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No. 39 (AEWA)



# International Single Species Action Plan for the Conservation of the Madagascar Pond-heron

*Ardeola idae*



Convention on the Conservation of  
Migratory Species of Wild Animals (CMS)

Agreement on the Conservation of  
African-Eurasian Migratory Waterbirds (AEWA)

**International Single Species Action Plan  
for the Conservation of the Madagascar Pond-heron**

*Ardeola idae*



**CMS Technical Series No. 20**

**AEWA Technical Series No. 39**

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First draft: 10 June 2008, presented to experts

Second draft: 29 July 2008 presented to Range States and AEWA Technical Committee

Third draft: September 2008, adopted by the 4<sup>th</sup> session of the Meeting of the Parties to AEWA in September 2008 and the 9<sup>th</sup> session of the Conference of the Parties to CMS in December 2008

### **Geographical Scope**

This International Single Species Action Plan requires implementation in the following countries regularly supporting Madagascar Pond-heron: **Burundi, Comoro Islands, Democratic Republic of Congo, France** (Europa - Iles Eparses, administered from Réunion and Mayotte - eastern Comoro Island), **Kenya, Madagascar, Malawi, Mozambique, Rwanda, Seychelles** (Aldabra), **Uganda, United Republic of Tanzania, Zambia, Zimbabwe.**

### **Reviews**

This International Single Species Action Plan should be revised in 2018. An emergency review will be undertaken if there are sudden major changes liable to affect the population.

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**Picture on the cover:** Madagascar Pond-heron *Ardeola idae* © Ray Tipper

**Drawing on the inner cover:** Madagascar Pond-heron *Ardeola idae* © Sarah Plazzotta

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## CONTENTS

Preface .....	4
List of Acronyms .....	5
Executive Summary .....	6
1. Biological Assessment .....	7
2. Available Key Knowledge .....	11
3. Threats . .....	14
4. Policies and Legislation Relevant for Management .....	19
5. Framework for Action .....	23
6. Monitoring and Evaluation .....	29
References .....	30
Annex 1: Localities where the Madagascar Pond-heron has been recorded .....	32

## **Preface**

This International Single Species Action Plan for the Conservation of the Madagascar Pond-heron (*Ardeola idae*) was commissioned to the BirdLife International Africa Partnership Secretariat and compiled by the Species Programme Manager, Mr. Paul Kariuki Ndong'ang'a and Eric Sande, Lecturer at the Zoology Department of the Makerere University in Kampala, Uganda. The drafts of the plan went through rigorous consultations including comments from experts, governmental officials from the Range States, CMS Scientific Council Members and the AEWA Technical Committee. The third draft was adopted by the 4<sup>th</sup> session of the Meeting of the Parties to AEWA in September 2008 and the 9<sup>th</sup> session of the Conference of the Parties to CMS in December 2008. The Action Plan follows the format for Single Species Action Plans approved by the 2<sup>nd</sup> Session of the Meeting of the Parties to AEWA in September 2002.

## **List of Acronyms**

- ABO:** Association Burundaise pour la Protection des Oiseaux  
**AEWA:** Agreement on the Conservation of African-Eurasian Migratory Waterbirds  
**ASITY:** ASITY Madagascar / the Malagasy League for Bird Conservation  
**CBD:** Convention on Biological Diversity  
**CITES:** Convention on International Trade in Endangered Species of Wild Fauna and Flora  
**CMS:** Convention on the Conservation of Migratory Species of Wild Animals  
**DRC:** Democratic Republic of Congo  
**EIA:** Environmental Impact Assessment  
**IBA:** Important Bird Area  
**INECN:** Institut National pour l'Environnement et la Conservation de la Nature (Burundi)  
**MEEFT:** Ministère de l'Environnement, des Eaux et Forêts et du Tourisme (Madagascar)  
**MINITERE:** Ministry of Land, Environment, Mines and Water Resources (Rwanda)  
**MPH:** Madagascar Pond-heron  
**NP:** National Parks  
**ORTPN:** Rwanda Office of Tourism and National Parks  
**PBZT:** Parc Botanique et Zoologique de Tsimbazaza (Madagascar)  
**Ramsar:** The Convention on Wetlands, signed in Ramsar, Iran, in 1971  
**SIF:** Seychelles Islands Foundation  
**SSG:** Site Support Group  
**WHC:** Convention Concerning the Protection of the World Cultural and Natural Heritage, adopted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1972  
**ZICOMA:** Zones d'Importance pour la Conservation des Oiseaux a Madagascar. Antananarivo

## Executive Summary

The Madagascar Pond-heron *Ardeola idae* is listed as Endangered in the IUCN Red List. This is because it has a very small population (estimated at 2,000 – 6,000 individuals) which is undergoing a continuing decline. Whilst it remains fairly widespread in Madagascar, populations are low. It breeds from October to March in Madagascar, Aldabra (Seychelles), Mayotte (eastern Comoro Island, France) and Europa (Iles Eparses, administered from Réunion, to France). It has a large non-breeding range in Central and East Africa including the Comoro Islands, Mozambique, Zimbabwe, Zambia, Malawi, the United Republic of Tanzania, Kenya, Uganda, Burundi, Rwanda and the Democratic Republic of Congo; and is also a vagrant in Angola and Somalia.

The main threats directly or indirectly affecting the Madagascar Pond-heron include habitat destruction and degradation; human disturbance at nesting sites; reduced nesting sites leading to competition for nesting, feeding and roosting sites; and collection of eggs and young birds. In Madagascar, there is increasing evidence of hybridisation with the much more common Squacco Heron *A. ralloides*, although the latter does not breed on Mayotte, Aldabra or the Comoros.

The purpose of this action plan is to improve the current conservation status and knowledge base of the Madagascar Pond-heron within the next 10 years. The following are among the priority conservation actions recommended to address the identified threats in order to achieve this purpose: (1) regulate access to sites during the breeding season, including designing and implementing community-run control, (2) develop and/or support the implementation of existing management plans of the known breeding sites, (3) prevent development which will reduce the species' breeding habitat, (4) designate all breeding sites under national protected area legislation and as Ramsar sites, (5) implement EIA studies in the species habitats before any development, (6) make the status, threats and the species' priority actions more known and appreciated by the general public, (7) perform coordinated censuses in all countries and conduct training for data collectors in identification and survey techniques in order to determine the actual population size and trends, (8) undertake research to determine the extent, impacts and causes of hybridisation of *A. idae* with *A. ralloides*, (9) implement field surveys to identify all breeding colonies in Madagascar and key sites in the non-breeding range, and (10) study the habitat requirements of the species.

Emphasis for site conservation activities will focus on Madagascar, Mayotte, Aldabra and Europa where the species breeds, because the main threats to the species' survival appear to relate to breeding.

## 1. Biological Assessment

<p><b>General Information</b></p>	<p>The Madagascar Pond-heron <i>Ardeola idae</i> is a small (45–48 cm) white heron with reddish legs. In breeding plumage it is all white, with long crest and scapular plumes. It has a blue bill and bare orbital skin, the former with dark tip. In non-breeding plumage, it is dark brown on crown and streaked dark brownish on mantle and underparts. It is found singly or in small groups, often with Squacco Heron <i>A. ralloides</i> or egrets. It nests colonially with other herons.</p> <p>It is listed as Endangered in the 2008 IUCN Red List because it has a very small population that is undergoing a continuing decline as a result of many of its breeding colonies being heavily and increasingly exploited for eggs and young (BirdLife International 2008). This exploitation is exacerbated by pressures on its wetland habitats.</p> <p>Currently, the Madagascar Pond-heron is listed in Appendix II (Migratory species conserved through Agreements) of CMS<sup>1</sup> and in Column A, Categories 1b and 1c of the AEWA Table 1<sup>2</sup>.</p>
<p><b>Taxonomy and Systematics</b></p>	<p><b>Phylum:</b> Chordata  <b>Class:</b> Aves  <b>Order:</b> Ciconiiformes  <b>Suborder:</b> Ardeae  <b>Family:</b> Ardeidae  <b>Subfamily:</b> Ardeinae  <b>Genus:</b> <i>Ardeola</i> (Boie)  <b>Species:</b> <i>Ardeola idae</i> (Hartlaub, 1860)  <i>Ardea idae</i> Hartlaub, 1860. Journal of Ornithology 8, p. 167; east coast of Madagascar.  <b>Alternative names:</b> Malagasy Pond Heron, Madagascar Squacco Heron  <b>Taxonomic sources:</b> Dowsett and Forbes-Watson (1993), Sibley and Monroe (1990, 1993)</p>

<sup>1</sup> Migratory species that have an unfavourable conservation status or would benefit significantly from international cooperation organised by tailored agreements are listed in Appendix II to CMS. For this reason, the Convention encourages the Range States to conclude global or regional Agreements for the conservation and management of individual species or, more often, of a group of species listed on Appendix II.

