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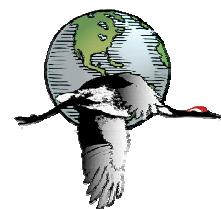


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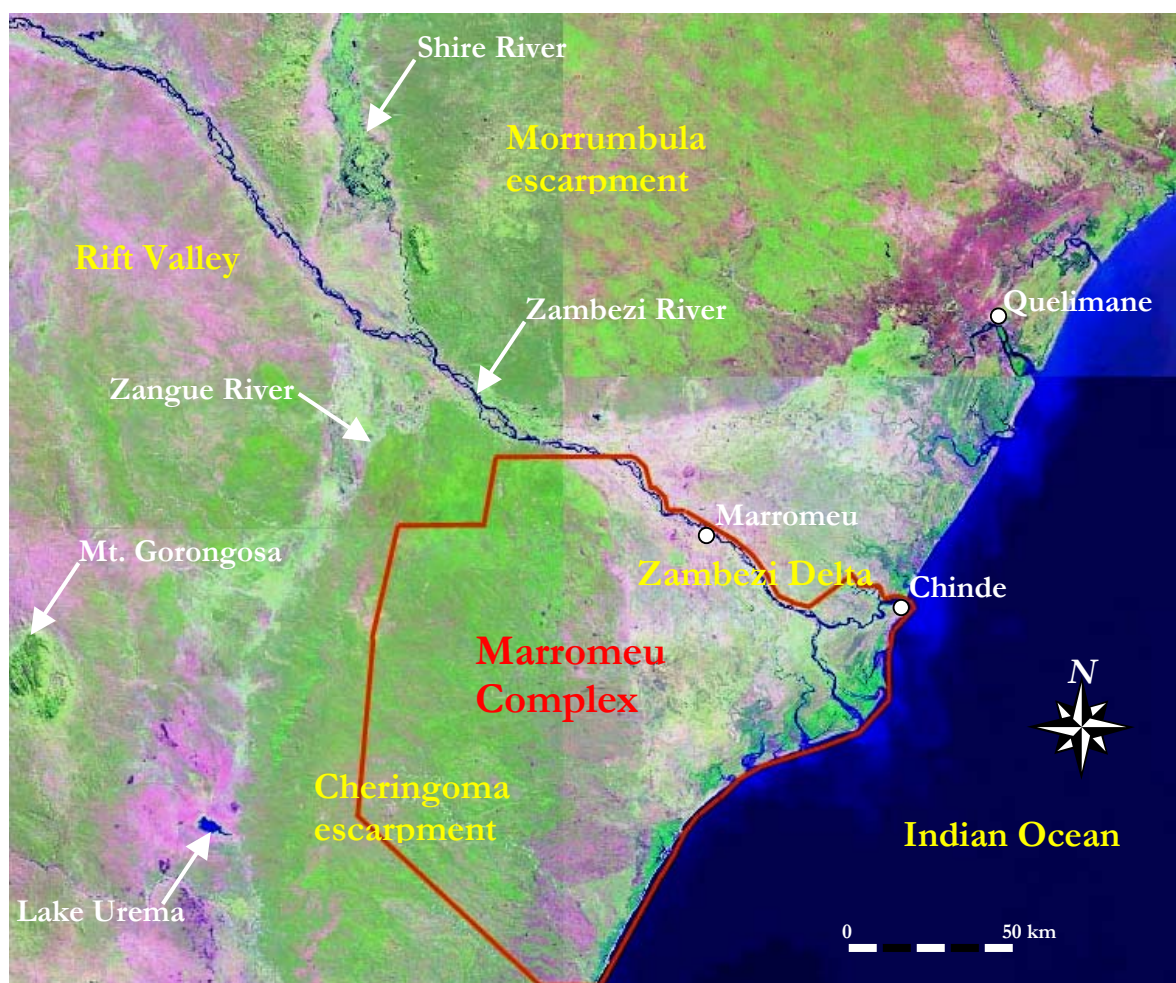
# Zambezi Valley News

Newsletter of the Working Group for Conservation and Sustainable Development in the Lower Zambezi Valley



Volume 1 Number 2

## THE ZAMBEZI DELTA: A WETLAND OF INTERNATIONAL IMPORTANCE



Composite satellite image (Landsat 7 ETM, July 2003) of the Marromeu Complex, showing the Zambezi Delta, Cheringoma escarpment, and other regional features. Map produced by Richard Beilfuss and Carlos Bento.

