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Conserving Herons

A Conservation Action Plan for the Herons of the World

James A. Kushlan

TOUR DU VALAT

Conserving Herons
is dedicated to the memory of
Heinz Hafner and of James Hancock.

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Executive summary

Conserving Herons is the conservation action plan for the herons of the world. It is a product of the Heron Specialist Group and is the third version of such a planning tool, appearing ten years after the first. The Plan sets forth strategic principles for heron conservation, which focus on conservation of populations, habitat, sites, and flyways outlining specific global and regional conservation projects.

Agami Heron

This edition of the plan assesses the conservation status of 62 extant species and 259 populations. Assessing conservation status of species is a cooperative venture among the Heron Specialist Group, the

waterbird population estimates program of the Ramsar Convention Bureau and Wetlands International and the species conservation assessment program of the World Conservation Union (IUCN) and BirdLife International. Nine species and 12% of heron populations are assessed as being under threat. Four recent populations are thought now to be extinct. Overall, habitat degradation is the most important threat to herons, and the plan identifies the characteristic habitat for herons of conservation interest. The Plan recognizes the criticality of protecting important sites for herons and endorses sites also identified as Wetlands of International Importance by the Ramsar Bureau and as Important Bird Areas by BirdLife International. As most heron species migrate or otherwise move seasonally, some inter-continentally, the plan identifies flyway conservation as being an important tool in heron conservation.

Partnerships are the principal means of moving heron conservation forward. In addition to the planning and assessment partnerships noted above, the Plan recognizes that heron conservation often can best proceed as part of more-encompassing conservation programs, such as flyway and migratory species initiatives, wetland and coastal conservation programs, continental, regional and national bird conservation initiatives, protected areas conservation, biodiversity conservation, and local conservation actions. The latter are the most critical, as heron conservation ultimately depends on site and habitat conservation, which are primarily local matters. The sustainable use of habitats by both people and herons managed at the local level is considered to be the ultimate key to heron conservation.

Herons are overall an adaptable group of birds, most of which have been able to co-exist with humans over much of their natural ranges. Most heron populations are not facing immediate threat. Those that are at conservation risk, for the most part, are facing crises in habitat, which can be addressed through specific actions that support herons or through participation in more-encompassing habitat and ecosystem conservation programs. That people and herons have proven over and over again that they can live in harmony is the best hope for the long-term future of this group of birds.

Black Heron

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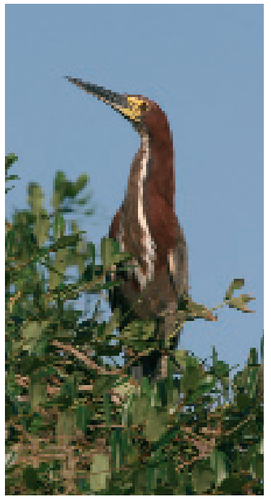
Introduction

Little Blue Heron

Conserving Herons **is the action plan for the conservation of the herons of the world. It assesses the conservation status of over 250 populations of herons around the world, suggests a conservation strategy, and summarizes specific conservation projects needed to effect the conservation of the herons around, It is the third version of such a plan (the earlier reports being Hafner et al. 1996 and Hafner and Kushlan 2002). Input is welcome for future versions. It is fundamentally based on two major syntheses of the conservation needs and biology of the herons of the world (Kushlan and Hafner 2000, Kushlan and Hancock 2005) as well as subsequent information from many sources. These two books should be consulted for detailed information and supporting documentation, which are not repeated in the present report.**

Conserving Herons is a contribution of the Heron Specialist Group. This Group was founded over 20 years ago by Heinz Hafner and James Kushlan (for its history see Hafner *et al.* 1986, Hafner and Kushlan 1990, 1996, Kushlan and Hafner 1991, 1993). The Heron Specialist Group is an association of individuals and institutions committed to the conservation of herons. Its sole purpose is heron conservation. It is recognized as the lead worldwide partnership for the conservation of herons by the International Conservation Union (IUCN) and Wetlands International. The Group serves principally as a communication linkage among its over 200 members.

Conserving Herons concerns heron species and population – 62 presently-recognized extant species of the avian family Ardeidae and 259 populations that have been delineated for conservation purposes. Although fundamentally a tropical taxon, herons are well distributed over much of the globe, from the tropics to the far reaches of the temperate zones and even into the sub arctic. Many species are large, visible, human-habitat oriented and, therefore, well known. Others are small, cryptic and retiring and, therefore, little appreciated. Some have large, nearly cosmopolitan, ranges. Others are now restricted, as far as is known, to a few struggling and increasingly isolated individuals. Heron populations often occur within human dominated landscapes. Some have come to depend on human activity for their well-being. Herons have shown themselves to be adaptable. Most populations are not in immediate threat. Some are, however, and these require immediate conservation action.



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Left: Rufescent Tiger Heron
Right: Purple Heron

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Black-crowned Night Heron

Not since the 1800's, when heron populations were decimated in many places in the world because of the plume trade, have herons faced such critical pressures as they do today. Some species and populations are balanced on the verge of extinction; a few may no longer be salvageable. Among these are the nine species and 31 populations currently assessed as being at risk. Four populations have already gone extinct in historic times. It is hoped that Conserving Herons will encourage conservation action for the most threatened of the herons, habitats, and important places. Action on behalf of less threatened species is also needed, to keep common herons common, as are global and continental initiatives to organize conservation, manage data bases, and maintain communication linkages. Conservation action on behalf of habitats herons use, especially natural and artificial wetlands, is needed almost everywhere.

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Grey Heron

Conservation strategy

Herons comprise a natural taxonomic group of species found around the world, with the greatest diversity being in the tropics. Herons are for the most part relatively large, readily noticed, and well appreciated by most local cultures and societies.

They are obvious large predators where they occur, and so interact with prey also of interest to humans. While typically birds of wetlands and seacoasts, they also use other habitats. Many herons have been able to accommodate to their landscape being usurped and altered by humans. Some populations have become dependent on these human- altered and human-managed landscapes. Conservation of habitats and sites and linkages among sites are the best single approach to heron conservation. However, basic information on status, trends, dispersion, movements, year-round habitat

requirements, important sites, and survival are lacking for many species. However appreciated herons are by people, few active conservation programs likely will be undertaken on their behalf alone. Some such programs are critical, to prevent extinction. But in other cases, heron conservation can and should be included within broader conservation programs. These characteristics of herons and their conservation situation inform development of an overall strategy for organizing conservation action.

The global conservation strategy for herons recognizes the need for information, planning, communication, and actions. Actions involve populations, habitats, sites, flyways, and partnerships and are carried out at global, regional and local scales. It is within the framework presented by these strategic considerations, that global and regional conservation projects are set.

• Information: Much is known about herons and their conservation needs. These have been summarized in two volumes (Kushlan and Hafner 2000, Kushlan and Hancock 2005). However much is left to be discovered, in that for many populations the most basic, yet critical, information on numbers, trends, and dispersion is not available. Perhaps surprisingly, species limits are not even understood for some herons. For most of the over 250 populations of conservation interest, sub-specific studies have not been done or are conflicting in their findings. So herons are a family of birds that requires much additional research of evolutionary relationships using molecular techniques in order to better define populations from a conservation perspective. Although some species are very well known, mostly those from North America and Europe, others, in fact the majority, are much more poorly understood and in some case nearly unstudied. Research is needed to produce new information required for conservation. Even very basic studies of habitat requirements, population status, movements, and demography are valuable to conservation. The Plan encourages the research and monitoring necessary to support heron conservation.

• Planning: The Heron Specialist Group, through its conservation plans, systematizes approaches and priorities to heron conservation action. Priority is given to global actions and local and regional actions for populations under threat. Projects are described that address the principal factors adversely affecting these at risk populations. Within the general overall framework and priority projects, heron conservationists and committed organizations work at their own scales and in their own ways to further the overall goal of heron conservation.

Great Egret

• Communication: Heron specialists and conservation-oriented organizations are scattered around the world, but their goals, interests, tools, and problems have much in common. Communication is the key to encouraging standardization of techniques, focusing activities, and sharing results. The Heron Specialist Group is a network for communication among heron specialists. The conservation plan, reports, scientific papers and books, web site, and periodic meetings are mechanisms for accomplishing communication exchange. Similarly important is communication with other conservationists, nongovernmental organizations, governments, and the public.

• Population: Conservation actions on behalf of heron populations are informed by the assessments of population conservation status, which provide ratings of threat, population estimates, and population threshold values. By far, most of the conservation projects identified in this plan are based on the needs of specific populations.

• Habitat: Conservation actions on behalf of heron habitat focus especially on those habitats used by the most threatened populations of herons. There are a few cases where direct interventions in habitat conservation on behalf of herons are required. However, for both herons at risk and other populations, conservation of habitat in most cases should be part of more-encompassing conservation planning and habitat conservation programs. Herons are part of the ecosystems – natural and man made – that support them. It is these ecosystems that must be conserved.

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Cattle Egret

• Sites: Conservation actions on behalf of sites of importance to herons are carried out in large part, although not entirely, through the programs for identifying Wetlands of International Importance and Important Bird Areas, many of which include important heron sites. Thus heron conservation is done within conservation partnerships with the Ramsar Bureau, BirdLife International, national and regional authorities and local site champions. Heron sites are networked through communication linkages.

• Flyways: Conservation actions within heron flyways are carried on in concert with more encompassing flyway programs. Herons for the most part follow the migratory pathways used by other waterbirds and so flyway conservation that encompasses other waterbirds benefits herons as well.

• Partnerships: Heron conservation is inherently a partnership activity. In only a few cases will it be possible or even desirable to launch focused heron conservation action programs, although in those few cases these are essential. Effective heron conservation is carried out as part of more encompassing programs, such as biodiversity protection, flyway initiatives, wetland and coastal

conservation programs, continental and national bird conservation initiatives, protected areas conservation, and local conservation initiatives. Partnerships with governments are critically important, and these need to be encouraged to adopt national, regional and local policies favoring heron conservation.

• Global: Some activities are required at a global scale, such as managing planning, communication, and information exchange. The Heron Specialist Group and its sponsors organize and encourage these global activities.

• Regional: Populations are defined in large part by their local distributions. Regional approaches to conservation can effectively focus on local populations in need by targeting the specific issues facing them as understood by local experts. The Plan is organized around projects that are identified on regional bases. Most of these projects are complex and need to be undertaken by networks and partnerships of individuals, organizations, and governments.

• Local: While the Plan is global and regional in its scope, it is not overlooked that all real conservation action is local. It is the local communities who live with herons, local organizations that undertake specific conservation action, and local sites that need to be protected. Sharing information on the importance and methods of heron conservation with individuals, institutions, local authorities, and local educational institutions is needed. Environmental education programs are central to effective local action, and herons have been shown to be useful in conveying a variety of locally focused conservation messages. The use of herons in local environmental education is encouraged. Activities of local communities of people who live with herons are recognized as central elements of heron conservation.

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Capped Heron

Conservation approaches

Population Conservation

The Heron Specialist Group assesses the conservation status of populations of herons, which are delineated for conservation purposes both taxonomically and geographically.

The results of the current (2007) assessment is shown in Table 1. This table provides a fundamental organizing framework for the conservation of heron populations. It reflects the results

Rufous Night Heron

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of collaboration among the Heron Specialist Group, Wetlands International/Ramsar Bureau, and BirdLife International/ IUCN. Taxonomy and English names for species are consistent with Kushlan and Hancock (2005) and Delany and Scott (2006) (although not BirdLife (2004)). The order of listing of populations, population estimates, and 1% conservation threshold values are consistent with Delany and Scott (2006). Conservation status of species at risk (shown in bold font) is consistent with the IUCN RedList assessment (BirdLife International 2004, IUCN 2006). Bold entries in the population status column represent subspecies considered by BirdLife (2004) to be full species. Kushlan and Hafner (2000), BirdLife International (2004), IUCN (2006), Kushlan and Hancock (2005), and Delaney and Scott (2006) should be consulted for background and references to the taxonomic decisions and conservation assessments shown in this table.

Three species and one subspecies of herons in this list are likely extinct. These are all island forms which were adversely affected by the impact of human colonization. Nine species are endangered: Malagasy Heron, White-bellied Heron, Slaty Egret, Chinese Egret, Malagasy Pond Heron, White-eared Night Heron, Japanese Night Heron, Australasian Bittern, and New Guinea Tiger Heron. All of the most threatened species occur in the Eastern Hemisphere, none in the Western. Two species are from Madagascar. The night herons and tiger herons are species of tropical forests. Given the level of risk, specific conservation actions plans and programs are required for each of these species. Additional information on the biology and conservation of each heron species may be found in Kushlan and Hafner (2000), Kushlan and Hancock (2005) and BirdLife (2004).

Conservation approaches

Some individual populations are of conservation concern. Of the 259 populations identified to be tracked for conservation, 31 are considered to be near threatened, vulnerable or endangered – about 12%. Few data on population size for any heron are exact, but many are sufficient to suggest an order of magnitude of the population. In some cases it is clear that populations are decreasing, even if quantitative data are unavailable. Overall, most populations at risk are island populations, and some are now exceptionally small. The 1% threshold is given for populations for which sufficient information on overall population size is available. These are the population levels that may qualify a site important to herons to become a Ramsar Wetlands of International Importance or a BirdLife Important Bird Area.

Little Egret

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Table 1. Species and populations of herons showing species conservation status (SCS), distribution, population conservation status (PCS), 1% conservation population threshold, and population estimate.

