An acceptable method for rodent population monitoring was implemented in two villages in the Lassa fever endemic region of Sierra.

The results of this pilot study will directly inform future rodent trapping to model population dynamics and risk of zoonoses spillover.

Rodent population assemblages and the potential for changing Lassa mammarenavirus emergence dynamics in Sierra Leone: A pilot study

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INTRO

- Lassa fever is an endemic zoonoses in Sierra Leone caused by *Lassa mammarenavirus*.
- The location of cases within the country is heterogenous, primarily found in the East.[1]
- The primary rodent reservoir has been identified as *Mastomys natalensis* a commensal rodent species
- A dynamic rodent assemblage model to understand spillover risk is being developed. Observed species diversity and abundance from repeated trapping activities will be used to parameterise this model. This study was implemented to pilot this approach

METHODS

1. Historical Lassa fever cases and serological studies in rodents were geolocated. Land use types within 2km buffer zones were extracted to guide study site selection.[2]
2. Two villages in Eastern Sierra Leone (Lalehun and Seilama) were identified as study sites.
3. 5 trap sites were established with Sherman traps for a combined 1846 trap-nights.
4. Rodents were identified to species morphologically, molecular identification is pending.
5. Blood samples and organ samples were obtained for future *Lassa mammarenavirus* investigations
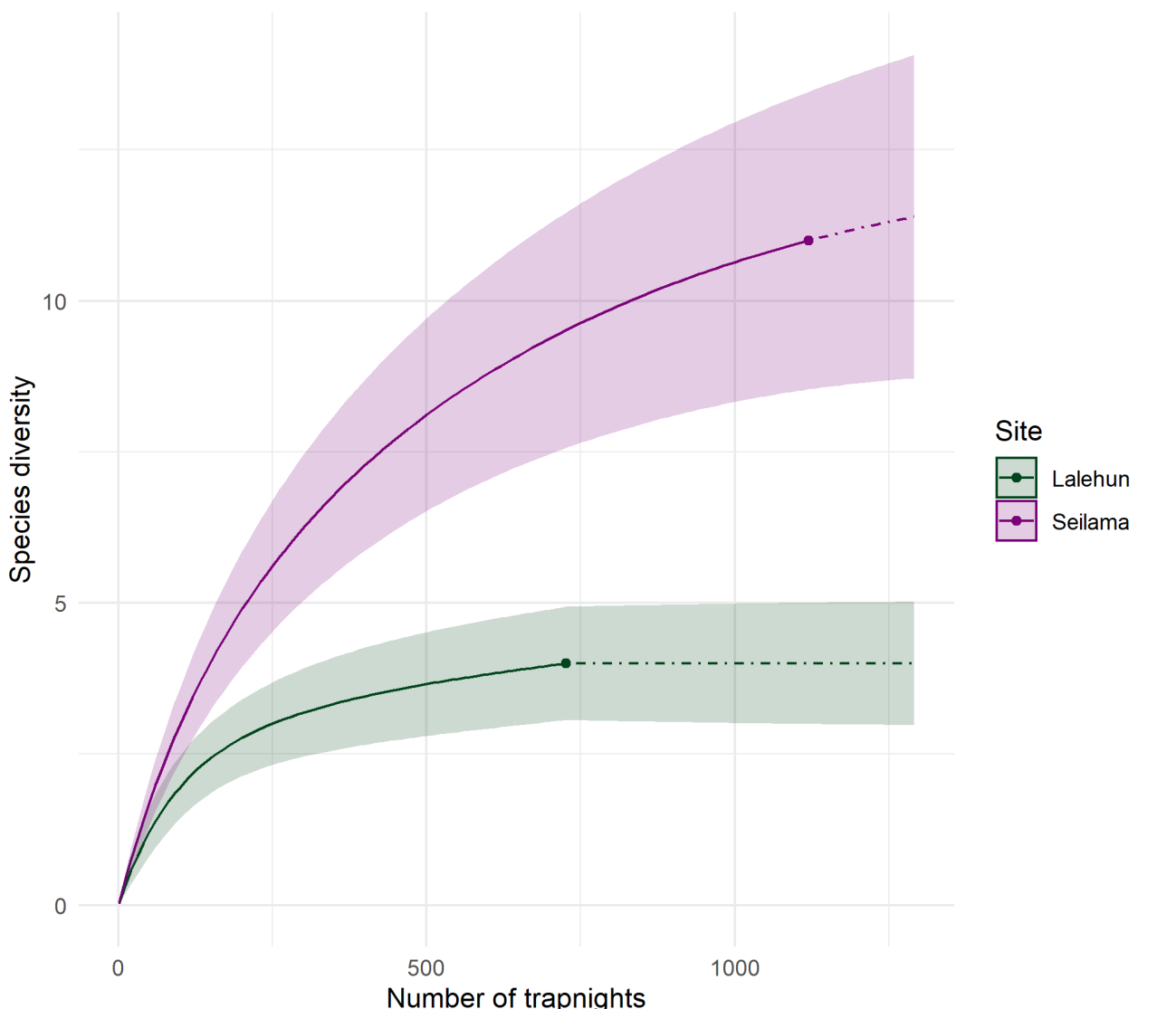

Figure 1: Trap locations and captures in Lalehun

Figure 2 : Trap locations and captures in Seilama

Figure 3: Species accumulation curves

RESULTS

- The study design and protocol was acceptable for the local communities.
- 65 rodents were trapped.
  - Crocidura species -17
  - Praomys species – 14
  - Lophuromys species – 14
  - Mus species – 5
  - Others - 15
- The trap success rate was 3% in Lalehun (n = 22) and 3.8% in Seilama (n = 43).
- Species accumulation curves suggested good coverage in Lalehun however, the asymptote was not reached in Seilama.