<sup>2</sup> AEWA provides for coordinated and concerted action to be taken by the Range States throughout the migration system of waterbirds to which it applies.

Category 1: (a) Species which are included in Appendix I to the Convention on the Conservation of Migratory species of Wild Animals;  
 (b) Species which are listed as threatened in Threatened Birds of the World (BirdLife International 2008); or  
 (c) Populations, which number less than around 10,000 individuals.



<p><b>Population Development</b></p>	<p>There is one population which breeds in small colonies in many places in Madagascar (F. Hawkins <i>per</i> Dodman, 2002), on Aldabra, where the main known breeding site is, Ile aux Aigrettes (Betts 2002), in Mayotte (2 breeding sites known: Clément <i>com. pers.</i>) and on the atoll of Europa in the Mozambique Channel. F. Hawkins (<i>per</i> Dodman 2002) believes that colony size in Madagascar is often less than 10 pairs, and there might be 100-200 colonies or perhaps substantially fewer, giving a maximum estimate of some 6,000 birds, and minimum of 2,000. One of the highest counts is from Lac Alarobia or Tsarasaotra near Antananarivo, where there were 162 individuals in January 1998 (Dodman <i>et al.</i> 1999). However, no other sites meet the previous 1% level of 100 (a threshold used for instance in the IBA programme, determined before the more recent, lower population estimate of 2,000-6,000). This is despite its occurrence at a large number of sites. This indeed suggests that numbers in Madagascar are considerably lower. The population on Mayotte is estimated to be between 50 and 100 individuals, with variation over the years; up to 10 nests were found in 2007 in mixed colonies with Cattle Egrets (<i>Bubulcus ibis</i>), but total nests of Madagascar Pond-heron were surely &gt;10 (Clément <i>com. pers.</i>). Rocamora and Skerrett (2001) estimate the Aldabra population to be 20-50 pairs. The population on Europa numbered up to 15 pairs in 1996 (Le Corre and Safford 2001). The population estimate of 2,000-6,000 was therefore proposed, based mainly on this breeding information.</p> <p>Whilst the species remains fairly widespread, populations are low, and increasing exploitation at breeding sites is likely to increase the rate of population decline (ZICOMA 1999). As a result, a rapid and on-going population decline is suspected (BirdLife International 2008).</p>
<p><b>Distribution throughout the Annual Cycle</b></p>	<p>It breeds on Madagascar, Aldabra in Seychelles, Mayotte (Comoro Island, France), and Europa (France). It has a large non-breeding range in Central and East Africa including the Comoro Islands, Mozambique, Zimbabwe, Zambia, Malawi, United Republic of Tanzania, Kenya, Uganda, Burundi, Rwanda and the Democratic Republic of Congo (BirdLife International 2008); and is also a vagrant in Angola and Somalia (Dean 2000). Details of exact localities where the species has ever been recorded are provided in Figure 1 and Annex 1. It is present almost throughout Madagascar, but is always uncommon (ZICOMA 1999). It is rare in the south and probably commonest in suitable wetlands in the west (Morris and Hawkins 1998).</p>
<p><b>Survival and Productivity</b></p>	<p>No data.</p>
<p><b>Life History: Breeding</b></p>	<p>It breeds from October to March, beginning around the start of rains (rains begin around November). It is colonial, usually in mixed colonies, in Madagascar especially with <i>A. ralloides</i> and with <i>Bubulcus ibis</i> in Mayotte; colonies formerly contained up to 1,000 nests of present species.</p>

	<p>It nests in trees, bushes or shrubs near water, 0.5-4 m up; in mixed colonies, nests of present species tend to be higher than those of <i>A. ralloides</i> in Madagascar; in Mayotte, nests tend to be in the middle and lower than the nests of <i>Bubulcus ibis</i> in a mixed breeding colony located in a mangrove (Clément com. pers.); the nest is made of interlaced twigs. Normally 3 eggs (2-4); incubation c. 20 days; chicks have buffy yellow down; start to leave nest at c. 15 days, and can feed alone at under 4 weeks old. Normally single clutch, but a second may be laid in February-March. Afterwards dispersing to mainland Africa to spend the non-breeding season.</p>
<b>Life History: Feeding</b>	<p>It feeds on small fish, reptiles (lizards and geckos), amphibians (frogs) and small invertebrates including grasshoppers and beetles. Mostly in fresh water habitat, usually at pond edges, dams and sluggish rivers in wooded areas or fringing vegetation. In Mayotte, despite breeding colonies being found in mangroves, feeding is in fresh water (M. Salamolard <i>pers. com</i>). It is a secretive, solitary feeder, only rarely forming flocks. On Aldabra, birds feed mainly alongside other heron species. Prey is caught mainly by walking slowly or standing motionless at the water's edge, in shallow water or on floating vegetation. Most of the feeding observations have been done from the breeding range.</p>
<b>Life History: Outside Breeding Season</b>	<p>No data.</p>
<b>Habitat Requirements: Breeding</b>	<p>Shallow water bodies fringed with vegetation or with floating vegetation, including marshes, lakes, ponds, slow-flowing rivers, rice fields; mangroves on Aldabra and Mayotte. Typical forest species which takes refuge in trees when disturbed.</p>
<b>Habitat Requirements: Feeding</b>	<p>See below – outside breeding season and above: in breeding season</p>
<b>Habitat Requirements: Outside Breeding Season</b>	<p>Outside the breeding season, it is found along the banks of small streams, including those inside forests. It is also found on rice paddies, and more rarely in mangroves and on the seashore. It is migratory but <i>ad hoc</i> data suggests some site fidelity and residence in suitable habitat; in Tanzania largely restricted to small wetlands, ponds, dams with adjacent bushes or small trees.</p>

