Gardens of Stone SCA Eastern Pygmy Possum events/activities

This event is a Lithgow Environment Group Inc initiative and was made possible from a Lithgow City Council grant and Blue Mountains Conservation Society donation, commissioning our local fauna ecologist Andrew Lothian – Biodiversity Monitoring Services who has been monitoring local fauna populations for over 15 years.

His knowledge extends prior to the 2013 and 2019-2020 fires, documenting evidence based records in the surrounding natural areas and within the Gardens of Stone State Conservation Area.

Lithgow Environment Group has worked with Andrew since 2020 (after the fires), placing the Eastern Pygmy Possums nest tubes in various locations, and continues to monitor nest boxes on a regular basis. LEG initiated connecting Andrew with Lithgow District Women Shed, volunteering his time to assist with making the tubes. Andrew will present his knowledge with how native flora and fauna are travelling since the fires.

Andrews credentials: Principal Ecologist/Director Biodiversity Monitoring Services, President Ecological Consultants Association of NSW, Certified Practicing Ecological Consultant, BAM Accredited Assessor

Preserving the balance of Nature

Our community strong and resilient but with loss, fear and the need to heal, help comes to the forefront

Our group was desperate to help in any way after the 2019-2020 fire.

The journey began

Timeline activities from 2022 to 2025
Declaration of GoS SCA declared May 2022 first placements Jan 2023 volunteers

Lithgow Environment Group invites you to our next EPP & Nature walk
25TH May 2024 9am-1pm Cnr Wolgan Road and Long Swamp Trail
Lidsdale. (1) Facebook Lithgow Environment (@info_legl / X (twitter.com)

Join us on our 4th Eastern Pygmy Possum monitoring nest tubes & nature walk in the Gardens of Stone SCA. The day will be yours with easy walking, 4klm return and to share your thoughts on what inspires you, tells you a story or a special interest. This is about you and nature. Limited spaces RSVP 20th May lithgowenviro@gmail.com

Bring your diary or clip board and let's walk together. We would value and welcome your feedback sharing via our FB page

Lithgow Environment Group (LEG) & local Fauna expert Andrew Lothian will share their knowledge on the native Flora & Fauna in this area.

Where to meet: Cnr Wolgan Road & Long Swamp Trail Lidsdale. Park your vehicle ensure it is secured.

When: Saturday 25th May 2024; 9am-1-00pm

Further information: There are no toilets. Closest public toilets Tennis courts Wolgan Road or Wallerawang village. Wear appropriate weather gear, sturdy boots, hats/sunscreen. Food and water. Camera, phone, journal folder. Pending weather, if inclement weather you will be notified by email.

Images Julie Favell Biodiversity Monitoring Services Julie Favell

Biodiversity Monitoring Services

Web page: www.lithgowenvironment.au

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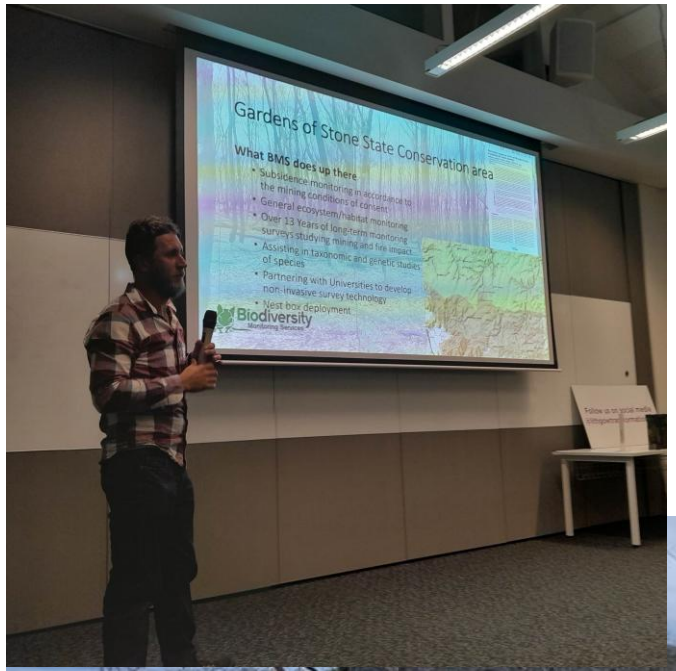
May 2023 Nature Journal Walk


Gardens of Stone State Conservation area
What BMS does up there
Biodiversity


Gardens of Stone
State Conservation Area
PARK FIRE BAN

FEMALE EASTERN PYGMY POSSUM, MAY 2024

FEMALE EASTERN PYGMY POSSUM, MAY 2024


Male FEATHERTAIL
GLIDER MAY 2024

Male FEATHERTAIL GLIDER MAY 2024

Male FEATHERTAIL GLIDER MAY 2024

LEG continues with checking the tubes with activity. Most recent Feb 2025 Fauna Ecologist Mikaela had a surprise with *Antechinus agilis. May 2025 check no activity.*

How is our natural area Gardens of Stone travelling after 2019-2020 fire

Andrew Lothian
Principal Ecologist

Biodiversity Monitoring Services

Outline

Introduction – Who am I? What do I do? Why?

Methods – study area, survey techniques

Results – diversity over time, relative abundance

Discussion – lessons learnt, issues arising from frequency of fire

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Who, what, why?

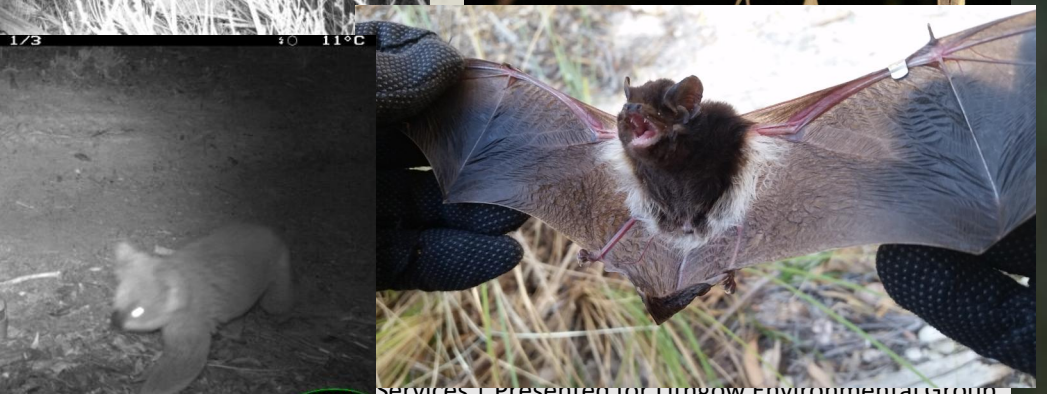
Long term monitoring programs

Impact assessment

Offset investigation

Target fauna survey

Blue Mountains/Lithgow Fauna



Threatened Birds

Glossy Black-Cockatoo

Gang-gang Cockatoo

Turquoise Parrot

Little Eagle

Owls – Powerful, Barking, Masked, Sooty

Honeyeaters – Regent, Painted, Black-chinned

Woodland birds – Scarlet Robin, Flame Robin, Speckled Warbler, Varied Sittella

36 species lost over 25% of their habitat in 2019 bushfires (Birdlife Australia)

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Threatened Reptiles

Blue Mountains Water Skink

Broad-headed Snake

Rosenberg’s Goanna

Pink-tailed Legless Lizard

Biodiversity Monitoring Services

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Threatened Frogs

Giant Burrowing Frog

Red-crowned Toadlet

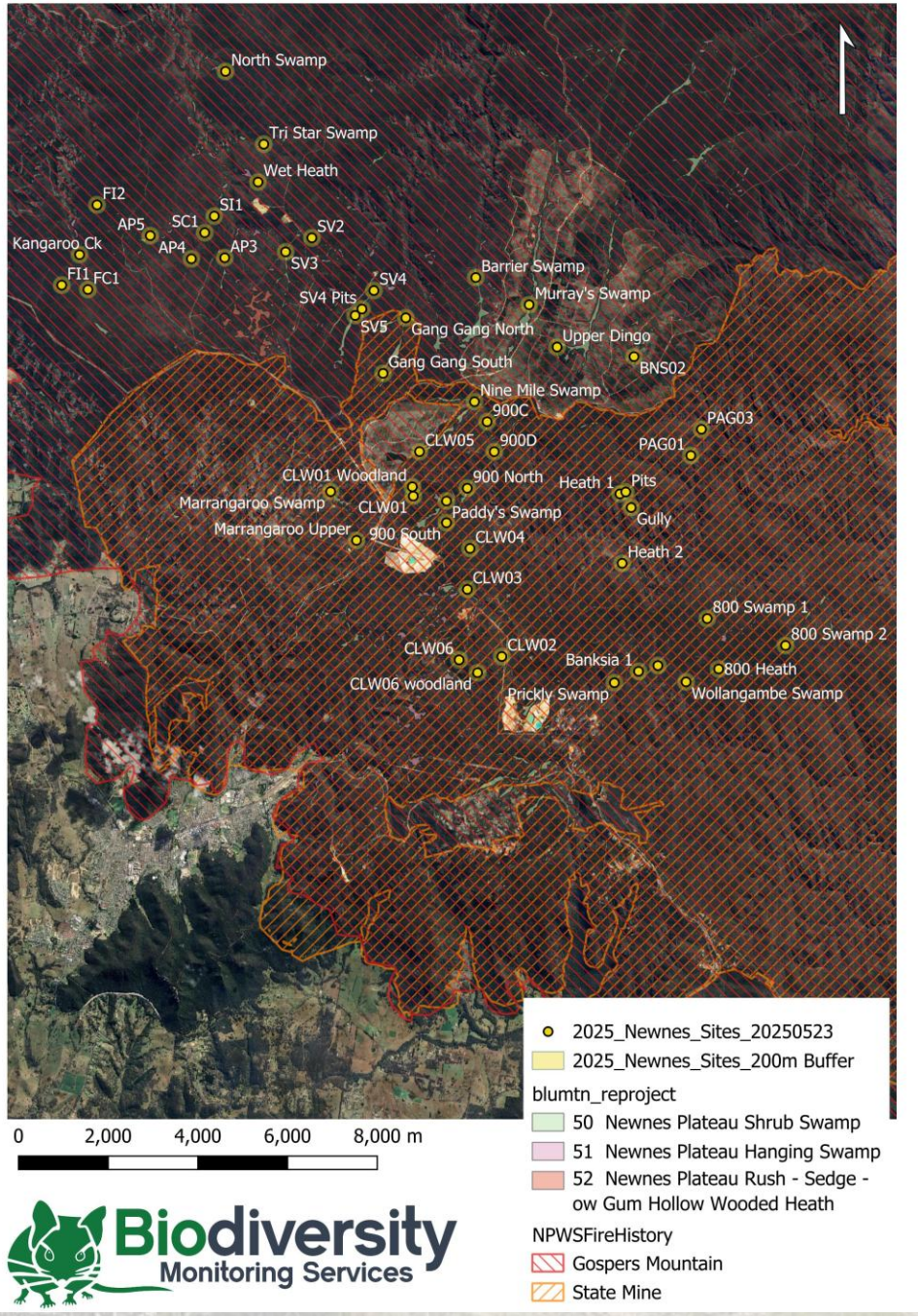
Stuttering Frog

Green and Golden Bell Frog

Images courtesy of Clulow and Swann, 2018)

Methods – Study Area

- Newnes State Forest → GoS SCA - Lithgow
- Wide variety of micro-climates and vegetation communities, including swamplands, heathlands, dry + wet sclerophyll forests, grassy woodlands and rocky escarpments
- 48 long-term monitoring sites (2011-2025) → 19 control, 29 impact
- State Mine Fire – Oct 2013 (orange)
- Gospers Mountain Fire – Dec 2019 (red)



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Methods – Survey techniques

- Birds, small mammals, bats, arboreal mammals, reptiles, frogs, threatened invertebrates (5 days/4 nights per site)
- Wide variety of survey techniques for the various fauna groups:
  - Traps – small and large Elliott, cage, glider tube, both ground and tree mounted
  - PIR cameras, Anabat, hair tubes, sand pads
  - Spotlighting, call playback
  - Pitfalls, reptile funnels, artificial habitat, rock turning
  - Physical searches
  - Diurnal bird census

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or Lithgow Environmental Group

Pygmy Possum Tubes

- Use of PVC pipes/nest boxes as monitoring devices for the Eastern Pygmy Possum, as well as other small mammals
- Use of dacron insulation, toilet paper roll for inner wall structure and leaf litter flooring, drain holes in bottom
- Monitored for scats, compressed litter and other indications of use

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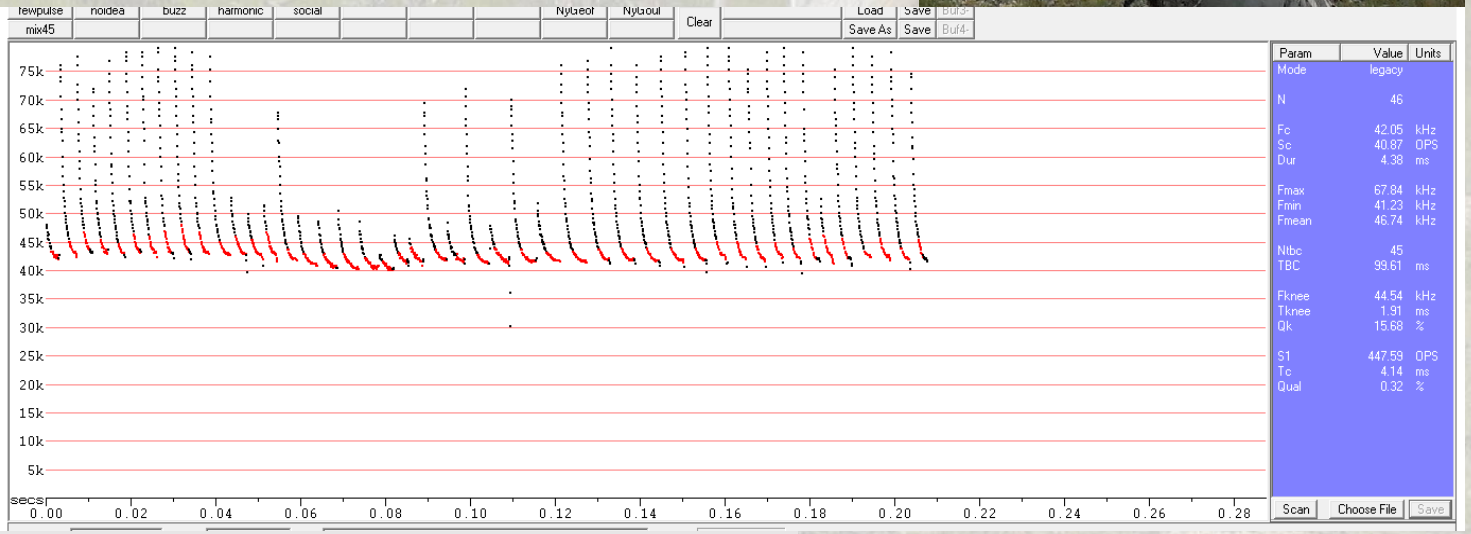
Harp Traps and Anabat Recording

- Both techniques used for the physical capture and the ultrasonic recording of bats
- Harp trapping uses fine string to capture and hold them until release
- Anabat is capable of recording high frequency echolocation calls of microbats



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Habitat post fire: 2020, 2023, 2025

