STORK, IBIS, AND SPOONBILL

Conservation Assessment and Management Plan

Chonburi, Thailand, July 1995

SPECIES SURVIVAL COMMISSION

STORK, IBIS AND SPOONBILL CONSERVATION ASSESSMENT AND MANAGEMENT PLAN WORKSHOP

Chonburi, Thailand
26 - 29 July 1995

WORKING DOCUMENT

Edited by
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Compiled by
Workshop Participants

Hosted by
Khao Kheow Open Zoo

A Collaborative Workshop of

The Zoological Park Organization of Thailand
The Royal Forest Department of Thailand
IUCN/SSC Stork, Ibis and Spoonbill Specialist Group and
IWRB Waterbird Specialist Group
IUCN/SSC Conservation Breeding Specialist Group

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A contribution of the IUCN/SSC Conservation Breeding Specialist Group, The Zoological Parks Organization of Thailand, The Royal Forest Department of Thailand, the IUCN/SSC Stork, Ibis, and Spoonbill Specialist Group, and the IWRB Waterbird Specialist Group.

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26-29 July 1995
Chonburi, Thailand

SECTION 1

EXECUTIVE SUMMARY AND RECOMMENDATIONS

Executive Summary

The goals of the Stork, Ibis and Spoonbill CAMP workshop were:

1. To review the population status and demographic trends for storks, ibises and spoonbills, to assign New IUCN Red List categories of threat and to identify management options for stork, ibis and spoonbill taxa.

2. To provide recommendations for *in situ* and *ex situ* management, research and information-gathering for all stork, ibis and spoonbill taxa, including: recommendations for PHVA workshops; more intensive management in the wild; taxonomic research, survey, monitoring, investigation of limiting factors, taxonomy or other specific research.

3. To produce a Conservation Assessment and Management Plan for Storks, Ibises and Spoonbills, presenting the recommendations from the workshop for review by workshop participants and distribution to all parties interested in stork, ibis and spoonbill conservation.

The CAMP Workshop was organized by the Conservation Breeding and Stork, Ibis and Spoonbill Specialist Groups in collaboration with the Thailand Royal Forestry Department and the Zoological Parks Organization. The Workshop was conducted at the Khao Kheow Open Zoo in Chonburi, Thailand, 26-29 July 1995. Approximately 40 experts on wild and captive management of storks, ibises and spoonbills from 12 countries gathered for an intensive and interactive review of their status in each range country. Participants in the Thailand Workshop formed 3 working groups (Status of Southeast Asian stork, ibis and spoonbill taxa in the wild; Status of stork, ibis and spoonbill taxa in captivity; and Status of non-Southeast Asian stork, ibis and spoonbill taxa) to: 1) determine best estimates of the status of all stork, ibis and spoonbill taxa; 2) assign each taxon to a IUCN Category of Threat; and 3) identify areas of action and information needed for conservation and management purposes. Participants in the workshop and the composition of the working groups are listed in Appendix III.

Although all stork, ibis and spoonbill taxa were considered during the workshop, the majority of the participants were from Southeast Asian countries. Therefore, the information from that region may be more accurate and complete than for other regions of the world. The information in this report will be reviewed at regional CBSG Meetings and at Stork, Ibis and Spoonbill CAMP Review sessions in other regions of the world. The document will be revised as new information becomes available.

The assessments and recommendations of the working groups were circulated to the entire group prior to production of the final workshop draft report. The draft report was distributed to all participants and their comments have been incorporated into this working document. Summary recommendations concerning research, management, assignment of taxa to appropriate threat status and captive breeding goals were supported by the workshop participants. Special topic working groups convened to discuss and prepare reports on issues of importance to storks, ibises

and spoonbills in Southeast Asia. The topics considered were Southeast Asian conservation priorities, reintroduction and Southeast Asian regional collection planning. The recommendations of the reintroduction and regional collection planning working groups were circulated in draft form and agreed upon by all workshop participants. They are listed in items 4 and 5 of this summary. The report from the conservation priorities working group is found in Section 2.

Results

Sixty-six distinct Stork, Ibis and Spoonbill taxa (species, subspecies and/or populations) were considered by the Stork, Ibis and Spoonbill Conservation Assessment and Management Plan. These 66 taxa were assigned to one of the following categories, based on the New IUCN Red List criteria (see Appendix I for category definitions and explanations):

Table 1. Threatened Stork, Ibis and Spoonbill Taxa - New IUCN Categories of Threat.

NEW IUCN CATEGORY OF THREAT	NUMBER OF TAXA	PERCENT OF TOTAL
Extinct	1	1.5
Extinct in Wild	0	0
Critical	5	7.6
Endangered	6	9.1
Vulnerable	7	10.6
Conservation Dependent	0	0
Low Risk	44	66.7
Data Deficient	3	4.5
TOTAL	66	100

The specific criteria by which these assignments were made are listed on the taxon data sheets.

Table 2. List of Stork, Ibis and Spoonbill taxa in the IUCN categories.

Category & List #	TAXON
Extinct	
39	*Bostrychia olivacea rothschildi*
Critical	
32	*Pseudibis davisoni*
33	*Thaumatibis gigantea*
36	*Nipponia nippon*
40	*Bostrychia olivacea bocagei*
62	*Platalea minor*
Endangered	
13	*Ciconia stormi*
17	*Ciconia boyciana*
18	*Ephippiorhynchus asiaticus asiaticus*
23	*Leptoptilos dubius*
26	*Threskiornis aethiopicus abbotti*
34	*Geronticus eremita*
Vulnerable	
3	*Mycteria cinerea*
8	*Ciconia nigra*
16	*Ciconia ciconia asiatica*
22	*Leptoptilos javanicus*
27	*Threskiornis aethiopicus bernieri*
56	*Plegadis ridgwayi*
61	*Platalea leucorodia archeri*
Lower Risk	
2	*Mycteria americana*
4	*Mycteria ibis*
5	*Mycteria leucocephala*
6	*Anastomus oscitans*
7	*Anastomus lamelligerus*
9	*Ciconia abdimii*
10	*Ciconia episcopus microscelis*
14	*Ciconia maguari*
15	*Ciconia ciconia ciconia*
19	*Ephippiorhynchus asiaticus australis*
20	*Ephippiorhynchus senegalensis*
21	*Jabiru mycteria*
24	*Leptoptilos crumeniferus*
25	*Threskiornis aethiopicus aethiopicus*
28	*Threskiornis melanocephalus*
29	*Threskiornis molucca*
30	*Threskiornis spinicollis*

Table 2. (Continued)

Category & List #	TAXON
Lower Risk	
31	*Pseudibis papillosa*
35	*Geronticus calvus*
37	*Bostrychia olivacea olivacea*
38	*Bostrychia olivacea cupreipennis*
41	*Bostrychia olivacea akleyorum*
42	*Bostrychia rara*
43	*Bostrychia hagedash*
44	*Bostrychia carunculata*
45	*Harpiprion caerulescens*
46	*Theristicus caudatus*
47	*Theristicus melanopis*
48	*Cercibis oxycerca*
49	*Mesembrinibis cayennensis*
50	*Phimosus infuscatus*
51	*Eudocimus albus*
52	*Eudocimus ruber*
53	*Plegadis falcinellus falcinellus*
54	*Plegadis falcinellus peregrinus*
55	*Plegadis chihi*
57	*Lophotibis cristata*
58	*Platalea leucorodia leucorodia*
59	*Platalea leucorodia major*
60	*Platalea leucorodia balsaci*
63	*Platalea alba*
64	*Platalea regia*
65	*Platalea flavipes*
66	*Ajaia ajaja*
Data Deficient	
1	*Balaeniceps rex*
11	*Ciconia episcopus episcopus*
12	*Ciconia episcopus neglecta*

Table 3. Distribution of threatened Stork, Ibis and Spoonbill taxa.

Country/Continent	Taxa & IUCN Category of Threat						Total
	CR	EN	VU	LR	DD	EX	
Africa	1	2	3	21	1	1	29
Australia	0	0	0	6	0	0	6
Bangladesh	0	0	2	4	1	0	9
Cambodia	2	2	2	3	0	0	10
China	2	1	3	2	0	0	8
Europe	0	1	1	2	0	0	4
India	0	2	3	5	1	0	11
Indonesia	1	1	2	3	0	0	7
Japan	1	1	1	2	0	0	5
North and South Korea	0	1	1	0	0	0	2
Lao PDR	2	1	1	2	0	0	6
Malaysia	0	1	2	1	1	0	5
Myanmar	1	2	1	3	1	0	8
Nepal	0	2	3	4	1	0	10
North America	0	0	0	6	0	0	6
Pakistan	0	1	1	4	1	0	7
Philippines	0	0	0	2	1	0	3
South America	0	0	1	13	0	0	14
Sri Lanka	0	1	1	3	1	0	6
Thailand	1	3	2	3	0	0	9
Vietnam	2	1	3	3	0	0	9

Most taxa are found in more than one country or region.

Recommendations

1. 14 of the 66 taxa (21.2%) were recommended for Population and Habitat Viability Assessment (PHVA) workshops. PHVA recommendations are pending for 4 additional taxa.

2. 171 recommendations for Research Management were made in the following categories:

Survey	38 taxa
Monitoring	41 taxa
Life history research	21 taxa
Habitat management	22 taxa
Taxonomic research	12 taxa
Limiting factors research	18 taxa
Limiting factors management	13 taxa
Husbandry	2 taxa
Other	4 taxa

For many taxa, more than one type of research management was recommended.

Table 4. Research management recommendations for Stork, Ibis and Spoonbill taxa assigned Critical (CR), Endangered (EN), or Vulnerable (VU) IUCN Red List Categories.

Topic	Recommendations by IUCN Category			Total
	CR	EN	VU	
Survey	4	4	6	14
PHVA	4	6	2	12
PHVA Pending	1	0	0	1
Monitoring	3	7	5	15
Life History	3	3	4	10
Habitat Management	3	4	3	10
Taxonomy	2	0	1	3
Husbandry	0	0	0	0
Limiting Factors Research	2	3	4	9
Limiting Factors Management	1	3	3	7

3. 47 of the 66 taxa are present in captivity (71.2%). 25 of the 66 stork, ibis and spoonbill taxa (37.9%) were recommended for one of three levels of captive programs (based in part on IUCN Red List criteria):

Table 5. Captive Program Recommendations for Stork, Ibis and Spoonbill by New IUCN Categories of Threat (See Appendix I for explaination of captive program recommendations).

IUCN Category	Level 1	Level 2	Level 3	Pending	No
Critical	1	0	0	4	0
Endangered	4	0	0	2	0
Vulnerable	2	0	2	2	1
Lower Risk	3	0	13	3	25
TOTAL	10	0	15	11	26

Captive programs for 13 taxa (including the extinct taxa, *Bostrychia olivacea rothschildi,* and *Ciconia episcopus neglecta*, classified as data deficient) were listed as "pending," meaning that recommendations for such would be postponed until further information was available, either from survey, a PHVA, or other sources. Twenty-eight species/subspecies/populations were identified as not requiring captive programs.

4. **Captive Breeding of Storks, Ibises and Spoonbills:** During the Stork, Ibis and Spoonbill CAMP Workshop the issue of cooperative, regional collection planning was discussed. A consensus conclusion was that, in Southeast Asia, breeding programs should be developed cooperatively among the various range countries for stork, ibis and spoonbill taxa for which a Level 1 captive program has been recommended. The specific recommendations resulting from this discussion are as follows:

We encourage all captive breeding institutions to :

I. Link all Level 1 programmes with conservation of wild populations regardless of whether removal of founders from the wild is required for implementation of captive breeding programmes.

II. Remove founders from the wild for a Level 1 programme only if :
   a. a PHVA in the range countries of the taxon demonstrates the need for a captive program for the taxon.
   b. competence in captive breeding has been demonstrated for the taxon or a closely related taxon
   c. the captive population is managed as part of a conservation plan for the wild populations.

We encourage Southeast Asian captive breeding institutions to :

I. As necessary for implementation of Level 1 programs, replace
   a. related taxa with NO captive recommendations and
   b. other common animals that do not require a captive programme for conservation purposes, with taxa in Level 1 programmes.

II. Develop/cooperate in captive breeding programs for Level 1 species for conservation purposes,

III. Adapt the source material from the "Stork Conservation and Captive Management Manual" [copies of which can be obtained from Catherine King] Rotterdam Zoo, and translate the relevant parts of the manual into each language of the range countries. Similarly, adapt the "Heron, Ibis and Spoonbill (HIHAG) Husbandry Notebook" [copies of which can be obtained from Anna Marie Lyles, Associate Curator of Animals, Central Park Wildlife Center, 830 Fifth Avenue, New York, New York 10021-7095, e-mail: wcs13@transit.nyser.net, fax: 212-988-0286, phone: 212-439-6503] and to translate relevant parts of the manual into each language of the range countries.

5. **Reintroduction of Storks, Ibises and Spoonbills:** During the Stork, Ibis and Spoonbill CAMP Workshop the issue of reintroduction was discussed. The specific recommendations resulting from this discussion are as follows:

We encourage Southeast Asian captive breeding institutions to :

I. Follow the draft IUCN reintroduction guidelines,

II. Exchange information and develop training programs specific to needs of Southeast Asian countries, possibly on a Southeast Asian scale, as knowledge and experience necessary to follow the draft IUCN guidelines are not readily available,

III. Adopt reintroduction procedures that are as effective and simple as possible and tailored to Southeast Asian countries,

IV. Cooperate among Southeast Asian countries to implement programs when suitable.

Table 6. Summary Data for All Stork, Ibis and Spoonbill Taxa (Category definitions can be found in Appendix I)

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num[a]
	Ciconiiformes																	
	Balaenicipitidae																	
1	Balaeniceps	rex (Shoebill)	Sudan to Zambia	D	D	1	S	?	10,000 - 15,000	1,4	L,I,T, W	DD		M,Hm, Lm,Lr	Yes	No	3	14.13.5
	Ciconiidae																	
2	Mycteria	americana (American Wood stork)	SE USA, Caribbean, C America, S America into Argentina	D	D	4	S?	?	50,000-100,000	1	H,Hf,I,L	LR		S,M	No	3	2	22.22.65
3	Mycteria	cinerea (Milky stork)	Vietnam, Malaysia, Sumatra,Java, Sulawesi, Cambodia, S. Thailand	D	D?	>4F	D	?	>6,000; Indonesia :6,000 Malaysia :<100 Cambodia :>16	1,2	Lf,Hf,I, Ps,Po	VU	B1, C2a	S,M, Hm	Yes	1	1-2	14.18.99
4	Mycteria	ibis (Yellowbilled stork)	Senegal to Sudan & Cape Province	D	D	1	S	?	25,000-100,000	3,4	H,L,F	LR		None	No	No	2	17.18.36
5	Mycteria	leucocephala (Painted stork)	Pakistan, India, Bangladesh, Cambodia, Sri Lanka, Thailand, Vietnam, Nepal, Lao PDR, Myanmar	D	D	3F?	D	?	15,000-20,000	2,3	Lf,Hf,Ps?	LR		Hm,O	No	1/2	2	36.22. 671
6	Anastomus	oscitans (Asian openbill stork)	India, Nepal, Sri Lanka, Bangladesh, Myanmar, Thailand, Pakistan, Vietnam, Cambodia	D	D	2	S	?	125,000	1,2,3	Hf	LR		S,M,O	No	3/ No	3	7.3.14
7	Anastomus	lamelligerus (African openbill stork)	African tropics south of the Sahara	D	D	1	D/I?	?	>100,000	2,3,4	Hf,L	LR		S	No	No	3	12.5.7
	Anastomus	lamelligerus lamelligerus	Senegal to Sudan & Zimbabwe															

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num*
	Anastomus	lamelligerus madagascariensis	Madagascar															
8	Ciconia	nigra (Black stork)	Africa, Eurasia, N to Sweden, W to Spain, E to China, Mongolia, former USSR, Bangladesh, Nepal, India, Laos Pakistan, Myanmar, N Thailand, N & S Korea, Japan, Hong Kong, Vietnam	D	D	>2	S	?	>100,000	1,2,3,4	Pu,Ps,Po,L, Ln,Pl	VU	C2a,B	Hm,S, M,Lh	Yes	3	2	74.46.82
9	Ciconia	abdimii (Abdim's stork)	Niger to Ethiopia to Angola & Transvaal, Oman, Yemen	D	D	1	S	?	25,000-100,000	2,4,5	L	LR		None	No	No	1	39.50.70
	Ciconia	episcopus (Woollynecked stork)	Africa, Indian subcontinent, Indonesia, Philippines, Vietnam, Thailand, Cambodia															
10	Ciconia	episcopus microscelis	Senegal to Sudan & Cape Province	D	D	1	S	?	25,000-100,000	3,4	None	LR		None	No	No	2	12.15.63 for the species
11	Ciconia	episcopus episcopus	India, Sri Lanka, Myanmar, Pakistan, Bangladesh, Nepal	D	D	1?	D	?	<2,500?	2,3	Ps?, L?	DD		T,M,S Lh,O	No	No	2	ISIS: 4.4.0
12	Ciconia	episcopus neglecta	Malaysia to Philippine Islands, Sunda Islands	D	D	1?	D	?	<2,500?	3,4	L	DD		T,M, S,Lh	No	P	2	None
13	Ciconia	stormi (Storm's stork)	Kalimantan,Sumatra Malaysia, S.Thailand	D	D	3	D	?	<1,500?	3,4	L	EN	B,C	S,M, Lm,Lh	Yes	P	2	4.4.6
14	Ciconia	maguari (Maguari stork)	South America (E of the Andes)	D	D	1	S	?	50,000-100,000	3,4	H,I,Hf,L	LR		S,M	No	No	2	21.17.25
	Ciconia	ciconia (White stork)	Europe, Middle East, W C Asia, NW & S Africa															

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num[a]
15	Ciconia	ciconia ciconia	Europe, N Africa, S Africa	D	D	3	D/S	7-8 y	500,000	1,2	Dp,L,Pl,Ps, H	LR		M,Hm, Lm	No	3	1	85.71. 168
16	Ciconia	ciconia asiatica	Kazakhstan, Kirghizstan, Tazikistan, Uzbekistan, NW China India, Pakistan and Nepal	D	D	1	I?	?	~3,000	2,3	Ps,Pl	VU	C2	T,S, M,Lr, Lh	No	No	?	None
17	Ciconia	boyciana (Oriental White stork)	Russia (middle and lower Amur region), NE China (Nenjiang), N Korea (?), S and C China, Taiwan, Hong Kong, Japan	D	D	1	D	?	2,500-3,500	2,3	L,Ln,Ps,Hf, I	EN	C2a, D,A	S,M,Lr Lh	Yes	1	2	54.52.76
	Ephippiorhynchus	asiaticus (Blacknecked stork)																
18	Ephippiorhynchus	asiaticus asiaticus	India, Nepal, Sri Lanka, Cambodia, Bhutan, Pakistan, Vietnam, Myanmar and Thailand	D	D	3F	D	?	>500	2,3	Dp,L,I,T, Ps?,Pu	EN	C2,A	S,M, Hm,Lr Lm	Yes	1	3	4.3.0 (20.15.45 for the species)
19	Ephippiorhynchus	asiaticus australis	New Guinea, N & E Australia	D	D	1	S	?	<10,000	1,4	Hf,L	LR		M,Lh	No	No	3	1.0.3
20	Ephippiorhynchus	senegalensis (Saddlebill stork)	Senegal to Sudan & Transvaal	D	D	1	S?	?	<10,000	4,5	L,T	LR		M,H, Lm,Lr, Lh	No	No	3	66.67.14
21	Jabiru	mycteria (Jabiru)	S Mexico to Argentina	D	D	1	S?	?	10,000-25,000	1,5	L,I,H	LR		S,M, Lh	No	No	3	13.11.24
22	Leptoptilos	javanicus (Lesser adjutant stork)	India, Nepal, Sri Lanka?, Myanmar Bangladesh, Thailand, Cambodia, Vietnam?, Malaysia, Indonesia, Lao PDR, Bhutan, SW China	D	D	6?	D	?	5,000	1,2,3	L,Hf	VU	C2,A	S,M, Lh,Lr, Hm	No	1	3	29.23. 109

