Tracking flagship wetland bird species in Namibia

Ann Scott, Mike Scott, Hanjo Böhme, Mark Boorman, Conrad Brain, Seth Guim, Holger Kolberg, John Mendelsohn, Gabriel Shatumbu, Wilferd Versfeld, Absalom Vilho
Much of this work was conducted under the auspices of the **FLIGHT PATHS FOR WETLAND FLAGSHIPS PROJECT**
- Tracking flagship wetland birds to identify areas outside protected areas for targeted conservation action

Thank you for generous **sponsorship and support** to the Environmental Investment Fund of Namibia, the Ministry of Environment & Tourism, the Go Green Fund, the European Investment Bank, the Hessische Gesellschaft für Ornithologie und Naturschutz and Mathias Stein, Barbara Hudoc, Hildegard Bekker; also from SIDA, the UNDP Small Grants Programme, The Overberg Explorer, Ramsar Small Grants Fund, Wilderness Wildlife Trust, International Crane Foundation/Endangered Wildlife Trust Partnership, Polytechnic of Namibia/Namibia University of Science and Technology, University of Cape Town, SPAN Park Innovation Grants Fund and other partners.
The Namibia Blue Crane Project
Namibia Crane Working Group
Distribution and threats to Blue Cranes

Endemic to South Africa:
- South Africa
- Namibia
- (Botswana)

Threats in Namibia:
- Fragmented and genetically isolated population
- Human encroachment
- Long-term changes in water availability

Are the SA and Namibian populations genetically differentiated?
Numbers and conservation status of Blue Cranes

Global population: 25,000

Namibia: 23? In decline
Critically Endangered in Namibia, Near Threatened in SA, Globally Vulnerable

Maximum numbers of Blue Cranes (adults + subadults) at Etosha National Park and surrounds during the wet and dry season 1974 to 2016

- Wet season
- Dry season
Known movements of Blue Cranes in South Africa

Colour ringing (n = 296) and satellite telemetry (n = 10; 1996-1999) in SA showed only short nomadic movements (max. 95 km); seasonal altitude-related migration in east (McCann et al. 2001).

*No confirmed movements to or from Namibia.

Recent studies on colour ringing (n = 649) in SA still show short nomadic movements (average 25 km from natal point); only one movement of 500+ km; high regional fidelity (Van Velden et al. 2016; 11 satellite trackers fitted (7 still active): small localised movements (6-20 km); roost sites (T Smith EWT pers. comm.).
Tracking cranes in United States

Tracking of Sandhill Cranes in United States (Dave Brandt)

- >150 standard PTTs on Sandhill Cranes
- 18 leg-mounts on Sandhill and 45 on Whooping Cranes

Purpose: to track chronology of use and use of fall staging areas and wintering grounds, in order to target harvest

Movements across US and into Canada and Russia
Known movements of Blue Cranes in the Etosha area

**Seasonal cycle** at Etosha: breed on Pan edge in **wet season**; after fledging move northwards out of Park, e.g. to Omadhiya lakes (Lake Oponono) in the **dry season**. Return via Andoni before the first rains.

What are the reasons for these seasonal movements - why do the birds leave the Park?

Which areas other than Lake Oponono do the cranes use (so that conservation efforts can be targeted)?
Census/tracking methods for Blue Cranes

- 31 birds ringed (2006 – 2016; movements up to 120 km)
- 5 birds fitted with radio/VHF transmitters (2007 – 2011; movements 50-120 km)
- 4 GPS satellite trackers fitted (2008 – 2016)
Distribution of Blue Cranes in the Etosha area according to aerial census (wet season)
Satellite tracking results to date

- **8/4/08**, large adult at Namutoni. Transmitted until 26/4/08: device preened into feathers; bird seen subsequently.
- **22/4/10**, large chick at Springbokfontein. Transmitted well for about two weeks, but chick was preyed upon before it fledged.
- **7/4/11**, large, just-fledged juvenile east of Salvador. Transmitted until 2/5/11, after which no further signals were received. On 29/10/12 the bird turned up at Kahenge, 120 km west of Rundu and 300 km north-east of Salvador. Transmitter was still in place, but not transmitting. Bird unfortunately did not survive.
Satellite tracking results to date

- 5/4/16, large, almost fledging juvenile at Charitsaub. **Solar leg-mount** transmitted well and local movements were recorded. Flew 49 km north-west to the (dry) Ekuma River mouth on 19/5/16; juvenile was preyed upon.
Tracking results to date: habitats used

Etosha

Lake Oponono

Is it about food?

