Temporal Change in Acoustic Diversity at Parah Forest, Thailand

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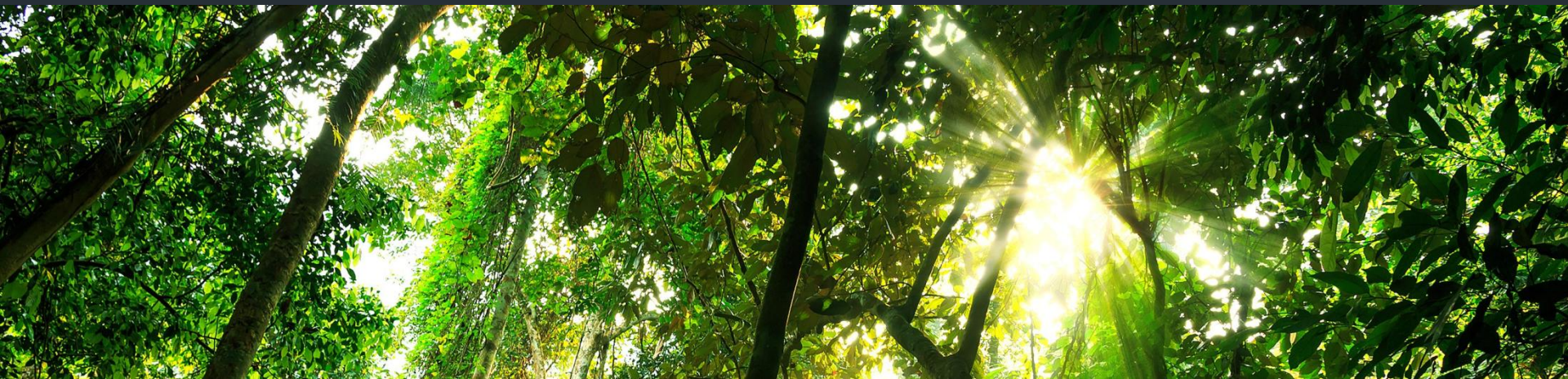
Soundscape Ecology

- Soundscape Ecology is an emerging area of science which does not focus on the identification of species
- Soundscape Ecology aims to find out how diverse a habitat is, and compare the biodiversity between habitats specially with temporal and seasons.

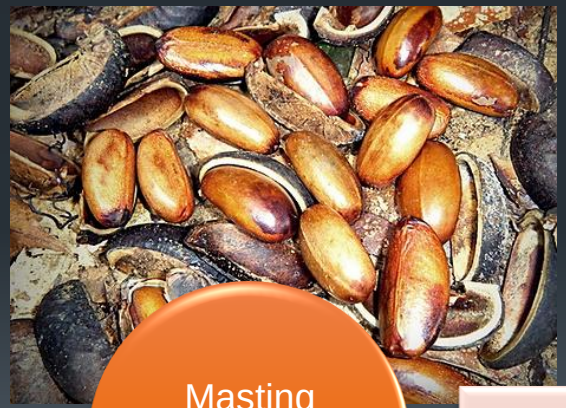


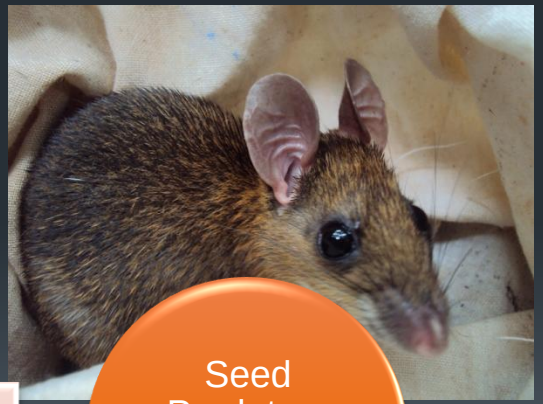
Soundscape Ecology

- Anthropogenic effects
  - Airplanes
  - Cars
  - Air conditions
- Climate change
  - Rainfall
  - Wind
  - Thunderstorm
- Animal communication
  - Birds
  - Amphibians
  - Insects
  - Mammals

Objective

- We investigated the temporal and seasonal ADI variations between wet (December) and dry seasons (January, February, March) at Parah forest, Khao Nan National Park.





