Pionus Parrots Research Foundation

The Fat Parrot

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PPRF Announces Formal Study

The PPRF is pleased to announce that the first formal study of wild Pionus parrots will commence on July 2004 in Mindo, Ecuador.

Coral-billed Pionus eating guayaba in the Mindo Valley. Photo by Vinício Pérez.

The PPRF began its work with an informal preliminary study consisting of 6 trips to Ecuador's Mindo Valley. Four species of Pionus parrots reside in the valley. Over a five year period we have positively identified the most important food sources of these parrots, have identified breeding locations, have recorded a variety of behaviors, debunked the popular height-dominance theory as applied to Pionus parrots, and have identified Bronze-winged roosting areas. In addition, photographic methods have been refined to enable researchers to record details of the daily lives of Pionus parrots.

The three-year study will focus on how Pionus parrots in the valley interact with agricultural crops, specifically corn. To that end, the PPRF secured a three-year rental of a cornfield in a secluded section of the valley. The field was planted on May 17, 2004. Two blinds have been constructed at the edges of the field to enable field workers to observe, photograph, videotape, and sound record without being detected by the normally-cautious Pionus parrots. Much of the avicultural information available to us claims that Pionus parrots are notorious for raiding and destroying farmers' corn crops. Our preliminary work in the Mindo Valley, however, suggests that this claim may be unfounded. This study will help to establish once and for all whether or not the birds deserve their present reputation.

In addition, researchers will be able to verify aspects of Pionus behaviors identified in the preliminary study, namely the rigid schedule these birds maintain and their use of sentinels to assure the safety of the all-important flock.

In This Issue...

Angels Needed

Folks, there is some special equipment we will need to make our three-year research project in Mindo, Ecuador a success. If you or your club are looking for a way to make a meaningful contribution, or if you just happen to have access to some unused equipment, we'd sure appreciate your help. Here is a list of items we can use:

1) We need two handheld GPS units that can link to a laptop computer through a USB or serial port. We don't care what brand they are as long as they work and operating instructions are available. We have two Magellan units now, but they do not link to a computer. We'd even consider trading our units to someone who has downloadable units that offer more features than they need.

2) A digital videocamera.

3) A Minidisc DAT recorder with microphones suitable for outdoor use.

4) Leica Televid T77APO spotting scope with zoom eyepiece (Swarovski and Kowa also make similar scopes - the lenses MUST be coated and the body should be sealed so that it can be nitrogen charged).

5) A 5 megapixel digital camera with a 56K or higher memory card.

6) Write-in-the-Rain field notebooks.

7) Bicycles. We will buy these in Ecuador and they will be used by the field team to travel from their housing accommodations to the research site.

If you can provide any of these items or have questions you'd like answered, feel free to get in contact with Russ at rshade@fast.net. You can call me at home after 7PM Eastern Time at 610-767-8595, and at my cell phone anytime (484-894-5368).

Budget.

Here is the breakdown of costs the PPRF will have to cover for the first year of our three year study.

Salaries and Airfare - $3400.00 The Study Director will receive a stipend. The Study Director's airfare will be paid by the PPRF as will a portion of Janine Spencer's airfare. David Wilson is paying all of his own tavel expenses.

Transportation in Ecuador - $175.00 Covers one vehicle trip to Mindo to deliver equipment as well as bus costs for the science staff and taxi fares to and from the airport)

Housing/Food in Quito - $500.00 Covers one night each at the beginning of the trip for Joe, David, and Janine. An additional 4 nights are included for David to use for "time-off."

Housing/Food in Mindo - $3800.00 This figure covers 12 weeks of accommodations (6 weeks for David, 3 weeks each for Joe and Janine) based on a total rate of $45.00/day (includes the 22% IVA tax). We may be able to reduce this figure after some negotiation.

Research Site Fees Mindo - $600.00 $200.00 remaining for 2004 and $400.00 deposit due for 2005.