Habitat post fire: 2021, 2022, 2024, 2025

Habitat post fire: 2013, 2021, 2023, 2024, 2025

Results

- Fauna responses to fire
  - Diversity metrics
  - Species relative abundances
- Habitat metrics in response to the fire (Catling and Burt 1995)

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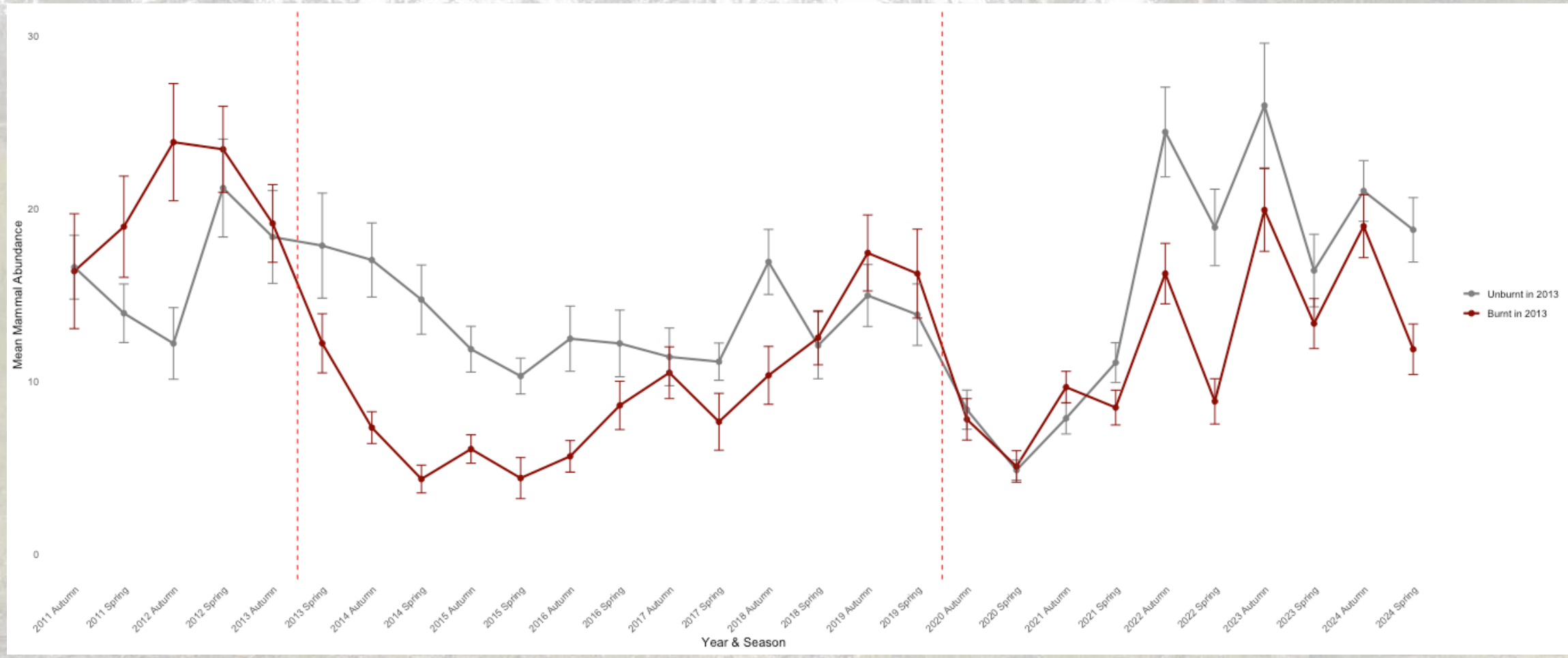
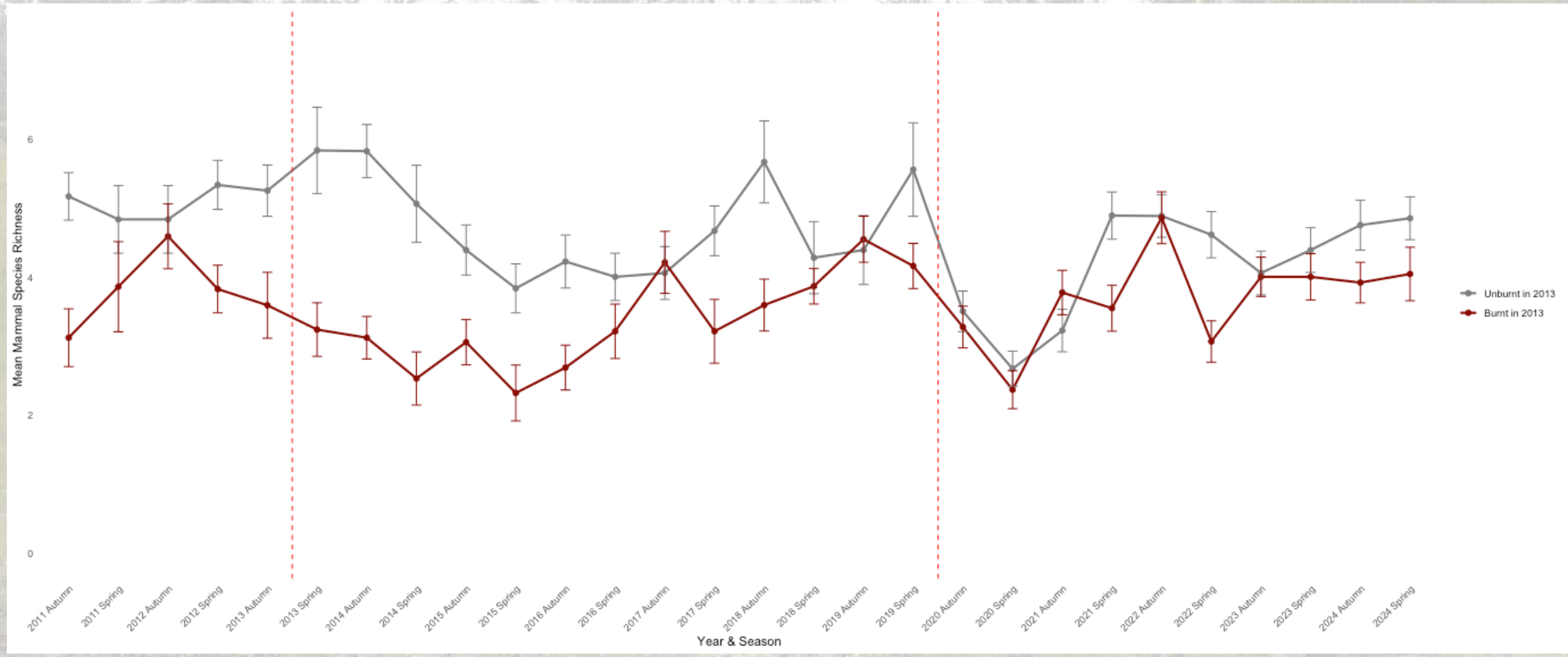
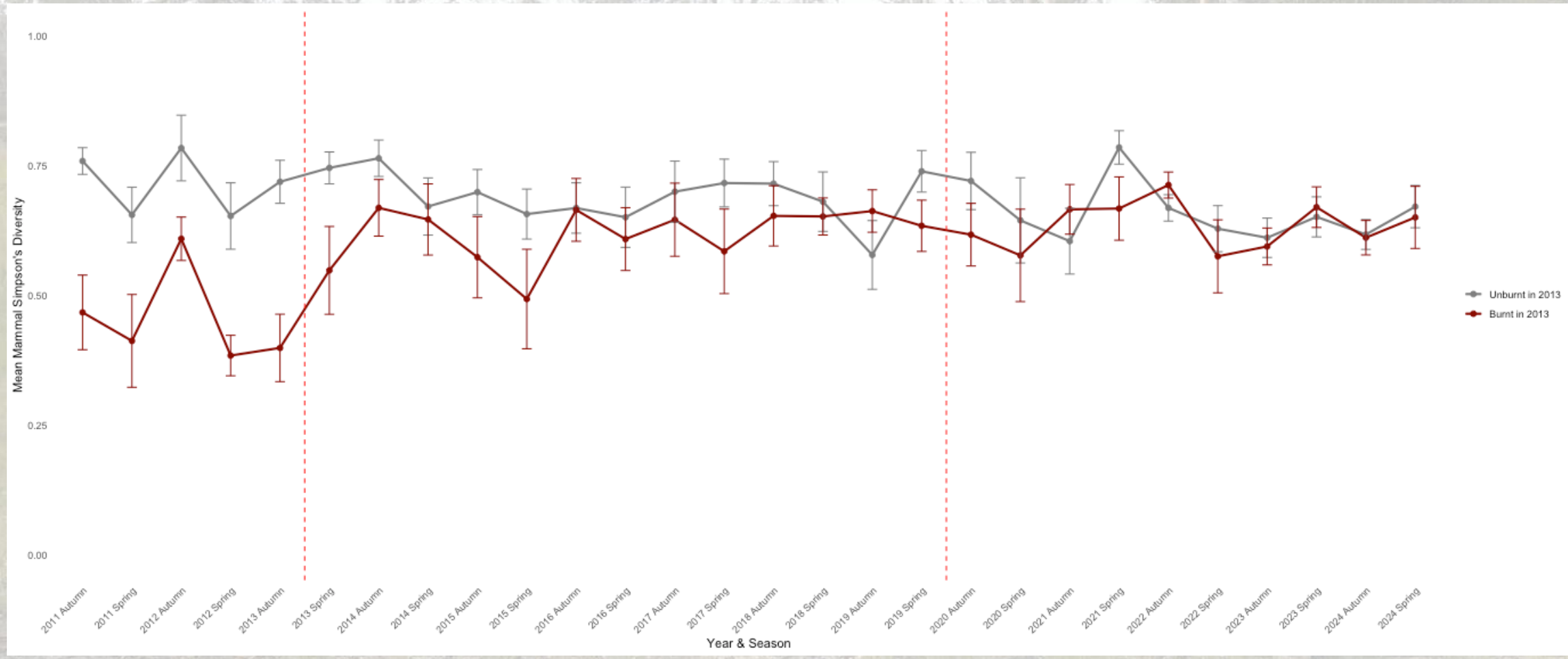
Mammal abundance



