

LAKE BARINGO

Another casualty of the furadan scourge

We always want to know more. This trait is inherently human; we learn throughout our lives. Knowledge breeds curiosity, and curiosity takes us to wonderful places. With this in mind, I headed to Lake Baringo...

THE AUTHOR



PHOTO BY: MUNIR VIRANI

SHIV KAPILA was born and raised in Kenya before pursuing studies in the United Kingdom. He received a Masters degree in Conservation from University College London and has been working on African Fish Eagles at Lake Naivasha and Baringo with support from The Peregrine Fund and the National Museums of Kenya.

After working on the African Fish Eagle, *Haliaeetus vocifer*, at Lake Naivasha for close to two years, my affinity for these birds has almost developed into an obsession. They are a reliable and rewarding raptor to study, and supremely dignified and graceful. I was keen to expand my research on Fish

Eagles to other areas, and with good cause. Although considered a relatively common bird throughout most of its range, as birds of prey go, the African Fish Eagle is an ideal candidate to use as an umbrella species, an indicator species of environmental change. As a slow-to-mature bird and an apex predator with low rates of reproduction, this raptor can accurately offer early warning signals of environmental stress. Their population and breeding structures and observed fluctuations can also, and often do, reflect changes in conditions within their ecosystems. By studying these fluctuations, they enable scientists to assess the health of the ecosystem, and, by protecting them, we invariably conserve their entire habitat. The birds are most commonly found around freshwater lakes and rivers, and in Kenya this means Lakes Naivasha and Baringo.

Lake Baringo is radically different from Lake Naivasha; at only 160 km north of Naivasha, its altitude is over 1,000 metres lower. This has a dramatic effect on the temperature and vegetation. It's warm enough to support crocodiles and dry enough to attract specialist bird species which one would only expect to encounter in

PHOTO BY: MASUMI GUDKA





Adult from Parmalok island fishing.



Female Fish Eagle catching its lunch.

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northern Kenya's arid scrublands - such characteristics mean the birds on the local checklist approach 500 species. The differences do not end there - the shorelines are seemingly perfect for Fish Eagles: high cliffs directly overlooking the lake means the fishing should be easy, marshland abounds, providing cover and ample training grounds for juveniles, and maze-like island groups in the north seem to double the available territory space.

Being of similar size to Lake Naivasha, one would expect there to be

comparably similar populations of Fish Eagles, exhibiting the same behavioural and breeding patterns. Unfortunately, numbers at Baringo have always been low. Fish Eagle counts were first conducted here in the late 1960s and early 1970s by the late Dr Leslie Brown, Kenya's "Father of Raptor Biology", whose highest recorded number was 70 individuals including both adults and juveniles. The highest population at Naivasha was 224, recorded at the same time as the 70 birds at Baringo. In those days, Baringo and its environs

were almost pristine -development had hardly penetrated this far north and the lake's conditions were assumed to exhibit a natural state, or as close to it as possible. A probable cause of these low densities may be the lake's location, climate and geography; Baringo is an oasis surrounded by desert, and its isolation may result in repelling wandering Fish Eagles, reluctant to even explore a habitat that may seem barren (a lone female on one of the lake's smaller islands who lost her mate in 2006 has not found another after four years; at Naivasha she may have done so in less than a week). The resultant low turnover rates ensure that populations could be stable, but could rarely increase. Research continued in the late 1990s and early 2000s by Dr. Munir Virani (of The Peregrine Fund and the National Museums of Kenya) and by this time numbers had dropped to a low of 36 individuals, close to a 50% loss.



PHOTOS BY: MASUMI GUDKA

**Adult turning in for a kill.**

After a lull of five years, during which no counts were conducted, I made my first visit to Baringo in November 2010. This was primarily to assist Masumi Gudka, a Kenyan student studying towards a Masters degree in Conservation Biology at the University of Cape Town. Gudka was looking at the chemistry and toxicology of Lake Naivasha and how this is affected by large-scale horticulture. Intensive horticulture and agriculture is largely absent from the shores of Lake Baringo, so it was used as a control or neutral site to which we can compare Lake Naivasha. Gudka was assessing levels of certain chemicals in lake sediment, water, fish and Fish Eagles. She had enlisted Simon Thomsett, Kenya's leading authority on raptors, and myself to help trap the birds in order to draw some of their blood to test for particular toxins that they may be exposed to.

The numbers of Fish Eagles I counted was exceedingly low at only 20

individuals, including two juveniles and two transient (non-territorial) adults. This again, was close to a 50% loss from the previous count and represents a staggering rate of decline over those five years. The islands experienced the most marked reduction; the largest of these islands (Ol Kokwe) lost four out of its five pairs. This highlighted the gravest threat to this lake: poisoning. Despite bans on its distribution and sale, Furadan, a deadly carbamate is still sold, among others, in larger towns close to Baringo such as Marigat, and is indiscriminately used in the area. Originally intended to combat nematode worms in the farming industry, this chemical has been abused; it has been used as a retaliatory killer to destroy problem carnivores, most infamously

in the Maasai Mara Game Reserve with devastating effects. This lethal chemical is a major influence in causing a 60% decline in African vulture populations over the past two decades and severely depleting Kenya's lion numbers. It and other poisons are used at Lake Baringo for the same reason but with the desired effect of killing crocodiles. Crocodiles occasionally take goats and other livestock and the usual response is to kill them by laying out poison-laced fish on the shore in areas where they are known to frequent. This method is opportunistic and indiscriminate; often causing large-scale collateral damage: the most recent reported poisoning incident took place on Ol Kokwe in 2006 and not only killed eight crocodiles, but also thirteen Fish Eagles,



Adult Fish Eagle showing leucistic wing patches.

