

# Research Needs of Non-Academic Institutions 2010

Compiled for the student workshop "Getting the most out of collaborations with Non-Academic Institutions", at the COS/AOU/SCO meeting in San Diego, California, February 7th, 2010.  
Questions about the list? Please email Kristina Cockle (kristinacockle@gmail.com)

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## 1. INTRODUCTION

This document is intended to help graduate students in ecology, ornithology or conservation develop research projects relevant to the goals of non-academic institutions in the Americas. In January 2010, I asked non-academic institutions to provide a wishlist of research questions they'd like to see addressed. This is a somewhat eclectic summary of their responses.

## 2. ONLINE DATABASES OF RESEARCH NEEDS

### *a. Partners in Flight*

- i. Research needs assessment <http://www.partnersinflight.org/pubs/McAllenProc/TOC.cfm>. A comprehensive and current piece on avian research needs, especially as related to bird conservation. (Contributed by Terry Rich)
- ii. Partners in Flight database of research needs <http://www.partnersinflight.org/pifneeds/> PIF priorities lists were developed through an extensive process of looking at all species and habitats to determine their relative importance to an area, and determining what research questions would best contribute to conservation objectives in each region. Using this database, a researcher would find a project of interest, then look for NAls that might be suitable for collaboration on that issue. (Contributed by Erica Dunn)

### *b. Joint Ventures*

- i. Most Joint Ventures have strategic regional implementation plans that make testable assumptions. Students should look at the needs in their region (E.g. Upper Miss - Great Lakes <http://uppermissgreatlakesjv.org/ResearchandMonitoring.cfm>) and contact the Joint Ventures Science Coordinators for more information on research needs and funding

opportunities/partners. (Contributed by Andy Paulios)

### 3. SPECIFIC RESEARCH PROJECTS

#### **a. National Parks of Argentina, Delegación Regional NEA**

Contact person: Dalma Raymundi

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Website: [www.parquesnacionales.gov.ar](http://www.parquesnacionales.gov.ar)

- i. The population of doves in El Palmar National Park appears to be increasing rapidly. We would be interested in having somebody study the causes and consequences. Two possible causes might be the local advance of exotic shrub species in the park and the regional increase in land cultivated for grain. El Palmar National Park could provide lodging.
- ii. We urgently need a way to deal with the problem of coatis in the tourist area of Iguazu National Park. The coatis are native species but they steal food and are becoming aggressive. Tourists don't respect the rules; they give the coatis food and try to pick them up. Now the capuchin monkeys are associating with the coatis and learning from them. Iguazu National Park could provide lodging.
- iii. There are many more areas of research needed; contact Dalma for more information.

#### **b. Sonoran Joint Venture (SW US & NW Mexico)**

Contact Person: Carol J. Beardmore

Phone: 602-242-0524 x 248

E-mail: [Carol\\_Beardmore@fws.gov](mailto:Carol_Beardmore@fws.gov)

Website: [www.sonoranjv.org](http://www.sonoranjv.org)

- i. Management & Restoration. For 2010 we encourage proposals that address management and restoration in the following habitats: Arid Borderlands (1) riparian wetlands (2) desert grasslands (3) desert scrub; Mexican Highlands (1) Desert grasslands (2) Mixed conifer/pine-oak; California Coasts and Mountains (1) coastal sage scrublands (2) grasslands (including foothills and often associated with oak-savannah) (3) riparian and freshwater wetlands; Pacific Lowlands (1) tropical deciduous forest (scrub deciduous forest) (2) coastal Wetlands (3) islands (4) riparian.
- ii. Monitoring. We encourage monitoring proposals (especially Coordinated Bird Monitoring) for the following groups: 1. Waterbird and shorebird breeding and wintering surveys; aerial surveys combined with ground surveys for winter; breeding surveys target specific habitats including sand, mud and salt; combine shorebirds with winter waterfowl when possible. 2. Landbird surveys, higher elevation forest and grassland surveys, including Sierra Madre Sparrow; surveys along an elevational gradient; includes inventory needs, point counts and area searches. 3. Colonial waterbird surveys, specifically for Little Blue Heron, Tricolored Heron, and Reddish Egret. 4. Riparian landbird surveys, especially raptors and psitticines in Mexico; projects designed to complement Arizona Bird Conservation Initiative's Coordinated Bird Monitoring riparian project. 5. Secretive marsh birds, especially Light-footed Clapper Rail and Black Rail. 6. Muscovy and Masked Duck surveys. 7. Pelagic bird surveys, including training.