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num[s]
23	Leptoptilos	dubius (Greater adjutant stork)	India, Cambodia, Myanmar?, Nepal, C Thailand, Lao PDR	D	D	2	D	?	>700	1,2,3	Ln,Hf,Pl	EN	C2a	S,M, Hm,Lr	Yes	1	3	15.12.40
24	Leptoptilos	crumeniferus (Marabou stork)	Senegal to Sudan & Transvaal	D	D	1	I	?	100,000-1,000,000	3	None	LR		H	No	3	3	137.149. 221
	Threskiornithidae																	
	Threskiornis	aethiopicus	Africa, Madagascar, Iran, Iraq															
25	Threskiornis	aethiopicus aethiopicus (Sacred ibis)	Africa, Iraq, Iran	D	D	2F	S(Afr) ?(In/Iq)	?	Africa :>200,000 Iran/Iraq :200	3,4;1,3	L,I,Hf	LR		S,Hm	No	No	1	ISIS: 25.19.9 For the species: 135.124. 1033
26	Threskiornis	aethiopicus abbotti	Aldabra I	B?	A?	1	D	?	150-200	3,4	L,I,	EN	D	M,Hm	Yes	P	1	None
27	Threskiornis	aethiopicus bernieri	Madagascar	D	D	1	D	?	<10,000	3,4	L,I,Hf	VU	C,A	M,Lm, Lr	No	P	1	None
28	Threskiornis	melanocephalus (Oriental white ibis)	Pakistan, India, Sri Lanka, Nepal, Myanmar, Indonesia, Vietnam, China, Cambodia, Malaysia, Japan, Philippines, Hong Kong, Taiwan, Bangladesh, Bhutan, Thailand, Lao PDR	D	D	?	D	?	<10,000	2,3	Ln,Hf,Ps,I, Pu	LR		S,M, Hm,Lr, Lh	P	1/3	1	7.9.120
29	Threskiornis	molucca (Australian white ibis)	Moluccas, New Guinea & Australia	D	D	≥3	S	?	<100,000	1,4	L	LR		M,S	No	No	1	15.9.24

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num°
	Threskiornis	molucca molucca	W Papuan Islands, Seram, Geser & great Kai Islands of the Moluccas, New Guinea															
	Threskiornis	molucca strictipennis	Australia															
	Threskiornis	molucca pygmaeus	Rennell & Bellona (Solomon Is)															
30	Threskiornis	spinicollis (Strawnecked ibis)	Australia & Tasmania, Irian Jaya	D	D	≥2	S	?	500,000	1,4	None	LR		None	No	No	1	28.36. 141
31	Pseudibis	papillosa (Black ibis)	India, Nepal, Bangladesh, Pakistan	D	D	1	?	?	>10,000	1,2,3	Ps	LR		M,Lh	No	3	?	0.2.1
32	Pseudibis	davisoni	Myanmar, Vietnam, Cambodia, Lao PDR, Indonesia	D	C/D	2	D	?	<1000?	3,4	Hf,I,L	CR	C2a	S,M, Lh,Hm T	Yes	P	2?	0.0.2
33	Thaumatibis	gigantea (Giant ibis)	Cambodia, Lao PDR	B	B	1	D	?	<100	2,3	Hm,Hf	CR	C2a	S,M	P	P	?	None
34	Geronticus	eremita (Waldrapp ibis)	Morocco, Saudi Arabia	D	C	2	S	?	Morroco :<325 Saudi Arabia :<25	1,2	I,L,S	EN	D	M,Hm, Lm,O	Yes	1	1	252.294. 470
35	Geronticus	calvus (Bald ibis)	S Africa, Lesotho, Swaziland	D	D	1	S	?	5,000-8,000	1,2	Hf,L,S,I	LR		M,Hm	Yes	1	1	22.12.27
36	Nipponia	nippon (Oriental crested ibis)	Shaanxi Province of China	B	B	1	I (slowly)	?	37	1,2	Hf,L,Ln,Ps, D,S,P	CR	C2a,D	M,Lh	Yes	1	3	6.7.17
	Bostrychia	olivacea (Olive ibis)	Africa															
37	Bostrychia	olivacea olivacea (Olive ibis)	Sierra Leone, Liberia	D	D	1	?	?	<10,000??	4,5	Hf,L,W	LR		T,S, M,Hm, Lm,Lr, Lh	No	P	?	None

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num°
38	Bostrychia	olivacea cupreipennis	S Cameroon to W Zaire	D	D	1	?	?	<10,000	4,5	Hf,L	LR		T,S, M,Hm, Lm,Lr, Lh	No	P	?	None
39	Bostrychia	olivacea rothschildi (Rothschild's olive ibis)	Principe I	A?	A?	None?	D	?	0?	3,4	Hf,L	EX	C	T,S, M,Hm, Lm,Lr, Lh	P	P	?	None
40	Bostrychia	olivacea bocagei (Sao Tome dwarf olive ibis)	Sao Tome I	B	A	1	D	?	<50	3,4	Hf,L	CR	D	T,Hm, Lm,Lr, Lh,S	Yes	P	?	None
41	Bostrychia	olivacea akleyorum	Kenya	D	D	1	?	?	<10,000	4,5	L	LR		T,S,Lr	No	No	?	None
42	Bostrychia	rara (Spotbreasted ibis)	Liberia to E Zaire & Angola	D	D	1	S?	?	<10,000	4,5	Hf,L	LR		S,Lr	No	No	?	None
43	Bostrychia	hagedash (Hadada ibis)	Africa S of the Sahara Desert	D	D	1	S	?	100,000-250,000	4,5	None	LR		None	No	3	1	32.37.29
	Bostrychia	hagedash brevirostris	Gambia to Zaire															
	Bostrychia	hagedash nilotica	Ethiopia to Uganda															
	Bostrychia	hagedash erlangeri	Somalia to Malawi															
	Bostrychia	hagedash hagedash	Southern Africa															
44	Bostrychia	carunculata (Wattled ibis)	Ethiopia	D	D	1	S	?	<10,000	4,5	None	LR		None	No	No	?	None
45	Harpiprion	caerulescens (Plumbeous ibis)	C Brazil to N Argentina	D	D	1	S	?	50,000-100,000	?	L	LR		None	No	No	?	<10
46	Theristicus	caudatus (Buffnecked ibis)	E Panama to French Guiana; Central South America	D	D	>2	S	?	25,000-100,000	5	?	LR		T,S	No	3	2	14.13.5

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num°
	Theristicus	caudatus caudatus	E Panama to French Guiana															
	Theristicus	caudatus hyperorius	C South America															
47	Theristicus	melanopis	W South America	D	D	?	S	?	25,000-100,000	?	?	LR		T,S	No	No	2	5.5.5
	Theristicus	melanopis melanopis	S Chile, S Argentina															
	Theristicus	melanopis branickii	Ecuador, Peru, N Bolivia															
48	Cercibis	oxycerca (Sharptailed ibis)	SE Colombia to Surinam, N Brazil	D	D	2	S	?	10,000-25,000	?	None	LR		S,M	No	No	?	None
49	Mesembrinibis	cayennensis (Green ibis)	Panama to NE Argentina	D	D	1	S	?	50,000-100,000	?	None	LR		None	No	No	?	None
50	Phimosus	infuscatus (Barefaced ibis)	N&C South America east of Andes	D	D	2	S	?	100,000-250,000	?	None	LR		None	No	No	?	None
	Phimosus	infuscatus berlepschi	N South America															
	Phimosus	infuscatus nudifrons	Highlands of C & S Brazil															
	Phimosus	infuscatus infuscatus	Paraguay, Uruguay NE Argentina															
51	Eudocimus	albus (White ibis)	S USA to N South America	D	D	1	S	?	100,000-150,000	1,4	L	LR		T,M	No	No	1	48.45.63
52	Eudocimus	ruber (Scarlet ibis)	N South America & Trinidad	D	D	1	S	?	100,000-150,000	1,2	I,L	LR		M	No	3	1	431.440. 829
	Plegadis	falcinellus (Glossy ibis)	Eurasia, Africa, Australia, Islands of Asia, N, C & S America															

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num°
53	Plegadis	falcinellus falcinellus	S Europe, Asia, Africa, C America	D	D	5	I	?	>100,000	1,2	F,Ln,Hf,	LR		S,M,Lr	No	3	2	4.5.26; 43.43. 141 for species
54	Plegadis	falcinellus peregrinus	Philippine Is, Indonesia, Papua New Guinea, Australia, Madagascar	D	D	2	?	?	>1,000,000	2,3	?	LR?		S,M	No	P	2	0.0.16
55	Plegadis	chihi (Whitefaced ibis)	NW USA to SC South America	D	D	>2	S	?	>1,000,000	2,4	L	LR/VU		Hm,S	No	3	2	23.15.6
56	Plegadis	ridgwayi (Puna ibis)	Peru, Bolivia, Chile, NW Argentina	D	D	4	D?	?	10,000-15,000	2	I,Hf	VU	C2, B	S,Lm, Lr,Lh,	No	3	2	24.23.89
57	Lophotibis	cristata (Madagascar crested ibis)	Madagascar	D	D	2	S	?	10,000	4,5	L,Sf,Hf	LR		S	No	No	?	None
	Lophotibis	cristata cristata	E Madagascar															
	Lophotibis	cristata urschi	W Madagascar															
	Plataleinae																	
	Platalea	leucorodia (Eurasian spoonbill)	Europe to NE China, India, Sri Lanka, E & W coast of N Africa															
58	Platalea	leucorodia leucorodia	Netherlands, S Europe to Asia Minor, Africa	D	D	2	S?	?	10,000-35,000	1,4	F,I,L,Pu	LR		M,Hm	No	3 (sp)	2	10.10.39 For the species: 54.60. 134
59	Platalea	leucorodia major	C Asia to Japan, Egypt, India, Taiwan, Indochina	D	D	2	D	?	>25,000	2,3	L,Hf	LR		S,M, Hm,Lh	P	No	2?	None

	TAXON		WILD POPULATION												CAPTIVE PROGRAM		
#	SCIENTIFIC NAME		RANGE	Ext Occ	Area Occ	# Loc	% Decl	Yr/Gen	Pop #	DQ	Thrts	Tent. IUCN	Criter used	Rsrch Mgmt Recs	PHVA	Rec	Diff	Num°
60	Platalea	leucorodia balsaci	Mauretania	D	D	1	S??	?	<10,000	1,4	?	LR		M	No	No	2	None
61	Platalea	leucorodia archeri	Red Sea coasts, Somalia	D	D	1	?	?	500-1,500	1,4	Hf?, I,Pu,W,S	VU	D	S,Lm	No	P	2	None
62	Platalea	minor (Blackfaced spoonbill)	S Japan to S China, Taiwan, Vietnam, Thailand, Hong Kong	D	C	2	D	?	400	1,2	H,L,I,Po	CR	C2b, A,D	S,M, Hm,Lh Lr	Yes	P	2?	2.4.0
63	Platalea	alba (African spoonbill)	Gambia to Sudan, S to Cape Province	D	D	1	S	?	10,000-25,000	1,4	L,Hf	LR		M	No	3	2	51.57.83
64	Platalea	regia (Royal spoonbill)	Australia to New Guinea, Sulawesi, New Zealand	D	D	1	I	?	100,000-250,000	1,4	None	LR		None	No	No	2?	3.1.5
65	Platalea	flavipes (Yellowbilled spoonbill)	Australia	D	D	1	S	?	25,000-100,000	1,4	None	LR		None	No	No	2?	1.2.1
66	Ajaia (Platalea)	ajaja (Roseate spoonbill)	S USA to C Argentina & Chile	D	D	>2	S	?	100,000-250,000	1,4	L	LR		S	No	3	2	135.136. 239

STORK, IBIS AND SPOONBILL CONSERVATION ASSESSMENT AND MANAGEMENT PLAN (CAMP) WORKSHOP

WORKING DOCUMENT

December 1995

Report from the workshop held
26-29 July 1995
Chonburi, Thailand

SECTION 2

SPECIAL TOPIC REPORT

SOUTHEAST ASIAN CONSERVATION PRIORITIES

At the meeting, representatives of each country set conservation priorities for their respective countries with regard to storks, ibises and spoonbills. Species in each country were given priorities (Table 1).

In addition, certain countries also indicated further conservation priorities by geographic region or threat:

INDIA: Geographic regions and habitats were given priorities. Two areas were given first priority. In the Brahmaputra Valley there is concern for *Anastomus oscitans, Ciconia nigra, Ephippiorhynchus asiaticus, Leptoptilos javanicus* and *L. dubius*. In the Ganngetic Plain conservation efforts should include *Mycteria leucocephala, Anastomus oscitans, Ciconia episcopus, Ephippiorhynchus asiaticus, Leptoptilos javanicus, Threskiornis melanocephalus* and *Plegadis falcinellus*. Second priority was assigned to the wetlands of semiarid regions in Gujarat, eastern Rajasthan and Ceccan and Central India. In these areas, the species of concern are *Mycteria leucocephala, Anastomus oscitans, Ephippiorhynchus asiaticus, Threskiornis melanocephalus, Pseudibis papillosa* and *Plegadis falcinellus*. Third priority was given to flooded grasslands, agricultural fields (paddies) and sandy areas throughout the country. Species of concern in these habitats are *Mycteria leucocephala, Anastomus oscitans, Ciconia episcopus, Threskiornis melanocephalus* and *Pseudibis papillosa*.

CHINA: Geographic regions were given priorities. The greatest priority was given to the large wetlands in the Sanjiang Plain in Heilongjiang Province where the status of the *Ciconia boyciana* and *Platalea leucorodia* are of concern. Furthermore, *Platalea minor* may breed in this area and efforts should be made to locate breeding colonies. Next in priority were the middle and lower reaches of the Changjiang River and the Three Gorges. Many species are of concern in these areas. The last priority was assigned to the southeast coast of Fujian Province. In this area there is concern for the *Ciconia boyciana* and *Platalea minor*.

MYANMAR: Specific lakes and associated wetlands, croplands and grasslands were given priorities. Three areas were assigned the highest priority: Moeyingyi Lake and associated agricultural fields, Inle Lake and associated agricultural fields and grasslands, and the Aya Waddy Delta Region and associated rivers and estuaries. The birds of concern in these regions are *Ciconia episcopus, Ephippiorhynchus asiaticus, Leptoptilos javanicus* and *L. dubius*. Next in importance are Hlawga Lake, Kye-in Lake and Minhla Naung Yan Lake where *Ciconia nigra, Threskiornis melanocephalus* and *Plegadis falcinellus* are found. Finally, it is important to preserve the Shweyaungdaw Lake where *Mycteria leucocephala* and *Anastomus oscitans* are found.

THAILAND: The status of species and threats were given priorities. Of highest priority is the study of the distribution and status of rare and endangered species: *Mycteria leucocephala, Cico-*

nia stormi, Ephippiorhynchus asiaticus, Leptoptilos javanicus, L. dubius, Plegadis falcinellus, Platalea leucorodia and *P. minor*. Next in importance are the study and protection of the breeding habitat of *Mycteria leucocephala* and *Leptoptilos javanicus*. Finally, is it important to examine the effects of pesticides on *Mycteria leucocephala* and *Anastomus oscitans*.

CAMBODIA: Geographic regions were given priorities. Of greatest priority is the preservation of the wetlands of the Tonle Sap, including the Great Lake (Batabang Province) and the Boeng Chmar (Kampong Thom Province). Next in importance is the coastal area in Kampot Province. Finally, the preservation of the Tonle Kong in Ratanakiri Province is important.

VIETNAM: Geographic regions were given priorities. Of highest priority are the wetlands in Dong Nai, Minh Hai and Thuan Hai provinces in the south. Next in importance are wetlands in Nam Ha Province in the north and the Tien River in the Mekong Delta.

TABLE 7. SPECIES CONSERVATION PRIORITIES FOR STORKS, IBISES AND SPOONBILLS IN SOUTHEAST ASIAN COUNTRIES.

	PRIORITIES*								
SPECIES	INDIA	CHINA	MYANMAR	THAILAND	CAMBODIA	VIETNAM	PHILIPPINES	MALAYSIA	INDONESIA
CICONIIDAE (storks)									
Mycteria cinerea					1	1		1	1
M. leucocephala	4	3	2	1	1	3			
Anastomus oscitans	4		3		3	1	3		
Ciconia nigra	3	2	2						
C. episcopus	3		1		2	1	1	2	2
C. stormi				1				1	1
C. ciconia									
C. boyciana		1							
Ephippiorhynchus asiaticus									
E. a. asiaticus	2		1	1	2	2			
E. a. australis									2
Leptoptilos javanicus	2	3	1	1	2				1
L. dubius	1								

SPECIES	INDIA	CHINA	MYANMAR	THAILAND	CAMBODIA	VIETNAM	PHILIPPINES	MALAYSIA	INDONESIA
THRESKIORNITHIDAE (ibises and spoonbills)									
Threskiornis melanocephalus	3	3	2		1		3		3
Pseudibis papillosa	4	3							
P. davisoni					1	1	2		1
Thaumatibis gigantea					1	1			
Nipponia nippon		1							
Plegadis falcinellus	3	3	2	1	3				
P. f. falcinellus									
P. f. peregrinus									
Platalea leucorodia major	4	2		1					
P. minor		1		1		1			
P. regia									2

* 1 represents highest priority, and decreasing priorities were assigned increasing numbers.

STORK, IBIS AND SPOONBILL CONSERVATION ASSESSMENT AND MANAGEMENT PLAN WORKSHOP

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Compiled by the Workshop Participants

SECTION 3

TAXON DATA SHEETS
FOR STORK, IBIS AND SPOONBILL TAXA

TAXON DATA SHEET

SPECIES: *Balaeniceps rex* (Shoebill)
STATUS: **New IUCN:** Data Deficient
Criteria based on:
CITES: Appendix II

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Sudan to Zambia
Concentrated Migration Regions: None
Historical Distribution: Sudan to Zambia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 10,000 - 15,000
Regional Population(s): Sudan; Uganda to Zambia
Data Quality: 1, 4

Recent Field Studies: None

Threats: Human interference, persecution or disturbance; Loss of habitat; Trade for live animal market; War
Trade: 25 birds have been traded to Europe, the USA and Asia in the last 5 years

Comments: Large numbers have been reported in the Sudan in the past, but the current civil war in that country has precluded any recent surveys.

Recommendations:
Research Management: Monitoring, Habitat management, Limiting factors management, Limiting factors research
PHVA: Yes (after surveys)
Captive Program Recommendation: No
Level of Difficulty: 3
Existing Captive Population: 14.13.5

Sources: Hancock *et al.* (1992); King and Brouwer (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Mycteria americana* (American wood stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Southern North America including Mexico and into Central America, South America into Argentina, Caribbean
Concentrated Migration Regions: None
Historical Distribution: Southeast United States, Caribbean, Central America, South America into Argentina
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 4, South America, Central America, Caribbean and the southeast United States

Population Trends: Stable ?
Trend over past 100 years: Stable ?
Generation Time: Unknown

World Population: 50,000 - 100,000
Regional Population(s): USA: 10,000; Mexico: 16,000 - 20,000; Costa Rica: 6,000; Venezuela: 9,000
Data Quality: 1; 1; 1; 1

Recent Field Studies:

Threats: Hunting, hunting for food, human interference, loss of habitat
Trade: Insignificant

Comments:
Recommendations:
Research Management: Continue Survey and Monitoring
PHVA: No
Captive Program Recommendation: Level 3 (North America: research, education)
Level of Difficulty: 2
Existing Captive Population: 22.22.65
Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995) U.S. Fish and Wildlife Service 1995.
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Mycteria cinerea* (Milky stork)
STATUS: **New IUCN:** Vulnerable

Criteria based on: Extent of occurrence (B1), Population estimates and number of mature individuals (C2a)

CITES: I
Taxonomic Status: Species
Current Distribution (breeding and non-breeding): Vietnam, Cambodia, Malaysia, Indonesia (Java, Sumatra, Sulawesi).
Concentrated Migration Regions: Unknown
Historical Distribution: Malaysia, Indonesia (Sumatra and Java), southern Thailand, Cambodia, Vietnam.
Extent of Occurrence: D
Area Occupied: D, but not properly known
Number of populations: >4F (Indonesia [Sumatra, Java and Sulawesi]; Malaysia; Cambodia and Vietnam)
Population Trends: Decline (?) (Malaysia -decline)
Trend over past 100 years: Declining
Generation Time: Unknown
World Population: >6,000
Regional Population(s): Indonesia-6,000; Malaysia-<100; Cambodia->16, Vietnam-not known
Data Quality: 1,2
Recent Field Studies: A series of surveys; AWB - PHPA since 1987 (Indonesia); AWB, IUCN and Cambodian Forestry Department for 1994 (Cambodia); Occasional Census by Wildlife Department (Malaysia).

Threats: Hunting for food, human interference, habitat fragmentation, pesticides, poisoning.
Trade: Insignificant
Comments:

Recommendations:

Research Management: Survey, monitoring and habitat management

PHVA: Yes
Captive Program Recommendation: Level 1 (Southeast Asia)
Level of Difficulty: 1-2
Existing Captive Population: Asia 5.5.75; Europe 2.2.16; N. America 7.11.8; Total: 14.18.99
Sources: Perennou *et al.*, 1994; Rose and Scott, 1994; Silvius and Verheugt, 1989; Sibuea *et al.*, 1994, 1995, 1996; King and Brouwer, 1995.
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Mycteria ibis* (Yellowbilled stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and wintering): Senegal to Sudan and Cape Province
Concentrated Migration Regions: None
Historical Distribution: Senegal to Sudan and Cape Province
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 25,000 - 100,000

Regional Population(s): None
Data Quality: 3/4

Recent Field Studies: None

Threats: Fishing, hunting, loss of habitat

Trade: Insignificant

Comments:

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 2
Existing Captive Population: 17.18.36

Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Mycteria leucocephala* (Painted stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not known
Taxonomic Status:

Current Distribution (breeding and non-breeding): Breeding population: India, Bangladesh, Cambodia, Sri Lanka, Thailand, Vietnam; Non-breeding population: Nepal, Pakistan, Lao PDR, Myanmar.
Concentrated Migration Regions: not known.
Historical Distribution: Pakistan and India to Southwest China, Sri Lanka, Thailand, Cambodia and Vietnam.
Extent of Occurrence: D
Area Occupied: D
Number of populations: 3F? (Indian subcontinent; Myanmar and Thailand; Cambodia)
Population Trends: Unknown
Trend over past 100 years: Declining
Generation Time: Unknown
World Population: 15,000 - 20,000
Regional Population(s):
Data Quality: 2,3

Recent Field Studies: Vijayan (1991); A. R. Rahmani in India since 1993; in Cambodia (Mundkur *et al.*, 1995); south Thailand (RFD, 1989), Asian Waterfowl Census since 1987.

