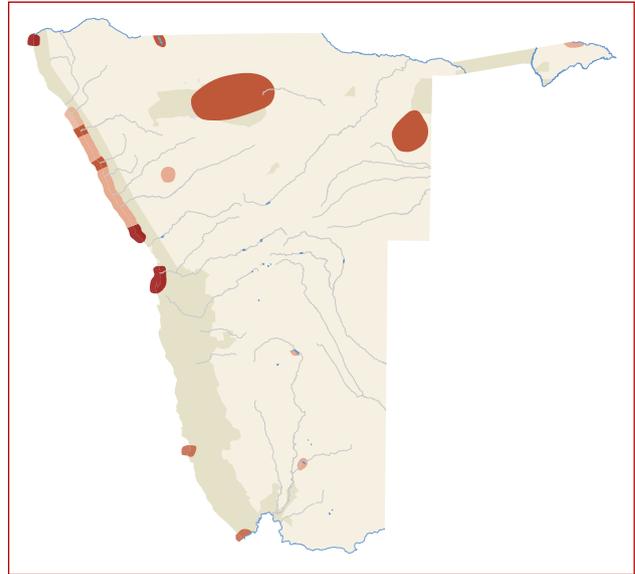


# LESSER FLAMINGO | *Phoeniconaias minor* (*Phoenicopterus minor*)

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## DISTRIBUTION AND ABUNDANCE

More restricted in distribution in southern Africa than the Greater Flamingo *Phoenicopterus roseus*, this species breeds in Africa at only three natural, flooded salt pans, the Etosha Pan in Namibia, the Sua Pan in Botswana and Lake Natron in Tanzania (Berry 1972, Brown *et al.* 1982, McCulloch & Irvine 2004), and at an artificial island at Kamfers Dam near Kimberley, South Africa, built in 2006 (Anderson 2012). Non-breeding birds in Namibia are found concentrated at commercial inland salt pans and coastal bays, especially at Walvis Bay and Sandwich Harbour. River mouths, such as those of the Kunene and Orange rivers, also hold small numbers of birds. Inland they are most numerous at Etosha Pan, the Omadhiya lakes (north of Etosha) and birds probably on their way to Sua Pan occur in the Tsumkwe Pans (Williams & Velasquez 1997b, Simmons *et al.* 1999). The bird occupies an area of 49,000 km<sup>2</sup> in Namibia, of which 40% lies within conservation areas (Jarvis *et al.* 2001).

The global population is thought to number up to 3.2 million birds (IUCN 2012a); the African population appears to have decreased from about four million birds (Howard 1997, Simmons 2000) to a maximum of 2.5 million birds (IUCN 2012a). It is suggested that major exoduses may have occurred, possibly to India and Pakistan, where mass breeding took place in 2003 (B Parasharya unpubl. data).

<b>Conservation Status:</b>	Vulnerable
<b>Southern African Range:</b>	Namibia, Botswana, South Africa, Zimbabwe
<b>Area of Occupancy:</b>	49,000 km <sup>2</sup>
<b>Population Estimate:</b>	40,000 to 55,400 adults
<b>Population Trend:</b>	Fluctuating with recent increase
<b>Habitat:</b>	Coastal lagoons, flooded salt pans, salt works
<b>Threats:</b>	Low breeding frequency and success, water abstraction from breeding sites, toxins, pesticides, collisions with fences and power lines, disturbance by aircraft

Fluctuating, highly nomadic populations make it difficult to provide accurate estimates for southern Africa or Namibia. The largest numbers recorded in southern Africa were an estimated 1.4 million birds on the Makgadikgadi Pans in Botswana in 1974 (Parker 1975), and about 1.1 million birds in Etosha National Park in 1971 (Berry 1972). These were exceptional numbers, probably arising from high rainfall in southern Africa bringing influxes of birds from East Africa (Borello *et al.* 1997, Simmons 1997n).

The highest simultaneous winter count from southern Africa recorded 40,000 birds in July 1994 (Simmons 1997n) and showed that populations resident in southern Africa declined markedly between the late 1970s, when 55,000 birds were estimated in southern Africa (Cooper & Hockey 1981), and the mid 1990s. Since then, the total resident southern African population has shown an increase, with 64,500 birds (including 55,400 in Namibia) recorded in July 2003 (M Anderson, D Harebottle, RE Simmons unpubl. data), a 17% increase since the late 1970s.

