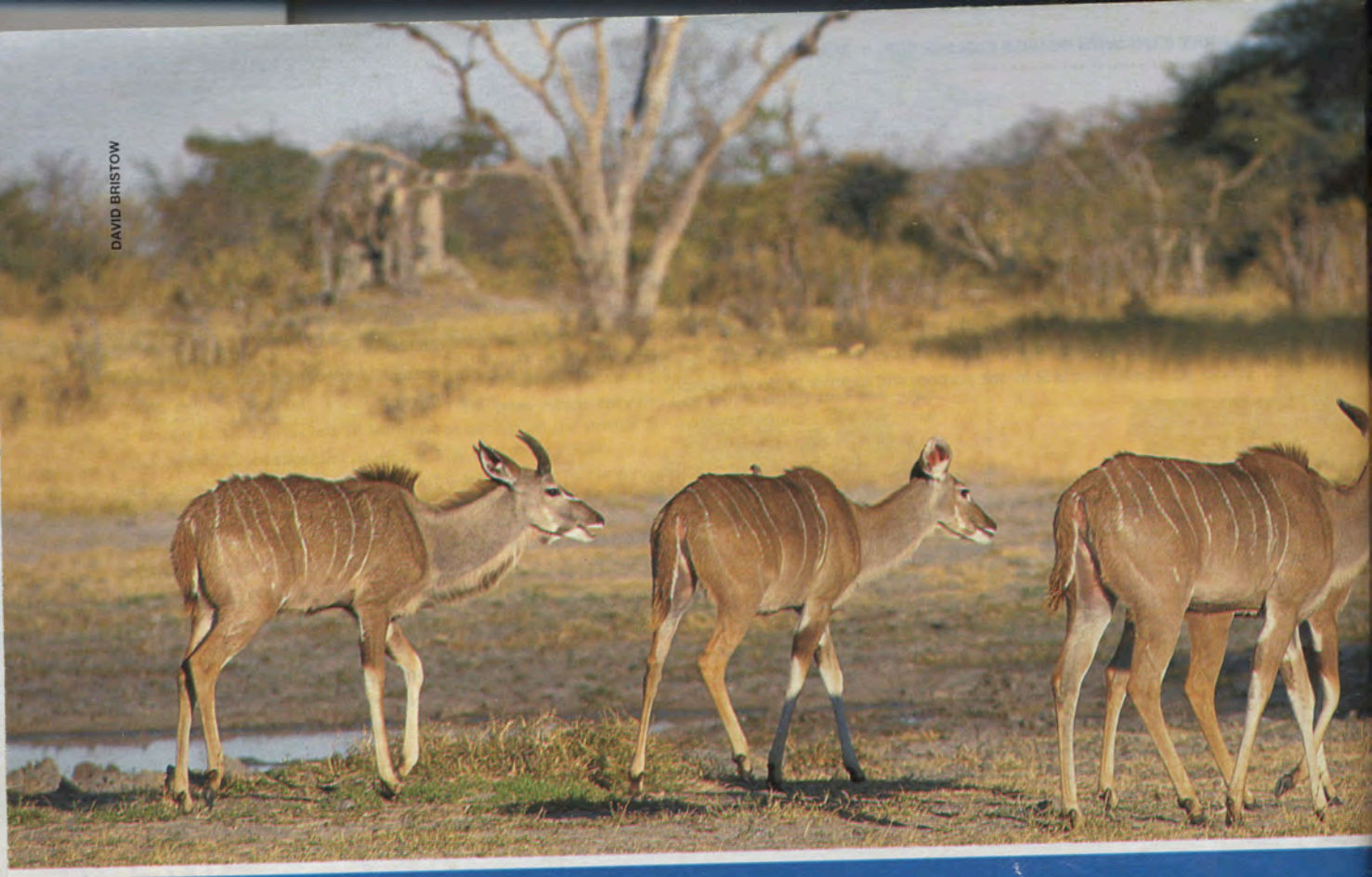


DAVID BRISTOW

Tracking salt islands
among the Delta's living lace

Last month **Thomas Gumbricht** looked at channel development in the Okavango Delta. This month the Swedish scientist traces the birth and death of the Delta's strange salt islands.

From water level the Okavango Delta is about hippos, crocs, elephants and reeds. From the air it's a different matter. For me a helicopter flight was the best – even if one of my airsick co-passengers had to use my camera bag to throw up in.

From the air you can see the point-bar islands formed along the inner curves of the Okavango and Nqoga rivers. The large lagoons of Gadikwe and Gobega on the Maunachira Channel are signs of once-large river flows. If you look carefully you can see large point-bar islands and old channel beds far from the present channels. From up high you can also see the interior of the islands – virtually impossible when going in *mokoro* or motorboat. Many of these islands are barren in their interiors, surrounded by a ring of lush vegetation. These doughnut-shaped islands have a history worth the telling.