## Madagascar Pond-heron (*Ardeola idae*) - all known sites

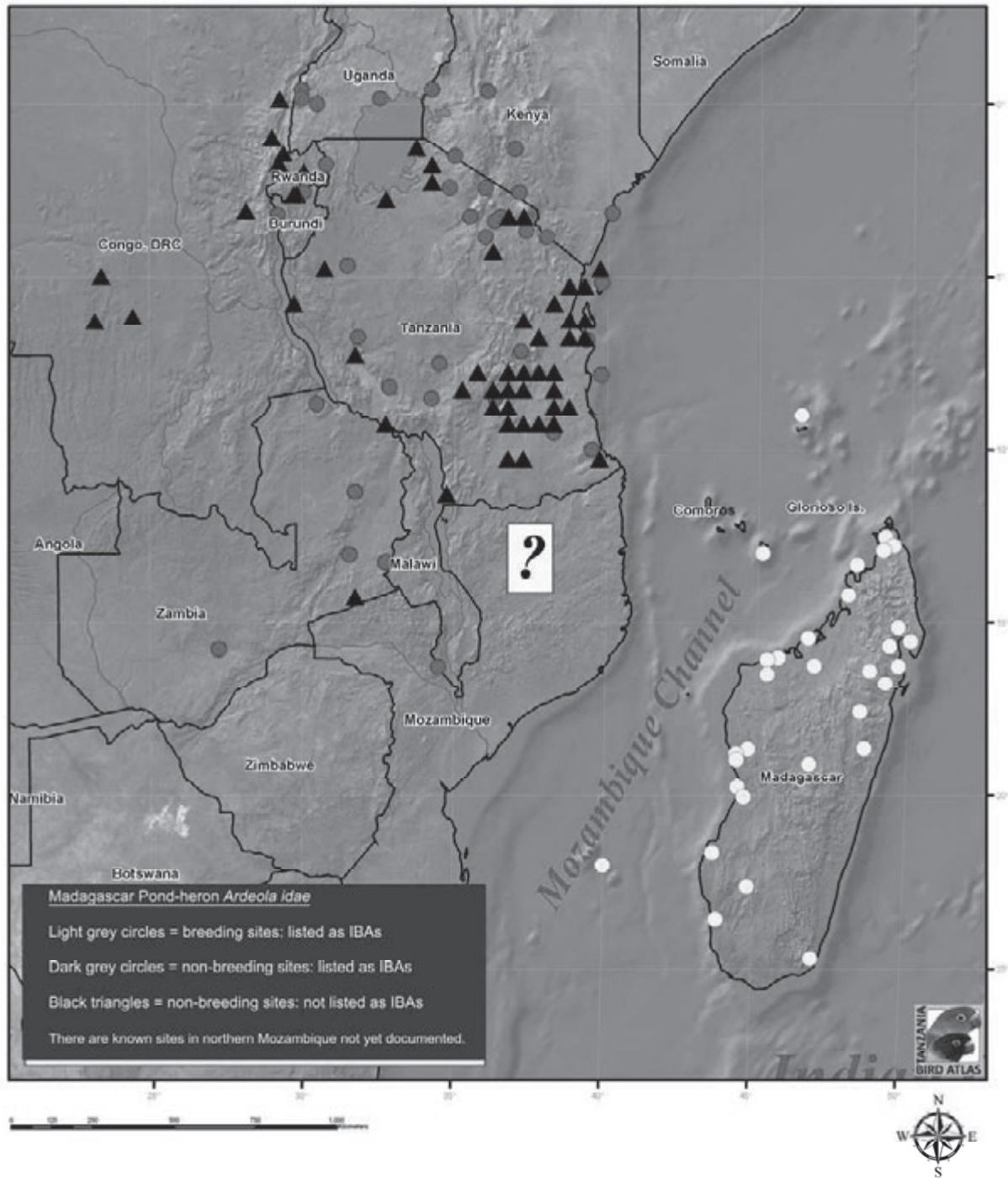


Figure 1: Distribution of Madagascar Pond-heron – localities where recorded (Neil & Elizabeth Baker)

## 2. Available Key Knowledge

Table 2.1: Global Population estimates of Madagascar Pond-heron

Breeding range	Wintering, or core non-breeding range	Estimate	Trend
Madagascar, Aldabra (Seychelles), Europa (Réunion) Mayotte (France)	Burundi, Comoro Islands, DRC, Kenya, Malawi, Mozambique, Rwanda, United Republic of Tanzania, Uganda, Zimbabwe and Zambia. Vagrant in Angola and Somalia	2,000-6,000	Declining

Table 2.2: National population estimates of Madagascar Pond-heron

Country	Breeding no.	Non-breeding no.	Quality	Year(s) of estimate	Population trend	Baseline population	References
Madagascar	2,000-6,000	N/A	?	2002	Decline	No data	F. Hawkins (in litt) per Dodman (2002)
Madagascar	1,000	N/A	?	2008	No data	No data	Rene de Roland, L.A pers. com.
Europa (France)	15 pairs	10-50 2003	?	1996; 2003	No data	No data	Le Corre and Safford (2001); Salamolard pers. com.
Mayotte (France)	15 pairs (2003); 0 (2005) 10-20 pairs (2007)	50-100	?	2003, 2005, 2007	Stable to increasing	Recently found (2003) as breeding population	Rocamora 2004; Clément pers com.
Aldabra (Seychelles)	20-50 pairs	N/A	?	2001?	No data	No data	Rocamora & Skerrett (2001)
Burundi							- No data available on national population estimates -
Comoros							- No data available on national population estimates -
DRC							- No data available on national population estimates -
Kenya							- No data available on national population estimates -

Country	Colony	Year of breeding	No. of Breeding pairs	Other species in mixed colonies	Breeding success (no. fledgings/BP)	Legal status of the site	Conservation problem
Madagascar	Lac Amparihibe, Makira	2004	6 adults	<i>Tachybaptus pelzenni</i>	n=3	Temporary Protection (New Protected Area)	Natural catastrophe (cyclone)
Madagascar	Parc Botanique et Zoologique de Tsimbazaza	1996 1997 2006 2007 2008	4 pairs 8 pairs 2 pairs 3 pairs 5 pairs	<i>Ardeola ralloides</i> , <i>Bubulcus ibis</i> , <i>Egretta alba</i> , <i>Butorides striatus</i> , <i>Nycticorax nycticorax</i> , <i>Egretta dimorpha</i> , <i>Melanophox ardesiaca</i> , <i>Ixobrychus minutus</i>	n =16; unknown; 5; 9; 14	Botanical & Zoological Park	Disturbance by visitors; Site modification in an attempt to rehabilitate it (2007)
Mayotte (France)	Bouéni Bay	2003 (Nov); 2007	15 pairs; 10-20 pairs	<i>Bubulcus ibis</i>	unknown	none	Disturbance; No legal protection for site; probable collection of young birds (Rocamora 2004)
Mayotte (France)	Tsingoni Bay	2005; 2006	(1- ?)	<i>Bubulcus ibis</i>	unknown	none	Disturbance
Seychelles	Aldabra, Ile aux Aigrettes			- no information available -			
Reunión (France)	Europa			- no information available -			

Country	Breeding no.	Non-breeding no.	Quality	Year(s) of estimate	Population trend	Baseline population	References
Malawi							
Mozambique	No data	100's	Low	2008	No data	No data	L. Borghesio (pers. com)
Rwanda							
Uganda							
United Republic of Tanzania	No data	100's to low thousands	Low (best guess from 237 records over 30 years)	1980-2007	Decline	No data	Baker & Baker (in prep)
Zambia							

Table 2.3: Information from breeding colonies of Madagascar Pond-heron

Country	Colony	Year of breeding	No. of Breeding pairs	Other species in mixed colonies	Breeding success (no. fledgings/BP)	Legal status of the site	Conservation problem
Madagascar	Alarobia or Tsarasaotra Lake	1996 1997	234 pairs 70 pairs	<i>Ardeola ralloides</i> , <i>Bubulcus ibis</i> , <i>Egretta dimorpha</i> , <i>Egretta alba</i> , <i>Nycticorax nycticorax</i> , <i>Butorides striatus</i> , <i>Anas erythrorhyncha</i> , <i>Anas hottentota</i> , <i>Sarkidiornis melanotos</i> , <i>Dendrocygna viduata</i>	Unknown - Difficult to count young birds - mixed	Private Park; Ramsar site	Nesting habitat small and high competition from species in the colony; some young MPH eaten by <i>Nycticorax nycticorax</i>

### 3. Threats

The Madagascar Pond-heron is listed as Endangered on the IUCN Red List of Threatened Species because it has a very small population which is undergoing a continuing decline due to a combination of factors. The main ones include: (1) its wetland habitats are facing large-scale ecological transformation due to drainage especially for agriculture; (2) there is increased competition from other herons (especially the more common *A. ralloides* in Madagascar); (3) in Madagascar, there is increasing evidence of hybridisation with the much more common Squacco Heron *A. ralloides*, although the latter does not breed on Mayotte, Aldabra or the Comoros; (4) many of its breeding colonies are heavily and increasingly exploited for eggs and young especially in Madagascar; and (5) disturbance especially at breeding sites.

