DAMMING THE MIGHTY CUNENE

Biologists need to suggest how ecological damage can be minimised.

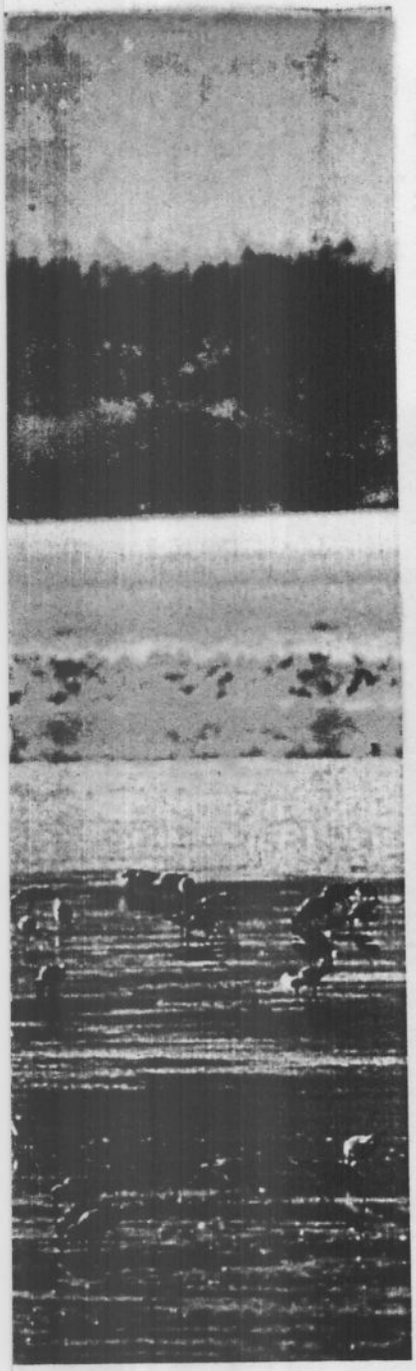
Rob Simmons

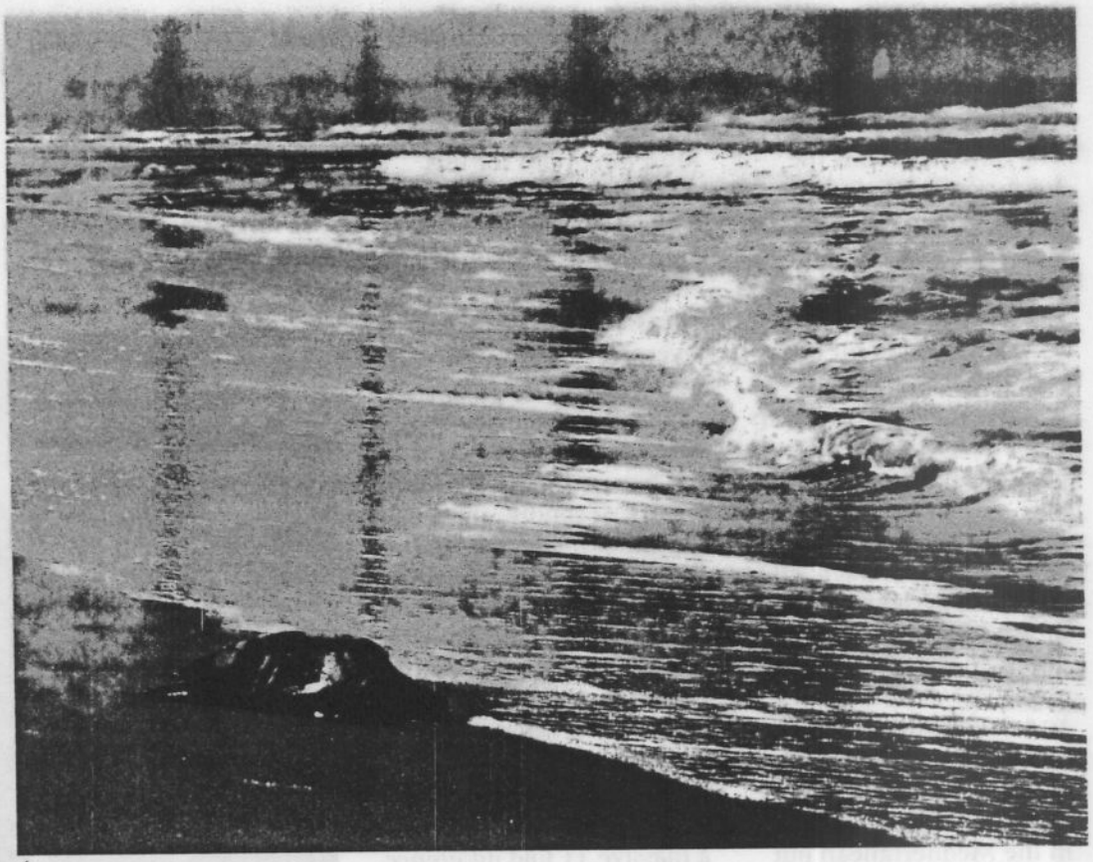
To the naturalist, the 1050 km long Cunene River holds many lures, not least of which is its sheer isolation. The lower Cunene, running along the Namibia-Angola border, lies at the top end of an uninhabited desert, a place of dunes, rocks, gorges and fierce winds. The sense of desolation is not an illusion: the area must surely rank as one of the least spoilt, most remote corners of Africa. This is a harsh environment; winds at its mouth reach over 60kph and suspended particles reduce visibility (and bird life) to almost zero. Feeding birds are frequently blown off their feet, and high winds can occur on 8 of every 10 days, abruptly changing from chilling 13°C south-westers to 35°C east winds within minutes. The river itself is the haven that lulls and feeds, and sometimes rages, adding an enormous diversity of fish, birds and reptiles to the area.

