

**CORACIIFORMES TAG
REGIONAL COLLECTION PLAN
Second Edition, November 1, 2004**



White-throated Bee-eaters

D. Shapiro, copyright Wildlife Conservation Society

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All Program Managers not on the Steering Committee are advisors

See Appendix II for contact information

Last Vote of Confidence: 2002

TAG website address: <http://www.coraciiformestag.com/>

See Conservation and Science section on AZA website www.aza.org for information updates

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Regional Collection Plan Summary:

Creation of this document

The Coraciiformes TAG has met annually to discuss component programs, to discuss proposed changes and to ratify recommended changes. We have also used the Coraciiformes listserv extensively, to involve TAG members who could not attend meetings. The TAG Definition, Mission Statement, Selection Criteria and Decision Tree sections were reviewed and approved by the Steering Committee, then circulated on the listserv for a 6 week comment period for Institutional Representatives (IRs). It was approved in December 2002. In the first half of 2003, the taxonomic list was reviewed by the Steering Committee, and then circulated for comments by IR, again with a six-week comment period, via the listserv. No new taxa were recommended for programs. Because all recommended programs but one have been established or approved, and because the major taxonomic groups covered by the TAG have significantly different management requirements, space concerns have been addressed by individual programs. This document was submitted to WCMC in August 2003. Comments were returned to the TAG chair by AZA in January 2004. This final draft includes responses to those comments.

Differences from RCP version I.

The important differences between this document and the first edition of the plan are identification of a single program species in genera where several species were originally identified as possible programs. Of the programs recommended in the first edition, only two, 'phase in' for the Common Hoopoe and Pied Kingfisher, have not been established. Details can be found in the program narratives, below. Table 1 summarizes the history of each program, including status as of February 2004.

Table 1: Program Summaries

Taxon	Common name	Program	date	Program	date of	type of	latest	latest SSP/PMP
		type	program	manager	program change	change	studbook	recommendations
			approved					
Hornbills								
<i>Ceratogymna bucinator</i>	Trumpeter	PMP	Sep-99	Dupree	October-02	new manager		
<i>Ceratogymna brevis</i>	Silvery-cheeked	PMP	Sep-99	Dupree	October-02	new manager		
<i>Aceros corrugatus</i>	(Sunda) Wrinkled	PMP	Feb-99	Kowalczyk			December-01	August-03
<i>Aceros undulatus</i>	(Bar-pouched) Wreathed	DERP	Feb-99	Kowalczyk	December-02		December-01	
<i>Aceros cassidix</i>	(Sulawesi Wrinkled) Red-knobbed	DERP	Feb-99	Kowalczyk	December-02		December-01	
<i>Buceros bicornis</i>	Great	SSP	Jun-89	Myers	May-02	new manager		June-03
		studbook		Schoen	June-03	new manager	December-98	
<i>Buceros rhinoceros</i>	Rhinoceros	SSP		Myers	May-02	new manager		
		studbook		Schoen	June-03	new manager	December-98	
<i>Anthracosceros coronatus/albirostris</i>	Indian/Oriental Pied	PMP	Jun-99	Schoen	September-02	phase out		
		PMP	Jun-99	Schoen	September-02	phase out		
<i>Tockus erythrorhynchus</i>	Red-billed	PMP	Sep-99	Smith			August-02	October-02
<i>Tocus deckeni</i>	Von der Decken's	PMP	Sep-99	Smith			August-02	
<i>Bucorvus abyssinicus</i>	Abyssinian Ground	PMP	Jun-89	Boylan	January-01	new manager	December-94	expected April-04
<i>Bucorvus leadbeateri</i>	Southern Ground	PMP	Jun-89	Boylan	June-02	new manager		expected April-04
Hoopoes								
<i>Phoeniculus purpureus</i>	Green Woodhoopoe	PMP	Nov-01	Hatcher			September-02	December-02
Bee-eaters								
<i>Merops nubicus</i>	Carmine	DERP		Arland/			Bee-eater page on TAG website	
<i>Merops albicollis</i>	White-throated	DERP		Vince			Bee-eater page on TAG website	
<i>Merops bullockoides</i>	White-fronted	DERP					Bee-eater page on TAG website	
Kingfishers								
<i>Dacelo novaeguinea</i>	Kookaburra	PMP	Sep-90	Meyers			December-02	May-03
<i>Halcyon c. cinnamomina</i>	Guam Kingfisher	SSP	Jun-95	Bahner			December-03	December-03
<i>Halcyon c. pelewensis</i>	Pelew Kingfisher	<i>in situ</i>						
Motmot								
<i>Momotus momota</i>	Blue-crowned Motmot	PMP	Sep-99	Graham			November-03	December-03
Rollers								
<i>Coracias caudata</i>	Lilac Breasted	PMP	Feb-87	Snyder	February-96	phase out	December-02	
<i>Coracias cyanogaster</i>	Blue-bellied	PMP	Jul-99	Snyder			December-02	December-03
<i>Coracias benghalensis</i>	Indian					DERP		

Coraciiformes TAG definition:

The Coraciiformes TAG covers all 98 species in the order Coraciiformes. Appendix I, summarizing species, including subspecies, status in the wild, U.S. and global captive populations and AZA program status, can be found starting on page 22.

Taxonomy and General References

The taxonomy of some families in the Coraciiformes, notably the Bucerotidae, has been the subject of multiple revisions. To a large extent, however, the TAG is limited by the taxonomies adopted by ISIS, as this forms the basis for record keeping by AZA institutions. We have identified good references for each of the families in the Coraciiformes, when possible choosing those that are widely available and affordable. Volume six of the series Handbook of Birds of the World (del Hoyo et al.) covers the order Coraciiformes in detail and it the best general resource, providing a comprehensive review of the existing literature on the order, as well as discussions of taxonomy. Complete citations appear on page 21. A comprehensive bibliography of the Coraciiformes can be found on the TAG website.

Families, Genera and Species in the Coraciiformes :

del Hoyo, J., Elliott, A. and Sargatal, J. eds, 2001. Handbook of Birds of the World, Volume 6, Mousebirds to Hornbills.

Momotidae (Motmots) 8 species, 6 genera

Todidae (Todies) 4 species, one genus

Reference: De Schauensee, A guide to the Birds of South America. (1970)

Brachypteraciidae (Ground Rollers) 12 species, 2 genera

Leptosomidae (Cuckoo Rollers) one species

Reference: Langrand, O. Guide to the Birds of Madagascar (1990).

Coraciidae (Rollers) 12 species, 2 genera

Alcedinidae: (Kingfishers) 22 species, 2 genera

Dacelonidae: (Kingfishers) 56 species, 8 genera

Cerylidae: (Kingfishers) 9 species, 3 genera

Meropidae (Bee-eaters) 24 species, 3 genera

Reference: Fry et al, Kingfishers, Bee-eaters and Rollers (1992)

Upupidae (Hoopoes) one species

Reference: Del Hoyo *et al.*, Volume 6 (2001)

Phoeniculidae (Woodhoopoes) Three genera, nine species

Reference: Del Hoyo *et al.*, Volume 6 (2001)

Bucerotidae (Hornbills) 54 species, 9 genera

The Hornbill TAG, EEP and Specialist groups have recommended using the taxonomy published by Alan Kemp (1996).

While there is no universal agreement on any taxonomic description of the Bucerotidae, this is comprehensive and the only reference both widely available and readily affordable.