Threats: Habitat fragmentation, hunting for food, and possibly pesticides.
Trade: Yes, though not extensive; internal/national trade in Cambodia.
Comments:
Recommendations:
Research Management: Habitat management, studies on impact of pesticides
PHVA: No
Captive Program Recommendation: Lao PDR, Thailand - Level 1; Cambodia, Malaysia - Level 2
Level of Difficulty: 2
Existing Captive Population: Asia 7.4.665; Europe 11.10.6; N. America 17.7.0; Total: 36.22.671
Sources: Vijayan (1991); Mundkur (1991); Perennou *et al.* (1994); Rose and Scott (1994); Mundkur *et al.* (1995); Wang Qishan (1995, unpublished report); Busabong K. and Siripon T, (1990), King and Brouwer, 1995.
Compilers:

TAXON DATA SHEET

SPECIES: *Anastomus oscitans* (Asian openbill stork)
STATUS: **New IUCN:** Lower risk
Criteria based on:
CITES:

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): India, Nepal, Sri Lanka, Bangladesh, Myanmar, Thailand, Pakistan, Vietnam, Cambodia.
Concentrated Migration Regions:
Historical Distribution: Indian subcontinent through Thailand, Cambodia to Vietnam
Extent of Occurrence: D
Area Occupied: D
Number of populations: 2, probably not fragmented; (Indian subcontinent, Myanmar and Thailand; and Cambodia).
Population Trends: Stable (Thailand - Increasing)
Trend over past 100 years: Stable (Thailand - increasing)
Generation Time: Unknown

World Population: >125,000
Regional Population(s): Thailand - 115,000
Data Quality: 1, 2, 3

Recent Field Studies: BNHS (1982-89); A.R. Rahmani (1993 onwards); Wildlife Institute of India (1994); A. Choudhury (1987-onwards); Asian Waterfowl Census since 1987.

Threats: Hunting for food
Trade: Insignificant

Comments:

Recommendations:
Research Management: Survey, monitoring, pesticide studies
PHVA: No
Captive Program Recommendation: Thailand, Laos - level 3; Malaysia - No
Level of Difficulty: 3
Existing Captive Population: Total: 7.3.14
Sources: Vijayan (1991); McClure 1974; Wildlife Institute of India (1994); A. Choudhury (1991, 1993, 1994); Perennou *et al.* (1994); Bubphar Amget, pers. comm. (1995); King and Brouwer, 1995.
Compilers: Bubphar Amget and working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Anastomus lamelligerus* (African openbill stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species (Two subspecies suggested: A.l. lamelligerus and A.l. madagascariensis)

Current Distribution (breeding and wintering): African tropics south of the Sahara
Concentrated Migration Regions: None
Historical Distribution: African tropics south of the Sahara
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: A.l.l. increase ?; A.l.m. decrease
Trend over past 100 years: Unknown
Generation Time: Unknown

World Population: >100,000

Regional Population(s): as per suggested subspecies (A.l.l. mainland Africa; A.l.m. Madagascar)
Data Quality: 2,3,4

Recent Field Studies: None

Threats: A.l.l.: None; A.l.m.: Hunting for food, loss of habitat

Trade: None
Comments:
Recommendations:
Research Management: A.l.m.: Survey
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 3
Existing Captive Population: 12.5.7

Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Ciconia nigra* (Black stork)
STATUS: **New IUCN:** Vulnerable
Criteria based on: C2a, B
CITES: Appendix II
Taxonomic Status:
Current Distribution (breeding and non-breeding): Breeding: Africa, Eurasia, north to Sweden, west to Spain, east to eastern China Mongolia, and former USSR (Kazakhstan, Kirghizstan, Tadijikstan, Uzbekistan, southern Russia). Non-breeding: Africa, Bangladesh, Nepal, India (common in Assam), Pakistan, Myanmar, north Thailand, south China, N. and S. Korea, Japan (very rare), Hong Kong, Vietnam, Lao PDR.
Concentrated Migration Regions: N.E. India, China (Xinjiang, Liaoning, Hebei), Israel.
Historical Distribution: India to Vietnam, and North China and Russia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: >2
Population Trends: Stable
Trend over past 100 years: Declining
Generation Time: Unknown
World Population: >100,000
Regional Population(s): China - 1,000; NE India >1,000; <5000 in southern Asian populations; Europe, Central and northern Asia 20,000-50,000.
Data Quality: 1,2,3,4
Recent Field Studies: China (Wang Qishan 1995, unpublished); Ma Ming Xinjiang 1994; Liu Huan Jin 1989; Su Huan-long 1989); India (A. Choudhury - since 1987); Asian Waterfowl Census (since 1987).

Threats: Pollution (oil), pesticides and poisoning, habitat and nest site loss, powerlines.
Trade: Insignificant
Comments: International Black Stork Conference held in 1993, following conference to be held in 1996. Migration studies planned (M. Stradz pers. comm.).
Recommendations:
Research Management: Habitat management, survey, monitoring, life history studies
PHVA: Yes
Captive Program Recommendation: Thailand level 3; Europe level 3
Level of Difficulty: 2
Existing Captive Population: Total: 74.46.82
Sources: Rose and Scott (1994), King and Brouwer (1995), Stradz *et al.* (in press), Perennou *et al.* (1994); Choudhury (1991, 1994), Liu Hung Jin (1989), Ma Ming, Batujrhan, and Lu Jianjian (1993), Su Hue Long (1989), King and Brouwer, 1995.
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Ciconia abdimii* (Abdim's stork)
STATUS: **New IUCN:** Lower risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and wintering): Niger to Ethiopia to Angola and Transvaal, Oman, Yemen
Concentrated Migration Regions: Not yet identified
Historical Distribution: Ethiopia to Angola and Transvaal
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 25,000 - 100,000
Regional Population(s):
Data Quality: 2,4,5

Recent Field Studies: Unknown

Threats: Loss of habitat

Trade: Insignificant

Comments:

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 1
Existing Captive Population: 39.50.70

Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Ciconia episcopus episcopus* (Woollynecked stork)
STATUS: **New IUCN:** Data deficient
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies; taxonomic status and distribution of all taxa unclear

Current Distribution (breeding and non-breeding): India, Sri Lanka, Myanmar, Pakistan, Bangladesh, and Nepal
Concentrated Migration Regions: Non-migratory
Historical Distribution: India, Sri Lanka, Myanmar, Pakistan, Bangladesh, Nepal
Extent of Occurrence: D
Area Occupied: D
Number of populations: 1? (India, Sri Lanka, Pakistan, Nepal, Bangladesh and Myanmar)

Population Trends: Not known
Trend over past 100 years: Declining
Generation Time: Unknown

World Population: <2,500?
Regional Population(s): Not known
Data Quality: 2, 3

Recent Field Studies: Cambodia (AWB, Forestry Department and IUCN-1994); India (Bharatpur - Rahmani 1994); Choudhury (1992-1994); Asian Waterfowl Census since 1987.

Threats: Unknown, possibly pesticides, loss of habitat
Trade: Not known.
Comments: 1) Wide distribution, low densities; 2) taxonomic classification needed since proper information on distribution of subspecies not clear and all birds within this geographic range are considered as *episcopus*.

Recommendations:
Research Management: Taxonomic studies, monitoring, survey, reproductive biology studies, life history studies.
PHVA: No
Captive Program Recommendation: No
Level of Difficulty: 2
Existing Captive Population (ISIS): 4.4.0
Sources: Choudhury (1994); Mundkur *et al.* (1995), Perennou *et al.* (1994).
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Ciconia episcopus microscelis* (Woollynecked stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Senegal to Sudan and Cape Province
Concentrated Migration Regions: None
Historical Distribution: Senegal to Sudan and Cape Province
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable

Generation Time: Unknown

World Population: 25,000 - 100,000
Regional Population(s): None
Data Quality: 3/4

Recent Field Studies: None

Threats: None
Trade: None

Comments:

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 2
Existing Captive Population: 12.15.63 for species

Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Ciconia episcopus neglecta* (Woollynecked stork)
STATUS: **New IUCN:** Data deficient
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies; taxonomic status and distribution of all taxa unclear

Current Distribution (breeding and non-breeding):
Concentrated Migration Regions:
Historical Distribution: Malaysia to Philippine Islands, Sunda Islands
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1?

Population Trends: Declining
Trend over past 100 years:
Generation Time: Unknown

World Population: <2,500?

Regional Population(s):
Data Quality: 3,4

Recent Field Studies:

Threats: Loss of habitat

Trade:

Comments:

Recommendations:
Research Management: Taxonomy, monitoring, survey, life history studies
PHVA: No

Captive Program Recommendation: Pending
Level of Difficulty: 2
Existing Captive Population (ISIS): None

Sources:
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Ciconia stormi* (Storm's stork)
STATUS: **New IUCN**: Endangered
Criteria based on: Extent of occurrence (B) and Population estimates (C)
CITES: Not listed

Taxonomic Status:

Current Distribution (breeding and non-breeding): Indonesia (Sumatra and Kalimantan), Malaysia & southern Thailand
Concentrated Migration Regions:
Historical Distribution: Indonesia (Sumatra and Kalimantan), Malaysia & southern Thailand
Extent of Occurrence: D
Area Occupied: D
Number of populations: 3 (peninsular Malaysia, Borneo, Sumatra)

Population Trends: Not known
Trend over past 100 years: Declining
Generation Time: Unknown

World Population: <1,500?
Regional Population(s): Unknown
Data Quality: 3, 4

Recent Field Studies: Nakasatien (1987)
Threats: Loss of habitat

Trade: Insignificant

Comments:

Recommendations:
Research Management: Survey, monitoring, limited factors management and life history studies
PHVA: Yes

Captive Program Recommendation: Southeast Asia - Pending
Level of Difficulty: 2
Existing Captive Population: 4.4.6

Sources: Nakasatien (1987), Silvius and Verheugt (1989), King and Brouwer (1995)
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Ciconia maguari* (Maguari stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): South America (east of the Andes)
Concentrated Migration Regions: Disperse, route unknown
Historical Distribution: South America (east of the Andes)
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 50,000 - 100,000

Regional Population(s):
Data Quality: 3,4

Recent Field Studies: None

Threats: Hunting, hunting for food, human interference, loss of habitat

Trade: None

Comments:

Recommendations:
Research Management: Survey, monitoring
PHVA: None

Captive Program Recommendation: No
Level of Difficulty: 2
Existing Captive Population: 21.17.25

Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Ciconia ciconia ciconia* (White stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed
Taxonomic Status: Subspecies
Current Distribution (breeding and wintering): Europe, Northern Africa, Southern Africa.
Concentrated Migration Regions: Gibraltar; Bosphorus; Near East
Historical Distribution: Europe, Northern Africa, Southern Africa
Extent of Occurrence: D
Area Occupied: D
Number of Locations: There are three populations -- one that breeds in Spain (and reintroduced populations in Western Europe) and northern Africa and winters in Spain and northwest Africa; and one that breeds in Central and Eastern Europe and winters in eastern and southern Africa; a small population breeds in southern Africa.

Population Trends: Western population: decreasing; Eastern population: stable
Trend over past 100 years: See Population Trends
Generation Time: 7 - 8 years
World Population: 500,000
Regional Population(s): Western population: 85,000; Western population: 400,000; Southern African population: 30
Data Quality: 1/2
Recent Field Studies:
Threats: Decline in prey species, hunting, loss of habitat, powerlines, pesticides
Trade: None
Comments: It has been extirpated from Sweden, Denmark, The Netherlands, France, Switzerland and Belgium. Reintroduction programs are ongoing in most of these countries.
Recommendations:
Research Management: Monitoring, Habitat management, Limiting factors management
PHVA: No
Captive Program Recommendation for *Ciconia ciconia*: Level 3 (education): SE Asia and Europe
Level of Difficulty: 1
Existing Captive Population: 85.71.168 (Ciconia ciconia: 430.407.860; most birds not identified to subspecies level)
Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995); Rheinwald *et al.* (1989)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Ciconia ciconia asiatica*
STATUS: **New IUCN:** Vulnerable
Criteria based on: Population estimates (C2)
CITES:

Taxonomic Status: subspecies (subspecific status should be re-examined)

Current Distribution (breeding and non-breeding): Breeding: Kazakhstan, Kirghizstan, Tazikistan, Uzbekistan, NW China. Non-breeding: India, Pakistan and Nepal.
Concentrated Migration Regions:
Historical Distribution: Central Asia, western China and India
Extent of Occurrence: D
Area Occupied: D
Number of population: 1

Population Trends: Increasing?
Trend over past 100 years: Not known
Generation Time: Unknown

World Population: ~3,000
Regional Population(s): Not known
Data Quality: 2,3
Recent Field Studies: Asian Waterfowl Census since 1987

Threats: Pesticides and powerlines

Trade: Not significant

Comments:

Recommendations:
Research Management: Taxonomic studies, survey, monitoring, limiting factors research, life history studies
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Perennou *et al.* (1994), Rose and Scott (1994), Hancock *et al.* (1992).
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Ciconia boyciana* (Oriental white stork)
STATUS: **New IUCN:** Endangered
Criteria based on: Population estimates (C2a), Number of mature individuals (D), Population reduction (A)
CITES: Appendix I
Taxonomic Status:

Current Distribution (breeding and non-breeding): Breeding: Russia (middle and lower Amur region), NE China (Nenjiang), N Korea (?). Non-breeding: S and central China, Taiwan, Hong Kong and Japan.
Concentrated Migration Regions: China (Beidahe, Liaohe River and Shandong Province) and Russia (Lake Everon and Lake Bolon in the Khabarovsk region).
Historical Distribution: Northeast Asia, Japan
Extent of Occurrence: D
Area Occupied: D
Number of populations: 1
Population Trends: Declining
Trend over past 100 years: Not known
Generation Time: Unknown
World Population: 2,500-3,500
Regional Population(s): Not known
Data Quality: 2, 3

Recent Field Studies: China (1985-1995 Sungang Plains, Ma Yiqing *et al.* 1995; Fe Dien Jin Zhalong Nature Reserve -1988-1990). Russia (Shinanski Nature Reserve, Smirenski *et al.* 1991). Non-breeding: Wang Qi-shan 1989-1993; Migration: China (Wu 1985-1990 in Momoge Conservation Area (Jilin Province); Beidaihe Williams (since 1985).

Threats: Pesticides, loss of habitat, loss of nest sites, human interference, hunting for food.
Trade: Insignificant
Comments:

Recommendations:
Research Management: Survey, monitoring, limiting factors research, life history studies.
PHVA: Yes (Japan reintroduction population)
Captive Program Recommendation: Japan - level 1; China - Pending
Level of Difficulty: 2
Existing Captive Population: 54.52.76
Sources: King and Brouwer 1995, K. Murata (1995, pers. comm.), Williams *et al.* (1992).
Compilers:

TAXON DATA SHEET

SPECIES: *Ephippiorhynchus asiaticus asiaticus* (Blacknecked stork)
STATUS: **New IUCN:** Endangered
Criteria based on: Population estimates (C2) and Population reduction (A)
CITES: Not listed
Taxonomic Status: Two subspecies recognized following Rose and Scott (1994) and not Hancock *et al.* (1992).

Current Distribution (breeding and non-breeding): Breeding: India, Nepal, Sri Lanka, and Cambodia. Non-breeding: India, Nepal, Sri Lanka, Cambodia, Bhutan, Pakistan, Vietnam, Myanmar and Thailand.
Concentrated Migration Regions:
Historical Distribution: Indian subcontinent, Thailand to the north Malay Peninsula, Cambodia, south Lao PDR, Vietnam and Cambodia.
Extent of Occurrence: D
Area Occupied: D
Number of populations: 3F (Indian subcontinent, Sri Lanka, Cambodia)
Population Trends: Declining
Trend over past 100 years: Declining
Generation Time: Unknown
World Population: >500
Regional Population(s):
Data Quality: 2, 3
Recent Field Studies: India (Rahmani 1989, 1993, study continuing; Assam 1987 onwards Choudhury); Thailand (1992 RFD); Cambodia (Mundkur *et al.* 1995).
Threats: Loss of habitat, decline in prey species (over fishing), human interference, pesticides?, pollution and illegal trade.
Trade: Yes
Comments: Four birds from south Thailand with one pair nesting in 1980. No breeding recorded since. Two birds observed in 1993, after which there is no information.

Recommendations:
Research Management: Survey, monitoring, habitat management, limiting factors research and limiting factors management
PHVA: Yes
Captive Program Recommendation: SE Asia - level 1 (same as for species)
Level of Difficulty: 3
Existing Captive Population (ISIS): 4.3.0 (probably most of world population (20.15.45) is also *E. a. asiaticus,* except 1.0.4 birds in Australia).
Sources: King and Brouwer (1995), Mundkur *et al.* (1995), Rahmani (1989). R.F.D. (1993), Hancock *et al.* (1992); Choudhury (1991, 1994).
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Ephippiorhynchus asiaticus australis* (Blacknecked stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and non-breeding): New Guinea, North and East Australia
Concentrated Migration Regions: None
Historical Distribution: New Guinea, North and East Australia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: <10,000

Regional Population(s):
Data Quality: 1/4

Recent Field Studies: None

Threats: Hunting for food, loss of habitat

Trade: Insignificant

Comments:

Recommendations:
Research Management: Monitoring, Life history studies
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 3
Existing Captive Population (ISIS): 1.0.3

Sources: Hancock *et al.* (1992)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Ephippiorhynchus senegalensis* (Saddlebill stork)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Appendix II or III (recommend that it be listed in Appendix I)

Taxonomic Status: Species

Current Distribution (breeding and wintering): Senegal to Sudan and Transvaal
Concentrated Migration Regions: None
Historical Distribution: Senegal to Sudan and Transval
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable ?
Trend over past 100 years: Stable ?
Generation Time: Unknown

World Population: <10,000

Regional Population(s): None
Data Quality: 4/5

Recent Field Studies: Kemp (ongoing studies)

Threats: Loss of habitat, trade
Trade: 100 - 200 birds imported by European, North American and Asian dealers during the last 5 years.
Comments: Never common and widely dispersed so population changes may easily go unnoticed. This species should be put forward for inclusion in CITES.

Recommendations:
Research Management: Monitoring, Husbandry, Limiting factors management, Limiting factors research, Life history studies
PHVA: No
Captive Program Recommendation: No
Level of Difficulty: 3
Existing Captive Population: 66.67.14

Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Jabiru mycteria* (Jabiru)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Appendix I

Taxonomic Status: Species

Current Distribution (resident): Southern Mexico to Argentina
Concentrated Migration Regions: none
Historical Distribution: Southern Mexico to Argentina
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable ?
Trend over past 100 years: Stable ?
Generation Time: Unknown

World Population: 10,000 - 25,000

Regional Population(s): Central America: 150 - 250; Other: 10,000-25,000
Data Quality: 1; 5

Recent Field Studies: Frederick, P. 1993. SIS Newsletter.

Threats: Hunting, human interference, loss of habitat

Trade: None

Comments: None

Recommendations:
Research Management: Survey, Monitoring, Life history studies
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 3
Existing Captive Population: 13.11.24

Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Leptoptilos javanicus* (Lesser adjutant stork)
STATUS: **New IUCN:** Vulnerable
Criteria based on: Population estimates (C2), Population reduction (A)
CITES: Not listed
Taxonomic Status:
Current Distribution (breeding and non-breeding): Breeding: India, Nepal, Sri Lanka (?), Bangladesh, Myanmar, Thailand, Cambodia, Vietnam (?), Malaysia, Indonesia (Sumatra, Java, Kalimantan), southern LAO PDR. Non-breeding: Bhutan, SW China (Yunan), Indonesia (Bali).
Concentrated Migration Regions Not known
Historical Distribution: India to Southern China, Sri Lanka, Vietnam, Sumatra and peninsular Malaysia.
Extent of Occurrence: D
Area Occupied: D
Number of populations: 6? (Indian subcontinent, Sri Lanka, Sumatra, Java, Borneo, mainland Southeast Asia)
Population Trends: Unknown
Trend over past 100 years: Declining
Generation Time: Unknown
World Population: 5,000
Regional Population(s): Assam >2,000; Cambodia >50; Northern U.P >500; Myanmar 4; Thailand >20; Lao PDR 100; Vietnam 1; Malaysia - Indonesia 2,000
Data Quality: 1,2,3
Recent Field Studies: India (Choudhury 1987-ongoing; Rahmani 1994-ongoing; Saikia 1989-ongoing). Cambodia (Mundkur *et al.* 1995); Thailand (RFD 1994).
Threats: Hunting for food (NE India, Cambodia), loss of habitat (NE India, Vietnam, Thailand, Malaysia, Lao PDR, Cambodia)
Trade: Insignificant; Yes (Cambodia)
Comments:
Recommendations:
Research Management: Survey, Monitoring, Life History, Limiting factors research and habitat management.
PHVA: No
Captive Program Recommendation: SE Asia level 1
Level of Difficulty: 3
Existing Captive Population: 29.23.109
Sources: Wei Tienhao (1995, pers. comm.), King and Brouwer (1995), Perennou *et al.* (1995), Mundkur *et al.* (1995); Choudhury (1991, 1994). **Compilers:** Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Leptoptilos dubius* (Greater adjutant stork)
STATUS: **New IUCN:** Endangered
Criteria based on: C2a
CITES: Not listed
Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Breeding: India, Cambodia, Myanmar (?). Non-breeding: India, Cambodia, Nepal, central Thailand and Lao PDR.
Concentrated Migration Regions: Not relevant.
Historical Distribution: India, Vietnam, Greater Sunda Islands (?), Cambodia, Lao PDR
Extent of Occurrence: D
Area Occupied: D
Number of populations: 2
Population Trends: Declining
Trend over past 100 years: 90% decline
Generation Time: Unknown

World Population: >700
Regional Population(s):

Assam	>600
Cambodia	100-200
Thailand	2

(Myanmar, Vietnam, Nepal & Bangladesh ?)