Plans for Damming the Cunene River

For years now, the river has attracted engineers who seek new energy sources for Namibia. The river was first investigated in 1966, when Prof. D.C. Midgley carried out extensive hydrological studies. He concluded that the fast flowing Cunene was ideal for hydro-electrical power. Dams were planned, ideas were discussed, but nothing came of them. The river, in existence for thousands of years, continued its daily and monthly rhythm unabated.

Today, the river is once again in the headlines. This time talk is more serious; dams, and megawatts and turbines are no longer just ideas and dreams. A site close to the beautiful Epupa Falls, 190 km upstream of the mouth, has been identified as ideal for a deep water dam. The 130m-high wall – higher than Kariba's – will span a narrow gorge and the dam will inundate





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an area some 200 km². The dam will hold 5000 million cubic metres of water, 17 times the size of Hardap. At average flow it will take one year to fill. Reputedly, the scheme will electrify all of Namibia and the excess will be sold. The engineering should be relatively straight forward: the area is geologically stable, the gorge narrow and the river fast and perennial. So on the plus side there is potential power for all of Namibia with none of the waste products associated with modern power generation. This is the silver lining; but what of the environmental costs?

Ecological Surveys of the Cunene

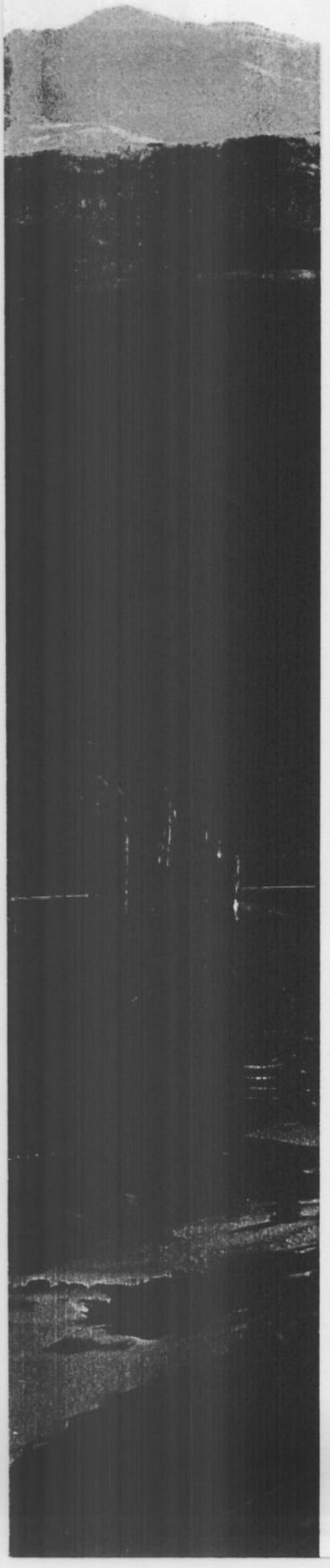
One of my tasks, as the (then) wetlands biologist for the Ministry of Wildlife, was to investigate the lower portion of the river, to determine three things. First, what species occur and *why* they occur in the Cunene. Second, what the effects of the dam might be on both the river environment and its fauna, and third, what might be done to alleviate any problems. Together with staff of the Skeleton Coast Park, two ecological surveys were undertaken in April and November 1991. These coincided with the peak and low flows of the river. We chose these periods for two reasons: to compare the natural highs and lows in the Cunene's annual cycle and to assess what effects consistently low flow would have on such a variable river.