Coraciiformes TAG Mission Statement:

The Coraciiformes TAG promotes *in situ* conservation of species in the order Coraciiformes and their habitats through participation in and support of field programs, by improving captive management and by using exhibition of captive birds to influence public opinion to favor conservation activities.

***Coraciiformes* TAG Goals**

1. Identify priority exhibit species for long-term display in AZA institutions and develop long-term population management programs for them.
2. Promote and support taxon priorities and population management programs identified in the Regional Collection Plan, for AZA institutions and others. In order to guide institutions that propose to work with Coraciiformes, each species, and in some case sub-species, has been separately considered, using criteria described below. These criteria have been used to identify priority taxa and recommendations for their management in AZA collections. All of the programs recommended in the first edition of the RCP have been created, except two 'phase in'.
3. Minimize the need for importation of wild specimens for captive programs.
Importation of wild birds, whether for display or propagation is costly, stressful and difficult. It can negatively impact wild populations, by giving them market value, by changing population structure or reducing population numbers. By focusing our efforts on particular taxa and improving our programs, we can reduce the number of birds taken from the wild. This includes using significant importation to found new programs or improve established ones.
4. Improve management and propagation techniques. Replicable and predictable techniques for management and propagation are necessary, to ensure availability of birds for our collections and for applications to conservation in the field.
5. Document successful husbandry protocols, starting with those species in active management programs.
Documentation is important, if programs are to progress and build on one another. We will start by documenting priority species, then expand to related species, looking for common techniques and trying to identify species specific differences.
6. Develop communication resources to ensure wide availability of information relating to all aspects of TAG taxa, both *ex situ* and *in situ*. We need to take advantage of new communication technology, while remaining aware that these are not available to all that need the information we wish to disseminate. The TAG has an active listserv, with members from five continents, as well as an excellent website: <http://www.coraciiformestag.com/>
7. Increase cooperative interaction with zoos in other regions, as well as the private sector. The Coraciiformes comprises taxa from all continents except Antarctica. Zoos in every region are beginning to develop active programs, often for species held in low numbers. By collaborating, we can increase the size of managed groups, pool information and reduce duplication of effort.

Space

While available space is important for all bird programs, space limitations for Coraciiformes are generally less significant than lack of techniques for reliable propagation. Most non-hornbill species work well in community aviaries. In addition, most of the taxa identified in this plan have distinct space and husbandry requirements and don't compete for space. More specific discussions of space will be found in the reports of the individual management programs, including target population sizes set by analysis of the studbook, guided by the PMC. In general, enough space is available now to meet program goals. Population targets for species that breed relatively reliably are at or below current population levels. Space may ultimately be an issue for the *Aceros* and *Buceros* hornbills, because breeding is not predictable. For *Aceros*, there is a reluctance to phase out non-program species and they continue to be propagated, reducing space for the PMP species. The two *Buceros* species do compete for space, but this will only become an issue if there is significant reproduction.

Criteria Used in Evaluation of Taxa for Management Programs

Each species, and in some case sub-species, in the order Coraciiformes has been separately considered by the TAG. The criteria described below were used to establish program priorities, also described below, for AZA institutions. In some cases, criteria are objective, for example, IUCN status. In others, like husbandry, criteria are subjective. The same

criterion may apply in different ways to different management programs. For example, a species that is difficult to breed might be a poor selection for an 'exhibit/classroom program,' but that might be the reason for identifying that species for intensive management in an SSP. There are no mathematical formulae that can create a collection plan from these criteria – the brains of the collection planners are essential.

Criteria:

1: Status in the wild: IUCN, BirdLife, CAMP and other ratings

Rare and threatened species are high priority for captive management actions that can support wild populations. This may include creation of a captive population, but might also consist of research in support of *in situ* efforts.

2. Documented captive population size in U.S.: data from studbooks, space surveys and ISIS

3. Documented captive population size outside U.S.: data from studbooks and ISIS

4. Availability: Probability that there are legitimate sources for acquisition of birds in the private sector, non-U.S. zoos, and dealers or by collection of wild specimens.

5. Potential for links with field programs: Species with active or probable field projects will be preferred, if all else is equal.

6. Educational value/ special exhibit value: Species may be important because of appearance, natural history, links with cultural and ethnic groups

7. Flagship potential: Species may serve as representatives of entire ecosystems, for Conservation education, legislation, habitat protection

8. Demonstrated interest by zoos and others: In many cases, one of many similar species may have become established in collections through historical accident. These should be retained, unless there is a strong reason for their replacement.

9. Possibility of use as research model: Common species may be valuable as surrogates for developing management and conservation techniques, answering medical and dietary questions and acting as foci for PR, fundraising etc. These actions might eventually justify establishing new captive programs, or might have application to conservation of species in the wild.

10. Funding potential

Some species, because of special circumstances, may be better subjects for fundraising than similar species -- the Guam Kingfisher is an example.

Program definitions

Because of resource limitations, not all specimens in any given collection will be part of active management programs. Non-program taxa may still be important to exhibition and education functions of zoos, and the category 'exhibit only' should not be confused with 'phase out', assigned to birds which are taking space needed for an active program. Non-managed species comprise that proportion of every collection for which it is impossible to provide more than good housing, care and support.

SSP:

Species are usually, but not always, rare or endangered in the wild. A management group, elected from the IR's representing AZA institutions holding or owning specimens, supports management programs. The SSP coordinator is usually, but not always, the studbookkeeper. The management group facilitates these activities and coordinates any *in situ* programs. Existing SSP populations serve different functions. Examples are:

1. genetic reservoirs for wild populations, generally populations with a management goal of maintaining a set amount of genetic diversity, for a stated period of time, often 90% of genetic diversity for 100 years
2. important components of zoo exhibit programs
3. subjects of husbandry research for key species that do not breed reliably in captivity
4. subjects of conservation research.

PMP:

usually, but not always, good exhibit species, sometimes common in the wild, but captive program preferable to regular import of new founders. The goal of the management program is to maintain a population for as long as possible, making the species reliably available for exhibit and education programs. The program is managed by the studbookkeeper, with input from SPMAG and/or the Population Management Center.

DERP:

Species of lower priority than those designated for SSP or PMP but still of special interest for one of several reasons:

display or education program In general, these are species that would be replaced with the same species, if an individual is lost, because of special graphics, involvement in curricula etc. If a program manager becomes available, some of these species would be good candidates for PMPs. No formal management program but when possible, attention will be paid to selection of mates and decisions to breed.

Model/research: common or relatively common species, to be used to develop techniques for management of related (or otherwise similar) forms that are rare, threatened or especially desirable for exhibit.

Exhibit only: Non-managed species comprise that proportion of every collection for which it is impossible to provide more than good housing, care and support. This category includes specimens which are part of an exhibit program but which have no specific role. Donations from the public are a good example. Many community aviaries have spaces not appropriate for program species, because of potential competition from other program species. Domestic animals and some education program animals are also in this category. In some cases, display of the species is entirely of rehabilitated, unreleasable wild specimens. Breeding will depend on ability to house and place offspring. All Coraciiformes species listed in ISIS that were not assigned to another program category, are listed as 'exhibit only.'

Phase in:

High priority species not existing in collections, which might be acquired -- this could require initial captive or field work in the range country, work with a model species, a special collecting trip, etc.

in situ: TAG supports programs for this species in its home range but the species is not exhibited in AZA collections.