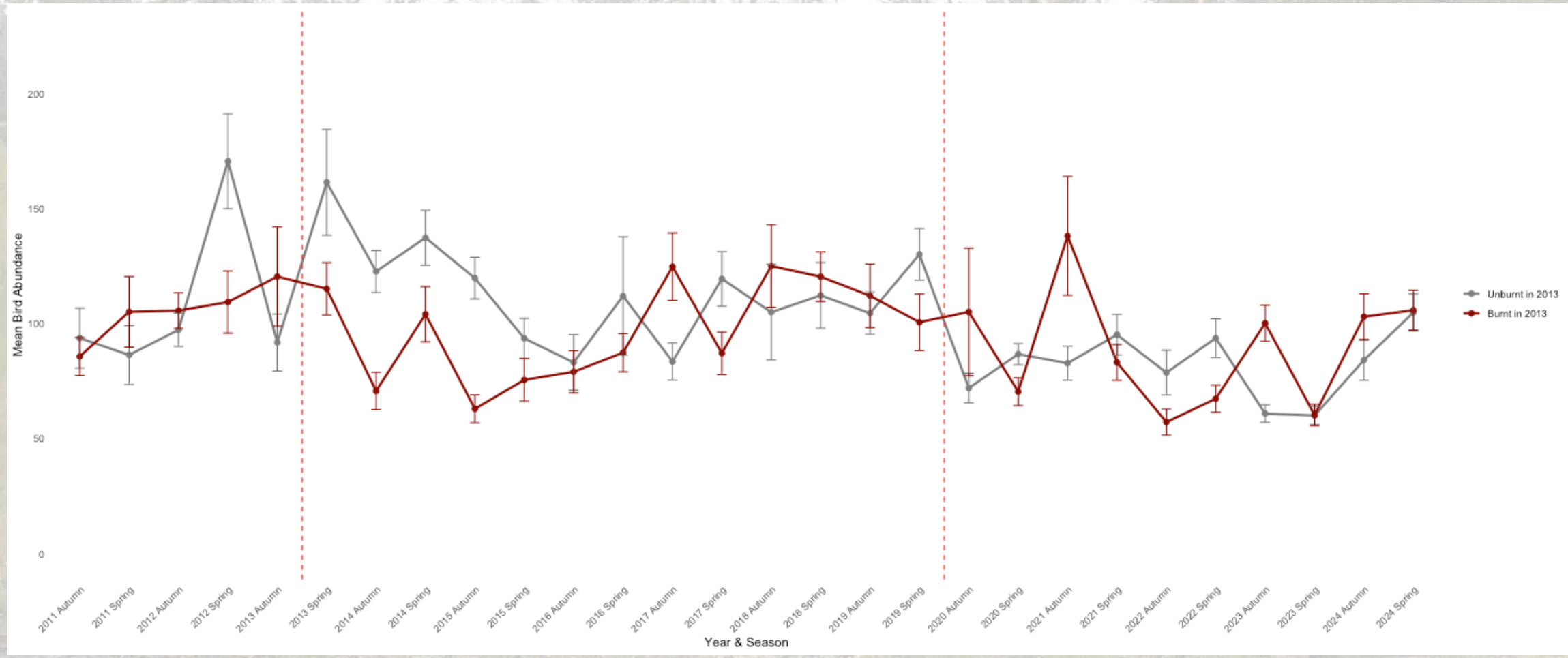
Mammal Species Richness



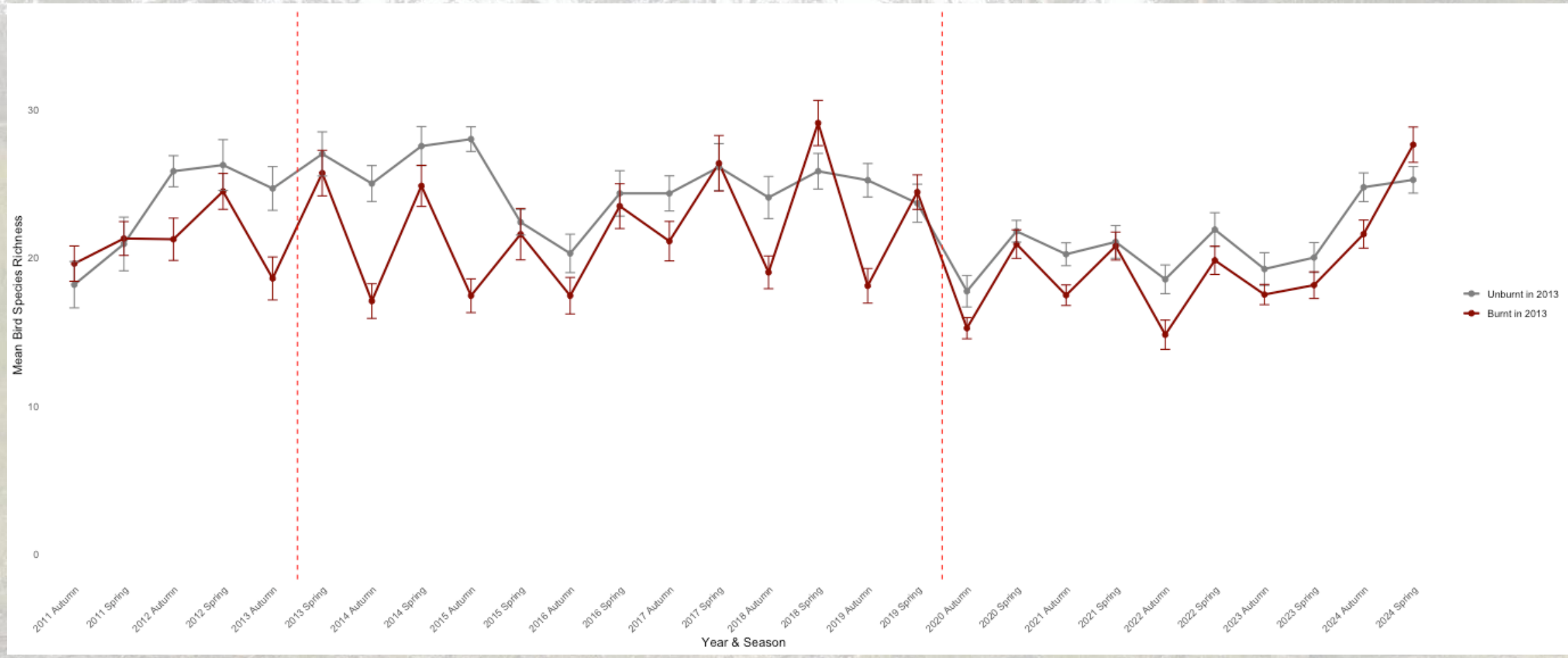
Mammal Simpson's Diversity



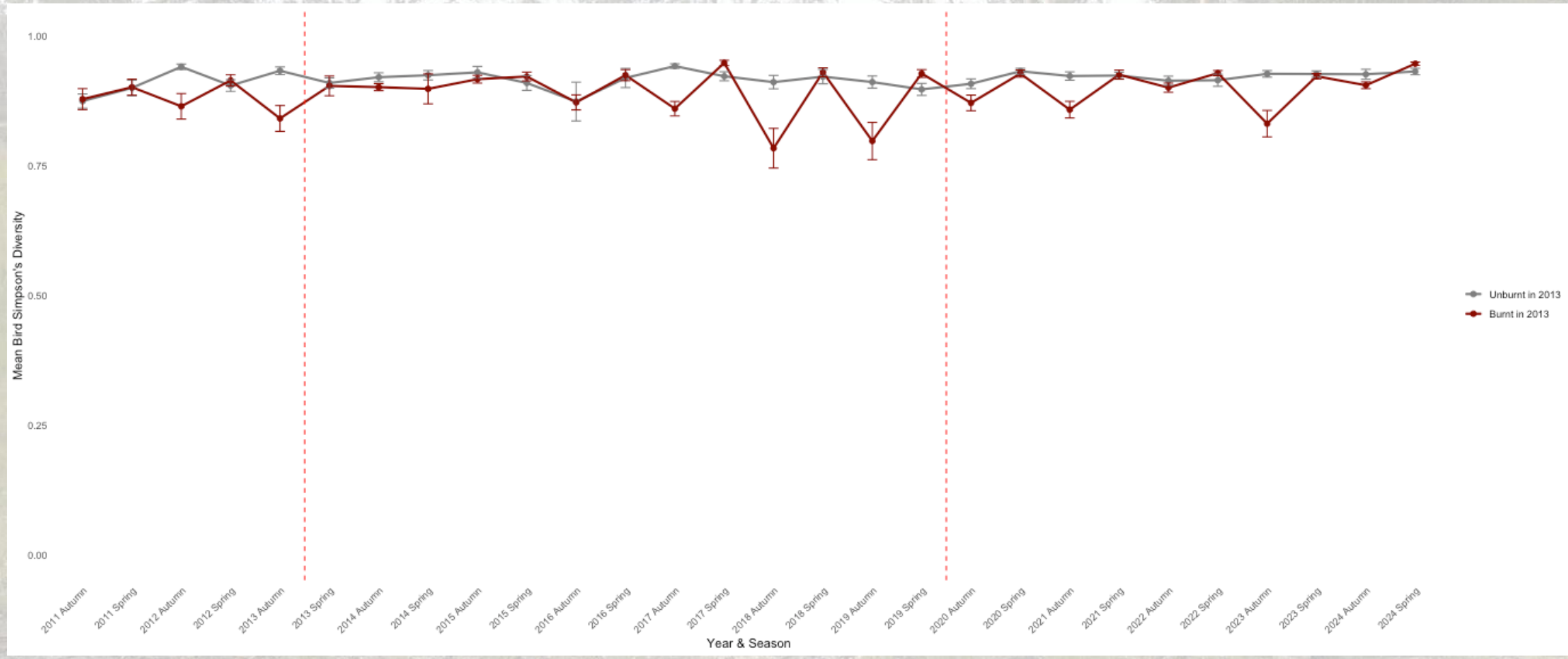
Bird abundance



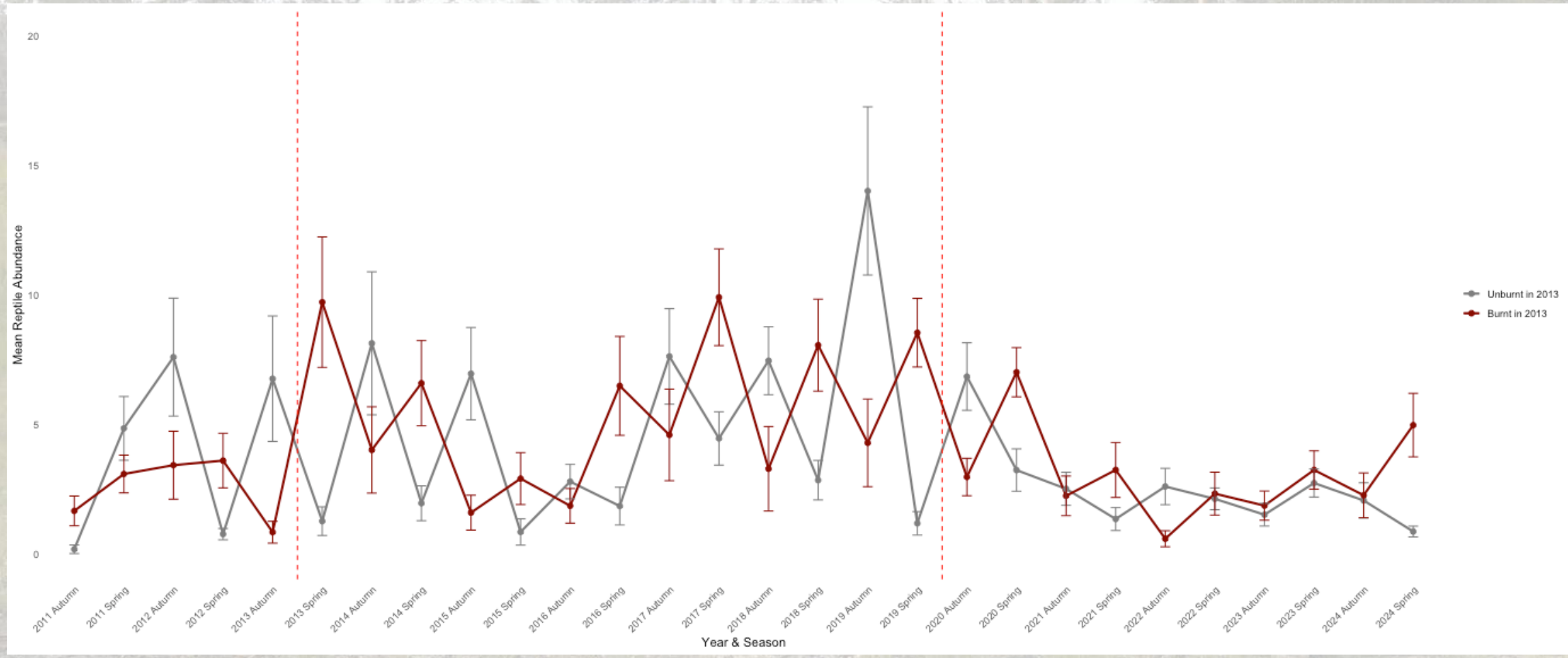
Bird species richness



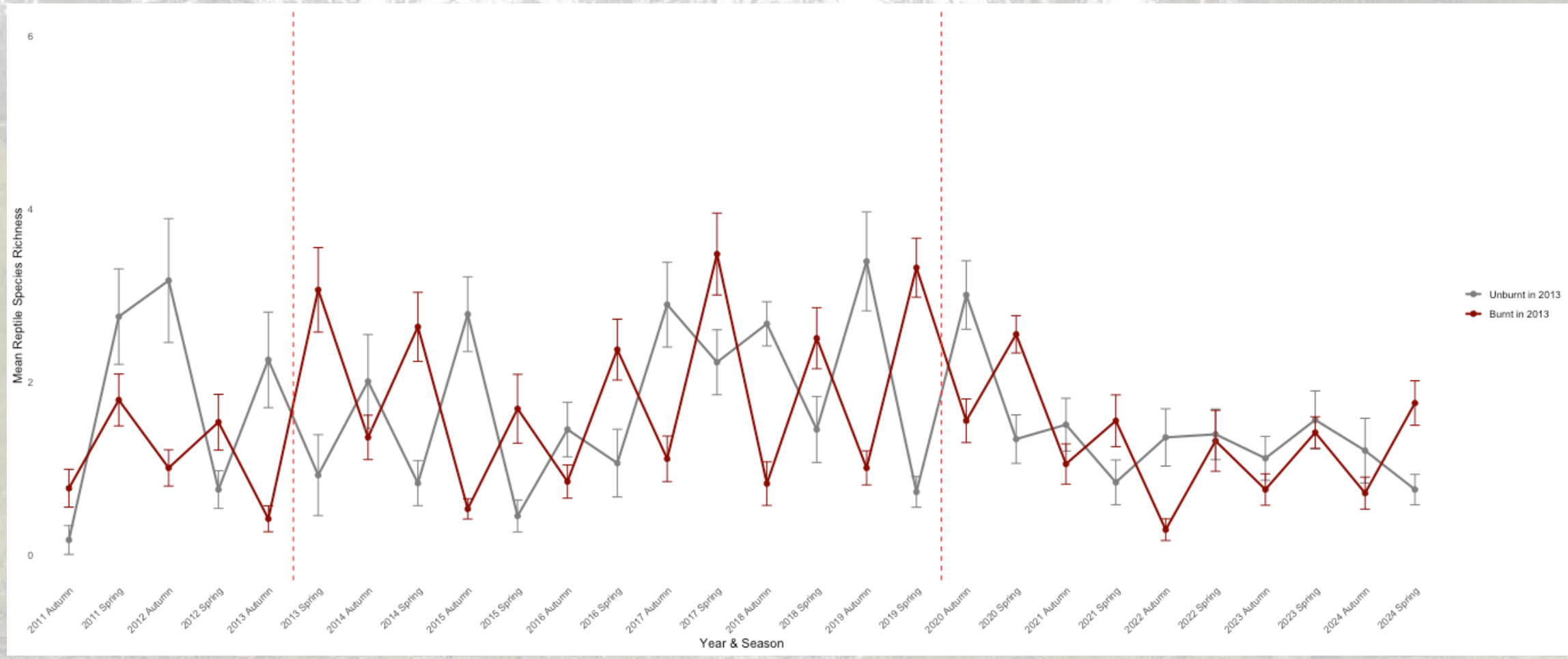
Bird Simpson’s diversity index



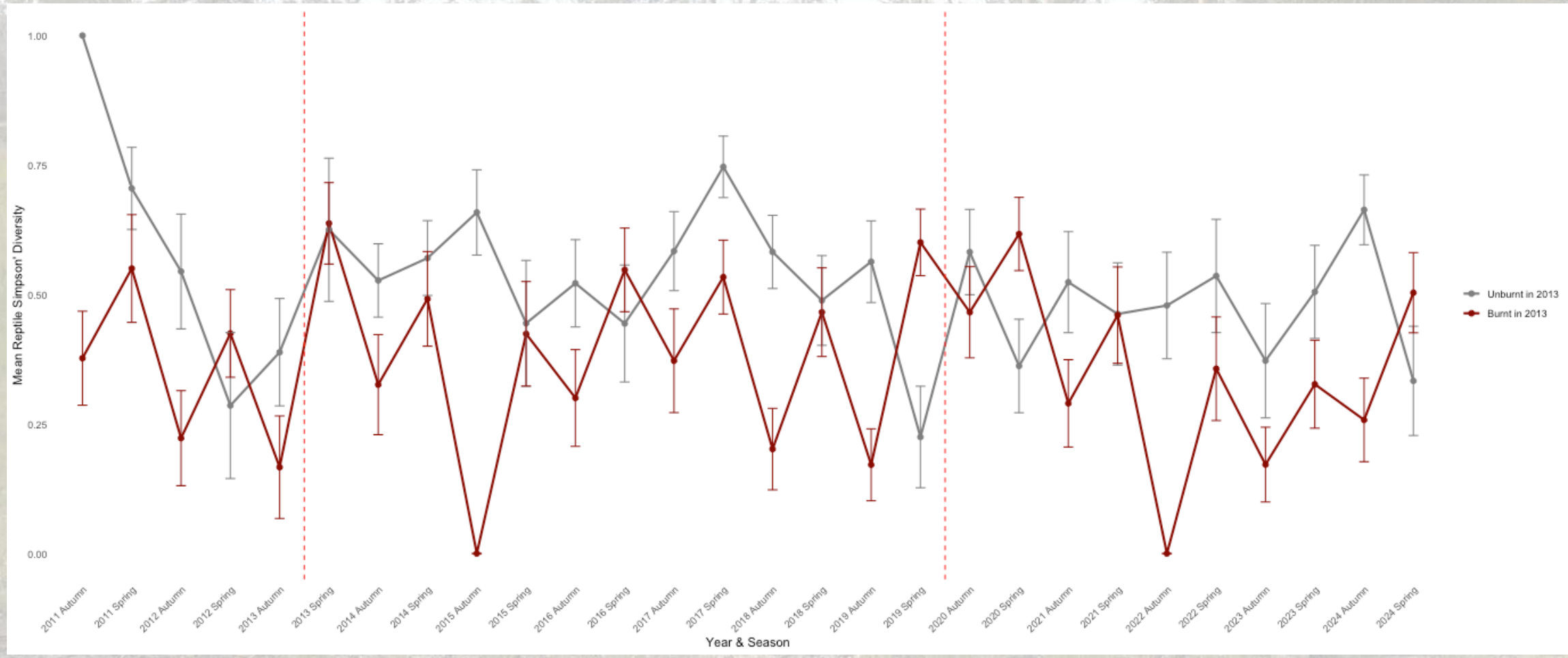
Reptile abundance



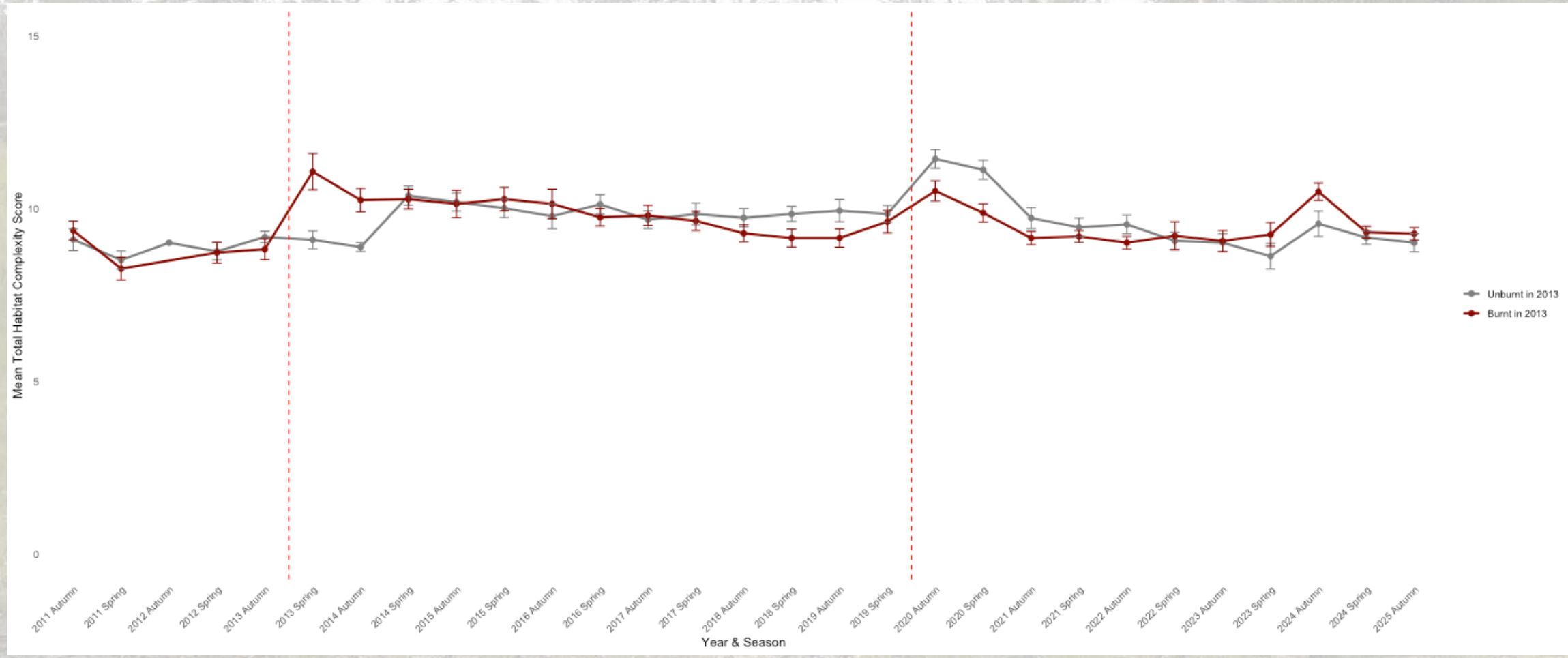
Reptile species richness



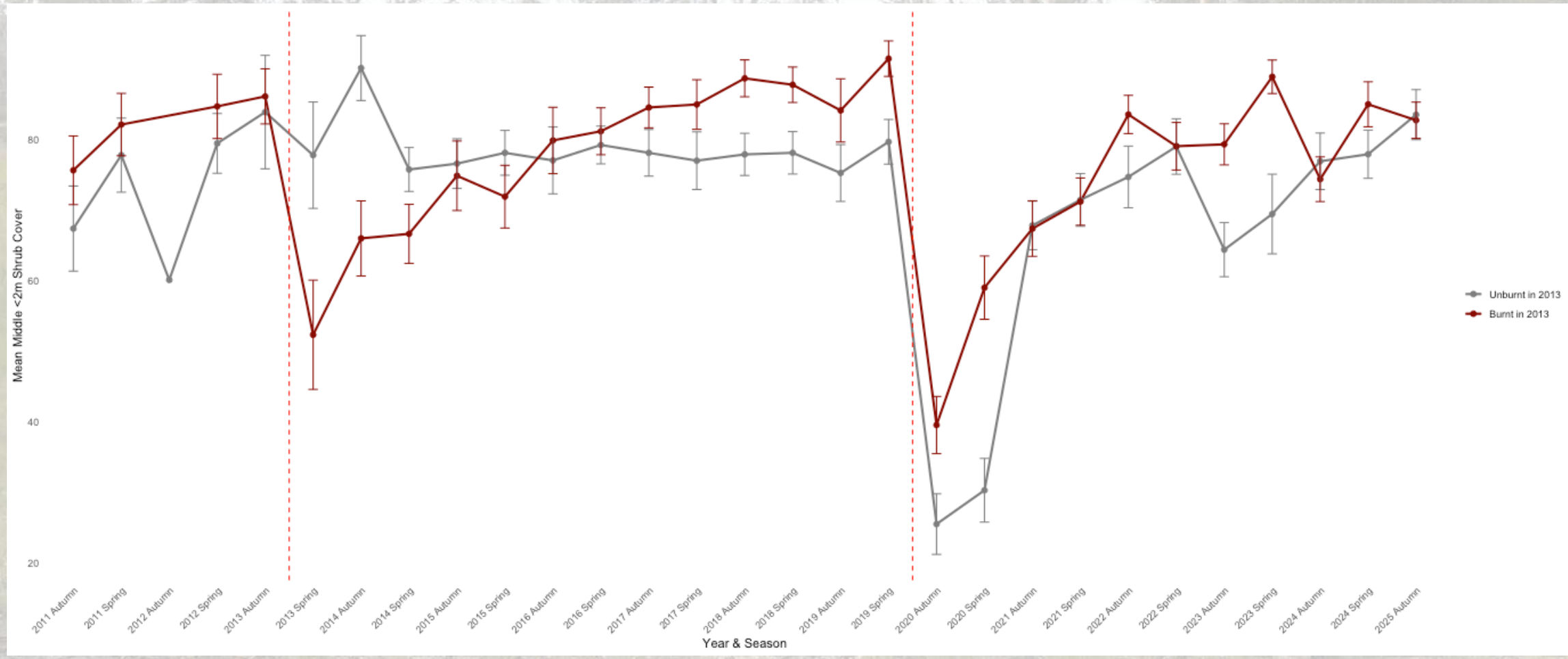
Reptile Simpson's Diversity Index



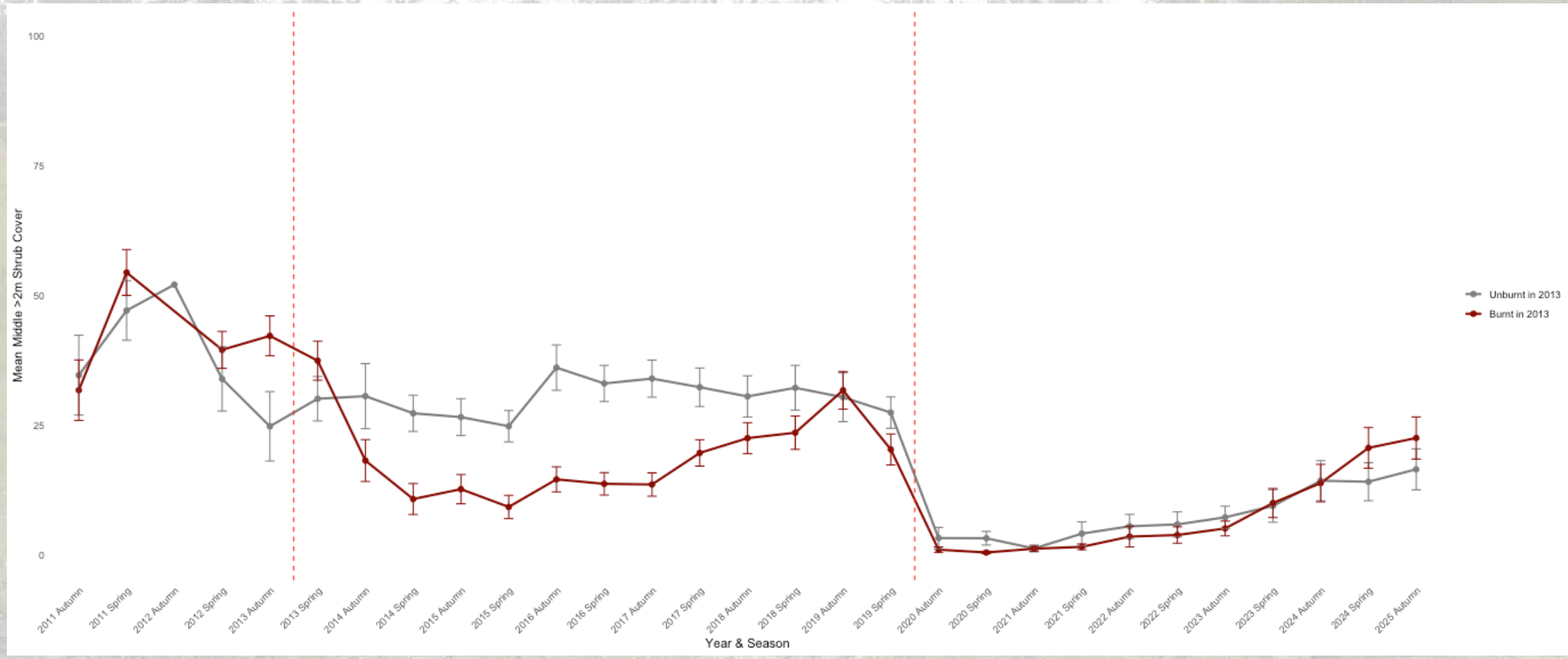