#### **c. Proyecto Selva de Pino Parana (Argentina)**

Contact Person: Kristina Cockle

E-mail: [kristinacockle@gmail.com](mailto:kristinacockle@gmail.com)

Website: <http://pinoparana.fundacionazara.org.ar>

We work to conserve the globally threatened Atlantic forest and its wildlife through research and community outreach in Argentina. This is a grassroots project run mostly by PhD students and volunteers, within an umbrella NGO (Fundación Azara).

- i. Attitudes toward threatened wildlife and habitat. Farmers in our region are among the poorest in Argentina, but they share their land with 17 species of globally threatened birds. What do these farmers think about the endangered species in their forest, how do they use the forest, and what do they need to keep forest on their land? How well do our local environmental education programs work to inform the public, change attitudes, and change behaviour? How do local people perceive the provincial parks in their neighbourhood?
- ii. Soil fertility. How can we help farmers maintain soil fertility over the long term so they don't abandon cropland and clear more endangered forest for crops?
- iii. Sustainable logging in Yaboty Biosphere Reserve. We've found that cavity-nesting birds need large live trees for nesting, and these trees are severely reduced in conventionally-logged forest. What specific forestry guidelines would work to ensure a lasting supply of trees for foresters and habitat for animals?
- iv. Environmental health/economics. What is the effect of environmental degradation on the health/financial situation of local farmers? (e.g., water quality, supply of resources)
- v. Nest predators. How does the predator community (birds, mammals, reptiles) differ between farming areas and more extensive forest, and how does that affect nest success of birds?
- vi. The insects of bamboo. Many bamboo species show extreme cycles, mass-producing seeds after many years (often 30 years) of rapid vegetative growth. Bamboos support several specialist bird species, many of them insectivores. What insects are associated with bamboo? Do bamboos support a higher insect biomass than other plants?
- vii. We are open to many other project ideas if they contribute to conservation or knowledge of Atlantic forest species and/or quality of life of local people (health, literacy, economy); contact Kristina for more information.

#### ***d. Kori Bustard Species Survival Plan***

Contact Person: Sara Hallager, Smithsonian National Zoo

E-mail: [hallagers@si.edu](mailto:hallagers@si.edu)

- i. Kori bustard behavior: Additional behavioral research that focuses on the behavior of wild kori bustards, and that can be used to make general comparisons with the behavior of kori bustards in zoos (e.g., based on daily activity budgets) in different social and physical conditions, will always be beneficial for improving appropriate animal management recommendations.
- ii. Enrichment: Most zoos employ some form of enrichment with their kori bustards. Research is needed to determine the efficacy of the enrichment as well as the required frequency.
- iii. Body condition: Huchzermeyer (1998) provides a scale (1-10) for scoring body condition in ostrich and Bailey (2008) provides descriptive text for assessing weight, hydration, cere, nares, beak, oropharynx, eyes, ears, pectoral muscle condition, neck, saccus oralis, body, coelomic space, vent, thoracic and pelvic limbs, feathers and skin. A grading system for overall body

condition that takes into account the entire body of the bird should be developed for kori bustards to assist in proper husbandry.