Phase out: Some species take up space needed for species with higher priority. These should be managed to reduce population size by restricting breeding, or placement outside AZA, when possible.

Not recommended: Species not currently in AZA collections and considered inappropriate for zoo exhibition.

No program: not listed in ISIS, not phase in or not recommended.

Decision Tree

Although holding space does not tend to be an issue for taxa in this TAG, the number of endangered, interesting and available Coraciiform taxa far exceeds the limits of space and manpower resources available for managed programs. Different kinds of programs require different levels of resources and activity, however. In order to optimize our ability to achieve the goals set for the TAG, we used the following Decision Tree to assign taxa to program categories. As time inevitably brings change, these assignments may also change over time.

(1) Is species currently kept by AZA institutions?

If yes, go to (2).

If no, category is

- a) '*in situ*' if there is currently an *in situ* project or good potential for an effective conservation project or
- b) 'phase in' if there is justification and potential to acquire the taxon, or
- c) 'not recommended' if the TAG feels that the species is inappropriate for zoo collections

(2) Is there an existing program for this species?

If no, go to (3).

If yes, does the current recommendation still make sense in light of current program definitions and the status of the captive population?

- a) If yes, recommend continuation;
- b) if no, start tree over and revise category.

(3) Is there a nucleus population of at least 10 pairs in AZA institutions, or a solid plan to acquire more birds?

If yes, go to (4).

If no, recommend the species for

- a) 'DERP' if dedicated exhibits/programs exist, species is to be used as a model or is of special interest
- b) 'phase out', if space is needed for a species with higher priority

(4) Is an AZA program justified by potential for a captive population to contribute to conservation of the wild population, need for population management to maintain a good exhibit species, taxonomic uniqueness, or educational value?

If yes, go to (5).

If no, recommend for

- a) 'DERP' if dedicated exhibits/programs exist, species is to be used as a model or is of special interest
- b) 'phase out', if space is needed for a species with higher priority

(5) If there is justification for creating a program, assign taxon to

- a) PMP
- b) SSP

PROGRAM NARRATIVES

Appendix I, page 22, lists each species and sub-species within the Coraciiformes and the program category to which it was assigned. ISIS data (or studbook data, if available) for all Coraciiformes species in ISIS are included, as are category of threat, if any. Existing and recommended programs are described in detail, below. Species not occurring in ISIS have been listed with 'no program' unless they are 'phase in', *in situ* or 'not recommended'.

Coraciidae: Rollers 12 species, one program

Species	Program category	Current Population	Target Population
<i>Coracias caudata</i>	Phase out	21.21.10	0.0
<i>Coracias cyanogaster</i>	PMP	34.31.13	50.50
<i>Coracias benghalensis</i>		3.7	na

Program Coordinator: Tim Snyder, Birmingham

Population targets set in consultation with the PMC. It is hoped to increase the target population for the Blue-bellied Roller to 100, as the Lilac-breasted Roller is phased out.

Rollers are an extremely popular exhibit group, generally common in the wild. The Lilac Breasted Roller *Coracias caudata*, was the first species approved for an AZA studbook on the basis of its exhibit value alone. However, this bird may be more aggressive than others in its family, established more by historical accident than design. In 1998, it was recommended that we investigate the possibility of developing programs for two or more other species, at least one African form and one Asian form. Until then, the Lilac Breasted Roller would be the recommended species, managed as a PMP, to be phased out when new species were established.



Tim Snyder, Lilac Breasted Roller studbookkeeper, investigated the availability of other species and the Blue-bellied Roller was approved as a PMP in 1999. As of 2003, the AZA population of Blue-bellied Roller is 78, with good founder numbers and unrelated birds that may be added to the population. The Lilac-breasted Roller population is 21.21.10, is aging, has low founder numbers and 'a fair amount of' inbreeding. The current recommendation is to phase out the Lilac-breasted Roller, and set a target size of 50.50 for the Blue-bellied Roller. The PMP coordinator has made contact with Ben Potterton, from the Shorelands in Norfolk, England regarding potential exchanges. He has also begun to investigate the availability of an Asian

Roller species. The Indian Roller is the only Asian Roller in collections, but most are post-reproductive. If additional specimens or other Asian species become available, we will consider developing a new program. Current (2002) studbook and masterplan are on the AZA website.

Brachypteraciidae: Ground Rollers -- 12 species, no programs

These poorly known Madagascar endemics are unrepresented in ISIS zoo collections and unlikely to become available. All are rare or vulnerable. No programs recommended.

Leptosomidae: Cuckoo Roller -- one species, no programs

Endemic to Madagascar and the Comoro Islands. Not in collections and unlikely to become available. No programs recommended.

Momotidae: Motmots -- 8 species, one program

Species	Program category	Current Population	Target Population
<i>Momotus momota</i>	PMP	48.38.11	50.50

Coordinator: Kevin Graham, Disney's Animal Kingdom

Population targets set in consultation with the PMC.

The Motmot studbook is current to December 31, 2002 and can be found on the AZA website. PMP recommendations for 2003 have also been posted. Existing space is adequate for the program target. There are several genetically valuable birds currently awaiting sexing. Recently, there has been a slight increase in the reproductive rate, including recently imported birds.

Concerns have been expressed pertaining to the differing subspecies of Motmots. The biggest concern is related to the sheer physical size differences across the subspecies. The population includes some birds weighing in at the low 80-gram range, varying up to some weighing in at 180 grams. The birds recently imported from Peru and Venezuela are smaller in size, most coming in around 100 grams.

The goal of the Blue-crowned Motmot PMP is to maintain 90% genetic diversity over a period of 100 years. This goal can be reached with very few additional importations needed if the breeding of wild caught birds is realized. This in the past has posed a serious problem, as few institutions have had continuing historical reproductive success. This trend would have to be reversed in order to reach the maximum potential genetic diversity. A priority for this program is documenting successful management techniques and exploring new husbandry concepts.

Todidae: Todies -- one species, no programs

Todies are delicate animals, seldom maintained in captivity and difficult to obtain. There is no conservation justification for developing programs for Todies at this time.

Alcedinidae: Kingfishers 22 species, 2 genera, no programs

Dacelonidae: Kingfishers 56 species, 8 genera, 2 programs

Cerylidae: Kingfishers 9 species, 3 genera, one proposed program

Taxon	Program category	Current Population	Target
<i>Ceryl rudis</i>	Phase In	0.0	20.20

A review of global ISIS data for Kingfishers shows no Cerylidae in collections, small numbers of one species in the Alcedinidae and several small to medium populations in the Dacelonid genera Dacelo and Halcyon. The most likely explanation for this is that the Dacelonids are predators of small ground animals, easier to transfer to artificial diets than the fish feeding Cerylidae and the insect and fish eating Alcedinidae. The TAG agreed that it would be valuable to develop management protocols for a non-Dacelonid Kingfisher and the Pied Kingfisher (*Ceryl rudis*), a common species with an enormous range, was identified as a potential. Contact was made with the Entebbe Zoo, in Uganda, where Pied Kingfishers nest on the grounds. A keeper from Entebbe visited several US zoos, and Marcia Arland, from the Bronx Zoo, visited Entebbe. The program has stalled because facilities for the program in US zoos could not be identified. Contact Chris Sheppard, the TAG chair, if you are interested in participating in this program.

Species	Program Category	Current Population	Target Population
<i>Dacelo novaeguinea</i>	PMP	85.82.17	100.100
Program Coordinator	Mark Myers, Audubon Park		



Population targets set in consultation with the PMC.