Habitat complexity



Mean shrub cover (<2m)

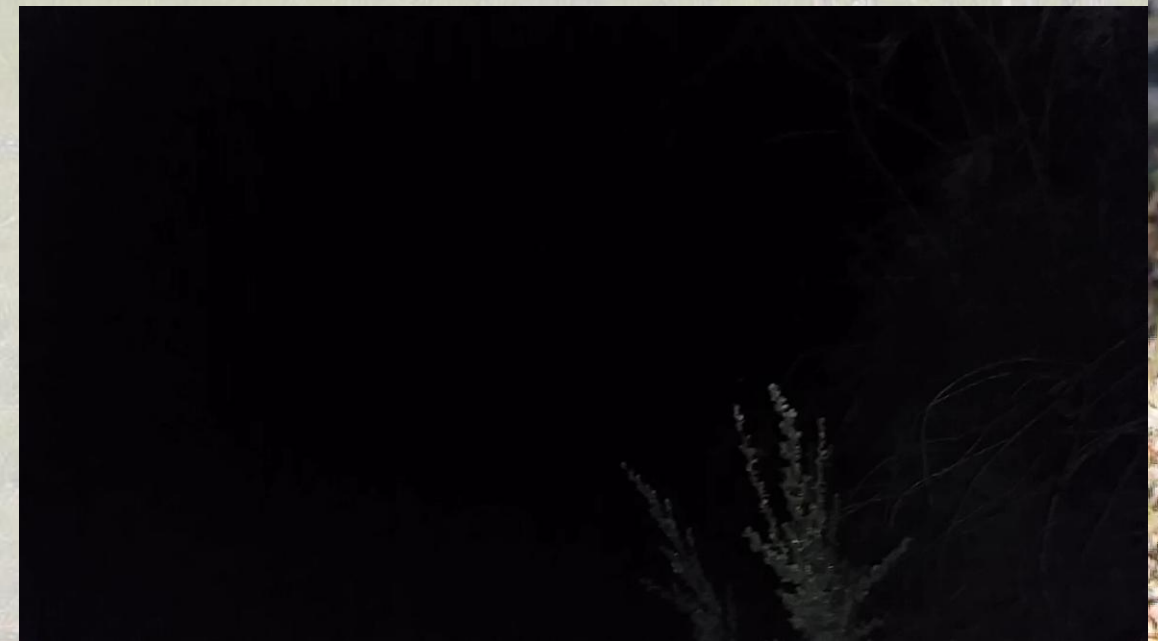


Mean shrub cover (>2m)



Species accounts

- Eastern Pygmy-possum
- Greater Glider
- Quoll
- Insectivorous bats
- Threatened birds
- Blue Mountains Water Skink
- Giant Dragonfly



Eastern Pygmy-possum

Cercartetus nanus

- Family: Burramyidae (pygmy possum)
- Related to Mountain Pygmy-possum
- Currently undertaking a research project with Australian Museum
- Reliant on banksia, eucalypt and bottlebrush for nectar and pollen, also eats invertebrates
- Listed as Vulnerable in NSW