- iv. Sunning: A study done by Fernandes and Hallager (2007) demonstrated that the act of sunbathing plays an integral role in the health and feather condition of captive kori bustards and suggests that ectoparasite control is the most plausible cause for sunning in captive kori bustards. However, additional observations are needed of birds in the wild to further elucidate the significance, frequency and occurrence of sunning in kori bustards.
- v. Sound sensitivity: Little is known about the hearing sensitivity of kori bustards, and additional research on hearing would provide some guidance for creating more objective recommendations for managing sound stimuli for this species.
- vi. Enclosure containment: Covered enclosures are strongly recommended if kori bustard hens are allowed to raise chicks naturally, and it is also possible that completely covered enclosures may help to minimize the risk of avian flu transmission. Further research is needed to determine the role that covered aviaries can play in minimizing the transmission of diseases from wild birds.
- vii. Single-sexed groups: There is a need to keep adult males (>3 years old) separate during the breeding season, because dominant males may kill or severely wound subordinate males. It is recommended that adult males be housed separately at all times. Where multiple males are maintained together, more research is recommended to determine the appropriate conditions (if any) for being able to house these males together all year round.
- viii. Energy requirements: Additional research that focuses on exact daily food intake and energy expenditure for this species, and that covers all life stages (e.g., chick, juvenile, reproductive adult, senescent adult), will be important to perform so that more specific nutritional requirements and recommendations can be developed for kori bustards.
- ix. Target serum/nutrient values: More information is needed from blood samples collected from clinically 'normal' kori bustards. It is recommended that blood samples be taken opportunistically (e.g., during routine physicals), and analyzed for nutritionally related information that can be used to develop appropriate target serum and nutrient values.
- x. Viral diseases: The following viral diseases have been associated with bustard species, but the significance of these viruses for the care and management of bustards in zoos remains unknown. More research is needed on the prevalence and treatment of these diseases within the zoo population: Adenovirus, Avian influenza, Avipox, Herpesvirus, Infectious bursal disease, Lymphoid leucosis, Marek's disease, Newcastle disease, Pigeon herpes, PMV-2, Reovirus.
- xi. Metabolic diseases: Hemosiderosis has been reported in some kori bustards managed in zoos, but the causal factors associated with this disorder are not yet known. More research is needed to test hypotheses that link this disorder with a possible dietary etiology, or a genetic predisposition.
- xii. Chick rearing: Angel wing in chicks can begin to occur between 7-11 days post-hatch. Although parent reared chicks seem to have higher growth rates than hand-reared chicks during the first week of life, parent-reared chicks tend not to develop angel wing. More research is needed to determine why parent reared chicks do not develop angel wing but hand-reared chicks do. Institutions should carefully monitor the growth rate of hand- and parent-reared chicks, and should maintain detailed records on the nutrient composition of the diets provided to hand-

reared chicks. More research is also needed on the ways in which both diet and exercise affect growth and development of kori bustard chicks. Preliminary research has shown that the mortality of female chicks within the first year is higher than mortality rates for males, and further research is needed to determine if this is a phenomenon seen in wild populations of kori bustards, or if it represents sub-optimal husbandry and management within zoo environments.

- xiii. Feathers and flight restriction: Pinioning kori bustards as chicks may make them more prone to injury and trauma within their enclosures, but more research is needed to determine the incidence of injuries in flight restrained and free-flighted individuals throughout the population of kori bustards managed in zoos. Additional information is needed to determine the natural molt pattern of kori bustards, and whether this pattern is affected by diet, local environmental conditions, the social environment, etc. Naturally molted feathers should be picked up and recorded as they are discovered so that the normal molt pattern of kori bustards can be described at different institutions.
- xiv. Artificial insemination: Artificial insemination has not been performed with kori bustards in AZA accredited institutions, although it remains a feasible approach to take in future reproductive efforts. Houbara bustard semen collection techniques have been successful in the United Arab Emirates, and might provide a useful foundation for future research if the technique is applied to kori bustards, but more research is needed on kori bustards to develop suitable semen collection, storage, and insemination practices that are specific to kori bustards.
- xv. Behavioral indicators of laying: Kori bustard females often pace excessively 2-3 days prior to egg laying, and typically do so around the area where egg laying will occur. However, not all females pace prior to egg-laying, and more research is needed to identify other behaviors that may reliably indicate imminent egg-laying.
- xvi. Assisted rearing: Cross-fostering and shared-rearing techniques have not been used with kori bustards in zoos in the United States, but further investigation into these approaches might be useful to determine if they are applicable to this species. Research should focus on the timing of cross-fostering attempts in kori bustards and related species, when this approach has been attempted, and the influence that imprinting has on the success of shared-rearing techniques.

#### ***e. Roadrunners***

Contact Person: Sara Hallager, Smithsonian National Zoo  
E-mail: [hallagers@si.edu](mailto:hallagers@si.edu)

- i. The difficulties in studying the low-density and elusive roadrunner in the field have limited the general understanding of many aspects of the species' life history including juvenile dispersal and recruitment. Habitat use and ecology of northern and eastern populations require study. The impact of human disturbance, such as urban development, pesticide use, and illegal hunting on some declining local populations needs further investigation.