The North American Kookaburra population was founded in 1895 and relied on importation of wild specimens until captive breeding became common in the 1960's. The population has grown steadily since then. This program was established in 1990.

The Kookaburra studbook, current to 12/31/02, and PMP from 5/5/2003 are available on the AZA website. The studbook population is 85.82.17 (184) in 73 AZA institutions. Excluding birds of unclear parentage gives a PMP population of 25.24.6 (55), with 20 represented founders. Phasing out birds of unknown parentage in favor of birds bred in the PMP will take several years, but should permit a population target of 100.100. The most current Regional Studbook and masterplan can be found on the AZA

website.

Species	Program Category	Current Population	Target Population
<i>Halcyon c. cinnamomina</i>	SSP	30.23.2	see text below

Halcyon c. pelewensis *in situ*

Coordinator: Beth Bahner Philadelphia Zoo

Population targets set in consultation with the PMC.

The Guam Micronesian kingfisher first arrived in mainland zoos in 1984 as part of the Guam BirdRescue Project, initiated in 1983 to assist Guam with devastating losses to its avifauna as a result of predation by the introduced brown tree snake. Beth Bahner established the studbook in 1986 and in 1988, Larry Shelton was appointed Species Coordinator. Beth Bahner assumed the position of Species Coordinator in 1990. The population has faced numerous challenges, most significant being high mortality in parent-reared chicks and young adult birds. Starting with a base of 29 wild caught birds, 17 of which are founders, the population grew steadily to a high of 65 birds in 1991 before experiencing a major crash. For the past 10 years the population has maintained a perverse balance between hatches and deaths, preventing significant growth. In 2001, the population again reached 65 but high mortality in 2002 caused the population to drop below 60 again. There are currently 33.23.2 (58) birds in 12 institutions. Three males were sent to Guam DAWR in 2003, with a breeding pair to follow in 2004. The intent of this program is to produce enough birds to sustain a reintroduction program on Guam. With that goal in mind, no realistic target population has been established. Husbandry Manual, Studbook current through 2003 and Masterplan from December 2003 are on the AZA website. A Vote of Confidence for the SSP coordinator was held in 2002.

Meropidae: Bee-eaters 24 species, 3 genera 3 programs

Species	Program Category	Current Population	Target Population
<i>Merops nubicus</i>	Model	34.33.11	na
<i>M. albicollis</i>	Model	16.8.8	na
<i>M. bullockoides</i>	Model	2.4.18	na

Until recently, Bee-eaters have been uncommon in collections; as aerial insectivores, they are difficult to accustom to a captive diet. In the last 10-15 years, however, their numbers have increased and zoos, both in the US and in Europe, have begun to solve the problems inherent in their management. As brightly colored, colonial birds with open habits, their potential for exhibit/education is high, although no forms are endangered. Three species, *Merops nubicus* (Carmine), *M. albicollis* (White-throated) and *M. bullockoides* (White-fronted) are most common in AZA zoos. The White-throated Bee-eater could soon be considered for a PMP. At this point, the emphasis is on learning Bee-eater aviculture. Because the family is of special interest, Marcia Arland, Bronx Zoo, and Martin Vince, Riverbanks Zoo, have agreed to identify and disseminate information as it develops. Information is also posted on the TAG website.



Upupidae: Common Hoopoe One species, one genus

Taxon	Program category	Current Population	Target
<i>Upupa epops</i>	Phase in	8.16	50.50



The Common Hoopoe is an extremely desirable exhibit bird, now in low numbers in U.S. collections. Because of high interest and space available for at least 100 birds, it was designated for a proposed new program in the first edition of the RCP. A group of birds was scheduled to arrive in fall of 2003 but this fell through because of logistical and health problems of the exporter. Contact Martin Vince for more information.

Phoeniculidae: Woodhoopoes and Scimitar-bills: 3 genera, 9 species, one program

Taxon	Program category	Existing Population	Target Population
<i>Phoeniculus purpureus</i>	PMP	25.18.5	40.40

Program Manager Sylvia Hatcher, Lowry Park

Population targets set in consultation with the PMC

The Green Woodhoopoe, *Phoeniculus purpureus*, is a good exhibit species with an interesting natural history and an extreme curiosity in its surroundings. Six subspecies have been identified depending on geographical location, two of which are currently identified in North American zoos. It is not rare, but management is important due to excessive inbreeding as well as escape occurrence. Roughly 8-10% of the historical captive population has escaped from zoological institutions, showing a need for greater care in choosing or building enclosures.

The first issue of the Green Woodhoopoe studbook, with data current through August 19, 2002 and PMP recommendations dated September 2002, can be found on the AZA website. Over the past two decades, population annual growth rates attributed to captive hatches have varied from year to year but the population has exhibited an overall trend of increase despite a marked decrease in the population in the late 80s and early 90s. Since 1999 institutions have maintained the highest living captive population, staying at about 50 birds. Of these, most are offspring from a very small number of breeders. The studbookkeeper is actively pursuing options for obtaining new bloodlines and is working on a space survey, in the hope of being able to increase the total population to 80.

The age distribution of this population is a relatively stable one with an even sex ratio but a disproportionate number of individuals in the middle age classes relative to younger animals. The vast majority of the population is 1-4 years old. Captive Green Woodhoopoes have lived to their late-teens. They have not been observed to reproduce beyond the ages of ten and seven years for males and females respectively, thus exhibiting a relatively long period of reproductive senescence.

Three major concerns:

- 1). the high degree of uncertainty of ancestry. While the parentage of most living individuals is known, uncertainties exist deeper in their pedigrees. Resolution via genetic testing is possible, if funding can be obtained.
- 2). Small population size. The relatively long period of reproductive senescence means that a substantial fraction of the population will always be post-reproductive.
- 3) Extremely high levels of inbreeding may have occurred, as the vast majority of the population is descended from unknown parents at a single institution. This species may be somewhat resistant to deleterious effects of inbreeding, and it is common for a young male to take over his father's territory and family. However, imports of new founders would be of high value.

Bucerotidae: Hornbills 54 species, 9 genera, six programs

Among the Coraciiformes, the Hornbills are most commonly found in collections and include the most rare and endangered forms. In some taxonomies, they are considered a separate order. Their unusual nesting habits and the fact that many species are large and spectacular have made them of special interest. However, they do not breed reliably and have small clutch sizes. Developing techniques for improving reproduction and husbandry is a high priority.

Pied Hornbill *Anthrococeros coronatus*

In the first edition of the RCP, it was recommended that populations of Pied Hornbills be investigated farther, before a program recommendation could be made. Lee Schoen from Houston undertook this job, which was complicated by some taxonomic confusion, both in the literature and in collections. His conclusion was that the existing population is

small (15 individuals) and aging. He recommended that any viable individuals be sent to join the EAZA program for this species, with no AZA program recommended. The AZA TAG endorsed this recommendation in 2002. The EAZA Anthroceros Hornbill studbook has recently been taken over by John A. Ellis, Curator of Birds, Zoological Society of London. Contact him for more information at phone +44 20 7449 6454 fax +44 20 7722 2852.

Philippine Hornbills *in situ*

Virtually all hornbill species in the Philippines are threatened. There are few specimens of these species in captive collections. However, there are active programs for hornbills in the Philippines, and they have support from zoos in Europe and N. America. The program designation for these taxa is 'in situ' and the TAG will explore ways of contributing to their conservation.