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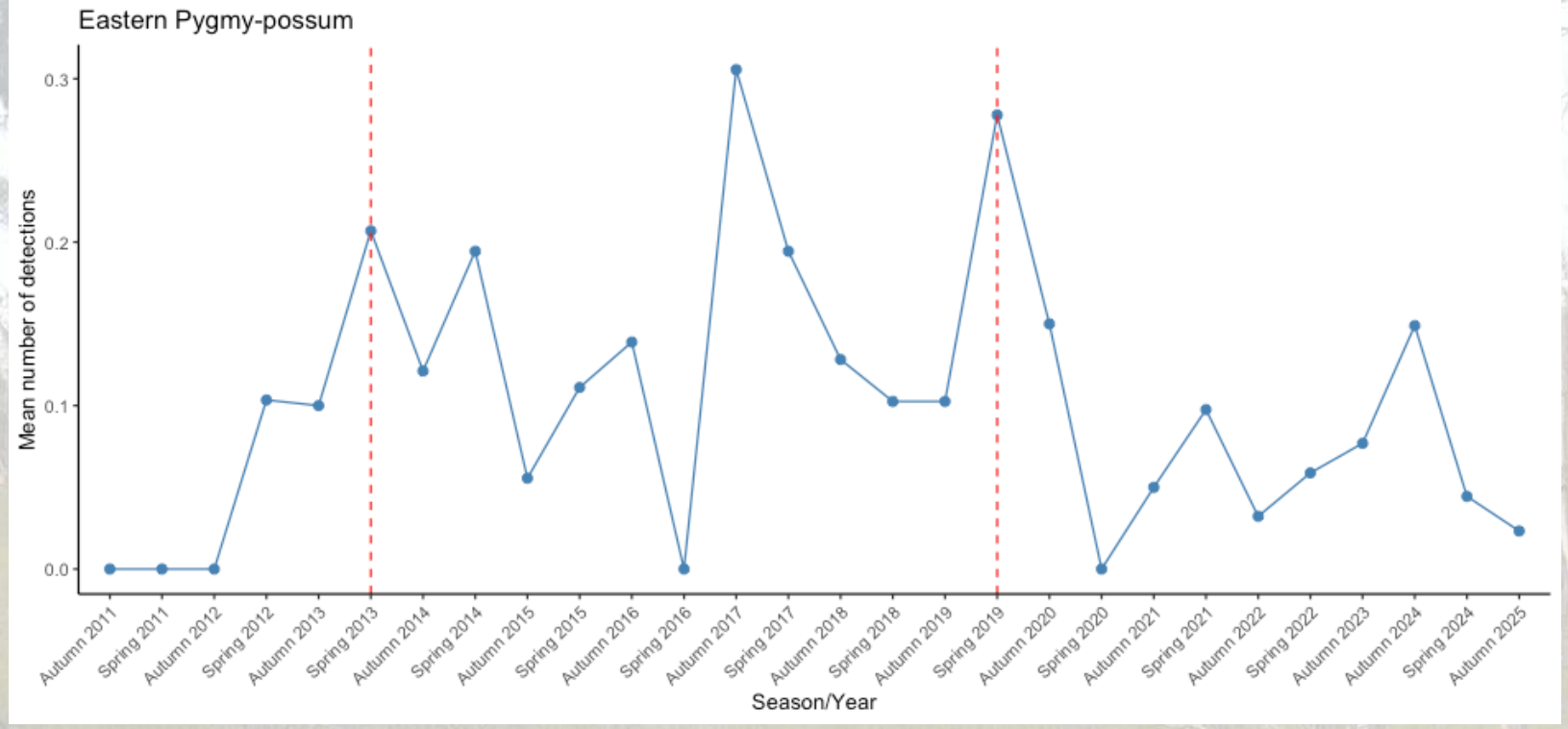
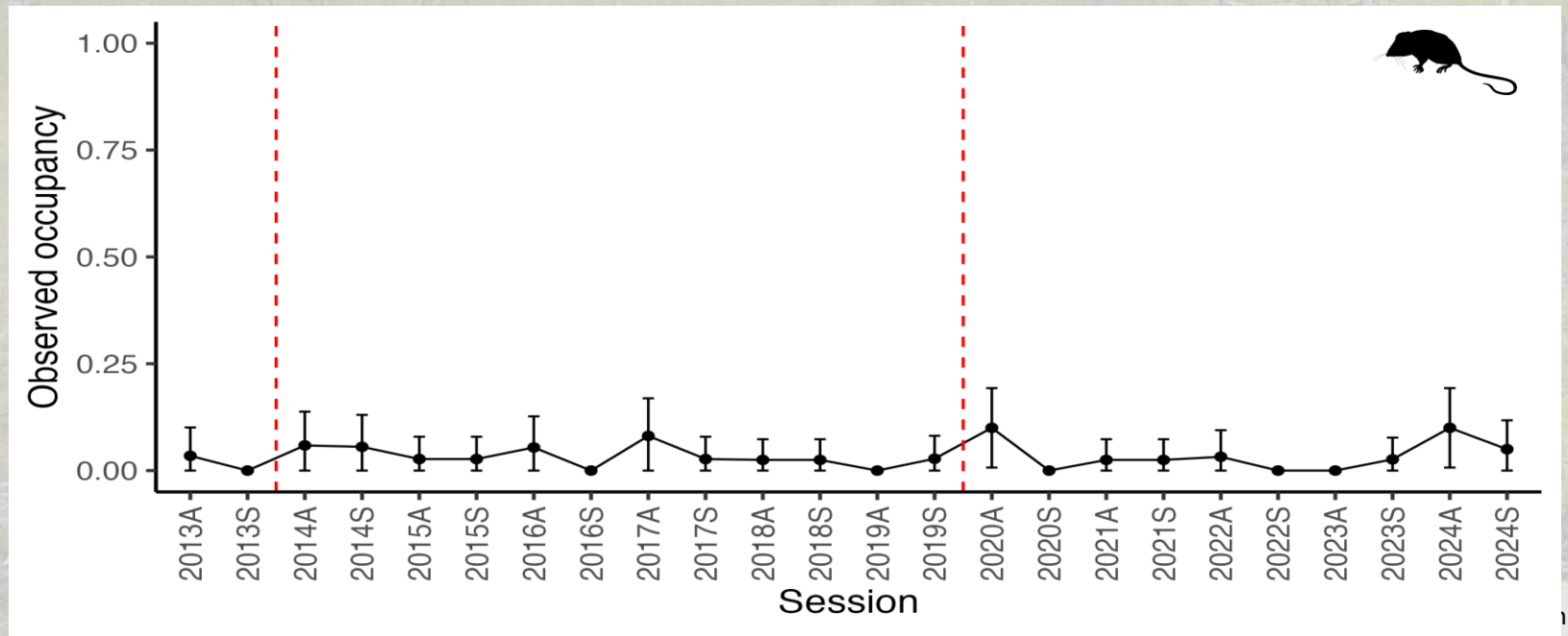

Eastern Pygmy-possum
Mean number of detections
0.0
0.1
0.2
0.3
Autumn 2011
Spring 2011
Autumn 2012
Spring 2012
Autumn 2013
Spring 2013
Autumn 2014
Spring 2014
Autumn 2015
Spring 2015
Autumn 2016
Spring 2016
Autumn 2017
Spring 2017
Autumn 2018
Spring 2018
Autumn 2019
Spring 2019
Autumn 2020
Spring 2020
Autumn 2021
Spring 2021
Autumn 2022
Spring 2022
Autumn 2023
Autumn 2024
Spring 2024
Autumn 2025
Season/Year


Observed occupancy
0.00
0.25
0.50
0.75
1.00
2013A
2013S
2014A
2014S
2015A
2015S
2016A
2016S
2017A
2017S
2018A
2018S
2019A
2019S
2020A
2020S
2021A
2021S
2022A
2022S
2023A
2023S
2024A
2024S
Session

Southern Greater Glider

- Listed as Endangered nationally and in NSW
- Declining through lower elevations (Smith and Smith 2018)
- Evidence of increases on Newnes Plateau prior to Gospers Mountain fire

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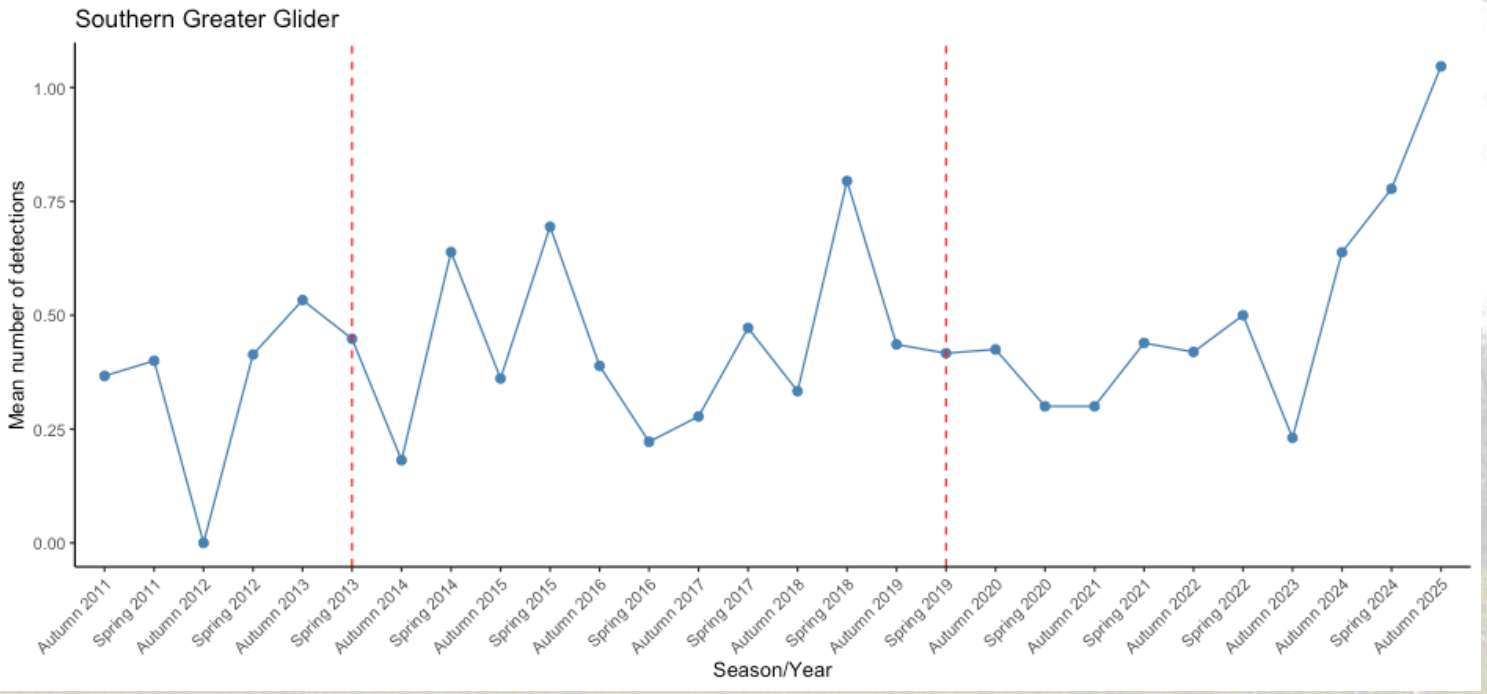

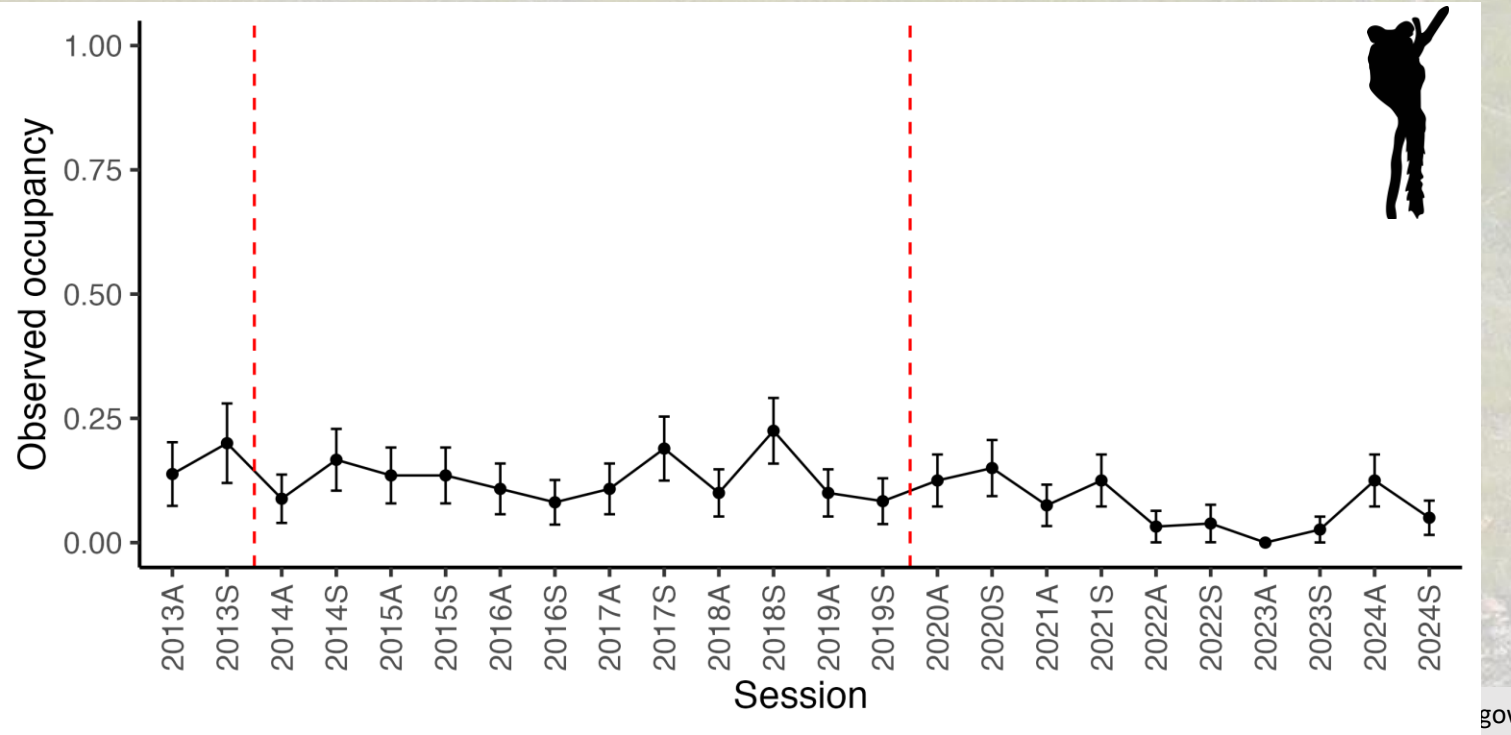

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Spotted-tailed Quoll

- Listed as vulnerable by NSW and endangered nationally
- Males disperse long distances, however, females remain close to maternal home range (<10km)
- Threats
  - Loss, fragmentation, degradation of habitat and hollows (dens)
  - Foxes and cats
- Low detections across Newnes Plateau

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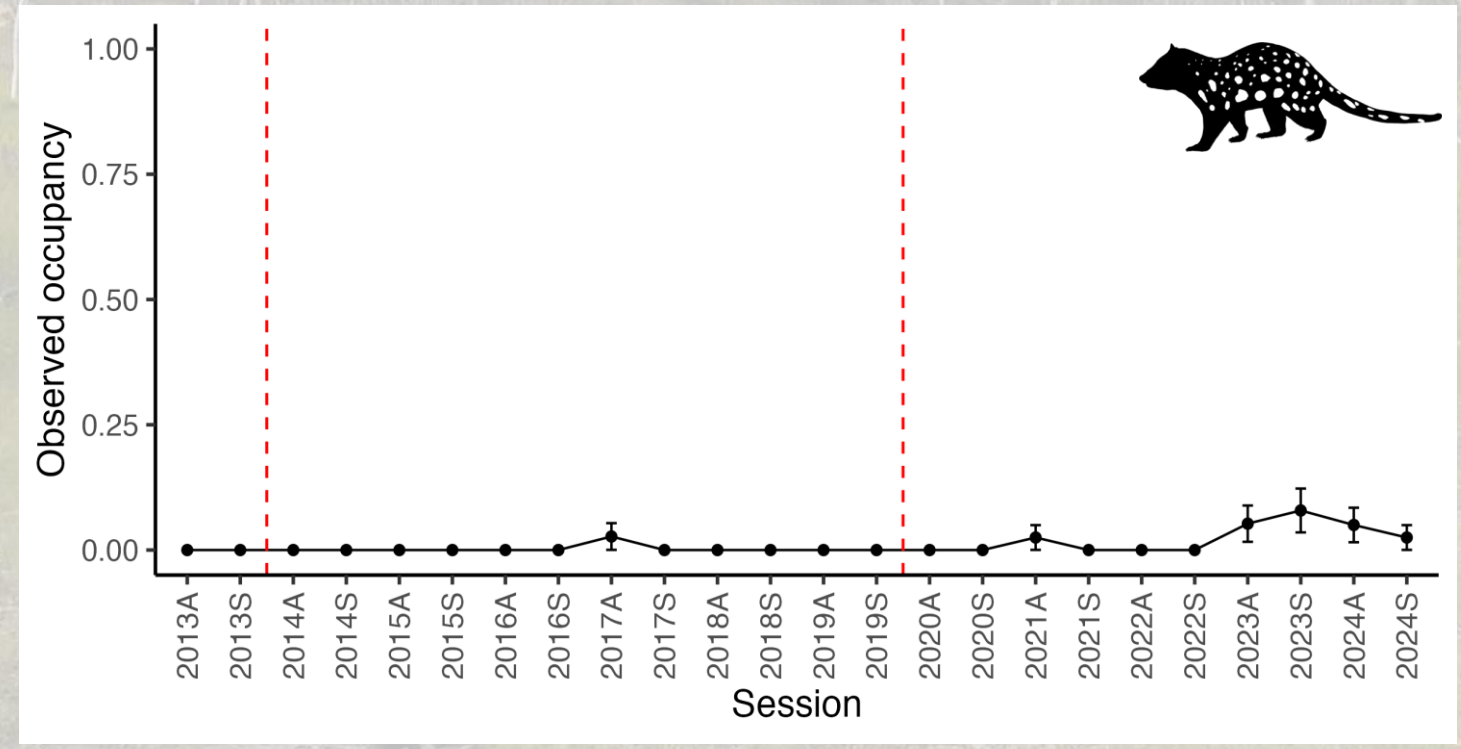