Total costs (excluding equipment costs) Mindo - $8475

Obviously, we need everybody's help. Please visit the www.fatparrots.org where you can make a donation using PayPal or mail your donation to Margrethe Warden, Treasurer, PO Box 490302, Lawrenceville, GA 30049

Bronze-winged Pionus parrot eating an Inga pod. Photo by Vinicio Perez

Digiscoping

By now I'm sure you're wondering about all the fantastic photographs contained in this issue of The Fat Parrot. If you've seen some of our presentations at AFA and other bird club activities, you've heard me Comment about how difficult it is to get good pictures because of the low light and high humidity conditions we encounter in the cloud forests of the Andes.

Camera lenses, because of their design and the nature of glass, reduce the light coming into a camera lens s with the end result being that the images recorded on film are far darker than they actually appear in the field. The solution was to create special high speed lenses.

But as a lens becomes faster and faster (that is, gathers more light) the cost of the lens increases dramatically. Since Pionus parrots and wild Pionus parrots in particular are wary of people coming too close, we were forced to use longer and longer lenses - and the costs of high speed long lenses is prohibitive for an organization like the PPRF. It is not unusual for some 600 - 1200 mm lenses to cost in the tens of thousands of dollars - they are very heavy and not fun to drag up and down the Andes, and they are very delicate - not the sort of equipment that fares well in a cloud forest environment.

When digital cameras began to be more widely-used, many photographers lamented that there seemed to be no way to use film camera lenses to capture digital images. As digital cameras became better in quality (there are now digital cameras in the $300-500 dollar range that capture images at a resolution of 5 megapixels), some folks began experimenting with spotting scope optics.

Common sense tells us that the larger the objective lens (the first lens that light reflected off an object passes through, the more light can be captured. For years birders (and the PPRF) have been using spotting scopes with objective lenses in the 60-80mm diameter range to see birds in low light conditions. So one day, somebody tried holding a digital camera up to the eyepiece - and digiscoping was born.

Spotting scopes, especially of the size we're talking about, have their problems too. Because the image is magnified some 20-

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60 times, any inconsistencies in the lens makeup or shape also gets magnified. And when light waves are bent as they pass through an objective lens and then carried for a long distance (some 10-12 inches) they do not always reform properly when passing through the eyepiece.

Thus, like high speed camera lenses, lenses must be very carefully polished. There are special coatings to help assure proper color reproduction and the tubes of these scopes must be charged with nitrogen to keep moisture (which can cause light waves to bend n an unpredictable manner) away from the lenses. These special spotting scopes cost in the range of $1000-$2000 depending on the brand selected. But a film camera lens with the same light handling characteristics would cost in the range of $12,000-$15,000.

Vinicio Perez shot all of the photos that appear in this isue with a Leica Televid T77 APO spotting scope. That scope with a zoom eyepiece retails anywhere from $1500-$1900 here in the US. There are other brands such as Swarovski and Kowa who make comparable scopes with angled, zooming eyepieces and special lens coatings which will enable us to get pictures that rival the quality of a 1000mm high speed film camera lens.

But these scopes are highly effective in the type of conditions we work in. As you can see from the photos in this issue, with a scope like this (as well as the Celestron scope we use now) we can observe aspects of Pionus behavior never seen before.

Managing Director's Notes

This is most certainly an historic time for the PPRF. While many of our supporters may have thought that the organization was fading from view, we're happy to give you this newslettter with all of its groundbreaking information.

I traveled to Mindo in early May this year to oversee the planting of our research cornfield and observation blinds for the formal study which will begin in just a few weeks. During that trip, I saw more Coral-billed Pionus parrots than I have seen on ANY trip. We also found Bronze-wingeds sitting in trees eating... Inga pods. And the best part is that we have perfected a photographic method that is already starting to provide the most revealing wild Pionus Parrot pictures ever taken anywhere by anybody - just look at the amazing photos included with this issue! What excited us the most is that we saw and photographed all of these birds less than 500 yards from our research site.

The town of Mindo is changing rapidly - in the last year the access road was paved and a dozen or so new hotels have started business in the town itself. The population is rising and the demands on the environment are increasing steadily. Still, the Pionus parrot flocks in the valley continue to flourish, yet another sign to me that this genus of parrots should be the "poster child" of aviculture.

The PPRF has recently produced a slide show that describes our work, what we've accomplished already and what we hope to do in the future. You can find out in this issue how to see that show at your local bird club.

