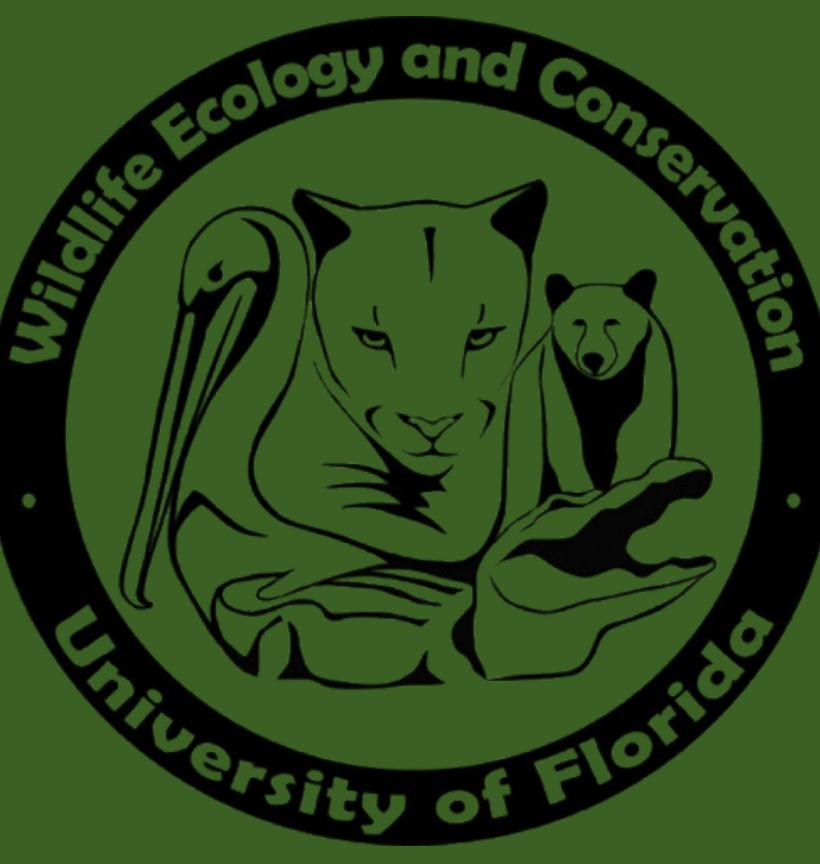


Research Techniques for the Endangered Aye-aye



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Introduction

Due to the elusive nature, nocturnality, and solitary lifestyle of the aye-aye (*Daubentonia madagascariensis*), we lack accurate estimates of their population size and distribution. Aye-ayes are classified as endangered, and their population continues to decline due to habitat loss and poaching. Implementing more effective research techniques to better understand the species' population dynamics is incredibly important for management.

Environmental DNA (eDNA) sampling from feeding traces

Pros:

Non-invasive.

Access to genetic information.

Can be used to describe abundance, effective population size, density, diet, and sex of individuals (Adams et al. 2019).

Cons:

May be difficult to locate if you are unaware of aye-aye whereabouts, but could train dogs to locate feeding traces.

Need advanced scientific equipment to analyze the feeding traces for genetic information (Aylward 2018).

Sometimes it is difficult to distinguish individuals from a population due to the amount of genetic material available (Adams et al. 2019).

Arboreal thermal camera trapping

Pros:

Non-invasive.

High resolution images, even in low light (Masurkar et al. 2024).

Can provide insights into behavior linked to stress or inflammation through reading the temperature variation. (Masurkar et al. 2024).