Taxon	Program category	Current Population	Target Population
<i>Aceros corrugatus</i>	PMP	23.26	35.35
<i>Aceros undulatus</i>	DERP	11.13.2	na
<i>Aceros cassidix</i>	DERP	11.9.0	na

Program Manager: Eric Kowalczyk, Woodland Park
 Population targets set in consultation with the PMC

The original charge for this program was to evaluate AZA populations of *Aceros corrugatus*, *undulatus* and *cassidix*, determine how many species we could realistically work with and make recommendations for program categories. Space limitations restrict the program to one species. *Aceros corrugatus*, the Wrinkled Hornbill, was recommended by the studbookkeeper, working with the AZA PMC, based on population size and founder representation. The TAG endorsed the recommendation in 2002. The other species will continue to be monitored. The most recent studbook and PMP recommendations can be found on the AZA website.

The goal of the program is to preserve 90% of founding genetic diversity for 20 years. This short time period was selected as the maximum possible to allow that level of genetic preservation. It is hoped that identification of new space, improved genetic management and location of new founders will allow the population target to be increased. There are 23.26 living birds, from 21 facilities in the North American studbook, but because not all birds are of known heritage, or are in an appropriate situation for reproduction (e.g. display/education only), the managed PMP population comprises 16.19.3 birds, in 15 institutions. At least one F1 pair has produced offspring. Space will become available as birds of unknown heritage are removed from the population, and by taking advantage of space created as Pied Hornbills are phased out.

Taxon	Program category	Current pop.	Target pop.
<i>Buceros bicornis</i>	SSP	26.25.1	50.50
<i>Buceros rhinoceros</i>	SSP	20.23.1	35.35

Program Managers: Mark Myers, Audubon Park, SSP coordinator;
Lee Schoen, Houston, studbookkeeper.

Populations targets set in consultation with the PMC.



Mark Myers took over as program chair in 2002. Lee Schoen became studbookkeeper in early 2003. Developing reliable avicultural techniques is a priority, as well as supporting programs in the field. Recent work has provided information on mating behavior, nutrition and physiology. However, breeding remains sporadic and increasing the rate of reproduction is a primary goal. The masterplan recommendations for *B. bicornis*, from March 2003, can be found on the AZA website. Masterplanning for *B. rhinoceros* took place in January, 2004 and that plan is also posted on the website. Coordination with EAZA programs will be important for long term maintenance of these populations. Koen Brouwer of the Netherlands is the EAZA coordinator and may be contacted at: EAZA Executive Office c/o Artis ZooPlantage 1018 CZ Amsterdam The Netherlands

Taxon	Program category	Current Population	Target Population
<i>Tocus erythrorhynchus</i>	PMP	35.34	40.40
<i>Tocus deckeni</i>	Phase out	25.21.6	0.0

Program Manager: Kim Smith, Milwaukee

Population targets set in consultation with the PMC

The first edition of the Coraciiformes TAG Regional Collection Plan identified two *Tocus* species, Von der Decken's and Red-billed, as potential programs. Program manager Kim Smith analyzed both populations, with the help of the PMC. The red-billed hornbill was recommended, because it has better founder numbers, and age distribution, for a PMP with a target size of 75 individuals, with an eventual increase to 125 desirable. There is strong demand for this species, which does well in community aviaries, and which can replace Von der Decken's as it is phased out, so space is available to expand the population. The current studbook and PMP are available on the AZA website .

Taxon	Program category	Current ISIS population.
<i>Bucorvus ledbeateri</i>	PMP	29.29.5
<i>Bucorvus abyssinicus</i>	PMP	33.29.6

Program Manager Jeanette Boylan, Dallas

Both species of Ground Hornbills are good exhibit birds and work on wild biology, captive husbandry and release are taking place in South Africa. It seems likely that in the long term, one species will be eliminated for reasons of space. The studbookkeeper will have both studbooks in final form when she attends PMP II school in April, 2004. Studbooks and PMPs will be posted on the AZA website shortly thereafter.

Taxon	Program category	Current ISIS population
<i>Ceratogymna bucinator</i>	PMP	17.24.6
<i>Ceratogymna brevis</i>	PMP	13.15.2

Program Manager, Cindy Dupree, Central Florida

Cindy Dupree was approved as program manager for these species in January, 2002. It is expected that only one of these two taxa will ultimately be selected for a PMP, but the studbooks must be completed and analyzed first.

Five Year Action Plan

(* indicates funding priority)

TAG Goal : Improve management and propagation techniques

1. * Create database of Hornbill diet items and nutritional analysis. Investigate variation in nutritional requirements among species with different feeding habits.
 2. Endocrine Research in Hornbills:
San Diego has begun investigating the hormonal cycles involved in hornbill reproduction. Expanding the program beyond the genus *Buceros* is a priority.
North Carolina has been working to assess stress levels and reproductive cycling in Abyssinian Ground Hornbills. The TAG will support these efforts by providing samples and, where possible, funding.
 3. Produce and distribute husbandry manuals for priority taxa. We should start by evaluating the EAZA Hornbill manual.
 4. Create TAG development committee to work on fundraising for action projects.
 5. Investigate socialization and pair formation with groups of captive hatched chicks, as well as newly introduced adults
 6. Improve handrearing protocols, especially for hornbills, and determine when handrearing is appropriate. Because handreared birds may not be good candidates for breeding, we should test puppet rearing and develop protocols for testing 'tameness'. We should summarize available handrearing information for publication and incorporate recommendations into the next edition of the RCP and on the TAG Web site.
 7. Identify important characteristics of artificial nest sites for all taxa.
 8. Veterinary Research
Advisor Dr. Kathryn Gamble has several veterinary projects underway.
 - a. A survey of causes of mortality across the order. Facilities should submit samples and pathology information as it becomes available. The necropsy protocol is available on the TAG website. Dr. Gamble's contact information is below.
 - b.. A study of Hornbill casque morphology:
The external appearance of the hornbill casque (54 extant sp.) has been imaged and used as species identification. However, aside from the Greater Helmeted Hornbill (*Buceros vigil*), its internal anatomy remains vaguely described. This project will utilize radiography, computed tomography, contrast imaging, and anatomic preparation to advance the clinical understanding of casque anatomy. The interconnections of the casque space with the sinuses (nasal and cranial), the nares themselves, and the oropharynx should be revealed by this systematic approach. The information gathered will improve veterinary care as well as may elucidate functional roles for the casque or comparable anatomy between species. The Tissue Request has been made at this time to maximize collection of any specimen while awaiting funding notice. If a specimen is available, please contact Kathryn Gamble, DVM, MS, DACZM at Lincoln Park Zoo using the information listed below.
- Please contact the Veterinary Advisor when:
- a) a specimen from the listing is available and collected;
 - b) a species not on the listing is available;
 - c) your institution does not have long-term freezer storage but a specimen is available;
 - d) your institution has previously frozen specimens that could be appropriate for this project.

Dr. Kathryn Gamble
Director of Veterinary Services
Lincoln Park Zoo
2001 North Clark, Chicago, IL 60614
(312) 742-7722
(312) 742-7823 (fax)
kgamble@lpzoo.org

TAG Goal: Minimize the need for importation of wild specimens for captive programs

1. Establish model population of *Ceryx rudis*
2. Ensure that planned import of *Upupa epops* results in a PMP and intensive aviculture, to establish good management protocols.