The cranes roost in water – predator evasion
Where else do they go? - looking further afield

No cranes recorded at Oponono from September 2007 – August 2010
Suitable habitats in southern Angola ground-truthed, flight 2007, further investigations 2014
* A Blue Crane arrived at Kahenge, 300 km east of Salvador, on 29/10/12
Limitations/challenges of tracking

- Price of GPS trackers and tracking
- Difficulties of capture, especially older birds (easier to capture chicks); narrow window of opportunity
- Birds may be preyed upon (especially young birds)
- Small sample size - too few birds left
The way forward

• What do Blue Cranes in Namibia need, so that conservation efforts can be directed more effectively?
• Why do they leave the Park?
• Apart from Lake Oponono, where else do they go?
Tracking the flight paths of flamingos
NamPower/Namibia Nature Foundation Strategic Partnership
GREATER FLAMINGO  
*Phoenicopterus roseus*

Global population: 680,000 (max) 
Population in Namibia: 41,000 – 51,000 adults

**Vulnerable** in Namibia

**THREATS**
Low breeding frequency and success, water abstraction, reduced rainfall, pesticides, hydrogen-sulphide eruptions, collisions with power lines, disturbance by aircraft

LESSER FLAMINGO  
*Phoeniconaias minor*

Global population: 3.2 million (max) 
Population in Namibia: 40,000 – 55,400 adults

**Vulnerable** in Namibia, **Globally Near Threatened**

**THREATS**
Low breeding frequency and success, water abstraction from breeding sites, toxins, pesticides, hydrogen-sulphide eruptions, collisions with fences and power lines, disturbance by aircraft
Distribution of Greater Flamingo and Lesser Flamingo in Namibia
Known movements of flamingos in southern Africa
Nomadic and migratory movements

GPS PTT satellite tracking of two Greater Flamingos and three Lesser Flamingos from Botswana (G McCullogh et al. 2003); showed that one G Flamingo moved from Botswana to the Namibian coast, and other birds to the east

GSM (Ecotone) transmitter tracking of six flamingos at Kamfer’s Dam, Northern Cape in June 2016 (M Pretorius et al. EWT); four more trackers have been fitted subsequently
Known movements of flamingos

Study on tracking of three Greater Flamingos in Tanzania and Kenya (Neil Baker) showed movements (map on left) and (individual) habitat selection – important implications for conservation.

Study in Bolivia on Andean Flamingos and interactions with transmission lines (G Beaulac & H Hausman, Inter-American Development Bank)
Reasons for tracking flamingos in Namibia

- Flamingos are prone to **collisions on power lines**: 137 incidents on record (2006-2015) – 28% of all incidents in Namibia
- Identification of flamingo flight paths can enable **proactive avoidance/mitigation** for new power lines
Tracking methods for flamingos

2 solar powered and 1 battery powered GPS satellite tracker, fitted to 5 birds at Mile 4 Saltworks (2013 – 2015):
- 4 Greater Flamingo
- 1 Lesser Flamingo
Satellite tracking results to date

- No major migratory movements inland (for breeding) due to dry cycle
- Movements from Mile 4 Saltworks up coast to Cape Cross (100 km), and from Mile 4 down coast to Walvis Bay (45 km)
Satellite tracking results to date

Greater Flamingo (804-1)

Greater Flamingo (804-2)
Satellite tracking results to date

Greater Flamingo (804-3)

Much flying under conditions of **poor light**: number of readings per hour in flight (according to flying speed) for a Lesser Flamingo fitted with a GPS PTT at Cape Cross (May-June 2014)
Tracking results to date

Which are the preferred habitats within the main sites? Why do the birds move from one site to the other? Do these sites complement one another?
Tracking results to date

At Mile 4 Saltworks, the flamingos showed a preference for a shallow pond (18 cm deep) with the lowest salinity/fresh sea water inlet (study by Wendy Gold, Windhoek International School 2015).
Power line surveys/monitoring – results
Flamingo incidents
Power line surveys in Erongo: Trekkopje Bypass

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bustard</td>
<td>43</td>
</tr>
<tr>
<td>Flamingo</td>
<td>37</td>
</tr>
<tr>
<td>Korhaan</td>
<td>15</td>
</tr>
<tr>
<td>Waterbird</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>98</strong></td>
</tr>
</tbody>
</table>
Gerus – Rundu 350 HVDC

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flamingos</td>
<td>20, 2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>22</td>
</tr>
</tbody>
</table>
Pros and cons of tracking

- **Trackers**: high price of GPS PTTs and Argos tracking; GSM transmitters an option
- **Good capture method** with noose traps and suitable capture site
- **Transmission time** short: 5 - 11.5 months – birds disappear or die
- **Difficulties of predicting rainfall** – sufficient and at right time to **trigger migrations** inland
- **At best, present tracking does not give detailed** flight paths, only shortest line between two sequential points; **altitude data** not highly accurate
The way forward

- What do these birds need and do, so that conservation efforts can be directed more effectively; where are they flying?
- Continue to monitor power lines for flamingo incidents (which indicate where the birds are flying)
- Mitigate sections of power line that prove to have high concentrations of incidents
- Further analysis of data (e.g. altitude; habitat preferences)
- Further tracking – for targeted project?