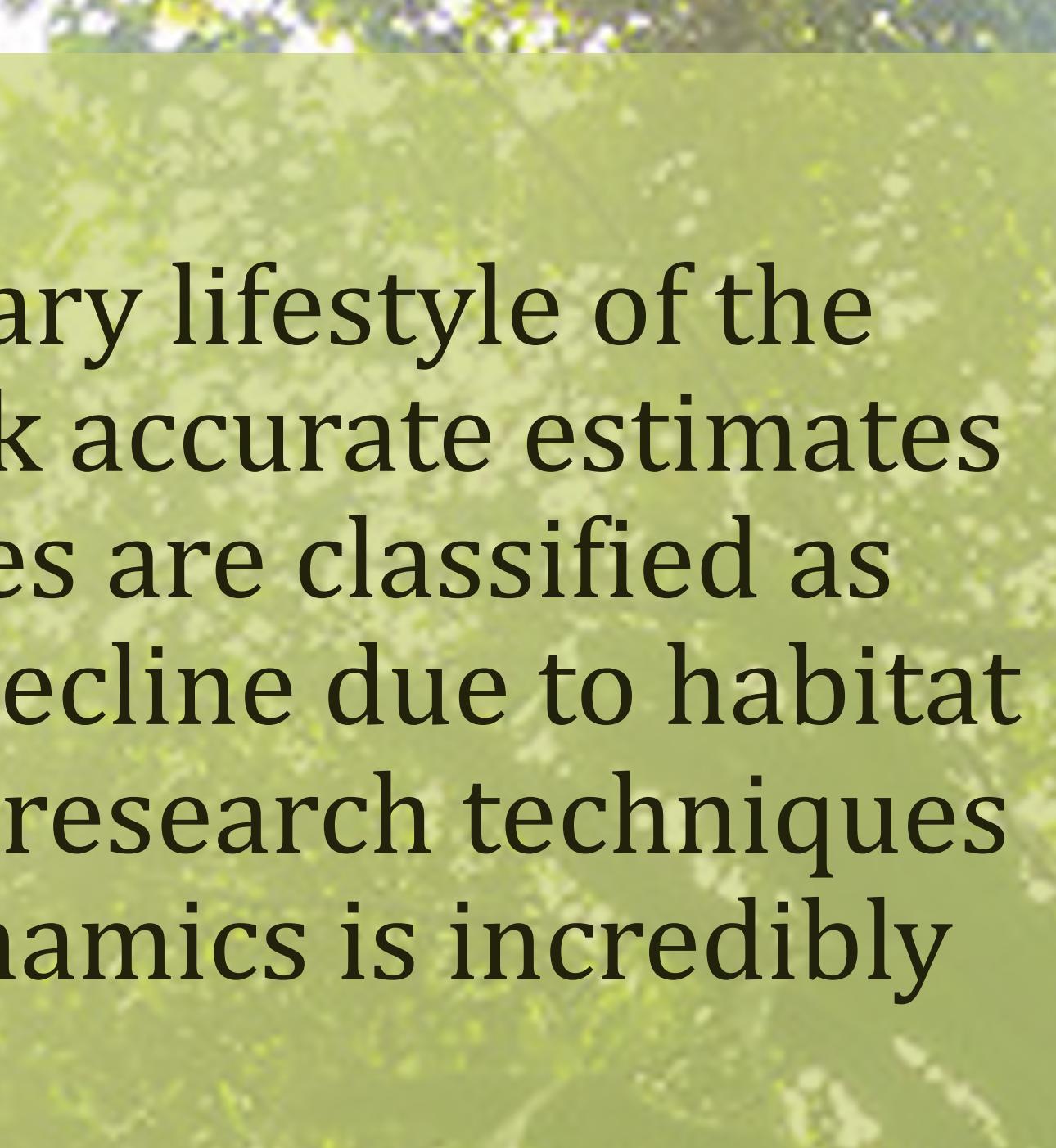
Cons:

Could be stolen or altered by humans or animals.

Expensive.

Relatively low detection due to the complex structure of the canopy (Chen et al. 2021).

Large amount of data storage needed (Masurkar et al. 2024).



Vibroacoustic sensors on trees to pick up Aye-aye tapping

Pros:

Data can be viewed remotely and detection is automatic (Potamitis and Rigakis 2024)

Non-invasive approach.

Would not affect their natural behavior.

Could be small and hidden.

The sensors have high scalability (Potamitis and Rigakis 2024).

Cons:

Possible technical difficulties.

High initial installation cost.

Requires quiet conditions and is sensitive to environmental noise (Potamitis and Rigakis 2024).

Requires a connection with a server for the vibrations/ data to be processed (Potamitis and Rigakis 2024).



Acoustic monitoring

Pros:

Non-invasive

Aye-ayes have a distinct call which makes it easy to distinguish from other animals.

Cost-effective

Cons:

Aye-ayes have a sparsely distributed population, and have low-frequency calls so acoustic monitoring would only be effective at hearing individuals nearby. (Ramsier and Dominy, 2012)

Time consuming

Recommendations

When deciding on the best method for individual studies, the major factors to consider would be the cost and availability of the necessary technology.

- Sampling eDNA from feeding traces is particularly effective at studying the genetic diversity.
- Utilizing arboreal thermal camera traps may provide less data compared to the others.
- Vibroacoustic sensors could provide population data and information on foraging behavior.
- Acoustic monitoring could provide information on the number of aye-ayes in the area.

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