TAG Goal: Develop communication resources

1. Support TAG website. Link Hornbill web page to species on Bird Conservation International's Endangered Birds of Asia and to Global Hornbill network site.
2. Find ways to get WCS Asian Hornbill posters into the field in range countries. We need to identify programs that could use the posters and people traveling to those locations that would be willing to carry posters.
3. Ensure a TAG presence at the next International Hornbill Symposium, in 2005.

TAG Goal: Support *in situ* conservation

1. Continue to collect Bucerus feathers for distribution in Borneo and recruit student or other individual(s) to evaluate the program. Contact Chris Sheppard for more information.
2. Promote Hornbill Research Foundation's Hornbill Nest Adoption Program, through annual posting on the Coraciiformes website and providing information on how to support the program to potential donors.
3. Support Pilai Poonswad's proposal to establish a Conservation Education Centre for Narathiwat Province, Thailand. Contact Eric Kowalczyk at Woodland Park for further information. Phone: 206 684 4880 Fax 206 684 4854 email eric.kowalczyk@zoo.org

4. Support established *in situ* projects:

Conservation of the Rufous-necked Hornbill in Thailand

Principal investigators: Pilai Poonswad and Anak Pattanavibool, World Hornbill

Once found from Nepal to Vietnam, the Rufous-necked hornbill is now extinct in parts of its range and barely hanging on in others. Hunted by local tribes and loss of habitat due to logging and agriculture are taking their toll. In Thailand, its last stronghold, fewer than a thousand birds remain, largely in remote mountain regions. Project goals are: 1: assessment of the current population trends and distribution of the hornbill in Thailand. 2: comprehensive understanding of the bird's habitat status and trends. 3: Develop strong social awareness and appreciation of conservation of the hornbills and their ecological components 4: Improved capacity of forest rangers who are taking care of hornbills and their habitat. Woodland Park Zoo and Audubon Zoo both support this project at this time. Contact Eric Kowalczyk at Woodland Park, or Mark Myers at Audubon, for further information.

The ecology of two African Hornbills

Contact Principal investigator, Tom Smith, University of California at Los Angeles tbsmith@obee.ucla.edu, for more information.

Project goals: 1) detail movement patterns of 30 *C. atrata* and *C. cylindricus* using satellite telemetry; 2) use both biotic and abiotic data to investigate causes of hornbill movements and generate a predictive framework for these behaviors; 3) determine the effects of habitat conversion and the pattern of forest fragments on hornbill movement patterns by integrating this data with radar imaging; and 4) synthesize the results from the above work to understand the implications for seed dispersal and conservation.

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APPENDIX I

CORACIIFORMES SPECIES, STATUS AND PROGRAM RECOMMENDATIONS

STATUS = IUCN CONSERVATION STATUS

Rare

Vulnerable

Endangered

Critical

Near threatened

Data Deficient

PROGRAM, existing or recommended

(see page 8 for program definitions)

SSP = Species Survival Program

PMP = Population Management Program

DERP = Display or Education program, research/model or Exhibit Only

In situ

Phase in

Not Recommended

Phase out

No Program: not in ISIS, not Phase in and not Not Recommended

ISIS/US: data from studbooks was used when available

ISIS/global (includes data from US)

Genus	species	subspecies	Common name	Status	ISIS/US	ISIS/global	Program
Coracias	garrulus		European Roller	Not listed	5.1.0	9.4.1	DERP
Coracias	abyssinica		Abyssinian Roller	Not listed	0.1.0	0.1.0	DERP
Coracias	caudata		Lilac-breasted Roller	Not listed	25.23.7	77.49.44	Phase Out
Coracias	spatulata		Racket-tailed Roller	Not listed	11.13.3	11.14.3	DERP
Coracias	naevia		Rufous-crowned Roller	Not listed	4.5.0	10.12.0	DERP
Coracias	benghalensis		Indian Roller	Not listed	2.5.0	5.4.2	DERP
Coracias	benghalensis	affinas		Not listed	1.0.0	1.0.0	
Coracias	benghalensis	benghalensis		Not listed	0.1.0	0.1.0	
Coracias	benghalensis	indica		Not listed	0.1.0	0.1.0	
Coracias	temminckii		Celebes Roller	Not listed			No program
Coracias	cyanogaster		Blue-bellied Roller	Not listed	28.23.13	42.16.14	PMP
Eurystomus	glaucurus		Broad-billed Roller	Not listed			No program
Eurystomus	gularis		Blue-throated Roller	Not listed			No program
Eurystomus	orientalis	orientalis	Dollar Bird	Not listed	1.5.1	3.6.3	DERP
Eurystomus	azureus		Azure Roller	Vulnerable			No program
Brachypteracias	squamigera		Scaley Ground Roller	Vulnerable			No program
Brachypteracias	leptosomatas		Short-legged Grnd Roller	Vulnerable			No program
Atelornis	pittoides		Pitta-like Ground roller	Rare			No program
Atelornis	crossleyi		Crossley's ground roller	Near Threatened			No program
Uratelornis	chimaera		Long-tailed Grnd Roller	Vulnerable			No program
Leptosomus	discolor		Cuckoo Roller	Not listed			No program
Hylomanes	momotula		Tody Motmot	Not listed			No program
Aspatha	gularis		Blue-throated Motmot	Not listed			No program
Electron	platyrhynchum		Broad-billed Motmot	Not listed			No program
Electron	carinatum		Keel-billed Motmot	Vulnerable			No program
Eumomota	superciliosa		Turquoise -browed Motmot	Not listed	1.0.0	1.0.0	DERP
Baryphthengus	ruficapillus		Rufous Motmot	Not listed			No program
Momotus	momota		Blue-crowned	Not listed	37.38.13	48.52.24	PMP
Todus	multicolor		Cuban Tody	Not listed			No program
Todus	angustirostris		Narrow-billed Tody	Not listed			No program
Todus	mexicanus		Puerto Rican Tody	Not listed			No program
Todus	jamaicensis		Jamaican Tody	Not listed			No program
Alcedo	hercules		Blyth's Kingfisher	Near Threatened			No program
Alcedo	atthis		Common	Not listed	0.0.0	1.1.1	DERP
Alcedo	atthis	japonica	River	Not listed	0.0.0	0.0.3	
Alcedo	semitorquata		Half-collared	Not listed			No program
Alcedo	quadribrachys		Shining Blue	Not listed			No program
Alcedo	meninting		Blue-eared	Not listed			No program
Alcedo	azurea		Azure	Not listed	0.0.0	0.0.3	DERP
Alcedo	websteri		Bismarck	Vulnerable			No program
Alcedo	cyanopecta		Philippine Pectoral	Not listed			No program
Alcedo	argentata		Silvery	Vulnerable			No program
Alcedo	cristata		Malachite	Not listed			No program
Alcedo	leucogaster		White-bellied	Not listed			No program
Alcedo	coerulescens		Caerulean	Not listed			No program
Alcedo	lepida		Variable Dwarf	Not listed			No program
Alcedo	vintsiodes		Madagascar Malachite	Not listed			No program
Alcedo	euryzona		Blue-banded	Vulnerable			No program
Ceyx	erithacus		Oriental Dwarf	Not listed	0.0.0	0.0.1	DERP
Ceyx	melanurus		Philippine Dwarf	Vulnerable			No program
Ceyx	fallax		Celebes Dwarf	Near Threatened			No program