English Name	Scientific Name	SCS	Population	Range	PCS	1%	Population
Grey Heron	*Ardea cinerea*	LC	*A.c.cinerea*	SubSahara Africa	LC	10000	
			A.c.cinerea	W. Europe, NW Africa	LC	2700	290000-340000
			A.c.cinerea	C & E Europe	LC	2200	189000-256000
			A.c.cinerea	C, SW Asia	LC		
			A.c.cinerea	S Asia	LC	1000	100000
			A.c.jouyi	East Asia	LC	10000	
			A.c.jouyi	Sumatra	VU	15	1000-2000
			A.c.monicae	Mauritania	VU	100	7500-12500
			A.c.firasa	Madagascar, Seychelles	EN	50	5000
Great Blue Heron	*Ardea herodias*	LC	*A.h.herodias*	N, C America	LC		124500
			A.h.herodias	W North America	LC		(in above)
			A.h.herodias	N Mexico	LC		(in above)
			A.h.herodias	Baja Mexico	LC		
			A.h.fannini	Alaska, W Canada	LC	65	6500
			A.h.wardi	North America	LC		
			A.h.occidentalis	Florida, Caribbean	VU		1500
			A.h.occidentalis	Caribbean	VU		
			A.h.occidentalis	C America	VU		
			A.h.cognata	Galapagos	LC		
Cocoi Heron	*Ardea cocoi*	LC		South America	LC	10000	
White-necked Heron	*Ardea pacifica*	LC		Australia, Oceania	LC	1000	
Great Egret	*Ardea alba*	LC	*A.a.alba*	Europe,	VU	470	38000-54000
			A.a.alba	SW Asia	LC	1000	
			A.a.melanorhynchos	Tropical Africa	LC	3000	100000-500000
			A.a.egretta	N America,	LC	2700	270000
			A.a.egretta	Mexico	LC		
			A.a.egretta	Central America	LC		
			A.a.egretta	Caribbean	LC		
			A.a.egretta	South America	LC		
Eastern Great Egret	*Ardea modesta*			S Asia (nb)	LC	1000	
				E. Asia (nb)	LC	1000	
				Indonesia	LC		
				Australia	LC	1000	
				New Zealand	VU	1	100
Intermediate Egret	*Ardea intermedia*	LC	*A.i.intermedia*	S Asia	LC	1000	
			A.i.intermedia	E, SE Asia, C Japan, Indonesia	LC	1000	
				Indonesia	LC		
			A.i.brachyrhyncha	SubSahara Africa	LC	1000	
			A.i.plumifera	E Indonesia, New Guinea, Australia	LC	10000	
Black-headed Heron	*Ardea melanocephala*	LC		Africa	LC	3000	100000-500000
Malagasy Heron	*Ardea humbloti*	EN		Madagascar	EN	20	1000-3000
White-bellied Heron	*Ardea insignis*	EN		SE Asia	CE	6	250-1000
Sumatran Heron	*Ardea sumatrana*	LC		SE Asia	LC	1000	
				Australia	VU	75	7500
Goliath Heron	*Ardea goliath*	LC		SubSahara Africa	LC	1000	
				SW Asia	EN	1	50
Purple Heron	*Ardea purpurea*	LC	*A.p.purpurea*	Tropical Africa	LC	880	75000-100000
			A.p.purpurea	SW, NW Europe, NW Africa	LC	120	11500-12100
			A.p.purpurea	C, E Europe, Mediterranean	LC	2200	13500-300000
			A.p.purpurea	SW Asia (br)	LC	250	
			A.p.madagascariensis	Madagascar	VU	75	5000-10000
			A.p.bournei	Cape Verde Is.	EN	1	<50
			A.p.manilensis	S Asia	LC	250	25000
			A.p.manilensis	SE, E Asia	LC	1000	
Cattle Egret	*Ardea ibis*	LC	*A.i.ibis*	S. Africa	LC	10000	
				Tropical Africa	LC		
				NW Africa	LC	1300	100000-150000
				SW Europe	LC	2800	250000-310000
				E Mediterranean, SW	LC	1000	
				Asia	LC		
				N America (USA, Canada)	LC		750000-1500000
				Mexico	LC		
				C America	LC		
				Caribbean	LC		
				S America	LC		
			A.i.seychellarum	Seychelles	LC	100	
			A.i.coromandus	S Asia	LC		
				E, SE Asia	LC	10000	
				Australia, New Zealand, New Guinea	LC	10000	100000
Green Heron	*Butorides virescens*	LC	*Butorides virescens*	C, E North America	LC		
			Butorides virescens	Mexico	LC		
			Butorides virescens	Central America	LC		
			Butorides virescens	Caribbean	LC		
			Butorides virescens	Bermuda	VU	1	30
			B.v.bahamensis	Bahamas	LC		
			B.v.anthonyi	W N America, N Baja California	LC		
			B.v.frazari	S Baja California	LC		
Striated Heron	*Butorides striata*	LC	*B.s.striata*	C America (Panama), N South America	LC		
			B.s.striata	C South America	LC		
			B.s.striata	Bolivia	LC		
			B.s.sundevalli	Galapagos	LC		
			B.s.brevipes	E Africa, SW Asia	LC	250	
			B.s.atricapilla	SubSahara Africa	LC	10000	
			B.s.rutenbergi	Madagascar	LC	250	
			B.s.rhizophorae	Comoro Islands	LC	100	
			B.s.craufordi	Aldabra, Amirante	LC	50	5000
			B.s.degens	Seychelles	LC	100	
			B.s.albolimbata	Chagos Islands, Maldives, Diego Garcia	VU	100	
			B.s.chloriceps	India	LC	250	25000
			B.s.spodiogaster	W. Sumatra, Andaman, Nicobar	LC		
			B.s.amurensis	NE China, SE Russia, Korea, Japan, Ryukyu, Bonin, Taiwan, S China	LC		
			B.s.actophila	S. China, N Indonesia, N Myanmar	LC		
			B.s.javanica	W Indonesia, Indian Ocean, Myanmar, Thailand	LC	1000	
			B.s.moluccara	Moluccas	LC		
			B.s.moluccara	NW New Guinea, Aru	LC		
			B.s.solomonensis	New Ireland, Solomon Islands, Vanuatu, W Fiji	LC	250	
			B.s.idenburgi	W Papua	LC		
			B.s.flyensis	S New Guinea	LC		
			B.s.stagnatilis	N Australia	LC		
			B.s.stagnatilis	NW Australia	LC		
			B.s.stagnatilis	NE Western Australia	LC		
			B.s.patruelis	Tahiti, Society	LC	2	100-200
			B.s.macrorhyncha	E Australia	LC		
			B.s.macrorhyncha	SC New Guinea, NE Queensland	LC		
			B.s. carcinophila	Taiwan, Philippines, Sulawesi	LC		
			B.s steini	Lesser Sundras, Indonesia	LC		
Squacco Heron	*Ardeola ralloides*	LC	*A.r.ralloides*	SW Europe, NW Africa	LC	40	2700-5600
			A.r.ralloides	C, E Europe, E Mediterranean	LC	600	24000-76000
			A.r.ralloides	SW Asia	LC	1000	
			A.r.paludivaga	Sub Saharan Africa, Madagascar	LC	4500	300000-600000
Indian Pond Heron	*Ardeola grayii*	LC		SW Asia S Asia	LC	10000	
				Myanmar, Andaman, Nicobar	LC		
				Maldives	VU		
Chinese Pond Heron	*Ardeola bacchus*	LC		E, SE, S Asia	LC		
Javan Pond Heron	*Ardeola speciosa*	LC	*A.s.speciosa*	W C Indonesia, S Philippines	LC		
			A.s.continentalis	C Thailand, S Indochina	LC	1000	
Malagasy Pond Heron	*Ardeola idae*	EN		Madagascar, Aldabra, East Africa	EN	40	2000-6000
Rufous Bellied Heron	*Ardeola rufiventris*	LC		E & S Africa	LC	1000	
Reddish Egret	*Egretta rufescens*	LC	*E.r.rufescens*	S USA	VU	250	9000-15000
			E.r.rufescens	Mexico	VU	15	1500
			E.r.rufescens	Central America	VU	100	
			E.r.rufescens	Caribbean	VU	100	
			E.r.rufescens	N South America	VU	275	≤>2250-3000
			E.r.dickeyi	San Luis Island, W Mexico	VU		
Pied Heron	*Egretta picata*	LC		Oceania	LC	1000	
Slaty Egret	*Egretta vinaceigula*	VU		C Africa	VU	40	3000-5000
Black Heron	*Egretta ardesiaca*	LC		SubSahara Africa	LC	1000	
				Madagascar	NT		
Tricolored Heron	*Egretta tricolor*	LC	*E.t.tricolor*	N South America	LC		≤>180000
			E.t.ruficollis	USA	LC		293000
			E.t.ruficollis	Mexico	LC		>1500
			E.t.ruficollis	Central America	LC		
			E.t.ruficollis	Caribbean	LC		
White-faced Heron	*Egretta novaehollandiae*	LC	*E.n.novaehollandiae*	New Zealand, Australia, New Guinea, E Indonesia	LC		>5000
			E.n. parryi	NW Australia	LC		

English Name	Scientific Name	SCS	Population	Range	PCS	1%	Population
Little Blue Heron	*Egretta caerulea*	LC		N America	LC	2600	225000-300000
				Mexico	LC	1100	75000-150000
				Central America	LC		
				Caribbean	LC		
				South America	LC		>150000-285000
Snowy Egret	*Egretta thula*	LC	*E.t.thula*	Central and North America	LC	2100	215000
			E.t.brewsteri	W North America, Baja California	LC	10000	
			E.t.thula	Mexico	LC	1100	75000-150000
			E.t.thula	Central America	LC		
			E.t.thula	Caribbean	LC		
			E.t.thula	South America	LC		>390000-1170000
Little Egret	*Egretta garzetta*	LC	*E.g.garzetta*	Sub Sahara Africa	LC	3500	200000-500000
			E.g.garzetta	W Europe, NW Africa	LC	1300	200000-500000
			E.g.garzetta	C, E Europe	LC	580	44000-72400
			E.g.garzetta	Barbados	VU	1	30-60
			E.g.garzetta	W Asia	LC	1000	
			E.g.garzetta	S Asia	LC	1500	100000-200000
			E.g.garzetta	E SE Asia	LC	10000	
			E.g.nigripes	Java, New Guinea	LC		
			E.g.immaculata	Australia, New Zealand	LC	1000	
			E.g.gularis	W Africa	LC	1000	
			E.g.schistacea	NE Africa, Red Sea	LC	1000	
			E.g.schistacea	SW Asia	LC	170	17000
			E.g. dimorpha	Madagascar	LC	130	6000-20000
			E.g. dimorpha	Aldabra, Amirante	LC	60	3000-9000
			E.g. dimorpha	E Africa	LC	100	10000
Chinese Egret	*Egretta eulophotes*	VU		East Asia	VU	30	2600-3400
Eastern Reef Heron	*Egretta sacra*	LC	*E.s. sacra*	SE Asia, Andaman, Nicobar, China, Taiwan, Korea, Japan, Indonesia, Philippines	LC	10000	
			E.s albolineata	New Caledonia, Loyalty	LC	15	1000-2000
Whistling Heron	*Syrigma sibilatrix*	LC	*S.s.sibilatrix*	South America	LC		>750-1500
			S.s.fostersmithi	South America	LC		>5000-25000
Capped Heron	*Pilherodius pileatus*	LC		South America	LC		
Yellow-crowned Night Heron	*Nyctinassa violacea*	LC	*N.v.violacea*	North America	LC	1100	75000-150000
			N.v.violacea	Mexico, Central America	LC		
				Socorro, W Mexico	LC		
			N.v.calignis	Panama, W South America	LC	450	>40500-48000
			N.v.cayennensis	Colombia, NE, E Brazil,	LC		
			N.v.bancrofti	W Mexico TO El Salvador, West Indies	LC		
			N.v.pauper	Galapagos	LC		
Black-crowned Night Heron	*Nycticorax nycticorax*	LC	*N.n.nycticorax*	W Europe, NW Africa	LC	790	61000-97000
				C, E Europe, E. Mediterranean	LC	1200	92100-138000
				C Asia	LC	1000	
			N.n.nycticorax	SubSahara Africa, Madagascar	LC		
			N.n.nycticorax	S Asia	LC	12500	100000-150000
			N.n.nycticorax	E, SE Asia	LC	10000	
			N.n.nycticorax	North America	LC	11000	750090-150000
				Mexico	LC		
				Central America	LC		
				Caribbean	LC		
				South America	LC		>150000-750000
			N.n.obscurus	S South America	LC		
			N.n.falklandicus	Falklands-Malvinas	LC	80	5700-10800
Reunion Night Heron	*Nycticorax duboisi*	EX		Reunion	EX		
Mauritius Night Heron	*Nycticorax mauritianus*	EX		Mauritius	EX		
Rodrigues Night Heron	*Nycticorax megacephalus*	EX		Rodrigues	EX		
Rufous Night Heron	*Nycticorax caledonicus*	LC	*N.c.caledonicus*	New Caledonia	LC	30	2000-4000
			N.c.manillensis	Philippines, NE Borneo, Sulawesi	LC		
			N.c.pelewensis	Palau, Carolines	LC	100	
			N.c.mandibularis	Bismarck, Solomons	LC	1000	
			N.c.billi	Java, Australia, New Guinea	LC	10000	
White-backed Night Heron	*Nycticorax leuconotus*	LC		W Africa	LC	1000	
White-eared Night Heron	*Gorsachius magnificus*	EN		China	EN	6	250-1000
				Vietnam	EN		1

English Name	Scientific Name	SCS	Population	Range	PCS	1%	Population
Japanese Night Heron	*Gorsachius goisagi*	EN		S Japan; nb: Ryukyu, SE China, Philippines	EN	6	250-1000
Malayan Night Heron	*Gorsachius melanolophus*	LC	*G.m.melanolophus*	SW India	LC		
			G.m.melanolophus	Indochina, SW China	LC		
			G.m.melanolophus	Philippines	LC		
			G.m.melanolophus	Palauan, Philippines	LC	100	
			G.m.melanolophus	Nicobar	LC	100	
South American Bittern	*Botaurus pinnatus*	LC	*B.p.pinneatus*	Central America, N South America	LC		
			B.p.caribaeus	E. Mexico, Belize	LC		
North American Bittern	*Botaurus lentiginosus*	LC		North America	LC	20000	2980000
European Bittern	*Botaurus stellaris*	LC	*B.s.stellaris*	W Europe, NW Africa	LC	900	5850-6700
				C E Europe, E Mediterranean	LC		
				W C Asia (nb)	LC	1000	
				C Asia (nb)	LC		
				S, E Asia	LC	1000	
Australasian Bittern	*Botaurus poiciloptilus*	EN	*B.s.capensis*	S Africa	EN	50	5000
				Australia	VU		2500-10000
				Tasmania	VU		
				New Zealand	EN		580-725
				New Caledonia, Loyalty	EN		>50
Streaked Bittern	*Ixobrychus involucris*	LC		N South America	LC	10000	
				S South America	LC		
Least Bittern	*Ixobrychus exilis*	LC	*I.e.exilis*	N, C America, Caribbean	LC	1300	128000
			I.e.pullus	Sonora, NW Mexico	LC		
			I.e.bogotensis	Colombia	LC	5	150-750
			I.e.erythromelas	N South America to Paraguay	LC		
			I.e.peruvianus	C W Peru	LC		
Little Bittern	*Ixobrychus minutus*	LC	*I.m.minutus*	W Europe, NW Africa	VU	150	11900-17900
			I.m.minutus	C, E Europe, NE Africa	LC	2200	110000-325000
			I.m.minutus	W, SW Asia	LC	1000	
			I.m.minutus	S Asia	LC	250	
			I.m.payesii	SubSahara Africa	LC	1000	
			I.m.podiceps	Madagascar	VU	90	3000-15000
			I.m.dubius	SW, E Australia, New Guinea	LC	75	>7500
			I.m.novaezelandiae	Australasia	EX		
Yellow Bittern	*Ixobrychus sinensis*	LC		Seychelles	LC	3	<300
				S Asia	LC		
				E, SE Asia	LC	10000	
Schrenck's Bittern	*Ixobrychus eurhythmus*	LC		E, SE Asia	LC	250	
Cinnamon Bittern	*Ixobrychus cinnamomeus*	LC		S Asia	LC		
				SE Asia, Taiwan, S Japan	LC	1000	
Dwarf Bittern	*Ixobrychus sturmii*	LC		SubSahara Africa	LC	1000	
Black Bittern	*Ixobrychus flavicollis*	LC	*I.f.flavicollis*	S Asia	LC	1000	
			I.f.flavicollis	E, SE Asia	LC	1000	
			I.f.australis	Australia, New Guinea, Bismarck	VU	200	>20000
			I.f.australis	Timor	LC		
			I.f.australis	Runnell	LC	5	<500
			I.f.woodfordi	New Britain, New Ireland	LC	100	
			I.f.australis	Solomon	LC	100	
Zigzag Heron	*Zibrillus undulatus*	LC		South America	LC		
Bare-throated Tiger Heron	*Tigrisoma mexicanum*	LC	*T.m.mexicanum*	C & N\ South America	LC	100	10000
			T.m.mexicanum	Sonora, S. Mexico	LC		
Fasciated Tiger Heron	*Tigrisoma fasciatum*	LC	*T.f.fasciatum*	SE Brazil, NE Argentina	LC	100	
			T.f.salmoni	C. America, NW, W South America	LC		
			T.f.pallescens	NW Argentina	LC		
Rufescent Tiger Heron	*Tigrisoma lineatum*	LC	*T.l.lineatum*	SW Mexico, W Ecuador, N Bolivia, E Brazil	LC		
			T.l.marmoratum	C Bolivia, E Brazil, NE Argentina	LC		
New Guinea Tiger Heron	*Zonerodius heliosylus*	NT		New Guinea, New Britain	NT	100	
White-crested Tiger Heron	*Tigriornis leucolophus*	DD		W Africa	LC	1000	
Agami Heron	*Agamia agami*	LC		Central, South America	LC		
Boat-billed Heron	*Cochlearius cochlearius*	LC	*C.c.cochlearius*	E Panama, Guyana, Amazonia, NE Argentina	LC		
			C.c.zeledoni	W Central Mexico	LC		
			C.c.phillipsi	E Mexico, Belize	LC		
			C.c.ridgwayi	S Mexico, W Honduras, El Salvador	LC		
			C.c.panamensis	Costa Rica, Panama	LC		

Habitat Conservation

Overall, habitat protection is the most serious concern for the conservation of heron populations.

