



**FORMAT FOR REPORTS**

**OF THE PARTIES**

**AGREEMENT ON THE CONSERVATION OF AFRICAN-EURASIAN MIGRATORY WATERBIRDS  
(The Hague, 1995)**

**Implementation during the period 2005 and 2008**

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## Table of Contents

<b>1. Overview of Action Plan implementation</b>	<b>5</b>
<b>2. Species conservation</b>	<b>6</b>
Legal measures	6
Single Species Action Plans	6
Emergency measures	6
Re-establishments	7
Introductions	7
<b>3. Habitat conservation</b>	<b>8</b>
Habitat inventories	8
Conservation of areas	8
Rehabilitation and restoration	8
<b>4. Management of human activities</b>	<b>9</b>
Hunting	9
Eco-tourism	9
Other human activities	9
<b>5. Research and monitoring</b>	<b>10</b>
Status of research and monitoring programmes for species	10
<b>6. Education and information</b>	<b>11</b>
Training and development programmes	11
Raising public awareness	11
<b>7. Final comments</b>	<b>12</b>
<b>8. Progress to implement Resolutions and Recommendations of the Meeting of the Parties</b>	<b>13</b>
<b>9. OPTIONAL SECTION – Planned and future actions</b>	<b>14</b>
<b>List of abbreviations and acronyms used in the report</b>	<b>15</b>
<b>References</b>	<b>16</b>
<b>Appendices</b>	<b>17</b>
Appendix 1: Status of Single Species Action Plans	17
Appendix 2: List of sites of international importance	
Appendix 3: Status of management plans for sites of international importance	17
Appendix 4: List of research and monitoring programmes and projects	17
Appendix 5: List of national institutions involved in migratory waterbird conservation	17
Appendix 6: List of relevant World Wide Web addresses for national institutions involved in migratory waterbird conservation	17

Appendix 7: List of relevant migratory waterbird and habitat conservation projects initiated, ongoing or completed in the last three years

17

## **1. Overview of Action Plan implementation**

*Summary of progress to date*

*1.2 Outline of planned actions for national implementation over the next three years*

*1.3 Outline of priorities for international co-operation over the next three years*

## **2. Species conservation**

### **Legal measures**

*2.1 Has a national policy/strategy or legislation to protect and conserve species covered by the Agreement (Table 1: column A; column B) and their supporting important areas been developed? If so:*

**All the species covered by the Agreement and (Table: column A; Column B) of which Kenya is a range state are all protected under the Wildlife Act Cap 376 (Laws of Kenya). The review process of the legislation and policy to enhance their conservation and management of their populations and status together with other wildlife species was initiated during this reporting period, and is on-going. The main features of the spelt out in different Articles of the Wildlife Act. Other relevant Acts in place to enhance the conservation of their habitats include Environmental Management and Coordination Act, Water Resources Management Act among others.**

**Different key stakeholders are responsible for the implementation of the legislation. These include relevant Government Departments such as the Kenya Wildlife Service (Focal Organization on AEWA), National Environment Management Authority, National Museums of Kenya and Water Resources Management Authority. In addition, other non-governmental organizations including BirdLife International Partners are involved in the conservation and research programmes on the species. Local NGO include Nature Kenya, East African Wildlife Society (wetland working group)**

**Other national initiatives also contribute albeit indirectly to the conservation and management of these species. These are organized and coordinated through inter-ministerial committees.**

*2.2 What legal measures or practices has your country developed to prohibit or regulate for the following (refer also to section 4 on hunting):*

**Taking of, and trade in birds listed in Columns A and B are prohibited under the Wildlife Act. However, where necessary and under strict licensing procedures by the Wildlife Management Authority, the species can be taken purely for research purposes. These should in overall view be aimed at contributing the required information to enhance their conservation. The method of taking such species is monitored to ensure that non-targets are not interfered with. In addition, where licenses are issued for hunting, there are open and closed seasons and bag limits are defined through the Chief Licensing**

## **Officer in the Wildlife Management Agency – the Kenya Wildlife Service.**

### **Single Species Action Plans**

2.3 Of the species covered by the Agreement (species listed in Table 1: column A), which spend part or all of their life history in your country, which have formal international (Category 1, species marked with an asterisk) or national (column A) Single Species Action Plans:

- a. Proposed? *Balaeniceps rex*
- b. In preparation? *Ardeola idea*
- c. Being implemented? *Phoeniconais minor*

### **See Appendix 1**

### **Emergency measures**

2.4 Describe any bilateral or multilateral co-operative action that your country has undertaken to develop and implement emergency measures to conserve species in response to unfavourable or endangering conditions occurring in the Agreement area.

**The conservation of wildlife is increasingly becoming a major challenge due to a number of factors. During this reporting period, Kenya was at the forefront in advocating for the conservation of habitats and species covered by AEWA. These included among other advocating for stop on the proposed development in a major breeding site for Lesser Flamingos – Lake Natron. The Nile basin initiative also considers the conservation of Migratory species where Kenya advocates for the conservation of important habitats.**

### **Re-establishments**

2.5 Has a policy on species re-establishments been developed in your country? If yes, please outline the main features of the policy and give details of any re-establishment programmes for species covered by the Agreement.

**At present no stand-alone policy on re-establishments has been developed. However, various sectoral policies address issues relevant to maintaining suitable habitats for wildlife species including species covered under the Agreement.**

## **Introductions**

*2.6 Has your country developed and implemented legal measures to prohibit the introduction of nonnative species? Please provide details, particularly describing measures to control the release or introduction of non-native species (please indicate which species and their status).*

**Legal measures governing introductions and species conservation and management are covered under the Wildlife Act. During this reporting period no non-native waterbird species was introduced in Kenya.**

## **3. Habitat conservation**

### **Habitat inventories**

*3.1 Has your country developed and published inventories of important habitats for species covered by the Agreement? If yes, please provide details, including any provisions to maintain or update these inventories.*

**Yes, the country has a suite of 60 sites globally recognized as Important Bird Areas. Of the 60 sites, 13 sites are recognized under the Congregatory Criteria with significant numbers of waterbirds under the Agreement. In addition, some of the sites are already listed as Ramsar Sites.**

*3.2 Has your country undertaken a strategic review of sites to develop a national network of important sites or areas for species covered by the Agreement? Please append a list of identified sites of international importance.*

**The development of a national network of sites important for the species covered under the Agreement is important and has been on-going. This is has however, not been under any direct coordination of the AEWAs Administrative Authority, but through collaborative efforts with different stakeholders both with the government agencies and non-governmental organizations. The idea behind this is to know whether there are additional sites that could qualify for listing as Important Bird Areas or sites that require urgent conservation actions as refuges for waterbird populations.**

**Among the sites of international Importance identified include: Kiunga Marine Reserve, Kisite Mpunguti National Park, Tana Delta, Lake Jipe, Lake Magadi, Dandora Sewage Ponds, Lake Naivasha, Lake Elmenteita, Lake Nakuru, Lake Ol Bollosat (Potential Important Bird Area), Lake Bogoria, Lake Baringo, Lake Sergoit (potential IBA), Lake Turkana, Lake Simbi, Koguta Swamp, Kusa Swamp, Dunga Swamp and Yala Swamp**

## Conservation of areas

3.3 Describe the legal frameworks and other measures through which sites (including transfrontier sites) including of international importance gain practical protection. (Please append a list of internationally important protected sites.)

Development of harmonized legal frameworks for the conservation of important habitats for wildlife including species under the Agreement continues to be a major challenge in developing countries including Kenya. At present there is no stand-alone wetland policy in the country. The Kenya wetland policy has been developed and is now before cabinet for ratification in addition, various sectoral policies address issues related to wetlands management. For transfrontier sites the situation is further complicated by the individual countries' strategic interests on important sites within their territories. However, with the regional agreements such as East Africa Community and Nile Basin Initiative, NEPAD it is possible that transfrontier sites important for the waterbirds and other wildlife would in future receive the desired attentions. What are required are joint programmes and activities that cover sub-regions. There are hopes that under the AEWA/GEF Wings over Wetlands Project different transfrontier sites used by waterbirds in the Agreement Area would receive adequate attentions under the Critical Sites Network Component of the wings over Wetlands Project. Among international important transfrontier sites in Kenya include Lake Turkana. The other sites with potentials to host species under the Agreement include Lake Jipe.

3.4 Has your country developed a management planning process for protected sites? If yes, please outline the types of management plans and organisations responsible for development and implementation.

Yes, the country has a management planning process for the protected areas. In an effort to enhance the management of Kenya's wildlife protected areas, KWS has developed and adopted a standardized protected areas planning Framework (PAPF) that is used to guide preparation of protected area management plans. Indeed all protected areas including Marine Protected Areas (MPAs) have management plans some of these plans are due for review and those being reviewed will use the planning frame work developed.

3.5 How many protected sites have formal management plans (please append a list of sites and their management planning status):

a. Proposed? Dandora Sewage Ponds, Lake Magadi, Lake Sergoit , Lake

**Simbi, Kusa Swamp, Dunga Swamp and Yala Swamp, Koguta Swamp,**

*b. In preparation?* **Amboseli National park, Tana Delta,**

*c. Being implemented?* **Kiunga Marine Reserve, Kisite Mpunguti National Park, Mobasa national Park, Dini Chale Lake Jipe, , Lake Naivasha, Lake Elmenteita, Lake Nakuru, Lake Ol Bollosat, Lake Bogoria, Lake Baringo, Lake Turkana, Mt Kenya national park , Nairobi national Park**

*3.6 What measures does your country have in place to ensure the wise use of wetland habitats and to prevent habitat degradation e.g. pollution control and managing water resources? Please provide examples of best practice initiatives particularly involving cross-sectoral co-operation or public part.*

**The government of Kenya has to date put in place certain legislative frameworks to address conservation and wise use of wetland ecosystems; the biggest milestone was the enactment of a National Environment Management and Co-ordination Act (EMCA) in 1999. that provides for strict conservation and management of wetland. The existence of these frameworks have created the desired impact, with the national wetland policy to synergize the sectoral policies and catalyze the domestication of MEAs increased participation of the private sector and providing environment where local and international NGO are able to operate and conserve wetlands.**

#### **Rehabilitation and restoration**

*3.7 Does your country have a policy for the identification, rehabilitation and restoration of wetlands important for species covered by the Agreement? Please provide examples of rehabilitation and restoration projects and initiatives undertaken.*

**Kenya has a policy to develop integrated management plans for all wetlands of national importance. Most of the wetland of national important has management plans that provide specific actions for wetland rehabilitation and restoration. Example of wetland rehabilitation programmes include the removal and management of invasive species in lake Victoria while at the same time initiating programmes to reduce pollution by industry and domestic sources. At a national level other than the invasive species in wetland most wetlands need continuous monitoring and programmes that reduce the impact of human activities.**

## **4. Management of human activities**

### **Hunting**

*4.1 Outline the main features of legislation or legal measures in your country to control hunting of the species covered by the Agreement (e.g. use of lead shot and poisoned baits, and to eliminate illegal taking).*

**The Article 61 of the Wildlife Act (Laws of Kenya) under review provides in details the regulations in controlling hunting of particular species identified as gamebirds. A schedule of the revised Act has species – some of which are in the AEWA lists. Phasing out lead shot has however, been a major challenge as alternatives seem to be very expensive to the licensed hunters. But efforts are being made through the wildlife management authority to encourage the hunters to use environmentally friendly options. Poisoned baits are generally not acceptable as non-target species also become victims.**

*4.2 Does your country monitor hunting levels? If so, how is this information collated and reported?*

**Yes, hunting levels are monitored in Kenya in different ways. First, the licensing office at the wildlife management authority sets quotas. In addition, there are open and close seasons which are strictly adhered to before licenses are issues. To that standards are adhered to, a screening system is applied before licenses are issued.**

*4.3 Describe action undertaken by hunting clubs and organisations to manage hunting activity e.g. co-operative action, issuing of licences and proficiency testing of individual members.*

**Hunters are encouraged to form clubs and be organized in such a way that they are able to assist in monitoring illegal hunters in their areas. However, the management wildlife management authority still lacks adequate capacity for proficiency testing and would appreciate support from AEWA Secretariat and other Parties with developed programmes to streamline this activity.**

### **Eco-tourism**

*4.4 What is the status of eco-tourism programmes or initiatives in your country? Please provide examples of projects with an indication of the significant outcomes.*

**Bird tourism is not well developed in areas outside protected areas in Kenya. However, working in collaboration with BirdLife International Partnership, bird tourism is being packaged and would have immense potentials both within and without protected areas.**

4.5 What social and economic benefits accrue to the local communities from the conservation of important waterbird sites?

**In waterbird sites where bird tourism is taking shape, the local communities working in collaboration with BirdLife International Partner in Kenya (Nature Kenya) and Kenya Wildlife Service have been encouraged to form Site Support Groups. These groups have benefited from training programmes on waterbird monitoring techniques. Various donations of field equipment and encouragement of the local people to develop bird watching as an attraction have been undertaken.**

**Other human activities**

4.6 Does your country carry out Environmental Impact Assessment (EIA) of activities potentially affecting protected sites or areas important for species covered by the Agreement? If yes, briefly describe the main features of your EIA policy and procedures.

4.7 Please describe the main features of your planning policy and provide examples of practical implementation (e.g. activities to minimising disturbance of species populations or limit the impact of species populations on crops or fisheries). Please summarize any land-use conflicts especially emphasising successful solutions to problems encountered in promoting the wise-use of waterbirds and their habitats.

**~~~INPUTS REQUIRED FROM ECOSYSTEMS AND EIA  
DEPARTMENTS HERE??????~~~**

## 5. Research and monitoring

### Status of research and monitoring programmes for species

5.1 How are priorities for research identified in your country? Please briefly describe your country's research programmes, including any bilateral or multilateral co-operative action, for wetland habitats and for species covered by the Agreement (e.g. studies into species population, ecology and migratory patterns). Please append a list of research activities initiated, ongoing or completed in the last three years.

Priority research topics on waterbirds research are developed through consultative processes in collaboration with key stakeholders. Once this is done, researchers are encouraged to develop concepts and undertake research activities.

Some research activities initiated, on-going and completed in the last three years targeting waterbirds include:

Impacts of recreational disturbance on ecology and distribution of Kittlitz's Plover *Charadrius pecuarius*

Distribution and population status of Roseate Tern *Sterna dougallii* in a coastal Kenya important Bird Area

Impacts of recreational disturbance on breeding performance of Roseate Tern *sterna dougallii* in Kisite Mpunguti Important Bird Area  
East African flyway and key site network of the Lesser Flamingo (*Phoenicopterus minor*) documented through satellite tracking

5.2 What monitoring activities does your country undertake, including any bilateral or multilateral co-operative action, of wetland areas and species covered by the Agreement (e.g. national monitoring schemes, International Waterfowl Census)? Please append a list of monitoring activities or programmes initiated, ongoing or completed in the last three years

Annual waterbird monitoring has been on-going in Kenya for over 15 years. This is conducted under the African Waterbird Census Programme (AfWC), and involves counting waterbirds in key sites every January. In addition, mid-year waterbird counts are undertaken in the month on June/July.