The PPRF will be fundraising for the next few months; you can see the study budget and equipment requests included in this issue. This work is extremely important because if we can have a successful first year, we will have established a history that will make it easier for us to get institutional grants next year. Take your newsletter with you when you visit other people (you'll be able to download a color version of the newsletter at the fatparrots website). Sometimes I'm surprised when I mention my trip and someone wants to know more. For example, one of the pharmacists at the drugstore I frequent wants to know more about getting involved with

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the fieldwork. The store where I get my film developed after I return from Mindo has several clerks who have inquired about accompanying us just for the chance to do some cloudforest photography. If you meet someone who shows interest, invite them to join the PPRF. Offer them a copy of the newsletter (or show them where to download it). Ask them to consider supporting the project with a contribution - large or small, or "in kind." We could easily fund this study if four to five hundred people each gave us $20.00. If each PPRF member would contribute personally and interest four other nonmembers to contribute, the study would be completely funded.

By the way, we should dub the research field as the John Leydecker Cornfield since it was a half-joking comment made by John during the rain-soaked and mosquito-laden experience in November 1999 which led to the PPRF and... a rented cornfield!

Science Team

The PPRF has as its mission to conduct joint amatuer/professional studies of Pionus parrots. Each trip that we take and all research we conduct is done by teams of scientists, and aviculturists. For our first formal study, it's important that the study be designed properly so that the data we collect will serve to enrich BOTH the science and aviculture community.

Study Director **Joseph Engler** is a wildlife biologist with the U. S. Fish & Wildlife Service at the Ridgefield National Wildlife Refuge where he is responsible for the development, coordination, and implementation of field programs on 5 wildlife refuges in the American West. He previously worked at two other wildlife refuges in California and Utah where he conducted population surveys, habitat surveys, endangered species surveys and raptor surveys. He also trains and supervises other biologists and volunteers who participate in these projects. HE writes funding proposals and implements research projects using agency, interagency, and private consultants and leads field trips and banding demonstrations for college students, teachers, and other interested groups.

Joe also has a background in GPS (including software), radio telemetry, Passive Integrated Transponder systems, and has received the National Audobon Society's William Dutcher award in 1994 as well as USFWS Superior Performance and Achievement Awards at least five times during the past decade. He's led birding tours in Mexico, Guatemala, and Costa Rica. In 2003 he traveled to Mindo to work with the PPRF. Joe has earned a B. S. in Horticulture from the University of Maryland and a B. S. in Wildlife Science from Pennsylvania State University.

Joe has a unique perspective because he keeps Pionus parrots in his home as well, so he has both a personal and professional interest in the work of the PPRF. Joe is skilled in digital camera usage as it pertains to wildlife. His other interests include dragonflies and similar insects so during his trip to Mindo he kept busy during off hours investigating the many unusual insects found there. We are quite fortunate to have a scientist with Joe's background and interests working with us.

Field biologist **David Wilson** is a Ph. D candidate at Australian National University. He earned his Bachelor of Environmental Science from Adelaide State University. David has experience conducting bird surveys, radio tracking, GPS/GIS systems, and bird handling. For the past two years he has been involved in a monitoring project involving Eclectus parrots. In addition he has worked on a variety of research projects including the Pink-lipped Spider orchid, the effects of kangaroo harvesting on ecosystem dynamics, and habitat use and re-introduction potential of the Southern emu-wren.

David has been the recipient of the Australian National University's postgraduate award scholarship, the Vacation Scholarship provided by the Western Mining Corporation, the A. R.

Science Team *continued from page 5*

Riddle Scholarship for excellence in Environmental Biology, and the Ena Orrock Lewcock award for excellence in biology. HE has published his work in a variety of scientific journals.

Like Mark Ziembicki, Ph. D, who assisted us on our first trip in 1999, David is spending a year doing volunteer work with neotropical bird research in South America. He is presently working in Venezuela and will join the team in Ecuador in mid-July.

Another goal of the PPRF is to involve promising researchers with our work on Pionus parrots in the hope of inspiring future generations to continue with the research. To that end, David is our first "success story" since it was Mark who suggested to David that he become involved with our work.