DISCUSSION

- The villages will be retained for the longitudinal rodent trapping project.
- The villages contain representative habitats for Eastern Sierra Leone, competent for Lassa fever transmission
- Further study sites will be established to increase habitat coverage
- The number of trap nights will be increased on future visits as guided by the species accumulation curves.

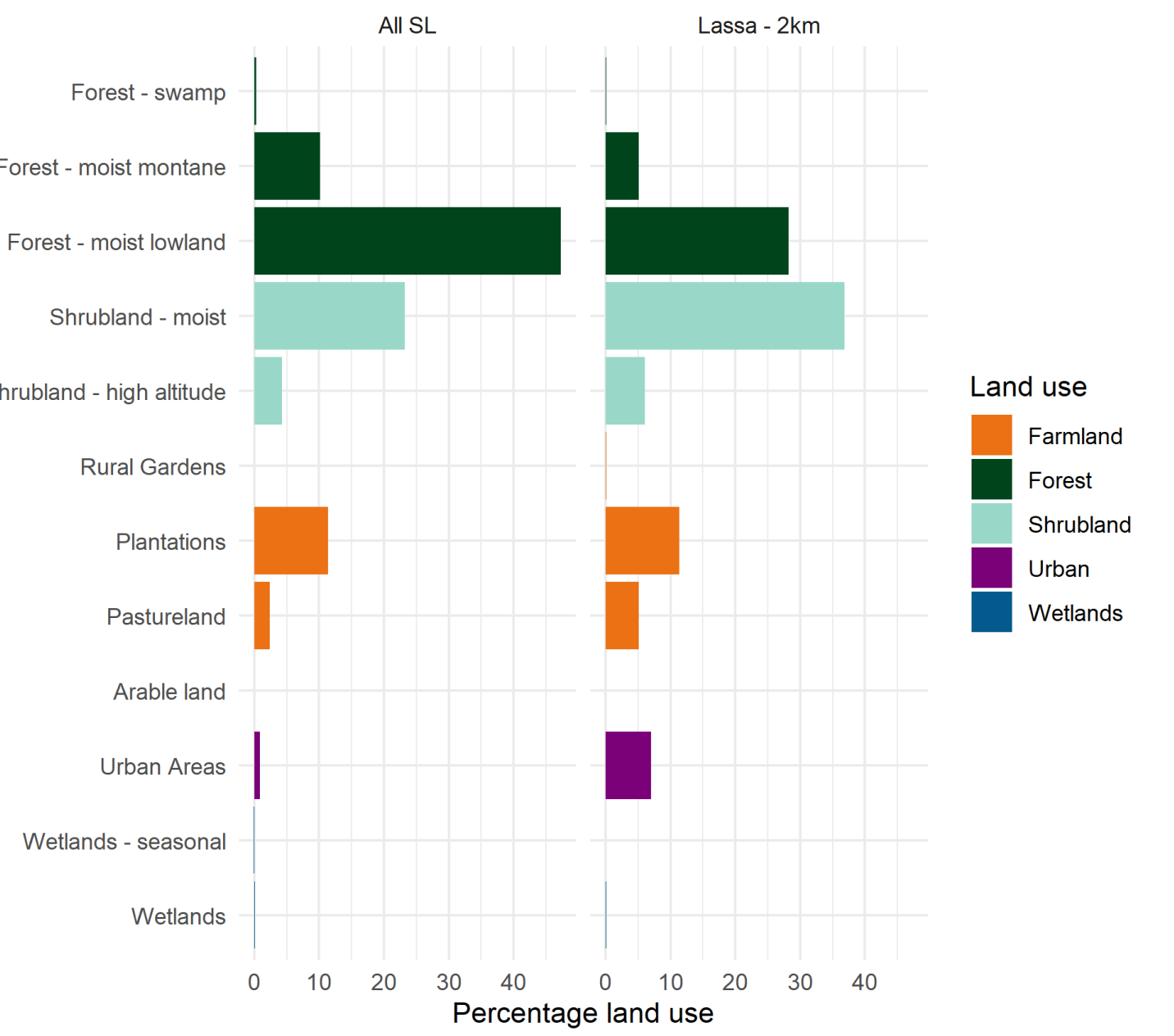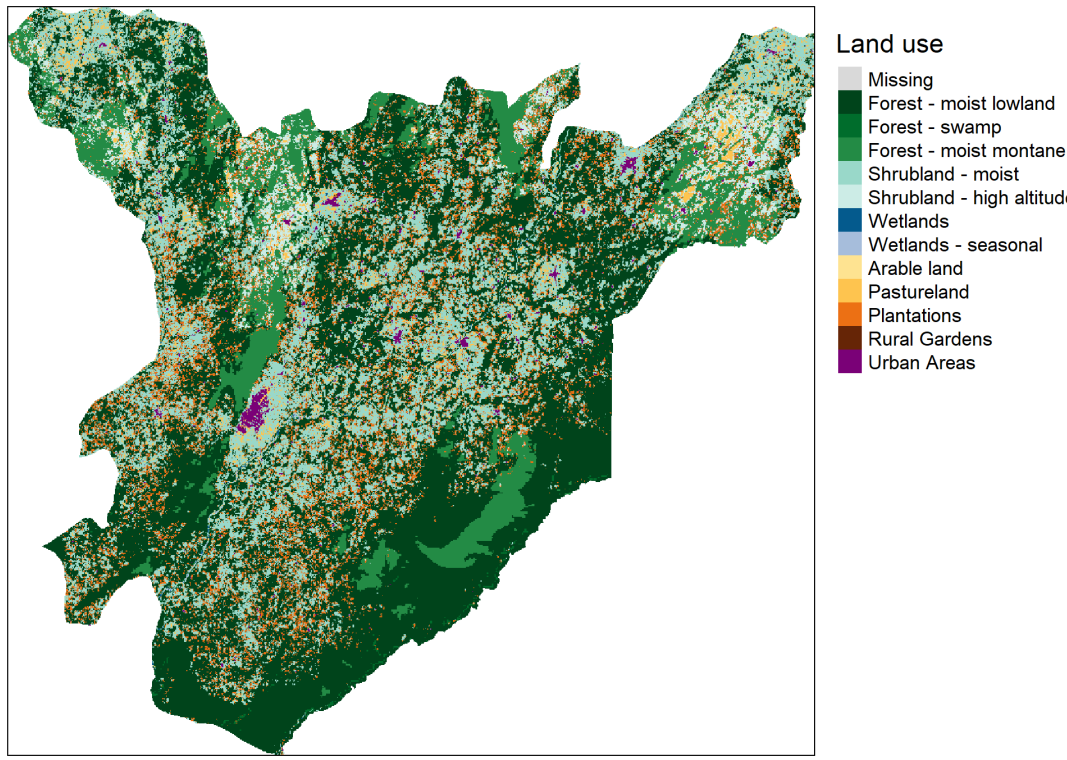The estimated carbon footprint of this field study was 2.38 tonnes of CO_2e