## 6. Education and information

### Training and development programmes

*6.1 Describe the status of training and development programmes which support waterbird conservation and implement the AEWA Action Plan.*

Kenya has an elaborate training programme for water bird conservation which include the training for bird identification training in Kenya Wildlife Training Institute that train both KWS staff and volunteer water bird enumerators who participate in the bi-annual water bird counts. Kenya and other countries in African continent have developed the International Wetland course supported by Ramsar, BirdLife International, KWS, Uganda Wetland Division and the Wetland International on wetland conservation. At the university level a number of students both graduate and undergraduate are undertaking courses and research on issues related birds and wetland conservation. There area tailor made ranger training programmes on wetland conservation especially for those working in wetland areas under protection.

*6.2 What bilateral or multilateral co-operative action is your country undertaking to develop training programmes and share examples of good practice?*

The conservation of the lesser flamingo in the eastern African region is one of the main multilateral cooperative actions undertaken during the reporting period on saline lakes. In 2006 a regional meeting on flamingo was conducted to develop strategies for their conservation. Other initiative include the conservation of crossbred wetlands especially the L. Natron

### Raising public awareness

*6.3 Describe activities to raise public awareness of the objectives of the AEWA Action Plan. Please outline any particular successes generating public interest in, and securing support for, waterbird and wetland conservation (e.g. campaigns, information notes or other initiatives)?*

The national education and awareness programme on wetland aims at providing environmental education, public awareness and promotion programmes both on and off-site, highlighting wetland ecosystems and their values. The national programme is being implemented in partnership with both the public and private sectors. The focal areas

include policy influence where national leaders become more aware of the need to conserve wetlands. It also aims at increased knowledge, understanding awareness of wetlands and their values by communities that depend on wetlands for their livelihoods. Involving communities and volunteers in the assessment of wetland species and populations monitoring in wetland areas and habitats with and aim of actively involving the public in wetland conservation.

## **7. Final comments**

### *7.1 General comments on the implementation of the AEWA Action Plan*

**Kenya agrees with the action plan and is implementing some of the identified activities**

### *7.2 Observations concerning the functions and services of the various AEWA bodies*

- a. The Agreement Secretariat*
- b. International organizations*
- c. AEWA NGO partners*

### *7.3 How might the Action Plan be further developed as a practical aid for national and international conservation of migratory waterbirds?*

**The to develop a Joint Work Plan for Ramsar Convention, CMS and AEWA similar to the one developed for 2003-2005 to increase synergy between the three conventions.**

**8. Progress to implement Resolutions and Recommendations of the Meeting of the Parties**

*Please summarize progress to implement decisions of previous Meetings of the Parties.*

## **9. OPTIONAL SECTION – Planned and future actions**

Contracting Parties are invited to outline below any further information regarding the aims of the Agreement, for example, planned actions or other informative examples.

1. Species conservation
2. Habitat conservation
3. Management of human activities
4. Research and monitoring
5. Education and information

## List of abbreviations and acronyms used in the report

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## Appendices

### Appendix 1: Status of Single Species Action Plans

#### *Ardeola idea*

#### Single Species Action Plan for the Madagascar Pond-Heron *Ardeola idae*



Photograph by Neil Baker

Edited by Eric Sande and Kariuki Ndang'ang'a 15-17 April 2008, BirdLife International - Africa Partnership Secretariat, Nairobi Workshop Report, 18 April 2008

#### Summary

Critical threats of Madagascar Pond Heron that need to be addressed to save the species from further decline

1. Limited awareness by governments
2. Limited scientific information
3. Habitat destruction/degradation
4. Human disturbance at nesting sites
5. Collection of eggs and young birds at nesting sites
6. Competition with other species
7. Reduced nesting sites
8. Many data gaps on breeding population

Priority Actions to increase the known population of Madagascar Pond Heron (MPH) and to save the species from further decline

1. Collect existing literature about the species & give the reference for the 6000 individuals currently being cited by BirdLife International
2. Collect information from workers & scientists who worked in the breeding sites
3. Carry out aerial surveys of heronries
4. Conduct field surveys for new colonies and to check what other species exist in heronries
5. Support the implementation of existing management plans of the known breeding sites
6. Monitoring the known breeding sites
7. Conduct detailed studies on breeding biology and ecology
8. Lobby and work with policy makers to make the status, threats and priority actions on MPH more known and appreciated by the general public
9. Develop & distribute advocacy materials eg posters, leaflets and put information on websites to raised awareness about the species in the public at national and regional levels
10. Propose alternative environmentally friendly activities in the identified breeding sites
11. Identify key sites in non breeding range, raise their profile and lobby for their protection of priority species

#### Introduction

The workshop was opened by the Regional Director for Africa Dr. Hazell Thompson who welcomed the participants and informed them action plan production is not a waste of time as many people think. He informed the participants that the use of action plans depends on the user and that stakeholders need to be active on driving the plans rather than being passive. Action plans when available can be used to raise funds in a short time since they already have priority projects/ activities identified for the species in question as was the case for the White-necked Picathartes in Sierra Leone recently. Hazell further emphasized the importance of actions plans as they have saved 16 species since 1994 and have made the decline of 33 species slow in the BirdLife partnership.

The workshop was attended by 17 participants from 9 range states (Annex 1). It was facilitated by Eric Sande and Paul Kariuki Ntang'ang'a. The workshop involved a review and updating of the background information about the species, a thorough look at the threats in the breeding and wintering rages, development of a realistic actions based on the identified threats and a field visit on Nairobi national park which is one of the areas where the species is commonly recorded in Kenya. The workshop program is shown in Annex 2 and participants expectations are presented in Annex 3.

Kriuki Ntanganga the use of cards and flip charts to ensure that all participants contribute and all ideas contributed are collectively discussed and used in the action planning process (Annex 4a). Kariuki further presented a working definition of an action plan and emphasized that saving species through the development and implementation of action plans is a priority of BirdLife International (Annex 4b). Being a globally Endangered species and a CMS Appendix II species, both BirdLife International and CMS have to ensure that the species is conserved working hand in hand with the stakeholders in the range states.

#### Background information about the species

Madagascar is a strong hold and a major breeding ground for the species. In their presentation (Annex 5), Rivo Rabarisoa and Julien Ramanampamonjy indicated that MPH breeds in colonies with other waterbirds. Two breeding sites identified in Madagascar and there are two major breeding sites: Lac Alarobia (Lac Tsarasaotra): Private Ramsar site (5 ha) and Parc Botanique & Zoologique de Tsimbazaza (Botanical & Zoological Park, 8 ha). They further noted that there has been a reduction in the number of pairs from 50 and

30 in 1981 to 5 and 0 (Is that the information we gave, we had about 5 pairs at PBZT in 2008?) in 2008 at Parc Botanique and respectively. There was an incidence in 2007 at Tsarasaotra Lac when 10 (20) individuals of young birds were taken in Zoo in Germany for captive breeding programme as ex-situ conservation in Vogel park of Walsrode, financed by European Association of Zoos and Aquaria

In Tanzania, the species could potentially occur anywhere in the country where the Common Squacco Heron occurs according to Neil Baker (Annex 6). Neil noted that there are 237 records of MPH over a period of 30 years. He however noted that the records outside the core period could be due to misidentification though this error does not significantly over estimate or under estimate the birds. Neil wondered whether in some sites where the habitat has reduced, we are not sure whether is reduced habitat or limited observers which accounts for the reduction in MPH populations.

In Seychelles, Lindsay Chong-Seng (Annex 7) there are probably 20-50 pairs of MPH at least where the species breeds (Rocamora & Skerrett, 2001) and that no visitors are allowed in Aldabra Atoll – UNESCO World Heritage Site. He noted that cats, rats and crabs are potential predators of MHP.

In Malawi, Samuel Kamoto and Potiphar Kaliba noted that data about MPH in this country is scanty because there has not been systematic counts targeting the species. They however noted that habitat destruction and degradation are the major threats of the species at sites with no special protection (Annex 8).

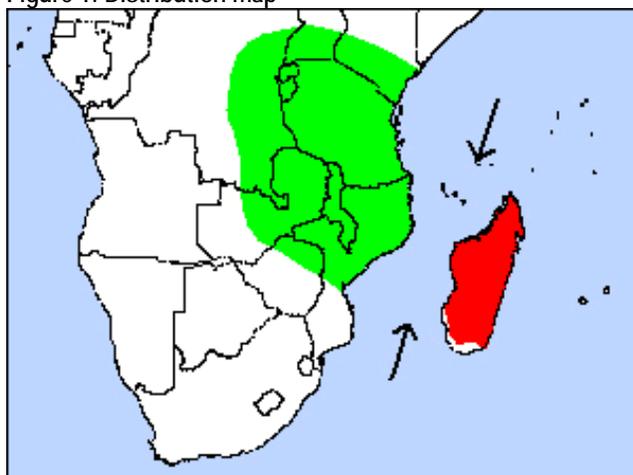
The updated information on population estimate in all the range states, breeding habitat, non-breeding habitat and diet of the MPH are shown in Tables in the subsequent pages while a map showing the distribution of MPH by sightings is indicated in Figure 1.

## BACKGROUND INFORMATION: MADAGASCAR POND-HERON

### BIOLOGICAL ASSESSMENT

General Information	Small (45-48 cm) white heron. Breeding plumage all white, with long crest and scapular plumes. Blue bill and bare orbital skin, former with dark tip. Reddish legs. In non-breeding plumage, dark brown on crown and streaked dark brownish on mantle and underparts. Found singly or in small groups, often with <i>A. ralloides</i> or egrets. Nests colonially with other herons.
Taxonomy	Phylum: CHORDATA Class: AVES Order: CICONIIFORMES Family/Sub-family Ardeidae Taxon: <i>Ardeola idae</i> (Hartlaub, 1860)
Population development	A decline has been reported over the last 50 years, most notably on the high plateau (Morris and Hawkins 1998, Salvan 1970, 1971, 1972). Whilst it remains fairly widespread, populations are low, and increasing exploitation at breeding sites is likely to increase the rate of population decline (ZICOMA 1999).
Distribution throughout annual cycle	breeds on Madagascar (2,000-6,000 individuals <sup>7</sup> ), Aldabra (100 breeding pairs - Benson and Penny, 1971) in the Seychelles, and Europa (to Réunion, to France). It has a large non-breeding range in Central and East Africa including the Comoro Islands, Mozambique, Zimbabwe, Zambia, Malawi, Tanzania, Kenya, Uganda, Burundi, Rwanda and Democratic Republic of Congo. It is present almost throughout Madagascar, but is always uncommon (Morris and Hawkins 1998). It is rare in the south and probably commonest in suitable wetlands in the west (Morris and Hawkins 1998).
Survival and productivity	
Life History: Breeding	Breeds from October to March, afterwards dispersing to mainland Africa to spend the non-breeding season. It principally inhabits freshwater wetlands, particularly shallow waterbodies fringed with vegetation and adjacent trees.
Life History: Feeding	It feeds on fish, insects and small invertebrates (Morris and Hawkins 1998).
Life History: Outside breeding season	Outside the breeding season, it is commonly found along the banks of small streams, including those inside forest. It is also found on rice paddies, and more rarely in mangroves and on the seashore. Migratory but ad hoc 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 (N. Baker <i>pers comm.</i> )
Habitat requirements: Breeding	
Habitat requirements: Feeding	
Habitat requirements: Outside breeding season	

Figure 1: Distribution map



Green – non-breeding  
Red - Breeding

AVAILABLE KEY INFORMATION

Population estimates of Madagascar Pond-heron

Global

Breeding range	Wintering, or core non-breeding range	Africa	Estimate	Trend	Notes
Madagascar, Aldabra, Europa	Central & E Africa	X	2,000-6,000	Declining	5,000 according to Rabarisoa in litt.

Source: Waterbird Population Estimates – 4<sup>th</sup> edition

Country	Breeding no.	Non-breeding no.	Quality	Year(s) of estimate	Population trend	Baseline population	References
Burundi	?	?					
Burundi							
Comoros							
Comoros							
DRC							
Europa							
Kenya	none	Information gaps still exist	Inadequate	1990-2008	Unknown	Unknown	WI Database, NMK database, Nature Kenya's sighting records
Madagascar	5 pairs			2007			
Madagascar	3 pairs			2006			
Madagascar	2 pairs			2005			
Madagascar	21 individuals			2000			
Malawi							
Mayotte							
Mozambique							
Rwanda							
Seychelles (Aldabra)	20-50 pairs			2001?			Rocamora & Skerrett 2001
Seychelles (Aldabra)	<100 birds			1971?			Benson & Penny 1971
Tanzania	none	100's to low thousands	Low (best guess from 237 records over 30 yrs)	1980-2007	Decline	No data	Baker and Baker (in prep)
Uganda							
Zambia							

Breeding habitat and habit (Madagascar)

Colony	year of first breeding	Number B P (min-max)	Habitat	Breeding among colony of? Mixed colony with.....	Breeding success (n fledgings/BP)	Legal status of the site	Conservation problem
Parc Botanique et Zoologique de Tsimbazaza	1996	4 pairs	Lake	<i>Ardeola ralloides</i> , <i>Bubulcus ibis</i> , <i>Egretta alba</i> , <i>Butorides striatus</i> , <i>Nycticorax</i> , <i>Egretta dimorpha</i>	n =16	Botanical & Zoological Park	Disturbance by visitors
Alarobia or Tsarasaotra Lake	1996	234 pairs	Lake	<i>Ardeola ralloides</i> , <i>Bubulcus ibis</i> , <i>Egretta dimorpha</i> , <i>Egretta alba</i> , <i>Nycticorax nycticorax</i> , <i>Butorides striatus</i> ,	Unknown - Difficulty to count young birds mixed	Private Park Ramsar site	Nesting habitat too small and big competition of species in the colony

Parc Botanique et Zoologique de Tsimbazaza	1997	8 pairs	Lake	<i>Ardeola ralloides, Bubulcus ibis, Egretta alba, Butorides striatus, Nycticorax, Egretta dimorpha</i>	unknown	Botanical & Zoological Park	Disturbance by visitors
Alarobia or Tsarasaotra Lake	1997	70 pairs	Lake	<i>Ardeola ralloides, Bubulcus ibis, Egretta dimorpha, Egretta alba, Nycticorax nycticorax, Butorides striatus, Anas erythrorhyncha, Anas hotentota, Sarkidiornis melanotos, Dendrocygna viduata,</i>	Unknown Difficulty to count young birds mixed	Private Park	Too big competition of species in the colony, with a big colony of ducks also some Young MPH eaten by Nycticorax
Parc Botanique et Zoologique de Tsimbazaza	2006	2 pairs	Lake	<i>Ardeola ralloides, Bubulcus ibis, Egretta alba, Butorides striatus, Nycticorax nycticorax, Egretta dimorpha</i>	n= 5	Botanical & Zoological Parc	Too much human activities
Parc Botanique et Zoologique de Tsimbazaza	2007	3 pairs	Lake	<i>Ardeola ralloides, Bubulcus ibis, Egretta alba, Butorides striatus, Nycticorax, nycticorax, Egretta dimorpha, Melanophoyx ardesiaca, Ixobrychus minutus</i>	n= 9	Botanical & Zoological Parc	Site rehabilitation
Parc Botanique et Zoologique de Tsimbazaza	2008	5 pairs	Lake	<i>Ardeola ralloides, Bubulcus ibis, Egretta alba, Butorides striatus, Nycticorax, Egretta dimorpha, Melanophoyx ardesiaca, Ixobrychus minutus</i>	n=14	Botanical & Zoological Parc	Too much human activities