The Government of Mozambique has declared the Marromeu Complex of the Zambezi Delta as the first *Wetland of International Importance* in Mozambique, under the Ramsar Convention. We congratulate the Government for its foresight and long-term commitment to the Zambezi Delta. The Ramsar Convention is the world's foremost international agreement for the protection and sustainable use of wetlands, and assures the conservation of the Zambezi Delta for future generations. The 688,000 ha. Marromeu Complex includes the Marromeu Special Buffalo Reserve,

four surrounding hunting concessions, the Sena sugar estates, and coastal mangroves on the southbank of the Zambezi Delta.

For the past decade, the Museum of Natural History and International Crane Foundation (ICF) have undertaken extensive research and education programs to raise awareness about the importance of the Marromeu Complex for the people and wildlife of Mozambique. The complex features a diverse mosaic of vegetation communities,



*Cape buffalo in the Zambezi Delta during the wet season in a year of good flooding conditions. Photo by Paul Dutton.*

including dry lowland forest with wetland pans, miombo woodland with wet grassland and riverine swamp forest, acacia savanna and thicket, palm savanna, seasonally flooded grassland, permanently flooded swamp grassland, papyrus swamp, reed swamp, lagoons, mangrove forest, dune thicket, and beaches.

These vegetation communities in turn support abundant and diverse wildlife, including Cape Buffalo (the largest population in Africa prior to the civil war), African Elephant, Lichtenstein's Hartebeest, Sable Antelope, Eland, Burchell's Zebra, Hippopotamus, Waterbuck, Reedbuck, and many other species. Predators include Lion, Leopard, Cheetah, Wild Dog, and Spotted Hyena. The complex supports the densest concentration of waterbirds in Mozambique, including large nesting colonies of Great White Pelicans, Pinkbacked Pelicans, Whitebreasted Cormorants, Yellowbilled Storks, African Openbill Storks, ibises, herons, and egrets. Tremendous numbers of Spurwing Geese, Fulvous Ducks, Whitefaced Ducks, and other waterfowl feed on the floodplain. Thousands of intra-African and Palearctic migratory shorebirds depend seasonally on the inter-tidal estuarine zone, including Greater and Lesser Flamingoes. The complex is home to 120 breeding pairs of endangered Wattled Cranes and provides critical refuge for up to 30% of their global population during times of extreme drought in southern Africa. Other species of international concern include Grey Crowned Cranes, Saddlebill Storks, Woollynecked Storks, Goliath Herons, African Skimmers, Redwing Pratincoles, and Caspian Terns. Humpback and Minke Whales occur offshore, along with Bottlenosed, Roughtoothed, and Humpback Dolphins.

The Marromeu Complex is also vital for the national economy of Mozambique, and provides subsistence for hundreds of thousands of rural villagers. The extensive coastal mangroves and estuaries nourish the prawn fishery on the Sofala bank, one of Mozambique's most important sources of export revenue. The floodplain swamps provide important spawning grounds for riverine and oceanic fishes. These floodplains also support an important freshwater fishery during years of good flooding—following the 2001 floods, for example, fishing camps were established across the delta and dried fish were exported to Malawi and Zimbabwe. The wet grasslands provide critical dry-season grazing lands for livestock. The rich delta soils support the largest sugar plantation in Mozambique and productive flood-recession agriculture. The savannas and woodlands provide fuelwood, building materials, wild fruits, honey, and medicinal plants to local communities. The complex also offers exclusive ecotourism and trophy hunting opportunities through the hunting concessions.

Because of its considerable ecological and socio-economic values, the Marromeu Complex is among the most important wetlands in Africa. The Marromeu Complex now joins the Okavango Delta in Botswana and the Kafue Flats in Zambia as the premier *Wetlands of International Importance* in the Zambezi River basin. In fact, the complex is a global example of a wetland that plays a substantial hydrological, biological, and ecological role in the natural functioning of a major river basin and coastal system. The commitment of the Government of Mozambique to designate the Marromeu Complex as a Ramsar Site was honored as a "Gift to the Earth" by the World Wide Fund for Nature (WWF), their highest award for globally significant conservation achievement.