#### ***f. American Forest Foundation***

Contact Person: Margaret Munford and Todd Gartner  
E-mail: [mmunford@forestfoundation.org](mailto:mmunford@forestfoundation.org),  
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Website: <http://www.forestfoundation.org>

AFF is a nonprofit conservation organization that works to stem the loss and enhance the quality of America's woodlands. We help families sustainably manage their land for multiple benefits—like clean water, wildlife habitat, carbon sequestration, recreation, and wood products. In conjunction with our 50-state network of partners and volunteers, our programs grow healthy forests, conserve habitat, and

engage youth and communities in conservation efforts. Our extensive education programs work to ensure decision makers and educators understand the value of America's woodlands through quality environmental education and outdoor learning for children and adults across the country. AFF is interested in research that fills gaps in our understanding of forest ecology, the socio-economic dimensions of forest ownership and management, and the impact of public policies on forest sustainability. Research findings should be applicable to public policy development for the ultimate enhancement and conservation of America's family woodlands.

- i. Mechanisms for Maximized Conservation Benefit. One topic of interest is a thorough compilation and analysis of conservation efforts that aggregate landowners. Recognizing that individual efforts are often too small for scalable conservation benefit, many project leaders aggregate small landowners through cross-boundary cooperation projects. These projects range from carbon aggregation projects to hunt clubs to limited partnerships. The analysis should focus on identifying which methods and strategies work best for the greatest conservation impact. What is the current state of landowner aggregation and cooperative projects for conservation? How can the current models be improved for enhanced and increased conservation value? How does cooperation and/or aggregation increase revenue opportunities for landowners? What policies encourage the adoption and implementation of cooperative models?
- ii. Tools for Ecosystem Service Markets. Another topic of interest is the analysis of financial and legal tools landowners might use to participate in and engage with ecosystem service markets. The initial costs and management of endowments can serve as a severe obstacle for many interested landowners. An in-depth analysis of legal and financial tools will help AFF in the development and implementation of emerging ecosystem markets for woodland owners. Ideas for initial queries are revolving funds, low interest loans, payback through credit generation and timber revenue, tax credits, derivatives, and bonds. What financial and legal tools are currently utilized by landowners to engage in ecosystem service markets? Are there additional tools available that are currently under-utilized? How significant an influence are initial costs for endowments in current ecosystem markets? How might any tools (utilized or not) be enhanced for greater landowner participation in ecosystem service markets?

**g. American Bird Conservancy**

Contact Person: Jessica Hardesty Norris, Seabird Program Director

E-mail: [jhardesty@abcbirds.org](mailto:jhardesty@abcbirds.org)

Website: [www.abcbirds.org](http://www.abcbirds.org)

Please note that ABC is not offering support for these projects. Instead, we are sharing some of the research needs that we have prioritized for our conservation work. For some of these projects, we have excellent contacts and can provide some logistical help and technical guidance- others are simply animals we wish we knew more about. But all are species and activities that are high on our list of priorities. We are working on a webpage with more ideas and more details- look for it!

- i. Artificial nest design for the Black-capped Petrel (DR)
- ii. Breeding behavior of the Honduran Emerald
- iii. Breeding ecology of the Black-capped Petrel (DR/Haiti)
- iv. Community conservation of the Galapagos Petrel
- v. Develop & test large-scale habitat models for forest birds' in the Appalachian Mountains BCR
- vi. Develop & test large-scale habitat models for grassland birds in the Central Hardwoods BCR
- vii. Distribution and ecology of Diamantina Tapaculo, *Scytalopus diamantinensis* (BR)