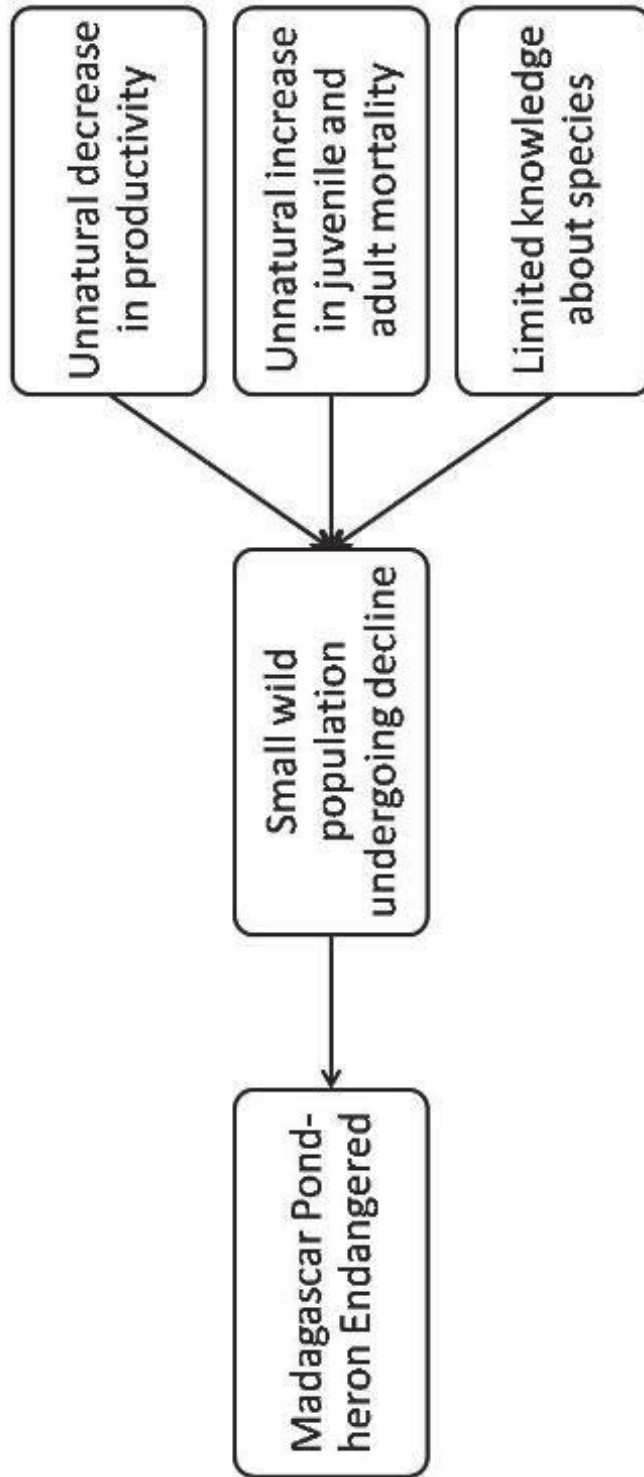
The inability to identify the species properly in the field, and differentiate it from the *A. ralloides* is another problem facing field workers and is likely to affect any legislation in non-breeding countries. Knowledge on the species is generally limited, especially regarding the following aspects (1) population size and trends; (2) location of all breeding sites in Madagascar; (3) details regarding extent, impact and causes of hybridisation with *A. ralloides*; (4) habitat requirements especially in the non-breeding range; and (5) ecology of the species. These knowledge gaps are obvious research priorities which need to be filled in order to conserve the species.

The threats facing this species are analysed in detail using a problem tree (Figure 2).