Field biologist **Janine Spencer** has been a PPRF member for five years and has accepted the responsibility of writing the formal study for this project. In addition, she will be taking time off from her fulltime job to join us in Mindo.

Janine has been a wildlife biologist for 15 years. She has a B.S. degree from Oregon State University and an M.A. degree from Prescott College. She has worked as a bird biologist since 1992 in the southwestern U.S. She has monitored, surveyed, and/or designed habitat protected areas for several threatened, endangered, or sensitive species which include peregrine falcons, bald eagles, southwestern willow flycatchers, Yuma clapper rails, northern goshawks, burrowing owls, Mexican spotted owls, yellow-billed cuckoos, cactus ferruginous pygmy owls; as well as other species such as Sonoran desert tortoise, black-footed ferrets, and protected plant species. She has experience identifying birds of the southwest by sight and sound, in both desert and high elevation forest communities. She writes Biological Evaluations and works under the National Environmental Protection Act (NEPA) to evaluate project impacts to protected flora and fauna using Environmental Assessments. She has worked with federal and state government agencies, National Guard properties, municipalities, power companies, and private enterprise to make sure they are in compliance with the laws that protect our natural resources. Janine took Spanish Immersion classes in the cloud forest of Monteverde, Costa Rica and she is a companion to several parrots in her home in Tucson. She is an experienced outdoors person who is used to working in high temperatures, high humidity, swamps, and deserts, and she has an avid interest in parrots both as an ornithologist and as a companion parrot person. She has been a member of Pionus Parrot Research Foundation for several years.

Volunteer Field Workers Needed

If you're an aviculturist or birder over 18 with an interest in acquiring first-hand knowledge of how parrots live in the wild, then the PPRF has an opportunity for you. The PPRF charter commits us to conducting joint scientific/ avicultural studies. WE have the scientists lined up - now we're looking for some interested aviculturists and birders.

We're looking for some individuals who would like to spend a week or more (up to six) participating in our upcoming study in Mindo, Ecuador. Your work would consist of sitting in an observation blind and recording the activities of the Pionus parrots that visit our research cornfield. If you're a person who likes to explore, we can also use some folks willing to walk to other locations in the valley to record Pionus parrot behavior in areas away from the research site. The data you record will be included in the paper the PPRF will publish at the end of the study three years from now.

US citizens do not need visas to visit Ecuador as long as

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they have a valid US passport.

Ecuador is a beautiful country. Quito is a large, international city that was once the center of the Inca Empire. You'll stay in Quito overnight then board a bus for the four hour trip to Mindo the next morning. In Mindo you'll be staying at one of two hotels designed especially for foreign visitors. You'll have gourmet quality meals, tile floors, and one of the richest environments on earth. The climate in Mindo is mild - 55-75 degrees. You'll be in a BirdLife Internation IBA (important bird area) which is home to some of the best birding available in South America, so if you're a birder, expect to make some additions to your life list! In addition to Pionus parrots, you'll see several varities of conures, parrotlets, over 30 species of hummingbirds, tanagers, king birds, pygmy owls, quetzals, squirrel cuckoos, toucans, barbets, etc.

Your costs? Roundtrip airfare to Quito from the US varies from $400-$900 (go to www.cheaptickets.com for the best deals). Your hotel in Quito on the nights of your arrival and departure will be around $30.00 per night for a single. You can eat quite well in Quito for $15.00 a day. In Mindo, your room and board should be $300 or less per week. Ecuador uses the US dollar as currency, so there's no reason to exchange money. Additionally, prices are significantly lower in Ecuador especially for leather and woven goods so if you like to shop, you can find some great bargains. If you are a member of a bird club, consider asking your club to contribute to the experience either by helping you with your costs or, if that's not necessary, by making a contribution to the PPRF to help cover the other costs of the study.