- viii. Distribution and ecology of Sincora Antwren, *Formicivora grantsaui* (BR)
- ix. Distribution, ecology, and conservation threats of Black-hooded Antwren, *Formicivora erythronotos* (BR)
- x. Ecology and conservation threats of Galapagos Martin, *Progne modesta* (EC)
- xi. Ecology and conservation threats of Galapagos Rail, *Laterallus spilonotus* (EC)
- xii. Ecology and conservation threats of Hoary-throated Spinetail, *Synallaxis kollari* (BR)
- xiii. Ecology and conservation threats of Lava Gull, *Leucophaeus fuliginosus* (EC, Galapagos)
- xiv. Ecology and Conservation Threats to Eastern Bewick's Wren
- xv. Ecology of Bahia Spinetail, *Synallaxis cinerea* (BR)
- xvi. Ecology of Bahia Tyrannulet, *Phylloscartes beckeri* (BR)
- xvii. Ecology of Banded Cotinga, *Cotinga maculate* (BR)
- xviii. Ecology of Kaempfer's Tody-Tyrant, *Hemitriccus kaempferi* (BR)
- xix. Ecology of Slender Antbird, *Rhopornis ardesiacus* (BR)
- xx. Ecology of Stresemann's Bristlefront, *Merulaxis stresemanni* (BR)
- xxi. Estimate demographic parameters (e.g. survival, reproductive success) for forest birds' in the Appalachian Mountains BCR
- xxii. Estimate demographic parameters (e.g. survival, reproductive success) for grassland birds in the Central Hardwoods BCR
- xxiii. Estimate regional demographic parameters for priority grassland and shrubland species using large-scale reclaimed minelands, and for forest birds adjacent to these areas
- xxiv. Foraging behavior of Lear's Macaw, *Anodorhynchus leari* (BR)
- xxv. Foraging ecology of the Red-fronted Macaw
- xxvi. Habitat use by wintering Golden-winged Warblers, *Vermivora chrysoptera*, in northern Nicaragua
- xxvii. Identify core wintering areas for breeding populations of the Appalachian Mountains BCR's highest priority species (that one is hard to word---I want to know where the birds that ACTUALLY breed in Appalachia overwinter, to better link our partnership's conservation efforts internationally)
- xxviii. Identify important migration stopover sites for waterbirds (shorebirds, wader) in the central US
- xxix. Identify major migration corridors and stopover sites for landbirds in the Appalachian Mountains BCR
- xxx. Link climate change projections into habitat models for priority forest birds in the Central Hardwoods BCR and Appalachian Mountains BCR
- xxxi. Population ecology of Black-cheeked Ant-Tanager (Costa Rica)
- xxxii. Population ecology of Honduran Emerald, *Amazilia luciae* (Honduras)
- xxxiii. Population ecology of Mangrove Hummingbird (Costa Rica)

- xxxiv. Population ecology of Maroon-fronted Parrots, *Rhynchopsitta terrisi* (MX)
- xxxv. Population ecology of Purple-backed Sunbeam, *Aglaeactis aliciae* (PE)
- xxxvi. Population ecology of Thick-billed Parrot, *Rhynchopsitta pachyrhyncha* (MX)
- xxxvii. Population status of Cocos Cuckoo, Cocos Flycatcher, and Cocos Finch on Cocos Island (Costa Rica).
- xxxviii. Population status, distribution, and ecology of San Andres Vireo, San Andre Island (Colombia)
- xxxix. Population status, distribution, and ecology of Short-crested Coquette (Mexico)
  - xl. Research and identify conservation actions for the Critically Endangered Brown Spider Monkey *Ateles hybridus* and Blue-billed Curassow *Crax alberti* at their stronghold population site of El Paujil Bird Reserve.
  - xli. Restoration of overgrazed grasslands for Worthen's Sparrows, *Spizella wortheni* (MX)
  - xlii. Satellite tracking of Lear's Macaw movements, *Anodorhynchus leari* (BR)
  - xliii. Wintering habitat use by Mountain Plovers, *Charadrius montanus*, in the Saltillo Grasslands of northern Mexico

#### ***h. Klamath Bird Observatory***

Contact Person: Jaime Stephens, Research and Monitoring Director

E-mail: [jlh@klamathbird.org](mailto:jlh@klamathbird.org)

Website: <http://www.KlamathBird.org>

Klamath Bird Observatory conducts long-term monitoring and applied research projects that provide scientific results about bird population trends, demographics, life history, distribution and habitat relationships. Our scientific results inform conservation and land management decisions. Ongoing studies address decisions related to wildfire and fuel reduction, water and wetland management, restoration effectiveness, and climate change. We have opportunities for collaboration with graduate students and early career professionals where management driven research questions can be answered with existing data and also with new studies designed to address pressing information needs. Here are 3 example projects for which data are available:

- i. Analysis of Vegetation Composition and Structure at Long-term Constant Effort Mist-netting Locations. This project will include analysis of the vegetation composition and structure at fifteen banding stations to identify similarities between sites and changes over time. These results will be informative in interpretation of bird population trends, response to management actions, and will be used as covariates in future analyses.
- ii. Population trends for Black Terns in the Klamath Basin. This project would utilize breeding Black Tern data collected over a period of 12 years to inform conservation and management decisions for the wetland ecosystems Black Terns depend on, and improve our standardized regional long-term monitoring effort for Black Terns in future years. Our objective is to determine population trends and assess correlative factors such as water level, for Black Terns breeding in the Klamath Basin and deliver this information to land managers that are faced with wetlands management decisions.
- iii. Fire History and Bird Communities. This project would look at fire history in the Klamath-Siskiyou Bioregion and associated bird communities, to test hypotheses of what vegetation and fire variables (i.e. time since burn) correlate to bird communities. This information will be

valuable in landscape level planning and complement results of recent and ongoing fuels reduction studies.

