flood impact on wetland birds

One of the features of a warming planet is increasingly erratic rainfall; years of drought followed by devastating floods. Fortunately, many waterbirds are pre-adapted to cope with such extremes, especially in southern Africa where they have evolved to exploit episodic rainfall events in semi-arid and arid regions. But how do waterbirds respond to floods in areas where rainfall – and access to water – is more predictable? Peter Ryan explores the consequences of recent floods on the birds of the Western Cape's Olifants River Valley.

The maxim 'nature abhors a vacuum' reflects the fact that evolution favours strategies to take advantage of new opportunities. Most organisms respond to favourable conditions by breeding, but the rate of population growth is limited by the number of offspring per breeding attempt and the generation time. For birds, these are generally conservative relative to many other animals. Where birds have an advantage is through their great mobility, which enables them to exploit short-term food resources through movement.

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Waterbirds are past masters of this strategy, moving to areas where conditions are suitable and breeding when they get there. Any birder with a wetland in their local patch will have seen how the numbers of waterbirds fluctuate due to local immigration and emigration. The reasons for such movements are more difficult to infer, especially if your perspective is limited to a single site. Numbers might increase because conditions have become more favourable, attracting birds from surrounding areas. Alternatively, conditions might have deteriorated elsewhere, forcing birds to move to new areas. For example, numbers of ducks at Strandfontein Sewage Works in Cape Town peak in late summer, when seasonal wetlands in this winter-rainfall area dry out.

Movements at a local scale are nested within larger-scale drivers of bird movement. Seasonal changes in temperature and hence productivity, which are particularly marked in the northern hemisphere, trigger large-scale migrations of waterbirds to lower latitudes in the northern winter. Many of these long-distance migrants reach southern Africa in the austral summer. And although temperature changes are less marked in the southern hemisphere, rainfall is largely seasonal, driving regional movements. Historically within South Africa, many 'resident' waterbirds moved inland in summer, following the summer rains, and to the coast in winter. These movements have been muted by the proliferation of dams, which provide water year-round and limit the need to undertake regional movements.

In arid regions, rainfall is so unpredictable that waterbird movements are nomadic or irruptive. A host of species, including flamingos, South African Shelduck, Pied Avocets, Black-winged Stilts and Black-necked Grebes, take advantage of sporadic rainfall events, often arriving within a few days of rain falling. It remains a mystery quite how they know that rain has fallen hundreds of kilometres away; they might detect distant thunderstorms through low-frequency sound or pressure gradients or even olfactory signatures from flooded pans.

Satellite-tracking of Grey Teal in the arid interior of Australia shows that almost all long-distance movements – some of more than 1000 kilometres – are triggered by heavy rainfall or flooding at their destination within a week or so of departure. Often a teal arrives at a site hours after heavy rain. However, not all long-range movements are 'successful'. Occasionally a teal flies several hundred kilometres to an area where there has been no rain, only to loop back to its original wetland site.

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So far, we have only considered food availability as the main driver of movements. But other factors might also play a role: the need for specific habitats for nesting or moulting, or to limit the risk of predation or exposure to disease, or as a result of a marked change in human disturbance. And waterbirds might be forced to move to avoid natural disasters, such as major floods. Which brings us to the main subject of this article.

The winter of 2023 brought above-average rains to the south-western Cape, with extensive flooding in June and September. The Olifants River was particularly hard hit in the first event. Citrusdal was cut off for a week after all roads into the town were washed away. For the past decade, I have spent a week at the beginning of January on the Olifants River south of Citrusdal. While family and friends relax by the river, I cycle and walk each morning, trying to atlas as many birds as possible. By 2018 I had discovered most of the best birding areas and visit them each year. I thus have a consistent search effort against which to judge changes in bird communities.

In 2024 I was intrigued to see how the flood had affected the valley's birds. Each year I typically find 120–130 species, but each year I add a few new ones to the list, so that by 2023 I had seen 168 species in the area. There were few obvious changes in the land birds in 2024. Black Saw-wings were present for the first time since 2020 and African Olive Pigeons for the first time since 2021 – both species typical of more mesic habitats. And I failed to find a Capped Wheatear for the first time in five years, possibly because the fallow fields were more heavily vegetated than usual due to the wet winter.

However, it was the waterbirds that most interested me. Prior to 2024, I had recorded 41 waterbird species. Of these, only 15 occurred along the river; the remainder were at the many farm dams built to support the citrus orchards that occupy much of the valley floor. The flood had scoured the river, clearing some of the palmiet that had been gradually encroaching the channel. We paddled kayaks 15 kilometres along the river and saw two Little Bitterns, the first since 2021, but Common Moorhens were absent, and most of the regular riverine species, including Black Duck, >

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ABOVE Whiskered Tern breeding was staggered, ranging from newly hatched chicks (above) to fledglings that accompanied their parents to nearby foraging areas.

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Reed Cormorant and Malachite Kingfisher, were less abundant than usual. I surmise that the flooding displaced some of these birds and six months later they had yet to return. Purple Herons were more common than usual on the nearby farm dams, possibly having moved from the river.

The farm dams close to my base were disappointing. The range of habitats they offered didn't appear to differ from other years, but I struggled to find many waterbirds. There were no ducks apart from Egyptian and Spur-winged geese and a few Yellow-billed Ducks, and even Blacksmith Lapwings were scarce. The only positive change was an increase in breeding activity among the grebes: four pairs of Great Crested Grebes each had three or four chicks, whereas I would normally be lucky to see one pair with at most two chicks, and several pairs of Little Grebes also had chicks. I was beginning to think that the widespread flooding must have created new habitat to attract waterbirds away from the valley.

On the fifth day I discovered where they were. A complex of four dams seven kilometres south of Citrusdal had many of my missing species, plus eight new waterbirds that I'd not recorded before: African Spoonbill, Black-winged Stilt, Common Greenshank, Little Stint, Black-necked Grebe, Cape Shoveler, Southern Pochard and African Swamphen. This differed dramatically from the one or two new waterbirds added per year for the past four years. Even more remarkable was the abundance of breeding activity. There was a colony of at least 50 pairs of Whiskered Terns on one dam, delivering a steady stream of frogs and tadpoles to their chicks. Several pairs of Black-winged Stilts and Kittlitz's Plovers also had chicks, as did Red-knobbed Coots, Egyptian Geese and Blacksmith Lapwings.

My list for the week was 150 species, 18 more than my previous record, and brought my total for the area to 178 species. Based on this snapshot six months after the flood, it appears that the flood was beneficial for waterbirds in the upper Olifants River Valley, attracting several species from surrounding areas. This conclusion supports our understanding that waterbirds benefit from being so mobile in a changing world. Sadly, not all birds are equally flexible.

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