#### Non-breeding habitat and habit

Country	site	year	Staging number	Legal status of the site	Conservation problems
Madagascar	Baie de Baly wetland	2006	6	No legal status	Conversion of wetland into rice field
Madagascar	Baie de Baly wetland	2007	2	No legal status	Conversion of wetland into rice field
Madagascar	Baie de Baly wetland	2008	9	No legal status	Conversion of rice field
Madagascar	Boanamy-Bombetoka Complex	2007	18	No legal status	Habitat destruction and collecting young birds
Kenya	Busia grassland IBA	2007	1	Unprotected, private farms	Severe and immediate threat from high human population density to the tiny grassland patches, pressure from sugarcane farming
Kenya	Sabaki river mouth IBA	2007	1	Not protected	Changing land use practices
Kenya	Nairobi National Park IBA	2006, 2004, 2002, 2001	Total=11	National Park, protected	Lack of buffer zone for park and development pressure from the city, Climate change

Kenya	Manguo flood plain	2006, 2003	2	Private / Public	Over-use of water threatens the swamp to dry, land in privately owned & is subject to land use change
Kenya	Runda Ponds, Nairobi	2006	1	Private / Public	Site subject to potential land-use change
Kenya	Nairobi Racecourse	2005	1	Private/ public	Site subject to potential land-use change
Kenya	Ngong rd forest sanctuary, Nbi	2005	1	Private / public	
Kenya	Carnivore Biodiversity park	2005	1	Private / Public	Site subject to potential land-use change
Kenya	Lake Nakuru National Park IBA	2005	1	National Park, protected	Conflict between conservation & development, industrial pollution, fragile lake ecosystem, Human wildlife conflict, catchment degradation, Climate change
Kenya	Amboseli National park	2004, 1996	Total=2	National Park, protected	Human-wildlife conflict, water problem due to dry spells, Impacts of recreational disturbance ,Climate change
Kenya	J. Hewett's, Langata Nbi	2004	1	Private/Public	Site subject to potential land-use change
Kenya	Ngong, Endashant Swamp	2003, 2002	2	Private/Public	Site subject to potential land use change
Kenya	Gethumbwini Estate, Thika.	1997	1	Private/Public	Site subject to potential land use change
Kenya	Malindi Golf Course, Malindi.	1997	1	Private/Public	Site subject to potential land use change
Kenya	Msambweni, Mombasa	1997	1	Private/Public	Site subject to potential land use change
Kenya	Ngong Rifle Range	1997	1	Private/Public	Site subject to potential land use change
Kenya	Masai Mara National Reserve IBA	1996	1	National reserve, some protection	Growing human population, land-use changes, pressure from large-scale farming on the park surroundings and

					recreational disturbance,
Kenya	Bamburi Nature Trail, Mombasa (Heller Park)	1995	1	private	Site subject to potential land use change
Rwanda	Akagera National Park	2006		Protected area	Hunting and Wildfire
Rwanda	Kigali City	2007		Unprotected	Infrastructure
Rwanda	Gashora	2006		Unprotected	Cultivation
Burundi	Rusizi national reserve	2004	1	Gazetted Protected area	Encroachment, disturbance regular human presence
Burundi	Rwihinda managed Reserve	2008	2	Gazetted Protected area	Regular human presence ,encroachment
Burundi	Lake Tanganyika shores	2008	1	Not legally protected	Industrial pollution, urban expansion
Zambia	Kafue Flats		? Rare visitor	National Park, Game Management Area, unprotected	Damming of the Kafue River, invasion by <i>Acacia pigra</i>
Zambia	South Luangwa National Park	Recorded most years, most recent 2006	?Rare but regular visitor	National Park	None
Zambia	Shiwa Ngandu		? Rare visitor	Farm and conservancy	Unknown
Zambia	Sumbu National Park		? Few - vagrant	National Park	Unknown
DRC	Moba	1929		Unprotected	
Malawi	Salima	1988	2	Not protected	Destruction of habitats
Malawi	Lilongwe Sewage	1989	2	Private property	None Know
Malawi	Liwonde National Park	2001	2	National Park Protected under National Parks and Wildlife Act	None known
Malawi	Namizimu	2001	1	Forest Reserve Protected under Forestry Act	Destruction of habitats
Malawi	Lengwe National Park	2001	2	National Park Protected under National Parks and wildlife Act	None known
Malawi	Elephant Marsh	2002 2003	1 1	Not protected	Destruction of habitats
Malawi	Hyde Dam Limbe	2002	1	Private property	Destruction of habitat
Malawi	Kasungu National Park	2006	1	National Park	None Known

Knowledge on habitat, diet and occurrence

Country	site	Water quality*	Prey species*	Feeding period (daylight, night)	Legal status	Conservation problems
Madagascar	Botanical & Zoological park of Tsimbazaza	Fresh	Crickets, Frogs, small fish	daylight		
Madagascar	Tsarasaotra Lake	Fresh	Small fish	daylight		
Madagascar	Baie de Baly wetland	Fresh & brackish	Crickets,	daylight		
Madagascar			Small fish			
Madagascar	Boanamary - Bombetoka complex	sea-water	Unknown	daylight		
Burundi	Rusizi national reserve	fresh	Not known so far	No precise information, need of more research	Protected by Burundi environmental Act and other specific laws	See the table above
Burundi	Rwihinda managed Reserve	Fresh	Not known so far	idem	Idem	idem
Burundi	Lake Tanganyika shores	Fresh	Not known so far	idem	Not legally protected	idem
Rwanda	Kigali	unknown		Daylight	unprotected	Infrastructure and cultivation
Tanzania	Kilombero Ramsar Site	fresh	Invertebrates in rice paddies, at one time seen small lizard	Observed during day time	Ramsar site	Overgrazing, a potential threat
Zambia	South Luangwa	Fresh	Frog	Daylight	None	Unknown
Malawi	(sites mentioned above)	Fresh usually at pond edges, dams and sluggish rivers in wooded areas or fringing veg.	?	?	Protected under National Parks and Wildlife	Destruction of Habitats (mainly agric. activities) in areas outside protected areas i.e. Forest Reserves, National Parks and Wildlife Reserves
DRC	Moba	Fresh				

\* fresh, brackish, sea-water

The majority of the range states have ratified the various conventions/agreements which benefit the species in one way or another. In addition, many range states have put in place a number of legislations at national levels which, if well implemented can save the species from further decline.

International Conventions & agreements ratified by the range states

Country	CBD	CITES	AEWA	CMS	RAMSAR	WHC			
Burundi	√	√							
Comoros									

DRC									
Europa									
Kenya	√	√	√	√	√	√			
Madagascar	√	√	√	√	√				
Mayotte									
Mozambique									
Rwanda	√	√			√				
Malawi									
Seychelles									
Tanzania									
Uganda	√	√	√	√	√	√			
Zambia	√	√			√				

National legislation in the range states

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 stipulates 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		INECN
DRC	none	none	National Biodiversity Strategy			Ministry of Environment, Nature Conservation and Tourism
Europa						
Kenya	none	Protected under IBA with protection as National Parks		Yes		Kenya Wildlife Service, KWS
Madagascar	EN	Catégorie I, Classe I : Animaux protégés (=strict protection)	DECRET N°2006-400 portant classement des espèces de faune sauvage	Yes	Equivalent of 19200 to 38500 Euro fine plus 1 to 5 years of prison or one of the two penalty kinds	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	?	MK 4000 in default 2 years imprisonment	Department of National Parks
Mayotte						
Mozambique						
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					
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) No 12, of 1974; Wildlife Policy 2007	Yes	Not set. Unknown	Wildlife Division within Ministry of Tourism and Natural Resources

Uganda						
Union des Comores		All Ardeidae are "espèces partiellement protégées »				
Zambia	None		Wildlife Act			Zambia Wildlife Authority

Participants prepared a press release (Annex 9) about the MPH SAP that is being developed highlighting the main problems affecting the species and the critical activities needed to save the species.

### Threat analysis

Eric Sande introduced a the problem tree analysis to identify the threats to the species and indicated that the problem tree

- helps to identify all the threats
- helps to do a systematic analysis of all the threats (what causes the other)
- after all threats have been identified, we can prioritise them to identify the critical ones on which the objectives & subsequently activities of the action plan can be based

Participants in 3 groups identified 15 main threats using the problem tree analysis on which objectives and activities were formulated.

### Main threats of MPH

1. Limited awareness by governments (1)
2. Limited scientific information (1)
3. Limited lobbying by conservationists (2)
4. Limited resources (human and financial) (2)
5. Habitat destruction/degradation (1)
6. Drainage of marshes (2)
7. Agricultural expansion (2)
8. Watershed deforestation (2)
9. Human disturbance at nesting sites (1)
10. Collection of eggs and young birds at nesting site(1)
11. Competition with other species(1)
12. Reduced feeding sites (2)
13. Reduced nesting sites (1) at the known breeding site (Botanical and zoological Park and Tsarasaotra lake)
14. Many data gaps on breeding population (1)
15. Increase in human population (1)

### Key:

1=factor causing or likely to cause a very rapid declines (>30% over 10years)

2= factor causing or likely to cause a very rapid declines (20-30% over 10years)

### Aim

Improve the current conservation status and knowledge base of the MPH within the next 5 years

### Objectives

1. Regional survey to identify more breeding sites of MPH in Madagascar, Comoros, Aldabra, Cosmoiedo, Astove and Europa
2. Improve action on the known breeding sites
3. Raise the profile of MPH in the range states
4. Systematically collect and manage data on population, distribution, feeding and habitat requirements of the species in non breeding range states
5. Undertake measures to restore and protect key breeding sites identified
6. Determine the extent of MPH habitat conversion

## Actions

Regional survey of breeding sites	Priority	Time Scale	Lead agency
Collect existing literature about the species & give the reference for the 6000 individuals currently being cited by BirdLife International	Critical	Short	ASITY
Collect information from workers & scientists who worked in the breeding sites	Critical	Short	SIF/ ASITY
Carry out aerial surveys of heronries	Critical	Short	ASITY
Conduct field surveys for new colonies and to check what other species exist in heronries	Critical	Short	ASITY/SIF
<b>Improve action on known breeding sites</b>			
Support the implementation of existing management plans of the known breeding sites	Critical	long	ASITY/SIF
Monitoring the known breeding sites	Critical	Medium	SIF/ ASITY
Conduct detailed studies on breeding biology	Critical	Long	SIF, University of Antananarivo
<b>Raise the profile of MPH in the range states</b>			
Lobby and work with policy makers to make the status, threats and priority actions on MPH more known and appreciated by the general public	critical	medium	Relevant ministries, Birdlife Partners
Develop & distribute advocacy materials eg posters, leaflets and put information on websites to raised awareness about the species in the public at national and regional levels	Critical	Medium	SIF/BirdLife partners
Capture MPH information about MPH in Researchers' monthly reports in addition to other globally threatened, CMS/AEWA species	medium	ongoing	SIF, Birdlife partners/government departments
Propose alternative environmentally friendly activities in the identified breeding sites	Critical	ongoing	Birdlife partners & government agencies
Include MPH in media campaign (radio, TV, newspapers) together with other threatened, CMS and AEWA species	Medium	ongoing	Birdlife partners & government agencies
Include MPH in existing special events for threatened, CMS and AEWA species eg wetlands day, Bird Migratory days, etc	High	Ongoing	Birdlife partners & government agencies
Include MP in relevant stakeholder meetings at local, national and regional levels	High	ongoing	Birdlife partners & government agencies
Include MPH & other water birds in the ongoing training programs for staff, conservationists and students to improve species identification skills, survey techniques, etc	Medium	Ongoing	Birdlife partners, universities, wildlife colleges
<b>Systematic collection and management of data on population, distribution, feeding and habitat requirements of the species in non breeding range states</b>			
Develop identification kit and guide for herons	Medium	Medium	Birdlife partners and other NGOs
Identify key sites in non breeding range, raise their profile and lobby for their protection of priority species	Critical	Medium	Birdlife partners and other NGOs
Organise and conduct training for data collectors in identification, survey techniques and data management	High	ongoing	SIT, Birdlife partners & government agencies
Initiate/strengthen water bird databases in range states and ensure that MPH is included	High	ongoing	Birdlife partners
Conduct studies on the non breeding ecological requirements of the species	High	long	Birdlife partners
Create an international network of MPH among range states	Medium	short	Birdlife partners
Encourage birdwatchers to submit records to the network	Medium		Birdlife partners
Establish pollution levels of MPH habitats	?	medium	Birdlife partners
Establish a pollution monitoring program in MPH habitats	?	ongoing	Birdlife partners/Universities
<b>Undertake measures to restore and protect key breeding sites</b>			
Advocate for formal protection of key breeding sites once identified	Medium	Medium	ASITY/SIF, governments
Initiate a pilot program for artificial breeding in identified sites	Medium	Medium	ASITY/SIF, governments
Lobby for/purchase of some as reserves that hold key breeding colonies/ heronries	Medium	Medium	ASITY/SIF, governments

Determine the extent of MPH habitat conversion			
Analyse the existing habitat images to establish the temporal changes of MPH habitats in key sites using remote sensing	Medium	medium	Birdlife Partners
Advocate for and implement EIA studies in breeding and potential MHP habitats before any development	Medium	ongoing	Birdlife Partners

#### Priority ratings

**Critical:** action needed to prevent a large decline in the population which could potentially lead to extinction

**High:** action needed to prevent decline of more than 20% of the population in  $\leq 20$  years

**Medium:** action needed to prevent decline of less than 20% of the population in  $\leq 20$  years

**Low:** action needed to prevent local population declines or which is likely to have only a small impact on the population across the range states

#### Time scale criteria

**Short:** Completed within the next 1 year

**Medium:** completed within the next 1-3 years

**Long:** completed with 1-5 years or more

#### Monitoring and Evaluation

##### *How?*

This will be done through tracking the level of implementation of various activities as outlined in the Activities table. A column with added to this table in which assessment of progress (activity compared to indicator) will explained. This table will be circulated to the MPH network for filling twice a year.

