

# It's a numbers game: inundative biological control of water hyacinth (*Pontederia crassipes*), using *Megamelus scutellaris* (Hemiptera: Delphacidae) yields success at a high elevation hypertrophic reservoir in South Africa.

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## ABSTRACT

Classical biological control of water hyacinth in South Africa has been constrained by cool winter temperatures that limit population growth of the biological control agents, and highly eutrophic waters which enhance plant growth. However, inundative releases of the control agent, *Megamelus scutellaris* (Hemiptera: Delphacidae), at the Hartbeespoort Dam, South Africa, suggest that water hyacinth can be managed successfully using biological control as a standalone intervention for the first time in the absence of herbicide operations, despite eutrophication and a temperate climate. Sentinel-2 satellite images were used to measure the reduction in water hyacinth cover from over 37% to less than 6% over two consecutive years since *M. scutellaris* was first released on the dam in 2018, while site surveys confirmed a corresponding increase in *M. scutellaris* population density from fewer than 500 insects/m<sup>2</sup> in October 2019, to more than 6000 insects/m<sup>2</sup> by March 2020. Inundative release strategies are recommended for the control of water hyacinth in South Africa at key stages of its invasion, particularly after winter, and flooding events.