No fresh sand is reaching the interior of the Delta at present, and islands further away from a channel generally begin as termite mounds. But all islands have a capacity to grow by themselves. If you could pile up just the salt that flows into the Okavango each year, you would have a cube with 50-metre sides. Most of this ends up in and around islands.

The trees around the island edges are rooted in fresh water – and they consume a lot of it. Here you find the sycamore figs (*Ficus sycamorus*) with their yellow bark, the majestic African ebonies (*Diospyros mespiliformis*) and sausage trees (*Kigelia africana*). More towards the island centre the unmistakable knobthorn acacias (*Acacia nigrescens*) often dominate; but in the dry centre only the real fan palm (*Hyphaean ventricosa*) and occasional leadwoods (*Combretum imberbe*) survive, towering above hardy grasses able to tolerate the high salt levels. This salt is so dense in places it forms crystals.

Eventually these islands will grow and merge, pinching off the water which flows to that part of the Delta, replacing it with pans that get flooded annually and then dry out – accumulating more salt year by year.

A fine place to study island growth is Chitabe, where Wilderness Safaris runs a pleasant camp. It's an old point-bar island which has been growing by salt accumulation.

We awoke at Chitabe on my 40th birthday, and the temperature was up around 40°C. I took it as a sign. We got up early, and my 'present' was to drill 20 auger holes – by hand – to a depth of three metres. The salt had turned the sand to cement. Eventually, to escape the work, I pretended to do some birding – after six trips to the Okavango at least I can recognise hornbills. Trees, I find, are easier to watch as they don't fly away, and they tell you a lot about the soil and water.

The birthday cake prepared by Paul and Shareen Kristafor of Chitabe was the best I can ever remember tasting.

WHEN CHITABE WAS FORMED, MUCH MORE WATER must have being flowing in the Santatadibe Channel. But why is the Thaoge, nearby, the curviest of all channels on the Delta? And where

Opposite, top and bottom: While the watery fringes of islands in the main delta area have a strip of lush riverine forest, the insides are doughnut-like with almost totally salt substrates and, of course, unpalatable grasses. Above: While tectonic movements may dictate the main direction of flow, it is these biological dredgers which determine where the water flows season by season.

- Water
- Mid channel communities
- Primary floodplain
- Secondary floodplain
- Grassland (occasionally flooded)
- Riverine forest
- Dry grassland/salt pan (occasionally flooded)
- Dry Woodland (dominated by Acacia)
- Dry Woodland (dominated by Mopane)
- Dry Woodland (dominated by Combretum)
- Grassland
- Dry grassland/salt pan

Above: The vegetation map compiled by the research team using remote sensing, and a resultant key of the main plant communities.

Below: The panhandle area (left) with just one channel running along a geological fault, and the alluvial fan area (right) where the waters flow wherever they seem to want to.

did the waters go that filled Lake Ngami 150 years ago when David Livingstone and then Charles-John Andersson were there?

Knowledge about the historical changes in water flow and flooding is a key to understanding future changes in the Okavango, which might stem from climatic alterations, water abstractions, or constructions of dams upstream in Angola.