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

##### *By who?*

National contacts will evaluate progress nationally

BirdLife Africa Secretariat in Liaison with AEWA Secretariat will lead Globally

The MPH network (working virtually by email) will fill in table

The key driver persons for this process will be Julien (breeding range) and Neil Baker (non-breeding range)

##### *How often?*

Twice per year.

#### Next steps

What?	By when?	By who?
Distribution map	21 April 2008	Neil Baker
MPH Network forum started	17 April 2008 - done	All, Neil Baker
Draft SAP circulated to participants for comments	21 April 2008	Eric and Kariuki
Comments received from participants	28 April 2008	All
Comments incorporated and 2 <sup>nd</sup> draft circulated widely (people may start using as working document). Also further circulated to wider experts and CMS & AEWA	2 May 2008	Eric and Kariuki
Draft ready for AEWA MoP to be held in August 2008		

Comments: Need for SAP to be launched; Need for systematic distribution and profiling at key events.

#### Evaluation

Participants were given 12 questions (Annex 9) assessing the action planning process and were asked to score very good, good, fair and poor for each question. The results are presented in the figure below which shows that the workshop was generally a success



Annex: 1 List of participants and their contacts

NAME	COUNTRY	ROLE	EXPERIENCE in SAPs	ADDRESS	TELEPHONE	EMAIL
Alfred Owino	Kenya	Conservation Biology	Lesser Flamingo	Kenya Wildlife service P O Box 40241-00100 NBO	+254 20 6000800	alfred@kws.go.ke
Claudien Nsabasaga	Rwanda	Research Assistant Ornithology, D Diana Fossey Gorrilla Fund International	Graver's Swamp Warbler	P10 105 Musanke, Northern Province Rwanda	+250 0875464	claudienn2000@yahoo.fr
Eric Sande	Uganda	Lecturer, Makerere University	More than 15	Zoology Dept P O Box 7062, Kampala	256 772688552	Ericсанде@zoology.mak.ac.ug, ericsанде@hotmail.com
Fred Barasa	Kenya	IBA Research Fellow	None	NMK, P.O Box 40658 – 00100 Nairobi	+254 -722441074	funyekenye@yahoo.com
Hazell Thompson	Kenya	Conservation Biology	SAPs in All BirdLife Africa	P.O Box 3502, GPO, Nairobi	+254 8562490 or +254 8562246	Hazell.thompson@birdlife.or.ke
Henry Ndithia	Kenya	Research Scientist of National Museum of Kenya	Lesser Flamingo	P.O Box 70898-00400 Nairobi	+254 - 723572256	hndithia@museums.or.ke hndithia@yahoo.com
Jarton Shawa	Zambia	Research Technician	Blue Swallow	South Luagwa Area Management Unit P.O Box 18, Mfuwe	097 7 260289	jncnjs@yahoo.com
Jasson John	Tanzania	Lecture-University of Dar Es Salaam./Wildlife Society of Tanzania (BirdLife Partner)	Flamingo and SGT.	P.O Box 35064, Dar Es Salaam Tanzania	+255 754373235	wirldornithology@udsm.ac.tz
Lindsay Chong-Seng	Seychelles	Sciences Programmes Coordinator	Seychelles Magpie Robin	P.O Box 392, Mahe Seychelles	+248 514451 or +248 321735	l.chongseng@sif.sc
Lizanne Roxburgh	Zambia	Biologist, Zambian Ornithology Society	None	P/Bag16, Woodlands Lusaka	+260 977723547	lizanne@coppernet.zm.
Neil Baker	Tanzania	Birder, Tanzania Bird Atlas	Maccoa Duck – Lesser Flamingo	P.O Box 1605, Iringa Tanzania	+255 786404792	tzbirdatlas@yahoo.co.uk
Potiphar Kaliba	Malawi	Researcher Ornithology, National Museums of Malawi. Ag. Director	- SGT and Blue Swallow - Wattled Crane	National Museums of Malawi P.O Box 30360 Blantire 3 Malawi	02651875909	Museum@malawi.net
Rivo Rabarisoa	Madagascar	BirdLife Madagascar (Coordinator, Wetland project)	Madagascar Fish Eagle Lesser Flamingoes	BP 1074 ANTANANRIVO (101) Madagascar	+261 020324006824	<a href="mailto:rivo.rabarisoa@birdlife-mada.org">rivo.rabarisoa@birdlife-mada.org</a>
Samuel Kamoto	Malawi	Head, Natural Resources management and Environmental Education Program at the Wildlife and Environmental Society	None	Wildlife and Environment Society of Malawi, Private Bag 578, Limbe,	+265 08329145 or +265 01843502/428	samkamoto@africa-online.net

				Malawi		
Julien Ramanampamonjy	Madagascar	Curator of Bird / TSIMBAZAZA, last President of Asity league fay Protection of Birds	a) Pond Hero, 1996 to 1997, St Louis Zoo situation Report b) Long Tail Ground Roller. 2000-7 in Situ/ex Situ	Curator of Birds, .O Box 4096 ANTANARIVO – 101 Madagascar	+261 340374893	julien_acity@onel.moov.mg acity@mel.moov.mg
Jeam Rushemeza	Burundi	Technical Advisor at INECN in Management & Ecotourism within PAs		BP 56 Gitega-Burundi	25722403031 25777756707	rushemj1@yahoo.fr
Dieudien Bizimana	Burundi	ABO				
Paul Kariuki Ndong'ang'a	Kenya	Africa Species Programme Manager, BirdLife International	Several (at least 4)	P. O. Box 3502, 00100, Nairobi, Kenya	+254 20 8562246	paul.ndanganga@birdlife.or.ke

**Annex 2: Species Action Plan development workshop for the Madagascar Pond-Heron  
15-17 April 2008, BirdLife International Africa Partnership Secretariat, Kasarani**

Tuesday 15	Wednesday 16	Thursday 17
<p>Opening Introduction Workshop Program (ES) Self introductions &amp; Expectations (ES) BirdLife Species work, CMS/AEWA (KN) Workshop Techniques (KN)</p>	<p>Recap of day 1 (ES) Action program Plenary (ES) to: -Review and &amp; prioritize the threats on the entire problem tree (ES) -Agree on longevity of Plan -Group work to formulate objectives (inc indicators &amp; verification means) basing on priority threats</p>	<p>Recap of day 2 (KN) Action Program cont. Activities Group work to formulate activities (inc priority setting, time scale responsible Organisation) of the different objectives</p>
Tea/Coffee break (1030-1100)	Tea/Coffee break (1030-1100)	Tea/Coffee break (1030-1100)
<p>Background information to the species (ES) Overview (KN) Country presentations by Country Reps focusing on : -Population status -Local distribution -National legislation -Main threats to the species Participants update the tables in the background document circulated (KN)</p>	<p>Plenary (ES) to generate consensus on: -objectives -Formulate Aim of the plan For the rest of the day &amp; night, participants will ponder about activities vis-à-vis the threats</p>	<p>Group presentations on activities (ES)</p>
Lunch break (1-2pm)	Lunch break (1-2pm)	Lunch break (1-2pm)
<p>Threats to the species -Presentation on the use of Problem tree to identify main threats (ES) -Group work to identify causes of main threats building up of Problem tree branches (ES/KN)</p>	<p>Field work (KN)-Visit to Nairobi National Park</p>	<p>-Plenary session to review priority activities vis-à-vis prior threats (ES) -M&amp;E (KN) -Review Press release (KN) -Next steps (KN) -Final evaluation (ES)</p>

		-Closing dinner/party (KN)
Tea/Coffee break (4-430pm)		
Group presentations on causes of main threats (ES/KN) Evaluation (ES)		

ES=Eric Sande, KN=Kariuki Ndang'ang'a

Annex 8: Madagascar Pond-heron the situation in Malawi

1. **Legal status**

National Red Data Book <sup>(1)</sup>	National protection status	Under what law is the species protected	Is the Sp. legally protected from being deliberately killed?	Is the Sp. legally protected from egg harvest?	Is the Sp. Legally protected from nest destruction?	What are the penalties for	Who is the highest national authority for protection of birds
N/A	Protected species	National Parks & wildlife Act	Yes	Does not breed in the country	Does not breed in the country	MK 4000 (30USD) in default 2 years imprisonment	Depart. of Nat. Parks and wildlife

(1) Indicate the existence of a RDB in your country and the status of the species according to this RDB.

2. **Non-breeding population-** known or thought to visit during the non-breeding season

Site	Year	Staging number	Wintering number	Legal status of the site	Conservation problems
Salima	1988	2	N/B	Not protected	Destruction of habitats
Lilongwe Sewage	1989	2	N/B	Private property	None Know
Liwonde National Park	2001	2	N/B	National Park Protected under National Parks and Wildlife Act	None known
Namizimu	2001	1	N/B	Forest Reserve Protected under Forestry Act	Destruction of habitats
Lengwe National Park	2001	2	N/B	National Park Protected under National Parks and wildlife Act	None known
Elephant Marsh	2002 2003	1 1	N/B	Not protected	Destruction of habitats
Hyde Dam Limbe	2002	1	N/B	Private property	Destruction of habitat
Kasungu National Park	2006	1	N/B	National Park	None Known

Please, if possible, add a map with the location of the different sites

- Areas spotted are in Central and Southern Malawi

3. **Feeding ecology-**

Site	Water quality (fresh, brackish, sea-water)	Prey species*	Feeding period	Legal status	Conservation problems
Areas mentioned above	Fresh usually at pond edges, dams and sluggish rivers in wooded areas or fringing vegetation	Not recorded	Not recorded	Protected under National Parks and Wildlife Act	Destruction of Habitats ( mainly agricultural activities) in areas outside protected areas i.e. Forest Reserves, National Parks and Wildlife Reserves

If possible, indicate seasonal variations in prey composition

4. **Research and conservation**

What research has been conducted with the Sp over	What conservation efforts have there been for the Sp	What is the general attitude of the public toward the Sp	What is the general attitude of the conservation
---	--	--	--

DRAFT

the past 10 years ?	over the past 10 years ?		authorities toward the Sp
Done with the general assessments of habitats by Museums of Malawi ( e.g. Assessment of water birds in general)	Protected under National Parks and Wildlife Act and Forestry Act ( Through general Conservation not species specific)	This species is not eaten. The flesh of a heron is considered awful to eat	Conservation attitude of authorities is good because this species is treated as a protected species. Any bird that is considered by birdlife as worth special protected is an automatic candidate to be listed as a protected species requiring special protection under the National Parks and Wildlife Act

Please give a list of the main references published on the Sp in your country.

Francoise & Robert Dowset- Lemaire, 2006: The birds of Malawi-An Atlas and Hand book, TauracoPress and Aves a.s.b.l Belgium.

**Annex 9: Strategy for saving the doomed Madagascar Pond-heron developed**

Madagascar Pond-heron *Ardeola idea*, one of the world's most enigmatic waterbird species, has now received common attention from all its range states.

Between 15<sup>th</sup> and 17<sup>th</sup> April 2008, 17 delegates drawn from nine countries came together to strategise on reversing the declining trend of the heron's population. The decline, reported over the last 50 years, has seen this bird move from being common to being in the Endangered. This implies that if no immediate action is taken, the species will become extinct in the near future. In a workshop held in Nairobi, the delegates developed an Action Plan to save the species.

The Madagascar Pond-heron only breeds in Madagascar, Aldabra, Europa and Mayotte - all Western Indian Ocean Islands from November to April. It then migrates to 10 mainland African countries where it frequents small inland fresh water ponds with trees on the side.

The Madagascar Pond-heron has a range of over 2 million square kilometers and an estimated world population of less than 6000 birds. Being a migratory species with such a huge range and few remaining individuals, a concerted effort is required to save the bird. In fact, Julien Ramanampomjy, a founder member of ASITY Madagascar, an NGO dedicated to protecting birds in Madagascar, gave an indication that the members of breeding birds in some known heronries have declined dramatically from 232 birds in 2007 to none in 2008. In his opening remarks to the workshop, Dr. Hazell Thompson the Africa Regional Director of BirdLife International emphasised on the need for a single species action plan. "Since the action plan looks at threats and identifies priority actions, it is a useful tool for advocating action to save a species", he said.

The participants quickly realised that for the Madagascar Pond-heron to survive, a lot of actions have to be implemented especially in Madagascar. Key ones include gathering of further information on its occurrence and ecology; raising its profile and taking action to protect the species mainly at its breeding sites.

The Action Planning workshop was organised by the Africa Partnership Secretariat of BirdLife International- in liaison with the secretariat of the Agreement on the conservation of Africa-Eurasian Waterbirds (AEWA). Financial support was provided by the Convention on the Conservation of Migratory Species of Wild Animals (CMS) represented by UNEP-CMS Secretariat.

**Annex 10: Madagascar Pond Heron Workshop Evaluation Form**

Tick in the right Box (1=Very good, 2=Good, 3=Fair and 4=Poor)

		1	2	3	4
1	Were you provided with enough background information?				
2	Was the background information provided in time?				
3	How were the oral presentations of background information?				
4	How did you like the problem analysis in the context of the species threats, objectives and actions?				
5	What was your assessment on group work and interaction by participants?				
6	What was your assessment on the facilitators in clarity, allowing participants contribute and driving the process in general?				
7	What was your assessment on the food and intervals between breaks?				
8	What was your assessment on accommodation?				

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9	Do you think the time was enough to develop this plan?				
10	What is your ranking on the SMARTNESS of the plan?				
11	What is your general assessment of planning process				
12	What is your assessment on the involvement of the participants in the Action plan development and write up?				

*Phoeniconais minor*

# National Single Species Action Plan for the Conservation of the Lesser Flamingo *Phoenicopterus minor* in Kenya



Compiled by :National Lesser Flamingo Conservation Committee

Through UNEP's Project: "Developing Strategies to Address the Declining Flamingo Populations and Densities in the Rift Valley Lakes in Kenya"

With support from: Chinese Artist- Mr Luo Hong, Kenya Wildlife Service & East Africa Wild Life Society

April 2008



#### ACRONYMS

AEWA: Agreement on the Conservation of African-Eurasian Migratory Waterbirds  
CMS: Convention on the Conservation of Migratory Species  
CITES: Convention on International Trade in Endangered Species of Wild Flora and Fauna  
RAMSAR:  
IBA: Important Bird Area  
UNESCO: United Nations  
NBSAP: National Biodiversity Strategic Action Plan  
NEAP: National Environmental Action Plan  
SAP: Species Action Plan  
KWS: Kenya Wildlife Service  
IUCN: World Conservation Union

#### Executive Summary

The Lesser Flamingo (*Phoenicopterus minor*), the smallest flamingo species, is a spectacular bird of much ecological and economic value. Despite being the world's most numerous flamingo, this bird is currently classified as globally 'near' threatened in the IUCN Red List of Threatened Species, indicating that it is considered likely to qualify for a threatened category in the near future. In Kenya the Lesser Flamingo is largely confined to the Rift Valley soda lakes, with a population fluctuating between 279,620 and 1,453,513 in the period 1992 to 2007 (estimated in the months of January).