Like Greater Flamingos, populations of Lesser Flamingos have the potential to increase rapidly with several good breeding years. For example, 64,000 pairs recorded at Sua Pan, Botswana, in 2000 injected about 31,000 fledglings into the southern African population in one year (McCulloch & Irvine 2004). This was reflected in the increase in maximum non-breeding numbers at Walvis Bay from 33,000 birds between 1984 and 2001 (Williams 1987b, Jarvis *et al.* 2001) to 43,400 birds in July 2003 (Wearne & Underhill 2005).



## ECOLOGY

The Lesser Flamingo prefers a more saline habitat than the Greater Flamingo, especially salt pans, salt works evaporation ponds, and brackish rivers, such as the Ekuma River (Berry 1972, Williams & Velasquez 1997b, W Versfeld pers. obs.). In East Africa these conditions may bring together hundreds to millions of birds (Brown & Root 1971).

Breeding in Etosha occurs typically after annual rainfall exceeds 400 mm and egg-laying, which usually begins later than in the Greater Flamingo, typically from May and into June, starts within weeks of the birds migrating to the pan (Berry 1972). Success is greater, on average, when rainfall exceeds 440 mm (Simmons 1996). Breeding colonies usually comprise several thousand nests far out on the salt pan, frequently mixed with Greater Flamingos (Berry 1972, W Versfeld unpubl. data). Females lay a single egg on a raised nest mound, often in synchrony with thousands of other birds (Berry 1972). In 1972, 54,000 pairs laid eggs in July and August, of which 30,000 hatched chicks and 22,000 reared young (Berry 1972). Breeding is rarely successful however, and

receding pan water reduces food supplies and increases predation, leading to mass mortality (Berry 1972, Simmons 1996). Of 24 breeding attempts by Greater and Lesser Flamingos at Etosha in 57 years, only eight produced thousands or tens of thousands of chicks. Thus, Lesser Flamingos attempt to breed at Etosha once every 2.4 years and are successful once every 7.1 years. Five breeding attempts occurred at Etosha between 1996 and 2009. Fewer than 1,000 chicks fledged in 2000 (TO Osborne, RE Simmons pers. obs.), 5,000 chicks fledged in 2004 (C Brain, W Versfeld pers. obs.) and 2,500, 10,000 and 1,500 fledglings were produced in 2006, 2008 and 2009, respectively (Versfeld 2010). The recruitment rate is estimated at 0.04 to 0.053 young per pair per year – a rate too low to sustain southern African populations (Simmons 1996).

The Lesser Flamingo feeds during the day and at night for up to 12.5 hours, by wading in shallow water, with the bill upside-down, filtering cyanobacteria from the water surface, and small diatoms from the bottom layers (Brown *et al.* 1982). The main cyanobacteria at Etosha and Sua Pans are *Anabaena* spp. and *Naticula halophila* (Berry 1972, G McCulloch unpubl. data).



## THREATS

Breeding frequency and success are naturally low at Etosha Pan (Simmons 1996), but this will in future be exacerbated by reduction in eastward water inflow onto Etosha Pan from the Omuramba Owambo due to mining of aquifer water outside the national park (Christelis & Struckmeier 2001). Climate change will probably further affect this, as annual rainfall is expected to diminish over southern Africa in future years (IPCC 2001, Simmons *et al.* 2004). At the unprotected Sua Pan breeding site in Botswana, soda ash mining around the main breeding site pumps water from deep underground and may reduce water levels on the pan (Hancock 1990).

Mass mortality events have been reported from the Rift Valley Lakes of East Africa (B Childress pers. comm.), but are not known to occur in southern Africa. However, the frequent occurrence of toxic hydrogen sulphide eruptions (Weeks *et al.* 2003) in coastal areas sporadically claims the lives of a few hundred flamingos at Walvis Bay and Sandwich Harbour (R Braby, K Wearne pers. obs.). Low-level organochloride pesticide residues used extensively in the catchment area of the Ekuma River against malaria-carrying mosquitoes directly threaten flamingos and sub-lethal levels of Dieldrin and DDT are known from flamingo eggs (Berry 1972, CJ Brown unpubl. data).

Additional threats are few, but oil spills in the increasingly busy harbour at Walvis Bay have

the potential to disrupt feeding at this important overwintering site. Collisions with cattle fences that cross Sua Pan and with overhead power lines are frequently reported from Botswana and Zimbabwe (G McCulloch, PJ Mundy pers. obs.). The construction of a desalination plant just north of Wlotzka's Baken on the central Namibian coast and the associated power line infrastructure may thus have a serious impact on the Namibian flamingo population. Increasing numbers of low-flying aircraft harass foraging birds on Sandwich Harbour mudflats (R Braby pers. obs.), despite warnings from authorities to stay out to sea or above 1,000 m altitude, as per regulations.



