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Of mongooses and mitigation: Ecological analogues to geoengineering

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Anthropogenic global warming is a growing environmental problem resulting from unintentional human intervention in the global climate system. If employed as a response strategy, geoengineering would represent an additional intentional human intervention in the climate system, with the intent of decreasing net climate impacts. There is a rich and fascinating history of human intervention in environmental systems, with many specific examples from ecology of deliberate human intervention aimed at correcting or decreasing the impact of previous unintentionally created problems. Additional interventions do not always bring the intended results, and in many cases there is evidence that net impacts have increased with the degree of human intervention. In this paper, we report some of the examples in the scientific literature that have documented such human interventions in environmental systems, which may serve as analogues to geoengineering. We argue that a high degree of system understanding is required for increased intervention to lead to decreased impacts. Given our current level of understanding of the climate system, it is likely that the result of at least some geoengineering efforts would follow previous ecological examples where increased human intervention has led to an overall increase in negative environmental consequences.