In Kenya, the species has the potential of benefiting from the national implementation of the various international conventions that have been ratified as well as a wide range of national laws that favour protection of the species, its key sites and habitats. At the same time a large number biodiversity conservation projects and strategies that do relate to the conservation of the Lesser Flamingo are taking place in Kenya. All these need to be harmonised in a manner that can provide more benefit to the species.

The most critical threats to the survival of the Lesser Flamingo in Kenya are thought to be the loss and/or the degradation of its specialised habitat. Habitat degradation results from alteration in hydrology and changes in water quality. Threats of high importance include poisoning (particularly by cyanobacteria toxins) and infectious diseases (mycobacteriosis and avian cholera). Threats of low importance include salt extraction and the disturbance of breeding colonies by human activities. All other threats, including human disturbance of non-breeding sites, predation and competition with other species for food and breeding sites birds are perceived as being threats of local importance.

This 10-year plan envisions ensuring a long-term survival of the East African population of the Lesser Flamingo such that the global population is ultimately removed from the list of Near Threatened species in the IUCN Red Data List. It aims at stabilising the population size and distribution of the Lesser Flamingo in Kenya within the next five years. This will be achieved through the following objectives: (1) maintaining all key sites maintained in good ecological condition (2) stopping disturbance key non-breeding sites and at sites where birds are known have attempted to breed or to have traditionally bred (3) reducing the impact of poisoning and diseases on Lesser Flamingo populations (4) initiating and sustaining an operational national and regional network and collaboration programme for the conservation of the Lesser Flamingo, and (5) filling knowledge gaps on aspects of the ecology of Lesser Flamingo such as population numbers and distribution, threats, values, and causes of die-offs. These objectives will be addressed by all stakeholders through undertaking projects and activities outlined under six key groupings: policy & legislation, species & habitat conservation, monitoring and research, public awareness & training, and community involvement.

#### 1.0 Introduction

The Lesser Flamingo (*Phoenicopterus minor*), the smallest flamingo species, is a spectacular bird of many ecological and economic values. Despite being the world's most numerous flamingo, this bird is currently classified as globally 'near' threatened in the IUCN Red List of Threatened Species, indicating that it is considered likely to qualify for a threatened category in the near future. The largest population (c. 1.5 - 2.5 million individuals) of the four globally recognized Lesser Flamingo populations, occurs on the alkaline-saline lakes of the Great Rift Valley in East Africa. This population however faces many threats, key among them being pollution, disease and habitat loss, exacerbated by climate change and drought.

Lesser Flamingos have many important ecological and conservation roles, which make them important to the biological diversity of the Rift Valley lakes (KWS-WCMC Binu Project, 2005; Childress *et al.*, 2007; Carlo & Collar, 2000). Their populations and concentrations in eastern Africa are unique and of global and regional conservation concern. They are sensitive and respond to changes in the environmental conditions of their habitats by moving away from them (Simmons, 2000; Tuite, 2000; KWS-WCMC Binu Project, 2005). The changes in the lakes may be a reflection of the changes within the watersheds. Their movements between the lakes are indicative of the ecological and biological linkages between the saline-alkaline lakes in the region (Githaiga, 2003). The suspected decline of their population has made them recognized and listed by important international conservation agreements, which have also led to suggestions of special actions to manage the birds and mitigate the declining trends.

The need for concerted action to conserve this species has long been recognised, and already stakeholders at a global level have developed an International Single Species Action Plan for this species (Childress 2007). Nationally, in Kenya, stakeholders initially brought together in July 2007 (Lelo and Ngigi 2007) made a resolution to develop a National Action Plan for the Lesser Flamingo in Kenya. This was driven by the realisation that conservation of the Lesser Flamingo in Kenya has already elicited a lot of interest and requires coordinated and multidisciplinary action. Development of a national plan would therefore help in focussing action, engaging all relevant stakeholders and seeking commitments.

This National Action Plan was developed through a process that included a review of the International Action Plan and its domestication, and a national stakeholder workshop to analyse threats nationally, prioritise actions that need to be undertaken to address threats and lay out a strategy on how to move ahead. The action plan has a lifespan of 10 years and should be reviewed and updated every three years (first review 2011). An emergency review will be undertaken if there are sudden major changes liable to affect the population.

#### 2.0 Background Information

##### 2.1 Taxonomy

Kingdom: Animalia  
Phylum: Chordata  
Class: Aves  
Superorder: Carinatae

Order: Ciconiiformes  
 Family: Phoenicopteridae  
 Genus: *Phoenicopterus* (Linnaeus, 1758)  
 Species: *Phoenicopterus minor* (Geoffroy, 1798)

The taxonomic relationships of flamingos have been difficult to establish. Historically, they have been thought to be most closely related to Anseriformes, Charadriiformes or Ciconiiformes by different researchers. Recent DNA analyses have shown that flamingos are most closely related to the Podicipedidae and are divided into two clades based on their genetic similarities: one containing *P. ruber*, *P. roseus* and *P. chilensis*, with the other containing *P. minor*, *P. andinus* and *P. jamesi*.

## 2.2 Distribution and population status

### 2.2.1 Global distribution and population status

The total global non-breeding population is estimated to range from 865,000 to 2,640,000, with a mean of 1,752,500 birds. Four separate populations are recognised for conservation purposes, although it is assumed that some interchanges probably occur between the populations. The largest population, estimated to be between 1.5 and 2.5 million individuals, occurs on the alkaline-saline lakes of the Great Rift Valley in East Africa. Smaller populations occur in the Rann of Kachchh in north-western India, estimated to be approximately 390,000 birds, in southern Africa, estimated to be between 55,000 and 65,000 birds, and in West Africa, estimated to be between 15,000 and 25,000 birds. Declines have been suggested for much of Africa, but are difficult to clarify due to widescale movement within the continent.

The Lesser Flamingo is regularly seen in 29 countries from West Africa, across sub-Saharan Africa and along the SW Asian coast to South Asia, and occurs as a vagrant in 23 additional countries. However, its global population is concentrated in 10 core countries and confirmed regular breeding is confined to just five sites in four of these countries.

### 2.2.2 Distribution and population status in Kenya

In Kenya the Lesser Flamingo is largely confined to the Rift Valley soda lakes (Figure 1, Table 1). Major concentrations are found at lakes Nakuru, Bogoria and Elementeita. Concentrations of feeding birds can exceed one million at lakes Nakuru and Bogoria. They are seldom seen far from the Rift Valley. In Kenya the population, in the period 1992 to 2007 estimated in the months of January, fluctuated between 279, 620 and 1,452,513 birds with a mean of 937,249 (Figure 2). In most years during this period the national population estimates were above 750,000, while low estimates of less than 400,000 birds were recorded in the years 1996, 2004, 2005 and 2007. Data quality in Kenya is good as it is derived from the waterbird counts that are done bi-annually. The large estimate range is the result of frequent large-scale movements of birds among sites and range states, resulting in low minimum counts and high maximum counts for individual sites.

**Table 1: Population estimates of Lesser Flamingo in \*key Kenyan sites (with >2000 birds)**

Site	Protection status	IBA	RAMSAR site	Max Number	Min Number	Notes/citation
Lake Nakuru	NP	Yes	Yes	1893507	1133	
Lake Sonachi				2750	18	
Lake Bogoria	NR	Yes	Yes	1350695	14645	
Lake Elmenteita	Private, Unprotected	Yes	Yes	588376	711	
Lake Logipi	Unprotected	No	No	500000	?	
Lake Oloidien	Private, Unprotected	Yes	No	350533	4	
Lake Magadi	Private, Unprotected	Yes	No	40188	2121	
Lake Solai	Unprotected	No	No	6864	1	
Lake Turkana	Unprotected	Yes	No	5000	?	
Sabaki River mouth	Unprotected	Yes	No	2600	16	

\*Some other sites where Lesser Flamingo has been recorded, though in lower numbers (<2000) include Lake Naivasha, Sabaki River Mouth, Lake Simbi, Amboseli National Park, Dandora Sewage Ponds, Lake Ol Bolossat, Mombasa Salt Works, Dunga Swamp and Lake Baringo, among others.

### Figure 1

### Distribution of Lesser Flamingos in Kenya

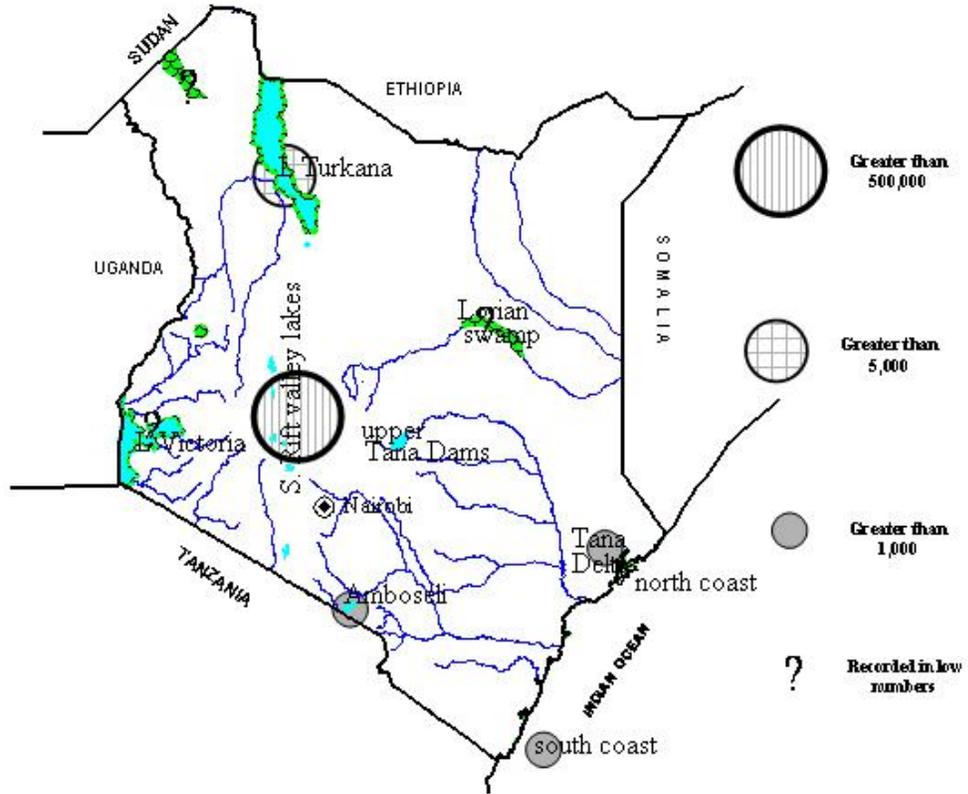
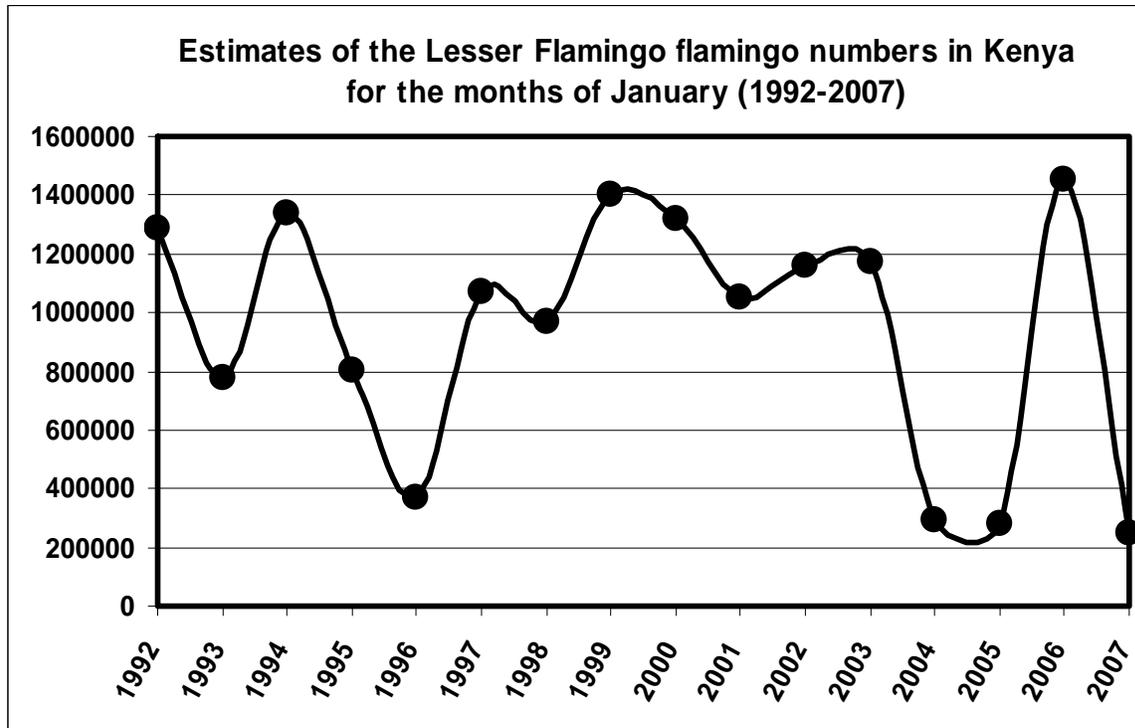


Fig. 2:



### 2.3 Movements

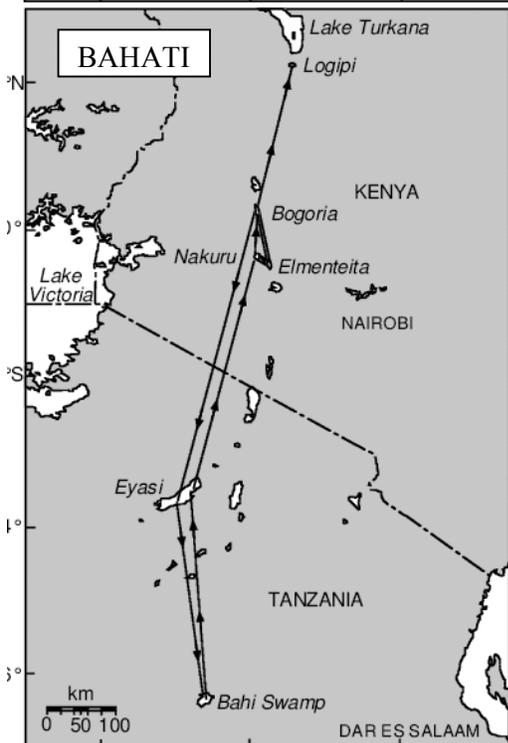
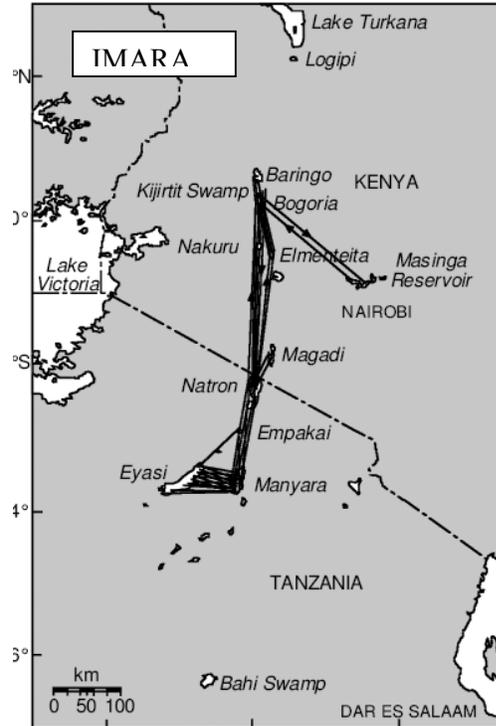
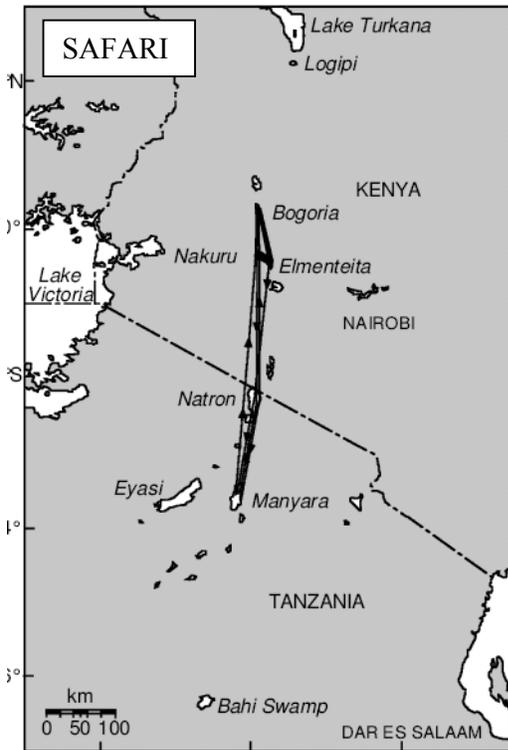
#### 2.3.1 Global movements

Breeding periods are erratic, depending on the timing of seasonal rains, but most breeding occurs between September and November in South Asia, and between November and February in eastern and southern Africa. Breeding in West Africa has not been confirmed. During breeding periods, if there has been sufficient rainfall and breeding conditions are suitable, Lesser Flamingos congregate at five well-known and regular breeding sites, frequently in large mixed breeding colonies with Greater Flamingos. When not breeding, the Lesser Flamingo occurs in virtually all sub-Saharan countries and from the Arabian Peninsula to India. It is a non-migratory itinerant species with flocks constantly on the move between feeding sites, sites that are often in different countries and several hundred kilometres apart. These movements occur mostly at night.

#### 2.3.2 East African movements

The Lesser Flamingo is highly nomadic. In East Africa, the number of individuals on a given lake has been shown to double or halve in a period of just two weeks. A study was done in October 2002 during which satellite transmitters were affixed to four adult male Lesser Flamingos at Lake Bogoria, Kenya to understand individual movements of birds (Childress *et al.* 2004, Figure 3). The individual birds showed different movement patterns, which included frequent visits to a network of sites. The study showed that the key site network for Lesser Flamingos in East Africa consists of seven alkaline lakes in Kenya and Tanzania (Logipi, Bogoria, Nakuru, Elmenteita, Natron, Manyara and Eyasi) and an ephemeral fresh water wetland in central Tanzania (Bahi Swamp).

Figure 3: Movements of three of the four individual birds that were marked at L. Bogoria and satellite tracked between October 2002 and July 2003 (Source: Childress *et al.* 2004)



- During the nine-month study, (15 October 2002–14 July 2003), Safari made 16 interlake flights, visited five different lakes, spending a mean 16 days at each stop and travelling 1,866 km.
- During nine months of tracking him (18 October 2002–17 July 2003), Bahati made 12 interlake flights, visited six different lakes and wetlands, spent an average 20.9 days at each stop, and travelled a total of 1,917 km.
- During the first 101 days, Imara travelled 4,792km moving among nine different lakes 44 times. The mean time spent at each was only 2.3 days. Following this initial period of frenetic activity, Imara seemed to settle and began spending much longer periods at many of his stops. During the remaining 171 days of the pilot study, he travelled 1,307km moving among six different sites 15 times, spending an average 11.4 days. Overall, he visited 11 different lakes and wetlands, many several times, between Lake Baringo in Kenya and Lake Eyasi in Tanzania (500km). In total, his interlake flights covered 6 099 km.
- Bendera stayed on Lake Bogoria for 38 days, after which his PTT stopped transmitting. Throughout the final day of transmission, the movement sensor on the PTT indicated no movement.

## 2.4 Protection Status

In Kenya, the level of protection offered to Lesser Flamingo can be demonstrated by (a) the protection status of the sites it occupies (Table 1 above), (b) International and regional conventions ratified by Kenya which are of relevance (Table 2) , and (c) Relevant national laws, policies and institutions that protect the species and its habitat (Table 3)

**Table 2: Major international conventions and agreements of relevance to the Lesser Flamingo that have been ratified by Kenya**

Convention/Agreement	Listing of Lesser Flamingo, its sites or habitat	Kenya's obligations and relevance to Lesser Flamingo	Focal point/ Responsible institution
Convention on the Conservation of Migratory Species (CMS)	Appendix II	For migratory species that have an unfavourable conservation status or would benefit significantly from international co-operation organised by tailored agreement. 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	KWS
African-Eurasian Migratory Waterbird Agreement (AEWA)	Annex II of this agreement, and Columns A and B of the AEWA 2006-2008 Action Plan	Kenya shall endeavour: (a) to conserve and, where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction; (b) to prevent, remove, compensate for, or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; and (c) to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species.	KWS
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	Appendix II	Trade in Lesser Flamingo specimens requires the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met: (a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species; (b) the Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and (c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment	KWS
Ramsar Convention on Wetlands	5 sites listed as RAMSAR sites: Lakes Nakuru, Naivasha, Elementaita, Bogoria and Baringo.	Convention provides the framework for the conservation and wise use of wetlands and their resources through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world. As a Contracting Party, Kenya is required to designate at least one suitable wetland within its territory for inclusion in a List of Wetlands of International Importance maintained by the Ramsar bureau.	KWS
Algiers Convention		Kenya as contracting party is obliged to ensure conservation, rational use and development of soil, water, floral and faunal resources.	??
Convention on Biological Diversity			??
The World Heritage Convention			??
UNESCO's Man and Biosphere Programme			??

**Table 3: National laws and policies affecting conservation of Lesser Flamingo in Kenya**

Law or Policy	Relevance	Responsibility
Environmental Management and Coordination Act (EMCA) 1999	Section 54 of EMCA 1999 makes provision for declaration of any area of land, sea, lake or river to be a protected natural environment can be useful in the protection of LF habitats. Section 42 of the Act provides for a mandatory Environmental Impact Assessment (EIA) for new projects. A regular environmental audit of existing projects is provided for in Sections 68 and 69. The Act therefore guarantees that any planned development and ongoing projects will not have an adverse effect on biodiversity and environment quality.	EMCA

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Public Health Act, CAP 242	Provides clear regulations for proper waste disposal and waste management to enhance a healthy environment. This is applicable in flamingo sites threatened by pollution.	Ministry of Health; Local Authorities
The Wildlife (Conservation and Management) Act, CAP 376	Sections 6-20 of the Act provides for the creation of conservation areas for the preservation of key habitats and their biodiversity. Lesser Flamingos and their habitats can benefit from such conservation measures.	KWS
The Water Act, 2002 ,Water Rules 2007 & River authorities Act, Cap 443.	Sections 11-18 of the Act provide for the conservation, control, apportionment and use of the water resources in Kenya. Provisions of the Act can be applied for the protection of fragile water resources and related environments that include Lesser Flamingo habitats.	Ministry of Water, Water Authorities
The Agriculture Act CAP 318	This Act provides for the application of sustainable agricultural practices, pollution control, and conservation of soil and water resources. By encouraging the protection of fragile land including slopy areas and riverine habitats especially in water catchment through application of sustainable agricultural practices, silt loading into flamingo habitats from erosive activities can be reduced.	Ministry of Agriculture
The Forest Act, CAP 385; Forest Act, 2006	Sections 21- 45 of the Act provides for the management, protection, conservation, control and regulation of plantation and indigenous forests. Provisions against soil erosion and introduction of alien species can contribute to protection of Lesser Flamingo habitats.	Ministry of Environment and Natural Resources; Kenya Forest Service
The Land Planning Act, CAP 303	The Act provides for the development of integrated management plans for river basins that take into consideration the protection and conservation of critical natural resources within a drainage area such as the Lesser Flamingo habitats.	Ministry of Land?
Land Control Act CAP 406	The Act spells out agricultural practices that ensure that good and sustainable land husbandry standards are maintained within specific agricultural areas. It is therefore relevant for the conservation of catchment areas leading to a reduced loading of eroded materials to wetland areas that include Lesser Flamingo habitats.	Ministry of Land?
The Local Government Act CAP 265	The Act empowers local authorities to establish and maintain conservation areas and take measures necessary for proper urban planning, and sustainable natural resource exploitation in their areas of jurisdiction. Councils can invoke this Act to conserve critical habitats like those of the Lesser Flamingos.	Local Authorities
The Environmental Management and Coordination Regulations, 2006	Sections 4-8 restricts the access and use of any threatened species, establishment of facilities for recovery and rehabilitation of threatened species and full restoration of threatened species into their natural habitats. These provisions can be applied for the conservation of Flamingos and their habitats.	??
The East African Community Treaty, 1999	Articles 111-116 provide for the cooperation in the conservation and management of natural resources, transboundary pollution control and the coordinated conservation and sustainable utilization of wildlife and other tourist sites in the region though harmonization of policies. These provisions can allow for formulation region wide conservation strategies of the of the migratory Lesser Flamingos	Ministry of East African Cooperation

## 2.5 Relationship with other biodiversity strategies

There are several National Policies, Strategies and Action Plans that have direct relevance to LF conservation and protection of their ecosystems in the Rift Valley Lakes in Kenya. Effective and coordinated enforcement and implementation of these policies and strategies will enhance the status of flamingo conservation. Examples include:

- National Biodiversity Action Plan and Strategy
- National environment Action plan (NEAP)
- National Forest Policy and Action Plan
- National Wildlife Conservation and Management Policy and Action Plan
- National Climate Change Action Plan Framework
- National Desertification Action Plan and Strategy
- National Water Conservation and Management Policy and Action Plans.
- National Land Use Policy-(draft)
- National Agriculture Policy, Act and Action Plans
- National Wetlands Policy (draft)

### *Existing Projects which are relevant to Lesser Flamingo conservation*

There are several on-going conservation and sustainable development projects that are currently being implemented by diverse organizations within the watersheds of Lesser Flamingo habitats of Lakes Nakuru, Bogoria and Elementeita. Examples of such projects are as below:

- AEWA/GEF Wings Over Wetlands Project
- WCK- Conservation Education Programme
- Farming Systems Kenya –Support to local communities
- WWF & Earthwatch Institute -research and monitoring programmes in Lakes Nakuru, Bogoria and Elementeita.
- SUMAWA- River Njoro Watershed Management Project
- CDTF- Project on Environmental restoration, soil and water conservation and community livelihood initiatives
- Farming Systems- Community Livelihoods, Restoration of riparian land and the catchment
- Kenya Forest Service- Protection & Restoration of Forests in the catchment.
- KWS/Egerton University –Department of Environment and Development- Environmental training and capacity building for stakeholders especially local communities.
- WARMA-Sustainable Management of Water Resources within the Catchment basins

## 2.6 Habitat requirements

Habitat use and food requirements are generally well known in Kenya. The species depends primarily on shallow saline/alkaline lakes, wetlands and coastal areas. It does not breed in Kenya, though past records show that it bred at lakes Magadi and Turkana in 1962 and 1957 respectively. The only known breeding site currently in East Africa is Lake Natron. There are four other known breeding sites elsewhere, two in southern Africa (Makgadikgadi Pans in Botswana and Etosha Pan in Namibia) and two in India (Zinzuwadia and Purabcheria salt pans). Breeding on a new artificial island at Kamfers dam in South Africa and at Aftout es Sâheli in Mauritania has yet to be confirmed. Of these breeding sites, only Etosha Pan and the two sites in India are officially protected.

### *Breeding habitat requirements:*

Inaccessible to terrestrial disturbance from humans or animal predators

Subject to seasonal flooding that is sufficiently shallow (and calm) to enable the construction of the traditional conical mud nests without them being washed away, but sufficiently deep and long-lasting to prohibit terrestrial predators from reaching the nesting colony.

Within easy flying distance (i.e. 120-180 km) of a good feeding site for the parents.

### *Feeding habitat requirements:*

Water chemistry enables growth of cyanobacteria and diatoms.

Several hours each day when the surface of the water is sufficiently calm to enable the flamingos to feed. If the surface of the water is not calm, they are unable to feed.

## 2.7 Biology and Ecology

### *2.7.1 Productivity & survival*

Individual Lesser Flamingos do not breed annually, and their clutch size is one. Between 1953 and 1962, estimated mean breeding success in five major breeding attempts observed at lakes Natron (Tanzania) and Magadi (Kenya) was 41-43% (range: < 5% - 70%) of eggs laid. Most of the mortality occurred during the first three weeks from predation, nest desertion and getting entrapped in the mud surrounding the nesting area. Lesser Flamingos live at least 40 years and have an estimated generation length of 22-24 years. There is insufficient data to estimate annual mortality/survival.

### *2.7.2 Life history*

**Breeding:** Believed to reach sexual maturity at 3-4 years of age. Breeds following seasonal rains that provide the flooding necessary to isolate remote breeding sites from terrestrial predators and the soft muddy material for nest building. Nests built from mud substrate; mean incubation: 28 days; fledging: ~70 days. Lesser Flamingos do not breed readily in captivity.

**Feeding:** Feed on species of microscopic cyanobacteria and benthic diatoms found only in alkaline lakes, salt pans and saline lagoons and estuaries. Feed primarily by swimming and filtering the algae and diatoms with a specialised bill that contains up to 10,000 microscopic lamellae.

**Outside breeding season:** In eastern Africa they congregate in huge flocks on major feeding lakes.

## 2.8. Threats and potential threats (problem analysis)

The most critical threats to the survival of the Lesser Flamingo (factors causing or likely to cause very rapid population decline of more than 30% over 10 years or three generations) are thought to be the loss and/or the degradation of its specialised habitat. Habitat degradation results from alteration in hydrology (caused by river damming and increased abstraction) and changes in water quality (increased salinity etc.). Threats of high

importance (factors causing or likely to cause rapid declines (20-30% over 10 years or three generations) were determined to include poisoning (particularly by cyanobacteria toxins) and infectious diseases (mycobacteriosis and avian cholera). Threats of low importance were identified to include salt extraction and the disturbance of breeding colonies by human activities. All other threats, including human disturbance of non-breeding sites, predation and competition with other species for food and breeding sites birds are perceived as being threats of local importance (factors causing or likely to cause negligible decline). Descriptions of the threats is provided in Annex 1a while threat importance rankings at six core sites lake is in Annex 1b.