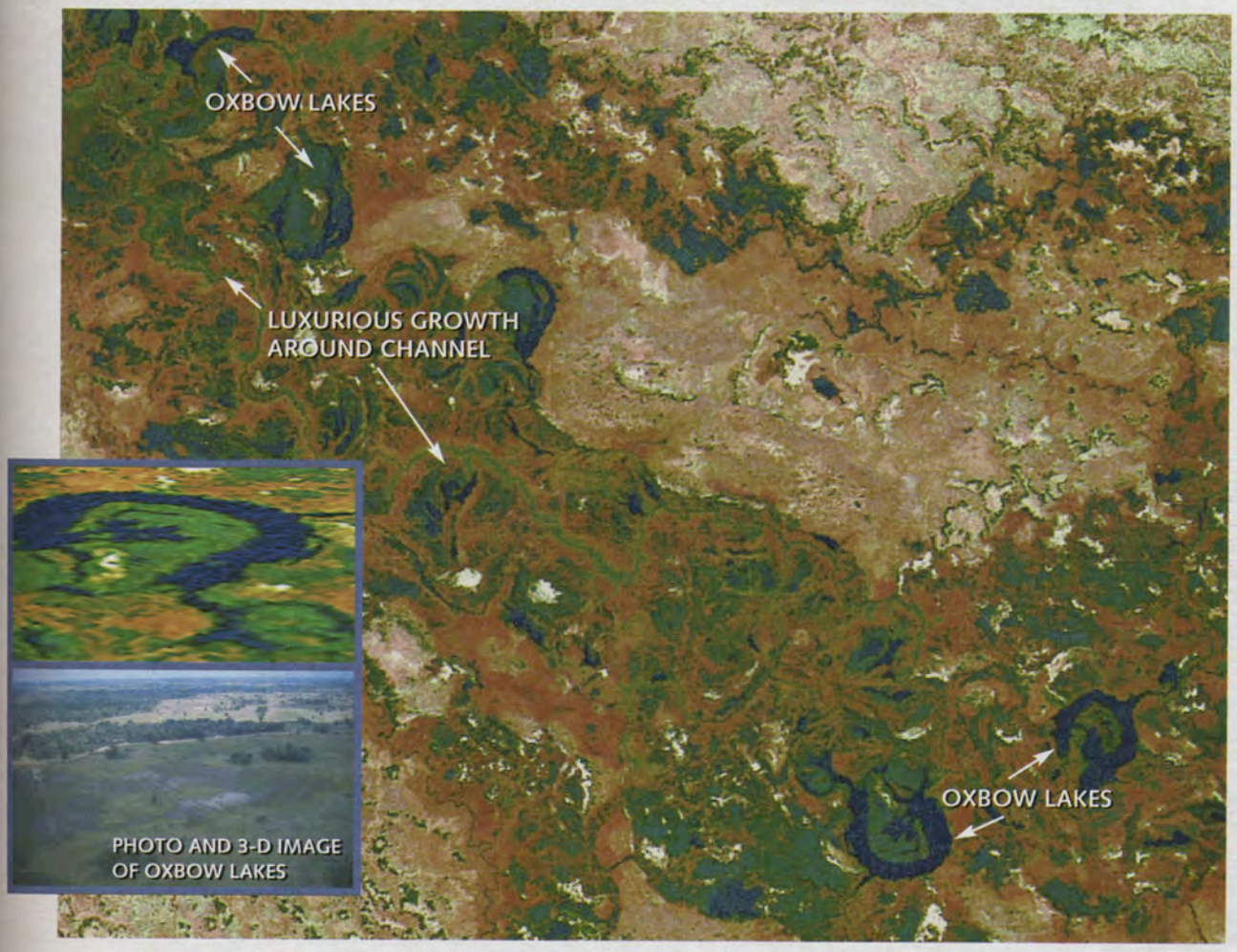
Satellite images, of course, are the only practical way to get information about flooding and channel changes. We used the Nasa Terra satellite and a civil version of the famous U-2 spy-plane (see Spying on the 'sea of land' in *Getaway* October 2002).

We decided to do a ground survey to coincide with the U2 overflight. With 200 litres of petrol, 20 litres of beer, 10 litres of wine and two litres of gin we were off feeling well stocked. A kilometre up the Thamalakane River from our camp we turned south into the Boro. The channel was dredged in the 1980s to improve downstream water flow. This has left levees on both sides of the channel where researchers regularly measure the change in water levels.

Our goal was to identify typical island and swamp areas to use for interpreting satellite and spy-plane images. The trick was to find a relation between what was on the ground or water and the colours of the images. If we could log the colour differences between, for example, reed, papyrus, hippo grass, various sedges, palms, mopane, acacia and the salty island interiors, then we'd be able to use the satellite images to distinguish different vegetation species throughout the Okavango – and create a vegetation map.

The first site we wanted to investigate was just inside the buffalo fence. To get there the whole crew of five had to jump into the water and drag the boat for 200 metres through the sedge. It is one thing gliding through the sedge in a *mokoro* – but quite another moving a large, heavily laden motorboat through the vegetation. This is croc country.

The second stop was at the Gametrackers lodge on



Flood season after flood season, the water of the Delta seems to shift by some mysterious inner force; but satellite images help to reveal its hydrological realities. The author (below right) celebrates his birthday at Chitabe camp.

Xaxaba Island – but we had to be patient while a herd of buffaloes slowly moved out of our way. We didn't stay the night at Xaxaba (a scientist's budget is generally limited) but went a bit further up the Boro and found a suitable island. As the sun set we heard a hippo grouching about his grazing ground occupied by tents. We lit a fire, and listened to the African night. Whoop whoop, the hyena was not far off, and further away the roaring of a couple of lions.

The next days we added more sites to our list of surveyed spots. One of us stumbled over a sleeping hyena – who got the biggest fright is still being debated.

Back in Maun we hired a chopper to fly over our sites, and I hung out through the window to take photographs. A helicopter is the superior vehicle for nature photography if your time is limited but your wallet is not.

THE RESULTS? IT IS CLEAR THAT THE AREA OF FLOODing has changed dramatically within living memory. For proof we got hold of older satellite images going back to 1985 and on the internet we found other images dating back as far as 1972.

The maps form the basis of continuing research for better understanding of the Delta, that reassure of biodiversity. Our aim is to be able to forecast how the Okavango will respond to changes in climate, water abstraction and other upstream activities. Our hope is that such forecasts can be used for informing both local people and national governments on the consequences of different plans, management and policies.

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