Data Quality: 1,2,3

Recent Field Studies: India (Bhattacharya 1991; Choudhury 1986 ongoing; Rahmani 1994, on-going studies); Cambodia (Mundkur *et al.* 1995).
Threats: Hunting for food, loss of nesting habitat (Assam, Cambodia), powerlines (Assam)
Trade: Probably significant (from Cambodia)

Comments:
Recommendations:
Research Management: Survey, Monitoring, Habitat management, Limiting factors research
PHVA: Yes
Captive Program Recommendation: SE Asia - Level 1
Level of Difficulty: 3
Existing Captive Population: 15.12.40
Sources: Mundkur *et al.* (1995), Perennou *et al.* (1994), King and Brouwer (1995), Hancock *et al.* (1992); Choudhury (1991, 1993, 1994).
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Leptoptilos crumeniferus* (Marabou stork)

STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and wintering): Senegal to Sudan and Transvaal
Concentrated Migration Regions: None
Historical Distribution: Senegal to Sudan and Transvaal
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Increase
Trend over past 100 years: Increase
Generation Time: Unknown

World Population: 100,000 - 1,000,000

Regional Population(s): None
Data Quality: 3

Recent Field Studies: Unknown

Threats: None
Trade: Insignificant

Comments: The species seems to be doing remarkably well. It gets along well with people.

Recommendations:
Research Management: Husbandry
PHVA: No

Captive Program Recommendation: Level 3 (husbandry for endangered congeners; Europe)
Level of Difficulty: 3
Existing Captive Population: 137.149.221
Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Threskiornis aethiopicus aethiopicus*
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and non-breeding): Two populations: 1) Africa south of the Sahara, from Senegal to the Cape of Good Hope, and 2) Iran/Iraq to Ethiopia and South to the Cape
Concentrated Migration Regions: None
Historical Distribution: Africa south of the Sahara desert, from Senegal to Ethiopia & S to the Cape, Iraq
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 2 - F

Population Trends: Continental Africa: Stable; Iran/Iraq: Unknown
Trend over past 100 years: Unknown
Generation Time: Unknown

World Population: >200,000
Regional Population(s): Continental Africa: >200,000; Iran/Iraq: 200
Data Quality: 3/4; 1/3
Recent Field Studies: None

Threats: Hunting for food, human interference, persecution, or disturbance, loss of habitat
Trade: None

Comments: We do not know the effect of the Gulf War on the Iran/Iraq population

Recommendations:
Research Management: Iran/Iraq population: Survey, Habitat management
PHVA: No
Captive Program Recommendation: No
Level of Difficulty: 1
Existing Captive Population (ISIS): 25.19.9; A total of 135.124.1033 Threskiornis aethiopicus (unknown subspecies) are kept.
Sources: Hancock *et al.* (1992); Rose and Scott (1994); King and Brouwer, 1995
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Threskiornis aethiopicus abbotti*
STATUS: **New IUCN:** Endangered
Criteria based on: <250 mature individuals (D)
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Aldabra I.
Concentrated Migration Regions: None
Historical Distribution: Aldabra I.
Extent of Occurrence: B ?
Area Occupied: A ?
Number of Locations: 1

Population Trends: Declining
Trend over past 100 years: Unknown
Generation Time: Unknown

World Population: 150 - 200

Regional Population(s):
Data Quality: 3/4

Recent Field Studies: Unknown

Threats: Human interference, loss of habitat

Trade: None

Comments:

Recommendations:
Research Management: Monitoring, Habitat management
PHVA: Yes

Captive Program Recommendation: Pending
Level of Difficulty: 1
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Threskiornis aethiopicus bernieri*
STATUS: **New IUCN:** Vulnerable
Criteria based on: < 10,000 individuals (C) and Decline > = 20% within three generations (A)
CITES: Not listed

Taxonomic Status:

Current Distribution (breeding and wintering): Madagascar
Concentrated Migration Regions: None
Historical Distribution: Madagascar
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Declining
Trend over past 100 years: Declining
Generation Time: Unknown

World Population: < 10,000
Regional Population(s):
Data Quality: 3/4

Recent Field Studies: None

Threats: Hunting for food, human interference, loss of habitat
Trade: None

Comments:

Recommendations:
Research Management: Monitoring, Limiting factors management, Limiting factors research
PHVA: No

Captive Program Recommendation: Pending
Level of Difficulty: 1
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Threskiornis melanocephalus* (Oriental white ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES:

Taxonomic Status: Species
Current Distribution (breeding and non-breeding): Pakistan, India, Sri Lanka, Nepal, Myanmar, Indonesia, Vietnam, China (Hebei, Helionjiang, Liaoning), Cambodia. Non-breeding: Pakistan, India, Sri Lanka, Nepal, Myanmar, Indonesia, Vietnam, China (Hebei, Helionjiang, Liaoning), Cambodia, Philippines, Japan, Hong Kong, Taiwan, Bangladesh, Bhutan, Malaysia, Thailand, and Lao PDR.
Concentrated Migration Regions: Not known
Historical Distribution: India, Sri Lanka, North and East to Nepal, Myanmar, Thailand and China, Vietnam and Cambodia, Malaysia, Indonesia, Japan.
Extent of Occurrence: D
Area Occupied: D
Number of populations: Unknown
Population Trends: Declining
Trend over past 100 years:
Generation Time: Unknown
World Population: $<10{,}000$
Regional Population(s): Thailand >100; Myanmar 3400; Indonesia 2000
Data Quality: 2, 3
Recent Field Studies: Wu Cheng Shen 1987 (Zhulong); Asian Waterfowl Census (since 1987).
Threats: Loss of nesting sites (west India), hunting for food (Cambodia and China), human interference and pesticides (Thailand), Pollution, human interference (China).
Trade: Not significant
Comments:
Recommendations:
Research Management: Survey, Monitoring, Habitat management, Limiting factors research, Life history studies
PHVA: Pending
Captive Program Recommendation: Lao PDR and Thailand - level 1; Malaysia - level 3
Level of Difficulty: 1
Existing Captive Population: 7.9.120
Sources: Brouwer *et al.* (1995), Mundkur, 1991; Mundkur *et al.* (1995), Perennou *et al.* (1994), Hancock *et al.* (1992), Sonobe and Usui (1993).
Compilers:

TAXON DATA SHEET

SPECIES: *Threskiornis molucca* (Australian white ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species (Subspecies: T.m. molucca, T.m. strictipenis, T.m. pygmaeus)

Current Distribution (breeding and wintering): Moluccas, New Guinea and Australia (T.m.m.: Moluccas and New Guinea; T.m.s.: Australia; T.m.p.: Solomon I)
Concentrated Migration Regions:
Historical Distribution: Moluccas, New Guinea & Australia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: ≥ 3

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: $< 100{,}000$

Regional Population(s): T.m.m.: 50,000; T.m.s.: 50,000; T.m.p.: ?
Data Quality: 1,4

Recent Field Studies: None

Threats: Loss of habitat (New Guinea/Irian Jaya, Solomon I)

Trade: None

Comments:

Recommendations:
Research Management: Monitoring, Survey (Solomon I)
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 1
Existing Captive Population: 15.9.24
Sources: Hancock *et al.* (1992); Rose and Scott (1994); Brouwer *et al.* (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Threskiornis spinicollis* (Strawnecked ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species (Subspecies are not recognized in this document)

Current Distribution (breeding and non-breeding): Australia, Tasmania, Irian Jaya
Concentrated Migration Regions: None
Historical Distribution: Australia & Tasmania
Extent of Occurrence: D
Area Occupied: D
Number of Locations: ≥ 2

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 500,000

Regional Population(s):
Data Quality: 1/4

Recent Field Studies: MacRoberts (ongoing)

Threats: None

Trade: None

Comments:

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 1
Existing Captive Population: 28.36.141

Sources: Hancock *et al.* (1994); Brouwer *et al.* (1995); Silvius & Taufik, 1990.
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Pseudibis papillosa* (Black Ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed
Taxonomic Status: Two species recognized as per Rose and Scott (1994).

Current Distribution (breeding and non-breeding): Breeding: India and Nepal. Non-breeding: India, Nepal, Bangladesh and Pakistan.
Concentrated Migration Regions: Not relevant
Historical Distribution: Pakistan, India, Nepal & Bangladesh, China.
Extent of Occurrence: D
Area Occupied: D
Number of populations: 1

Population Trends: Not known
Trend over past 100 years: Not known
Generation Time: Unknown

World Population: >10,000
Regional Population(s): Not known
Data Quality: 1, 2, 3

Recent Field Studies: India (Gujarat - Soni, 1988; Kumar & Soni 1986)
Threats: Pesticides

Trade: Insignificant

Comments:

Recommendations:
Research Management: Monitoring, Life history
PHVA: No

Captive Program Recommendation: N. America - level 3
Level of Difficulty: Unknown
Existing Captive Population (ISIS): 0.2.1

Sources: Brouwer *et al.* (1995), Perennou *et al.* (1994), Hancock *et al.* (1992), Sonobe and Usui (1993), Soni (1988) and Kumar and Soni (1986).

Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Pseudibis davisoni*
STATUS: **New IUCN:** Critical
Criteria based on: Population estimates (C2a)
CITES: Not listed

Taxonomic Status: Single species

Current Distribution (breeding and non-breeding): Cambodia, Indonesia (Kalimantan), Lao PDR, Vietnam, Myanmar (?).
Concentrated Migration Regions: Not relevant
Historical Distribution: Myanmar, Thailand, Vietnam, Cambodia & Lao PDR, Indonesia, Malaysia, SW China
Extent of Occurrence: D
Area Occupied: C/D
Number of populations: 2 (Indochina, Kalimantan)

Population Trends: Declining
Trend over past 100 years: Declining
Generation Time: Unknown

World Population: <1,000 (?)
Regional Population(s): Not known

Data Quality: 3, 4
Recent Field Studies: Vietnam (Eames *et al.* 1991); Lao PDR (Evans 1995, Duckworth *et al.* 1993); Indonesia (Holmes and Burton 1987); Cambodia (Mundkur *et al.* 1995).

Threats: Lao PDR-hunting for food, Vietnam-human interference and habitat loss.
Trade: Not significant
Comments:

Recommendations:
Research Management: Survey, Monitoring, Life history research, Habitat management, Taxonomy
PHVA: Yes
Captive Program Recommendation: Southeast Asia - Pending
Level of Difficulty: 2?
Existing Captive Population: 0.0.2
Sources: Duckworth *et al.* (1993); Evans (1995); Robson *et al.* 1993; Holmes & Burton (1987); Eames *et al.* 1992; Mundkur *et al.* (1995); Silvius & Verheugt (1989).
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Thaumatibis gigantea* (Giant ibis)
STATUS: **New IUCN:** Critical
Criteria based on: Population estimates (C2a)
CITES: Not listed

Taxonomic Status: Single species

Current Distribution (breeding and non-breeding): Lao PDR, Cambodia
Concentrated Migration Regions: Not relevant.
Historical Distribution: Mekong Delta of south Vietnam, Cambodia, Vietnam, peninsular Thailand and Malaysia
Extent of Occurrence: B
Area Occupied: B
Number of populations: 1

Population Trends: Decline
Trend over past 100 years: Decline
Generation Time: Unknown

World Population: <100 (?)
Regional Population(s): Lao PDRs 4, Cambodia 1
Data Quality: 2, 3

Recent Field Studies: Lao PDR (Duckworth *et al.* 1993, Tom Evans 1995); Cambodia (Barzen 1995; Mundkur *et al.* 1995).

Threats: Hunting for medicine and food in Cambodia

Trade: No

Comments:

Recommendations:
Research Management: Survey, Management
PHVA: Pending
Captive Program Recommendation: Pending
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None
Sources: Duckworth *et al.* (1993); Robson *et al.* (1993); Eames *et al.* (1992); Mundkur *et al.* (1995); Barzen (1994), T. Evans (pers. comm.).
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Geronticus eremita* (Waldrapp ibis)
STATUS: **New IUCN:** Endangered
Criteria based on: <250 mature individuals (D)
CITES: Appendix I

Taxonomic Status: Species

Current Distribution (breeding and wintering): Western coast of Morocco (Souss-Massa estuary); southwest Saudi Arabia
Concentrated Migration Regions: Unknown
Historical Distribution: Central Europe, Turkey, Syria, Yemen, Northern Africa
Extent of Occurrence: D
Area Occupied: C
Number of Locations: 2

Population Trends: Stable
Trend over past 100 years: Declining
Generation Time: Unknown

World Population: <350 individuals
Regional Population(s): Morocco <325; Saudi Arabia: <25
Data Quality: 1/2

Recent Field Studies: Ongoing
Threats: Human interference, loss of habitat including nestsites, catastrophic events

Trade: None

Comments: The Turkish population (Biricek) became extinct in the wild in 1989.

Recommendations:
Research Management: Monitoring, Habitat management, Limiting factors management, Reintroduction techniques
PHVA: Done in 1993 in Morocco; necessary for each future reintroduction attempt

Captive Program Recommendation: Level 1 (Europe/North America/Africa?)
Level of Difficulty: 1
Existing Captive Population: 252.294.470

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Kumerloeve (1984)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Geronticus calvus* (Bald ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Appendix II

Taxonomic Status: Species

Current Distribution (breeding and wintering): South Africa, Lesotho and Swaziland
Concentrated Migration Regions: None
Historical Distribution: South Africa, Lesotho and Swaziland
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Declining
Generation Time: Unknown

World Population: 5,000 - 8,000

Regional Population(s): None
Data Quality: 1/2

Recent Field Studies: None?

Threats: Hunting for food, human interference, loss of habitat, catastrophic events

Trade: None

Comments: Threatened by loss of foraging habitat and nesting sites

Recommendations:
Research Management: Monitoring, Habitat management
PHVA: Yes

Captive Program Recommendation: 1 (Africa?)
Level of Difficulty: 1
Existing Captive Population: 22.12.27

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Manry (1985)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Nipponia nippon* (Oriental crested ibis)
STATUS: **New IUCN:** Critical
Criteria based on: Population estimates (C2a), number of mature individuals (D)
CITES:

Taxonomic Status:
Current Distribution (breeding and non-breeding): China (Shaanxi Province).
Concentrated Migration Regions: Not relevant
Historical Distribution: China (Shaanxi Province), Korean peninsula, Japan, Russia (Khabarovsk peninsula).
Extent of Occurrence: B
Area Occupied: B
Number of populations: 1

Population Trends: Increasing slowly
Trend over past 100 years: Declining
Generation Time: Unknown

World Population: 37
Regional Population(s): Shaanxi: 37
Data Quality: 1, 2
Recent Field Studies: Crested Ibis Protection Centre of Shaanxi Ministry of Forestry since 1981 are responsible for study and protection.

Threats: Loss of habitat, loss of nest sites, hunting for food, pesticides, predation, disease (parasites) and catastrophes.

Trade: None

Comments:

Recommendations:
Research Management: Management, Life history
PHVA: Yes

Captive Program Recommendation: Level 1 (China)
Level of Difficulty: 3
Existing Captive Population: 6.7.17

Sources: Wang Qishan 1995; Cao *et al*, 1994. China Wildlife, (4): 6-7.
Compilers: Wang Qishan, Ma Yiqing

TAXON DATA SHEET

SPECIES: *Bostrychia olivacea olivacea* (Olive ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Sierra Leone, Liberia
Concentrated Migration Regions: None
Historical Distribution: Sierra Leone, Liberia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Unknown
Trend over past 100 years: Unknown
Generation Time: Unknown

World Population: <10,000 ??
Regional Population(s): None
Data Quality: 4/5

Recent Field Studies: None

Threats: Hunting for food, loss of habitat, war

Trade: None

Comments: There is extremely little information about this subspecies. There is a question of the taxonomic status of the mainland subspecies and of the island subspecies.

Recommendations:
Research Management: Taxonomic studies, Survey, Monitoring, Habitat management, Limiting factors management, Limiting factors research, Life history studies
PHVA: No

Captive Program Recommendation: Pending
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None
Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Bostrychia olivacea cupreipennis* (Olive ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Southern Cameroon to Western Zaire
Concentrated Migration Regions: None
Historical Distribution: Southern Cameroon to Western Zaire
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Unknown
Trend over past 100 years: Unknown
Generation Time: Unknown

World Population: <10,000
Regional Population(s): None
Data Quality: 4/5

Recent Field Studies: None

Threats: Loss of habitat, hunting for food
Trade: None

Comments: There is extremely little information about this subspecies. There is a question of the taxonomic status of the mainland subspecies and of the island subspecies.

Recommendations:
Research Management: Taxonomic studies, Survey, Monitoring, Habitat management, Limiting factors management, Limiting factors research, Life history studies
PHVA: No

Captive Program Recommendation: Pending
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Bostrychia olivacea rothschildi* (Rothschild's olive ibis)
STATUS: **New IUCN:** Extinct
Criteria based on: Population estimate; It has not been recorded in __ years
CITES: Not listed

Taxonomic Status: Subspecies (Some authors consider it to be a full species)

Current Distribution (breeding and wintering): Principe I
Concentrated Migration Regions: No
Historical Distribution: Principe I (E ?)
Extent of Occurrence: A ?
Area Occupied: A ?
Number of Locations: None ?

Population Trends: N/A
Trend over past 100 years: Decline
Generation Time: Unknown

World Population: 0 ?
Regional Population(s): N/A
Data Quality: 3/4

Recent Field Studies: None

Threats: Hunting for food, loss of habitat
Trade: None

Comments: There is little information. However the subspecies has not been seen in recent years.

Recommendations:
Research Management: Taxonomic studies, Survey, Monitoring, Habitat management, Limiting factors management, Limiting factors research, Life history studies
PHVA: Pending; If survey suggests that the subspecies still exists

Captive Program Recommendation: Pending
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Bostrychia olivacea bocagei* (Sao Tome dwarf olive ibis)
STATUS: **New IUCN:** Critically Endangered
Criteria based on: <50 mature individuals (D)
CITES: Not listed

Taxonomic Status: Subspecies (Some authors consider it to be a full species)

Current Distribution (breeding and wintering): Sao Tome Island
Concentrated Migration Regions: None
Historical Distribution: Sao Tome Island (E ?)
Extent of Occurrence: B
Area Occupied: A
Number of Locations: 1

Population Trends: Decline
Trend over past 100 years: Decline
Generation Time: Unknown

World Population: <50
Regional Population(s): N/A
Data Quality: 3/4

Recent Field Studies: Jones (PAOC in press)

Threats: Hunting for food, loss of habitat

Trade: None

Comments: There is little information. However the (sub-)species has not been seen in recent years.

Recommendations:
Research Management: Taxonomic studies, Surveys, Habitat management, Limiting factors management, Limiting factors research, Life history studies
PHVA: Yes
Captive Program Recommendation: Pending
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Jones (1989); Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Bostrychia olivacea akleyorum* (Kenyan olive ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Kenya
Concentrated Migration Regions: None
Historical Distribution: Kenya
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Unknown
Trend over past 100 years: Unknown
Generation Time: Unknown

World Population: <10,000
Regional Population(s): None
Data Quality: 4/5

Recent Field Studies: None

Threats: Loss of habitat

Trade: None

Comments: There is extremely little information about this species. There is a question of the taxonomic status of the mainland subspecies and of the island subspecies.