As far as equipment goes, bring along a pair of binoculars and a camera (digitals will work best). A light nylon raincoat will be useful; because of the high humidity in the cloudforest, clothes can take three to four days to dry. While insects are generally not a problem, you should take along a non-aerosol repellant (or purchase one in Quito) that contains DEET to repel the black flies that sometimes get a little enthusiastic. You'll be just a few miles south of the equator, bring some powerful sunscreen - I use an SP45. Good hiking boots/sturdy shoes are a must and a field hat will also come in handy. Other equipment that will come in handy but is not absolutely necessary woul be a GPS device (preferably one that can download into a computer), an altimeter/barometer watch, and a Write-in-the-Rain note pad for recording data. If you want to bring a camera tripod and your personal spotting scope, feel free to do so. We will also have internet access available, so if you can't travel without your laptop, feel free to bring it along.

If you're interested or have further questions, feel free to contact Russ Shade via email at rshade@fast.net. You can call him at home after 7PM Eastern Time at 610-767-8595, and at his cell phone anytime (484-894-5368).

PPRF Slide Show

Need a program for your next Bird Club meeting? The PPRF can help.

We converted one of our Powerpoint presentation onto photographic slides you can use to show your club the work that is being done by the PPRF. We'll be happy to loan you the slides for your next meeting — we have two sets. The only thing that we ask in return is that you pay the postage costs and include a small donation to the PPRF to help fund its work.

If you're interested in borrowing the slides, contact me at rshade@fast.net for more information.

Draft - Study Plan for Pionus Parrot Research Foundation: Pionus Parrot Species Diet and Natural History

Introduction

Many species of parrots are considered agricultural pests, especially in Australia and in the Neotropics (Halse 1986, Forshaw 1989). "In Latin America conflicts between man and parrots began with pre-European cultures…Scenes of parrots eating corn or being frightened away from crops are found in the Incas' pottery [as seen] in the Anthropoligical Museum of Lima, Peru" (Bucher 1992). "Charles Darwin was told that Monk parakeets (*Myiopsitta* monachus) were killed by the thousands along the Uruguay River to prevent crop damage when he visited Uruguay in 1833" (Darwin 1833 *in* Bucher 1992). Parrots are being seen as crop pests increasingly in the neotropics as agricultural endeavors have moved into what was previously remote, forested land.

According to Bucher (1992), Damage by parrots tends to be

(1) Exaggerated because these birds are conspicuous and noisy and are therefore easy to detect. There is a worldwide tendency to overstate bird damage by farmers (Dyer and Ward 1977).

(2) Damage is irregularly distributed in time and space; usually a few plots are severely damaged and many are left slightly damaged or untouched (Id., Bucher 1992), and as a result, damage at a regional level is usually minimal.

(3) Damage is commonly associated with agricultural frontiers. The expansion of agriculture into previously forested areas is accelerating in Latin America and provides a combination of feeding habitat (crops) and nesting habitat (forest patches).

(4) Damage is usually related to poor agricultural practices. Cultivation of marginal lands and plots with open spaces and low plant density or those that are left unharvested long after ripening are most likely to be affected.

Parrots have a few characteristics that are conducive to their activity as agricultural pests, such as being opportunists with high intelligence, much like ravens, and their flocking and communal grouping during non-breeding season. However, overall, parrots are not well-adapted to crop depredation, be-

cause of characteristics such as low reproductivity, the length of time to breeding age, a well-defined breeding period, and strict nesting habitat requirements (for example, cavities or cliffs) (Bucher 1992). "Neotropical parrots appear in general to be weakly adapted to exploit ephemeral resources such as crops, and can not sustain heavy losses such as those resulting from pest control practices. Unfortunately, lethal methods of control are usually employed first (Id.). Parrots are unique in their role as bird pests because some of the species are endangered and they often are valued as pets as well. "In many provinces no clear distinction has been made between parrot species. The classification 'parrot' has been used in legislation without any further taxonomic specification (Reynoso and Bucher 1989).

Bucher (1992) recommends a non-lethal, strategic approach to parrot control as crop pests. His first recommendation is that the damage be evaluated to determine whether it is significant enough to justify action. He recommends substituting less susceptible crops; planting crops nearby that lure or divert the birds; deterring the birds from the crop by visual, sound (such as recorded parrot distress calls), or taste repellants; patrolling, often done by children; and compensation for damage (which entails more time for damage assessment). Bucher also recommends "establishing a regional pattern of occurrence and intensity of damage in order to separate problems that affect a whole regional economy from isolated cases that, even if severe, are not regionally significant." Bucher (Id.) goes on to recommend specific alternatives, their cost-effectiveness, and environmental impact, based on the amount of damage and other factors.