#### ***i. PRBO Conservation Science***

Contact person: Nat Seavy (nseavy@prbo.org) or Geoff Geupel (ggeupel@prbo.org)

Website: [www.prbo.org](http://www.prbo.org)

- i. Anything about the scale at which management affects bird populations. There are a lot of studies that often have conflicting results – e.g., positive, neutral, or negative impacts of logging on bird populations. In many cases, this heterogeneity may be explained by the scale of the treatments. E.g., small treatment units might have a positive effect on an edge-associated species, whereas larger treatment units have a negative effect. Meta-analyses and other studies that help get at are extremely useful. PRBO's recent investment in informatics allows unprecedented access to large data sets at multiple scales (see <http://data.prbo.org/cadc2/>)
- ii. Dispersal. With climate change, we know that plants and animals will be shifting their ranges. Their ability to do this depends on dispersal behavior. For birds, we really don't know much about what a dispersal kernel might look like, or, what factors might go into changing it (e.g., conspecific attraction). There are some neat opportunities here for modeling and empirical work to help us understand how dispersal behavior is linked to the ability of bird populations to respond to environmental change.
- iii. Scaling local changes to population impacts. We know a lot about how birds respond to local factors, but what we really need to know is how these local changes scale up relative to the entire population. For example – say you dry up half the wintering shorebird habitat in California's Central Valley. Does that reduce the wintering shorebird population in half – or do those birds just shift to Nevada? At the end of the day, we really need to know more about entire populations than we do right now.
- iv. Understanding birds in the context of ecosystem services. The concept of ecosystem services is beginning to drive a larger and larger component of conservation actions. However, it is still unclear how bird populations can best be incorporated quantitatively in to an ecosystem services framework. Any work that can provide examples of how this can be done will strengthen bird conservation.
- v. Meshing economics with conservation planning. It is clear that over long time periods economic forces will have important effects on bird populations. For example, changes in the availability and cost of water in California's Central Valley could have huge impacts on habitat quality for migratory shorebirds. Interdisciplinary projects that can integrate economic projections with changes in biodiversity would make a significant contribution to the field of conservation planning.

## **4. OTHER CONTACTS, ADVICE AND RESOURCES**

### ***a. US Fish & Wildlife Service***

<http://www.fws.gov/science/doc/SHCTechnicalHandbook.pdf>

### ***b. Center for the Study of Tropical Birds, Inc.***

Contact Person: Jack Eitniear, Director

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Website: [www.cstbinc.org](http://www.cstbinc.org)

While ornithological research often follows the current new technological trend, a great deal of basic natural history research is still needed on many neotropical species. Of special need is research on game species so governments can make sound policy decisions. This includes not only game species we are familiar with like teal, deer etc but tropical species such as ocellated turkey, cracids, tinamou etc. I call this applied natural history. It not only allows students to make contributions to the scientific literature but to contribute to the formation of policy and often impact the actual conservation of the species.

**c. Sociedad Antioqueña de Ornitología (Colombia)**

Contact Person: Laura Agudelo-Álvarez

E-mail: [agudelo.laura@gmail.com](mailto:agudelo.laura@gmail.com)

Website: [www.sao.org.co](http://www.sao.org.co)

Contact Laura about possibilities for collaboration.

**d. Bird Studies Canada**

Phone: 888-448-2473

Email: [generalinfo@birdscanada.org](mailto:generalinfo@birdscanada.org)

Website: <http://www.bsc-eoc.org/>

BSC coordinates a cross-country network of migration monitoring stations, runs research programs that collect data via volunteer networks (species and habitat-specific surveys and studies; provincial Breeding Bird Atlases), and undertakes contracted research in its areas of interest (including work on many Species At Risk). Data are used to identify significant population changes and help direct conservation planning. Numerous grad students have done thesis work using BSC or bird observatory facilities, collecting data with the help of BSC volunteers and/or analyzing BSC data sets. Several professionals at universities have collaborative research projects underway. Inquiries are always welcome.

**e. Fundación Numashir (Ecuador)**

Contact Person: Juan Freile

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Nocturnal birds of Ecuador. Currently developing a study of distribution and conservation of 3 species of Glaucidium and 6 species of Megascops. Other studies awaiting funds are: human perceptions of owls, population density and habitat use of Aegolius harrisii, natural history of premontane and cloud forest.