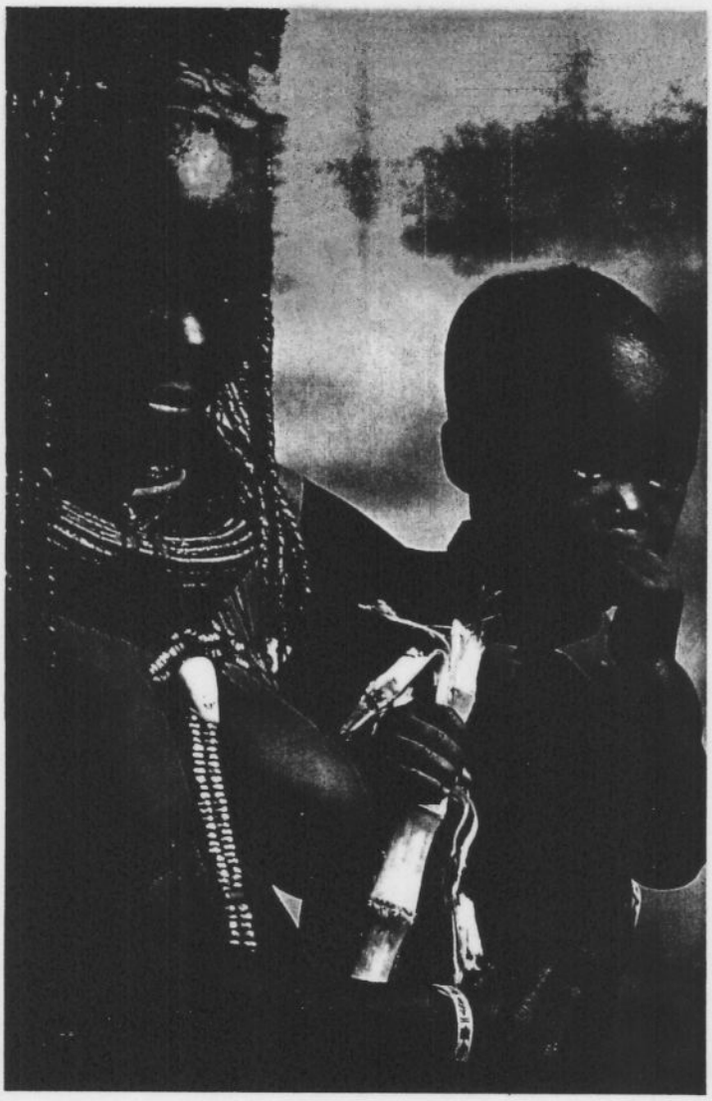
The Cunene lagoon proved to be the second richest wetland on the Namibian coast for birds: 72 wetland species have been recorded including 14 "Red Data" (endangered or threatened) birds. Clearly for the Cunene, the high diversity of fish-eaters such as ospreys, pelicans and terns is due to the astonishing abundance of fish in the lagoon. On one memorable, freezing day in November, I counted between 40 and 60 "springers" per minute jumping from the lagoon in a frenzy of activity that would have put any fisherman into a similar state. Fortunately, the area is protected within the Skeleton Coast Park and may become part of a larger park, contiguous with Iona in Angola.

We also caught and ringed over 300 birds of which the most interesting were eight Sandwich terns which had already been ringed. These birds, ringed as nestlings in western Europe, had flown (probably several times) the 8000+ km to this isolated spot. By lightly dye-marking them on the breast and resighting them, we found that they stayed up to 16 days before abruptly migrating in mid-April. Similarly, the commonest wading bird, the Little Stint, a 20g non-stop feeding dynamo, stayed on average 30 days and put on weight before its strenuous northerly migration. For these migrants, the isolated lagoon may be a most important stopover. For south-bound birds, a journey of over 700 km awaits them before the next stopover occurs in the Walvis Bay lagoon.

Other unexpected finds in the lagoon were two species of turtle. One, the Green Turtle, is a tropical marine species, which occurs in West African waters and breeds on some Angolan beaches. We counted up to 20 animals around the mouth but herpetologist Mike Griffin estimates that as many as 200 may occur. Suspicions that they may breed at the mouth rose when we found more beached in November, coincident with their

combining economic and ecological assessments have been completed. In any assessment benefits and costs must be weighed. However, in the modern world, economic benefits almost always outweigh ecological costs. Remember Rio? This is not a value judgement, it is basic human nature. Hence it is more fruitful for biologists to recommend ways in which ecological damage can be minimised. One such way is to set aside a certain proportion of the water for conservation purposes. This method, practised for many years in terrestrial systems (i.e. our national parks), rarely occurs in aquatic ones. This water, say 15% of the total available in the dam, could be released at appropriate times to mimic the peaks and troughs in natural flow. The timing of release can be dictated by river ecologists and occur from the top warm layers to counteract the cold water. These simple solutions would probably ameliorate many problems associated with regulated flow at Epupa. They mean that only 85% of the dam water can be used for power generation. While this may be anathema to economists accustomed to maximising profit, it would be essential for the maintenance of ecological processes and biodiversity – both protected under the Namibian constitution. Let us hope that compromises such as these can be implemented so that the Cunene can provide both power for Namibians and continue to be a haven for the unique fauna associated with its warm waters.





5. *Further upstream, the deep gorges of the Cunene at Hartmann's Valley – proposed sites for several dams.*
6. *About 200 Himba such as this mother and child who live along the river will be displaced by the dam water.*
7. *Damara Terns occurred regularly during surveys. Flocks of up to 2000 individuals have been previously recorded.*