Recommendations:
Research Management: Taxonomic studies, Survey, Limiting factors research
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Bostrychia rara* (Spotbreasted ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and wintering): Liberia to E Zaire and Angola
Concentrated Migration Regions: None
Historical Distribution: Liberia to E Zaire & Angola
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable ?
Trend over past 100 years: Stable ?
Generation Time: Unknown

World Population: < 10,000

Regional Population(s): None
Data Quality: 4/5

Recent Field Studies: None

Threats: Hunting for food, loss of habitat

Trade: None

Comments: Very little information on this species

Recommendations:
Research Management: Survey, Limiting factors research
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Bostrychia hagedash* (Hadada ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species (Subspecies: B.h. brevirostris, B.h. nilotica, B.h. erlangeri, B.h. hagedash)

Current Distribution (breeding and wintering): Africa, south of the Sahara (B.h.b.: Gambia to Zaire; B.h.n.: Ethiopia to Uganda; B.h.e.: Somalia to Malawi; B.h.h.: Southern Africa)
Concentrated Migration Regions: None
Historical Distribution: Africa, South of the Sahara Desert
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 100,000 - 250,000
Regional Population(s): No estimates for subspecies
Data Quality: 4/5
Recent Field Studies: None

Threats: None
Trade: None

Comments: This species seems to be doing very well.

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: Level 3 (surrogate, North America)
Level of Difficulty: 1
Existing Captive Population: 32.37.29

Sources: Hancock *et al.* (1992), Brouwer *et al.* (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Bostrychia carunculata* (Wattled ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and wintering): Ethiopia
Concentrated Migration Regions: None
Historical Distribution: Ethiopia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: <10,000

Regional Population(s): None
Data Quality: 4/5

Recent Field Studies: None

Threats: Unknown

Trade: None

Comments: This is an endemic species and seems to be doing relatively well.

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Harpiprion caerulescens* (Plumbeous ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Central Brazil to Northern Argentina
Concentrated Migration Regions: None
Historical Distribution: Central Brazil to Northern Argentina
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 50,000 - 100,000

Regional Population(s):
Data Quality: Unknown

Recent Field Studies:

Threats: Loss of habitat

Trade: None

Comments:

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population: < 10

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Theristicus caudatus* (Buffnecked ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Two subspecies (T. c. caudatus and T. c. hyperorius) have been proposed but not verified

Current Distribution (breeding and non-breeding): Eastern Panama to northern Brazil; Central South America
Concentrated Migration Regions: Unknown
Historical Distribution: Eastern Panama to French Guiana; Central South America
Extent of Occurrence: D
Area Occupied: D
Number of Locations: >2

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 25,000 - 100,000
Regional Population(s): As suggested per subspecies
Data Quality: 5 (Almost none)

Recent Field Studies: None
Threats: Unknown
Trade: None

Comments:

Recommendations:
Research Management: Taxonomic studies, Surveys
PHVA: No

Captive Program Recommendation: Level 3 (North America: Research)
Level of Difficulty: 2
Existing Captive Population: 14.13.5 (Most institutions do not indicate which subspecies they are keeping)
Sources: Hancock *et al.* (1992); Rose and Scott (1994); Brouwer *et al.* (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Theristicus melanopis*
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species (two subspecies *T. m. melanopis* and *T. m. branickii*) have been proposed but not verified.

Current Distribution (breeding and non-breeding): Western South America: T.m.m. south Argentina and south Chile; T.m.b. Ecuador, Peru, north Bolivia
Concentrated Migration Regions: None
Historical Distribution: Western South America (same as current distribution)
Extent of Occurrence: D
Area Occupied: D
Number of Locations: Unknown

Population Trends: Stable: T.m.m. increase; T.m.b. decrease
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 25,000 - 100,000; *T. m. branickii* has always been considered rare.
Regional Population(s):
Data Quality: Unknown

Recent Field Studies:
Threats: Unknown
Trade: None

Comments:

Recommendations:
Research Management: Taxonomic studies, Survey
PHVA: No
Captive Program Recommendation: No
Level of Difficulty: 2
Existing Captive Population: 5.5.5 (Most institutions do not indicate which subspecies they are keeping)

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Brouwer *et al.* (1995); Fjeldsa (1988)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Cercibis oxycerca* (Sharptailed ibis)
STATUS: **New IUCN:** Lower risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution: Southeast Colombia to Surinam, North Brazil
Concentrated Migration Regions: None
Historical Distribution: Southeast Colombia to Surinam, North Brazil
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 2

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 10,000 - 25,000

Regional Population(s):
Data Quality: Unknown

Recent Field Studies:

Threats: None

Trade: None

Comments: Very little information available on this species.

Recommendations:
Research Management: Survey, Monitoring
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None (0.0.2 erroneously reported at Edinburgh)

Sources:
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Mesembrinibis cayennensis* (Green ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Panama to NE Argentina
Concentrated Migration Regions: None
Historical Distribution: Panama to NE Argentina
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 50,000 - 100,000
Regional Population(s):
Data Quality: Unknown

Recent Field Studies:

Threats: None

Trade: None

Comments: Very little information available on this species.

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Phimosus infuscatus* (Barefaced ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species (Some authors consider three subspecies (P.i. infuscatus, P.i. berlepschi and P.i. nudifrons).

Current Distribution: South America: P.i.i. Paraguay, Uruguay, northern Argentina; P.i.b. Northern South America; P.i.n. Highlands of central and southern Brazil
Concentrated Migration Regions: None
Historical Distribution: South America
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 2

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 100,000 - 250,000
Regional Population(s):
Data Quality: Unknown

Recent Field Studies:

Threats: None

Trade: None

Comments:

Recommendations:
Research Management: None
PHVA: No
Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Eudocimus albus* (White ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species [Hancock *et al.* (1992) consider E. albus to be a subspecies of Eudocimus ruber].

Current Distribution (breeding and non-breeding): Southern USA and Northern South America
Concentrated Migration Regions: None
Historical Distribution: Southern USA to Northern South America
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable (colonies shift)
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 100,000 - 150,000
Regional Population(s): North America, Central America, South America
Data Quality: 1/4

Recent Field Studies: Frederick *et al.* (in press)

Threats: Loss of habitat
Trade: None

Comments:

Recommendations:
Research Management: Taxonomy, Monitoring
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 1
Existing Captive Population: 48.45.63

Sources: Hancock *et al.* (1992); Rose and Scott (1994), Brouwer *et al.* (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Eudocimus ruber* (Scarlet ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Appendix II

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Northern South America & Trinidad
Concentrated Migration Regions: None
Historical Distribution: Northern South America & Trinidad
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable (colonies shift)
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 100,000 - 150,000
Regional Population(s):
Data Quality: 1/2

Recent Field Studies: Frederick *et al.* (1990)

Threats: Human interference, loss of habitat

Trade: None

Comments:

Recommendations:
Research Management: Monitoring
PHVA: No

Captive Program Recommendation: Level 3 (Europe and North America: Education)
Level of Difficulty: 1
Existing Captive Population: 431.440.829

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Frederick *et al.* (1990); Brouwer *et al.* (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Plegadis falcinellus falcinellus* (Glossy ibis)
STATUS: **New IUCN:** Lower risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and non-breeding): Eurasia, Africa, and Central and South America.
Concentrated Migration Regions:
Historical Distribution: Eurasia and Africa.
Extent of Occurrence: D
Area Occupied: D
Number of populations: 5 (sub-Saharan Africa, west Africa/Europe, East Africa/SW Asia, S/SE Asia (nb), Caribbean (nb)

Population Trends: Increasing (colonies shift)
Trend over past 100 years: Increasing
Generation Time: Unknown
World Population: >100,000
Regional Population(s):
Data Quality: 1, 2

Recent Field Studies: J.K. Tiwari (1993-1994); A. Choudhury (1987-1994); Le Dien Duc & Le Dinh Thuy (1993).
Threats: Hunting for food, loss of nest sites, overfishing.
Trade: None

Comments:

Recommendations:
Research Management: Survey, Monitoring, Limiting factors research
PHVA: No

Captive Program Recommendation: Thailand - level 3
Level of Difficulty: 2
Existing Captive Population (ISIS): 4.5.26 but probably all of captive population 43.43.141, excluding 13.14.34 in Australia are *P. f. falcinellus*.
Sources: Brouwer *et al.* (1995), Hancock *et al.* (1992), Perennou *et al.* (1994), Rose and Scott (1994), A. Choudhury (1991).
Compilers:

TAXON DATA SHEET

SPECIES: *Plegadis falcinellus peregrinus*
STATUS: **New IUCN:** Lower risk (?)
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and non-breeding): Philippines (Palawan); Indonesia (Java eastwards); Papua New Guinea; Australia and Madagascar.
Concentrated Migration Regions: Not known
Historical Distribution: Philippines (Palawan); Indonesia (Java eastwards); Papua New Guinea; Australia and Madagascar.
Extent of Occurrence: D
Area Occupied: D
Number of populations: 2 (Australasia, Madagascar)

Population Trends: Unknown
Trend over past 100 years: Unknown
Generation Time: Unknown
World Population: >1,000,000
Regional Population(s): Australia 25,000-1,000,000, 2,500 Irian Jaya , Madagascar <10,000.
Data Quality: 2, 3

Recent Field Studies: Indonesia (Irian Jaya - Silvius & Taufik, 1990)
Threats: Unknown
Trade: Insignificant

Comments:

Recommendations:
Research Management: Survey, Monitoring,
PHVA: No

Captive Program Recommendation: Pending
Level of Difficulty: 2
Existing Captive Population (ISIS): 0.0.16 (but probably all 13.14.34 individuals in Australia are *P. f. peregrinus*).

Sources: Rose and Scott (1994), Silvius & Taufik (1990)
Compilers:

TAXON DATA SHEET

SPECIES: *Plegadis chihi* (Whitefaced ibis)
STATUS: **New IUCN:** Lower Risk (Vulnerable in North America)
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): W USA and SC South America
Concentrated Migration Regions:
Historical Distribution: W USA to SC South America
Extent of Occurrence: D
Area Occupied: D
Number of Locations: >2

Population Trends: Stable (Decreasing in USA; Stable in South America)
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: ≥1,000,000
Regional Population(s): North America (USA): 10,000 - 15,000;
South America: >1,000,000
Data Quality: 2/4

Recent Field Studies:

Threats: Loss of habitat (USA)
Trade: None

Comments:

Recommendations:
Research Management: Habitat management (USA); Survey (South America: especially in Argentina)
PHVA: No

Captive Program Recommendation: Level 3
Level of Difficulty: 2
Existing Captive Population (ISIS): 23.15.6

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Plegadis ridgwayi* (Puna ibis)
STATUS: **New IUCN:** Vulnerable
Criteria based on: Population estimates (C2), Extent of occurrence (B)
CITES: Not listed

Taxonomic Status: Species

Current Distribution: Peru, Bolivia, northern Chile and northwestern Argentina
Concentrated Migration Regions: Along the Peruvian coast
Historical Distribution: Peru, Bolivia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 4: 2 in Peru; 1 in Bolivia and 1 in Bolivia/Argentina

Population Trends: Declining ?
Trend over past 100 years: Declining ?
Generation Time: Unknown

World Population: 10,000 - 15,000
Regional Population(s): See number of locations
Data Quality: 2

Recent Field Studies: None

Threats: Hunting for food, human interference (egg collection)

Trade: None

Comments:

Recommendations:
Research Management: Survey, Limiting factors management, Limiting factors research, Life history studies
PHVA: No
Captive Program Recommendation: Level 3 (North America)
Level of Difficulty: 2
Existing Captive Population: 24.23.89

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Brouwer *et al.* (1995); Fjeldsa and Krabbe (1990)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Lophotibis cristata* (Madagascar crested ibis)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species (Subspecies: L.c. cristata and L.c. urschi)

Current Distribution (breeding and wintering): Madagascar (L.c.c.: east and north Madagascar; L.c.u.: west and south Madagascar)
Concentrated Migration Regions: None
Historical Distribution: Madagascar
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 2

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 10,000
Regional Population(s): Unknown
Data Quality: 4/5

Recent Field Studies: None

Threats: Hunting for food, loss of habitat, fire

Trade: Not significant; few birds observed with animal dealer in Madagascar in 1994 (D. Jeggo, *in litt.* to KB)

Comments: Seems to be stable but may suffer from massive habitat destruction

Recommendations:
Research Management: Survey
PHVA: No
Captive Program Recommendation: No
Level of Difficulty: Unknown
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Platalea leucorodia leucorodia* (Eurasian white spoonbill)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Netherlands, Central and Southern Europe to Asia Minor, Africa
Concentrated Migration Regions: Coast of France, Portugal, Spain, northern Africa, Italy, Greece
Historical Distribution: The Netherlands, Southern Europe to Asia Minor, Africa
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 2 (Western and Eastern European populations)

Population Trends: Stable ? (Dutch population increasing; parts of the eastern population are decreasing [need more information])
Trend over past 100 years: Decline ?
Generation Time: Unknown

World Population: 10,000 - 35,000
Regional Population(s): Western European: <3,000 (600+ pairs in the Netherlands in 1995, 850-900 pairs in Spain in 1990); Eastern European: 10,000 - 25,000
Data Quality: 1/4

Recent Field Studies: Poorter, Jonker *et al.* (ongoing); Aguilera (ongoing)

Threats: Fishing, human interference, loss of habitat, pollution
Trade: None
Comments:
Recommendations:
Research Management: Monitoring, Habitat management
PHVA: No
Captive Program Recommendation: 3 for the species
Level of Difficulty: 2
Existing Captive Population (ISIS): 10.10.39 [54.60.134 for *Platalea leucorodia*. (Most institutions holding this species do not identify subspecies kept)].

Sources: Hancock *et al.* (1992); Rose and Scott (1994), Brouwer *et al.* (1995)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Platalea leucorodia major*
STATUS: **New IUCN:** Lower risk
Criteria based on:
CITES:

Taxonomic Status: Subspecies

Current Distribution (breeding and non-breeding): Caspian and Central Asia, south to Southwest Asia and Indian subcontinent. Birds breeding in East Asia spend the non-breeding period south to Japan, Hong Kong and Indochina.
Concentrated Migration Regions:
Historical Distribution: Central Asia to Japan, Egypt, India, Taiwan
Extent of Occurrence: D
Area Occupied: D
Number of populations: 2 (Central and Southwest Asia to Indian subcontinent, East Asia to Indochina)

Population Trends: Decreasing.
Trend over past 100 years: Not known
Generation Time: Unknown

World Population: >25,000
Regional Population(s): China 2,500-3,000, Nepal 120
Data Quality: 2, 3

Recent Field Studies: Vijayan (1991), China, (Zhalong Nature Reserve - Wu *et al.* 1983); Asian Waterfowl Census (since 1987).
Threats: Loss of habitat, hunting for food
Trade: Unknown

Comments:

Recommendations:
Research Management: Survey, Monitoring, Habitat management, Life history
PHVA: Pending
Captive Program Recommendation: No
Level of Difficulty: 2?
Existing Captive Population (ISIS): None
Sources: Wang Qishan (1995); McClure (1974), Rose and Scott (1994), Perennou *et al.* (1994), Vijayan (1991).
Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Platalea leucorodia balsaci* (Mauritanian white spoonbill)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Mauritania
Concentrated Migration Regions: None
Historical Distribution: Mauretania
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable ??
Trend over past 100 years: Stable ??
Generation Time: Unknown

World Population: <10,000

Regional Population(s): None
Data Quality: 1/4

Recent Field Studies: Unknown

Threats: Unknown

Trade: None

Comments:

Recommendations:
Research Management: Monitoring
PHVA: No
Captive Program Recommendation: No
Level of Difficulty: 2
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Trotignon and Trotignon (1981): Counted between 8,600-10,000 birds in winter of 1989-1990.
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Platalea leucorodia archeri*
STATUS: **New IUCN:** Vulnerable
Criteria based on: <1,000 mature individuals (D)
CITES: Not listed

Taxonomic Status: Subspecies

Current Distribution (breeding and wintering): Red Sea coasts, Somalia
Concentrated Migration Regions:
Historical Distribution: Red Sea coasts, Somalia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Unknown
Trend over past 100 years: Unknown
Generation Time: Unknown

World Population: 500 - 1,500
Regional Population(s):
Data Quality: 1/4

Recent Field Studies: None

Threats: Hunting for food?, human interference, pollution, war?, catastrophe

Trade: None

Comments: This is a unique, isolated population that inhabits and area of human unrest. Conditions and threats may change over a short time.

Recommendations:
Research Management: Survey, Limiting factors management
PHVA: No

Captive Program Recommendation: Pending
Level of Difficulty: 2
Existing Captive Population (ISIS): None

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Luthin (1984)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Platalea minor* (Blackfaced spoonbill)
STATUS: **New IUCN:** Critical
Criteria based on: Population estimates (C2b), Population reduction (A), and number of mature individuals (D)
CITES: Not listed

Taxonomic Status:

Current Distribution (breeding and non-breeding): China, Japan, Korea (North & South), Vietnam, Hong Kong, Taiwan and Thailand.
Concentrated Migration Regions: East/Southeast Chinese coast, Nakdong estuary, Korea
Historical Distribution: China, Japan, Korea (North & South), Brunei, Vietnam, Hong Kong, Taiwan and Thailand.
Extent of Occurrence: D
Area Occupied: C
Number of Locations: 2
Population Trends: Declining
Trend over past 100 years:
Generation Time: Unknown
World Population: 400
Regional Population(s): Winter: Thailand-2, Taiwan-286, China-50, Vietnam-68; Breeding: South Korea-10 pairs (1995) and North Korea-15 pairs.

Data Quality: 1, 2

Recent Field Studies: Wan 1994; Wang Hui 1994; Wang Qi-shan 1995; Wang Hui 1989.
Threats: Hunting, loss of habitat, human interference, poisoning
Trade: 7 birds traded in recent years from North Korea to Japan and Germany.
Comments: An international Action Plan was prepared for this species in Taiwan in 1995.

Recommendations:
Research Management: Survey, Monitoring, Habitat management, Life history studies, Limiting factors research
PHVA: Yes
Captive Program Recommendation: Pending
Level of Difficulty: 2?
Existing Captive Population: 2.4.0

Sources: Rose and Scott (1994), Perennou *et al.* (1994), Brouwer *et al.* (1995)

Compilers: Working group on status of Southeast Asian taxa

TAXON DATA SHEET

SPECIES: *Platalea alba* (African spoonbill)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: No listed

Taxonomic Status: Species

Current Distribution (breeding and wintering): Gambia to Sudan, Cape Province, Madagascar
Concentrated Migration Regions: None
Historical Distribution: Gambia to Sudan, South to Cape Province, Madagascar
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 10,000 - 25,000

Regional Population(s):
Data Quality: 1/4

Recent Field Studies: None

Threats: Hunting for food, loss of habitat

Trade: Insignificant

Comments:

Recommendations:
Research Management: Monitoring
PHVA: No
Captive Program Recommendation: Level 3 (North America: research)
Level of Difficulty: 2
Existing Captive Population: 51.57.83

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Brouwer *et al.* (1995)
Compilers: Coulter and Brouwer

TAXON DATA SHEET

SPECIES: *Platalea regia* (Royal spoonbill)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Australia, Papua New Guinea, Indonesia (Irian Jaya west to Java), New Zealand
Concentrated Migration Regions: None
Historical Distribution: Australia to New Guinea, Sulawesi, New Zealand
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Increasing
Trend over past 100 years: Increasing
Generation Time: Unknown

World Population: 100,000 - 250,000
Regional Population(s): Not known
Data Quality: 1/4

Recent Field Studies: Indonesia (Irian Jaya - Silvius & Taufik, 1990)

Threats: None (Indonesia: Hunting for food, loss of habitat, pollution)

Trade: None

Comments:

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 2 ?
Existing Captive Population (ISIS): 3.1.5.

Sources: Hancock *et al.* (1992); Silvius & Taufik, 1990; Sibuea *et al.* 1995, 1996.
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Platalea flavipes* (Yellowbilled spoonbill)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and wintering): Australia
Concentrated Migration Regions: None
Historical Distribution: Australia
Extent of Occurrence: D
Area Occupied: D
Number of Locations: 1

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 25,000 - 100,000

Regional Population(s):
Data Quality: 1/4

Recent Field Studies: None

Threats: None

Trade: No

Comments:

Recommendations:
Research Management: None
PHVA: No

Captive Program Recommendation: No
Level of Difficulty: 2 ?
Existing Captive Population (ISIS): 1.2.1

Sources: Hancock *et al.* (1992)
Compilers: Brouwer and Coulter

TAXON DATA SHEET

SPECIES: *Ajaia (Platalea) ajaja* (Roseate spoonbill)
STATUS: **New IUCN:** Lower Risk
Criteria based on:
CITES: Not listed

Taxonomic Status: Species

Current Distribution (breeding and non-breeding): Southern USA to Central Argentina and Chile
Concentrated Migration Regions: None
Historical Distribution: Southern USA to Central Argentina & Chile
Extent of Occurrence: D
Area Occupied: D
Number of Locations: ≥ 2

Population Trends: Stable
Trend over past 100 years: Stable
Generation Time: Unknown

World Population: 100,000 - 250,000
Regional Population(s):
Data Quality: 1/4

Recent Field Studies: Bjork and Powell (1994)

Threats: Loss of habitat

Trade: None

Comments:

Recommendations:
Research Management: Survey (South America)
PHVA: No
Captive Program Recommendation: Level 3 (North America and Europe)
Level of Difficulty: 2
Existing Captive Population: 135.136.239

Sources: Hancock *et al.* (1992); Rose and Scott (1994); Brouwer *et al.* (1995); Wu and Xu (1983).
Compilers: Coulter and Brouwer

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SECTION 4

GLOBAL CAPTIVE ACTION RECOMMENDATIONS

Introduction

Captive data for SIS species have been compiled from various sources, including ISIS, a global stork census annually updated to include available new information, regional, national, and individual zoo inventories as well as personal observations. Census data for subspecies are taken only from ISIS, subspecies census data are also included in data for the species.