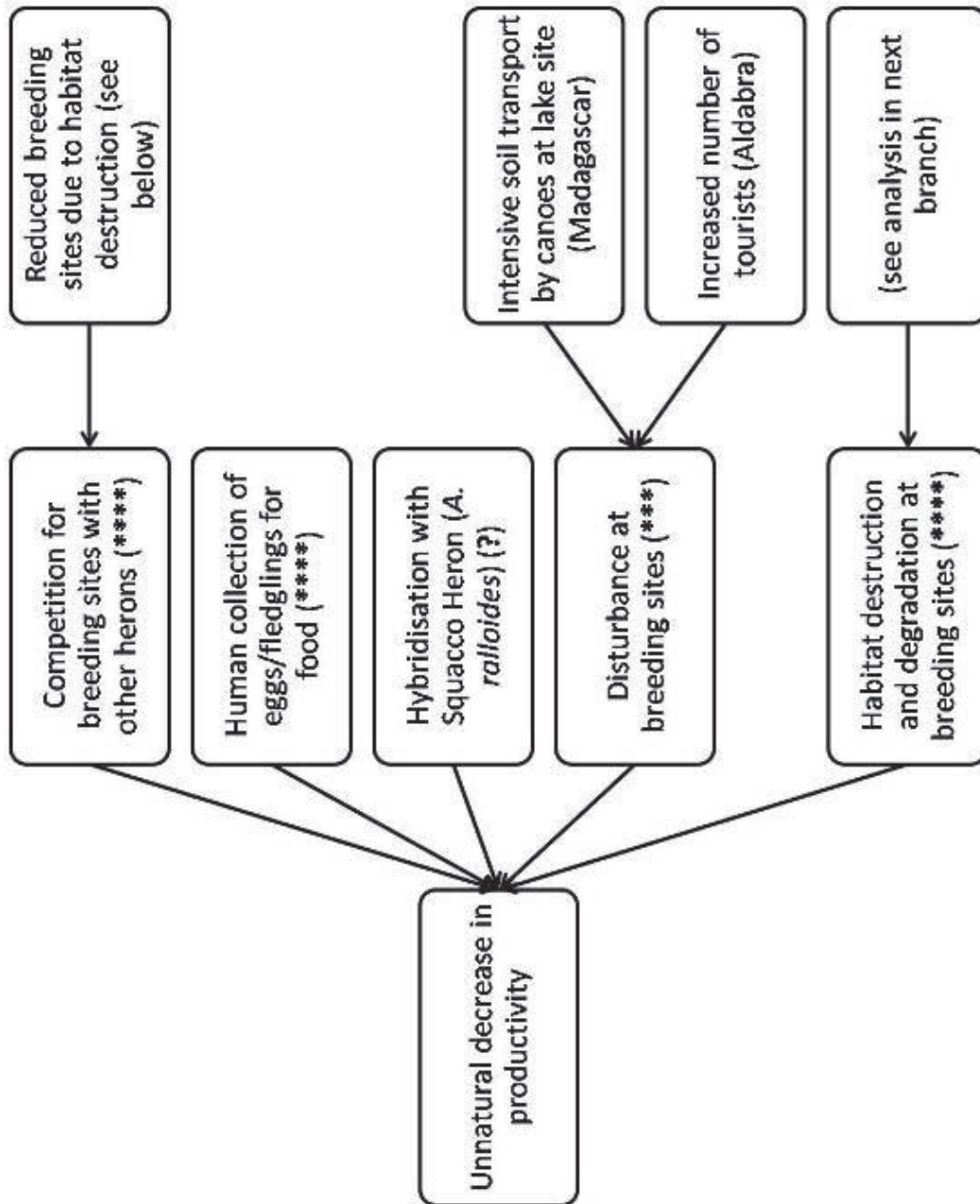
Figure 2: The Problem Tree

(a) Analysis of primary threats

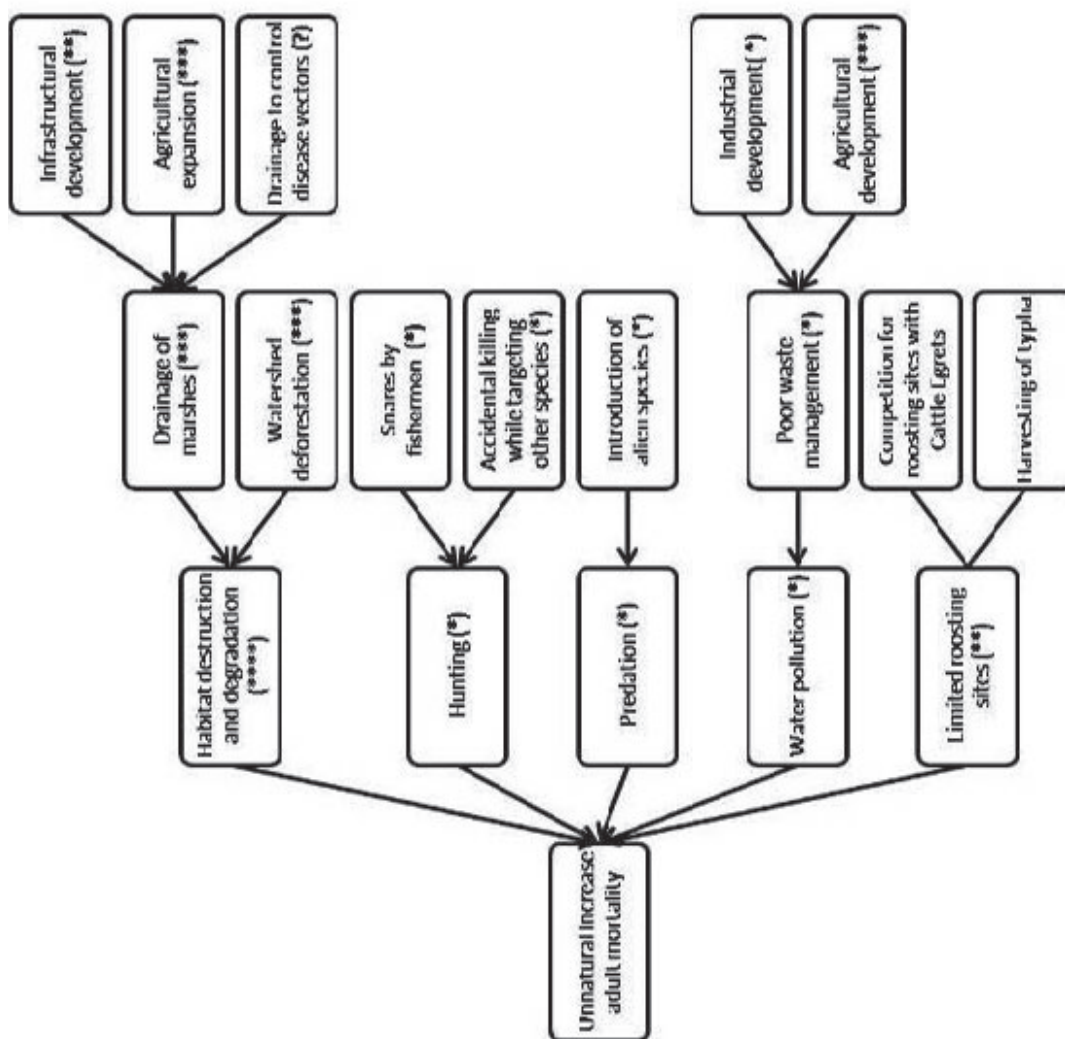




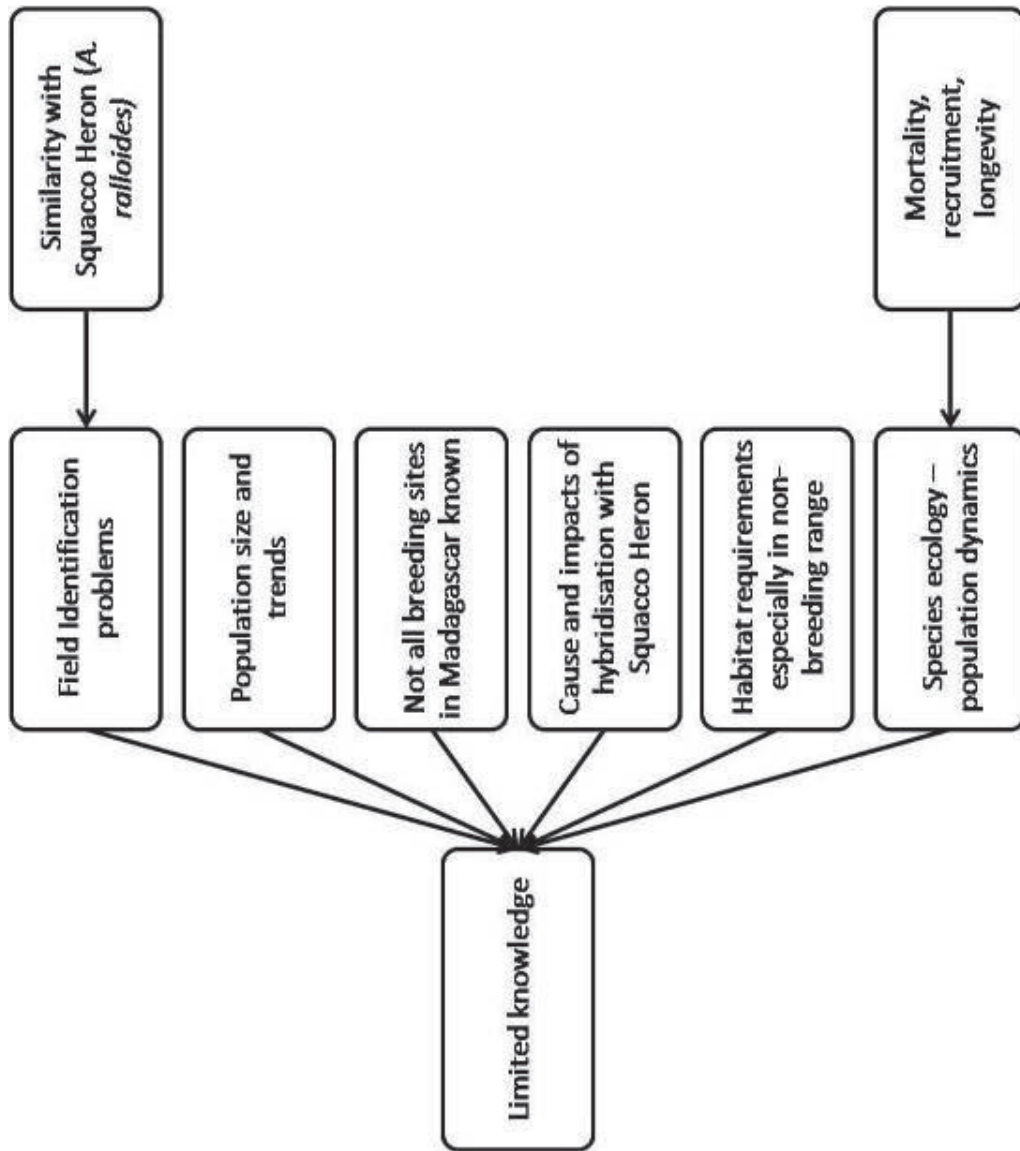
(b) Analysis of threats related to unnatural decrease in productivity (Key: \*\*\*\*=Critical, \*\*\*=High, \*\*=Medium, \*=Low, ? – unknown)



(c) Analysis of threats related to unnatural increase in adult mortality



(d) Analysis of knowledge gaps



#### 4. Policies and Legislation Relevant for Management

Table 4.1: International Conventions and Agreements ratified by the Range States

Country	CBD	CITES	AEWA	CMS	Ramsar	WHC
Burundi	X	X			X	X
Comoros	X	X			X	X
DRC	X	X		X	X	X
Réunion (France)	X	X	X	X	X	X
Kenya	X	X	X	X	X	X
Madagascar	X	X	X	X	X	X
Mayotte (France)	X	X	X	X	X	X
Mozambique	X	X			X	X
Rwanda	X	X		X	X	X
Malawi	X	X			X	X
Seychelles	X	X		X	X	X
Uganda	X	X	X	X	X	X
United Republic of Tanzania	X	X	X	X	X	X
Zambia	X	X			X	

X = yes

Table 4.2: National legislation relevant to the Madagascar Pond-heron

Country	Status in National Red Data Book	National protection status	Law protecting species	Legal protection from killing, egg harvesting and nest destruction	Penalties	Highest responsible authority
Burundi	None	None	Decree Nbr 1/6 of 3rd March 1980 article 6 where it is stipulated that hunting is prohibited in Burundi protected areas; Environment Act- environmental Code adopted by edict nbr 1/010 of 30th June 2000 articles 89,90 and 147; Forest Code of 25th March 1985	Yes	No information	INECN
Comoros	No information	All <i>Ardeidae</i> are "partly protected species»	No information	No information	No information	No information
DRC	None	None	National Biodiversity Strategy	No information	No information	Ministry of Environment, Nature Conservation and Tourism
Europa (France)	- No information available on national legislation -					
Kenya	None	With other threatened species in the Wildlife Act	No information	Yes	No information	Kenya Wildlife Service