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Antechinus

- Three species known in the area:
  - Agile Antechinus
  - Brown Antechinus
  - Mainland Dusky Antechinus
- Mainland Dusky Antechinus is now locally extinct (or at least no longer detected)

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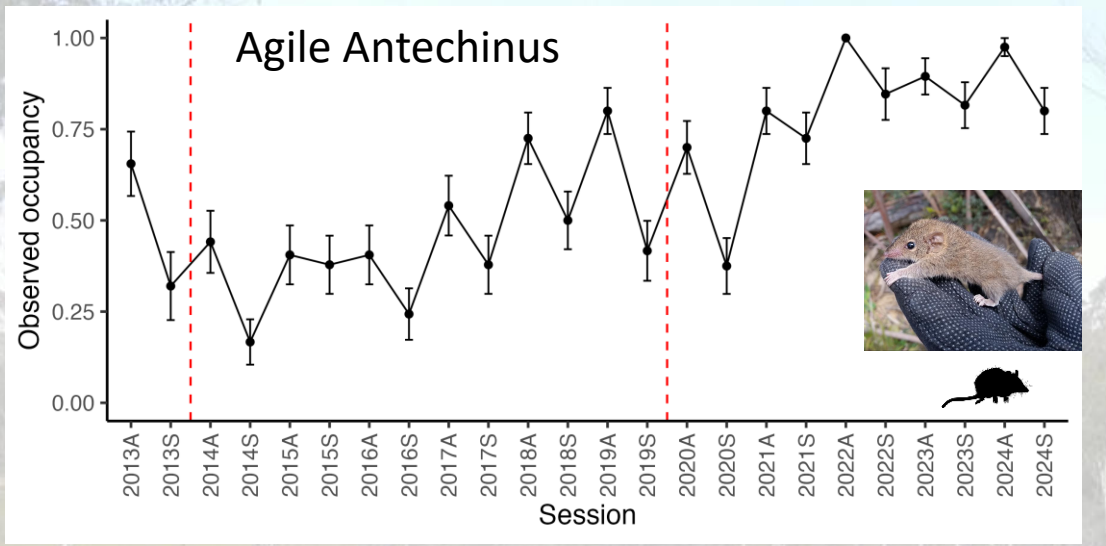

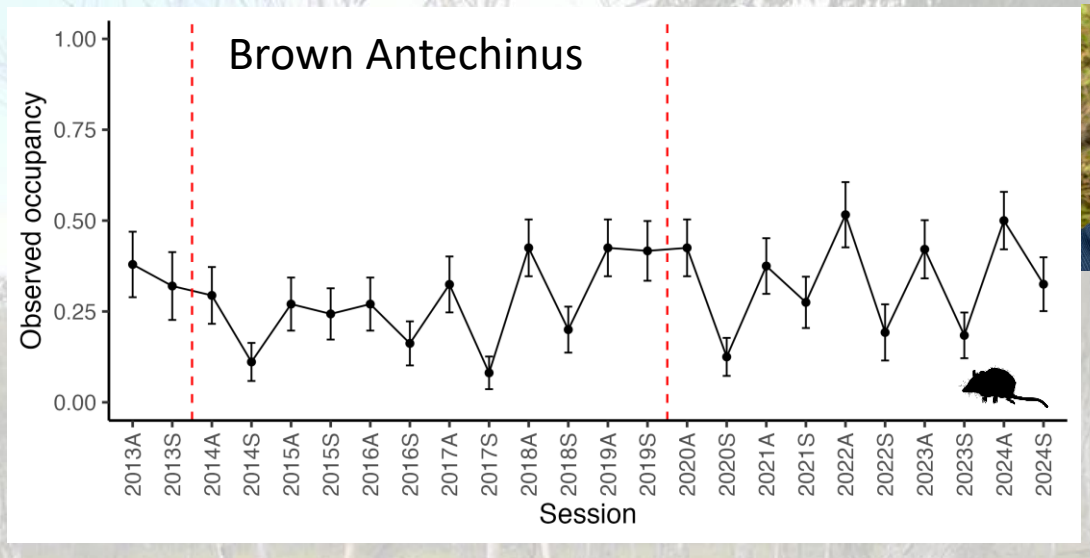

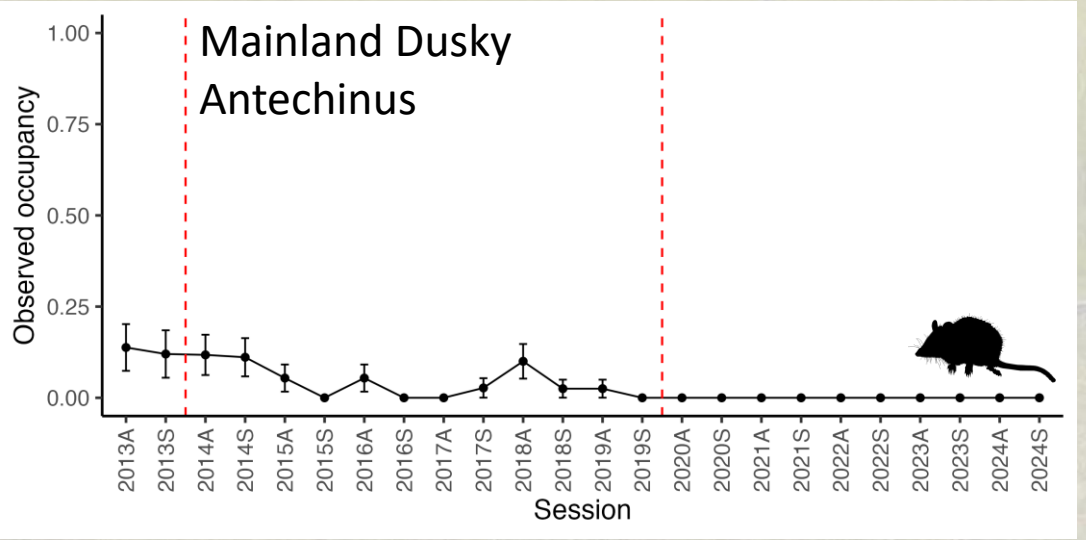

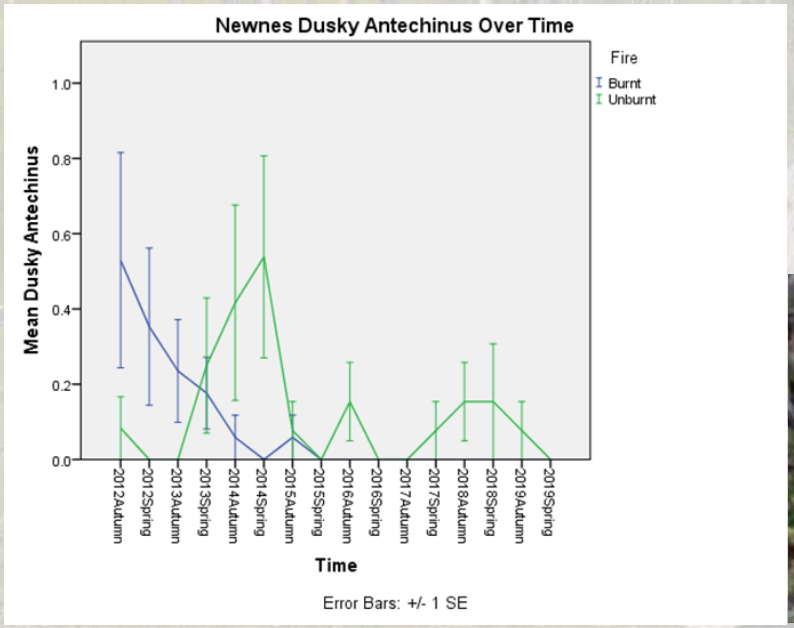

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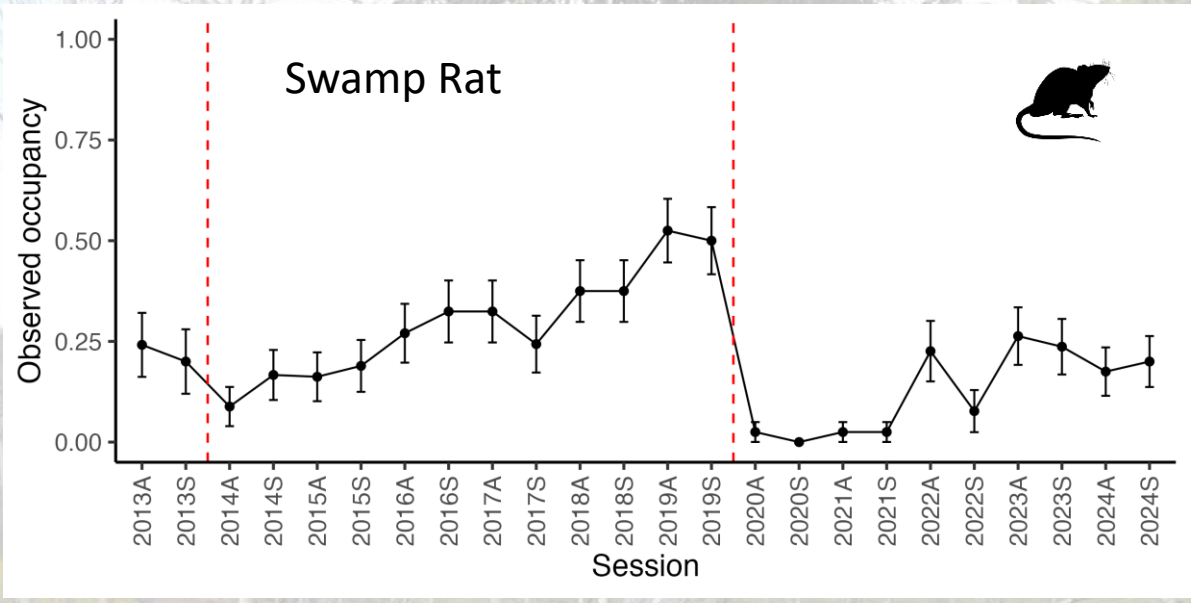
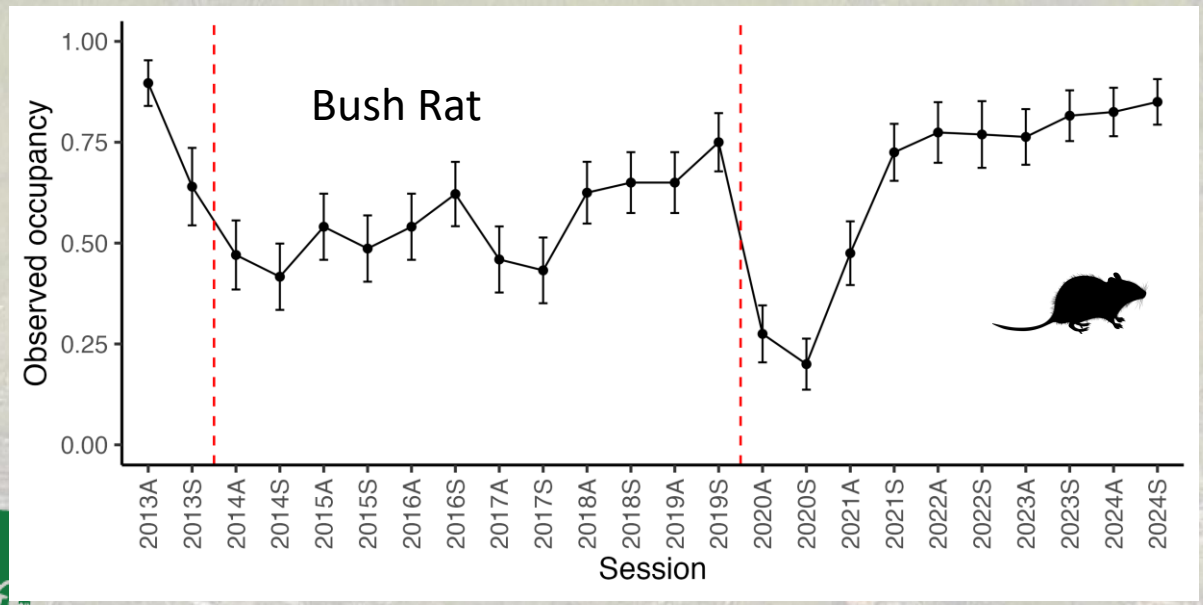
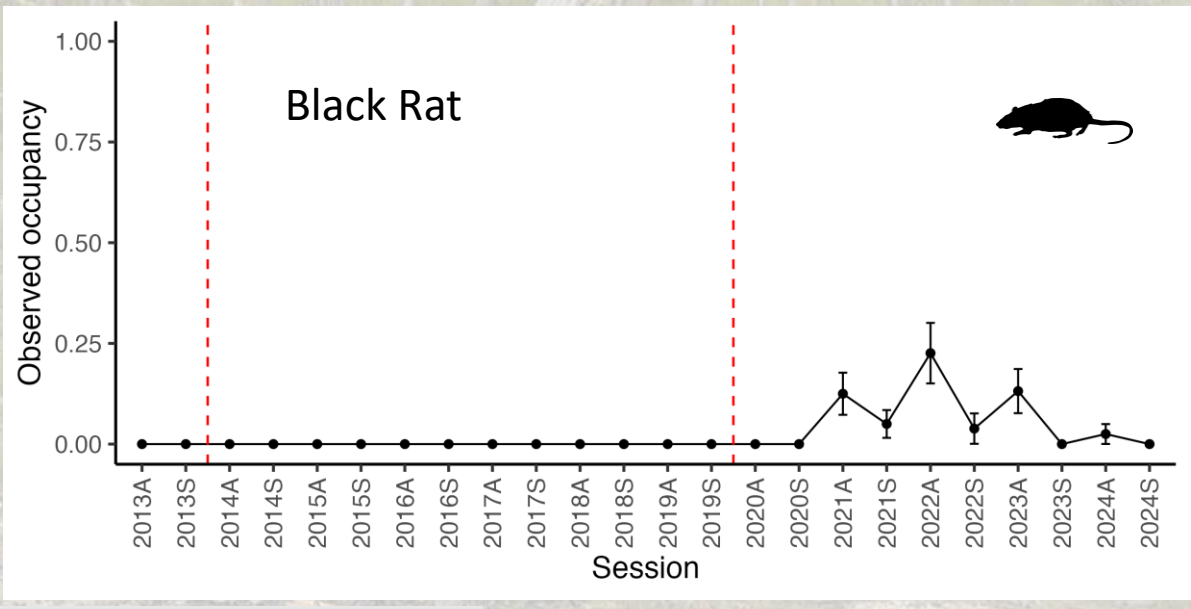
Rodents

- Five in the area:
  - Bush Rat
  - Swamp Rat
  - Black Rat (Exotic)
  - House Mouse (exotic)
  - Water Rat (Rakali)







Cave-roosting bats

- Large Bent-winged Bat
- Large-eared Pied Bat – utilise honeycombing in the roof of sandstone caves