Parah tree phenology

- Dec leaf shedding
- Jan bud burst

+

Masting Seeds in Aug

=

Seed Predators eg. Rat, Boars, Deers

Study area

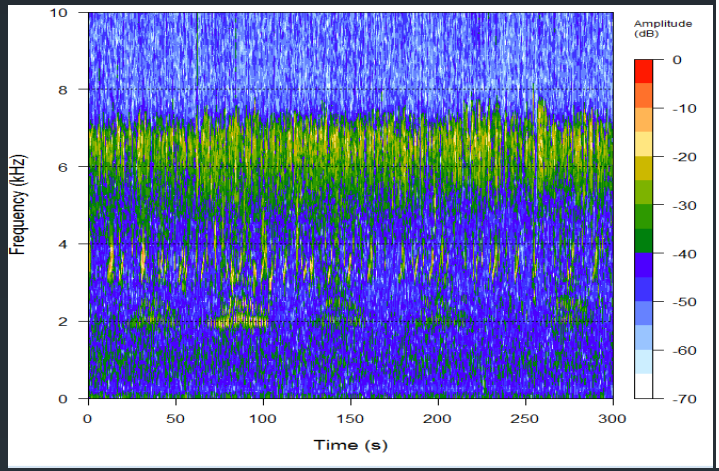
- Study area is located at Ranger Station 5 (Hui Lek) Khao Nan National Park, Nakhon Si Thammarat (8.867707°N, 99.626474°E)

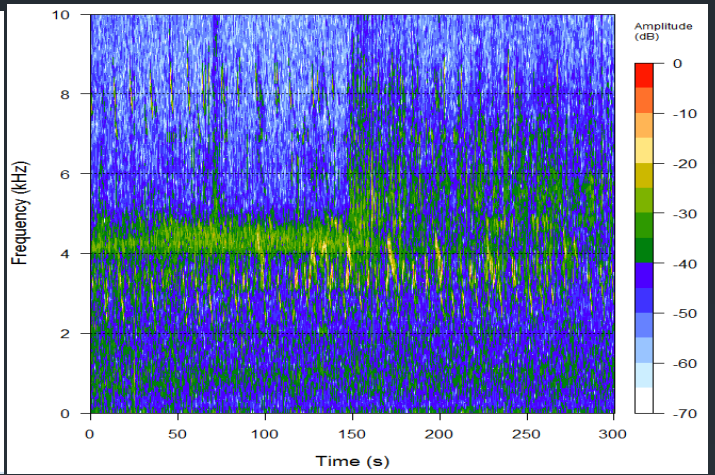
Methods

Song meter
autonomous recorder

- Song meter recorded every 30 min for 5 min duration
- Wet (Dec) and dry (Jan - Mar) seasons
- 10 days/month.
- Monthly patterns in soundscape power change using ADI.

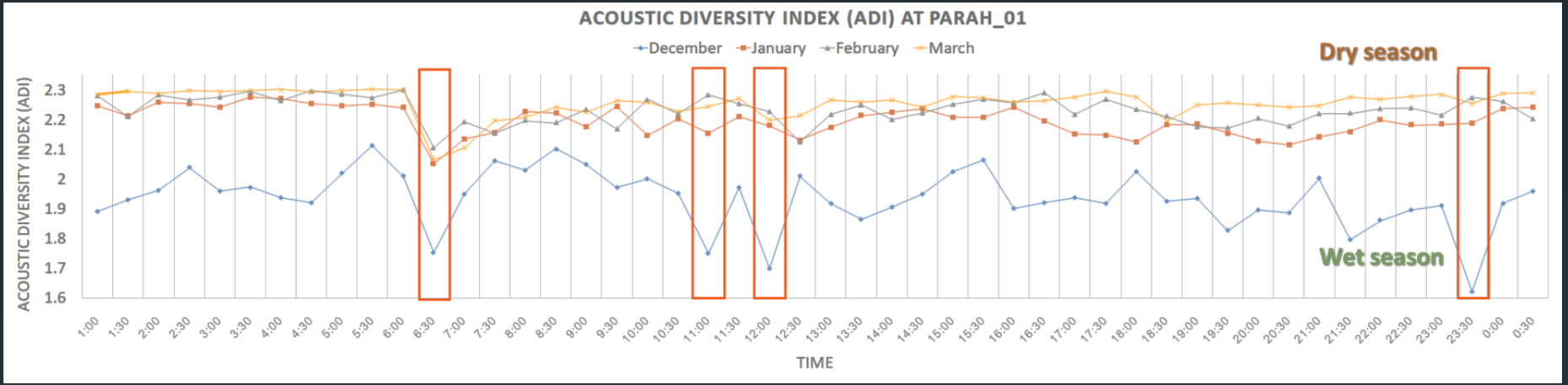
Methods





- Acoustic Diversity Index (ADI) was calculated by dividing the spectrogram into bins (default 10, each one of 1000 Hz) and taking the proportion of the signals in each bin above a threshold (default -50 dBFS).
- The ADI is the result of the Shannon index applied to these bins (Villanueva-Rivera *et al.* 2011).
- Data were analyzed by R 3.0.0.

