

# Nigeria's mountain streams are a haven for special creatures—they need protection

June 20 2024, by Emmanuel O. Akindele

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Agbokim Waterfalls, Agbokim, Cross River state, Nigeria. Credit: [Ei'eke](#) /Wikimedia Commons, [CC BY-SA](#)

Nigeria has many freshwater ecotourism attractions. Among them are the [Ikogosi warm spring](#), the [Osun-Osogbo river](#), and the [Olumirin](#), [Owu](#)

, [Arinta](#) and [Ekor](#) waterfalls.

Their scenic beauty and lush forests make these sites popular, but the [impacts of human activities](#) are likely to pose a growing threat to once-pristine freshwater systems.

The biodiversity and conservation value of these places has not been well researched. The conservation value of a freshwater ecosystem [lies in](#) its ability to support rare and threatened species, as well as species that indicate high ecological integrity. This is the ability of an ecosystem to [support and maintain](#) ecological processes and a diverse community of organisms.

To fill some of the gaps, my freshwater biodiversity research group [collected samples](#) of insects and other small creatures from four freshwater systems in the [Obudu mountains](#), along the border of Nigeria and Cameroon. The area falls into the [Lower Guinea Forest Biodiversity hotspot](#), where endemic and threatened species like western gorilla, red-eared monkey and drill gorilla are found.

There has been [no previous study](#) on the freshwater conservation value of the mountains, despite their known importance for biodiversity on land.

We also collected samples of invertebrate species from the Agbokim waterfalls and the Kwa river of the Cross River National Park, all along the Cameroon border.

Our findings revealed that the sites have very high conservation values. They have rare, notable and threatened invertebrates in the freshwater systems. These should be protected better.

## **Freshwater macroinvertebrates**

Freshwater macroinvertebrates [include aquatic insects](#) like dragonflies, mayflies, caddisflies, stoneflies, bugs and beetles; mollusks like snails and mussels; crustaceans like crabs and shrimps; and annelids (segmented worms). Macroinvertebrates, particularly the stress-sensitive ones like mayfly, stonefly, and caddisfly, have been [described](#) as the best indicators of freshwater quality. Stress-sensitive insects are insects that decline in population when their environment is disturbed.

Understandably, conservation attention is often focused on larger animals like crocodiles, monkeys and gorillas. These are the [flagship species](#) often used to draw attention to a [conservation area](#).

But the biodiversity and conservation value of the freshwater ecosystems are also important. Healthy freshwater systems are an essential requirement for animal and [human life](#) on land.

Freshwater macroinvertebrates are [ecological engineers](#) with several functions in freshwater ecosystems. They serve as [food](#) for fish in the water. The adult insects that emerge from the water are [food](#) for animals in the forests near the water.

Also, the presence of certain invertebrate species is a [good indicator](#) of good water and [environmental quality](#).

## **Importance of this border area**

We found that the freshwater systems of the Obudu mountains had more species of stress-sensitive mayfly, stonefly and caddisfly larvae when compared with similar studies in Nigeria. The Afundu stream in the mountains in particular had as many as 30 species of these stress-sensitive insects. The Kwa river of the Cross River National Park ranked second in terms of stress-sensitive insects, that is below 30 species.

This is a good indicator of a [pristine natural environment](#). There is a [direct correlation](#) between their diversity and the health of a freshwater ecosystem and its adjacent forest. The presence of many species is an extra sign of a healthy freshwater system.

We also found two endangered damselflies, *Africocypha centripunctata* and *Allocnemis vicki*, in the Obudu mountains, and some rare mayfly species at Agbokim waterfalls, Kwa river and the Obudu mountains. The three sites have very [high conservation values](#) based on their species compositions and several biological indices.

The [endangered damselflies](#) are found only along the Nigeria-Cameroon border. With such a narrow range of distribution, endemic species like these are easily eradicated. Once gone, they [can't be replaced](#). That is why any environment that is home to one of these species is usually given very high conservation attention.

## Looking forward

The three sites in our study appear to be havens for freshwater biodiversity. They are also candidate sites for conservation in Nigeria. Aside from the section of the Kwa river that we studied and a stream in the Obudu mountains (the Becheve Nature Reserve stream), the streams we investigated are not currently receiving due conservation attention. Considering the fact that ecotourists often visit the sites, they need to be well protected.

Since the Cross River National Park shares borders with the Obudu mountains, biodiversity conservation in the region would be greatly enhanced if the [National Park Service of Nigeria](#) extended its operations in the mountains. It could also partner with other organizations to do this.

Currently, the Nigerian Conservation Foundation focuses only on the

Becheve Nature Reserve. The site that had the highest number of stress-sensitive insects in our study, Afundu stream, was not under the management of any statutory organization.

These sites need protection because they could support other rare and threatened plants and animals—not all of them aquatic.

There is also a need for a more detailed ecological inventory of plants and animals in the pristine freshwater systems of Nigeria and their associated riparian forests. Without detailed studies, natural sites in Nigeria may, as a result of human activities, lose rare and [threatened species](#) before they are reported.

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