**2.9. Stakeholder analysis**

(workshop)

Stakeholder group	Region/site	Interest	Impact	Intensity
KWS	Country-wide	Biodiversity Conservation	+	◆◆◆◆

**2.10 Factors influencing success of action plan implementation (Risks and opportunities)**

(workshop input)

**3. Action Programme**

**3.1 Vision, aim and objectives**

	<b>Description and Justification</b>	<b>Indicators of success</b>
<b>Vision</b>	Ensure a long-term survival of the East African population of the Lesser Flamingo such that the global population is ultimately removed from the list of Near Threatened species in the IUCN Red Data List.	The species is currently categorised as globally Near Threatened The species is downlisted from Near Threatened to Least Concern in the IUCN Red Data List
<b>Aim</b>	To stabilise the population size and distribution of the Lesser Flamingo in Kenya at an average number of no less than 900,000* individuals within the next five years.	The species population size has witnessed a progressive decline in population size as a result of a number of factors the most critical of which is the degradation and of its specialized habitat, hence the need to stabilize the population size. Repeated annual and bi-annual coordinated Lesser Flamingo counts show population size stabilising at an average of 900,000 individuals.

*\*900,000 is the average number of individuals recorded in Kenya lakes between 1992 and 2007*

**Objectives**

1. 0	All key sites maintained in good ecological condition (****)	Lesser Flamingos have specific habitat requirements (see Section 2) hence all sites need to be carefully maintained to meet these requirements.	Favourable ecological conditions for Lesser Flamingo survival are met and maintained at all key sites.
2. 0	Disturbance stopped at key non-breeding sites and at sites where birds are known have attempted to breed or to have traditionally bred (*)	In Kenya there are many non-breeding sites used for feeding and roosting. At these sites, human disturbance may can affect feeding and limit access to freshwater needed for drinking and washing. In areas were breeding occurs or attempts have been reported, breeding failure could have resulted from human disturbance.	Existence and enforcement of regulations on acceptable distance that people are allowed to approach feeding populations and known watering or potential breeding areas.
3. 0	Impact of poisoning and diseases on Lesser Flamingo populations reduced (****)	Large-scale die-offs on feeding lakes in Kenya and Tanzania have in the past occurred and attributed variously to ingestion of industrial heavy metals, pesticides and cyanobacterial toxins. In some cases several infectious diseases have been singled out as having contributed to the deaths.	Bi-annual waterbird counts and observational reports show a significant reduction in the frequency and intensity of mass die-offs in Kenyan Rift Valley lakes.
4. 0	An operational national and regional network and collaboration programme for the conservation of the Lesser Flamingo initiated and sustained (***)	Currently there are number of institutions and individuals studying different aspects of the Lesser Flamingo ecology and conservation. However, their activities are uncoordinated with limited exchange of study findings.	An operational national and regional networking group with an easily retrievable database of past, ongoing and planned studies on Lesser Flamingos and their habitats in East African region. A regular flamingo update report mailed to stakeholders.
5. 0	Knowledge gaps on aspects of the Ecology of Lesser Flamingo such as population numbers and distribution, threats, values, and causes of die-offs filled (***)	A lot of information on the species is still lacking, yet it is needed to better conserve the species	Research and monitoring reports and scientific publications on distribution, threats, values, causes of die-offs by 2009

**Priority: \* = Low, \*\* = medium, \*\*\* = high, \*\*\*\* = critical**

**3.2 Projects**

**3.2 Projects**

- Objective 1 All key sites maintained in good ecological condition (\*\*\*\*)**
- 1.1 Designate remaining key sites as protected areas and Ramsar sites, and ensure they are maintained in favourable ecological status
  - 1.2 Conduct environmental impact assessments and audits of existing and proposed operations at all key sites
  - 1.3 Develop and implement integrated catchments management plans for the key sites
  - 1.4 Identify management needs of Lesser Flamingo habitat at key sites and implement necessary management actions
  - 1.5 Maintain, or restore where necessary, favourable hydrological conditions and water quality for the species
  - 1.6 Help local communities to develop alternative livelihood practices to reduce pressure on water catchment areas and actual sites
  - 1.7 Raise awareness about the conservation needs of the species at national and local level
- Objective 2 Disturbance stopped at key non-breeding sites and at sites where birds are known have attempted to breed or to have traditionally bred (\*)**
- 2.1 Prevent human disturbance (low flying aircraft, hot air balloons, salt collectors, birdwatchers, fishing) through legislation, planning, zoning and through enforcement of these rules as appropriate
- Objective 3 Impact of poisoning and diseases on Lesser Flamingo populations reduced (\*\*\*)**
- 3.1 Establish an integrated flamingo surveillance programme to allow for a more comprehensive determination of the cause of each die-off and take necessary measures to reduce the die-off scale
  - 3.2 Raise awareness amongst decision makers and industry about the risk of pollution to the Lesser Flamingo
  - 3.3 Ensure that pollution guidelines/legislation at key sites reflect the sensitivity of the species
  - 3.4 Ensure that pollution guidelines/legislation are developed and enforced, especially with reference to external loading of lakes with nutrients, industrial chemicals and heavy metals
- Objective 4 An operational national and regional network and collaboration programme for the conservation of the Lesser Flamingo initiated and sustained (\*\*\*)**
- 4.1 Form an inclusive and active 'Kenya/East Africa Lesser Flamingo Network or Working Group'
  - 4.2 Establish a regional Lesser Flamingo monitoring team to harmonize flamingo studies and conservation efforts
  - 4.3 Lobby for adoption of uniform regional guidelines and legislation on flamingo conservation and ensure implementation in all regional states
- Objective 5 Knowledge gaps on aspects of the ecology Lesser Flamingos such as population numbers and distribution, threats, values and causes of die-offs filled (\*\*\*\*)**
- (a) Fill population numbers and distribution knowledge gaps**
- 5.1 Determine population sizes and trends by developing a monitoring strategy and protocols (numbers, distribution, key sites), conducting regular coordinated aerial population surveys at non-breeding sites, at least tri-annually, monitoring breeding populations and breeding success whenever it occurs, and identifying potentially unknown breeding and non-breeding sites
  - 5.2 Determine population delineation and movements by conducting satellite tracking and ringing studies to determine movements of individuals between lakes, interchange and possible gene flow between populations, site usage, and relations with food availability and quality
  - 5.3 Establish a health surveillance strategy and conduct an integrated flamingo health surveillance programme to assess the effect of mass die-offs on Lesser Flamingo populations
  - 5.4 Develop an integrated flamingo health monitoring and evaluation system that can be used as an early warning system of environment quality changes likely to trigger mass die-offs
- (b) Fill habitat requirement knowledge gaps**
- 5.5 Systematically collect data on feeding habitat requirements, including daily food requirements, food quality at key sites and carrying capacity of key sites.
  - 5.6 Implement studies to understand the processes of the different water catchments that important for the key Lesser Flamingo sites

**(c) Fill threat knowledge gaps**

- 5.7 Systematically collect data on the role of diseases (infectious and non-infectious), cyanotoxins, heavy metals and other poisons in population regulation
- 5.8 Model long-term effects of climate change and diseases
- 5.9 Evaluate the relative importance of the different threats

**(d) Fill Lesser Flamingo value knowledge gaps**

- 5.10 Calculate the economic value of Lesser Flamingos to nations and local communities

**(e) Fill operational knowledge gaps**

- 5.11 Assemble a Lesser Flamingo bibliography
- 5.12 Assemble a database of funding sources

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Project table

	Project	Overall Priority	Lead Agencies	Time scale	Cost	L. Bogoria	L. Elementeita	L. Magadi	L. Nakuru	L. Logipi	L. Sonachi	L. Oloiden	Indicators	Risks and opportunities
<b>A</b>	<b>Policy and Legislation</b>													
1.1	Designate remaining key sites as protected areas and Ramsar sites, and ensure they are maintained in favourable ecological status	Critical		Short		X	X	L	X	H	X	X		
3.3	Ensure that pollution guidelines/legislation at key sites reflect the sensitivity of the species	Medium		Medium		L	H	L	H		L	L		
3.4	Ensure that pollution guidelines/legislation are developed and enforced, especially with reference to external loading of lakes with nutrients, industrial chemicals and heavy metals	Medium		Immediate		M	H	L	H		M	M		
4.3	Lobby for adoption of uniform regional guidelines and legislation on flamingo conservation and ensure implementation in all regional states	High		Immediate										
<b>B</b>	<b>Species and habitat</b>													
1.2	Conduct environmental impact assessments and audits of existing and proposed operations at all key sites	Medium		Medium		?	?	?	?	?	?	?		
1.3	Develop and implement integrated catchments management plans for the key sites	Medium		Medium		X	H	L	X	L	H	H		
1.4	Identify management needs of Lesser Flamingo habitat at key sites and implement necessary management actions	Medium		Medium		X	X	H	X	M	X	X		
1.5	Maintain, or restore where necessary, favourable hydrological conditions and water quality for the species	Medium		Long		H	H	M	H	L	L	L		

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	Project	Overall Priority	Lead Agencies	Time scale	Cost	L.	L.	L.	L.	L.	L.	L.	Indicators	Risks and opportunities
						Bogoria	Elementeita	Magadi	Nakuru	Logipi	Sonachi	Oloiden		
2.1	Prevent human disturbance (low flying aircraft, hot air balloons, salt collectors, birdwatchers, fishing) through legislation, planning, zoning and through enforcement of these rules as appropriate	Low		Short		L	M	L	H	L	L	L		
4.1	Form an inclusive and active 'Kenya/East Africa Lesser Flamingo Network or Working Group'													
4.2	Establish a regional Lesser Flamingo monitoring team to harmonize flamingo studies and conservation efforts	H		M										
<b>C</b>	<b>Monitoring and research</b>													
3.1	Establish an integrated flamingo surveillance programme allow for a more comprehensive determination of the cause of each die-off and take necessary measures to reduce the die-off scale	Medium		Ongoing		H	H	L	H		M	H		
5.1	Determine population sizes and trends by developing a monitoring strategy and protocols (numbers, distribution, key sites), conducting regular coordinated aerial population surveys at non-breeding sites, at least tri-annually, monitoring breeding populations and breeding success whenever it occurs, and identifying potentially unknown breeding and non-breeding sites	High		Ongoing										

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	Project	Overall Priority	Lead Agencies	Time scale	Cost	L. Bogoria	L. Elementeita	L. Magadi	L. Nakuru	L. Logipi	L. Sonachi	L. Oloiden	Indicators	Risks and opportunities
5.2	Determine population delineation and movements by conducting satellite tracking and ringing studies to determine movements of individuals between lakes, interchange and possible gene flow between populations, site usage, and relations with food availability and quality	High		Ongoing										
5.3	Establish a health surveillance strategy and conduct an integrated flamingo health surveillance programme to assess the effect of mass die-offs on Lesser Flamingo populations	Medium		Ongoing										
5.4	Develop an integrated flamingo health monitoring and evaluation system that can be used as an early warning system of environment quality changes likely to trigger mass die-offs	Medium		Immediate										
5.5	Systematically collect data on feeding habitat requirements, including daily food requirements, food quality at key sites and carrying capacity of key sites.	High		Medium										
5.6	Implement studies to understand the processes of the different water catchments that important for the key Lesser Flamigo sites	Medium		Medium										
5.7	Systematically collect data on the role of diseases and poisons in population regulation, including the effects of infectious and non-infectious diseases	High		Ongoing										
5.8	Model long-term effects of climate change and diseases	High		Ongoing										

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	Project	Overall Priority	Lead Agencies	Time scale	Cost	L. Bogoria	L. Elementeita	L. Magadi	L. Nakuru	L. Logipi	L. Sonachi	L. Oloiden	Indicators	Risks and opportunities
5.9	Evaluate the relative importance of different threats	Medium		Short										
5.10	Calculate the economic value of Lesser Flamingos to nations and local communities	Medium		Ongoing										
5.11	Assemble a Lesser Flamingo bibliography	Medium		Ongoing										
5.12	Assemble a database of funding sources	Medium		Ongoing										
<b>D</b>	<b>Public awareness and training</b>													
1.7	Raise awareness about the conservation needs of the species at national and local level	Medium												
3.2	Raise awareness amongst decision makers and industry about the risk of pollution to the Lesser Flamingo	Medium		Medium		M	H	L	H		L	H		
<b>E</b>	<b>Community involvement</b>													
1.6	Help local communities to develop alternative livelihood practices to reduce pressure on water catchment areas and actual sites	Medium												

#### 4.0 Monitoring and Evaluation Plan

The M &E plan for the Kenya Lesser Flamingo Action Plan will be done at project, objectives and aim levels with the national coordinating office and the lead agencies taking a lead but getting assistance from other stakeholders. The projects table with specific and measurable indicators will be used for M&E by adding two columns, one for Completion date and another for Remarks. The evaluation should be done annually.

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**Annex 1: Threats**  
**1a: Threat descriptions**

*1.0 Habitat loss and/or degradation*

*Importance: Critical*

The Lesser Flamingo is highly specialized. Its diet is limited to microscopic cyanobacteria and benthic diatoms that in Kenya occur only in saline/alkaline lakes. Because it is adapted to respond to changes in environmental conditions by moving among sites regularly, it is dependent on a network of such sites. Due to their nomadic nature Lesser Flamingo conservation needs to be based on a process that takes into account the entire sub-regional populations in eastern Africa. Catchment-based conservation strategies are equally important given the ecological linkages between the lakes and their watersheds. Activities in the catchments disrupt the ecological integrity of the lakes and their suitability as flamingo habitats. Most fluctuations in the flamingo numbers are caused or catalyzed by ecological and catchment processes and the effects of climatic and hydrological trends in the region. These changes have been aggravated by unsustainable land use and development practices within the watersheds.

*1.1 Effects of altered hydrology*

*Importance: Critical*

The Lesser Flamingo is sensitive to changes in water levels and quality. Cyanobacteria, its primary food, require a certain range of salinity to reproduce in sufficient quantities to feed large numbers of Lesser Flamingos. Changes in the abundance of cyanobacteria can have a substantial effect on the Lesser Flamingo population at a site.

Water levels are also critical to successful breeding. If the level is too high, the birds are unable to build their nests. If it is too low, terrestrial predators are able to reach the nests and destroy the breeding attempt. If the water level drops prematurely after the eggs are laid, but before the chicks are ambulatory, terrestrial predators are able to reach the colony and destroy the breeding attempt by feeding on the eggs and chicks. In Kenya, this may be relevant for the Ewaso Nyiro South River, which is an important source of water for Lake Natron. Activities that alter the flow of the river would affect the hydrology of Lake Natron, hence affecting the breeding of lesser flamingos.

