threats. Oral presentation to the annual meeting of the Association of Avian Veterinarians. Savannah, Georgia. 70 people.

Brightsmith, D. J. August 2008. Nutrition research at the Schubot Exotic Bird Health Center, Texas A&M University. Oral presentation to the annual meeting of the Association of Avian Veterinarians. Savannah, Georgia. 50 people.

Brightsmith, D. J. July 2008. The psittacine year: Natural history cycles in Peruvian parrots. Oral presentation to the Feener School of Environment and Society, Australian National University, Canberra Australia. 35 people.

Brightsmith, D. J. July 2008. The psittacine year: Natural history cycles in Peruvian parrots. Oral presentation to the Canberra Ornithological Society, Canberra Australia. 75 people.

- Brightsmith, D. J. July 2008. Aviculture and Conservation: a call to arms a cry for help. Oral presentation to the Parrot Society of Australia. Brisbane, Australia. 90 people.
- Brightsmith, D. J. July 2008. The Tambopata Macaw Project: Nesting and nutrition in the rain forests of Peru. Keynote oral presentation to the Parrot Society of Australia. Brisbane, Australia. 90 people.
- Brightsmith, D. J. July 2008. The psittacine year: Natural history cycles in Peruvian parrots. Oral presentation to the Parrot Society of Australia. Brisbane, Australia. 150 people.
- Brightsmith, D. J. May 2008. Tambopata Macaw Project: Eight years of ecology, conservation and creative financing. Oral presentation to the The Annual Conference of Parrots International. Los Angeles, CA. 120 people.
- Vigo, G. and D. J. Brightsmith. May 2008. Scarlet Macaw chick growth in Tambopata, Peru. Poster presentation to the The Annual Conference of Parrots International. Los Angeles, CA. 120 people.
- Brightsmith, D. J., April 2008. Conserving parrots through ecotourism and conservation science. Oral presentation to Conservation Horizons at Texas A&M University. 50 people.
- Brightsmith, D. J. April 2008. Macaw and parrot research in Tambopata, Peru: Nesting and reintroduction. Oral presentation given to the monthly meeting of Green Vets at Texas A&M University. 75 people.
- Brightsmith, D. J. March 2008. Scarlet Macaw reintroductions in Peru and Costa Rica. Oral presentation given to the meeting of the Scarlet Macaw restocking advisory group in Guatemala City, Guatemala. 20 people.
- Brightsmith, D. J. February 2008. Macaw and parrot research in Tambopata, Peru: Nesting, diet, disease, and reintroduction. Oral presentation given to the Conservation Medicine class at Texas A&M University. 12 people.
- Brightsmith, D. J. February 2008. The psittacine year: Natural history cycles in Peruvian parrots. Oral presentation given to the Conservation Medicine class at Texas A&M University. 12 people.
- Brightsmith, D. J. February 2008. Wildlife trade and the danger of emerging infectious diseases. Oral presentation given to the Conservation Medicine class at Texas A&M University. 12 people.
- Brightsmith, D. J. Nov 2007. The Psittacine Year: Geofagia, fenología y "migraciones": patrones anuales y roles en la vida de los psitácidos del Perú. Plenary session presented to the Sociedad Mesoamericana para la Biología y Conservación y III Simposio Mesoamericana de Conservación de Psittaciformes in Oaxtapec, Mexico. 150 people.
- Brightsmith, D. J. May 2008. Tambopata Macaw Project: Eight years of ecology, conservation and creative financing. Plenary presentation to the III Simposio Mesoamericana de Conservación de Psittaciformes in Oaxtapec, Mexico. 45 people.
- Brightsmith, D. J. November 2007. The Tambopata Macaw Project: Science and conservation in the rainforests of Peru. Oral Presentation to the Brazos Valley Audubon Society, College Station, Texas. 30 people.

- Brightsmith, D. J. October 2007. The psittacine year: Natural history cycles in Peruvian parrots. Oral presentation given to the South Texas Avian Symposium. College Station, Texas. 45 people.
- Brightsmith, D. J. August 2007. The Psittacine Year: Geofagia, fenología y “migraciones”: patrones anuales y roles en la vida de los psitácidos del Perú. Oral Presentation given to the Instituto Venezolano de Investigaciones Científicas, Division de Ecología. Caracas, Venezuela. 40 people.
- Brightsmith, D. J. June 2007. Clay licks of Tambopata, Peru. Oral presentation given to the staff and guests of Sandoval Lake Lodge, Tambopata, Peru. 40 people.
- Vigo Trauco, G. June 2007. Crecimiento postnatal del Guacamayo Escarlata (*Ara macao*: Linnaeus 1758) en la Reserva Nacional Tambopata - Madre de Dios. Thesis defense for the title of Biologist: Universidad Nacional Agraria La Molina. 20 people.
- Brightsmith, D. J. May 2007. Earthwatch, ecotourism, and conservation science: a mutually beneficial triumvirate. Oral presentation given to the Neotropical Ornithological Conference, Maturin, Venezuela. 60 people.
- Brightsmith, D. J., J. Taylor and T. D. Phillips. May 2007. Parrot geophagy: soil characteristics and soil consumption. Oral presentation given to the Neotropical Ornithological Conference, Maturin, Venezuela. 60 people.
- Vigo Trauco, G. and D. J. Brightsmith. May 2007. A photographic guide to aging nestling Scarlet Macaws (*Ara macao*). Poster presentation given to the Neotropical Ornithological Conference, Maturin, Venezuela.
- Brightsmith, D. J. March 2007. Scarlet Macaws reintroductions in Peru and Costa Rica. Alamo Exhibition Bird Club. San Antonio, Texas. 25 people.
- Brightsmith, D. J. April 2007. The psittacine year: Natural history cycles in Peruvian parrots. Oral presentation given to the Annual meeting of Parrots International. Los Angeles, CA. 90 people.
- Brightsmith, D. J. January 2007. The Tambopata Macaw Project: Nesting and nutrition in the rain forests of Peru. Oral presentation to the NPRPF Parrot Festival. Houston Texas. 130 people.

Educational Opportunities

The following students receive support from the Tambopata Macaw Project:

Gabriela Vigo Trauco completed her biology thesis for the Universidad Nacional Agraria La Molina entitled “Growth of Scarlet Macaw chicks in the Tambopata National Reserve – Madre de Dios, Peru.”

Oscar Butron completed his veterinary thesis for the Universidad Peruana Cayetano de Heredia entitled “Evidende of *Salmonella* spp. in wild psittacines and domestic birds of the Tambopata National Reserve.”

Daphne Matsufuji Sagawa (Masters student at La Molina, Lima, Peru) Artificial nest box design and breeding biology of smaller parrot species in southeastern Peru

Yesenia Quispe (Thesis student, UNAMAD, Puerto Maldonado, Peru) Impacts of tourism on bird behaviour along trail systems and associated with canopy towers

Peter Cowen (Manchester Metropolitan University, UK) The importance of secondary habitat as a seasonal food source for the parrot family in southeastern Peru.

Alan Lee (Manchester Metropolitan University, UK). The impacts of geophagy sites on parrot abundance and ecology in southeastern Peru

In addition, project members continue to give talks to tourists at the Rainforest Expedition lodges and at the local schools and universities.

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