Mauro Galetti (1993) reported that *Pionus maximiliani* in southeastern Brazil exhibited a generalist and seasonal diet that included 7.7 % corn from plantations that surrounded the semi-deciduous forest. J. Stoodley also referred to corn as a part of the *Pionus* diet, in his book, *Pionus* Parrots (1984). Bucher (1992) listed the scaley-headed parrot (*Pionus maximiliani*) as sporadically affecting citrus and sunflower crops and as frequently affecting corn crops (Id; Table 1 pg. 204). There is little other research related specifically to *Pionus* parrots as crop pests. Observations of foraging behavior of parrots in Neotropical forests are difficult, since many species are relatively rare and/or secretive (Karr 1975; 1990) and parrots are highly mobile, which can hinder observations of behavior. Karr (1990; pg. 58) stated that "Much theory in ecology proceeds from assumptions about the relationships among organisms and their foods. We believe that the aforementioned uncertainties justify caution in acceptance of general statements…about neotropical birds." PPRF questions this assumption of *Pionus* as significant pests in corn fields, since so little study has been conducted on this topic.

PPRF Preliminary Research

The Pionus Parrot Research Foundation (PPRF) has conducted preliminary studies of three species of *Pionus* in Mindo, Ecuador; the Bronze-winged Pionus (*Pionus chalcopterus*), the White-headed Pionus (P. *seniloides*), and the Coral-billed Pionus (*P. sordidus*). PPRF made their first trip to the area in November, 1999, to identify flocks of Bronze-winged Pionus, record behaviors, and obtain general information on diet. During this visit, *Pionus* species was only observed in the cornfield on one occasion out of 1,321 sightings.

The second trip, in January, 2001, identified active nesting sites of Bronze-winged Pionus, recorded breeding-related activities, and obtained additional diet information. The parrots were sighted eating heavily at an *Inga* species planting, at a time that coincided with the onset of breeding season. This observation correlates with Galleti's (1993) observations that the parrots eat the fruits (seed pods) from September through March. The *Inga* seeds are 18.9 percent protein by weight, and

the pods have a protein level of 10 to 12 percent (Duke 1983). Klasing (1998) and Stutchbury and Morton (2001) described the strong need birds have for increased protein ingestion prior to and during chick feeding.

Past observations by PPRF on both trips to Mindo indicate that damage to corn ears was concentrated in small areas of approximately ½ inch at the top of the ears, possibly suggesting that whatever was eating the corn may have been targeting grubs rather than the corn itself. Rough estimates of damage were 10 to 14 percent of the total crop. There was scant proof of corn grub infestation, although this pest is a significant problem in corn fields in North America. Local farmers queried during visits reported that Bronze-winged Pionus also eat pico-pico fruit a *Solanaceae*, *Acnistus arborencen*, aquacatilla (*Laureacea* sp.), and guayaba , (Genus *Psidium*

Purpose

The overall purpose of the study is to collect quantitative data regarding the type of pests observed in the corn field and the amount of utilization of each group; i.e. insects, Pionus parrots, other parrot species, other bird species, and mammal species. Activity patterns and foraging behavior of *Pionus* parrots in general will also be recorded.

Observations from previous visits indicated that the *Pionus* were possibly targeting corn grubs rather than the corn ears themselves, since the *Pionus* appeared to damage only a small area at the top of the corn ears and on only a small percentage of the crop. Questions that this study will attempt to answer include: (1) Specifically, is parrot depradation of corn more significant than that of other species depredating the corn (2) Are Pionus targeting the corn ears or grubs? (3) At what stage of corn maturation do grubs occur, and does this timing coincide with observations of parrots eating in the cornfields? (4) Are there other features that may first attract Pionus to an area, such as fruiting trees, nesting or roosting tree availability, presence of water, etc as determined through observation? (5) What other plant species and at what growth stage are they used by foraging *Pionus*? (6) Can crop damage by other wildlife species be visually distinguished from *Pionus* damage?