References:
1. Gibb R, Moses LM, Redding DW, Jones KE. Understanding the cryptic nature of Lassa fever in West Africa. Pathog Glob Health. 2017 Sep;111(6):276–88.
2. Jung M, Dahal PR, Butchart SHM, Donald PF, De Lamo X, Lesiv M, et al. A global map of terrestrial habitat types. Scientific Data. 2020 Aug 5;7(1):256.

Selecting the study sites

Lassa is typically reported from the East of Sierra Leone
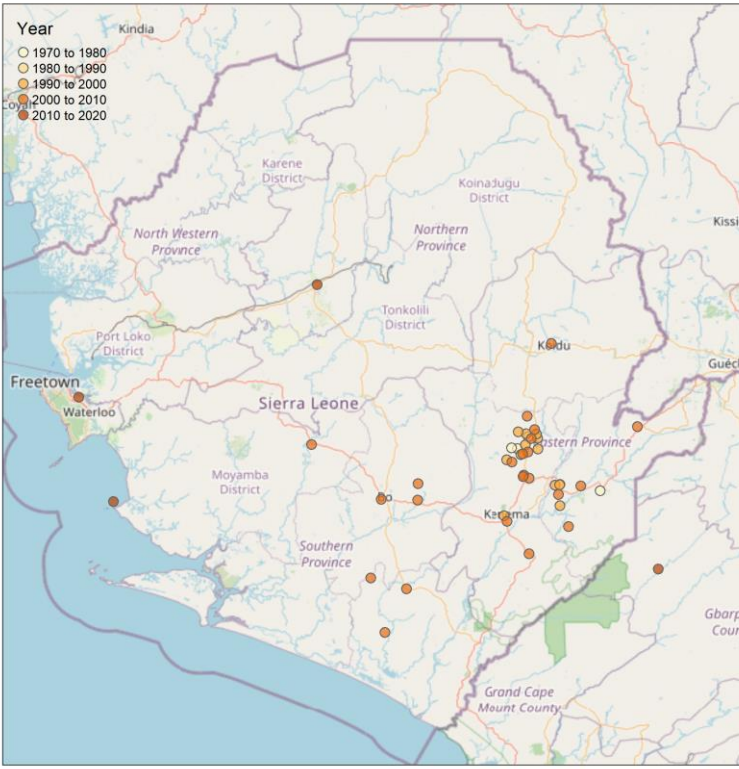
Land use in Eastern Sierra Leone has been classified to IUCN habitat types[2]

Land use in Lalehun and Seilama is somewhat representative of Eastern Sierra Leone

A comprehensive initial report is available at this link.

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