Genus	species	subspecies	Common name	Status	ISIS/US	ISIS/global	Program
Ceyx	madagascariensis		Madagascar Pygmy	Not listed			No program
Ceyx	pictus		African Pygmy	Not listed			No program
Ceyx	lecontei		African Dwarf	Not listed			No program
Lacedo	pulchella		Banded	Not listed			No program
Dacelo	novaeaguineae		Kookaburra	Not listed	78.74.20	142.137.77	PMP
Dacelo	novaeaguineae	novaeaguineae		Not listed	6.12.2	22.31.12	
Dacelo	leachii		Blue-winged	Not listed			No program
Dacelo	tyro		Spangled	Not listed			No program
Dacelo	gaudichaud		Rufous-bellied	Not listed	0.1.0	0.1.0	DERP
Clytoceyx	rex		Shovel-billed	Not listed			No program
Cittura	cyanotis		Lilac Kingfisher	Near Threatened			No program
Halcyon	amauroptera		Brown-winged	Near Threatened			No program
Halcyon	capensis		Stork-billed	Not listed			No program
Halcyon	melanorhyncha		Celebes Stork-billed	Not listed			No program
Halcyon	coromanda		Ruddy Kingfisher	Not listed			No program
Halcyon	badia		Chocolate-backed	Not listed			No program
Halcyon	smyrnesis		White-breasted	Not listed	0.1.0	0.1.4	DERP
Halcyon	pileata		Black-capped	Not listed	0.0.0	0.0.1	DERP
Halcyon	cyanoventris		Java	Not listed			No program
Halcyon	leucocephala		Grey-headed	Not listed	2.1.0	7.1.5	DERP
Halcyon	senegalensis		Woodland	Not listed	4.0.0	5.1.1	DERP
Halcyon	senegaloides		African Mangrove	Not listed			No program
Halcyon	malimbica		Blue-breasted	Not listed	0.0.0	0.0.4	DERP
Halcyon	albiventris		Brown-hooded	Not listed	1.0.1	1.0.1	DERP
Halcyon	chelicuti		Striped	Not listed			No program
Halcyon	chloris		Mangrove	Not listed	5.9.0	15.24.18	DERP
Halcyon	cinnamomina		Micronesian	Not listed	33.24.2	33.24.2	
Halcyon	cinnamomina	cinnamomina	Guam	Extinct in Wild			SSP
	cinnamomina	pelewensis	Pelew	Not listed			<i>in situ</i>
Halcyon	nigrocyanea		Black-sided	Data Deficient			No program
Halcyon	winchelli		Winchells's	Vulnerable			No program
Halcyon	diops		Moluccan	Not listed			No program
Halcyon	lazuli		Lazuli	Near Threatened			No program
Halcyon	macleayii		Forest	Not listed	0.0.0	5.2.7	DERP
Halcyon	albonotata		New Britain	Near Threatened			No program
Halcyon	leucopygia		Ultramarine	Not listed			No program
Halcyon	farquhari		Chestnut-bellied	Vulnerable			No program
Halcyon	pyrrhopygia		Red-backed	Not listed	0.0.0	2.1.8	DERP
Halcyon	funnebris		Sombre	Vulnerable			No program
Halcyon	chloris		Mangrove	Not listed	5.9.0	15.24.18	DERP
Halcyon	saurophaga		Beach	Not listed			No program
Halcyon	australasia		Timor	Not listed			No program
Halcyon	sanctus		Sacred	Not listed	0.0.0	15.22.12	DERP
Halcyon	veneratus		Tahiti	Not listed			No program
Halcyon	tuta		Pacific	Not listed			No program
Halcyon	fulgida		White-rumped	Not listed			No program
Halcyon	torotoro		Lesser Yellow-billed	Not listed			No program
Halcyon	megarhyncha		Mountain Yellow-billed	Not listed			No program
Todirhamphus	ruficollaris		Mangaia	Vulnerable			No program
Todirhamphus	godeffroyi		Marquesan	Endangered			No program
Todirhamphus	gambieri		Tuamotu	Vulnerable			No program

Genus	species	subspecies	Common name	Status	ISIS/US	ISIS/global	Program
Todirhamphus	enigma		Talud	Near Threatened			No program
Todirhamphus	australasia		Cinnamon-banded	Near Threatened			No program
Melidora	macrorrhina		Hook-billed	Not listed			No program
Actenoides	bougainvillei		Moustached	Vulnerable			No program
Actenoides	concretus		Rufous-collared	Near Threatened			No program
Actenoides	lindsayi		Spotted Wood	Not listed			No program
Actenoides	hombroni		Hombroni	Vulnerable			No program
Actenoides	monachus		Celebes Green	Near Threatened			No program
Actenoides	princeps		Regent	Not listed			No program
Tanysiptera	hydrocharis		Aru Paradise	Data Deficient			No program
Tanysiptera	reideii		Biak	Near Threatened			No program
Tanysiptera	galatea		Common Paradise	Not listed			No program
Tanysiptera	carolinae		Numfor Paradise	Near Threatened			No program
Tanysiptera	nympha		Rufous-breasted Paradise	Not listed			No program
Tanysiptera	danae		Brown-headed Paradise	Not listed			No program
Tanysiptera	sylvia		Buff-breasted	Not listed			No program
Megaceryle	maxima		Giant	Not listed			No program
Megaceryle	lugubris		Crested	Not listed			No program
Megaceryle	alcyon		Belted	Not listed	0.0.0	1.1.1	DERP
Megaceryle	torquata		Ringed	Not listed			No program
Ceryle	rudis		Pied	Not listed			Phase In
Chloroceryle	amazona		Amazon	Not listed			No program
Chloroceryle	americana		Green	Not listed			No program
Chloroceryle	inda		Green-and-Rufous	Not listed			No program
Chloroceryle	aenea		American Pygmy	Not listed			No program
Nyctyornis	amictus		Red-bearded	Not listed			No program
Nyctyornis	athertoni		Blue-bearded	Not listed			No program
Meropogon	forsteni		Celebes	Not listed			No program
Merops	gularis		Black	Not listed			No program
Merops	muelleri		Blue-headed	Not listed			No program
Merops	bullocki		Red-throated	Not listed			No program
Merops	bullockoides		White-fronted	Not listed	2.4.18	2.5.156	DERP
Merops	pusillus		Little	Not listed			No program
Merops	variegatus		Blue-breasted	Not listed			No program
Merops	oreobates		Cinnamon-cheasted	Not listed			No program
Merops	hirundinaceus		Swallow-tailed	Not listed			No program
Merops	breweri		Black-headed	Not listed			No program
Merops	revoilii		Somali	Not listed			No program
Merops	albicollis		White-throated	Not listed	16.8.8	18.10.44	DERP
Merops	orientalis		Little Green	Not listed			No program
Merops	boehmi		Boehm's	Not listed			No program
Merops	viridis		Blue-throated	Not listed	2.2.0	2.2.0	DERP
Merops	persicus		Blue-cheeked	Not listed			No program
Merops	superciliosus		Madagascar	Not listed			No program
Merops	ornatus		Rainbow	Not listed	0.0.0	5.6.10	DERP
Merops	apiaster		European	Not listed			No program
Merops	leschenaulti		Bay-headed	Not listed			No program
Merops	malimbicus		Rosy	Not listed			No program
Merops	nubicus		Carmine	Not listed	11.17.30	17.10.79	DERP
Merops	nubicus	nubicus		Not listed	34.33.11	34.33.15	DERP
Merops	nubicus	nubicoides		Not listed	0.1.0	0.1.0	DERP