*The Marromeu Complex supports globally-significant concentrations of waterbirds and endangered species such as the Wattled Crane. Photo by Richard Beilfuss.*



*The Marromeu Complex includes some of highest quality mangroves on the Indian Ocean Coast. Photo by Richard Beilfuss.*

### **Towards the holistic management of the Marromeu Complex**

As part of this commitment, Mozambique must now prepare a comprehensive management plan for the Marromeu Complex. The key to the management plan lies in balancing the substantial conservation and economic values of the wetland and recognizing the complex as an inseparable part of the broader landscape. The plan must thus address management opportunities and challenges at multiple scales, ranging from the Zambezi Delta plains to the surrounding uplands to the entire Zambezi River basin.

#### ***The Zambezi Delta***

At the heart of the Marromeu Complex is the Marromeu Special Buffalo Reserve (1500km<sup>2</sup>) on the Zambezi Delta plain. These productive grasslands provide refuge for Cape Buffalo, African Elephant, Waterbuck, and other species from hunting, enabling them to successfully reproduce and raise their young. The surrounding hunting concessions (8252km<sup>2</sup>) extend from the edge of the buffalo reserve into the adjacent Cheringoma highlands. During the civil war, wildlife was heavily persecuted in this region resulting in a 95% or greater reduction in Cape Buffalo, Waterbuck, Burchell's Zebra, Hippopotamus, and other species between 1979 and 1995. Today, with properly enforced hunting quotas based on scientific studies these wildlife populations can recover to their historic levels while still sustaining the lucrative commercial trophy hunting industry. The area has tremendous ecotourism potential, including bird watching tours, walking safaris, makoro trips, and

“Big Five” photographic safaris—Cape Buffalo, African Elephant, Lion, and Leopard now occur in the complex and there is an excellent opportunity to restore the Black Rhino population that formerly occurred in the region.

Some of the most extensive mangroves on the Indian Ocean coast occur in the Zambezi Delta. These mangroves sustain the lucrative *wild-caught* prawn industry, an outstanding example of sustainable land use that promotes conservation and economic development. The mangroves also support nursery grounds for commercially important fish, protect against coastal erosion, provide habitat for many wildlife species, and supply a variety of forest products for people living in the coastal zone. The Marromeu Complex therefore includes critical mangrove areas along the southbank up to the coastal port at Chinde.

The Marromeu Complex also includes the economically-important Sena sugar estates near the village of Marromeu. The management of the sugar production fields, which are currently expanding to cover their historical (pre-war) extent, is strongly linked to the hydrological and ecological values of the natural wetlands of the Zambezi Delta. Elsewhere in the world, unregulated sugar production has negatively affected water quality and quantity in adjacent wetlands. By managing the Sena sugar estates as part of the overall wetland ecosystem, however, these conflicts can be recognized and resolved.



*Pivot-irrigation system used for sugar production in the Zambezi Delta. Photo by Richard Beilfuss.*

The Salone depression, a river corridor that connects the southbank floodplains to the Zambezi River, forms the northern boundary of the Marromeu Complex near the apex of the Zambezi Delta. The movement of floodwaters through the

Salone depression is obstructed by large dikes constructed for roadway and railway lines along the Zambezi and the abandoned railroad levee that runs between Marromeu and Inhamitanga. Much of the widely-reported degradation of the Zambezi Delta is due to this blockage, especially in conjunction with regulated Zambezi flows below Cahora Bassa Dam. The restoration of water movement through the Salone depression is therefore essential for restoring the Marromeu Complex to its full potential. Improved hydrological conditions will also benefit local people who grow subsistence crops that depend on high water table conditions in the Salone depression.



*Water movement from the Zambezi River to the delta through the Salone depression must be restored as part of Marromeu Complex management plan. Photo by Richard Beilfuss.*

### ***The Cheringoma escarpment***

The proper management of the Zambezi Delta ecosystem also depends on the sustainable utilization of the surrounding uplands on the Cheringoma escarpment. The gentle backslope of the Cheringoma rises gradually from the delta plains to an elevation of nearly 400m, forming the eastern side of the Rift Valley. The Mungari, Ruave, Sanga, and Zuni Rivers rise on the crest slope of the Cheringoma and fan out along the edge of the Zambezi Delta, sustaining wetlands and lakes on the western half of the delta that no longer receive floodwaters from the regulated Zambezi River. These wetlands support the majority of species in the Marromeu Complex, including the globally endangered Wattled Crane that occurs only in the portion of the Zambezi Delta that is sustained by Cheringoma runoff. Cheringoma waters also nourish the mangrove swamps along the coastline from the Zambezi Delta to Beira, sustaining the Sofala bank prawn fishery. Many species of wildlife move seasonally from the delta floodplains to the Cheringoma to feed in the uplands when lowland

areas become inundated during the wet season. This annual migration reduces grazing pressure on the floodplain and enables the grasslands to rejuvenate. The Cheringoma is also a regional wildlife corridor, connecting the delta to the legendary Gorongosa National Park (3770km<sup>2</sup>) in the Rift Valley.