Country	Status in National Red Data Book	National protection status	Law protecting species	Legal protection from killing, egg harvesting and nest destruction	Penalties	Highest responsible authority
Madagascar	EN	Category I, Class I: protected animals (=strict protection)	Decree N°2006-400 on the classification of species of wild fauna	Yes	Equivalent of €19,200 to €38,500 Euro fine and/or 1 to 5 years of prison	MEEFT (Ministère de l'Environnement, des Eaux et Forêts et du Tourisme) under the authority of the Minister
Malawi	None	Protected species	National Parks and Wildlife Act	No information	MK 4000 in default 2 years imprisonment	Department of National Parks
Mayotte (France)	None	Protected species in Mayotte	Order n°347/DAF/list of protected species in Mayotte	Yes	Unknown	Ministry of Environment, Ministry of Agriculture and Préfecture of Mayotte
Mozambique			- No information available on national legislation -			
Rwanda	None		Protected Area decree (1974)	Not yet	Fine for illegal hunting is being discussed by parliament	Rwanda Office of Tourism and National Parks (ORTPN) and Ministry of Land, Environment, Mines and Water Resources (MINITERE)
Seychelles	None	No information	No information	No information	No information	No information
Uganda			- No information available on national legislation -			

Country	Status in National Red Data Book	National protection status	Law protecting species	Legal protection from killing, egg harvesting and nest destruction	Penalties	Highest responsible authority
United Republic of Tanzania	None; National SSAP for species in preparation	Wild animal category/ not within the hunting quota; Protected due to Global Red List status & AEWA	Wildlife Conservation Act (WCA) CAP 283 R. E. 2002; Wildlife Policy 2007	Yes	Not set. Unknown	Wildlife Division within Ministry of Natural Resources and Tourism
Zambia	None	No information	Wildlife Act	No information	No information	Zambia Wildlife Authority

## 5. Framework for Action

**Goal:** To ensure favourable conservation status of the Madagascar Pond-heron

**Purpose:** Improve the current conservation status and knowledge base of the Madagascar Pond-heron within the next 10 years

Table 5.1: Objectives and indicators

Objectives	Indicators
<b>Objective 1:</b> To reduce and manage human disturbance at breeding sites	No human disturbance during the presence of species at sites other than managed visits
<b>Objective 2:</b> To limit and reverse human activities that reduce or degrade the species' habitat	Management actions on the ground aimed at maintaining the species' habitat in at least 50% of key sites in 10 years.
<b>Objective 3:</b> To prevent exploitation of the species' eggs and young.	No unmanaged access by people and animals in core areas during breeding season
<b>Objective 4:</b> To raise the species' profile in the range states	At least one new Madagascar Pond-heron site gets legal protection status (Protected Area, or Community-based conservation in the first 5 years)
<b>Objective 5:</b> To determine the actual population size and trends and undertake appropriate training in proper field identification of <i>A. idae</i> .	Populations and trends determined
<b>Objective 6:</b> To determine the extent, impacts and causes of hybridisation of <i>A. idae</i> with <i>A. ralloides</i> .	Research outputs of scientific investigations
<b>Objective 7:</b> To establish the extent of the species' range and distribution with a focus on identifying all breeding localities	Range and distribution mapped
<b>Objective 8:</b> To study the species' survival and productivity, as well as life history outside the breeding season	Research outputs of scientific investigations
<b>Objective 9:</b> To determine the species' habitat requirements and references	Research outputs of scientific investigations



Table 5.2: Actions, their relative importance, time scale and lead agencies

Action	Priority	Time Scale	Lead agency
<b>Objective 1: To reduce and manage human disturbance at breeding sites</b>			
<b>1.1</b> Designate key breeding sites as Ramsar sites	Critical	5 years	Government agencies
<b>1.2</b> Develop and implement site visitation protocol for birdwatchers at the species' sites	Low	2 years	Government agencies, Conservation NGOs
<b>1.3</b> Regulate access to sites during the breeding season, including designing and implementing community-run control of access.	Critical	Ongoing	Government agencies, Conservation NGOs, Community-based local conservation groups
<b>1.4</b> Develop and or support the implementation of existing management plans of the known breeding sites	Critical	Ongoing	Government agencies, Conservation NGOs
<b>1.5</b> Prevent development which will reduce species' breeding habitat	Critical	Ongoing	Government agencies, Conservation NGOs
<b>1.6</b> Purchase some sites that hold key breeding colonies/ heronries as reserves	Medium	Medium	Government agencies, Conservation NGOs
<b>Objective 2: To limit and reverse human activities that reduce or degrade the species' habitat</b>			
<b>2.1</b> Analyse the existing habitat images to establish the temporal changes of the species' habitats in key sites using remote sensing	Medium	2 years	Government agencies, Conservation NGOs
<b>2.2</b> Designate all breeding sites under national protected area legislation	Critical	5 years	Government agencies

Action	Priority	Time Scale	Lead agency
2.3 Prevent development which will reduce species' habitat	Critical	Ongoing	Government agencies
2.4 Implement EIA studies in species habitats before any development	Critical	Ongoing	Government agencies, Conservation NGOs
2.5 Prevent harvesting of <i>Typha</i> at species' roosting sites	High	Ongoing	Government agencies, Conservation NGOs
2.6 Engage communities in conservation of species' habitat through support and expansion of local conservation groups, e.g. SSGs and their activities	Medium		Government agencies, Conservation NGOs, Community-based local conservation groups
2.7 Develop and or/support the implementation of existing management plans of the known non breeding sites	High	Ongoing	Government agencies, Conservation NGOs
<b>Objective 3: To prevent exploitation of the species' eggs and young.</b> <ul style="list-style-type: none"> <li data-bbox="954 197 1010 696">▪ (Activities as in objective 1)</li> </ul>			
<b>Objective 4: Raise the species' profile in the range states</b>			
4.1 Make the status, threats and the species' priority actions more known and appreciated by the general public	Critical	Medium	Government agencies, Conservation NGOs
4.2 Develop and distribute advocacy materials e.g. posters, leaflets and put information on websites to raise awareness about the species in the public at national and regional levels	Critical	Medium	Government agencies, Conservation NGOs
4.3 Capture information about the species in field workers' periodic reports in addition to other globally threatened, CMS/AEWA species	Medium	Ongoing	Government agencies, Conservation NGOs

Action	Priority	Time Scale	Lead agency
4.4 Include Madagascar Pond-heron in media campaign (radio, TV, newspapers) together with other threatened, CMS and AEWA species	Medium	Ongoing	Government agencies, Conservation NGOs
4.5 Include Madagascar Pond-heron in existing special events for threatened, CMS and AEWA species e.g. World Wetlands Day and World Migratory Bird Day (WMBD) etc.	High	Ongoing	Government agencies, Conservation NGOs
4.6 Include the species in relevant stakeholder meetings at local, national and regional levels	High	Ongoing	Government agencies, Conservation NGOs
4.7 Include the species and other water birds in the ongoing training programs for staff, conservationists and students to improve species identification skills, survey techniques, etc	Medium	Ongoing	Government agencies, Conservation NGOs
4.8 Support and expand community conservation groups and their activities	Medium	Ongoing	Government agencies, Conservation NGOs
<b>Objective 5: To determine the actual population size and trends and undertake appropriate training in proper field identification of <i>A. idae</i>.</b>			
5.1 Develop identification kit and guide for herons	Medium	1 year	Research institutions, Birding organisations, Government agencies, Conservation NGOs
5.2 Identify and investigate all of the suitable sites throughout Madagascar	High	2 years	Research institutions, Birding organisations, Government agencies, Conservation NGOs
5.3 Develop a suitable census technique	High	3 years	Research institutions, Government agencies,