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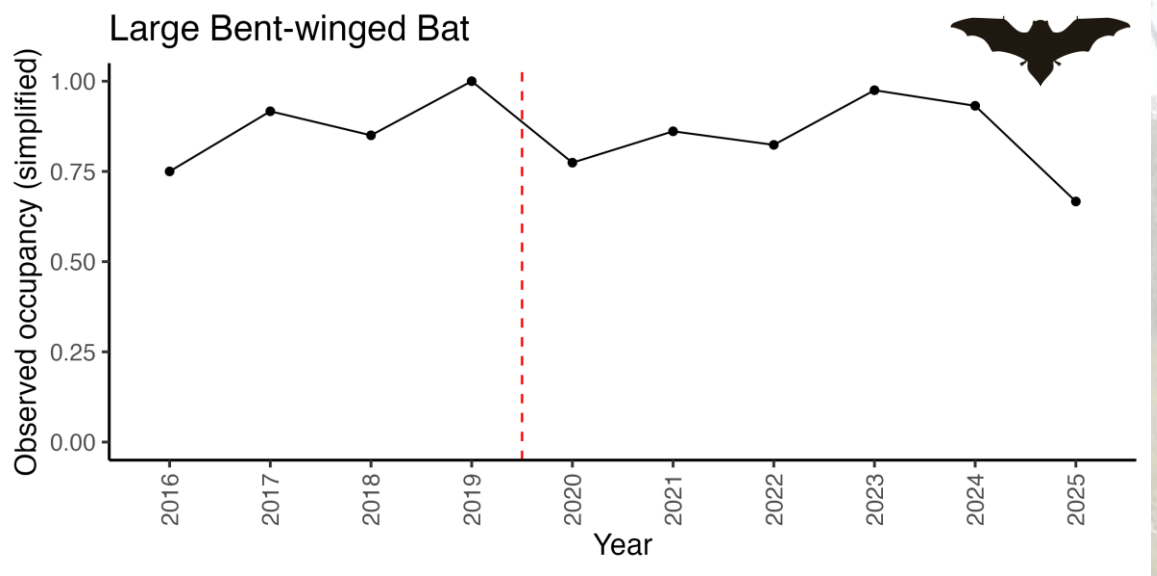
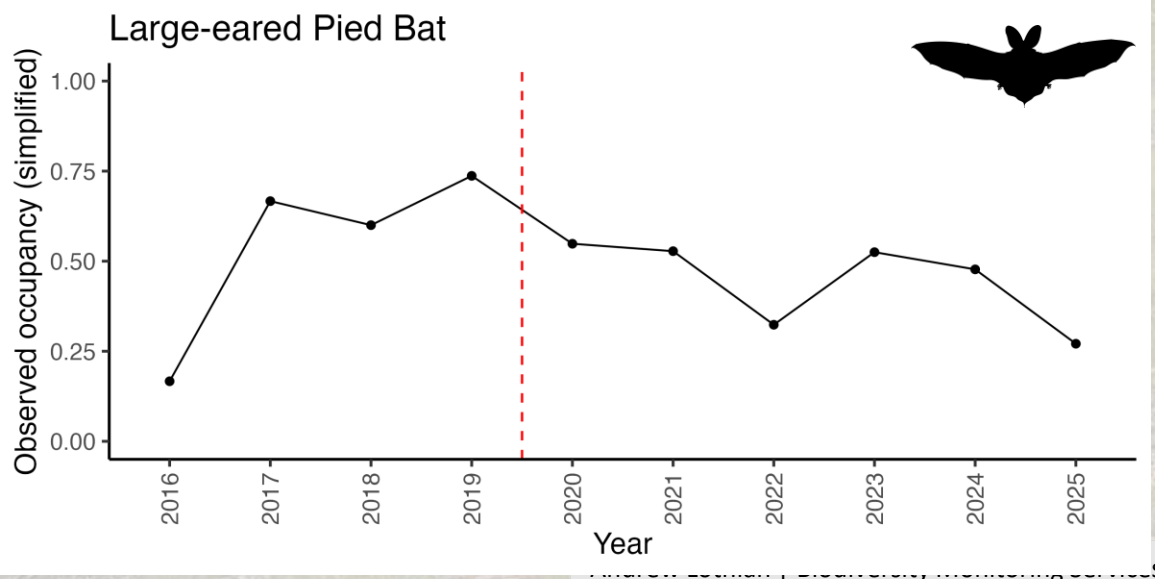
Cave-roosting bats

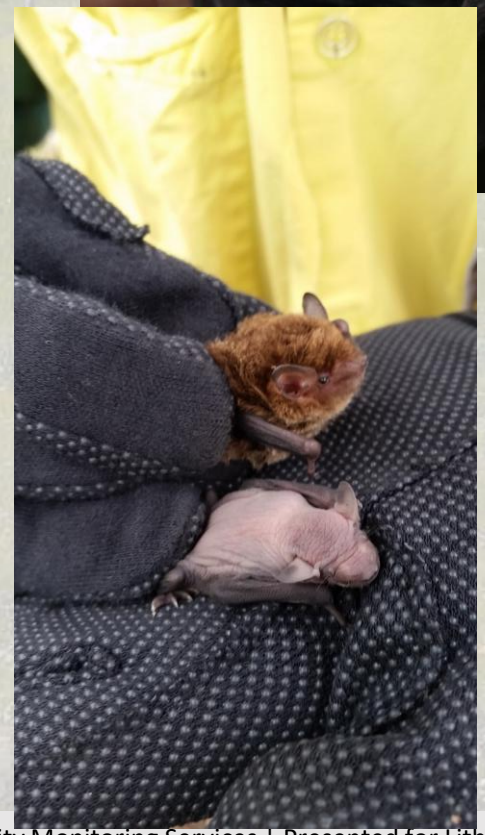




Tree-roosting Bats

Eastern False Pipistrelle

- All species make use of tree hollows and flaking bark for roosting
- Diet – hunt for moths, flies, Trichoptera, beetles, weevils
- Also look out for Grey-headed Flying Fox



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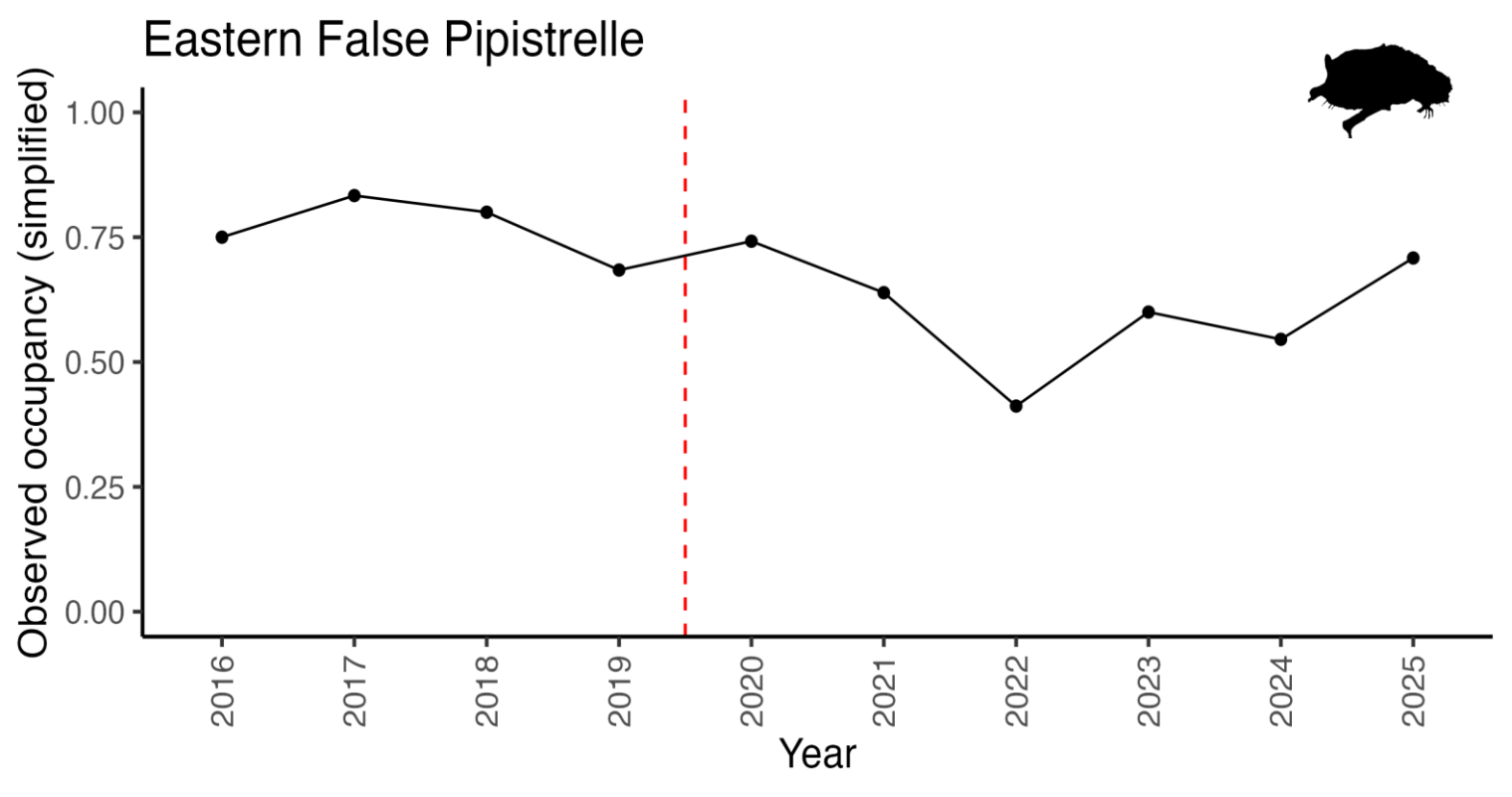
Tree-roosting Bats



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Threatened Birds

South-eastern Glossy Black-Cockatoo

Gang-gang Cockatoo

Turquoise Parrot

Little Eagle

Owls – Powerful, Barking, Masked, Sooty

Honeyeaters – Regent, Painted, Black-chinned

Woodland birds – Scarlet Robin, Flame Robin, Speckled Warbler, Varied Sittella

36 species lost over 25% of their habitat in 2019 bushfires (Birdlife Australia)

Gang-gang Cockatoo

Scarlet Robin

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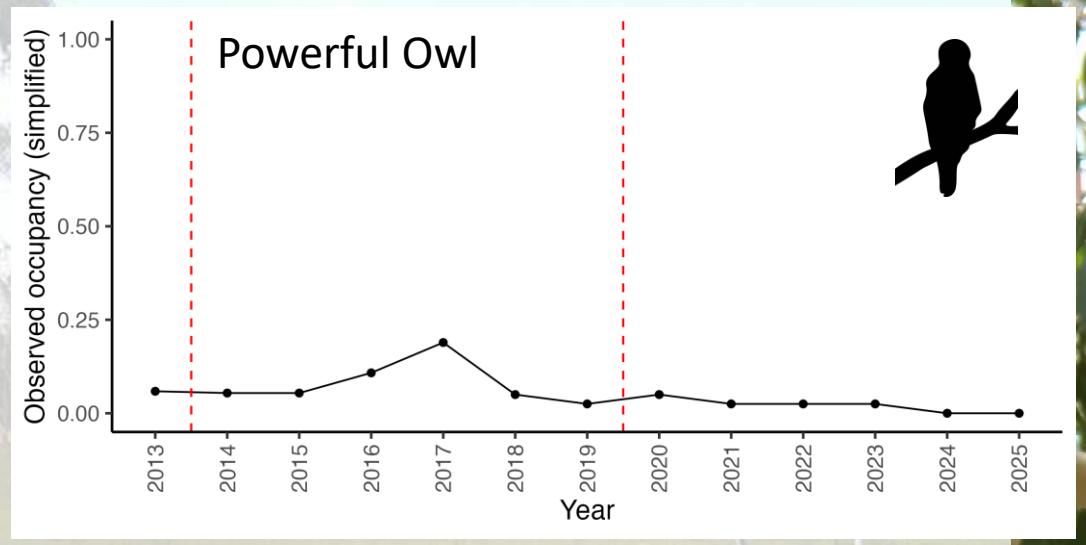

