Introduction

Bushmeat is widespread in communities surrounding the protected areas of the Serengeti, Tanzania, where hunting is conducted illegally for both food and cash [1].

Because of the illegal and sensitive nature of hunting, there is continuous uncertainty surrounding hunting rates and catch composition [2].

How can non-compliant harvest behaviour and observation uncertainty be incorporated in our management recommendations?

Using simulation modelling, harvester and wildlife observation uncertainty are explicitly incorporated and their impacts on management decisions and migratory and resident wildlife are currently being investigated.

Study system model: MSE approach

Conceptual model using an integrated MSE* approach [3]

Step 1: Multi-species harvest model

Main drivers and processes incorporated in seasonal age-and sex-structured model

- Wildebeest migration
- Births (impala)
- Natural mortality
- Interspecific competition/ facilitation
- Illegal harvest (all species)

Resident topi (Damaliscus korrigum, left) and impala (Aepyceros melampus, right) are harvested all year-round

April (start of dry season)

- Births (all species)
- Illegal harvest (impala and topi)

October (start of wet season)

Migratory wildebeest (Connochaetes taurinus) travel through the western Serengeti, close to villages, during the dry season

Step 2: Indirect questioning techniques

We use indirect questioning to reduce the bias of answering sensitive questions. Methodological trials suggest respondents are most comfortable with the unmatched card technique.

Unmatched count technique:
Based on a list of several items, respondents indicate the number of items that are applicable to them.

Sensitive item is only included in the card shown to one sub-sample. Differences in means between two sub-samples estimate prevalence of sensitive behaviour.

Ongoing data collection in 15 villages, western Serengeti.

Next steps

- Develop household utility model and investigate harvester decision-making and behaviour as a function of management intervention.
- Delineate general management rules and potential future scenarios based on scenario-building analyses with multiple stakeholders.
- Develop an unified bushmeat hunting model based on MSE approach to produce robust management advice under uncertainty for effective conservation interventions.

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Literature


Observation uncertainty and bias

Observation uncertainty: current state of the system is not completely known due to difficulties in making accurate measurements.

Examples:
1. respondents’ reluctance to admit engagement in illegal bushmeat hunting affects estimates of number of hunters;
2. variations in observer performance and animal observability affect population estimates obtained from aerial surveys.

Illegal bushmeat hunting in the Serengeti: management under uncertainty

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