Herons use a variety of habitats, including many human-altered landscapes. Although some species are relatively terrestrial, using grasslands and forests, herons more typically use aquatic habitats, where they forage by wading in shallow water. Most species depend on shallow wetlands and on coastal environments – habitats that are under threat everywhere. Because herons are dependent on wetland function, their presence and population status can serve as biological indicators of habitat condition. Many heron populations are migratory, depending during the course of an annual cycle upon a succession of habitats and sites sometimes at great distances apart, even on different continents. The importance of protecting habitat is reflected in the goal to the identify and protect important sites for herons and of connecting these through flyway and communication networks. Conservation of wetlands and other heron habitats, including Important Bird Areas, depends in large part on local and regional social and economic factors. It is local communities, organizations, and governments that must be committed to the sustainable use of their environment. So local action and local initiative are essential to conserve habitat of the world's herons. As an adaptable family of birds, herons can live in harmony with people provided the habitat used by both herons and people is properly maintained.

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Cattle Egrets

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Heron Nesting Colony on an Island

Characteristic habitats used by herons of conservation concern are shown in Table 2.

Habitats where herons occur are often at risk. Nesting sites particularly need to be inventoried and protected. Feeding and roosting sites used while nesting, on migration, and during non-nesting seasons also need to be identified and protected. There are occasions where populations are at particular risk or habitat is very limited that conservation action is required directly in support of heron conservation. Without action in support of these heron populations, it is likely these populations will not persist. For most species, it is particularly effective for conservation of habitat to be undertaken within a larger land management context, such as wetland protection, watershed protection, flood control and water supply management, green space preservation, biodiversity conservation, or nature reserves. Humans nearly always play a dominating role in habitat used by herons. Much of human activity in habitats they co-occupy with herons is not detrimental to herons, some human activity greatly enhances habitat value, and some activity has become so supportive that heron populations now depend on its continuation. With proper conservation action, much of human activity and heron habitat use can be compatible.

Habitats that herons use are variable and seasonal locally. Temperature or rainfall, or both, vary in ways the effect herons profoundly. Many populations migrate, both temperate herons in response to annual seasonality and tropical herons in response to wet/dry changes. Most temperate populations migrate to warmer

climates for winter. Some populations are highly irregular in their movements. In Australia, inter-annual differences between flood and drought years substantially change the extent and dispersion of available habitat. In South America, ocean oscillations change the rainfall and runoff patterns from one year to the next. Any climate change, such as global warming, that effects rainfall can cause significant changes in wetlands and therefore of the patterns of heron use. Conservation of habitat for herons needs to be cognizant of seasonal, annual, and long term changes in weather and climate.

Table 2. Characteristic habitat used by heron populations of conservation concern.

Streams, rivers, marshes in mature forest
Ardea imperialis
Gorsachius magnificus
Gorsachius melanolophus
Gorsachius goisagi
Ixobrychus flavicollis
Zonerodius heliosylus

Swamps, marshes, rice fields
Ardea cinerea firasa
Ardea cinerea- Sumatra
Ardea goliath South and Southwest Asia
Ardea imperialis
Ardea sumatrana
Ardea humbloti
Ardea purpurea madagascariensis
Egretta alba alba Europe and N Africa
Egretta alba New Zealand
Egretta vinaceigula
Egretta ardesiaca
Nycticorax nycticorax nycticorax
Ardeola ralloides ralloides
Ardeola grayii. grayii
Ardeola grayii phillipsi
Ardeola rufiventris
Ardeola idae
Nycticorax nycticorax Europe
Zonerodius heliosylus

Lowland forests
Gorsachius magnificus
Gorsachius melanolophus (all subspecies)
Gorsachius goisagi
Zonerodius heliosylus

Waterbodies
Ixobrychus minutus minutus
Ixobrychus minutus podiceps
Ixobrychus sinensis

Reed beds
Botaurus stellaris stellaris
Botaurus stellaris capensis
Botaurus poiciloptilus
Ixobrychus minutes podiceps
Ixobrychus minutus Europe
Ardeola ralloides Europe
Ardeola idea Madagascar

Ephemeral marshes
Egretta vinaceigula
Egretta ardesiaca
Ardeola ralloides ralloides
Ardeola grayii grayii
Ardeola grayii phillipsi
Ardeola rufiventris
Ardeola idae

Shallow inland waters
Ardea humbloti
Ardea cinerea altirostris
Ardea sumatrana
Ardea goliath
Ardea purpurea madagascariensis
Egretta alba alba
Egretta alba maorianus
Egretta eulophotes

Coastal lagoons
Ardea herodias occidentalis
Egretta rufescens
Egretta eulophotes
Ardeola grayii Maldives
Ardea cinerea firasa

Upland habitats
Ardea purpurea bournei

© Eric Vidal

Agami Heron

The most threatened of the habitats on which herons depend are wetlands, tropical forests, tropical coastal lagoons, islands, reedbeds, and rice fields.

Overall, conserving wetlands is an important element of conserving heron populations of herons worldwide. Since the beginning of the 20th century, wetlands have been drained, canalized, flooded, and otherwise altered. The process of wetland modification is only accelerating. Wetlands that survive largely already have been degraded to some extent. It is of special importance to conserve those few remaining large wetlands, on which multiple species of herons and other waterbirds depend. These include the Everglades and Mississippi valley of North America, the Amazon, Llanos and Pantanal of South America, the Danube and Rhone deltas of Europe, the Sudd, Congo, and Okavango of Africa, the Tigris-Euphrates, Indus, Ganges, and Mekong of Asia, the Fraser-Darling of Australia. The Fraser-Darling and Okavango, for example, support the majority of certain populations at high risk.

In wetlands, schemes for the management of waters and lands have tended to adversely affect herons at every turn. Mangrove forests appear to be under particular threat throughout the tropics. Conversion to agriculture and aquaculture is a particularly serious threat. In Europe, many of the valuable wetlands in East and Central Europe are still unprotected, particularly the great river floodplains, where major threats are still posed by development programs. In Australia's Fraser-Darling Basin, a long history of man made changes to the natural flows have been detrimental to heron populations,

which are further complicated by the extensive inter-annual variation in rainfall. In North America, the largest tropical wetlands, the Everglades has been reduced to half its size and its natural flow regime altered resulting in well documented population decreases in herons. In Mexico and Central America, wetlands have been being drained for millennia. On the smaller islands of the Caribbean, few wetlands now remain, many of these are privately owned, and nearly all are under immediate threat. In the Greater Antilles and SubSahara Africa, large wetlands are essential habitats for both resident herons and those from continents to the north. There seem to be compelling correlations between conditions on African wintering grounds and the status of European breeding populations, suggesting the importance of habitat outside the breeding zones.

Wetland patches are localized. Most wetlands are to some extent ephemeral with size, area, and value to herons varying among years. A site, which contains a multitude of small wetlands in dry years, may become a single large wetland in wet years. Some site are not suitable except in exceptional years. Heron populations using extensive wetlands require an entire localized network of protected sites, some of which may not be used every year. Maintaining the local dynamic nature of wetlands is a key to their functioning and to their use by herons. Where natural hydrological dynamics have been irreversibly altered, active, or at least heron-sensitive, management of wetlands especially water levels and hydroperiods, may be required for heron conservation.

Tricolored Heron on nest with egg

Reddish Egret

Next to wetlands, lowland tropical forests appear to be the heron habitats most critically at risk. Given herons' overall dependence on wetlands, it might be unexpected that lowland tropical forests are habitats of such critical interest. But several of the most endangered species are characteristic of this habitat, which is under relentless pressure from logging everywhere. The White-eared Night Heron, Japanese Night Heron, Malayan Night Heron – all in Asia, New Guinea Tiger Heron – in New Guinea, and the White-crested Tiger Heron – in Africa, are species that depend on this habitat. Reduction in extent, connectivity and functioning of the lowland tropical forests is the principal cause for the vulnerable conservation status of these species.

Tropical coastal lagoons and shores are the essential habitats for a several species and ecologically distinctive populations of herons. These sites are characterized by their shallow, warm, clear water, and as such are also attractive to humans who use and abuse the environment. It is in the coastal tropical wetlands and lagoons that some of the greatest threats to herons occur. Development, drainage, conversion, aquaculture, over-harvest of forage species, pollution, and other degradations threaten some of the most important coastal heron sites. Some populations are specifically adapted to these habitats, such as the Great Blue Heron (Great White Heron) and Reddish Egret in the Americas, several populations of the Little Egret, the Chinese Heron, and the Eastern Reef Heron. Because of the intensity of human economic interests, protection and restoration of these habitats are complex both biologically and economically. Due to their complexity, it seems that parts of such zones should be set aside as protected areas, which can support herons.

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Striated Heron on the Galapagos

Islands are critical to herons. Most herons are colonial and nest on islands, either true off shore islands, islands in lakes, rivers, wetlands and floodplains, or distinctive habitat islands within a larger habitat. Nesting and roosting islands provide protection from predators and disturbance and permit aggregative behaviors to occur unimpeded. Human impacts on islands are often profound. Small, isolated islands suitable for nesting are often at risk to development, disturbance, predation, and degradation. Herons themselves tend to degrade their nesting sites. Where islands are in short supply individual sites may require active management. In fact herons accommodate well to the provision of artificial nesting sites on islands protected from disturbance and predation. Large islands and island chains often support ecologically or taxonomically distinctive populations. Several island species/populations have gone extinct in historic times or are at risk today, showing how vulnerable island populations can be.

Reed beds are the essential habitat for herons such as bitterns and the Purple Heron. All the heron populations in Europe that are of concern depend on reed beds for breeding and feeding. Reedbed alteration, due to drainage for agriculture or industry, disturbance by tourism, reed harvest, and pollution, has negative effects on herons. Nature reserves to protect these beds are highly desirable. Active heron-sensitive management of harvested fields is needed. Fortunately much has been learned in recent years to lend guidance to such management.

Flooded ricefields have become critical habitats for herons nearly wherever they occur. In Europe, with the loss of natural habitats,

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Eurasian Bittern

herons have shifted to ricefields and now depend on the continuation of beneficial ricefield cultivation. The favorable habitat provided by ricefields undoubtedly contributed to heron population increases in northern Italy, where much of the western European population of the Black-crowned Night Heron is now concentrated. In Spain, Purple Herons, Little Egrets, night herons, Squacco Herons and Little Bitterns are concentrated in areas of intensive rice cultivation. A similar situation exists in the Axios Delta in Greece, southern Turkey (Goksu and Cukurova Deltas), Nile Delta of Egypt, and the Camargue of southern France. Because herons depend on rice cultivation in flooded fields, modification in the management of these fields, especially conversion to drier cultivation styles, would have serious detrimental effects on heron populations. Rice cultivation also can be detrimental to herons, especially when it replaces natural habitat that is itself highly productive for herons. Also pesticides used in rice cultivation can adversely effect herons. Encouraging and enabling the management of ricefields, worldwide, to continue to support waterbird conservation is a high global priority.

Site Conservation

The dependence of herons on specific habitats, which often are quite localized, provides an important opportunity for conservation.

Important nesting areas can be determined for each population and efforts undertaken to protect and manage these sites. The importance of conserving specific sites for herons cannot be over-emphasized. Most herons breed colonially and so depend on a few specific sites for nesting, as opposed to being widely dispersed across the landscape. Species that do not nest colonially also are site dependent in that they nest in space-restricted habitats, such as wetland patches. Feeding sites are also localized in most areas. Herons either feed where they nest or fly to feed in changeable places within flying distance from the nesting site. Further, herons depend on restricted areas to feed and roost, such as wetlands, ponds, lake edges, small islands, and seashores. Herons also depend on specific areas during migration, and wintering. Heron conservation is particularly benefited by the identification, protection, and management of specific locations.

Two international programs are designed to identify sites that are of critical value to a significant percentage of a bird population. Wetlands of International Importance are identified by nations that are signatories to the Ramsar Convention. Important Bird Areas are identified by BirdLife International and its national partners.

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Mixed species colony of egrets

Congregatory waterbirds enjoy special criteria for identifying such sites. Many site designations have been based on numbers of congregatory waterbird species, and these sites usually support herons. Locations designated as Ramsar Sites and Important Bird Areas constitute the fundamental worldwide network of important sites for herons. However, within a country, Ramsar sites are relatively few and these are seldom sufficient for regional heron conservation. Important Bird Areas fill the gap to preserve other sites of importance to herons. Still additional sites that may not qualify as national or global IBAs also may be of critical importance to local populations. The worldwide identification of important areas for herons is central to the global conservation strategy. Identification, evaluation, management, protection and networking of important sites for herons need to be an ongoing process. The sites currently within these networks change regularly, and the most current lists are available on line (www.ramsar.org/index_list.htm, www.wetlands.org/rsis/; http://www.birdlife.org/datazone/sites/index.html).

Congregating in one place puts multiple individuals at risk. Colonial nesting and communal roosting expose an entire local population to whatever happens at a the site. Humans taking of eggs and young, which still occurs in many areas, is an extreme form of disruption. Historically, colonies were abandoned when adults were shot for their plumes. Predation by feral animals and various forms of disturbance by people similarly cause nesting failure. The situation is aggravated by rapid industrialization, urbanization, and tourist development, which brings people in closer contact with congregatory sites. This is especially critical in areas of economic deprivation and human population expansion. Because of this sensitivity, colonies, roosts and concentrated feeding sites need to be protected from disturbance and alteration. The efficacy of such protection depends in large part upon the local customs and habits. Cultures that cherish wildlife have protected colony sites for centuries. Cultures that eat wildlife tend to place colonies at grave risk, as heron nestlings are seen as quite edible. Cultures that shoot birds for sport, often include herons as targets. Cultures that emphasize development destroy important sites. Most species of herons can accommodate to repeated, non-damaging disturbance, as can be seen in many places, where herons nest in urban parks, farms and suburban settings. Many species are tolerant of high levels of human activity so long as there remain suitable feeding sites and any disturbance is persistent and non intrusive.

