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Can conservation and profits co-exist?: the case of lion hunting

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OBJECTIVE

- Using a detailed economic and biological model, we demonstrate that voluntary adoption of selective hunting practices by hunting companies can produce outcomes that are economically and ecologically beneficial.
- Hunting, both legal and illegal, adds pressure to wildlife populations throughout Africa. Trophy hunting, in particular, can have a significant role in wildlife conservation by employing sustainable management practices.
- Lions are valued from an economic perspective, since they are a highly-prized trophy, and they are a keystone species playing a vital role in the ecosystem. This importance is observed in Tanzania which houses the largest lion population in Africa.

MODEL

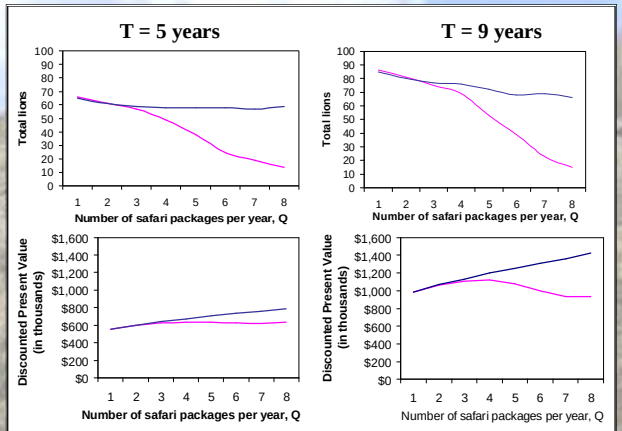
- The model integrates the profit-maximizing agent, the hunting company, with the detailed lion biology.
- The dynamics of the male lion population includes several key features: age-classes of male lions, infanticide, fighting, and migration.
- The firm maximizes its profits by choosing the number of three-week lion safaris to sell.
- The client's willingness-to-pay depends on the number of prime-age males available for hunting in the current year and the previous two years, since packages are booked in advance.

RESULTS

- Simulations assess two management practices (in figures to the left): 1) the current practice where all males aged 3 years and older can be hunted (the pink lines) and 2) selective hunting, which focuses on males aged 6 years and older (the blue lines).
- Assuming the firm chooses the same number of lion packages every year, which can occur due to the government's lion hunting quotas, the outcomes are assessed using two measures:

  1) discounted net present value representing economic gain for the firm (bottom figures)

  2) total male lion population in the last time period, T, representing biological benefits (top figures)
- The two management practices are simulated for differing planning horizons: T = 5 years, the current lease length for hunting blocks, and T = 9 years, the proposed lease period.



DISCUSSION

- We demonstrate that selective hunting will not have a detrimental effect on profits. On the contrary, the discounted present value increases under alternative management practices.
- Changing the lease period to nine-year leases, as proposed by the government, is beneficial for the wildlife and the companies.
- Given the extensive wildlife regulations in Tanzania, further lion hunting policies, such as selective hunting, need not come from the government but instead can be voluntarily adopted by companies since they align with their own profit-maximizing objective.

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