Action	Priority	Time Scale	Lead agency
<b>5.4</b> Organise and conduct training for data collectors in identification, survey techniques and data management	High	Ongoing	Research institutions, Government agencies, Wetlands International
<b>5.5</b> Perform coordinated censuses in all countries	Critical	Ongoing	Research institutions, Government agencies, Wetlands International, Other NGOs
<b>Objective 6: To determine the extent, impacts and causes of hybridisation of <i>A. idae</i> with <i>A. ralloides</i></b>			
<b>6.1</b> Design and implement a scientific study, e.g. genetic studies	Critical	5 years	Research institutions, Government agencies
<b>Objective 7: To establish the extent of the species' range and distribution with a focus on identifying all breeding localities</b>			
<b>7.1</b> Implement a field programme to identify all the breeding colonies in Madagascar	Critical	3 years	Research institutions, Government agencies
<b>7.2</b> Identify key sites in non-breeding range	Critical	3 years	Research institutions, Government agencies
<b>7.3</b> Initiate/strengthen waterbird databases in range states and ensure that the Madagascar Pond-heron is included	High	Ongoing	Research institutions, Government agencies
<b>7.4</b> Create an international network of people and institutions interested in the Madagascar Pond-heron and share information through the network	Medium	1 year	Research institutions, Government agencies
<b>7.5</b> Encourage birdwatchers to submit records to the network	Medium	Ongoing	Research institutions, Government Agencies

Action	Priority	Time Scale	Lead agency
<b>Objective 8: To study the species' survival and productivity, as well as life history outside the breeding season</b>			
<b>8.1</b> Design and implement a scientific study	Medium	10 years	Research institutions, Government agencies
<b>8.2</b> Undertake population modeling	Medium	10 years	Research institutions, Government agencies
<b>Objective 9: To determine the species' habitat requirements</b>			
<b>9.1</b> Design and implement a scientific study to undertake detailed research on the habitat requirements of the species	Critical	10 years	Government agencies, Research institutions
<b>9.2</b> Initiate a pilot programme for creation of artificial breeding sites/structures	Medium	5 years	Research institutions, Government agencies

## 6. Monitoring and Evaluation

This will be done through tracking the level of implementation of various activities as outlined in the Actions table. A column will be added to this table in which assessment of progress (activity compared to indicator) will be explained. This table will be circulated to the Madagascar Pond-heron network for completion twice a year.

Activity	Priority	Time	Lead Agencies	Progress made (compare to indicators)

Twice per year, national contacts will evaluate progress nationally. The Africa Secretariat of BirdLife International in liaison with AEWA Secretariat will provide the global lead and the Madagascar Pond-heron network (working virtually by email) will fill in the table. The key drivers for this process will be **Julien Ramanampamonjy** (breeding range) and **Neil Baker** (non-breeding range).

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## Annex 1: Localities where the Madagascar Pond-heron has been recorded.

Site	IBA	No. of records / notes	References
<b>Madagascar-41 sites</b>			
Montagne d'Ambre NP	MG003		ZICOMA 1999
Analamera SR	MG004		ZICOMA 1999
Akarana SR	MG006		ZICOMA 1999
Nosy Be	MG011		ZICOMA 1999
Masoala NP	MG017		ZICOMA 1999
Sahamalaza Bay	MG018		ZICOMA 1999
Ankobohobo wetlands	MG022		ZICOMA 1999
Mahavavy delta	MG025		ZICOMA 1999
Baly Bay NP	MG026		ZICOMA 1999
Ankarafantsika SNR	MG027		ZICOMA 1999
Marotandrano SR	MG029		ZICOMA 1999
Namoroka Tsingy SNR	MG030		ZICOMA 1999
Bemaraha Tsingy NP	MG037		ZICOMA 1999
Bemamba wetlands	MG038		ZICOMA 1999
Manambolomaty wetlands	MG039		ZICOMA 1999, Rabarisoa 2001
Anjanaharibe CF	MG040		ZICOMA 1999
Upper Rantabe CF	MG041		ZICOMA 1999
Mananara-North NP	MG042		ZICOMA 1999
Ambatovaky SR	MG043		ZICOMA 1999
Lake Alaotra	MG046		ZICOMA 1999
Mantadia NP	MG054		ZICOMA 1999
Lake Itasy	MG058		ZICOMA 1999
Tsiribihina Delta	MG059		ZICOMA 1999
Menabe Forest complex	MG060		ZICOMA 1999
Lake Ihotry HR	MG062		ZICOMA 1999
Zombitse-Vohibasia NP	MG065		ZICOMA 1999
Saint Augustin Forest	MG067		ZICOMA 1999
Tsitongambarika CF	MG072		ZICOMA 1999, Rabarisoa & all pers obs.
Bongolava wetland complex	-		BirdLife Madagascar 2005
Antongomena forest	-		Ramanampamonjy pers comm. *
Bekapika river rice fields	-		Ramanampamonjy & all per obs.
Betsiboka River	-		Ramanampamonjy pers comm.
PBZT	-		Ramanampamonjy pers comm.
Tsarasaotra Lake	-		Wilmé, L. and Jacquet, C. 2002
Road to Isorana	-		
Lavaraty	-		Rabarisoa (2007)
Sanira	-		Rabarisoa (2007)
Lagune of Fort Dauphin	-		Rio Tinto/BirdLife International Madagascar. BirdWatch Event report 2006.
Andranobe Lake	-		Ramanampamonjy pers comm.
Amparihibe Lake	-	Volcanic Lake inside intact forest	Lily-Arison and Sam The Seing
Matsaborimaitso Lake	-	Volcanic Lake inside intact forest	Lily-Arison and Sam The Seing

Site	IBA	No. of records / notes	References
<b>Comoros - Mayotte (France) breeding sites</b>			
Baie de Boueni	YT004	Found in 2003; 10-20 pairs in 2007	Rocamora (2004); Clément (pers com)
Baie de Tsingoni			Clément com.pers
<b>Comoros – Mayotte (France) non-breeding sites</b>			
Lake Dziani Karehani		Many records – year & no: :1958 -4; 1983 -5; 1985 - 3; 1992 -7; 1993 -7; 1995 -7; 1996 - 7; 2003 -12; 2004 -37	Loutte 2004; Clément (pers. com); Salamorand (pers com)
Pamandzi		1 in 1965	Clément and Salamorand ( <i>pers coms</i> )
Near White Island		1 in 1985	Clément and Salamorand ( <i>pers coms</i> )
Near Mramadoudour		1 in 1994	Clément and Salamorand ( <i>pers coms</i> )
Dzoumonyé		1 in 1994; 6 in 2003	Clément and Salamorand ( <i>pers coms</i> )
Retenue de Combani		2 in 2003; 5 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Vasières des Badamiers		1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Miréréni		>1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Chirongui		>1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Tsimkoura		>1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Mzouazia		>1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Mounyambani		>1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Dembéni		>1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
Ironibé		>1 in 2004	Clément and Salamorand ( <i>pers coms</i> )
<b>Comoros – non breeding sites</b>			
Grande Comore (Mitsamiouli)		1 in 1969	Louette, M (pers com)
Mohéli (Dziani Boudouni)		2 in 1983; 1 in 1993	Louette, M (pers com)
Anjouan (Pomoni)		Seen frequently	Louette, M (pers com)
<b>Seychelles - Aldabra breeding sites</b>			
Aldabra atoll	SC020		Betts (2002)
<b>French 'Iles Eparses'</b>			
Europa atoll	RE012	15 pairs 1996	
<b>Malawi 7 sites</b>			
Lengwe NP	MW021	no dates, sev records	Dowsett-Lemaire & Dowsett 2006
Hynde Dam, Limbe	-	1, 1984	Dowsett-Lemaire & Dowsett 2006
Lifu near Salima	-	1988	Dowsett-Lemaire & Dowsett 2006
Lilongwe sewage ponds	-	1989	Dowsett-Lemaire & Dowsett 2006
Namizimu, Liwonde NP	-	no dates	Dowsett-Lemaire & Dowsett 2006
Blantyre	-	no dates, sev records	Dowsett-Lemaire & Dowsett 2006
Elephant marsh	-	no dates, sev records	Dowsett-Lemaire & Dowsett 2006
<b>Rwanda 8 sites</b>			
Akagera NP	RW003		
Gashora	-		
Butare	-	7 specimens; formally	Prigogine 1976