Congregating in one place also provides the opportunity to focus conservation action at a few sites. This allows conservation to emphasize identification, inventory, protection, and management of sites over long periods within a regional landscape. Congregation sites also provide excellent tools for local conservation education.

Flyway Conservation

Most temperate zone species of herons are migratory, as are many tropical herons, which also undertake seasonal movements.

Thus for their year-round conservation, most populations of herons require a seasonal succession of habitats. Four of the five most vulnerable heron species in Europe (Little Bittern, Black-Crowned Night Heron, Squacco Heron and Purple Heron) are trans-Saharan migrants. Drought in their wintering area is probably a factor in the widespread decline of the European breeding populations since the 1970's. These populations can be conserved only by protecting the web of nesting sites, feeding sites, roosting sites, stop over sites, and wintering sites used during the year. Flyway conservation is a mechanism to bring together heron conservation activities across nations and even continents. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) provides one mechanism to encourage the conservation of herons and other waterbirds on a flyways basis. This convention aims for the conservation and effective management of wild terrestrial, marine and avian species, especially those considered as "endangered" over the whole of their migratory range. In Europe, under the Bonn Convention, an Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) covers an area of about 60 million square kilometers, encompassing more than 116 range states

Little Egret

Squacco Heron

in Africa, Europe and Asia. This agreement incorporates eight heron species. Other flyway agreements and initiatives are encouraged as a way of protecting heron migration routes. Flyway approaches to the conservation of herons and other waterbirds, outside the convention can also serve to organize widespread actions. For heron conservation globally, Ramsar sites and Important Bird Areas of importance to herons may be best organized on a flyway basis.

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Herons at roost

Global and regional conservation

Heron conservation has much in common world wide. Global and regional conservation plans, programs, and actions provide support, guidance, continuity, and consistency. Maintenance and enhancement of the Heron Specialist Group network provide networking among specialists. Periodic gatherings of specialists are needed to summarize status, conservation, and biology as information expands.

To determine global population sizes, cooperation is needed among individuals and organizations involved in inventory and monitoring range wide. A global database would allow evaluation of status and long term trends. Collaboration with site networks, conservation assessments, and population estimations need to continue. Regionally, nationally, and locally, specific projects are needed to provide conservation action for species of special concern. Below is a listing of priority conservation projects, with a brief description of the project goals, project rationale, and a brief project statement.

Global Conservation

Global 1. Global strategy for inventory and monitoring of heron nesting populations

Goal: Consistent inventory and monitoring activities of heron populations at selected important sites with data archived in a readily available web-based data base.

Population numbers and trends of herons are very little understood for most species and populations of conservation concern. Yet accurate population and trend estimates are essential in order to target conservation action where it might be most effective. Determining population levels and trends, assessing status, and identifying Important Areas need to be ongoing processes. Data should be archived in ways that make them readily available. Inventories of nesting populations and sites should to be undertaken in each appropriate political entity by local stakeholders. Depending on resources available, inventories should at least attempt to achieve a population estimate accurate to an order of magnitude. Ideally population inventories should be accurate to within 20% of actual. Based on inventory information, monitoring programs should be developed on a regional basis (political or ecological) and strive to have a sufficient accuracy to determine population size within 20% of actual and with sufficient precision to be able to detect a rate of population change equivalent to a 50% decrease over a period of 10 years or three generations. Standard methods of census and analysis should be used. Monitoring programs require a determination of bias, which then permits calculating actual population size and trends using data from multiple surveys. Few existing waterbird monitoring programs meet these standards, and in many cases entirely new programs should be developed. Data must be reported and archived in an international database. Selection of such a worldwide data base should be a high priority.

Organize a global program of inventory and monitoring of heron nesting populations and important sites, according to standard protocols, and archived in a universally accessible way.

Global 2. Global network of important sites for herons

Goal: A network of critically important sites for herons worldwide.

The Ramsar Bureau and BirdLife International are engaged in ongoing identification of sites of importance to congregatory waterbird species. Herons benefit from many such sites, even if their populations are not used to satisfy threshold criteria. However, herons also can also serve as reasons to identify such sites. Heron biologists and conservationist should work toward nominating sites of value to herons for listing as important bird areas and Ramsar sites. Sites already listed should be evaluated for their importance to herons and those so deemed should become part of the international heron site network. Information on important heron sites should be made available via internet. Management tools should be made available for sites to use.

Identify a global network of important heron sites; provide conservation tools.

Global 3. Long-term monitoring and research on herons at important sites

Goal: A network that monitors and investigates herons in important sites using compatible methodologies.

The network of sites important to herons (IBA/Ramsar) provides a framework for in depth study and monitoring of herons. Site-specific information on changing population numbers, habitat use, and ecology of herons is required in order to propose appropriate management for important sites. Comparative information on relationships among heron population size, conservation status, foraging and nesting habitat quality, and environmental change can lead to generalities that are transportable between sites. Many ecological relationships can only be determined through long-term studies. The global network of heron studies especially should include the most important heron sites, especially those in large wetland complexes such as the Everglades, Okavango, Amazon, Orinoco, Pantanal, Tigris-Euphrates, and Sudd.

Develop consistent monitoring and habitat use research programs at important heron sites.

Global 4. Tools for heron conservation

Goal: A handbook of standard procedures useful for heron conservation action.

Herons and their important places are widely scattered over the world. As a result those who have responsibility for such populations and sites are similarly scattered and not easily in communication. It is often difficult to find information on how to positively affect herons. However, such tools do exist, having been perfected over the years at many places. It would be helpful to assure that these methodologies are readily available to heron conservationists, preferably through websites.

Collect and synthesize successful methodologies useful for heron conservation and make these available.

Global 5. Taxonomic studies of the herons of the world

Goal: Better understanding of the evolutionary and systematic relationships of herons.

Understanding the evolutionary relationship among heron populations is required to develop conservation programs that place appropriate emphasis on distinctive populations. Recent molecular studies have shown unexpected results at species and higher taxonomic levels. Such molecular studies may be the only way to unravel the relationship among disjunct, similar looking herons. For example, as recently as 2005, Kushlan and Hancock realized that the large white egrets of Asia were in fact two species. Twenty years before, they proposed that herons previously considered to be as many as four species be considered a single species, but there is as yet no molecular data with which to test this hypothesis. Genetic information is needed on other heron species and populations as well. Some of the studies needed include the *Butorides* complex, the *Ardea alba/ modesta/ intermedia* complex*, Ardea herodias/ wardi/ occidentalis/ fannini* complex*, Ardea cinerea/ monicae/ sumatrana* complex*, Egretta garzetta/ dimorpha/ gularis* complex, *Cochlearius cochlearius* complex, *Ixobrychus exilis* complex.

Conduct taxonomy studies of selected heron populations using molecular techniques.

Global 6. Partnerships in heron conservation

Goal: Insure heron conservation has a place in comprehensive conservation initiatives.

Worldwide, conservation of herons can take place most efficiently within the context of more comprehensive initiatives. Flyway initiatives, all-bird conservation initiatives, continental, national and regional conservation planning, landscape and wetland conservation programs, and International Conventions such as Biodiversity, Wetlands of International Importance, and Migratory Species are examples of large scale conservation programs from which herons benefit. Locally, regionally, nationally, and continentally, heron conservationists should partner and engage these larger conservation programs to meet the conservation needs of herons. Specifically herons should be featured in flyway initiatives in Europe and Asia. A waterbird flyway initiative that includes herons is needed in the Americas. Wetland conservation programs are underway in many locations in the world; herons should be a critical component of such programs. In North America, several bird conservation initiatives include herons or their habitat within their scope. The hemispheric initiative, Waterbird Conservation for the Americas, includes herons within its conservation mandate. These trends of including herons in wider conservation efforts should be encouraged and expanded whenever feasible and appropriate.

Imbed conservation of herons within comprehensive conservation programs and initiatives.

Global 7. Captive breeding of heron populations at risk

Goal: Manage captive stocks of herons worldwide to achieve greatest conservation benefits.

Herons are kept in captivity in zoos and other facilities around the world. There is important education value of such displays to the local community. Stocks are, and should continue to be, managed to maintain genetic diversity and long term viability of the captive populations. The Ciconiiform Taxon Group partners with the Heron Specialist Group to assure proper management of captive stocks. It is important to focus husbandry on the most critically endangered species and populations, both to preserve the species and for eventual repatriation when habitat and ecological conditions merit. Herons that are candidates for captive propagation include White-eared Night Heron, Japanese Night Heron, White-bellied Heron,

Cape Verde Purple Heron, Asian Goliath Herons, and island populations such as those from Madagascar.

Maintain registry of herons in captivity; focus husbandry on populations at greatest risk.

Global 8. Bibliography of herons

Goal: Long term availability of the bibliography of herons.

A bibliography of literature on herons has been prepared and is available on line. It is up to date as of 2000, but has not been further updated. The bibliography should be updated. It should be re-designed so that readers can input new entries directly into the data base. A secure, long term sponsor needs to be identified.

Update and maintain long term the on-line bibliography of herons.

Global 9. Worldwide distribution of herons

Goal: Correction and evaluation of the distribution of herons worldwide.

A recent publication updated information on the distribution of all heron species of the world. Maps showing these distributions have been available on the Heron Specialist Group web site. Although these maps relied on the best available information, they are clearly not correct in all cases. For some species, the details or distribution are not correct; however for others it is likely that the ranges are seriously incorrect in places. It is important that information on ranges of heron species be as correct as possible. Ranges as they are currently depicted should be further evaluated by local experts and new information collated as it appears. A system should be devised so that changes to published ranges can be proposed on-line. The patterns of heron distribution worldwide should be analyzed for patterns of biological and conservation significance.

Update current range maps and further analyze distribution of the herons of the world.

Asia

Asia is home to a diversity of heron species and populations and to several of the most endangered herons in the world.

Deterioration of critical habitats, particularly coastal swamps and lowland forests, has effected these populations. Little information exists about some of these species, and their population status and important sites are hardly known. More information on distribution, identification of important sites, and conservation planning are essential for these endangered and vulnerable herons. Conservation in all cases requires the engagement and commitment of local communities and authorities. Basic information is needed for most species. Inventories and monitoring programs need to be developed in many areas, some of which are nearly inaccessible. A few species are in such dire need that captive propagation is required. Several species are teetering on the verge of extinction; action on their behalf is essential, now.

Asia 1. Conservation of the White-eared Night Heron

Goal: Save White-eared Night Heron from extinction.

The White-eared Night Heron is one of the most, if not the most, endangered heron species. It is known from 17 sites in China and one in Vietnam. All of these sites have been identified since 2001, when the species was first rediscovered – while being sold for food in a market. The Vietnam observation is the first in that country in 30 years. In China, the Oriental Bird Club, Kadoorie Farm and Botanic Garden, Guangxi University, Da Ming Shan Nature Reserve, and Guangxi Forestry Department are among the partners working to save the species from extinction. The total species population is uncertain and, in fact, its status is a matter of some disagreement among knowledgeable conservationists. Its population is certainly fewer than 1000 birds, and likely fewer than 250. Based on the success of recent surveys in finding new sites, these should be continued and expanded to determine the bird's presence in other sites within its potential range. Recent research has been able to better define habitat use, a combination of mountains, forest (both broad-leaved and mixed forest) and nearby aquatic habitats such as reservoirs, streams, ricefields or ponds. Clarification of its annual movements is needed. Wherever this species occurs, it must be completely protected from forest destruction, disturbance, hunting, and other population pressures from people. Establishing a captive

breeding program should be accomplished as soon as stock becomes available.

Better understand population size of the White-eared Night Heron; identify and protect every site used.

Asia 2. Inventory and conservation action plan for the White-bellied Heron

Goal: Finding new sites where the White-bellied Heron occurs; protection of every occupied site.

The status of the White-belled Heron is very unclear, but it certainly is one of the most endangered of herons. It is known only from two sites in Bhutan and one in India. The population is fewer than 1000, and likely fewer than 250. It has declined over almost all its range and surveys have not been able to locate it in other places. The known birds are so few as to be critically endangered. Additional surveys are needed to determine, especially in Myanmar, if there are other sites in which the species occurs. The Royal Society for the Protection of Nature and BirdLife International have been leading the efforts to study and conserve the known birds and inventory new sites. The species appears to use river forests and avoids human. Every nesting site is critical, and protection must be provided to every site identified. Its migratory movements and year-round habitat needs are nearly unknown, and need to be studied.

Determine nesting locations and seasonal movements of the White-bellied Heron; prepare a conservation plan for the species; protect every nesting site.

Asia 3. Distribution and status of the Japanese Night Heron

Goal: Save the Japanese Night Heron from extinction.

Japanese Night Heron is rare and highly endangered. Its population size is extremely low, and likely declining. There have been few recent confirmed breeding records (only at six sites). The only records of this species outside the breeding season are few and isolated. Clearly what is needed is clarification of the current distribution during and outside the breeding season to identify sites critical to its survival. A better population estimate is needed to serve as a basis for determining conservation status and to help develop the needed monitoring program. A quantitative inventory throughout the breeding range is critically needed. There is also a need to better characterize the sites and habitats used by the species for nesting and foraging. Habitat protection is most important. The Wild Bird Society of Japan has provided a basis for establishing a network of forest reserves for this species in Japan. The confirmed and possible breeding sites should be surveyed to re-confirm the night heron's presence, and the breeding sites and associated feeding sites that do exist all need to be protected. The species should be accorded full legal protection in Japan. Wider inventories of wintering areas also are needed. Migration occurs through the Ryukyu Islands and there appears to be a regular wintering population in Taiwan. Protection of remaining forested areas in these two areas would contribute significantly to the viability of the existing populations of this species. A conservation plan should be prepared that focuses on its important breeding, feeding, and wintering sites. If stock is secured, a captive breeding population should be established to eventually enhance the population through future releases.

Clarify the current status, distribution and numbers of this species during and outside the breeding season; protect all sites at which it occurs.

Asia 4. Conservation of the Chinese Egret

Goal: Better understanding of the distribution and protection of important sites for the Chinese Egret.

The Chinese Egret is a vulnerable heron, which has been a species of concern for many years. Due to this concern, much progress has been made in documenting additional nesting sites, stop over sites, and wintering areas, all of which need to be protected throughout its range. Its population is thought to be about 2600-3400 birds, but likely is larger. A coordinated range-wide inventory of nesting colonies and critical wintering sites is now needed. Emphasis should be in China and also areas to the north of the known range, such as Sikhote-Alin and Kamchatka. Basic studies and reviews of the biology of the species are needed to clarify its specific ecological requirements. A network of important nesting and wintering sites should be developed. A conservation plan compiled by all stakeholders should be developed that encompasses every important site. A range-wide inventory of wintering areas is also needed, including those known now to be important (and qualifying as IBAs): Kanghwa Island and Yongjong Island, South Korea, Jiangsu and Yancheng Coasts, Dongting Hu NR, Pangzhai and Quingxu/Huayan Res. P.R.o.China, intertidal mudflats on Palawan and at Ormoc and on Orlango Island in the Philippines, Tapei estuary, and coastal mudflats in Taiwan. Recent studies have found important sites in Malaysia

as well. Governments need to be encouraged to protect the known breeding, stopover and wintering sites. A range-wide monitoring program is needed.