## CONSERVATION STATUS

The Lesser Flamingo is classified as *Vulnerable* in Namibia, but is considered *Near Threatened* globally (IUCN 2012a) and in South Africa (Taylor *et al.* in press). We have classified it in a higher category for a number of reasons. Declines of 27% in southern Africa were estimated prior to 1995 and poor breeding recruitment at Etosha was suggested as the reason (Simmons 1996, 1997). Since that assessment, birds on Botswana's Sua Pan have bred more frequently (McCulloch & Irvine 2004, G McCulloch unpubl. data), with up to 90,000 pairs recorded in 2005/2006 and 44,000 pairs in 2008/2009. Etosha's birds have bred successfully on several occasions in the last decade, and southern African populations have increased beyond the 65,000 estimated in 2003 (M Anderson, D Harebottle RE Simmons unpubl. data). These figures vary widely and thus it is safest to say that more than 100,000 birds do occur in southern Africa (with a mean of about 116,000 birds as per figures above) when conditions are favourable. While these recent figures have put the population estimate above those of the early 1970s, the species is highly dependent on only three mass breeding sites, Etosha Pan, Sua Pan and Kamfers Dam (Anderson 2008, Anderson & Anderson 2010). In addition, the Etosha Pan site has been shown to be a non-viable breeding site because it adds too few fledglings to future generations to sustain southern African populations (Simmons 1996). Unfortunately, the Kamfers Dam island has also stopped producing recruits after it was flooded in 2011/2012 (Anderson & Anderson 2012). Thus the successful breeding of this species is essentially dependent on just one unprotected site at Sua Pan, which is currently mined for soda ash (Hancock 1990). This qualifies this species for the *Vulnerable* category in Namibia, because without the Sua Pan, the Namibian (and southern African) population would rapidly decline.

The Lesser Flamingo occurs in four Ramsar sites in Namibia. It is listed in Annex 2 of the Agreement on the

Conservation of African-Eurasian Migratory Waterbirds (AEWA), in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and in Appendix II of the Convention for the Conservation of Migratory Species of Wild Animals (CMS). It needs to be classified as *Specially Protected* species in any revised or new legislation pertaining to parks and wildlife in Namibia.



## ACTIONS

Regional collaboration is needed, through the International Lesser Flamingo Action Plan under the auspices of CMS and AEWA, to protect the species (Anderson 2012). There is a continuing need to undertake regular (five-yearly) simultaneous counts throughout Africa to gauge population fluctuations. These are best done from aerial photographs taken at mass breeding sites, or from counts of massed non-breeding congregations at coastal locations. To safeguard the continuing trend of increasing populations in southern Africa, management and tourism authorities should investigate the feasibility of artificial breeding islands at Etosha and other sites under threat. These would ensure more frequent breeding and greater success than currently experienced, and would negate the need for the (rarely successful) rescue of chicks stranded on drying salt pans (Berry & Berry 1976, Fox *et al.* 1997). The success of the breeding island in the Camargue region of France (Johnson 1989) has precipitated several attempts to build artificial breeding islands in southern Africa (Simmons 1996, M Anderson, W Tarboton unpubl. data) with little success, mostly because of needless bureaucracy. A notable exception is the artificial island at Kamfers Dam, which initially proved hugely successful and produced about 22,000 chicks in 2008 and 2009, but is now threatened by a proposed housing development, pollution and human-induced flooding of the island (Anderson 2012). The coastal breeding island constructed in 2001 at the Walvis Bay Salt Works has never been used by flamingos (R Braby, H Kolberg pers. obs.).

Monitoring of breeding events and their success on Etosha Pan by Etosha Ecological Institute staff should be continued and when breeding is successful, the ringing of a cohort of fledglings should take place using engraved colour rings. These will allow an assessment of survival and movement of these birds similar to that undertaken on birds released in Etosha in 1994 (Fox *et al.* 1997). Conservation management, in collaboration with the Directorate of Civil Aviation, Ministry of Works and Transport, should continue to prevent harassment of birds by low-flying aircraft at the coast. Because no breeding sites elsewhere are nationally protected, all breeding sites outside Namibia should be fully protected.