Genus	species	subspecies	Common name	Status	ISIS/US	ISIS/global	Program
Upupa	epops		Common Hoopoe	Not listed	0.0.0	14.17.28	Phase In
Upupa	epops	saturata		Not listed	8.16.0	8.17.1	Phase In
Phoeniculus	purpureus		Green Woodhoopoe	Not listed			PMP
Rhinopomastus			Scimitar-bill	Not listed			No program
Ceratogymna	elata		Yellow-casqued Wattled	Near Threatened	0.0.0	1.1.0	DERP
Ceratogymna	atrata		Black-casqued Wattled	Not listed	4.4.0	4.4.0	DERP
Ceratogymna	fistulator		Piping	Not listed			No program
	fistulator	fistulator					No program
	fistulator	sharpii					No program
	fistulator	duboisii					No program
Ceratogymna	bucinator		Trumpeter	Not listed	17.24.6	53.62.16	PMP
Ceratogymna	cylindricus		Brown-cheeked	Near Threatened			No program
	cylindricus	cylindricus					
	cylindricus	albotibialis					
Ceratogymna	subcylindricus		Grey-cheeked	Not listed			No program
	subcylindricus	subcylindricus					
	subcylindricus	subquadratus					
Ceratogymna	brevis		Silvery-cheeked	Not listed	13.15.2	22.27.4	PMP
Anthracosceros	coronatus		Indian Pied	Near Threatened	0.0.0	4.3.1	DERP
Anthracosceros	albirostris		Oriental Pied	Not listed	0.0.0	8.12.2	Phase out
	albirostris	albirostris			6.6.0	8.11.0	
	albirostris	convexus			0.0.0	7.9.2	
Anthracosceros	malayanus		Malay Black	Near Threatened	4.4.0	18.15.8	DERP
Anthracosceros	montani		Sulu	Critical			No program
Anthracosceros	marchei		Palawan	Vulnerable			No program
Anorrhinus	tickelli		Tickell's Brown	Near Threatened			No program
Anorrhinus	austeni		Austen's Brown	Not listed			No program
Anorrhinus	galeritus		Bushy-crested	Not listed	0.0.0	1.2.1	DERP
Penelopides	panini		Visayan Tarictic	Endangered	0.0.0	7.3.0	DERP
	panini	panini					
	panini	ticaensis					
Penelopides	exarhatus		Sulawesi Tarictic	Not listed			No program
	exarhatus	exarhatus		Not listed			
	exarhatus	sanfordi		Not listed			
Penelopides	manillae		Luzon Tarictic	Not listed	4.5.0	4.5.0	DERP
	manillae	manillae		Not listed			
	manillae	subnigra		Not listed			
Penelopides	affinis		Mindanao Tarictic	Not listed			No program
	affinis	affinis		Not listed			
	affinis	samarensis		Not listed			
	affinis	basilanica		Not listed			
Penelopides	mindorensis		Mindoro Tarictic	Endangered			No program
Aceros	comatus		White-Crowned	Near Threatened			No program
Aceros	nipalensis		Rufous-necked	Vulnerable			No program
Aceros	corrugatus		Sunda Wrinkled	Near Threatened	23.26.0	34.38.4	PMP
Aceros	leucocephalus		Mindanao Wrinkled	Near Threatened	0.1.0	1.2.0	DERP
Aceros	waldeni		Visayan Wrinkled	Critical			No program
Aceros	cassidix		Sulawesi Wrinkled	Not listed	10.8.1	13.12.1	DEP
Aceros	narcondami		Narcondam	Vulnerable			No program
Aceros	undulatus		Bar-pouched Wreathed	Not listed	12.15.4	24.28.6	DEP
Aceros	subruficollis		Plain-pouched	Vulnerable			No program

Genus	species	subspecies	Common name	Status	ISIS/US	ISIS/global	Program
Aceros	everetti		Sumba	Vulnerable			No program
Aceros	plicatus		Papuan Wreathed	Not listed	5.3.2	14.17.9	DERP
	plicatus	plicatus					
	plicatus	ruficollis			0	0.1	
	plicatus	jungei			2.2	0	
	plicatus	dampieri					
	plicatus	harterti					
	plicatus	mendanae					
Buceros	rhinoceros		Great Rhinoceros	Near Threatened	9.7.0	14.12.1	SSP
	rhinoceros	rhinoceros			0.1.0	5.7.0	
	rhinoceros	borneoensis			0.4.1	2.7.2	
	rhinoceros	silvestris			8.7.1	17.15.2	
Buceros	bicornis		Great	Near Threatened	26.25.1	53.59.3	SSP
Buceros	bicornis	bicornis			0.0.0	2.5.0	
Buceros	bicornis	Homrai			0.0.0	5.2.2	
Buceros	hydrocorax		Great Philippine	Near Threatened	0.0.0	2.1.1	DERP
	hydrocorax	hydrocorax			0.0.0	4.3.0	
	hydrocorax	semigaleatus					
	hydrocorax	mindanensis			0.0.0	0.2.0	
Buceros	vigil		Great Helmeted	Near Threatened			No program
Tockus	alboterminatus		African Crowned	Not listed	1.0.0	13.11.15	DERP
Tockus	bradfieldi		Bradfield's	Not listed			No program
Tockus	fasciatus		African Pied	Not listed			No program
	fasciatus	fasciatus			1.1.0	1.1.0	DERP
	fasciatus	semifasciatus			1.0.0	1.0.0	DERP
Tockus	hemprichii		Hemprich's	Not listed			No program
Tockus	pallidirostris		Pale-billed	Not listed			No program
Tockus	nasutus		Grey	Not listed	0.1.0	9.8.1	DERP
	nasutus	nasutus	African Grey		1.3.0	1.4.0	
	nasutus	epirhinus					
	nasutus	forskali					
	nasutus	dorsalis					
Tockus	monteiri		Monteiro's	Not listed			No program
Tockus	erythrorynchus		African Red-billed	Not listed	26.23.1	44.33.19	PMP
	erythrorynchus	erythrorynchus			0.0.0	1.1.0	
	erythrorynchus	rufirostris					
	erythrorynchus	damarensis					
Tockus	leucomelas		S. Yellow-billed	Not listed	0.0.0	2.3.0	DERP
Tockus	flavirostris		E. Yellow-billed	Not listed	8.4.1	13.7.2	DERP
Tockus	deckeni		Von der Decken's	Not listed	25.21.6	44.39.20	Phase Out
	deckeni	deckeni					
	deckeni	jacksoni					
Tockus	hartlaubi		Dwarf Black	Not listed			No program
	hartlaubi	hartlaubi					No program
	hartlaubi	granti					No program
Tockus	camurus		Dwarf Red-billed	Not listed			No program
Tockus	albocristatus		Long-tailed	Not listed			No program
	albocristatus	albocristatus					
	albocristatus	macrourus					
	albocristatus	cassini					
Ocyceros	griseus		Malabar Grey	Not listed			No program

Genus	species	subspecies	Common name	Status	ISIS/US	ISIS/global	Program
Oryx	capensis		Sri Lankan Grey	Not listed			No program
Oryx	capensis		Indian Grey	Not listed			No program
Bucorvus	capensis		Abyssinian Ground	Not listed	33.29.6	51.48.14	PMP
Bucorvus	capensis		African Ground	Not listed	29.29.5	71.73.15	PMP

Appendix II: contact information
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