Inventory breeding range to find nesting sites; develop a conservation plan that networks these sites and provides protection for the heron.

Asia 5. Distribution and status of Sumatran Heron

Goal: Clarification of the current status and distribution of the Sumatran Heron.

This species appears to be declining throughout much of its range and to have disappeared from most of the mainland south-east Asia (except parts of Indochina) in the last fifty years. A robust population persists in Indonesia, with small numbers in mainland south-east Asia and the Andaman Islands. A primary need is to clarify population size and status of the Sumatran Heron throughout its range in Asia. It is essential to determine the overall numbers of the species and also to refine identification of those populations of conservation concern. Its large size and solitary nature makes surveys and monitoring difficult, so a network of conservationists will be needed to determine its status and distribution and attend to its long-term conservation.

Clarify the current status and distribution of the Sumatran Heron in Asia; identify and assess the viability of its populations.

Asia 6. Inventory and status of Grey Heron population in Sumatra

Goal: Understand long-term viability of the Grey Heron population in Sumatra.

This population of the Grey Heron is restricted to the island of Sumatra. Very little information is available on waterbird populations on the island, and so little is known about this heron. The population is thought to be about 1000-2000 birds and is considered to be vulnerable, It occurs over a restricted range of habitats that are under threat. An inventory of the population needs to be undertaken to determine population size and nesting sites. The appropriate taxonomic status of this population needs to be determined.

Conduct an inventory of the Grey Heron on Sumatra; determine important sites; examine its systematics.

Asia 7. Status of Schrenck's Bittern

Goal: Understand status of Schrenck's Bittern during and outside the breeding season

The status of this species is not well known. It is necessary to clarify the range and location of sites of importance for this species outside the breeding season by conducting a thorough survey throughout its known distribution. Breeding season surveys should establish a more precise estimate of breeding populations. Similarly its non-breeding range needs to be better understood. Although the main non-breeding distribution likely is in the Philippines, there are records from various sites and habitats throughout Southeast Asia. Surveys should be undertaken of sites where the species is known to occur (concentrating on the Philippines) to identify the main non-breeding distribution. Information collected should be gathered and a conservation plan devised including, as appropriate, site protection of important nesting and non-nesting areas and hunting control.

Conduct an inventory of breeding and wintering areas of the bittern; develop a conservation plan.

Asia 8. Distribution of Indian Pond Heron in the Bay of Bengal

Goal: Understand status of the Bay of Bengal population of the Indian Pond Heron.

The waterbirds of the islands off the coast of Myanmar in the Bay of Bengal are little known. The Indian Pond Heron is one of these. It is desirable to develop and implement an inventory of the Indian Pond Heron in the area. This information would provide the basis for implementing waterbird conservation in the area.

Conduct inventory of the status of the Indian Pond Heron in the Bay of Bengal near Myanmar.

Asia 9. Conservation status of the Indian Pond Heron in the Maldives

Goal: Better understand status of the Maldives population of the Indian Pond Heron.

The Maldives is a large and complex system of islands that can be very difficult to access. Little is understood about the status of the

Indian Pond Heron population of the islands. It is considered to be vulnerable. In the short-term, the most important action should be to determine the current size of the population and conduct an assessment of habitat availability and the degree of threat to breeding and foraging habitats. Public awareness may have the greatest potential to improve the conservation status and the habitat, so increasing public awareness may become the main thrust of the conservation strategy.

Conduct inventory to determine population size and important sites for the Indian Pond Heron in the Maldives; increase public awareness.

Asia 10. Conservation status of the Black Bittern

Goal: Better understand the status and distribution of the Black Bittern.

The Black Bittern is extremely poorly known. It appears to be a species of lowland riverine forests. Details of distribution and breeding status are little understood. An inventory should be undertaken to provide information to form the basis for monitoring, carrying out of ecological studies, and developing as a conservation plan for this species.

Inventory the nesting range of the Black Bittern to determine status and conservation needs.

Asia 11. Conservation status of Malayan Night Heron populations

Goal: Better understand the conservation status of populations of the Malayan Night Heron.

Despite its wide distribution and apparent abundance in certain locales, due to its nocturnal habits and use of dense humid forests, the Malayan night heron remains little known. The best information on the species is from excellent studies of the breeding population in Taiwan. Overall, it appears to be substantially less at risk than the other *Gorsachius* night herons. But given conservation issues with the other species, clarification of the status of this species in various parts of its range is needed. Particularly, a range-wide inventory of nesting is needed on Sumatra and Peninsular Malaysia, where recent records suggest that these areas may support resident populations, Nicobar and Palawan where populations apparently are sedentary (birds on Palawan was sometimes considered a subspecies and are considered to be vulnerable), and also the apparently healthy populations recently located in Cambodia, Laos, Thailand and Vietnam. There is a need to increase survey efforts on remaining suitable forests in Philippines, its wintering range, which is under threat from logging. As there are several apparently disjunct populations of this species, some of which have been considered subspecies, so a systematic study is needed to define conservation populations.

Conduct a range-wide inventory of the status of the Malayan Night Heron in both potential breeding and wintering sites; clarify distribution and the status of its various populations; conduct taxonomic studies of populations using molecular techniques.

Asia 12. Status and distribution of the Goliath Heron in South and Southwest Asia

Goal: Search for populations of the Goliath Heron in Asia.

The south Asian and southwest Asian populations of the Goliath Heron are small, restricted, coastal, little understood, and seldom reported. Nesting status is unclear. If these populations still persist, they are likely to number under 50 birds. As a result the Asian population is considered to be endangered. It is necessary to conduct surveys and develop communication networks to determine the persistence of the species in the region.

Assess the current status and distribution of the two Asian populations of the Goliath Heron.

Asia 13. Distribution of large white egrets in Asia

Goal: Clarification of the distribution of the large white egrets of Asia.

The specific distinctiveness of *Ardea alba* and *Ardea modesta* has recently been proposed. Observations by authorities familiar with birds in the field are tending to agree that the two forms are distinctive. Both occur, at least seasonally, in Japan and Korea and have been given different local names, suggesting they are readily recognizable. However distinguishing the field characteristics of the two forms requires additional documentation. It is apparent that the published range maps for the two species in Asia are not correct, as the ranges appear to overlap in winter and perhaps at other times as well. The range of the Intermediate Egret is also unclear over this part of its range. What is needed is a determination of the seasonal ranges of the two large egrets and the Intermediate Egret in east Asia.

Determine seasonal distribution of the Great Egret, Eastern Great Egret, and Intermediate Egret in east Asia.

Asia 14. Conservation of the Eastern Reef Heron in China

Goal: Protection of important sites for the Eastern Reef Heron in Coastal China.

The Eastern Reef Heron, although common over much of its range, is rare and its distribution rapidly decreasing in China. Only a few individuals have been seen on surveys. This species has specialized habitat requirements on rocky or sandy coasts and so comes into conflict with development pressures in these areas. It is essential to determine important sites where the species still occurs and to develop programs to protect these sites.

Survey coastal China to determine sites where the Eastern Reef Heron occurs and develop protection programs.

Asia 15. Inventory of heron colonies in China

Goal: Complete an inventory of heron colonies throughout China.

Recent surveys suggest that China likely supports far more herons and heron colony sites than was appreciated. For example, a new colony of Chinese Egrets with 100 nests was recently discovered in Shandong, and a recent survey of Hainan Province found over 5000 nests of four species. Even larger colonies have been located. Population sizes, distributions, and important sites for herons in China need to be determined. This should be done in multiple ways, depending on available resources, interests and commitments from organizations, such as the Egret Research Group of the Hong Kong Bird Watching Society, universities, and government agencies.

Conduct a thorough inventory of heron colonies in China.

Europe

The European region, including Europe, the Mediterranean, North Africa, and the Middle East, is one of the best studied regions with respect to herons.

Reliable data on heron populations size exist for most European countries and for the most important breeding areas of North Africa. Major gaps in knowledge exist in Syria, Lebanon and Jordan, and in the east Mediterranean. No European heron species is globally endangered, but some populations are at risk, underlying the need for accurate status assessment and protection of important sites.

Europe 1. Status and monitoring of the Eurasian population of the Great Egret

Goal: Better understanding of the status of the Great Egret in Europe, Middle East, and North Africa.

The Great Egret population in Europe is vulnerable due to its small numbers and localized occurrence. However, the population appears to be increasing and expanding in Europe in both breeding and in winter. In Europe, there are few censuses of the breeding population, and only 7000-17000 individuals have been counted in wintering areas. It occurs but does not breed in North Africa. It has been expanding its range in small numbers in a westerly direction.
It appears to be most secure in the Eastern Mediterranean, Black Sea regions, and Russia. This Great Egret population deserves expanded monitoring efforts, particularly in the Eastern Mediterranean, the Middle East, Northern Africa, and Black Sea. Monitoring wintering populations is also important, as increases in wintering numbers appear to have presaged increased nesting numbers. Given how localized the breeding sites are, most colony sites require protection.

Inventory Great Egret populations in areas where information is slim; protect all nesting sites.

Europe 2. Monitoring and habitat protection for Eurasian Bittern in Europe

Goal: Documentation of the status and trend of the Eurasian Bittern in Europe and protection of important sites.

The Eurasian Bittern has experienced a notable decrease in west Europe over the past decades, although it remains common in parts of east

Europe. In the east, inventories are needed to determine the most important breeding sites. In the west, high densities of this bird are restricted to rare extensive reedbeds, especially in the Rhone delta of southern France. Sites where the bittern occurs in numbers need to be fully protected. The species is rare in North Africa, where breeding only occurs in a few small pockets of favorable habitat. All sites used by the bittern in North Africa need to be protected. New techniques permit more exact estimation and monitoring of breeding populations.

Continue and expand monitoring programs for Eurasian Bitterns in the European region; identify and protect important sites and all sites in north Africa and southern Europe.

Europe 3. Purple Heron conservation and monitoring in Europe, Middle East and North Africa

Goal: Continued and expanded survey and monitoring of Purple Heron in the Mediterranean.

European breeding populations of Purple Herons appear dependent on large reedbeds (>20-30 ha) for nesting, and they forage exclusively in freshwater wetlands throughout the year. They are sensitive to human disturbance. Purple Herons have declined in all European countries except for the small populations in Slovakia, Greece and Portugal. Recently there has been an increase in breeding areas in Italy, France and Spain. Long runs of data exist on the size of breeding populations in the Netherlands, Northern Italy, the Mediterranean coast of France, the Ebro Delta and the Albufera de Valencia in Spain. Purple Herons are rare in the Near East and in North Africa. Purple Heron nesting numbers should continue to be monitored and monitoring expanded to other important sites throughout Europe. To clarify the range in southern Europe and location of the most important wintering sites, a network of collaborators needs to be developed in the African wintering areas. All important sites identified should be protected. Continued collaboration among biologists and conservationists concerned with this species should continue and be formalized where possible.

Continue and expand collaborative inventories and monitoring of Purple Herons; evaluate trends of nesting populations; protect important sites.

Europe 4. Population status and conservation of the Squacco Heron in Western Europe

Goal: Better inventory and conservation action for populations of the Squacco Heron in Western Europe.

The Squacco Heron is the rarest heron in Europe. Its population appears to fluctuate in the western Mediterranean but seems to be increasing at present in southern Europe. It is necessary to continue to monitor breeding populations in the major breeding areas of Western Europe (Italy, southern France and Spain) and to conserve the important sites and wet woodlands. All important sites, as well as many potential sites, in the region need protection. The largest Squacco Heron populations of Western Europe today use ricefields, which are susceptible to changes in agricultural practice. Because Squacco Herons nesting in the Palearctic are long-distance migrants, most of them wintering south of the Sahara, the cause of population decline in Eastern Europe and fluctuations in the western Mediterranean may be operating outside the breeding season.
It is necessary to synthesize existing data on habitat use and feeding ecology across the major rice production areas in the Mediterranean region and to prepare management strategies that encourage heron-friendly agricultural practices in rice fields.

Inventory populations of the Squacco Heron in Western Europe; prepare management strategies for protection and maintenance of sites used by the herons, especially rice fields.

Europe 5. Inventory and protection of nesting sites of the Little Bittern in Europe and North Africa

Goal: Securing suitable breeding habitat in as many areas as possible in Europe and North Africa.

The Little Bittern in western Europe and north Africa is considered to be vulnerable because it has strongly decreased both in population size and range since 1970. The species' range appears to be contracting from west to east. There are few recent breeding records in north Africa. Although it is possible that the decline in European numbers is largely due to high mortality of birds during migration or when wintering in Africa, protection of nesting sites remains essential. Conservation efforts in Europe should concentrate on maintaining favorable breeding habitat over large areas.
It is necessary to conduct surveys to determine suitable breeding habitat and breeding status both in the known strongholds of the species and in areas where it has disappeared. Ecological studies

need to be undertaken to determine reasons for the decline in breeding numbers in Europe. Surveys should be conducted to determine the most important wintering habitat. It is critical to identify important sites for both breeding and wintering, and protect these sites.

Determine and protect the most important breeding areas for the Little Bittern in Europe and most important wintering sites in Africa.

Europe 6. Trend and habitat requirements of the Black-crowned Night Heron in Europe

Goal: Better protection of breeding populations of Black-crowned Night Heron in Europe.

The Black-crowned Night Heron nesting population in Europe is in slow or moderate decline. The largest, apparently stable, breeding population in Europe is in Italy where it depends on rice fields. Elsewhere, in the southern Mediterranean breeding distribution is limited to a few freshwater areas. Conservation of the species requires continued monitoring of breeding populations in the major breeding areas of western Europe (Italy, southern France and Spain). More importantly, a multinational program is needed for the conservation and management of wet woodlands and reedbeds. Existing data need to be synthesized on habitat use and feeding ecology across the major rice production areas in the Mediterranean region in order to prepare management proposals.

Continue to monitor breeding populations of the Black-crowned Night Heron at important sites in Europe; develop strategies to protect these sites, especially wet-cultivation rice fields.

Africa

For the majority of African heron populations, there are no historical or contemporary quantitative data, and it is therefore not possible to quantify population changes.

Of course, this needs to be rectified. Despite limited quantitative data, it is clear that conservation action for several species and subspecies on the African continent is needed. The Slaty Egret for instance is considered extremely vulnerable due to its dependence on the seasonal wetlands of central Africa. The Eurasian Bittern subspecies in southern Africa is today endangered due to shrinking and deteriorating habitats, and its intolerance of man. The Malagasy region, which includes the island complexes Seychelles, Aldabra, the Comoros, Madagascar, Réunion, Mauritius and Rodrigues, supports two species and eight subspecies that are endemic and require special conservation attention.

Africa 1. Inventory and site conservation for the herons in Madagascar

Goal: Better understanding of the status of all the heron populations of Madagascar and of conservation actions needed.

Among the locations in the world in which herons are in the greatest difficulty, the island of Madagascar stands out. Several species and populations of herons are at immediate risk and they share conservation issues mainly related to habitat destruction and degradation and hunting. The principal habitats are coastal mangroves, riverine floodplains, freshwater swamps and natural lakes. The degree and rate of degradation of aquatic habitats across the island has been alarming. Habitat loss, introduction of non-indigenous fish species, and hunting have caused dramatic population declines many of the region's waterbirds. Heron species of concern in the region are: *Ardea humblotti, Ardea cinerea firasa*, *Ardea purpurea madagascariensis*, *Egretta ardesiaca*, *Ardeola idea, Butorides striatus, Ixobrychus minutus podiceps* and *Ixobrychus sinensis*. A complete nationwide inventory of heron nesting sites is needed to provide accurate population estimates and to identify sites of importance to herons. Sites should be qualified as Important Bird Areas for herons, immediate protection provided, and conservation plans developed for the long term management of these sites. A national monitoring program for heron species at risk is needed.