PHOTOS BY: MASUMI GUDKA

two Goliath Herons and two Monitor Lizards. Among the dead were two goats, the very animals the perpetrators were trying to protect.

Normally top predator densities should recover, give enough time free from such disturbance, but other threats at Baringo hinder their increase: the area has been speedily and steadily overrun an invasive plant. Mexican Mesquite, *Prosopis juliflora*¹, was intentionally introduced to the Baringo area in the 1980s to increase resources of fuel-wood. It quickly became clear that no matter how high the demand for its fuel the plant would spread quickly,

and it now covers very large tracts of land near the lake. Native Acacia trees and grasses have been out-competed and are virtually absent from the area. The effect is detrimental to both the local human population who depend on the vegetation for their livestock and for the Fish Eagles that prefer to nest in the tall Acacia trees that used to surround the lake's shores. The situation has become so dire that the only active Fish Eagle nest we located was situated at the top of an invasive Kapok tree.

After four years, the lake's Fish Eagle numbers have declined precipitously to a low of 20 individuals, and this

may be having an ominous effect on their health. Of the nine Fish Eagles that we trapped and banded in the last year or so, eight showed physiological characteristics of a severely stressed population. The physical mutations we found in these Fish Eagles, such as hyperkeratinosis (abnormalities of the scales on their feet that are made from keratin, just like our fingernails) and leucism (patches of plumage lacking any pigmentation), can be caused by numerous deficiencies and toxins, but also points to some degree of inbreeding². This could be as a result of a combination of low populations

¹This shrub is listed as one of the 100 most virulent invasive species and has been deliberately introduced to large areas of northern Kenya.

Reference: World's Worst Invasive Alien Species: A selection from the Global Invasive Species Database. S. Lowe, M. Browne, S. Boudjelas, M. De Poorter. (2000) Published by The Invasive Species Specialist Group (ISSG), a specialist group of the Species Survival Commission (SSC) of the World Conservation Union (IUCN).

²Leucism is only naturally present at a rate of 0.1%-1% in wild bird populations. Incidences where it manifests in a higher proportion of a population is most likely to be due to some degree of inbreeding as it is an inherited condition.

Reference: A case of leucism in the burrowing owl *Athene cunicularia* (Aves: Strigiformes) with confirmation of species identity using cytogenetic analysis D. M. Nogueira, M. A. S. Alves. Zoologia (Curitiba, Impr.) vol.28 no.1



MAIN PHOTO: Adult soaring over the lake.
INSERT: Releasing a newly tagged adult on the North side of the lake.

with a minimal turnover rate: very few wandering adults get to the lake and those that are resident breed at very slow rates, so the gene pool remains small. Accounting for these factors, the lake may cease to support any of these powerful and captivating raptors in as little as ten years. The Fish Eagles at Baringo have been calculated to collectively generate over USD 150,000 per annum for the area in terms of tourism revenue and expenditure. Thus the loss of even one of these birds to retaliatory poisoning significantly impacts the local community.

Lake Baringo was declared a Ramsar site, a wetland of international importance, in 2002 but so far it has not been treated as such. Solutions to these problems are long term, but worth considering. Campaigns against the spread of the Mexican Mesquite can involve the continued use for fuel and with the addition of using its wood

for furniture and construction, and its pods for livestock feed and flour. This has been done successfully in South America, India and Niger where the plant has also invaded and taken a stranglehold of the landscape, but in these countries, people have learned to look upon the plant as a resource and have successfully arrested its increase.

The response to poisoning could be more immediate in the form of a total countrywide ban, but without punishment abuse could still, and often does, continue in more remote areas. Education against its effects from a young age can have more permanent impacts over the long run, and some success is being seen with education programmes held in conjunction with the International Vulture Awareness Day scheme.

These strategies, although dependent on a huge change in attitudes and practices, can work with careful implementation. Lake Naivasha has already suffered the indignity of being downgraded to the Montreux Record of degraded wetlands due to the unsustainable fashion in which it has been exploited by industry. Lake Baringo can and should avoid this embarrassment with some warranted and necessary effort.

As I sit on the shores of the lake at Robert's Camp, gazing at the sun setting over the horizon, lighting up the lake's surface with a shimmering glow, I can't help wondering what Baringo would be like without its charismatic hunters: its crocodiles and its Fish Eagles. Would it produce such amazement, encourage such inspiration? Or would it become just another 'muddy puddle', resigned to this fate because of neglect and mismanagement? ●