Regions here are defined as N. America: U.S., Canada and Mexico; Australia: Australia, New Zealand and New Guinea; Asia: Indian subcontinent, Sri Lanka, Southeast Asia and Far east Asia; Europe: Eurasia, Saudi Arabia, Israel; Africa: African continent and Madagascar.

Table 8.

GLOBAL CAPTIVE ACTION RECOMMENDATIONS FOR STORKS, IBISES AND SPOONBILLS

#	TAXON		CAMP DATA				WORLD					DISTRIBUTION OF CAPTIVE POPULATION									
	SCIENTIFIC NAME		WILD EST#	IUCN	PHVA	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
	Ciconiiformes																				
	Balaenicipitidae																				
1	Balaeniceps	rex (Shoebill)	10,000-15,000	DD	Y	No	14.13.5					Asia	3.2.2	Europe	6.5.3	NAmer	5.6.0				
	Ciconiidae																				
2	Mycteria	americana (American wood stork)	50,000-100,000	LR	N	3 NAmer	22.22.65					Asia	2.2.21	Europe	9.3.10	NAmer	1.2.7	SAmer	10.15.27		
3	Mycteria	cinerea (Milky stork)	>6,000	VU	Y	1	14.18.99					Asia	5.5.75	Europe	2.2.16	NAmer	7.11.8				
4	Mycteria	ibis (Yellowbilled stork)	25,000-100,000	LR	N	No	17.18.36					Asia	0.0.4	Europe	4.8.32	NAmer	13.10.10				
5	Mycteria	leucocephala (Painted stork)	15,000-20,000	LR	N	1 Thai, Loas; 2 Malay., Cambodia	36.22.671					Asia	8.5.665	Europe	11.10.6	NAmer	17.7.0				
6	Anastomus	oscitans (Asian openbill stork)	125,000	LR	N	3 SE Asia/No	7.3.14					Asia	1.1.5	Europe	6.2.9						
7	Anastomus	lamelligerus (African openbill stork)	>100,000	LR	N	No	12.5.7							Europe	6.3.7	NAmer	6.2.0				
	Anastomus	lamelligerus lamelligerus																			
	Anastomus	lamelligerus madagascariensis																			
8	Ciconia	nigra (Black stork)	>100,000	VU	Y	3 Europe/SE Asia	74.46.82					Asia	8.4.15	Europe	16.42.66	NAmer	6.0.0				

#	TAXON		CAMP DATA				WORLD					DISTRIBUTION OF CAPTIVE POPULATION									
	SCIENTIFIC NAME		WILD EST#	IUCN	PHVA	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
9	Ciconia	abdimii (Abdim's stork)	25,000-100,000	LR	N	No	39.50.70							Europe	14.16.53	NAmer	25.34.7	Africa	0.0.10		
	Ciconia	episcopus (Woollynecked stork)					12.15.63					Asia	6.6.57	Europe	2.1.6	NAmer	4.7.0	SAmer	0.1.0		
10	Ciconia	episcopus microscelis	25,000-100,000	LR	N	No	None														
11	Ciconia	episcopus episcopus	<2,500?	DD	N	No	4.4.0									NAmer	4.4.0				
12	Ciconia	episcopus neglecta	<2,500?	DD	N	P	None														
13	Ciconia	stormi (Storm's stork)	<1,500?	EN	Y	P	4.4.6					Asia	3.3.6			NAmer	1.1.0				
14	Ciconia	maguari (Maguari stork)	50,000-100,000	LR	N	No	21.17.25							Europe	4.4.2	NAmer	12.9.0	SAmer	5.4.23		
	Ciconia	ciconia (White stork)					430.407.860					Asia	43.38.65	Europe	324.331.735	NAmer	60.36.25	Africa	3.2.15		
15	Ciconia	ciconia ciconia	500,000	LR	N	3	85.71.168					Asia	5.3.15	Europe	45.51.150	NAmer	35.17.3				
16	Ciconia	ciconia asiatica	~3,000	VU	N	No	None														
17	Ciconia	boyciana (Oriental white stork)	2500-3000	EN	Y	1	54.52.76					Asia	36.40.72	Europe	16.10.4	NAmer	2.2.0				
	Ephippiorhynchus	asiaticus (Blacknecked stork)					20.15.45					Asia	14.13.40	Europe	3.1.0	NAmer	2.1.0	SAmer	0.0.1	Aus	1.0.4
18	Ephippiorhynchus	asiaticus asiaticus	>500	EN	Y	1	4.3.0					Asia	4.3.0								
19	Ephippiorhynchus	asiaticus australis	<10,000	LR	N	No	1.0.3													Aus	1.0.2

#	TAXON		CAMP DATA				WORLD					DISTRIBUTION OF CAPTIVE POPULATION									
	SCIENTIFIC NAME		WILD EST#	IUCN	PHVA	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
20	Ephippiorhynchus	senegalensis (Saddlebill stork)	<10,000	LR	N	No	66.67.14					Asia	4.4.0	Europe	31.33.9	NAmer	30.29.0			Africa	1.1.5
21	Ephippiorhynchus	mycteria	10,000-25,000	LR	N	No	13.11.24							Europe	1.4.6	NAmer	5.2.0	SAmer	7.5.18		
22	Leptoptilos	javanicus (Lesser adjutant stork)	5,000	VU	N	1 SE Asia	29.23.109					Asia	16.14.103	Europe	10.8.5	NAmer	3.1.0	SAmer	0.0.1		
23	Leptoptilos	dubius (Greater adjutant stork)	>700	EN	Y	1	15.12.40					Asia	12.5.37	Europe	1.5.3	NAmer	2.0.0				
24	Leptoptilos	crumeniferus (Marabou stork)	100,000-1,000,000	LR	N	3 Europe	137.149.221					Asia	4.6.42	Europe	84.86.152	NAmer	46.55.8	SAmer	0.0.1	Africa	3.2.18
	Threskiornithidae																				
	Threskiornis	aethiopicus (Sacred ibis)					135.124.1033					Asia	6.8.87	Europe	85.70.879	NAmer	44.46.67				
25	Threskiornis	aethiopicus aethiopicus	>200,000	LR	N	No	25.19.9							Europe	1.1.6	NAmer	24.18.3				
26	Threskiornis	aethiopicus abbotti	150-200	EN	Y	P	0														
27	Threskiornis	aethiopicus bernieri	<10,000	VU	N	P	0														
28	Threskiornis	melanocephalus (Oriental white ibis)	<10,000	LR	P	1 SE Asia, 3 NAmer	7.9.120					Asia	2.2.91	Europe	3.3.28	NAmer	2.4.1				
29	Threskiornis	molucca (Australian white ibis)	<100,000	LR	N	No	15.9.24							Europe	13.9.22	NAmer	2.0.0			Aus	0.0.2
	Threskiornis	molucca molucca					5.4							Europe	5.4						
	Threskiornis	molucca strictipennis					0.0.2													Aus	0.0.2

#	TAXON		CAMP DATA				WORLD					DISTRIBUTION OF CAPTIVE POPULATION									
	SCIENTIFIC NAME		WILD EST#	IUCN	PHVA	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
	Threskiornis	molucca pygmaeus					0														
30	Threskiornis	spinicollis (Strawnecked ibis)	500,000	LR	N	No	28.36.141					Asia	4.5.6	Europe	24.29.134					Aus	0.2.1
31	Pseudibis	papillosa (Black ibis)	>10,000	LR	N	3 NAmer	0.2.1							Europe	0.2.1						
32	Pseudibis	davisoni	<1,000?	CR	Y	P	0.0.2					Asia	0.0.2								
33	Thaumatibis	gigantea (Giant ibis)	<100	CR	P	P	None														
34	Geronticus	eremita (Waldrapp ibis)	<350	EN	Y	1	252.294.470					Asia	8.9.17	Europe	196.225.422	NAmer	44.53.26	Africa	4.7.5		
35	Geronticus	calvus (Bald ibis)	5,000-8,000	LR	Y	1	22.12.27							Europe	7.1.0			Africa	15.11.27		
36	Nipponia	nippon (Oriental crested ibis)	37	CR	Y	1	6.7.17					Asia	6.7.17								
	Bostrychia	olivacea (Olive ibis)																			
37	Bostrychia	olivacea olivacea	<10,000?	LR	N	P	0														
38	Bostrychia	olivacea cupreipennis	<10,000	LR	N	P	0														
39	Bostrychia	olivacea rothschildi	0?	EX	P	P	0														
40	Bostrychia	olivacea bocagei	<50	CR	Y	P	0														
41	Bostrychia	olivacea akleyorum	<10,000	LR	N	No	0														
42	Bostrychia	rara (Spotbreasted ibis)	<10,000	LR	N	No	0														

#	TAXON		CAMP DATA				WORLD					DISTRIBUTION OF CAPTIVE POPULATION									
	SCIENTIFIC NAME		WILD EST#	IUCN	PHVA	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
43	Bostrychia	hagedash (Hadada ibis)	100,000-250,000	LR	N	3 NAmer	32.37.29					Asia	4.3.7	Europe	8.8.11	NAmer	17.25.9	Africa	3.1.2		
	Bostrychia	hagedash brevirostris					8.11.3									NAmer	8.11.3				
	Bostrychia	hagedash nilotica					2.2.4									NAmer	2.2.4				
	Bostrychia	hagedash erlangeri																			
	Bostrychia	hagedash hagedash																			
44	Bostrychia	carunculata (Wattled ibis)	< 10,000	LR	N	No	0														
45	Harpiprion	caerulescens (Plumbeous ibis)	50,000-100,000	LR	N	No	< 10														
46	Theristicus	caudatus (Buffnecked ibis)	25,000-100,000	LR	N	3 NAmer	14.13.5							Europe	9.7.5	NAmer	5.6.0				
	Theristicus	caudatus caudatus																			
	Theristicus	caudatus hyperorius																			
47	Theristicus	melanopis	25,000-100,000	LR	N	No	5.5.5					Asia	2.3.3	Europe	3.2.2						
	Theristicus	melanopis melanopis																			
	Theristicus	melanopis branickii																			
48	Cercibis	oxycerca (Sharptailed ibis)	10,000-25,000	LR	N	No	0														
49	Mesembrinibis	cayennensis (Green ibis)	50,000-100,000	LR	N	No	0														

#	TAXON		CAMP DATA				WORLD					DISTRIBUTION OF CAPTIVE POPULATION									
	SCIENTIFIC NAME		WILD EST#	IUCN	PHVA	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
50	Phimosus	infuscatus (Barefaced ibis)	100,000-250,000	LR	N	No	0														
	Phimosus	infuscatus berlepschi																			
	Phimosus	infuscatus nudifrons																			
	Phimosus	infuscatus infuscatus																			
51	Eudocimus	albus (White ibis)	100,000-150,000	LR	N	No	48.45.63					Asia	4.4.6	Europe	14.11.28	NAmer	30.30.29				
52	Eudocimus	ruber (Scarlet)	100,000-150,000	LR	N	3 NAmer, Europe	431.440.829					Asia	16.19.19	Europe	166.185.572	NAmer	249.236.238				
	Plegadis	falcinellus (Glossy ibis)					43.43.141					Asia	0.0.1	Europe	25.26.102	NAmer	5.3.4			Aus	13.14.34
53	Plegadis	falcinellus falcinellus	> 100,000	LR	No	3 Europe	4.5.26							Europe	4.5.26						
54	Plegadis	falcinellus peregrinus	?	CR?	No	P	0.0.16													Aus	0.0.16
55	Plegadis	chihi (Whitefaced ibis)	> 1,000,000	LR/VU	N	3 NAmer	23.15.6									NAmer	23.15.5	SAmer	0.0.1		
56	Plegadis	ridgwayi (Puna ibis)	10,000-15,000	VU	N	3 NAmer	24.23.89							Europe	13.14.80	NAmer	11.9.9				
57	Lophotibis	cristata (Madagascar crested ibis)	10,000	LR	N	No	0														
	Lophotibis	cristata cristata																			
	Lophotibis	cristata urschi																			

#	TAXON		CAMP DATA				WORLD					DISTRIBUTION OF CAPTIVE POPULATION									
	SCIENTIFIC NAME		WILD EST#	IUCN	PHVA	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
	Plataleinae																				
	Platalea	leucorodia (Eurasian spoonbill)					4.60.134					Asia	0.1.0	Europe	53.55. 127	NAmer	1.4.7				
58	Platalea	leucorodia leucorodia	10,000-25,000	LR	N	3	10.10.39							Europe	9.7.38	NAmer	1.3.1				
59	Platalea	leucorodia major	>25,000	LR	P	No	0														
60	Platalea	leucorodia balsaci	<10,000	LR	N	No	0														
61	Platalea	leucorodia archeri	500-,1500	VU	N	P	0														
62	Platalea	minor (Blackfaced spoonbill)	400	CR	Y	P	2.4.0					Asia	1.3.0	Europe	1.1.0						
63	Platalea	alba (African spoonbill)	10,000-25,000	LR	N	3 NAmer	51.57.83					Asia	6.0.2	Europe	26.33. 56	NAmer	25.24.25				
64	Platalea	regia (Royal spoonbill)	100,000-250,000	LR	N	No	3.1.5													Aus	3.1.5
65	Platalea	flavipes (Yellowbilled spoonbill)	25,000-100,000	LR	N	No	1.2.1									NAmer	0.0.1			Aus	1.2.0
66	Ajaia	ajaja (Roseate spoonbill)	100,000-250,000	LR	N	3 NAmer, Europe	135.136. 239					Asia	0.0.9	Europe	24.29.8 3	NAmer	111.107. 145	SAmer	0.0.2		

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SECTION 5

APPENDICES

APPENDIX I: CONSERVATION ASSESSMENT AND MANAGEMENT PLANS

Introduction

Reduction and fragmentation of wildlife populations and habitat are occurring at a rapid and accelerating rate. For an increasing number of taxa, the results are small and isolated populations at risk of extinction. A rapidly expanding human population, now estimated at 5.25 billion, is expected to increase to 8 billion by the year 2025. This expansion and concomitant utilization of resources has momentum that cannot be stopped, the result being a decreased capacity for all other species to simultaneously exist on the planet.

As wildlife populations diminish in their natural habitat, wildlife managers realize that management strategies must be adopted that will reduce the risk of extinction. These strategies will be global in nature and will include habitat preservation, intensified information gathering, and in some cases, scientifically managed captive populations that can interact genetically and demographically with wild populations.

Successful preservation of wild species and ecosystems necessitates developing and implementing active management programs by people and governments living within the range area of the species in question. The recommendations contained within this document are based on conservation need only; adjustments for political and other constraints are the responsibility of regional governmental agencies charged with the preservation of flora and fauna within their respective countries.

Conservation Assessment and Management Plans (CAMPs)

Within the Species Survival Commission (SSC) of IUCN-The World Conservation Union, the primary goal of the Captive Breeding Specialist Group (CBSG) is to contribute to the development of holistic and viable conservation strategies and management action plans. Toward this goal, CBSG is collaborating with agencies and other Specialist Groups worldwide in the development of scientifically-based processes, on both a global and regional basis, with the goal of facilitating an integrated approach to species management for conservation. One of these tools is called Conservation Assessment and Management Plan (CAMP).

CAMPs provide strategic guidance for the application of intensive management techniques that are increasingly required for survival and recovery of threatened taxa. CAMPs are also one means of testing the applicability of the IUCN Red List criteria for threat as well as the scope of its applicability. Additionally, CAMPs are an attempt to produce ongoing summaries of current data for groups of taxa, providing a mechanism for recording and tracking of species status.

In addition to management in the natural habitat, conservation programs leading to viable populations of threatened species may sometimes need a captive component. In general, captive populations and programs can serve several roles in holistic conservation: 1) as genetic and demographic reservoirs that can be used to reinforce wild populations whether by revitalizing

populations that are languishing in natural habitats or by re-establishing by translocation populations that have become depleted or extinct; 2) by providing scientific resources for information and technology that can be used to protect and manage wild populations; and 3) as living ambassadors that can educate the public as well as generate funds for *in situ* conservation.

It is proposed that, when captive populations can assist species conservation, captive and wild populations should, and can be, intensively and interactively managed with interchanges of animals occurring as needed and as feasible. Captive populations should be a support, not a substitute for wild populations. There may be problems with interchange between captive and wild populations with regard to disease, logistics, and financial limitations. In the face of the immense extinction crisis facing many taxa, these issues must be addressed and resolved immediately.

The CAMP Process

The CAMP process itself is intensive and interactive and is unique in its ability to facilitate objective and systematic prioritization of research and management actions needed for species conservation, both *in* and *ex situ*. Workshop participants develop the assessments of risks and formulate recommendations for action using a spreadsheet with columns that require participants to provide data on the status of populations and habitat in the wild as well as recommendations for intensive conservation action. The spreadsheet is augmented with a Taxon Data Sheet for each taxon under review. Taxon Data Sheets provide documentation of reasoning behind recommendations, and include elaboration of data that does not fit into the spreadsheet format as well as details of other pertinent information.

During a CAMP workshop, the wild and captive status for each taxon under consideration are reviewed, on a taxon-by-taxon basis (usually at the subspecies level). For each taxon, there is an attempt to estimate the total population. It is often very difficult, even agonizing, to be numerate because so little quantitative data on population sizes and distribution exists. However, it is frequently possible to provide order-of-magnitude estimates, especially whether the total population is greater or less than the numerical thresholds for the population data used in determining categories of threat. CAMP spreadsheets include a "data quality" column so that "guesstimates" can be distinguished from population estimates based on solid documentation. The CAMP process attempts to be as quantitative or numerate as possible for two major reasons:

- Action plans ultimately must establish numerical objectives for population sizes and distribution if they are to be viable.
- Numbers provide for more objectivity, less ambiguity, more comparability, better communication and hence cooperation.

Information about population fragmentation and trends, distribution, as well as habitat changes and environmental stochasticity also are considered.

The CAMP process utilizes information from SSC Action Plans that may already have been

formulated by the taxon-based Specialist Groups as well as additional data, published and unpublished, from experts on the taxa. CAMPs have been endorsed by the SSC and by BirdLife International as the logical first step toward the development of taxonomic Action Plans where they do not yet exist.

For each taxon reviewed, three kinds of assessments/recommendations are made:
1) assigning taxa to New IUCN Red List Category of Threat;

2) making recommendations for research and management activities to contribute to the taxon's conservation. These recommendations aim to more fully integrate recommended research and management actions and known threats. Research management can be defined as an interactive management program including a strong feedback loop between management activities, evaluation of their effectiveness, and the response of the species;

3) making recommendations for captive programs that can contribute to the conservation of the taxon. These form the foundation for development of Global Captive Action Recommendations (GCARs) and regional strategic captive collection plans for the zoo and aquarium community.

The CAMP process uses a conservative taxonomic approach. In most cases, initial risk assessment and management recommendations are made in terms of the maximal distinction among possible "subspecies" until taxonomic relationships are better elucidated. Splitting rather than lumping maximizes preservation of options. Taxa can always be merged ("lumped") later if further information invalidates the distinctions or if biological or logistic realities of sustaining viable populations precludes maintaining taxa as separate units for conservation.

New IUCN Red List Categories
The threatened species categories now used in IUCN Red Data Books and Red Lists have been in place, with some modification, for almost 30 years (Mace *et al.*, 1994). The IUCN Red List criteria is one developmental step in an attempt to make those categories more explicit. These criteria subsequently have been revised and formulated into new IUCN Red List Categories, which are now being used in the CAMP process.

The New IUCN Red List Categories provide a system which facilitates comparisons across widely different taxa, and is based both on population and distribution criteria. Like the IUCN Red List criteria, the new criteria can be applied to any taxonomic unit at or below the species level, with sufficient range among the different criteria to enable the appropriate listing of taxa from the complete spectrum of taxa, with the exception of micro-organisms (see Mace *et al.*, 1994).

The categories of Critical, Endangered, and Vulnerable are all nested (i.e., if a taxa qualifies for Critical, it also qualifies for Endangered and Vulnerable). The New IUCN Red List Categories are:

EXTINCT (EX)
A taxon is **Extinct** when there is no reasonable doubt that its last individual has died.

EXTINCT IN THE WILD (EW)
A taxon is **Extinct in the Wild** when it is known only to survive in cultivation, in captivity, or as a naturalized population (or population) well outside the past range.

CRITICAL (CR)
A taxon is **Critical** when it is facing an extremely high risk of extinction in the wild in the immediate future as defined by the criteria.

ENDANGERED (EN)
A taxon is **Endangered** when it is not Critical but is facing a very high risk of extinction in the wild in the near future, as defined by the criteria.