Inventory the heron populations of Madagascar; identify and protect all important sites; enact conservation actions as needed at each site.

Africa 2. Save Cape Verde Purple Heron from extinction

Goal: Save the Cape Verde Purple Heron.

The subspecies of Purple Heron endemic to the island of Santiago, Cape Verde Islands, is highly endangered. The population has declined significantly since its discovery in 1951, from an estimated 75 pairs to a recent population estimate of 20 or fewer pairs, which use only two sites. Unlike other Purple Heron populations, this subspecies appears to be independent of wetlands, nesting in trees and apparently foraging on arid hillsides. There is no information on foraging habitat outside the breeding season, but it is suspected to use isolated, dry river valleys. The population is not viable under present conditions. Immediate conservation action provides the best possible chance of survival. A complete and accurate inventory of the population and its nesting, roosting, and feeding sites is needed immediately. The government should be encouraged to initiate formal protection of the species from hunting, disturbance and habitat destruction, and to provide immediate protection for the two known roosting/nesting sites. Research should be conducted to obtain and compile information needed to develop a conservation plan for the species, including identifying all nesting sites and foraging habitat and sites used during and outside the breeding season. The main priority must involve survey of all suitable trees on the island (these are very limited in number and therefore this is not as impractical as it sounds) and identification of foraging habitat and sites use. A monitoring program is needed at the two known breeding colonies and any other sites found. Public awareness and governmental commitment to conservation of the subspecies are essential.

Inventory Santiago, Cape Verde, for additional nesting sites; determine feeding habitat use year round; completely protect the birds and every nesting, roosting and feeding site.

Africa 3. Save Eurasian Bittern from extirpation in Southern Africa

Goal: Implementation of conservation action to protect sites used by the Eurasian Bittern in South Africa.

This subspecies of the Eurasian Bittern is confined to southern Africa and is in serious decline due to loss of wetland habitat and its apparent intolerance of human activity. This subspecies is among the most critical heron conservation concerns globally. It is now exceedingly rare or extirpated over much of its former range, and it may be only in Zambia and perhaps the poorly known eastern Angola wetlands that it survives in any numbers. In South Africa it breeds only in Natal and Transvaal, with a total population of fewer than 100 individuals. There appears to be little doubt that the entire population is in serious decline and endangered. The ecology and habitat requirements of this subspecies are little known. It is suspected to require extensive reed or mace beds. Unlike many taxa, the main problem is not a lack of suitable data to show the decline. Consequently, it is vital that urgent conservation action be undertaken. Although there is a need for a better understanding of the status and dynamics of this subspecies, it is far more urgent to implement conservation management and protection of all sites at which it occurs. The main scope of site protection should concentrate on the subpopulations in Zambia, eastern Angola, Natal (South Africa), and Transvaal (South Africa). Censuses should be conducted, using techniques recently developed in Europe. It is critical to address (through liaison with the departments responsible for the environment in the relevant governments) protection of the sites holding this subspecies.

Implement strict protection of each site in which the Eurasian Bittern occurs in southern Africa; clarify the current distribution and population; identify additional sites.

Africa 4. Conservation of the Malagasy Heron

Goal: Protection of the Malagasy Heron.

The Malagasy Heron has an overall population of only 1000-3000 birds and is considered to be endangered due to its localization in a few, threatened sites. It appears hunting continues. It is known to occur and may be still fairly common in four areas in western Madagascar, which provides the opportunity for successful conservation. It possibly breeds also on the Comoro islands, and this needs to be clarified. There is a clear suite of problems, mainly related to habitat destruction and degradation, which affect the survival of a number of waterbird species and endemic subspecies on Madagascar. Hunting and nest predation by locals and conversion of natural wetlands to rice agriculture are persistent threats to the Malagasy Heron. Known nesting sites require immediate and complete protection through efficient wardening combined with public awareness campaigns. It is desirable to conduct an inventory to locate additional nesting sites and potential sites, as well as an inventory to determine status in the Comoros. Conservation will require commitment of the government and conservation organizations active in the Malagasy region to take on the Malagasy Heron as a priority.

Locate and protect all nesting sites of the Malagasy Heron; stop hunting.

Africa 5. Conservation of the Malagasy Pond Heron

Goal: Better define the conservation status of the Malagasy Pond Heron.

Endemic as a nesting species to Madagascar, the Malagasy Pond Heron is considered to be endangered. With a population presently estimated at less than 250-1000 individuals, there has been a sharp decrease over the last 50 years, due to habitat loss and degradation, especially conversion of natural feeding areas for rice-growing where it appears to be out competed by the more recently established Squacco Heron. It is difficult for most observers to distinguish this species from local pond herons in winter. However recent evidence suggests that it may be more common than previous thought in winter in east Africa, suggesting its population is larger than presently estimated. A synthesis of available information and inventories of nesting sites and wintering areas are needed to determine population size. It is critical to identify important nesting sites and protect them. Conservation organizations in Madagascar are urged to take the lead and to collaborate on habitat conservation for the species in Madagascar. Establishing a captive breeding population may be of value. A better understanding of wintering range and habitat use in Africa is important, and this requires a better clarification of field identification.

Identify and protect all nesting sites of the Malagasy Pond Heron; better delineate the wintering range in Africa.

Africa 6. Conservation of the Grey Heron in Madagascar and related islands

Goal: Inventory and protection of nesting sites of Grey Heron in Madagascar, Seychelles, and related islands.

The Grey Heron of Madagascar is a recognized subspecies that is endangered due to persistent threats, principally from habitat destruction, hunting, and predation at breeding colonies. There are thought to be fewer than 5000 birds in the population, and likely far fewer. The taxonomic status of similar herons in the Comoros, Aldabra, Amirantes, and Seychelles is uncertain and needs to be clarified. All nesting sites supporting more than 50 individuals need to be protected. It is desirable to start public awareness programs that include heron conservation in the message.

Identify and protect important nesting sites of the Grey Heron on Madagascar; determine taxonomic and conservation status in Seychelles, Comoros, Aldabra, Amirantes, and Seychelles.

Africa 7. Conservation of the Purple Heron in Madagascar

Goal: Protection of the Purple Heron population in Madagascar.

The Purple Heron race endemic to Madagascar is vulnerable. It depends on freshwater lakes and rivers. Except in the south, it is considered to be common but appears to be declining overall. There is continuing pressure on wetland habitats in Madagascar, where the Purple Heron occurs. The population needs to be monitored and its important sites identified and protected from alteration and disturbance.

Develop monitoring programs for the Purple Heron population in Madagascar; protect important breeding and feeding sites.

Africa 8. Conservation of the Grey Heron in Coastal Mauritania

Goal: Better understanding of the dispersion and taxonomy of the Grey Heron in Mauritania.

The Grey Heron of coastal Mauritania is unusual due to its pale coloration, ground nesting, and extremely restricted range. This small population (7500-12500 individuals) is confined to the Banc d'Arguin in Mauritania and subject to considerable fluctuations in numbers of breeding birds. Due to its restricted range, this population is considered to be vulnerable. The breeding islands are extremely difficult to access and they are part of the Banc d'Arguin National Park, which has strict regulations. Tour du Valat in France and the National Park in Mauritania have collaborated to conduct aerial breeding censuses, which need to be continued. However, the precise distribution and size of this population are unclear. The feeding areas are very extensive and human population is so low that there is practically no disturbance to these birds. The primary aim of more extensive survey work should be to determine the full range, accurate population size, and assess the needs for active conservation. The taxonomic status of this population is far from clear, as there are suggestions that this population may be a relict that is worthy of a higher taxonomic classification.

Determine dispersion and habitat use by the Grey Heron in Mauritania during and outside the nesting season; insure that all important sites are protected; assess the taxonomy of this population using molecular techniques.

Africa 9. Conservation of the Little Bittern in Madagascar

Goal: Better understanding of the distribution and population size of the Little Bittern in Madagascar and implementation of conservation actions.

The Little Bittern population endemic to Madagascar is effected by loss of wetlands on the island. As a result the population is considered vulnerable. As far as is known, it is restricted to a few sites. Identification and protection of these sites is an absolute priority. The population size needs to be better documented and a monitoring program conducted.

Inventory nesting sites to determine important areas and population size of the Lest Bittern in Madagascar; protect these areas; monitor the population.

Africa 10. Systematics of heron populations on the Seychelles

Goal: Better understanding of the taxonomic status of the heron populations on the Seychelles.

Little is known of the taxonomic status of the isolated populations of herons on the Seychelles. These may represent colonists from Madagascar, and may or may not be distinctive. Limited habitat on the Seychelles means that all sites need to be protected. Fortunately a new emphasis on wetland conservation is being shown by the government. It is of importance to understand the genetic distinctiveness of the populations there.

Conduct studies of the systematics of the disjunct heron populations on the Seychelles to determine conservation status.

Africa 11. Conservation of the White-crested Tiger Heron in West Africa

Goal: Better understanding of the distribution and habitat requirements of the White-crested Tiger Heron in West Africa and protection of the tropical forests of West Africa.

Nearly nothing is known about the biology, status or conservation needs of the White-crested Tiger Heron. This species, the only tiger heron in Africa, occurs in tropical forest swamps, is very secretive, has been little reported, and nearly unstudied. It is found sparsely distributed in the west African rainforests of Gabon, lower Congo, and northern Democratic Republic of Congo, although it has declined in other parts of the Congo. It has recently been reported from over 60 sites, suggesting that it may be widespread in suitable habitat. Collecting information on additional sites is essential to help understand its distribution, status, and trend. Basic information on its biology is needed. Clearly protection of the lowland tropical forests of West Africa is essential to the conservation of this species.

Collect information on the distribution and biology of the White-crested Tiger Heron; encourage protection of forests in which it occurs.

Africa 12. Status and conservation of the Slaty Egret

Goal: Protection of important sites and a thorough inventory of the population of the Slaty Egret.

The Slaty Egret is found only in the swamps and floodplains of the major river systems of Central Africa, in Zambia, northern Botswana and Namibia. It is poorly known biologically. Its population is small, and given threats to its restricted wetland habitat, it is considered to be vulnerable. Flood regulation has already caused it to disappear from one part of the Kafue Flats in Zambia, and the population is threatened by a variety of proposed water management actions, such as plans to harness the waters of the Okavango Delta. Plans to clear large areas of the Okavango Delta of tsetse fly may seriously affect the ecology of the entire area and reduce prey for the egrets. Spraying may also disturb nesting colonies. The proposed development of a rice-growing project in the eastern Caprivi, Namibia, may markedly alter the functioning of the Zambezi floodplain. The impact of tourism and livestock industries together with the constant reduction of potential breeding sites by reed-cutting and fires are all likely to have negative effects on its population. Data on populations of this species, while locally limited, appears sufficient for selection of sites for protection, such as the Kafue Flats, Liuwa Plain and Bangweulu Swamp, Zambia; Okavango Delta, northern Botswana; Zambezi Delta, Mozambique; Caprivi strip, northern Namibia. It is critical to establish these as important sites and to implement their protection. A monitoring program is needed to assess impacts and assure conservation measures are adequate. Ecological studies are needed to determine the dynamics of colony-site choice and site fidelity, foraging site selection, habitat-preferences, colony size, and populations. Population status needs to be determined throughout its range in both nesting and non-nesting seasons. Based on the inventory and existing information, important sites need to be recognized.

Identify and protect important sites; increase understanding of the distribution and conservation status of the Slaty Egret.

Africa 13. Status and trends of the Black Heron in Africa

Goal: Better assessment of the existing population size and trends of the Black Heron and better understanding of its biology.

Little is known about the population status and trend of the Black Heron in Africa. It is uncommon and there is suspicion that it is declining on the continent, although quantitative data are few. It is important to develop a survey program to better determine the current conservation situation. Information on its biology is needed, especially understanding relationship**s** between fluctuations in local populations and water levels or rainfall. A monitoring program should be developed.

Assess the existing population size and trend of the Black Heron; better understand its biology.

Africa 14. Conservation of the Black Heron in Madagascar

Goal: Arresting population decline of the Black Heron in Madagascar.

The population of the Black Heron is in serious decline in Madagascar, but its status is not well documented. There is a need to better understand the status of the Black Heron in Madagascar, begin a monitoring program, locate important sites, and begin conservation measures.

Assess the existing population size and trend of the Black Heron in Madagascar; institute conservation measures at important sites.

Africa 15. Status and ecology of the Rufous-bellied Heron

Goal: Better understanding of existing population size, biology, and conservation objectives of the Rufous-bellied Heron.

The Rufous-bellied Heron is local and uncommon. Breeding is apparently sporadic in response to fluctuating water levels. It appears to be declining. However, existing data are not sufficient to confirm this. This species may well be of higher conservation concern than its current conservation status suggests. It is urgent to update a baseline population estimate and distribution from all available information.

In addition surveys are needed to improve knowledge of the current population status and identify priority sites for conservation. So little is known about the biology of the species that detailed ecological studies are desirable, especially to achieve a better understanding of its relationship with water conditions.

Synthesize available information; carry out an inventory to assess the current population trends and to identify priority sites.

Australasia

The continent of Australia, the large islands of New Zealand and New Guinea, and thousands of small islands of Oceania scattered across the Pacific Ocean support important heron habitats.

This huge and diverse area is considered as a single heron conservation region. On the Australian continent, the climate fluctuates from extreme drought conditions to extreme flooding. Large wetland systems, the Fraser-Darling and Kakadu, historically supported large numbers of herons. Of the native herons, only the Cattle Egret has been extensively studied in Australia. Data on other heron species are fragmentary. Very little research has been carried out in any of the island countries. Herons are known to move between Tasmania and the mainland of Australia and between Australia and Papua New Guinea. In many areas of this extensive region data are too sparse to truly understand the status and conservation issues of the herons there.

Australasia 1. Conservation of the Great Egret in New Zealand

Goal: Maintaining protection of known nesting colony and better understanding of important feeding areas.

The total population of Great White Egret in New Zealand is about 100 birds and so is considered to be vulnerable. The viability of such a small population is uncertain and critically dependent upon environmental and anthropogenic influences. Although it is encouraging that the population appears healthy and currently to be increasing, this small population must continue to be carefully monitored and its population dynamics and limiting factors studied. The colony and surrounding feeding areas are being guarded, and this needs to continue. It is important to inventory apparently suitable habitat during the breeding season to locate non-breeding birds and to assess the possibility that other colonies exist. Information is needed on feeding areas used during and outside nesting season to identify important sites. Research is also needed into the migration patterns and habitat usage along migratory paths.

Continue to protect the known colony site; survey other potential habitat for additional colony sites and for feeding habitat use year round.

Australasia 2. Conservation of the Australasian Bittern

Goal: Better understanding of the status each population of the Australasian Bittern and identification and protection of important sites.

