

Game theory—does the rhino poacher or the gamekeeper win?

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Conservationists at the University of Kent have used game theory to look at the likely outcome of the battle between rhino poachers and the gamekeeper or rhino manager.

Dr David Roberts, of the Durrell Institute of Conservation and Ecology (DICE) in the University's School of Anthropology, and Dr Tamsin Lee, of The Mathematical Institute, University of Oxford, looked at the interaction between poachers and a gamekeeper using [game theory](#), which was developed by the Noble Prize winner John Nash.

The [game](#) has two players, who each have two strategies: the gamekeeper/rhino manager may devalue horns or not (e.g. dehorning), and poachers may only target [rhinos](#) with full horns, or behave indiscriminately.

The manager wins when devaluing deters poachers, and poachers move to another ranch. Poachers win when the value of the stump left after dehorning is still worth the kill, so the manager may as well conserve his/her resources and not devalue horns. A key feature is that [poachers](#) can choose their strategy instantaneously. The value of a rhino horn is so great - greater per unit weight than gold, diamonds or cocaine - that the risk for the poacher has little influence.

The researchers conclude the game shows anti-poaching measures should not seek to tilt the game in the manager's favour, but instead change the game. For example, the trade could be legalised or campaigns started to

change behaviour, although the latter may take some time to impact on rhino populations.

Devaluing [rhino horns](#) as a theoretical game, is presented now online in the journal *Ecological Modelling*.

More information: Tamsin E. Lee et al, Devaluing rhino horns as a theoretical game, *Ecological Modelling* (2016). [DOI: 10.1016/j.ecolmodel.2016.06.009](#)

Provided by University of Kent

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