VULNERABLE (VU)
A taxon is **Vulnerable** when it is not Critical or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by the criteria.

CONSERVATION DEPENDENT (CD)
Taxa which do not currently qualify under any of the categories above may be classified as **Conservation Dependent**. To be considered **Conservation Dependent**, a taxon must be the focus of a continuing taxon-specific or habitat-specific conservation program which directly affects the taxon in question. The cessation of this program would result in the taxon qualifying for one of the threatened categories above.

LOWER RISK (LR)
A taxon is **Low Risk** when it has been evaluated and does not qualify for any of the categories Critical, Endangered, Vulnerable, Susceptible, Conservation Dependent, or Data Deficient.

DATA DEFICIENT (DD)
A taxon is **Data Deficient** when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.

NOT EVALUATED (NE)
A taxon is **Not Evaluated** when it has not yet been assessed against the criteria.

Captive Populations
Today, as more and more species are threatened with population declines, cooperative recovery programs, including both zoos and the private sector, may provide a major avenue for survival. This cooperation must include support for field research, habitat conservation, as well as public education.

When *ex situ* management was recommended, the "level" of captive programs was developed, reflecting status, prospects in the wild, and taxonomic distinctiveness. The captive levels used during the Stork, Ibis and Spoonbill CAMP are defined below.

Level 1 (1) - A captive population is recommended as a component of a conservation program. This program has a tentative goal of developing and managing a population sufficient to preserve 90% of the genetic diversity of a population for 100 years (90%/100). The program should be further defined with a species management plan encompassing the wild and captive populations and implemented immediately with available stock in captivity. If the current stock is insufficient to meet program goals, a species management plan should be developed to specify the need for additional founder stock. If no stock is present in captivity then the program should be developed in collaboration with appropriate wildlife agencies, SSC Specialist Groups, and cooperating institutions.

Level 2 (2) - Similar to the above except a species/subspecies management plan would include periodic reinforcement of captive population with new genetic material from the wild. The levels and amount of genetic exchange needed should be defined in terms of the program goals, a population model, and species management plan. It is anticipated that periodic supplementation with new genetic material will allow management of a smaller captive population. The time period for implementation of a Level 2 program will depend on recommendations made at the CAMP workshop.

Level 3 (3) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies but is recommended for education, research, or husbandry.

No (N) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies. Taxa already held in captivity may be included in this category. In this case species/subspecies should be evaluated either for management toward a decrease in numbers or for complete elimination from captive programs as part of a strategy to accommodate as many species/subspecies as possible of higher conservation priority as identified in the CAMP or in SSC Action Plans.

Pending (P) - A decision on a captive program will depend upon further data either from a PHVA, a survey, or existing identified sources to be queried.

The Review Process for CAMPs

The results of the initial CAMP workshops are reviewed: 1) by distribution of a preliminary draft to workshop participants; 2) by distribution to a broader audience which includes wildlife managers and regional captive programs worldwide; 3) at regional review sessions at various CBSG meetings and workshops, utilizing local expertise with the taxonomic group in question. Thus CAMP workshops are part of a continuing and evolving process of developing conservation and recovery plans for the taxa involved. The CAMP review process allows extraction of information from experts worldwide. In nearly all cases, follow-up workshops are required to consider particular issues in greater depth or on a regional basis. Moreover, some form of follow-up will always be necessary to monitor the implementation and effectiveness of the recommendation resulting from the workshop. In many cases a range of PHVA workshops result from the CAMP workshops.

STORK, IBIS AND SPOONBILL
CONSERVATION ASSESSMENT AND MANAGEMENT PLAN (CAMP)
TAXON DATA REPORT CATEGORIES
20 April 1995

The Conservation Assessment and Management Plan (CAMP) taxon data report is a working document that provides information that can be used to assess the degree of threat and recommend conservation action. The first part of the Sheet summarizes information on the status of the wild and captive populations of each taxon. It contains taxonomic, distributional, and demographic information useful in determining which taxa are under greatest threat of extinction. This information can be used to identify priorities for intensive management action for taxa.

SCIENTIFIC NAME: Scientific names of extant taxa: genus and species (or subspecies where appropriate).

TENTATIVE IUCN: Tentative Status according to the New IUCN Red List criteria (see Table 1 and additional materials)

CR = Critically Endangered
EN = Endangered
VU = Vulnerable
CD = Conservation Dependent
LR = Low Risk
DD = Data Deficient
NE = Not Evaluated

CRITERIA BASED ON: Indicate which of the New IUCN Red List criteria were used to assign a category of threat:

PR = Population reduction
EO = Extent of occurrence
PE = Population estimates
NM = Number of mature individuals
PX = Probability of extinction

CITES: List the CITES Appendix on which the species is listed, if appropriate.

OTHER: List whether the species has been assigned threatened status in other venues, e.g., nationally or in other conservation assessments.

TAXONOMIC STATUS: This indicates the taxonomic status of the extant taxa. Taxonomic uncertainties may be discussed in this section. Subspecies not considered separately should be listed here along with their distribution.

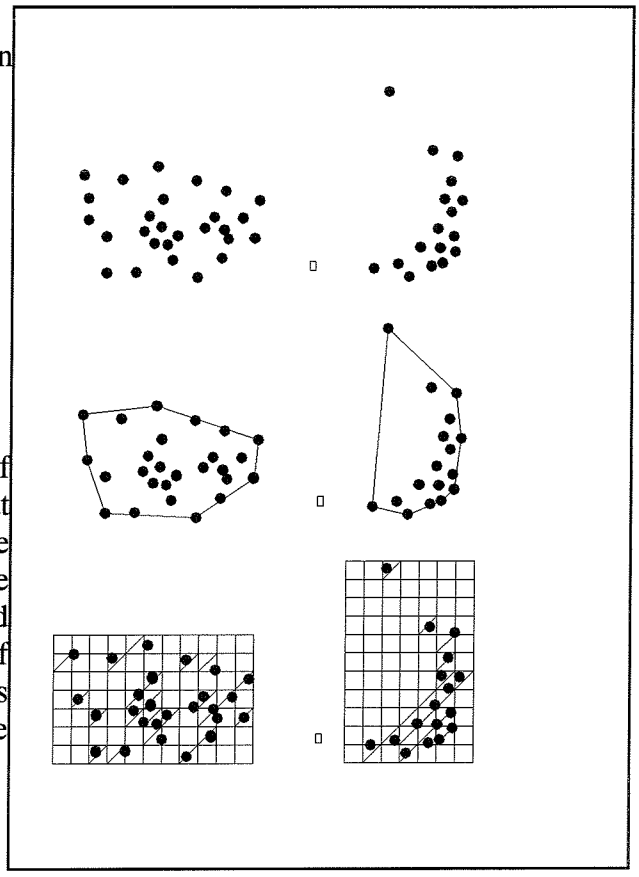
CURRENT DISTRIBUTION: List the geographical extent of locations of the species.

HISTORICAL DISTRIBUTION: List the historical distribution of the species

EXTENT OF OCCURRENCE: List the actual size of the area in which the species occurs, if possible. Also list the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred, or projected sites of present occurrence of a taxon, excluding cases of vagrancy (Figure 1). This measure does not take account of discontinuities or disjunctions in the spatial distributions of taxa. Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

A: < 100 km2
B: 101 km2 - 5,000 km2
C: 5,001 km2 - 20,000 km2
D: larger than 20,001 km2

AREA OF OCCUPANCY: List the area within the 'extent of occurrence' which is actually occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats. The area of occupancy is the smallest area essential at any stage to the survival of a taxon (e.g., colonial nesting sites, feeding sites for migratory taxa). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relent biological aspects of the taxon. The criteria include values in km2, and thus to avoid errors in classification the area of occupancy should be measured on grid squares or equivalents which are sufficiently small (see Figure 1).



A: < 10 km2
B: 11 km2 - 500 km2
C: 501 km2 - 2,000 km2
D: larger than 2,001 km2

Fig. 1. Two examples of the distinction between the extent of occurrence and area of occupancy. (a) and (b) are the spatial distribution of known, inferred, or projected sites of occurrence. (c) and (d) show one possible boundary to the extent of occurrence, which is the measured area within this boundary. (e) and (f) show one measure of area of occupancy which can be measured by the sum of the occupied grid squares.

 # LOCATIONS: Note the number of locations in which the taxon is found. If the population

is fragmented, indicate "F" after the number of locations.

POPULATION TRENDS - % CHANGE IN YEARS OR IN GENERATIONS: If possible, list the trend of the population (stable, declining, or increasing). If possible, list the percent of change over a particular time frame (e.g., 10 or 20 years) or number of generations. Specify the number of years or generations over which the decline has occurred, e.g., 10%/2g or 20%/20 yrs.

GENERATION TIME: Indicate the number of years in a generation. A generation is defined as the average age of parents in the population.

WORLD POPULATION: List the estimated numbers of pairs in the wild. If specific numbers are unavailable, estimate the general range of the population size.

REGIONAL POPULATION(S): List the estimated number of pairs in any particular region for which there are data, followed by the location.

DATA QUALITY: List the actual age of the data used to provide the population estimates. Also list the type of data from which the estimates are provided.
1 = Reliable census or population monitoring
2 = General field study
3 = Informal field sightings
4 = Indirect information (trade numbers, habitat availability).

Any combination of above = different data quality in parts of range.

RECENT FIELD STUDIES: List any current or recent field studies, the name of the researcher and the location of the study.

THREATS: List immediate or predicted events that are or may cause significant population declines. These may include:
A = Aircraft
C = Climate
D = Disease
Dp = Decline in prey species
Dr = Drowning
F = Fishing
G = Genetic problems
H = Hunting
Hf = Hunting for food
Hm = Hunting for medicine
Ht = Hunting for trophies
Hyb = Hybridization
I = Human interference, persecution, or disturbance
Ic = Interspecific competition

Ice = Interspecific competition from exotics
Il = Interspecific competition with domestic livestock
L = Loss of habitat
La = Loss of habitat because of exotic animals
Lf = Loss of habitat because of fragmentation
Ln = Loss of nest sites
Lp = Loss of habitat because of exotic plants
M = Marine perturbations, including El Niño and other shifts
N = Nutritional disorders or problems
P = Predation
Pe = Predation by exotics
Ps= Pesticides
Pl= Powerlines
Po= Poisoning
Pu= Pollution
S = Catastrophic events
Sd: drought
Sf: fire
Sh: hurricane
St: tsunami
Sv: volcano
T = Trade for the live animal market
Tp: trade for parts, including skins
W = War

TRADE:
Was the species present in Trade according to CITES records? If so, list year(s).

COMMENTS: Note any additional information that is important with respect to the conservation of the species.

RECOMMENDATIONS:

RESEARCH MANAGEMENT:
It should be noted that there is (or should be) a clear relationship between threats and subsequent outlined research/management actions. The "Research/Management" column provides an integrated view of actions to be taken, based on the listed threats. Research management can be defined as a management program which includes a strong feedback between management activities and an evaluation of the efficacy of the management, as well as response of the bird species to that activity. The categories within the column are as follows:

T = Taxonomic and morphological genetic studies
Tl = Translocations
S = Survey - search and find
M = Monitoring - to determine population information

H = Husbandry research
Hm = Habitat management - management actions primarily intended to protect and/or enhance the species' habitat (e.g., forest management)
Lm = Limiting factor management - "research management" activities on known or suspected limiting factors. Management projects have a research component that provide scientifically defensible results.
Lr = Limiting factor research - research projects aimed at determining limiting factors. Results from this work may provide management recommendations and future research needs
Lh = Life history studies
O = Other (record in detail on taxon data sheet)

PHVA: Is a Population and Habitat Viability Assessment Workshop recommended to develop an intensive management/recovery plan for the species?
Yes, No or Pending further data from surveys or other research.

CAPTIVE PROGRAM RECOMMENDATIONS:

Level 1 (1) - A captive population is recommended as a component of a conservation program. This program has a tentative goal of developing and managing a population sufficient to preserve 90% of the genetic diversity of a population for 100 years (90%/100).

Level 2 (2) - Similar to the above except a species/subspecies management plan would include periodic reinforcement of captive population with new genetic material from the wild.

Level 3 (3) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies but is recommended for education, research, or husbandry.

No (N) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies.

Pending (P) - A decision on a captive program will depend upon further data either from a PHVA, a survey, or existing identified sources to be queried.

LEVEL OF DIFFICULTY: What is the level of difficulty in maintaining the species in captive conditions?

1 = Least difficult. Techniques are in place for capture, maintenance, and propagation of similar taxa in captivity, which ostensibly could be applied to the taxon.

2 = Moderate difficulty. Techniques are only partially in place for capture, maintenance, and propagation of similar taxa in captivity, and many captive techniques

still need refinement.

3 = Very difficult. Techniques are not in place for capture, maintenance, and propagation of similar taxa in captivity, and captive techniques still need to be developed.

EXISTING CAPTIVE POPULATION: Number of individuals in captivity according to the International Species Information System. Please add other information, when available, as the numbers listed consist of only a portion of the captive population.

SOURCES: List sources used for information for the above data. (Author's name, year, title of article or book, journal, issue, and page numbers).

COMPILERS: List the names of the people who contributed information for this taxon data sheet, including the author of the data for the Handbook of Birds of the World.

APPENDIX II: GLOBAL CAPTIVE ACTION RECOMMENDATIONS (GCAR)

Introduction

The GCAR process involves considering all relevant data in intensive and interactive discussion involving experts representing the various organized regions of the zoo world. The objectives are systematic decision-making (as a result of working through the GCAR process), captive program prioritization, initial selection of global species target population sizes and identification of regional distribution of each taxon. This is followed by determining which species/subspecies and the estimated number of individual animals that should be included in captivity globally (target population size).

Determining Global Target Populations Using CAPACITY 3

Target population sizes are computed using the program CAPACITY 3 (Ballou, 1992). Using the CAPACITY program, global target population sizes are determined to achieve the captive program goals recommended for a particular taxon. The CAMP and GCAR processes attempt to achieve a goal of maintaining 90% of the program's original founder's heterozygosity for 100 years. Other program parameters that are set and manipulated include:

1. generation length
2. annual growth rate of the population
3. size of the current captive population and effective population size
4. the estimated effective population size/total population size (Ne/N) ratio
5. percentage diversity retained to date
6. current year

General steps used for computing global target population numbers using Ballou's Capacity Program 3.0:

1. Calculate the N by assessing the total number of individuals in captivity (from the ISIS TAG report).
2. Estimate the generation length by determining the median between the earliest age of reproduction and oldest age for reproduction, adjusting for decreasing reproduction with increasing age, if applicable.
3. Determine the crude lambda value which is the projected growth rate of the population under ideal conditions. If no better data are available, lambda can be estimated as the crude rate of change (CRC) found in the ISIS TAG report. When the CRC value is less than 1.0, it is necessary to artificially increase lambda to 1.1.
4. Determine the Ne as the number of living breeders (LivBr) taken from the ISIS TAG report, unless more accurate data are available.
5. Calculate the Ne/N) by dividing the number of living breeders by the total number in captivity.
6. Consider 100% diversity at the onset of the program and the current year as 0 unless the population has been in captivity for a period of time and the loss of genetic diversity is known.

7. Using the above parameters, the target populations are computed for different program lengths (50, 100, 150, 200 years). All world target numbers are based on a 100 year management program with 90% retention of heterozygosity.
8. In some cases, it may be necessary to modify the variables of effective population size (i.e., the number of available animals may be too few to establish a viable program, and it will be necessary to plan to import new founders into the management program).
9. When more accurate information is available (from current international studbooks, for example), those data should be used in place of ISIS values.
10. It in imperative that all details involving the computation of global target populations are documented and included in the final GCAR report.

These steps are used to estimate global population size recommendations for each of the species/subspecies recommended for captivity and then entered into the spreadsheet (Table 3).

Regional Responsibilities

The last step of the GCAR is for individual regions to begin to define specific interest in each recommended species/subspecies, information that later will drive regional responsibilities (i.e., the development of Regional Collection Plans) to preserve an overall viable world populaiton. GCAR spreadsheets are constructed with columns for identification of regions currently holding the taxon and the number of specimens in captivity within that region (see Table 5; Section 4). This table will be completed as each region reviews this document.

Depending on the current captive population distribution and the global target recommendations for the taxon, regional populations targets can be set, or current targets revised, by each organized region of the zoo and aquarium community on the basis of global conservation need.

GLOBAL CAPTIVE ACTION RECOMMENDATIONS (GCAR) SPREADSHEET CATEGORIES

The Global Captive Action Recommendations (GCAR) spreadsheet is a working document that provides information to be used for assessing degree of threat and recommending conservation action. The first section of the spreadsheet summarizes information (gathered during this CAMP workshop) on wild population status and level of captive program recommended for each taxon. This information can be used to identify priorities for captive management action.

TAXON
SCIENTIFIC NAME: Scientific names of extant taxa: genus, species, subspecies.

WILD POPULATION
EST #: Estimated numbers of individuals in the wild. If specific numbers are unavailable, general range of the population size is estimated.

IUCN: Status according to draft IUCN Red List criteria.

EX = Extinct
EW = Extinct in the Wild
CR = Critical
EN = Endangered
VU = Vulnerable
CD = Conservation Dependent
LR = Lower Risk
DD = Data Deficient
NE = Not Evaluated

CAPTIVE PROGRAM RECOMMENDATIONS

Recommendation:	**Level of Captive Program:**
Level 1 (1)	A captive population is recommended as a component of a conservation program. This program has a tentative goal of developing and managing a population sufficient to preserve 90% of the genetic diversity of a population for 100 years (90%/100).
Level 2 (2)	Similar to 'Level 1' except a species/subspecies management plan includes periodic reinforcement of the captive population with new genetic material from the wild.

Level 3 (3)	A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies but is recommended for education, research, or husbandry.
No (N)	A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species or subspecies.
Pending (P)	A decision on a captive program will depend upon further data either from a PHVA, a survey or existing identified sources to be queried.

WORLD

The information entered into this section of the GCAR spreadsheet defines the current global captive population and will be used to calculate target populations for each taxon recommended for captive management.

N:	Size of the current captive population
Gen Lgth:	Generation length
Ne:	Effective population size
Lambda:	Annual growth rate of the population
Trg Pop:	Target population size computed using Ballou's CAPACITY program. This is the proposed number of individuals that must be maintained in captivity to achieve the level of captive program recommended for that taxon.

DISTRIBUTION OF CAPTIVE POPULATION

Loc:	Location of a captive population of a particular taxon. This can be one of the organized regions of the zoo and aquarium world, a region not represented by a formal zoo association or a specific country holding that taxon.
Pop:	The number of individuals of a particular taxon currently maintained in the specified region.

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APPENDIX IV

IUCN RED LIST CATEGORIES

Prepared by the

IUCN Species Survival Commission

As approved by the
40th Meeting of the IUCN Council
Gland, Switzerland

30 November 1994

IUCN RED LIST CATEGORIES

I) Introduction

1. The threatened species categories now used in Red Data Books and Red Lists have been in place, with some modification, for almost 30 years. Since their introduction these categories have become widely recognised internationally, and they are now used in a whole range of publications and listings, produced by IUCN as well as by numerous governmental and non-governmental organisations. The Red Data Book categories provide an easily and widely understood method for highlighting those species under higher extinction risk, so as to focus attention on conservation measures designed to protect them.

2. The need to revise the categories has been recognised for some time. In 1984, the SSC held a symposium, 'The Road to Extinction' (Fitter & Fitter 1987), which examined the issues in some detail, and at which a number of options were considered for the revised system. However, no single proposal resulted. The current phase of development began in 1989 with a request from the SSC Steering Committee to develop a new approach that would provide the conservation community with useful information for action planning.

In this document, proposals for new definitions for Red List categories are presented. The general aim of the new system is to provide an explicit, objective framework for the classification of species according to their extinction risk.

The revision has several specific aims:

- to provide a system that can be applied consistently by different people;
- to improve the objectivity by providing those using the criteria with clear guidance on how to evaluate different factors which affect risk of extinction;
- to provide a system which will facilitate comparisons across widely different taxa;
- to give people using threatened species lists a better understanding of how individual species were classified.

3. The proposals presented in this document result from a continuing process of drafting, consultation and validation. It was clear that the production of a large number of draft proposals led to some confusion, especially as each draft has been used for classifying some set of species for conservation purposes. To clarify matters, and to open the way for modifications as and when they became necessary, a system for version numbering was applied as follows:

Version 1.0: Mace & Lande (1991)
The first paper discussing a new basis for the categories, and presenting numerical criteria especially relevant for large vertebrates.

Version 2.0: Mace et al. (1992)
A major revision of Version 1.0, including numerical criteria appropriate to all organisms and introducing the non-threatened categories.

Version 2.1: IUCN (1993)

Following an extensive consultation process within SSC, a number of changes were made to the details of the criteria, and fuller explanation of basic principles was included. A more explicit structure clarified the significance of the non-threatened categories.

Version 2.2: Mace & Stuart (1994)

Following further comments received and additional validation exercises, some minor changes to the criteria were made. In addition, the Susceptible category present in Versions 2.0 and 2.1 was subsumed into the Vulnerable category. A precautionary application of the system was emphasised.