The current population of the Australian Bittern is not well understood. Overall its populations is estimated to be 2500-10000, the range suggesting the wide confidence limits on the estimate. In Australia, it is thought to number not more 2500 birds. But no site is known to have more than 100 birds, and most recently reported sites hold fewer than 10 birds. Year to year variability in populations size due to differing environmental conditions is not well known, but could be significant to its long term population trend. Clearly more accurate monitoring is needed. Yet despite this uncertainty, it is undoubtedly decreasing in Australia and Tasmania as its habitat is altered. As a result, the Australian populations are considered vulnerable. In New Zealand, New Caladonia and the Loyalty Islands populations are smaller and considered to be endangered. Better data are needed to verify present status and distribution. Important sites for its conservation need to be discovered throughout it range. In each part of its range, awareness should be increased and information provided to local people. Throughout its range strict protection of the species and sites needs to be implemented.

Conduct inventories of the population status and important sites for all populations of the Australasian Bittern; assess trends; protect all important sites; implement additional conservation actions as determined.

Australasia 3. Status of the New Guinea Tiger Heron

Goal: Better understanding of distributions, habitat requirements, important sites, and conservation needs of the New Guinea Tiger Heron.

The New Guinea Tiger Heron is a bird of forested streams, confined to Indonesia and Papua-New Guinea. The species is considered to be near threatened. There is no population information on this species, and no information on its basic biology. In fact only thirty confirmed sightings have been documented in the last fifteen years, and it is currently known to be constantly present at only one site. It is likely more widespread than appreciated but is apparently absent from what should be appropriate habitat. It is among the least known herons in the world. Even the most basic data on its conservation status are needed. This heron is suspected to favor broad, heavily

forested lowland rivers, a habitat throughout its range that is under extreme pressure from logging and pollution. The most urgent action needed is to clarify the current details of distribution, provide a population estimate, and carry out ecological studies into its habitat requirements. Protection of the remaining forested lowland rivers is likely a requirement for the species.

Clarify the current distribution of the New Guinea Tiger Heron; provide better estimation of breeding populations; determine actions needed for conservation of lowland river forests.

Australasia 4. Persistence of the Little Bittern in New Zealand

Goal: Clear determination of persistence of the Little Bittern in New Zealand.

The New Zealand population of the Little Bittern is considered to be extinct. Data are not sufficient to determine this with certainty. A survey is needed to better determine whether the population persists.

Survey potential habitat of the Little Bittern in New Zealand to determine its persistence.

Australasia 5. Distribution and status of Sumatran Heron

Goal: Clarification of the current status and distribution of Sumatran Heron populations.

The Sumatran Heron is widespread but generally is reported to occur in only small numbers in any location. It uses lowland forests, a habitat under threat in most areas. It is widespread in distribution but sparse locally. It has been shown to abandon feeding and breeding areas close to human habitation. In New Guinea, considerable appropriate habitat remains and there seems to be no immediate threat in northern Australia, except perhaps along the developing east coast. Its status on Pacific islands is unclear. More information is needed on actual distribution and important sites. Its scarceness and solitary nature makes surveys and monitoring difficult, so information may need to be gleaned from numerous sources.

Survey status of Sumatran Heron over its range; identify important areas.

Australasia 6. Conservation of the Striated Heron in Chagos, Maldives and Diego Garcia

Goal: Protection of the Striated Heron in the Chagos, Maldives, and Diego Garcia.

The Striated Heron populations in Chagos, the Maldives, and Diego Garcia are considered to be vulnerable because of their restricted range on offshore islands. Populations on each island group were once considered separate subspecies (*Butorides striatus albolimbatus, Butorides striatus didi, Butorides striatus albidulus*), suggesting some level of distinctiveness. Status of the populations are not well known, and a survey is needed to determine population size and important sites on each island. Threats include the US military activities on Diego Garcia and increasing tourism on the Maldives. The status of the population on Chagos Islands is of particular interest, given the lack of human settlement there in the past decades. For all these islands, it is timely to develop a priority list of areas and sites for full protection.

Conduct survey of the Striated Heron in Chagos, the Maldives, and Diego Garcia; determine important sites for preservation; conduct a status and taxonomic review of the populations.

Australasia 7. Conservation of the Grey Heron in Sumatra

Goal: Assessment of the conservation status of the Grey Heron in Sumatra.

The Grey Heron population of Sumatra is much restricted and so is considered to be vulnerable. This population has previously been described as a distinct subspecies (*Ardea cinerea altirostris*). It is restricted to the island, where it occurs over a limited range of habitats, most of which are under some degree of threat. Information on waterbird populations on the island is sparse, so it is not currently possible to provide a population estimate greater than 700 mature individuals. Surveys covering the known or suspected distribution of the Grey Heron in Sumatra are needed to improve knowledge of taxonomic status, distribution and abundance. If the results suggest that there is a real cause for concern, then a more intensive conservation strategy should be prepared.

Conduct survey and assess conservation status and needs of the Grey Heron in Sumatra.

Australasia 8. Conservation of the Indian Pond Heron in the Maldives

Goal: Protection of the Indian Pond Heron in the Maldives.

The Indian Pond Heron population in the Maldives is vulnerable. It is highly restricted, exposed to pressure from tourism and habitat degradation. In the short-term, the most important action must be to determine the current size of the population, together with an assessment of habitat availability, and the degree of threat to breeding, and foraging habitats. The extent to which the species has a market in the Maldives needs to be determined and, if this exists, it needs to be controlled. Promotion of conservation awareness clearly needs to be a fundamental component of a conservation project.

Conduct an inventory of the population in the Maldives; determine and protect important sites; undertake a public awareness campaign to stop local capture and use of the species.

Australasia 9. Conservation of the Black Bittern in Australia

Goal: Clarification of conservation status, distribution, and needs of the Black Bittern in Australia.

The Black Bittern population in Australia is poorly known and suffering from wetland loss, habitat destruction and water problems. Despite lack of data, it is considered to be decreasing and is considered vulnerable overall in Australia. It has been classified as endangered in Victoria. It is necessary to establish its conservation status on a regional and national basis and to determine conservation strategies for its survival.

Determine conservation status of Black Bittern in Australia and ascertain conservation needs.

Australasia 10. Conservation of Little Bittern in Australia

Goal: Better determination of conservation status and needs of the Little Bittern in Australia.

The status of the Little Bittern is very poorly known in Australia, but it is uncommon and probably threatened by wetland loss and water management. It is thought to be decreasing and has been listed as a species of concern by two Australian states. It is necessary to determine its conservation status on a regional and national basis and to provide conservation strategies for its survival.

Determine conservation status of Little Bittern in Australia; ascertain conservation needs.

Australasia 11. Network of important heron sites in Australia

Goal: Establishment of a network of important sites for herons throughout Australia.

Many important sites for heron colonies are known in Australia. Some of these change from year to year, making preservation of particular sites more difficult. Based on available information and new inventories, colony sites used by herons throughout Australia should be identified and collated in a data base. These should be recognized as important sites for herons and networked to assist in their conservation. Given the vagaries of the Australian climate, these sites would not be expected to be used every year, but still should be protected to allow movement among sites in different years. This network could effectively be part of a more-encompassing waterbird site network.

Establish a network of sites important to herons around Australia.

America

Many species of herons are found throughout the Americas. In southerly locations both breeding and wintering populations intermingle seasonally.

Post breeding dispersal and migration result in large-scale annual movements of birds. For conservation purposes the entire New World is treated as a single region. The region includes North America, Central America, The Caribbean, and South America, as well as biogeographically (and politically) connected islands such as Bermuda, Falklands, Hawaii, and Galapagos.

South America, with its numerous and diverse wetlands and extensive floodplain forests, supports a particularly rich heron fauna, several genera and species being endemic to the continent. Data on nearly all populations are severely limited, but especially for species that nest singly or form small and dispersed colonies. Populations cannot now be estimated to any realistic degree of certainty, and even details of ranges are poorly documented. South America hosts some of the least understood herons of the world. To acquire more knowledge is at present a major concern and also a challenge in view of the inaccessible areas to cover, such as the huge Amazon and Pantanal Basins. In Central America, only recently has information begun to be assembled. In the Caribbean, heron populations are small and limited habitats on various islands put populations at risk. The Caribbean, Central America and northern South America hold habitat of importance to migrating and wintering North American populations. In contrast to the Neotropics, heron populations have been rather extensively studied in North America. Important sites are known for most species, and many are protected. A continental nesting data base exists, but regional or national initiatives for coordinated long-term censuses of colonial herons have not succeeded to date. An extensive, cooperative, infrastructure for bird conservation exists in Canada, USA, and Mexico, in which herons are included. There is a continuous need for improving monitoring programs in order to gain insight into status and trends and for the protection of nesting sites.

America 1. Distribution and status survey of herons in the Neotropics

Goal: Better understanding status of herons in Latin America and the Caribbean.

Population sizes, and even the distribution, of species of herons in the Neotropics are very poorly known. With the exception of some local populations, nearly no information exists on numbers and important sites for herons within most countries. Areas of particular concern are the Amazon, Pantanal, Llanos, Central America and the islands of the Caribbean. Among species of particular concern are the Zigzag Heron, Agami Heron, tiger herons, *Butorides* herons, Cocoi Heron, Reddish Egret, Great Blue Heron (dimorphic form), Capped Heron, Whistling Heron, and the newly colonizing Little Egret. Information on all species in all nations of the region needs to be improved through national inventories of nesting and wintering populations. Inventories should be organized on a national basis and the results communicated to both national agencies and national environmental organizations as appropriate. Information from across the region should be collated and synthesized into regional and national assessments. Hemispheric partnerships among governmental and nongovernmental conservation organizations, researchers, and nature tour guides and other groups are a way to gain information. A hemispheric web-based data entry system should be developed. Among existing networks, sites important to herons need to be identified and joined in a hemispheric communication network.

Conduct national surveys of heron population sizes throughout the Neotropics; develop a hemispheric data base for population information.

America 2. Population sizes and trends of herons in North America

Goal: Better quantification of the population sizes and trends of herons in North America.

North America has a long and extensive record of censuses and surveys of waterbirds, including herons. Yet estimating continental population sizes remains difficult due to the complexity, incompleteness, and incompatibility of the existing record. Given the attention bird conservation, including herons, receive in North America, it is essential that existing data be better evaluated and that heron monitoring be more encompassing, more consistent, and better coordinated. The existing North American data base for waterbird censuses needs to be continued and enhanced. Evaluation of these existing records to better estimate populations of heron in North America is needed, with due consideration for comparability. A continental monitoring program is needed that is both sufficiently accurate and sufficiently precise to show population size and trends.

Determine population size, and trends of herons in North America; continue North American Colonial Bird data base; establish a continent-wide program to monitor nesting colonies.

America 3. Important sites for herons in North America

Goal: Identification and monitoring of important sites for herons in North America.

The identification of important areas for birds is well underway in North America, at both national and sub national scales. It is now or will soon be possible to extract from the overall list, a selection of sites important to herons. These sites should be identified, systematized, monitoring programs developed, and conservation needs assessed.

Evaluate existing information to determine most important sites for herons; develop monitoring and conservation programs at these sites.

America 4. Herons and conservation partnerships in the Americas

Goal: Incorporation of herons in programs emanating from more inclusive conservation initiatives.

In Canada, USA, and Mexico, considerable progress has been made in developing coordinated approaches to bird conservation. The North American Bird Conservation Initiative serves as a facilitating body for much of bird conservation in the three countries, and the Waterbird Conservation for the Americas initiative does the same for waterbirds throughout the hemisphere. It is essential that heron conservation continue to be a part of these programs. Public lands, states within the United States, and non-governmental conservation organizations have recognized their roles in waterbird conservation, and many are initiating waterbird conservation planning and action on the ground, especially colony site protection. Wetland managers have particularly begun to include heron conservation within their activities. Herons need to continue to be a concern within these programs. Heron conservationists should participate in multi-species bird conservation planning, programs, initiatives, and conservation activity assuring that the needs and opportunities for heron conservation are a part of these larger conservation programs. Parks, refuges, nature reserves, national forests, private reserves, wildlife management areas, and similar protected areas have been set aside throughout the Americas, especially in North America. Mangers of these reserves must be at the forefront of conserving herons on their site, and so should be encouraged to consider the needs of herons in their plans and activities. There is a need to provide funding and training for local conservation organizations and individuals that could be encouraged to adopt and protect colonies.

Incorporate heron conservation within more encompassing bird conservation initiatives and management of protected areas.

America 5. Status and distribution of the Zigzag Heron

Goal: Better understanding of the status of Zigzag Heron throughout South America.

The status and biology of Zigzag Heron is nearly unknown. It has been reported only from a few sites in the greater Amazon, although it is expected to occur throughout forested tropical South America. Recent observation extend its confirmed range into the Orinoco and Llanos. It is a highly unusual heron in its morphology and likely its habits, but its biology is little understood and needs to be studied. While it is not likely that surveys can be conducted over its potentially vast range, a program to encourage reports on its occurrence can improve information on its dispersion, habitat, and population centers. Any location where more than a few occur, at this point, should be considered an important site for the species.

Improve knowledge of the distribution and habitat use by the species through encouraging and synthesizing reports; protect all nesting sites discovered.

America 6. Status and biology of the Agami Heron

Goal: Better understanding status and nesting biology of the Agami Heron.

The Agami Heron is quite an unusual heron. Its biology is little known, as shown by the recent discovery that it sometimes nests in large colonies. Likely there is much to be learned about its ecology and behavior that is of value to its conservation. Needed investigations include breeding behavior, foraging dispersion during nesting and year-round movements. Its dependence on fragile river and riparian forests needs to be better understood. Concentration in large colonies raises the importance of identifying and protecting these colony sites. Large nesting sites should be sought, characterized, and protected. Sites presently known in Belize and French Guiana are top priorities. Feeding areas associated with nesting colonies need to be determined.

Investigate biology and status of the Agami Heron; locate and protect large colony sites and associated feeding areas.

America 7. Distribution and status of Great White Heron and Reddish Egret in Caribbean

Goal: Clarification of the status of the Great White Heron and Reddish Egret on Caribbean coasts.

Two primarily North American herons are restricted to tropical coastal environments, which are degrading region wide. The conservation status of the dimorphic form of the Great Blue Heron, called the Great White Heron, and the Reddish Egret, also dimorphic, are of concern. These both may be declining in their North American strongholds. Records of individuals and small nesting populations of the Great White Heron and the Reddish Egret have been reported from several areas of the Caribbean and Central America. But the true status of these populations is not known. Given downward trends in the population core in North America, it is imperative to understand the full distribution of these herons.

Conduct surveys and establish communication networks to determine the status of Great White Heron and Reddish Egret along Caribbean coasts.

America 8. Conservation of the Reddish Egret in North America

Goal: Better delineation of the conservation status of the Reddish Egret in North America.

The Reddish Egret has a restricted geographical range and exploits a vulnerable coastal habitat. The total global population of the Reddish Egret is estimated to be about 12000-18000, although populations outside the United States may number fewer than 1000. Due to apparent declines, the population segments in North America are considered to be vulnerable. This dimorphic species is essentially restricted to shallow, tropical lagoons, which are suffering from ecological changes in recent years. Changing hydrology through building dikes and canals, thus altering the natural functioning of a coastal wetland, reduces the quality of the shallow flats on which these birds feed. Estuaries and coastal lagoons are exposed to contamination and under constant threat from development. Migratory pathways of North American Reddish Egrets are little known. There have been no recent population surveys. The genetics of the various populations are not understood. Important nesting sites need to be identified, and monitoring programs put in place. Fortunately, a Working Group has been established to coordinate research and conservation programs.