Site	IBA	No. of records / notes	References
		Astrida	
Gisagara	-		Prigogine 1976
Kisenyi	-		Prigogine 1976
Kigali	?		Prigogine 1976
<b>Burundi 3 sites</b>			
Rwihinda Lake	BI001		
Rusizi NP	BI004		
Lake Tanganyika	-		
<b>Kenya 18 sites</b>			
Arabuko-Sokoke	KE007		Brian Finch pers comm.
Sabaki river mouth	KE019	1, 2007	Kenya Birdfinder
Nairobi NP	KE036	regular, many records	Kenya Birdfinder
Amboseli NP	KE042	2 -	Kenya Birdfinder
Lake Baringo	KE044		Brian Finch pers comm.
Lake Naivasha	KE048		Brian Finch pers comm.
Lake Nakuru NP	KE049	1 -	Brian Finch pers comm.
Masai Mara	KE050	1, 1996	Brian Finch, Dave Richards pers comm.
Busia grasslands	KE057	1, 2007	Kenya Birdfinder
Manguo Swamp Limuru	-	2, 2003, 06	Don Tuner pers comm.
NAIROBI 8 SITES	-	multiple records	many refs
Ahero Rice Scheme	-		Brian Finch pers comm.
Lake Jipe	-		Brian Finch pers comm.
Eldoret	-		Brian Finch pers comm.
Thika Gethumbwini Estate	-	1, 1997	Don Tuner pers comm.
Malindi Golf Course	-	1, 1997	Kenya Birdfinder
Mombasa Msambweni	-	1, 1997	Kenya Birdfinder
Mombasa Bamburi NT	-	1, 1995	Kenya Birdfinder
<b>Uganda 3 sites</b>			
Rwenzori Mts NP	UG005	1, Turner (1980)	
Queen Elizabeth NP	UG007		
Lutembe Bay	UG018		
<b>Zimbabwe 1 site</b>			
Chipinga		1, 29 Sept 1923	Irwin 1981
<b>Zambia 7 Sites</b>			
Lochinvar NP	ZM011		
South Luangwa NP	ZM019	>30 at 5 sites	
Shiwa Ngandu	ZM023		
Sumbu NP	ZM035		
Lukusui NP	ZM041		
Sinde-Nyanje	-		
Nakode	-		
<b>Mozambique 9 Sites (some overlap ?)</b>			
Vilanculos		1, Aug 1999	
unnamed locality			Parker 2005
unnamed locality			Parker 2005
unnamed locality			Parker 2005
unnamed locality			Parker 2005

Site	IBA	No. of records / notes	References
unnamed locality			Parker 2005
Ilha Suafo		10-50 inds, May 2008	Luca Borgesio
Mala Mala			Branch & Branch 1998
Squacco Vlei			Branch & Branch 1998
<b>Democratic Republic of Congo 11 Sites</b>			
Merode	?	2 specimens	Prigogine 1976
Lusambo	?		Prigogine 1976
Kabinda	?		Prigogine 1976
Kamituga	?	6 specimens	Prigogine 1976
Lac Mokoto	?		Prigogine 1976
Butembo	?		Prigogine 1976
N. Kivu, région Kisenyi	?		Prigogine 1976
Lulenga, Kivu	?		Prigogine 1976
Moba, Katanga		see Chapin 1954	Chapin 1932
Kasenga, Katanga		see Chapin 1954	Prigogine 1976
Tshibati, Kivu		see Chapin 1954	Prigogine 1976
<b>United Republic of Tanzania 99 sites, 20 IBAs, note that 14 did not previously qualify for this species</b>			
Arusha NP	TZ001	Baker & Baker 2002	tanzaniabirdatlas.com 7 records
Katavi NP	TZ002	tanzaniabirdatlas.com	1 record
Mikumi NP	TZ006	Baker & Baker 2002	tanzaniabirdatlas.com 13 records
Ruaha NP	TZ007	tanzaniabirdatlas.com	2 records
Serengeti NP	TZ009	Baker & Baker 2002	tanzaniabirdatlas.com 8 records
Tarangire NP	TZ010	tanzaniabirdatlas.com	3 records
Mafia Island	TZ012	tanzaniabirdatlas.com	3 records
Ngorongoro CA	TZ013	tanzaniabirdatlas.com	3 records
Mkomazi GR	TZ016	tanzaniabirdatlas.com	1 record
Moyowosi-Kigosi GR	TZ017	tanzaniabirdatlas.com	3 records but huge site
Selous GR	TZ018	Baker & Baker 2002	tanzaniabirdatlas.com 41 records
Dar es Salaam coast	TZ021	tanzaniabirdatlas.com	55 records
Eluanata Dam	TZ022	tanzaniabirdatlas.com	1 record
Kilombero Valley	TZ025	Baker & Baker 2002	tanzaniabirdatlas.com 17 records
Nyumba ya Mungu dam	TZ030	tanzaniabirdatlas.com	1 record
Lake Natron	TZ031	tanzaniabirdatlas.com	sev records not yet entered
Lake Rukwa	TZ033	tanzaniabirdatlas.com	1 record but huge site
Usangu Flats	TZ038	tanzaniabirdatlas.com	1 record but huge site
Litipo FR	TZ051	tanzaniabirdatlas.com	1 record
<b>non IBA sites (some overlap) referenced to centre 1/4 degree square. 44 squares (multiple sites in some squares)/many of these records are single observations of single birds</b>			
Lake shore camp		tanzaniabirdatlas.com	
Malagarasi		tanzaniabirdatlas.com	
Rungwa River		tanzaniabirdatlas.com	
Smith Sound		tanzaniabirdatlas.com	
Musoma		tanzaniabirdatlas.com	
Mara forest		tanzaniabirdatlas.com	
Grumeti River		tanzaniabirdatlas.com	
Mbamba Bay		tanzaniabirdatlas.com	
Kibebe		tanzaniabirdatlas.com	

Mufindi Itona		tanzaniabirdatlas.com	
Olasiti		tanzaniabirdatlas.com	16 records
Tarangire NP south		tanzaniabirdatlas.com	
Kilombero Sugar		tanzaniabirdatlas.com	
Matundu FR		tanzaniabirdatlas.com	
Igumbiro		tanzaniabirdatlas.com	
Kilombero sth		tanzaniabirdatlas.com	
Kivukoni		tanzaniabirdatlas.com	
Ilonga		tanzaniabirdatlas.com	
Mkuyu River		tanzaniabirdatlas.com	
Moshi		tanzaniabirdatlas.com	
Mwomero ANC		tanzaniabirdatlas.com	
Morogoro		tanzaniabirdatlas.com	
Nyamvisi River		tanzaniabirdatlas.com	
Beho Beho		tanzaniabirdatlas.com	
Madaba		tanzaniabirdatlas.com	
Kibaoni		tanzaniabirdatlas.com	
Luwele		tanzaniabirdatlas.com	
Lulira		tanzaniabirdatlas.com	
Unnamed small pond		tanzaniabirdatlas.com	
Mkata		tanzaniabirdatlas.com	
Bagamoyo		tanzaniabirdatlas.com	
Ruvu Valley		tanzaniabirdatlas.com	
Selous GR		tanzaniabirdatlas.com	
Rufiji River camp		tanzaniabirdatlas.com	
Ngarambe		tanzaniabirdatlas.com	
Nahomba Tundu		tanzaniabirdatlas.com	
Kandalawe		tanzaniabirdatlas.com	
Matundu		tanzaniabirdatlas.com	
Ngezi FR		tanzaniabirdatlas.com	
Pangani		tanzaniabirdatlas.com	
Bwawani		tanzaniabirdatlas.com	
Ndege Beach		tanzaniabirdatlas.com	
Lake Kitere		tanzaniabirdatlas.com	
Probably within Selous GR ?		tanzaniabirdatlas.com	

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