Of course, the dry forests and miombo woodlands of the Cheringoma escarpment are an important resource for economic development in Mozambique as well. The inclusion of these areas in the Ramsar site does not imply that timber harvest and other uses of the forest must cease, but rather that these resources must be carefully managed to ensure the hydrological, ecological, and economic sustainability of the delta. Deleterious development projects such as eucalyptus plantations on clear-cut slopes may be prohibited, while more compatible selective-cutting operations may be promoted.



*Runoff from the Cheringoma escarpment provides a vital source of water for the Zambezi Delta. Photo by Richard Beilfuss.*

### ***The Zambezi catchment***

Over the millennia, the Zambezi Delta was sustained by the annual ebb and flow of the great Zambezi River. Annual floodwaters spilled over into the vast floodplains, irrigating agricultural crops, rejuvenating grasslands where wildlife and livestock grazed, depositing nutrient-rich sediments that sustained coastal mangroves, and stimulating the reproductive cycles of countless species of plants and animals. Today, these same life-giving waters must also generate electricity for distant cities, transport produce and minerals to the ocean, and supply water for grand irrigation schemes. With the operation of Cahora Bassa Dam since 1974, the ancient flood cycles of the Lower Zambezi River have become a phenomenon of the past. Inundation of the Zambezi Delta is now dependent on local rainfall-runoff from

the Cheringoma escarpment or on emergency water releases from the Cahora Bassa Dam during years of exceptional regional rainfall.

The sustainable management of the Marromeu Complex thus depends not only on sound management practices in the Zambezi Delta and surrounding Cheringoma escarpment, but also on judicious water management practices in the entire Zambezi catchment. Our goal is to restore natural floodwaters to the Zambezi Delta by developing, implementing, and monitoring a clear, equitable, and practical plan for the management of flow releases from Cahora Bassa Dam, in conjunction with the management plan for the Marromeu Complex (this plan is described in Zambezi Valley Newsletter Volume 1 Number 1). In this context, future development projects such as Mphanda Nkuwa Dam must also be compatible with the management of the Marromeu Complex.

### The Ways Forward

A tremendous first step has been taken by the Government of Mozambique in officially acknowledging the Marromeu Complex as a *Wetland of International Importance*. The next step is to assist the national government agencies (including Zambezi Valley Planning Authority, Ministry of Environment, Ministry of Tourism, Ministry of Agriculture, and Ministry of Fisheries), provincial and district governments, and community representatives in their efforts to coordinate the management plan. Technical support will be provided by various institutes involved in research in the delta, including the University of Eduardo Mondlane and Museum of Natural History and non-government organizations such as ICF, IUCN, and WWF. The planning process must be transparent and inclusive of everyone with a stake in the management of the Zambezi Delta, including

local residents, the private sector (e.g., Sena sugar, hunting concessions), and regional operators such as Hidroeléctrica de Cahora Bassa. To help facilitate this process, Mozambican resource managers now have access to training opportunities in wetland management and monitoring through the Ramsar Bureau and related programs.

The future of the Marromeu Complex lies in the balance between conservation and sustainable development. With sound ecological management, the social and economic values of the Marromeu Complex will increase over time as the prawn fisheries, subsistence production systems, hunting opportunities, forest products, and ecotourism prospects are enhanced. If we are successful, Mozambique may one day expand the Ramsar site to include the northbank of the Zambezi Delta—which contains one of the largest papyrus swamps in southern Africa—and the slopes of the Morrumbula escarpment that help nourish it. We envision the restoration and sustainable management of the entire Zambezi Delta ecosystem in perpetuity. ■



*Annual flooding from the Zambezi once sustained an important subsistence fishery on the delta floodplain. Photo by Paul Dutton.*

The Working Group for Conservation and Sustainable Development in the Zambezi Valley includes staff from university, private, government, and non-government organizations who are concerned with rural development, ecological sustainability, and the future of the Zambezi Valley.

The Zambezi Valley News is written and produced in Portuguese and English by Carlos Bento (Museum of Natural History-University of Eduardo Mondlane) and Richard Beilfuss (International Crane Foundation) and is free to any interested individuals or organizations.

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