Survey the numbers of nesting Reddish Egrets in North America; determine populations of conservation concern; identify and protect important nesting sites and the related foraging habitat.

America 9. Conservation of the Great White Heron in Florida

Goal: Conservation of the Great White Heron in Florida.

The Great Blue Heron population found in the extreme south of southern Florida and in parts of the Caribbean and Central America is unusual for the high proportion of individuals having all white plumage. This population, called the Great White Heron, has previously been recognized as a distinctive species and is more recently considered to be a subspecies of the Great Blue Heron. The population clearly differs from continental Great Blue Herons, but the extent of that differentiation remains unclear despite repeated study. In South Florida the Great White Heron has a restricted range in coastal lagoons. The population in South Florida is thought to be about 1000 birds. A long term monitoring program in the southern Florida Keys show the population to be decreasing there. There has not been consistent monitoring elsewhere in its Florida range Fortunately nesting sites in Florida are protected. The cause of the decline in the Florida Keys is not known. In Florida Bay, the population has been shown to be under food stress. Little is known about seasonal movements, nesting success, survivorship, and year-round habitat use and needs. Causes of the apparent population decreases in Florida Bay and in the lower Florida Keys need to be determined quickly as the downward trend is rapid.

Conduct censuses of the Great White Heron in Florida; develop monitoring programs; further evaluate population structure and demography; determine and reverse causes of population declines.

America 10. Conservation of the Little Egret in Barbados

Goal: Protection of the Little Egret in Barbados.

The Little Egret recently colonized the Western Hemisphere as a nesting species, becoming established in Barbados, West Indies. Its population there has not significantly increased over the decade since its colonization. It nests on a single tiny site and depends for feeding on the very few remaining wetlands on the island. Because of its small population and restricted habitat, this population is considered to be extremely vulnerable. The single nesting site,

in a private nature reserve, is degrading and requires active management before it disappears. Most feeding sites are not officially protected. In fact most sites are privately owned and managed and so have no assurance of persistence in long term. Current plans for parks in and near the present nesting sanctuary would decrease available habitat. Active management of the nesting site and protection of remaining wetlands, including privately maintained wetlands, are essential. The public in Barbados seems little aware of the presence of the species, and information needs to be provided to the public and the government. Individual birds are increasingly seen on other islands, suggesting dispersal, and the status of these birds needs to be better understood.

Manage nesting site of the Little Egret in Barbados; protect and enhance all wetlands used in Barbados; begin a public awareness campaign to highlight the species' presence and conservation needs.

America 11. Conservation of Green Heron in Bermuda

Goal: Protection of the nesting sites and feeding areas of Green Heron in Bermuda.

The Green Heron recently colonized Bermuda and nests at only a few sites. Due to its recent colonization, few nesting sites, and small population, this population is considered to be vulnerable. It is recently nesting at more sites, and the population appears to be expanding. This presents a nearly unique opportunity to document a natural colonization in detail. The changing status of the population should be documented thoroughly. All nesting sites need to be identified, and all nesting sites and feeding sites need to be protected. This likely involves conserving all of the remaining mangroves and freshwater wetlands on the island. Wetlands are so few, that creation of additional wetlands would benefit herons, and other species, by providing additional foraging and nesting opportunities. Among its prey, the heron appears to eat an endemic killifish. The potential impact of the heron on the fish needs to be understood and if a problem exists, ways found to accommodate both species. Popularization of the presence of the Green Heron, as a new species to Bermuda, would provide public support for conservation of its habitat.

Conduct surveys to document the changing status of the species on Bermuda; protect all nesting and feeding sites; better popularize the species.

America 12. Population status of the Yellow-crowned Night Heron on Bermuda

Goal: Re-assessment of the population status of the Yellow-crowned Night Heron on Bermuda.

The Yellow-crowned Night Heron was purposely introduced into Bermuda. It is considered to be replacing an extinct form of the night heron. It was introduced to control land crabs, and the experiment succeeded. The species is now well established on the island. It is time to reassess the population size, and synthesize and further evaluate the history of the introduction. It is also important to document its important nesting sites to assure their future conservation through island-wide conservation planning.

Reassess status of the Yellow-crowned Night Heron in Bermuda; identify important sites; develop conservation plan for protecting these sites.

America 13. Status of the Least Bittern in Peru

Goal: Understanding status and distribution of Least Bitterns in Peru.

The Peruvian populations of the Least Bittern are little understood. *Ixobrychus exilis peruvianus* is an apparently disjunct population in several lagoons and marshes along a narrow coastal belt of Central Peru, a heavily populated area, *Ixobrychus exilis erythromelas* occurs in the north and east of the country. Its status and distribution is not sufficiently understood. Fishing, duck hunting, reed cutting for basket making, pesticide run-off from adjacent agriculture, public recreation, livestock grazing and drainage likely affect wetlands throughout this range. To better understand the status of the species, an inventory is needed and important sites determined throughout Peru. Also the subspecific systematics of these populations needs to be better studied.

Conduct nationwide inventory; determine important sites; investigate taxonomic distinctiveness of Least Bitterns in Peru.

America 14. Status and conservation of American Bittern in North America

Goal: Better documentation of the status, important sites, and trends for American Bitterns throughout North America and development of conservation actions at important sites.

The nesting sites of the American Bittern in North America are poorly documented. Difficulties in techniques have inhibited development of a census and monitoring program, so neither population size nor trend is well understood. It is thought, however, that the population is decreasing and its range retreating northward. Recent developments in acoustic sampling, in both Europe and America, hold promise that the species finally can be appropriately censused and monitored. It is necessary to fine tune the protocol and put it into place to determine range, population size, and important areas for American Bitterns throughout North America. Most sites are likely on protected areas in North America, and managers of these sites should be enlisted to conduct the monitoring and to develop conservation plans at each site. The causes of the apparent decrease in the population and range are not known, but it is similar to the situation faced by the other great bittern species. Determination of the reality and cause of decline is needed.

Adopt a standardized census protocol and conduct surveys of the American Bittern throughout its breeding range; increase investigations of the cause of the apparent population decrease; identify, protect, and manage important nesting areas.

America 15. Status of the Streaked Bittern in South America

Goal: Better understanding of the status and distribution of the Streaked Bittern.

The status of the Streaked Bittern is not well understood. It has been thought to be divided into two populations, one in northern South America and one in southern South America. But recent records from between these ranges suggest it may be more widespread. The range needs to be clarified. A third apparently disjunct population is found on the coast of Chile. There is almost no information on this Chilean population. It has been reported from Aconcagua, Region Metripolitana de Santiago, Libertador General Bernado O'Higgins, Maule, Bio-Bio, La Araucana and Los Lagos provinces, but the presence and status of herons in this area remain unclear. Habitat requirements of the several populations are unclear, given its wide range. Collection of birds and eggs for subsistence and trade may have a significant effect. Determining it range, conservation issues, and patterns of geographic variation are high priorities.

Conduct a survey of the status, distribution and geographic variation of the Streaked Bittern in South America

America 16. Status and biology of the Bare-throated Tiger Heron

Goal: Better understanding of the status and biology of Bare-throated Tiger Heron.

The Bare-throated Tiger Heron is the only heron whose population is centered in Central American. It generally has been thought to occur only along streams and forests. However on the Pacific coast, it has recently been documented to also use rocky shorelines, mangroves swamps, and even beaches. Clearly there is much to be understood about habitat use, distribution, and biology of this species throughout its range. Status of the species in the Gulf of Panama, coastal Mexico, and extreme northern Colombia needs to be better determined.

Determine the distribution, conservation status, and taxonomic status of all populations of the Bare-throated Tiger Heron; better delineate habitat use.

America 17. Status of the Fasciated Tiger Heron in the Neotropics

Goal: Better understanding of the status of the Fasciated Tiger Heron in the Neotropics.

The Fasciated Tiger Heron occurs in South and Central America, although the details of its range are not clear. Populations appear to be separated by the Andes and Amazon, and a third subspecies is recognized from Argentina. Recent records from northeastern South America suggest a wider range. Patterns of geographic variation need to be better studied, using molecular techniques. It is a very little known species biologically. It seems to occupy stream edge forests, a vulnerable habitat. Its populations are likely small, and likely threatened by habitat loss. Its range needs to be better understood and important areas identified.

Evaluate distribution, population size, and geographic variation of the Fasciated Tiger Heron throughout its range.

America 18. Systematics of Butorides Herons

Goal: Better definition of systematic relationships among *Butorides* populations.

Presently, the Striated Heron and Green Heron are considered to be separate species, although they previously had been considered the same, as had the population on the Galapagos. Different studies of specimens come to different conclusions, suggesting the need for use of additional characters, such as those molecular studies can provide. It is likely that the two forms interbreed in the southern Caribbean, although there is no evidence of interbreeding where their ranges meet in Central America. Several subspecies of Green Heron have described as has the distinctive population on the Galapagos. Study of the taxonomy of *Butorides* in the America using molecular techniques is needed. Expanding the study worldwide would be even more definitive. Knowing the patterns of geographic variation and evolutionary history of the group is needed to determine conservation strategy for the populations.

Re-examine the geographic variation of *Butorides* populations in the Americas.

America 19. Systematics of the Boat-billed Heron

Goal: Clarification of the taxonomy of the Boat-billed Heron.

It appears that the Boat-billed Heron is part of an ancient linage of herons. Several populations have been recognized as subspecies based on plumage differences. It is likely that the patterns of geographic variation and taxonomy of the Boat-billed Heron are not yet sufficiently clarified. There may be other subspecies or even species within this complex. Molecular techniques have not been applied to the species/subspecies taxonomy of this intriguing species. Knowing the evolutionary relationships within the taxon is important to defining conservation objectives for populations.

Conduct taxonomic study of Boat-billed Herons throughout its range, using molecular techniques.

America 20. Status and distribution of the Capped Heron

Goal: Better understand the population status, distribution, and biology of the Capped Heron.

The Capped Heron, a distinctive neotropical heron, is poorly known. It is thought to be an Amazonian species, but records of the details of its distribution are few. Its biology of nearly unknown. Basic information on biology and distribution is needed.

Determine the distribution and population status of the Capped Heron.

America 21. Status of the Yellow-crowned Night Heron

Goal: Better understanding of the status of Yellow-crowned Night Heron populations throughout its range.

The Yellow-crowned Night Heron is a species widespread in North America, Caribbean and coastal Neotropics. Several populations have been recognized as subspecies, but other populations may also be distinctive. Because conservation most effectively takes place on a population basis, the status of the heron in its various populations needs to be determined and conservation measures enacted as appropriate. Populations requiring particular attention include: Western Mexico; Central America; Panama; Tobago – especially Kilgwyn Swamp, Bon Accord Swamp, and Boccoo Reef reserve; coastal Colombia; Galapagos (the most distant population); Bermuda; and Caribbean Islands.

Conduct status surveys and study patterns of geographic variation of Yellow-crowned Night Heron populations in various parts of its range.

America 22. Status of the Little Blue Heron

Goal: Better understanding of the conservation status of the Little Blue Heron throughout its range.

The Little Blue Heron is considered to be of conservation concern in North America. Due to difficulty in censusing this species, concern is based primarily upon a lack of information. Its status is similarly little known through the rest of its range. In order to determine the conservation needs of this species, its true conservation status needs to be determined in North America and also through the rest of its extensive range. A focused survey is needed to determine nesting populations in North America. A general idea of status also needs to be determined in the rest of its range, likely thorough development of a communication network.

Conduct a conservation status assessment of the Little Blue Heron in North America and determine overall range-wide status.

America 23. Conservation of the Great Blue Heron in Western North America

Goal: Establishment of a network of protected nesting and feeding sites for the Great Blue Heron in northwestern United States and southwestern Canada.

The Great Blue Heron population of the coastal Washington, USA, and British Columbia, Canada, is recognized as distinct subspecies, a determination that recent study reconfirmed. The population is restricted and becoming fragmented. Its reproductive success has been declining in recent years as nesting colonies are increasingly predated by Bald Eagles. The population is about 10000 individuals, so at times remains robust. There is a need to establish a network of protected foraging and nesting sites that qualify as important sites for the subspecies. Numbers and reproductive success need to continue to be monitored. Sufficient habitat should be secured to ensure a viable population of the Great Blue Heron on the coast of Washington and British Columbia.

Determine and establish a protective network of important sites for nesting and foraging of the Great Blue Herons in coastal Washington and British Columbia.

America 24. Status and biology of the Lava Heron in the Galapagos

Goal: Better understanding of the status and biology of the Striated Heron population on the Galapagos Islands.

The Striated Heron of the Galapagos Islands, called the Lava Heron, is distinctive in both its plumage polymorphism and biology. Although widespread, on the shores of the islands, its biology is little reported. Nor is its status and population size well understood. The population deserves increased attention for both its biology and conservation. A monitoring program should be put in place to assure its continued status.

Better understand biology and status of Striated Herons on the Galapagos; establish monitoring program.

America 25. Status of Old World herons in the western hemisphere

Goal: Better understand status of Old World Herons in the western hemisphere.

The Grey Heron, Little Egret, and Western Reef Heron are observed with some regularity in the Western Hemisphere, particularly in the West Indies, where the Little Egret has become established on Barbados. It is being seen on other islands in recent years. Recording the Grey Heron and white form of the Little Egrets, superficially similar to North American herons, require observers be aware of their potential presence. The dark form of the Little Egret (also known as the western Reef Heron) has been observed along the North American east coast. The possibility of these species being more common than presently thought needs to be examined so that occurrence and possible colonization of the hemisphere can be documented.

Increase awareness and reporting of Grey Herons, Reef Herons and Little Egret sightings in the Western Hemisphere, especially in the West Indies.

America 26. Conservation of herons in the Everglades

Goal: Restore populations of herons in the Everglades of southern Florida.

The extensive marshes of the Florida Everglades were once one of the key areas for herons in North America. These marshes historically supported all North American species. Nearly all have nesting populations, and all winter in the area. Populations of distinctive forms such as the Great White Heron and Reddish Egret depend on coastal zones supplied by runoff from the Everglades. All evidence suggests that heron populations have declined since the institution of management of water in the Everglades, especially in the past 40 years. Much planning and resources are being devoted to restoring the Everglades. Within this program, the restoration of heron populations needs to be a high priority. Monitoring and restoration focus recently has been on a couple species that are readily counted. All species need attention, however.

Restore heron populations in the Everglades.

America 27. Reduce conflicts between herons and aquaculture

Goal: Institution of policies to reduce conflicts between herons and aquaculture throughout hemisphere.

In many areas of the Americas, herons come into conflict with aquaculture facilities. Thousands of birds are killed yearly at aquaculture facilities in the United States, even where laws are in effect that can regulate this killing. In other parts of the hemisphere legal protections are not present or enforced. Killing herons can result in local reduction of populations, but seldom effect levels of depredation. Killing herons outside the breeding season can effect populations over much larger areas than the facility itself. Studies are needed to determine the true impact of depredation at various types of facilities. It should be encouraged to design facilities that do not encourage predation by herons. Laws, regulations, and regulatory policies need to assure that local populations of herons are not adversely affected by heron control at aquaculture sites.

Reduce impact of control of herons at aquaculture facilities.

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