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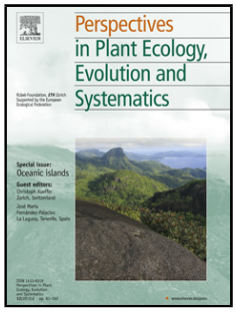

Title: Resistance of Drakensberg grasslands to compositional change depends on the influence of fire-return interval and grassland structure on richness and spatial turnover

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Resistance of Drakensberg grasslands to compositional change depends on the influence of fire-return interval and grassland structure on richness and spatial turnover

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Highlights

- Long-term impacts of fire-return interval on Drakensberg grasslands were assessed;
- Grass composition was largely resistant to variable return intervals;
- Forb richness corroborated with the Intermediate Disturbance Hypothesis;
- However, both frequent and infrequent regimes maintain unique species assemblages;
- Therefore, diversity requires a variable fire regime, likely similar to historic lightning-driven regimes.

Abstract

Frequent fire is necessary for maintaining sub-tropical and tropical grassland ecosystems, without which they may transform to forest. In the biodiversity-rich Drakensberg mountains of southern Africa, a challenge for conservation is to emulate the natural fire regime driven mainly by lightning ignition which existed before human influence commenced 25000 BP. Here, a naturally variable fire regime was replaced with a rigid, frequent fire regime about a century ago in order to maintain a vigorous grass sward for sustained water delivery. However, its impact on plant diversity is not known. We tested impacts of frequent and infrequent fire regimes established by 1957 on grassland composition and diversity at the long-term Cathedral Peak research catchments. Historic sampling of