Site Description

The Mindo Valley was the first Latin American region to be designated an Important Bird Area by Bird Life International. Because of its isolation and relatively pristine condition, the valley is home to over 370 bird species, including 45 species endemic to the area. Parrots in the valley include three *Pionus* species and the maroon-tailed conure, *Pyrrhura melanura.*.The barred parakeet (*Bolborhynchus lineola*), the rose-faced parrot (*Pionopsitta pulchra*) and the scaly-naped Amazon (*Amazona mercenaria*) have also been recorded in the valley. Twenty-five species of hawks reside in the valley as well.

The Mindo Valley in Equador is 85.5 sq km in area (33sq mi) with the northeast corner located at 00° 00’ 00” south, 78° 50’ 00” west. The valley is on the northwest slope of the active volcano, Guagua Pichincha, on the western cordillera of the Andes Mountains. The terrain of the valley and surrounding areas is quite rugged; the elevation at the floor of the valley is 1,250m, while the highest ridges in and around the valley reach 1,650m. (Russell Shade, pers. comm.).

The region is a typical sub-tropical cloud forest. Much of the valley is immersed in clouds for extended periods throughout the day. There are no seasonal variations in the climate except during periods of El Niño or La Niña. The temperature ranges from 10 to 15.6° Celsius (50 to 60° Fahrenheit) to

13.3 to 21.1° C (56 to 70° F). The annual precipitation ranges from approximately 3,000 to 3,500 mm.

Approximately 30 percent of the forested regions of the valley have been fragmented over the past three decades by cattle farmers and plantation growers. Crops produced on these deforested areas include guayaba and other tropical fruit, coffee, corn, and small amounts of bananas. Most families keep small flocks of chickens. There are no heavy industries located in the valley; most residents are farmers or farm workers, laborers, and shop keepers. The valley's population ranges between 1,000 and 1,200 persons. (Russell Shade, pers. comm.).

The actual study site within the Mindo Valley is a 1 ha field approximately 5,765m via the road; from Mindo, or approximately 4,800m northwest in a straight-line distance from Mindo. Elevation at the site is approximately 1,107m.

Methods

PPRF will rent a one hectare field that will be planted by a local farmer in two installments in order to maximize the observational period. The first half will be planted on about 1 May. The second half will be planted on about 1 June. Both fields will be planted perpendicular to the Mindo River. Maturation of the corn is estimated to take 100 to 110 days from seed to harvest; it typically takes 80 days to male flower and 90-93 days to female silk, depending on the variety of corn used (www.vegerains.org/documents/links_im_chl_corn.htm). The crop will be monitored by at least one or two people from early ear development until the hard kernel stage. The exact planting dates will be dependent upon the weather. Observation blinds will be constructed on both the east and west sides of the fields prior to corn planting. Blinds will be built at least 16m from known perches, to avoid disturbance. The stages of crop maturation will be recorded by date, along with the extent of grub damage, to be correlated with parrot activity.

Each corn row will be designated by a letter and perpendicular columns will be designated by number, in a grid pattern, so follow-up observations of corn plants can be made. This grid pattern will be useful in observing escape cover, grub infestations, or other significant factors. Individual corn ears will be marked once they've been visited by a parrot or other species, and the extent and type of damage to the ear will be assessed. Photos of damaged corn ears will include an identifying card with row letter and column number (eg. B-47).

Mid-way through the growing period, 2 to 4 observers will occupy the blinds from approximately 6:00 am to 10:00 am and from 4:00 pm to 7:00 pm daily. Other parts of the day will be used to check the corn field where birds or mammals were observed and record damage. Depending on findings in the field, observations times may be altered to record activity at different times of day as well. Parrot activity will be recorded from visual observations, still photos, video taping, and/or sound recording, along with the date, time, and weather conditions. Once the corn is ready to harvest, a final check of the number of ears damaged and type of damage will be compared to the estimated total number of ears produced. (The total number of ears will be estimated by counting the number of ears in a representative sample of 2 inside and 2 outside rows from each field.)

