

Carp dominate crayfish in invasive species battleground

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Louisiana red swamp crayfish

(PhysOrg.com) -- Louisiana red swamp crayfish and common carp are two of the most invasive species on the planet yet how they interact has only recently been revealed by scientists at Queen Mary, University of London.

The study, published in the journal [Plos ONE](#), investigated the interaction between the [crayfish](#) and [carp](#) in Kenya's Lake Naivasha between 2001 and 2008.

The crayfish were introduced to the Lake in the 1970s and have adopted a central role in the food web for more than 30 years, yet the carp,

introduced a little more than a decade ago, appear to have driven the crayfish away.

Lead author Dr Jonathan Grey from Queen Mary's School of Biological and Chemical Sciences said: "We first noticed the carp in our nets in 2003; by 2006 it was the dominant fish species in the Lake and at the end of our research in 2008, carp completely dominated the system.

"Although the carp have been fantastic for the local community's commercial fishing industry, it's been to the detriment of the crayfish."

The aim of the study was to see how the carp and Louisiana red swamp crayfish interacted between one another in Lake Naivasha, a large scale natural experiment which would help ecologists understand and predict changes in ecosystems with successive invaders.

Dr Grey said: "The movement of organisms around the globe is an important aspect of human-mediated environmental change.

"Classical studies have tended to focus on the effects of an [invasive species](#) on a native species; of course the reality is that many ecosystems will receive multiple invaders which will interact not only with the recipient community but also with each other."

Many interactions between existing and introduced species are realised through diet so the research team used a natural chemical signal of diet in the species' tissues to determine how they react to each other, a technique called stable isotope analysis.

"Because the signal reflects diet over space and time, our approach offers an appropriate scale for the study of population niches, the 'space' that a species occupies in a food web.

“Carp and crayfish eat the same types of food from the lake bed if they are not in conflict however with the carp’s population increase the crayfish were forced to eat a lower quality diet, including hippo dung.

“The dietary niche of the crayfish has been squeezed to such an extent that it is now almost impossible to catch crayfish in the Lake anymore.”

Lake Naivasha is extremely important to the local community and the wider economy of Kenya because of its large volume of freshwater both for drinking and floriculture, and the commercial fishery industry. Yet it has been the subject of a catalogue of ecological errors from [species](#) introductions over the last 100 years which affect its ability to provide ecosystem goods and services.

“The Lake provides such an important resource for the local community. We know that the influx of carp has helped commercial fishing in the area but with its continual dominance we don’t know to what extent it will affect the [lake](#)’s water quality and the wider ecosystem on which the thriving floriculture and agriculture industries rely,” Dr Grey said.

Provided by Queen Mary, University of London

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