Results



Average monthly ADI during December 2014 – March 2015 at Parah Forest, southern Thailand

Results

Daily fluctuation of ADI:

- ADI was low at 6:30 in both wet and dry seasons
- Dec: ADI = 1.7515329
- Jan: ADI = 2.0523214
- Feb: ADI = 2.1054078
- Mar: ADI = 2.06483575

Wet season

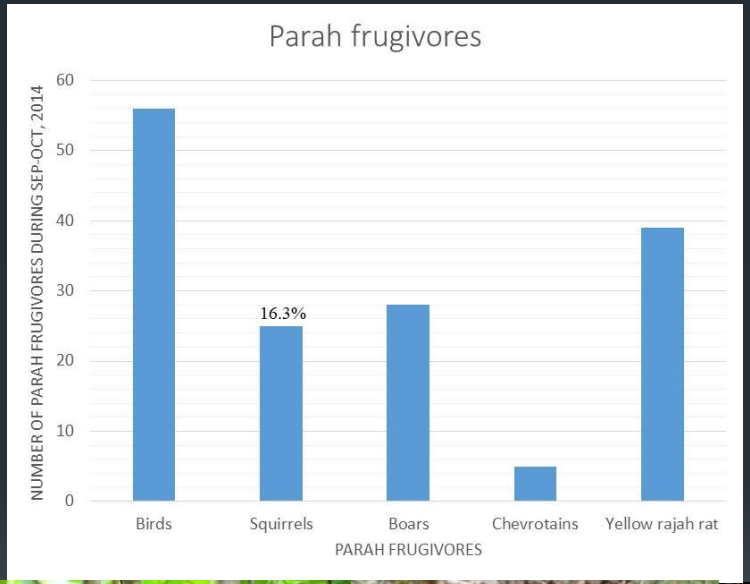
- Low ADI at
- 11:30 (ADI = 1.7492976)
- 12:00 (ADI = 1.6980318)
- 23:30 (ADI = 1.6219758)
- Further study on analysis of sound frequency is needed in order to fully understand the group of vocalizing animals.

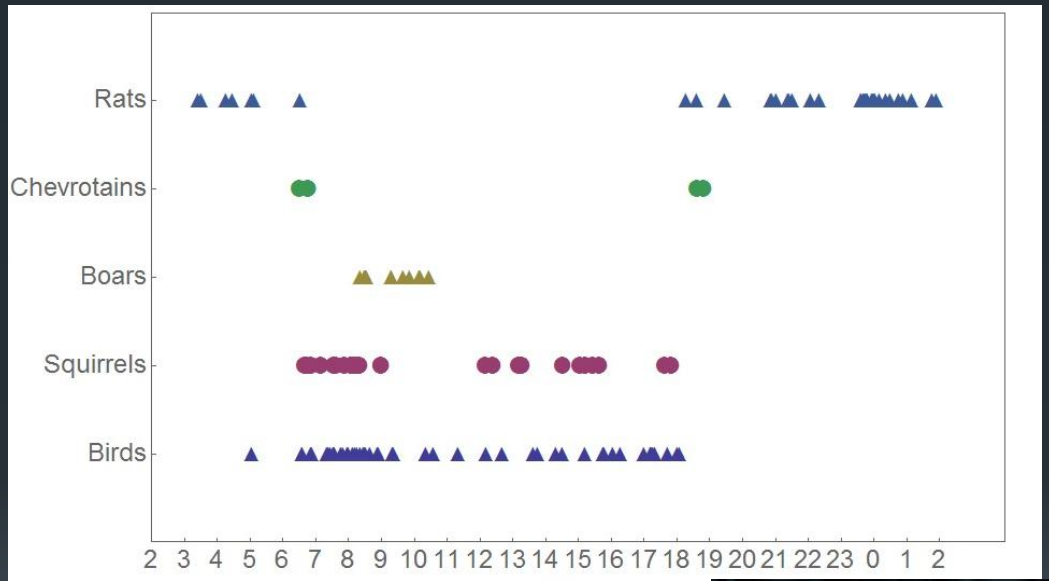
Results & Discussion

Seasonal fluctuation of ADI:

- ADI in wet season was lower than in dry season.
- During wet season, there were more abrupt changes in ADI (4 lower points of ADI).
- Patterns in ADI observed in 24 hr-cycle per day may reflect some temporal partitioning of acoustic space (“niches”) by different taxa.
- Vocalizing animals are believed to find and utilize acoustic spaces that are not filled by other sounds, a theory known as “acoustic niche hypothesis” (Krause, 1987).
- During the dawn chorus, probably there are some specific species (i.e. birds or insects) that make calls, appear to be relatively unaffected by other animals generated sounds

Foraging Time of Parah Frugivores at Khao Nan National Park





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