Final Version

This final document, which incorporates changes as a result of comments from IUCN members, was adopted by the IUCN Council in December 1994.

All future taxon lists including categorisations should be based on this version, and not the previous ones.

4. In the rest of this document the proposed system is outlined in several sections. The Preamble presents some basic information about the context and structure of the proposal, and the procedures that are to be followed in applying the definitions to species. This is followed by a section giving definitions of terms used. Finally the definitions are presented, followed by the quantitative criteria used for classification within the threatened categories. It is important for the effective functioning of the new system that all sections are read and understood, and the guidelines followed.

References:

Fitter, R., and M. Fitter, ed. (1987) The Road to Extinction. Gland, Switzerland: IUCN.

IUCN. (1993) Draft IUCN Red List Categories. Gland, Switzerland: IUCN.

Mace, G. M. et al. (1992) "The development of new criteria for listing species on the IUCN Red List." Species 19: 16-22.

Mace, G. M., and R. Lande. (1991) "Assessing extinction threats: toward a reevaluation of IUCN threatened species categories." Conserv. Biol. 5.2: 148-157.

Mace, G. M. & S. N. Stuart. (1994) "Draft IUCN Red List Categories, Version 2.2". Species 21-22: 13-24.

II) Preamble

The following points present important information on the use and interpretation of the categories (= Critically Endangered, Endangered, etc.), criteria (= A to E), and sub-criteria (= a,b etc., i,ii etc.):

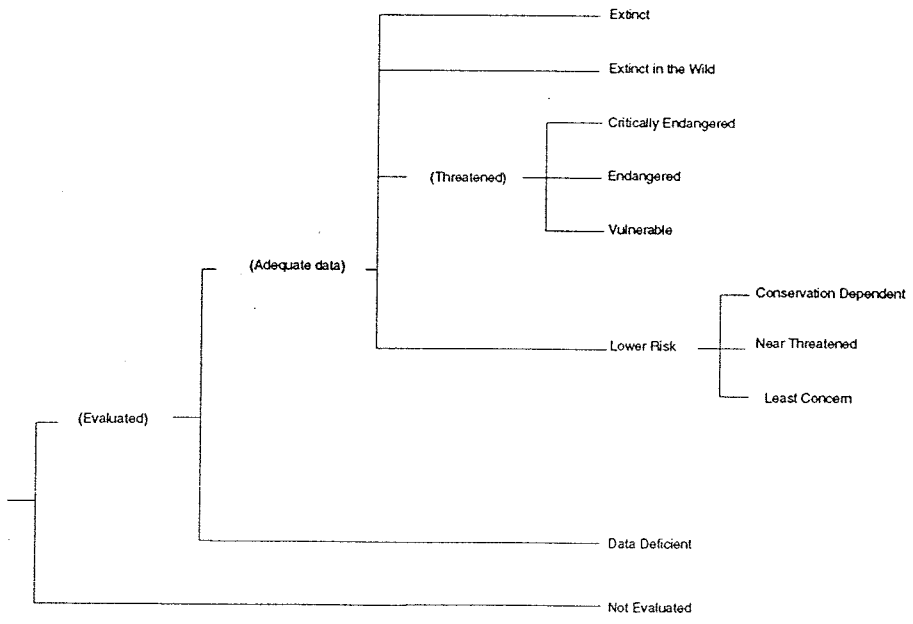
1. Taxonomic level and scope of the categorisation process

The criteria can be applied to any taxonomic unit at or below the species level. The term 'taxon' in the following notes, definitions and criteria is used for convenience, and may represent species or lower taxonomic levels, including forms that are not yet formally described. There is a sufficient range among the different criteria to enable the appropriate listing of taxa from the complete taxonomic spectrum, with the exception of micro-organisms. The criteria may also be applied within any specified geographical or political area although in such cases special notice should be taken of point 11 below. In presenting the results of applying the criteria, the taxonomic unit and area under consideration should be made explicit. The categorisation process should only be applied to wild populations inside their natural range, and to populations resulting from benign introductions (defined in the draft IUCN Guidelines for Re-introductions as "..an attempt to establish a species, for the purpose of conservation, outside its recorded distribution, but within an appropriate habitat and eco-geographical area").

2. Nature of the categories

All taxa listed as Critically Endangered qualify for Vulnerable and Endangered, and all listed as Endangered qualify for Vulnerable. Together these categories are described as 'threatened'. The threatened species categories form a part of the overall scheme. It will be possible to place all taxa into one of the categories (see Figure 1).

Figure 1: Structure of the Categories



3. Role of the different criteria

For listing as Critically Endangered, Endangered or Vulnerable there is a range of quantitative criteria; meeting any one of these criteria qualifies a taxon for listing at that level of threat. Each species should be evaluated against all the criteria. The different criteria (A-E) are derived from a wide review aimed at detecting risk factors across the broad range of organisms and the diverse life histories they exhibit. Even though some criteria will be inappropriate for certain taxa(some taxa will never qualify under these however close to extinction they come), there should be criteria appropriate for assessing threat levels for any taxon (other than micro-organisms). The relevant factor is whether any one criterion is met, not whether all are appropriate or all are met. Because it will never be clear which criteria are appropriate for a particular species in advance, each species should be evaluated against all the criteria, and any criterion met should be listed.

4. Derivation of quantitative criteria

The quantitative values presented in the various criteria associated with threatened categories were developed through wide consultation and they are set at what are generally judged to be appropriate levels, even if no formal justification for these values exists. The levels for different criteria within categories were set independently but against a common standard. Some broad consistency between them was sought. However, a given taxon should not be expected to meet all criteria (A-E) in a category; meeting any one criterion is sufficient for listing.

5. Implications of listing

Listing in the categories of Not Evaluated and Data Deficient indicates that no assessment of extinction risk has been made, though for different reasons. Until such time as an assessment is made, species listed in these categories should not be treated as if they were non-threatened, and it may be appropriate (especially for Data Deficient forms) to give them the same degree of protection as threatened taxa, at least until their status can be evaluated.

Extinction is assumed here to be a chance process. Thus, a listing in a higher extinction risk category implies a higher expectation of extinction, and over the time-frames specified more taxa listed in a higher category are expected to go extinct than in a lower one (without effective conservation action). However, the persistence of some taxa in high risk categories does not necessarily mean their initial assessment was inaccurate.

6. Data quality and the importance of inference and projection

The criteria are clearly quantitative in nature. However, the absence of high quality data should not deter attempts at applying the criteria, as methods involving estimation, inference and projection are emphasised to be acceptable throughout. Inference and projection may be based on extrapolation of current or potential threats into the future (including their rate of change), or of factors related to population abundance or distribution (including dependence on other taxa), so long as these can reasonably be supported. Suspected or inferred patterns in either the recent past, present or near future can be based on any of a series of related factors, and these factors should be specified.

Taxa at risk from threats posed by future events of low probability but with severe consequences (catastrophes) should be identified by the criteria (e.g. small distributions, few locations). Some threats need to be identified particularly early, and appropriate actions taken, because their effects are irreversible, or nearly so (pathogens, invasive organisms, hybridization).

7. Uncertainty

The criteria should be applied on the basis of the available evidence on taxon numbers, trend and distribution, making due allowance for statistical and other uncertainties. Given that data are rarely available for the whole range or population of a taxon, it may often be appropriate to use the

information that is available to make intelligent inferences about the overall status of the taxon in question. In cases where a wide variation in estimates is found, it is legitimate to apply the precautionary principle and use the estimate (providing it is credible) that leads to listing in the category of highest risk.

Where data are insufficient to assign a category (including Lower Risk), the category of 'Data Deficient' may be assigned. However, it is important to recognise that this category indicates that data are inadequate to determine the degree of threat faced by a taxon, not necessarily that the taxon is poorly known. In cases where there are evident threats to a taxon through, for example, deterioration of its only known habitat, it is important to attempt threatened listing, even though there may be little direct information on the biological status of the taxon itself. The category 'Data Deficient' is not a threatened category, although it indicates a need to obtain more information on a taxon to determine the appropriate listing.

8. Conservation actions in the listing process

The criteria for the threatened categories are to be applied to a taxon whatever the level of conservation action affecting it. In cases where it is only conservation action that prevents the taxon from meeting the threatened criteria, the designation of 'Conservation Dependent' is appropriate. It is important to emphasise here that a taxon require conservation action even if it is not listed as threatened.

9. Documentation

All taxon lists including categorisation resulting from these criteria should state the criteria and sub-criteria that were met. No listing can be accepted as valid unless at least one criterion is given. If more than one criterion or sub-criterion was met, then each should be listed. However, failure to mention a criterion should not necessarily imply that it was not met. Therefore, if a re-evaluation indicates that the documented criterion is no longer met, this should not result in automatic down-listing. Instead, the taxon should be re-evaluated with respect to all criteria to indicate its status. The factors responsible for triggering the criteria, especially where inference and projection are used, should at least be logged by the evaluator, even if they cannot be included in published lists.

10. Threats and priorities

The category of threat is not necessarily sufficient to determine priorities for conservation action. The category of threat simply provides an assessment of the likelihood of extinction under current circumstances, whereas a system for assessing priorities for action will include numerous other factors concerning conservation action such as costs, logistics, chances of success, and even perhaps the taxonomic distinctiveness of the subject.

11. Use at regional level

The criteria are most appropriately applied to whole taxa at a global scale, rather than to those units defined by regional or national boundaries. Regionally or nationally based threat categories, which are aimed at including taxa that are threatened at regional or national levels (but not necessarily throughout their global ranges), are best used with two key pieces of information: the global status category for the taxon, and the proportion of the global population or range that occurs within the region or nation. However, if applied at regional or national level it must be recognised that a global category of threat may not be the same as a regional or national category for a particular taxon. For example, taxa classified as Vulnerable on the basis of their global declines in numbers or range might be Lower Risk within a particular region where their populations are stable. Conversely, taxa classified as Lower Risk globally might be Critically Endangered within a particular region where numbers are very small or declining, perhaps only because they are at the margins of their global range. IUCN is still in the process of developing guidelines for the use of national red list categories.

12. **Re-evaluation**

Evaluation of taxa against the criteria should be carried out at appropriate intervals. This is especially important for taxa listed under Near Threatened, or Conservation Dependent, and for threatened species whose status is known or suspected to be deteriorating.

13. **Transfer between categories**

There are rules to govern the movement of taxa between categories. These are as follows: (A) A taxon may be moved from a category of higher threat to a category of lower threat if none of the criteria of the higher category has been met for 5 years or more. (B) If the original classification is found to have been erroneous, the taxon may be transferred to the appropriate category or removed from the threatened categories altogether, without delay (but see Section 9). (C) Transfer from categories of lower to higher risk should be made without delay.

14. **Problems of scale**

Classification based on the sizes of geographic ranges or the patterns of habitat occupancy is complicated by problems of spatial scale. The finer the scale at which the distributions or habitats of taxa are mapped, the smaller will be the area that they are found to occupy. Mapping at finer scales reveals more areas in which the taxon is unrecorded. It is impossible to provide any strict but general rules for mapping taxa or habitats; the most appropriate scale will depend on the taxa in question, and the origin and comprehensiveness of the distributional data. However, the thresholds for some criteria (e.g. Critically Endangered) necessitate mapping at a fine scale.

III) Definitions

1. Population

Population is defined as the total number of individuals of the taxon. For functional reasons, primarily owing to differences between life-forms, population numbers are expressed as numbers of mature individuals only. In the case of taxa obligately dependent on other taxa for all or part of their life cycles, biologically appropriate values for the host taxon should be used.

2. Subpopulations

Subpopulations are defined as geographically or otherwise distinct groups in the population between which there is little exchange (typically one successful migrant individual or gamete per year or less).

3. Mature individuals

The number of mature individuals is defined as the number of individuals known, estimated or inferred to be capable of reproduction. When estimating this quantity the following points should be borne in mind:

- Where the population is characterised by natural fluctuations the minimum number should be used.

- This measure is intended to count individuals capable of reproduction and should therefore exclude individuals that are environmentally, behaviourally or otherwise reproductively suppressed in the wild.

- In the case of populations with biased adult or breeding sex ratios it is appropriate to use lower estimates for the number of mature individuals which take this into account (e.g. the estimated effective population size).

- Reproducing units within a clone should be counted as individuals, except where such units are unable to survive alone (e.g. corals).

- In the case of taxa that naturally lose all or a subset of mature individuals at some point in their life cycle, the estimate should be made at the appropriate time, when mature individuals are available for breeding.

4. Generation

Generation may be measured as the average age of parents in the population. This is greater than the age at first breeding, except in taxa where individuals breed only once.

5. Continuing decline

A continuing decline is a recent, current or projected future decline whose causes are not known or not adequately controlled and so is liable to continue unless remedial measures are taken. Natural fluctuations will not normally count as a continuing decline, but an observed decline should not be considered to be part of a natural fluctuation unless there is evidence for this.

6. Reduction

A reduction (criterion A) is a decline in the number of mature individuals of at least the amount (%) stated over the time period (years) specified, although the decline need not still be continuing. A reduction should not be interpreted as part of a natural fluctuation unless there is good evidence for this. Downward trends that are part of natural fluctuations will not normally count as a reduction.

7. Extreme fluctuations

Extreme fluctuations occur in a number of taxa where population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude (i.e., a tenfold increase or decrease).

8. **Severely fragmented**

Severely fragmented is refers to the situation where increased extinction risks to the taxon result from the fact that most individuals within a taxon are found in small and relatively isolated subpopulations. These small subpopulations may go extinct, with a reduced probability of recolonisation.

9. **Extent of occurrence**

Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (e.g., large areas of obviously unsuitable habitat) (but see 'area of occupancy'). Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

10. **Area of occupancy**

Area of occupancy is defined as the area within its 'extent of occurrence' (see definition) which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats. The area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon (e.g. colonial nesting sites, feeding sites for migratory taxa). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon. The criteria include values in km^2, and thus to avoid errors in classification, the area of occupancy should be measured on grid squares (or equivalents) which are sufficiently small (see Figure 2).

11. **Location**

Location defines a geographically or ecologically distinct area in which a single event (e.g. pollution) will soon affect all individuals of the taxon present. A location usually, but not always, contains all or part of a subpopulation of the taxon, and is typically a small proportion of the taxon's total distribution.

12. **Quantitative analysis**

A quantitative analysis is defined here as the technique of population viability analysis (PVA), or any other quantitative form of analysis, which estimates the extinction probability of a taxon or population based on the known life history and specified management or non-management options. In presenting the results of quantitative analyses the structural equations and the data should be explicit.

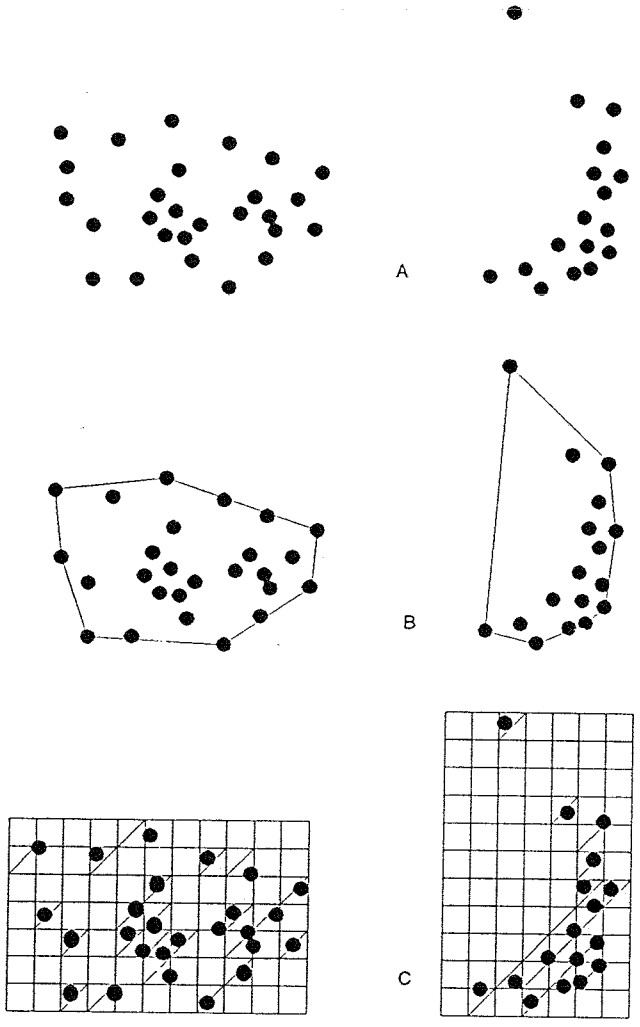


Figure 2:

Two examples of the distinction between extent of occurrence and area of occupancy. (a) is the spatial distribution of known, inferred or projected sites of occurrence. (b) shows one possible boundary to the extent of occurrence, which is the measured area within this boundary. (c) shows one measure of area of occupancy which can be measured by the sum of the occupied grid squares.

IV) The categories [1]

EXTINCT (EX)
A taxon is Extinct when there is no reasonable doubt that the last individual has died.

EXTINCT IN THE WILD (EW)
A taxon is Extinct in the wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria (A to E) on pages 12 and 13.

ENDANGERED (EN)
A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the criteria (A to E) on pages 14 and 15.

VULNERABLE (VU)
A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the criteria (A to D) on pages 16 and 17.

LOWER RISK (LR)
A taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:

1. **Conservation Dependent (cd).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.

2. **Near Threatened (nt).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.

3. **Least Concern (lc).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future

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[1] Note: As in previous IUCN categories, the abbreviation of each category (in parenthesis) follows the English denominations when translated into other languages.

research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE)

A taxon is Not Evaluated when it is has not yet been assessed against the criteria.

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V) The Criteria for Critically Endangered, Endangered and Vulnerable

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 80% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

a) direct observation
b) an index of abundance appropriate for the taxon
c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
d) actual or potential levels of exploitation
e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 80%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 100 km^2 or area of occupancy estimated to be less than 10 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at only a single location.

2) Continuing decline, observed, inferred or projected, in any of the following:

a) extent of occurrence
b) area of occupancy
c) area, extent and/or quality of habitat
d) number of locations or subpopulations
e) number of mature individuals.

3) Extreme fluctuations in any of the following:

a) extent of occurrence
b) area of occupancy
c) number of locations or subpopulations
d) number of mature individuals.

C) Population estimated to number less than 250 mature individuals and either:

1) An estimated continuing decline of at least 25% within 3 years or one generation, whichever is longer or

2) A continuing decline, observed, projected, or inferred, in numbers of mature

individuals and population structure in the form of either:

a) severely fragmented (i.e. no subpopulation estimated to contain more than 50 mature individuals)
b) all individuals are in a single subpopulation.

D) Population estimated to number less than 50 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or 3 generations, whichever is the longer.

ENDANGERED (EN)

A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 50% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

a) direct observation
b) an index of abundance appropriate for the taxon
c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
d) actual or potential levels of exploitation
e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 50%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d), or (e) above.

B) Extent of occurrence estimated to be less than 5000 km^2 or area of occupancy estimated to be less than 500 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at no more than five locations.

2) Continuing decline, inferred, observed or projected, in any of the following:

a) extent of occurrence
b) area of occupancy
c) area, extent and/or quality of habitat
d) number of locations or subpopulations
e) number of mature individuals.

3) Extreme fluctuations in any of the following:

a) extent of occurrence
b) area of occupancy
c) number of locations or subpopulations
d) number of mature individuals.

C) Population estimated to number less than 2500 mature individuals and either:

1) An estimated continuing decline of at least 20% within 5 years or 2 generations, whichever is longer, or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

a) severely fragmented (i.e. no subpopulation estimated to contain more than 250

mature individuals)
b) all individuals are in a single subpopulation.

D) Population estimated to number less than 250 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or 5 generations, whichever is the longer.

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VULNERABLE (VU)

A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer,, based on (and specifying) any of the following:

a) direct observation
b) an index of abundance appropriate for the taxon
c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
d) actual or potential levels of exploitation
e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 20%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 20,000 km^2 or area of occupancy estimated to be less than 2000 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at no more than ten locations.

2) Continuing decline, inferred, observed or projected, in any of the following:

a) extent of occurrence
b) area of occupancy
c) area, extent and/or quality of habitat
d) number of locations or subpopulations
e) number of mature individuals.

3) Extreme fluctuations in any of the following:

a) extent of occurrence
b) area of occupancy
c) number of locations or subpopulations
d) number of mature individuals.

C) Population estimated to number less than 10,000 mature individuals and either:

1) An estimated continuing decline of at least 10% within 10 years or 3 generations, whichever is longer, or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

a) severely fragmented (i.e. no subpopulation estimated to contain more than 1000 mature individuals)
b) all individuals are in a single subpopulation.

D) Population very small or restricted in the form of either of the following:

1) Population estimated to number less than 1000 mature individuals.

2) Population is characterised by an acute restriction in its area of occupancy (typically less than 100 km^2) or in the number of locations (typically less than 5). Such a taxon would thus be prone to the effects of human activities (or stochastic events whose impact is increased by human activities) within a very short period of time in an unforeseeable future, and is thus capable of becoming Critically Endangered or even Extinct in a very short period.

E) Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.