Changes in water and salinity levels can occur either from natural or man-made causes. Natural causes include flooding due to heavy rainfall and evaporation due to prolonged drought. Man-made causes include increased flooding and sedimentation. These occur due to deforestation, over-grazing or an increase in arable farming on steep slopes in the catchment. Reduced inflows and water levels also occur due to drainage of land for agriculture, infrastructure, creation of dams and reservoirs, canalisation of rivers, diversion of rivers, abstraction from feeder streams and rivers for irrigation and drinking water and reforestation.

*1.2. Wetland pollution*

*Importance: Medium*

Pollution is considered a probable catalytic agent to flamingo mortality within Kenya. Pollution is mainly from industrial and domestic pollutants in the form of heavy metals, pesticides and high nutrient loads that lead to the formation of toxic algal blooms. Due to the nature of alkaline lakes (shallow and relatively small), they are quickly influenced by the anthropogenic processes within the catchment basins.

Lake Nakuru, one of the most important habitats for Lesser Flamingos, is surrounded by agricultural activities. For the last three decades the adjacent Nakuru town has maintained a population growth rate of 10% per annum and today it supports an estimated population of 400,000 people (Kenya Population Census, 1999). It has several industries involved in manufacture and packaging of agricultural produce, tanneries, oil depots and an extensive informal sector, making it a prolific producer of solid, industrial and domestic effluents that finally end in Lake Nakuru especially during storms. Waste handling and treatment facilities have not kept pace with the rate of production thereby posing environmental pollution especially from storm water from the first flush rains.

Lake Elmenteita, another important Lesser Flamingo site is adjacent to Gilgil town with an equally fast growing population estimated now at 30,000 out of a total of approximately 100,000 people in the division. The town has a diatomite-mining factory, and a timber treatment plant within an area designated as Lake Elmenteita Ramsar site. Small scale agriculture and settlements in the upper reaches of Lake Elmenteita within Gilgil division are all potential sources of pollution.

Lake Bogoria is also an important Lesser Flamingo site. Increasing agricultural activities along the Sandai- Wasegges river systems draining the Subukia and Iguamiti highland to the South- East are contributing a lot of agro-chemicals from the farmlands increasing contamination risks of pollution. Subsistence agriculture is also prevalent in the other patches of springs.

Pollution of flamingo lakes has therefore increased with increase in human populations in the catchments. Heavy metals originating from local industries and excess nutrients from agricultural and domestic effluents from the surrounding farmlands have found their way into the lakes. This has also resulted in lake eutrophication leading to frequent algal blooms and possibilities of lesser flamingo mortality and sub-lethal stress arising from intoxication.

The principal actors on the sources of pollution are unplanned urban and industrial developments and ineffective compliance with EIAs and Environmental audit procedures. The management of both liquid and solid waste in these areas is equally wanting and research to identify and develop environmental management strategies that will help mitigate effects caused by industrial and storm water pollution is necessary.

*1.3. Extraction of salt and soda ash*

*Importance: low*

Lake Elmenteita and lake Magadi are the only saline lakes in Kenya where salt has been traditionally harvested. Salt harvesting in Elmenteita is small scale and mainly used for domestic purposes as livestock salt lick. This has been considered to play a low significance or threat to lesser flamingos as the species has lived with this. In Lake Magadi commercial harvesting has been on for several decades and this has affected the hydrology of the lake. The lake is however still heavily utilized by lesser flamingos and considered an important habitat.

*2.0 Disturbance of non-breeding populations by human activities*

*Importance: low*

Disturbance at those sites where sources of fresh water are limited prevents the birds from getting to fresh water for drinking and bathing. This could have serious implications for the birds on a local basis in the short term.

*2.1 Disturbance by human settlements*

*Importance: local*

Human settlements near flamingo sites could potentially stress non-breeding birds. In Lake Elmenteita, continuous land subdivisions and increased settlements have resulted in a portion of the lake being abandoned by the Lesser Flamingos. Low flying aircraft and hot air balloons in Lakes

Elmenteita and Nakuru could also be a source of disturbance. With an increase in the frequency of these activities it is expected that it will cause some impact to the populations.

### 3.0 Poisoning

*Importance: High*

Direct and indirect poisoning of Lesser Flamingos through the introduction of heavy metals, agrochemicals, domestic waste and industrial chemicals into the areas where they feed, or through cyanobacterial toxins may cause large scale illness and death. Large-scale die-offs, each involving tens of thousands of Lesser Flamingos have been attributed to ingestion of heavy metals, pesticides and cyanobacterial toxins, on feeding lakes in Kenya and Tanzania.

In Lake Bogoria, the ingestion of toxic cyanobacteria (*Synechococcus bigranulatus*, *Spirulina subsalsa*, *Phormidium terebriformis*, *Oscillatoria willei*) from the hot spring-mats are thought to have contributed to the mass mortalities. Supporting evidence for the contribution of the cyanobacterial toxins to the mass mortalities of lesser Flamingos was drawn from the presence of hot spring cyanobacterial cells and cell fragments and high concentrations of the cyanobacterial hepatoxins (microcystins) and neurotoxins (anatoxin-a) in dead flamingo stomach contents and faecal pellets. Neurological signs of cyanotoxin poisoning of the birds have also been observed. It is possible that during drinking lesser Flamingos feed on portions of toxic cyanobacteria that have detached from the mats.

Tests on dead lesser Flamingos have also revealed traces of heavy metals including zinc, copper, lead, mercury and cadmium. Hence the the actual causes of dead could have been heavy metals acting alone or in synergy with other stress factors such as the heavy metals, pesticides or opportunistic diseases

### 4.0 Infectious diseases

*Importance: High*

Infectious diseases may have played a role in the die-offs that have occurred in Kenya in the past decade (1993, 1995, 2000, 2002, 2006) and more recently in Tanzania (2004). They thus seem likely to threaten flamingo populations of Eastern Africa (Manyibe *et al.* 2007; Kilewo and Mlengeya 2004; Lugomela *et al.* 2006). Diseases such as avian flu, avian TB, avian cholera, botulism, salmonella and pseudomonas can contribute to large scale die-offs among Lesser Flamingos. In the die-offs during the past 30 years at feeding lakes in Kenya and Tanzania, several of these diseases have been singled out as having contributed to the deaths.

Infectious diseases that have been recorded in Lesser Flamingos in Kenya since 1970 include: mycobacteriosis (tuberculosis), avian cholera (pasteurellosis) and parasitic diseases.

### 5.0 Predation

*Importance: Local*

Baboons, African Fish Eagles, Steppe Eagles, Marabou Storks, feral dogs and hyenas do occasionally attempt to predate adult flamingos, but predation on healthy adult Lesser Flamingos is not usually a problem. Predation can be a serious problem at breeding sites, particularly when the water level has receded allowing access to terrestrial predators. Egyptian Vultures have been recorded predated eggs and chicks at Lake Magadi in Kenya.

### 6.0 Competition

*Importance: Local*

The main species that would compete with flamingos for food is the algae-eating fish and crustaceans Artemia brine shrimp. The later is common where salt extraction is taking place where it is introduced into the solar evaporation ponds to eat the algae. Lakes Bogoria and Elmenteita are not inhabited by fish. Lake Nakuru is inhabited by *Oreochromis alcalicus grahami* which does not feed on algae. There has been breeding attempts in Lake Nakuru and the failures cannot be attributed to competition but to probably to disturbance by humans and other wildlife species.

Many gaps however still exist concerning the level of competition with other avian species for space and breeding sites. The Lesser Flamingos tends to prefer isolated, flooded breeding sites, which do not seem suitable for other species.

Annex 1b. Threat importance rankings at species and site levels in core sites. Threat importance ranking key: 1 = critical, 2 = high, 3 = medium, 4 = low, 5 = local threat

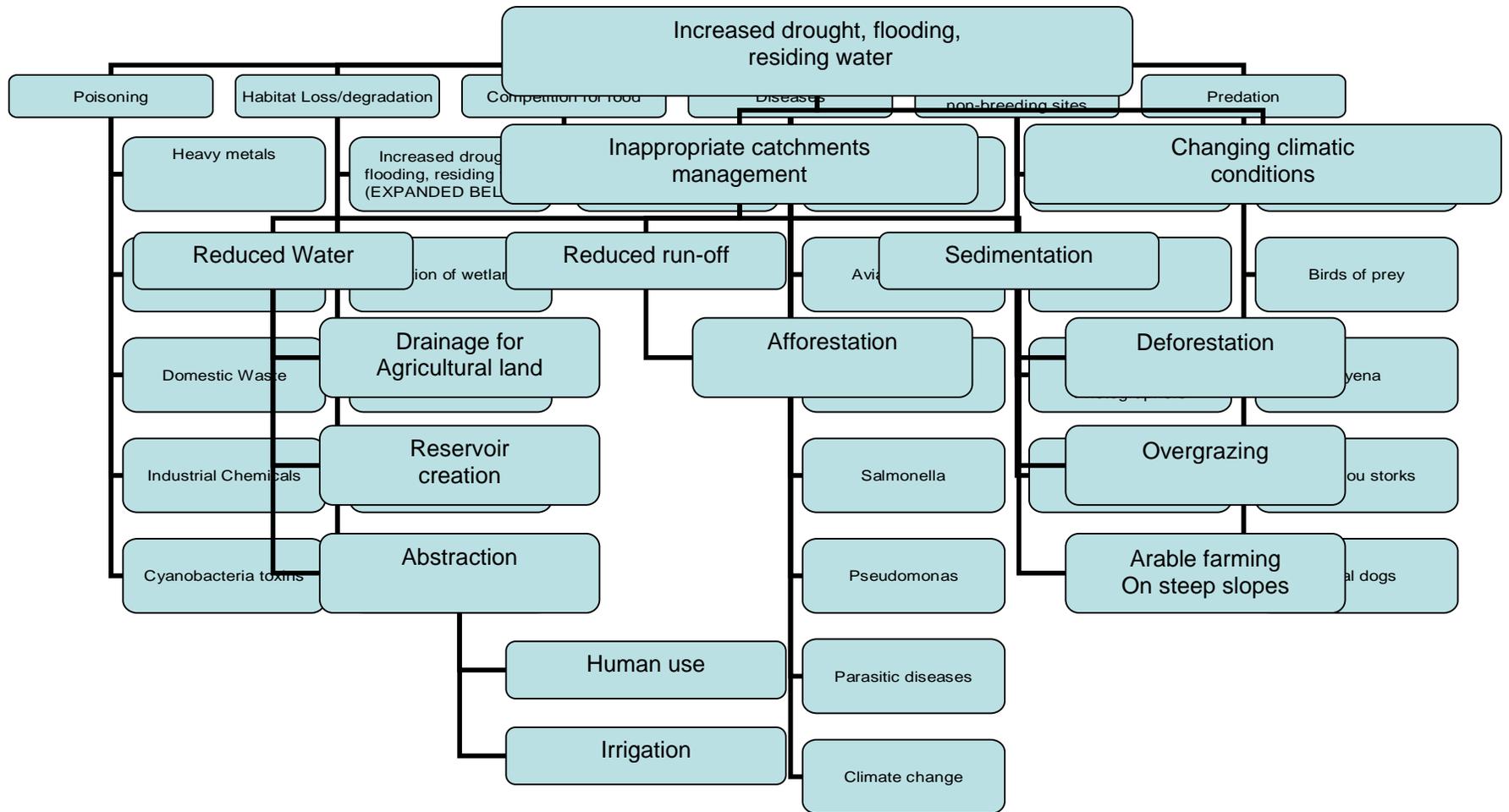
Species level importance	Primary threat	Sub-threat	Sub-threat	Sub-threat	Sub-threat	Sub-threat	National	L. Bogoria	L. Elementeita	L. Magadi	L. Nakuru	L. Logipi	Sonachi	Lake Oloiden
1	Habitat loss and/or degradation	Altered hydrology and/or water quality	Reduced water flow	Inappropriate catchment management	Water management	Drainage for agricultural land	2							
						Abstraction for human use	2							
						Abstraction for irrigation	2							
					Reduced runoff	Reforestation	2	2	2	2	2	?	3	4
					Increased flooding and sedimentation	Deforestation	2							
						Over-grazing	3	2				?		
						Arable farming on steep slopes								
			Increased drought	Climate change			2							
			Wetland Pollution	Pesticides			2							
				Industrial chemicals			2							
				Sewage			2							
				Heavy metals			2							
				Oil			2							
		Extraction	Salt / minerals				4							
			Oil & gas											
		Expansion of macrophytes	Fertilisers											
2	Poisoning	Heavy metals					2	3		2				
		Agro-chemicals					2	3	2				2	
		Industrial chemicals					2		4	2				
		Cyanobacteria toxins	Fertiliser eutrophication				2	1					?	
2	Disease	Avian flu					3							
		Avian cholera					2							
		Mycobacteriosis (Tuberculosis)					2							
		Parasites					2							
		Botulism												
		Salmonella												
		Pseudomonas												
		Climate change												
5	Human disturbance at non-breeding sites	Boating												
		Fishing												
		Hunting other species												
		Tourists					?							
		Planes/ Helicopters												
		Birdwatchers												
		Photographers					?							
5	Predation	Baboons					2							
		Birds of prey					2							

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Species level importance	Primary threat	Sub-threat	Sub-threat	Sub-threat	Sub-threat	Sub-threat	National	L. Bogoria	L. Elementeita	L. Magadi	L. Nakuru	L. Logipi	Sonachi	Lake Oloudien				
		Maribou Storks					2											
		Hyenas					2											
		Feral dogs																
5	Competition	For food	Fish				?											
			Crustaceans															
		For breeding sites	Terns															
			Pelicans															
			Cormorants															
			Gulls															
5	Collision with man-made structures	Power lines																
		Telephone lines																
		Fences																
		Light masts																
		Guide wires																

**Problem tree (threat analysis)**

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Problem tree (contd) – Habitat loss/degradation sub-branch

*Being implemented?*

**Oxyura maccoa**

**Please refer to** Berruti, A., Baker, N., Buijs, D., Colahan, B.D., Davies, C., Dellegn, Y., Eksteen, J., Kolberg, H., Marchant, A., Mpofu, Z., Nantongo-Kalundu, P., Nnyiti, P., Pienaar, K., Shaw, K., Tyali, T., van Niekerk, J., Wheeler, M.J. and Evans, S.W. (eds). 2007. International Single Species Action Plan for the Conservation of the Maccoa Duck *Oxyura maccoa*. AEW Technical Series No. 14. Bonn, Germany.

**Appendix 2: List of sites of international importance**

**Appendix 3: Status of management plans for sites of international importance**

**Appendix 4: List of research and monitoring programmes and projects**

**Appendix 5: List of national institutions involved in migratory waterbird conservation**

**Appendix 6: List of relevant World Wide Web addresses for national institutions involved in migratory waterbird conservation**

**Appendix 7: List of relevant migratory waterbird and habitat conservation projects initiated, ongoing or completed in the last three years**