

An evolutionary game theoretic model of rhino horn devaluation.

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In recent times, rhino populations are at a critical level due to the demand for rhino horn and the subsequent poaching. Rhinos now persist in protected areas or on private land.

Wildlife managers, in charge of these areas, attempt to secure rhinos using approaches to devalue the horn. However the efficacy of the approach is dependent on the behaviour of the poachers:

- They can be ‘selective poachers: they will not hunt dehorned rhinos or
- ‘indiscriminate poachers: they will kill any rhino as it is not possibly to fully devalue a horn.

Game theory has been used to examine the interaction of poachers and wildlife managers (Lee and Roberts, 2016). This work is however the first to consider an evolutionary game theoretic model to determine which strategy is preferred by a poacher in a dynamic manner.

The purpose of the work is to discover whether conditions which encourage the poachers to behave selectively exist, that is, they only kill those rhinos with full horns. The work contributes to the discussion of does devaluation work?

This paper shows that devaluing can indeed work, when implemented along with a strong disincentive framework, such as educational interventions and/or engaging the rural communities that live with wildlife.

This work contributes to an ongoing discussion surrounding the protection of endangered animals. Whilst it does not pretend to be the full solution it is an example of applying mathematics in a way to improve the world around us.