Cranes, sedges and a dry Zambezi

The vast wetlands of the Zambezi Delta are a thing of the past. Changes started about 100 years ago with the advent of sugarcane farming: to prevent flooding, dyke walls were built to constrain the river. The impacts of the dykes, however, pale by comparison with the impacts of Kariba (1958) and Cahora Bassa (1974) dams. Kariba traps more than half of the annual Zambezi flow and Cahora Bassa traps the rest. Today, flows of the lower Zambezi are dependent on input from Malawi's Shire River.

Even though there are releases of stored water for power generation, these no longer follow the natural flooding regime and, in all except the wettest years, the floodplain remains largely dry throughout summer. Drying of the floodplain has allowed palm savanna to replace wetland habitats. As the drying floodplain has become more accessible to people, poaching has escalated. Since 1970, the huge grazing herds of buffalo have been reduced by 95 per cent and the remaining animals no longer control plant growth.

Fitztitute student Carlos Bento, from Mozambique, has studied the impact of these changes on the globally vulnerable, wetland-dependent Wattled Crane *Grus carunculatus*. In 2000, the world population was estimated at 13 000–15 000 individuals – a revised estimate in 2001 places the figure at between 6 000 and 8 000.

Bento has found that the Delta's remaining 300 Wattled Cranes depend on tubers of the sedge *Eleocharis* for food. The sedges only produce tubers under seasonal conditions of flooding and drying. The tubers are both water-storage and reproductive organs. Where *Eleocharis* is constantly flooded, it reproduces sexually, without tubers, and it is these seeds that provide the colonisers for dry areas. *Eleocharis* covers 900 square kilometres of the Delta. However, 250 square kilometres is permanently inundated with water, due partly to the effects of seawater forcing fresh water above it. As a result, the plants here do not produce tubers. Analysis of aerial photographs suggests that another 250 square kilometres of *Eleocharis* that would have produced tubers has been lost to desiccation.

Despite these losses, cranes survive in part of the western Delta. The reason for this is that seasonal flooding here depends not on the behaviour of the Zambezi, but on smaller rivers originating on the Cheringoma Plateau to the west that feed into an area known as the Marromeu. These rivers are all unregulated and still provide natural seasonal floods that result in tuber production by *Eleocharis*. Data collected during surveys have been used to develop a model of the Marromeu cranes' population dynamics. Should conditions here remain unchanged, the population faces no immediate threat. At the same time, however, models also show that the population is producing very few surplus birds that could potentially bolster ailing populations elsewhere.

RICHARD BEILFUSS

An aerial view of the Marromeu floodplain.

Although all might be well at present, the combination of a drying delta and the removal of grazers has introduced a new threat to the cranes. Because grazers no longer keep the vegetation under control, people have resorted to fire as a means of gaining access to the Delta for fishing and poaching. On the one hand, this does increase the ease with which cranes can reach *Eleocharis* tubers, but on the other it poses a direct threat to chicks. Historically, chicks fledged before the start of the fire season; today this is no longer the case and fires occur almost throughout the year. Contrary to expectations, fledging success is lowest in the wettest years. The explanation for this is probably that these are also the years of fastest plant growth and hence the greatest frequency and extent of fires. The year 2001 was such a year – and only one quarter of all breeding pairs succeeded in fledging a chick (as against more than 40 per cent success in the dry year of 1999). Whilst collisions with powerlines are a major threat to Wattled Cranes in South Africa, it seems that one of the greatest threats to the Zambezi population stems from a complex series of interactions between drought and man, ultimately manifest in fire.

The Wattled Crane study is sponsored by the International Crane Foundation, the Disney Wildlife Conservation Fund, The Luc Hoffmann/Mava Foundation and the John D. and Catherine T. MacArthur Foundation. The project is part of a long-term holistic assessment of the ecological and socio-economic impacts of the Cahora Bassa Dam, aimed at improving water management in the lower Zambezi Valley for the benefit of people and wildlife.

Visit the FitzPatrick website: http://www.uct.ac.za/depts/fitzpatrick
Percy FitzPatrick Institute of African Ornithology, University of Cape Town, Rondebosch 7701, Cape Town, South Africa.
Tel. (021) 650 3290; fax (021) 650 3295; e-mail birds@botzoo.uct.ac.za