Descriptive analysis (mean, standard error, and range) will be developed from the data collected. Depending on the amount of data available, simple statistical comparisons may also be made. Bucher (1992) states that "proper damage evaluation, using sound statistical methodology, is essential for a rational approach to any parrot damage problem." Multiple regression analysis may be done, if enough data are collected, to test the hypothesis that parrot depredation is not significant compared to damage caused by other factors such as insects, mammals, or other birds. Data will be collected over a three year

period. Study Dates (in field) will run from August 1, 2004 – September 30, 2004 with similar dates in 2005 and 2006

Data and photos, etc. will be compiled and examined, with a rough draft available for review and comment by ornithologists and avicultural experts in 2007.

Budget Projections

Study Director (Joe Engler) salary: ..... $5,000 or 666.67/year

Joe's Airfare $2200

Airfare for 2 additional staff persons: $2500/year

Volunteers, per year: $100-1,400/year

10 minimum, 20 max - $70/day: $700-1400
(room, board in Mindo, 2 nights in Quito
and in-country transportation)

Field Rental: $600/year

Local Services (Vinicio): $700/year
5 days at 140/day/year

Miscellaneous expenses: $500

Yearly Budget Totals

Year 1:	***$8,966 - 9,766***
Year 2:	***$8,966 - 9,766***
Year 3:	***$8,966 - 9,766***

Literature Cited

Bucher, E. H. 1992. Neotropical parrots as agricultural pests Pages 201-219 *In* S.R. Beissinger and N. F. R. Snyder, eds. 1992. New World Parrots in Crisis: Solutions from conservation biology. Smithsonian Institute Press. Washington D.C.

Darwin, C. 1833. Charles Darwin's diary of the voyage of H.M.S. Beagle. *In* E.H. Bucher. 1992. Neotropical parrots as agricultural pests. *In* S.R. Beissinger and N. F. R. Snyder, eds. 1992. New World Parrots in Crisis: Solutions from conservation biology. Smithsonian Institute Press. Washington D.C.

Duke, J.A. 1983 unpubl. Handbook of energy crops.

Dyer. M.I. and P. Ward. 1977. Management of pest situations. Pages 267-300 *In* Granivorous birds in ecosystems. J. Pinowsky and S.C. Kendeigh, eds. Cambridge Press. Cambridge, MA. *In* S.R. Beissinger and N. F. R. Snyder, eds. 1992. New World Parrots in Crisis: Solutions from conservation biology. Smithsonian Institute Press. Washington D.C.

Galletti, M. 1993. Diet of the scaley-headed parrot (*Pionus maximiliani*) in a semideciduous forest in southeastern Brazil. Biotropica 25(4) pp. 419-425.

Halse, S.A. 1986. Parrot damage in apple orchards in Southwestern Australia. A review. Dept. of Conservation and Land Management, Western Australia. Tech. Rep. No.8. *In* E.H. Bucher. 1992. Neotropical parrots as agricultural pests. *In* S.R. Beissinger and N. F. R. Snyder, eds. 1992. New World Parrots in Crisis: Solutions from conservation biology. Smithsonian Institute Press. Washington D.C.

Karr, J.R. and J.D. Brawn. 1990. Food resources of understory birds in central Panama: Quantifications and effects on avian populations. Cooper Ornithological Society Studies in Avian Biology No. 13:58-64.

Klasing, K.C. 1998. Comparative avian nutrition. CAB International. New York.

Pionus Parrot Research Foundation (PPRF). 2003. Descriptions of studies completed in Mindo, Ecuador in November, 1999, and January, 2001. Accessed from website: http://www.fatparrots.org/pages/study.html.

Reynoso, H. and E.H. Bucher. 1989. Situación legal de la fauna Silvestre en la República Argentina. Ambiente y Recursos Naturales 6:22-28. *In* E.H. Bucher. 1992. Neotropical parrots as agricultural pests. *In* S.R. Beissinger and N. F. R. Snyder, eds. 1992. New World Parrots in Crisis: Solutions from conservation biology. Smithsonian Institute Press. Washington D.C.

Stoodley, J. 1984. Pionus parrots. Bezels Publications, Oxford.

Stutchbury, Bridget, J. M., and Eugene S. Morton. 2001. Behavioral Ecology of Tropical Birds. London. Academic Press.