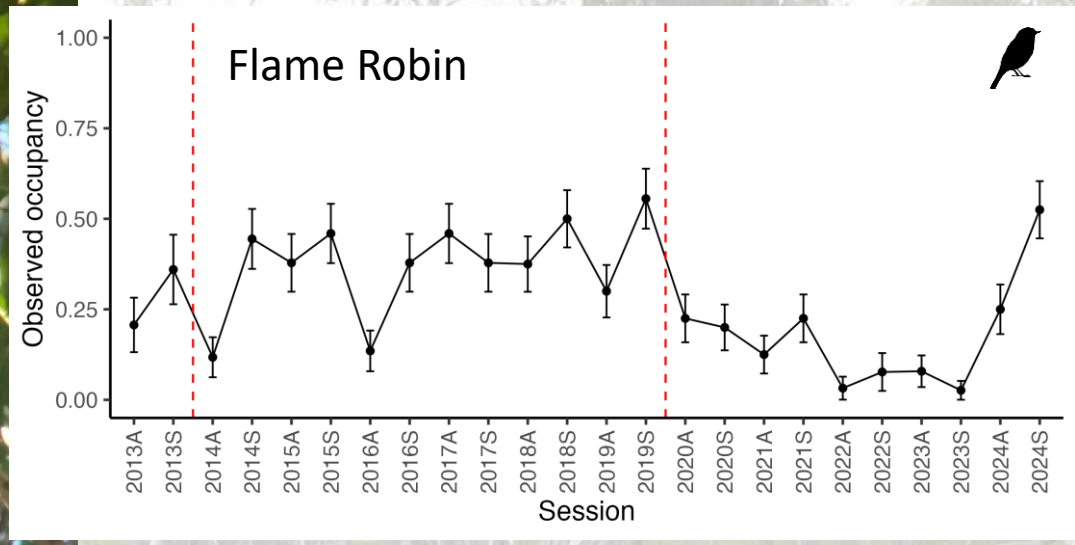

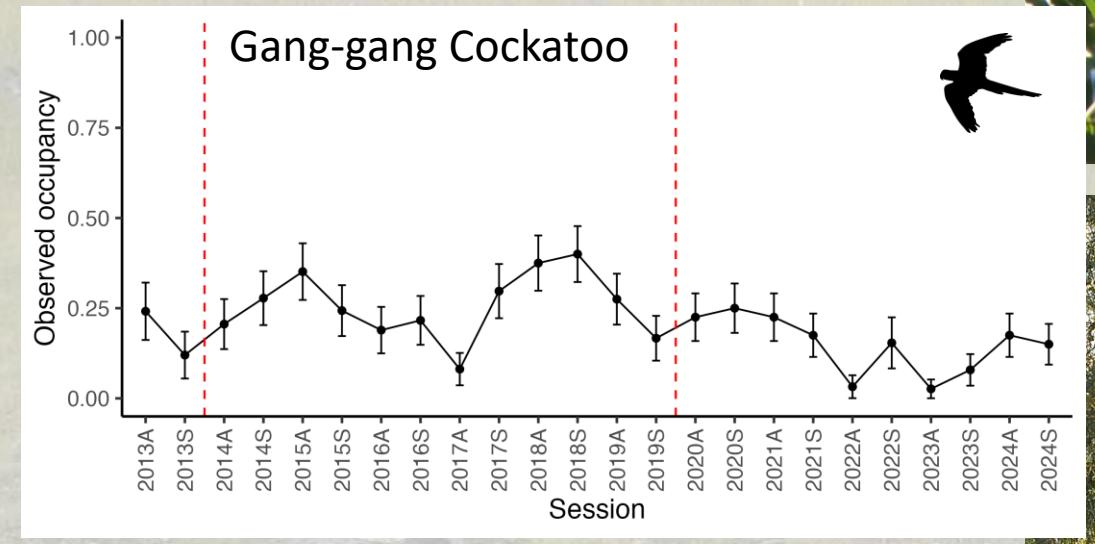

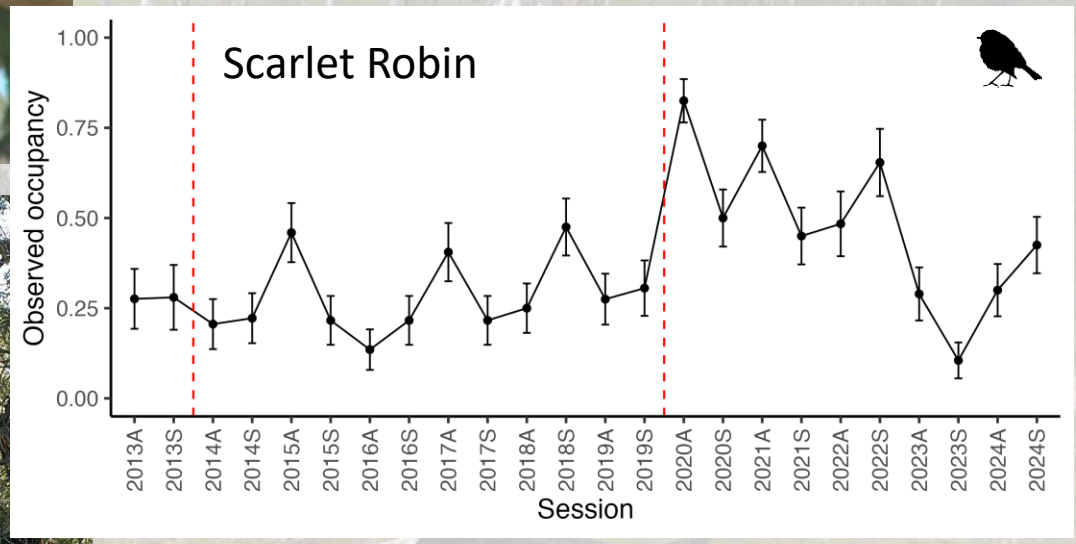

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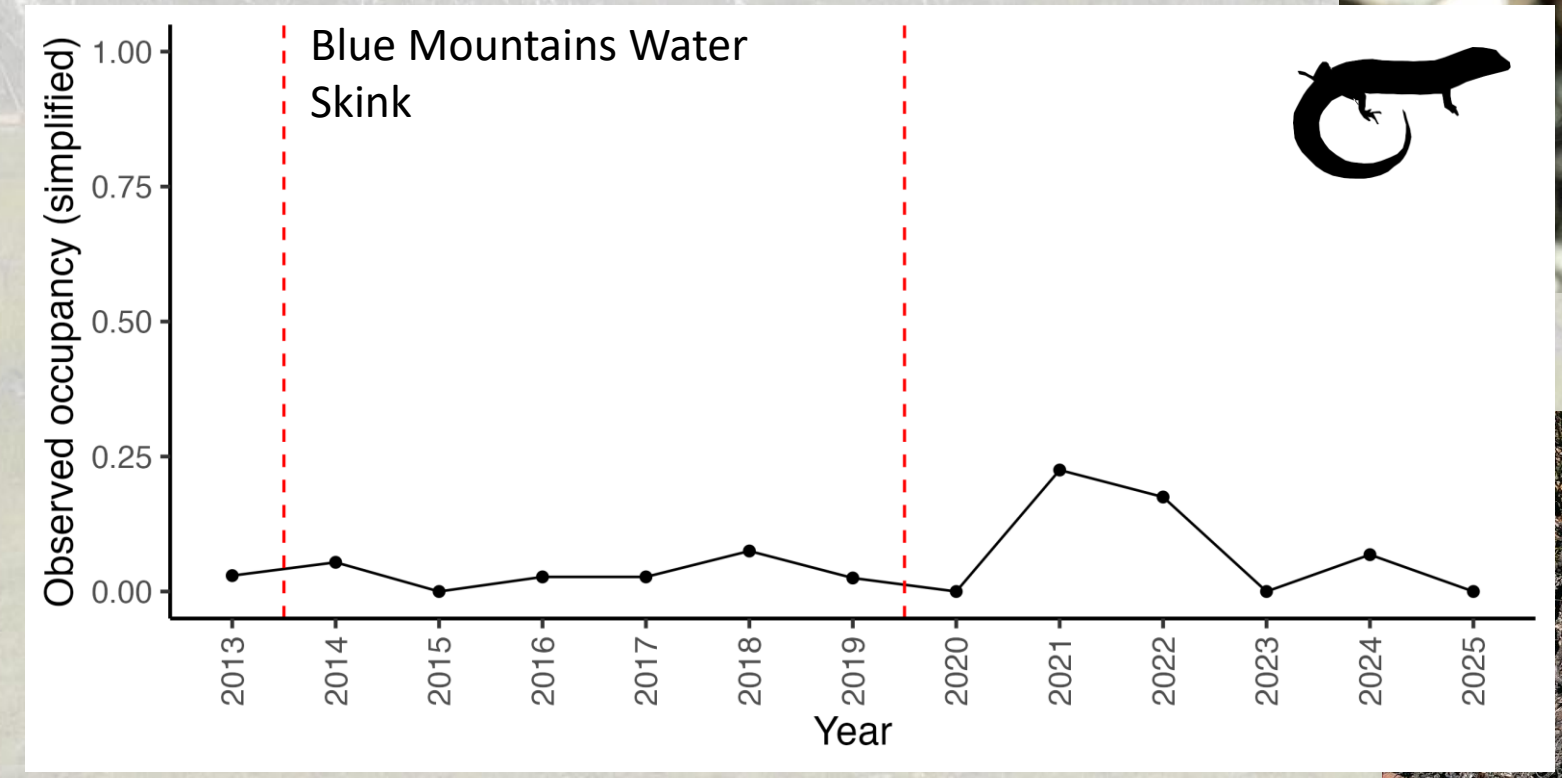
Threatened Reptiles



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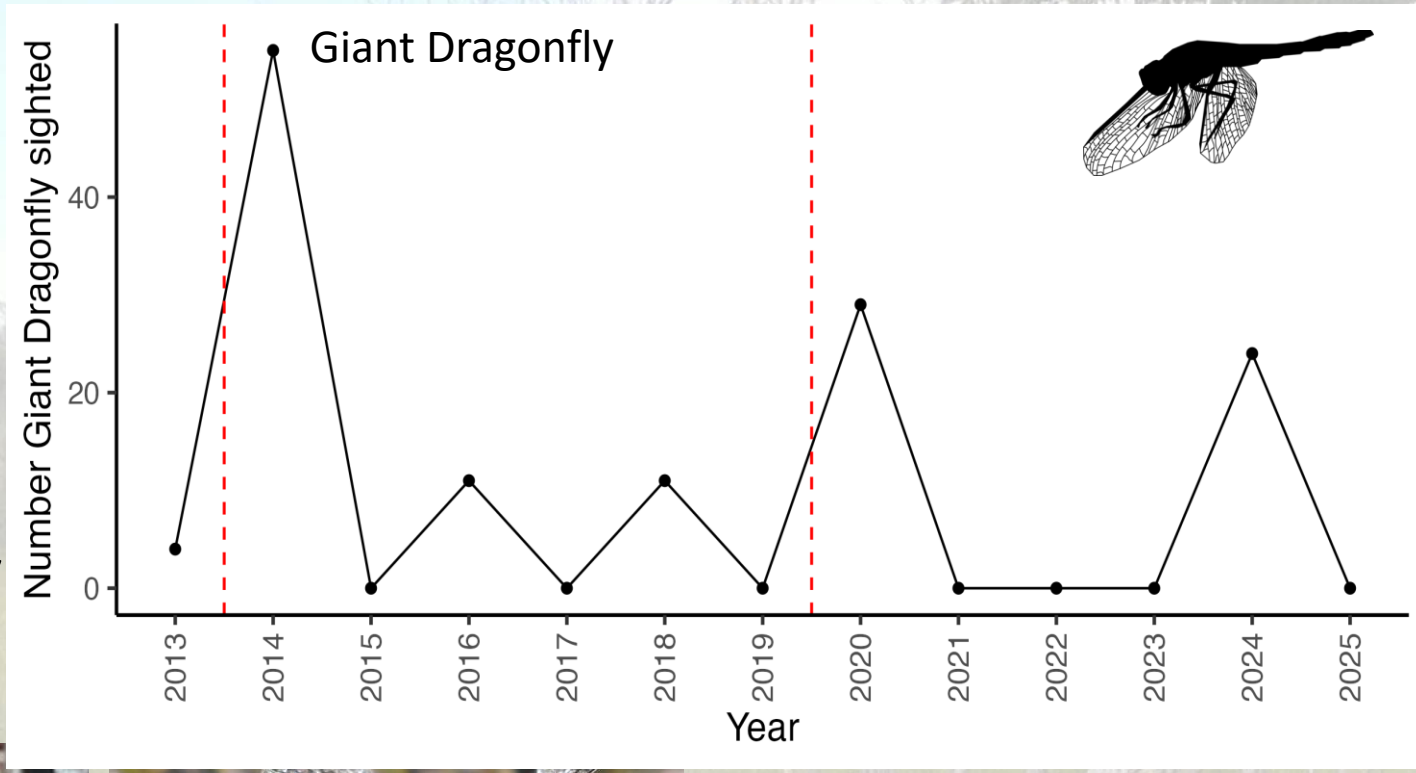
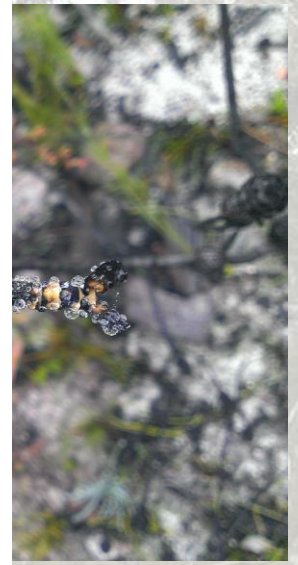
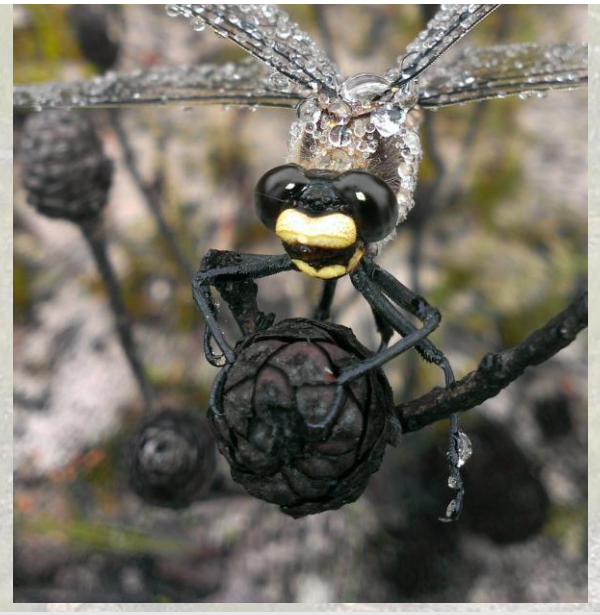
Threatened Invertebrates

Giant Dragonfly

Bathurst Copper Butterfly







Feral Animals

- Various introduced and exotic animals can negatively impact on our native species, either directly or indirectly. This includes:
  - Feral cat *Felis catus*
  - Fox *Vulpes vulpes*
  - Dingo/Wild dog *Canis lupus*
  - Rabbit *Oryctolagus cuniculus*
  - Horse *Equus caballus*
  - Pig *Sus scrofa*

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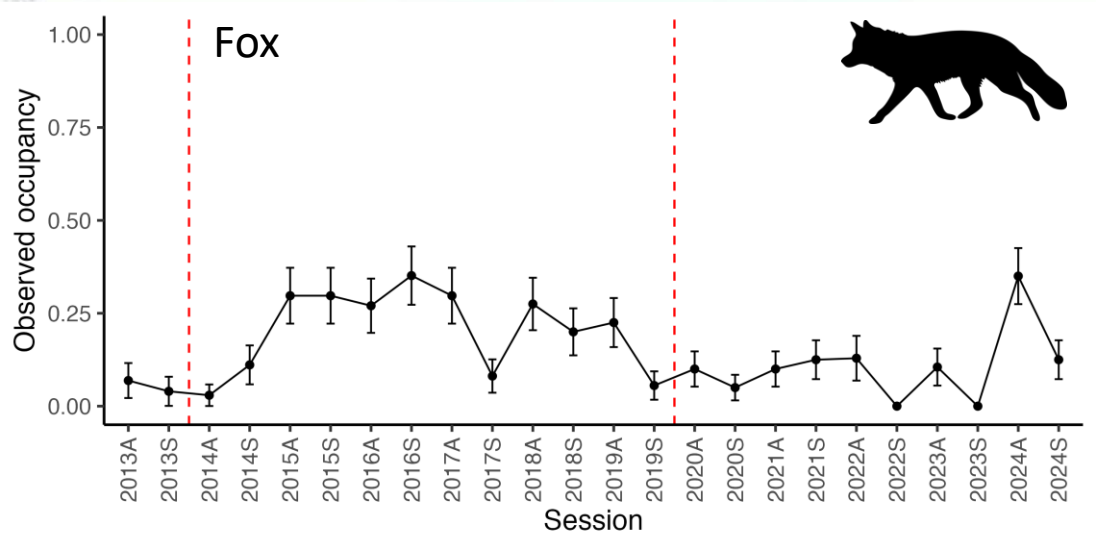
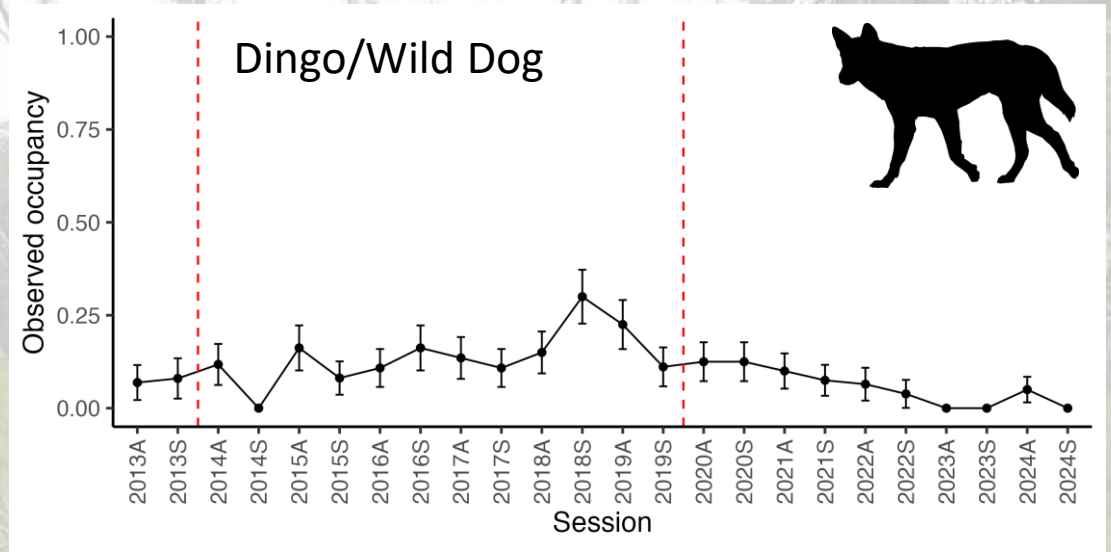
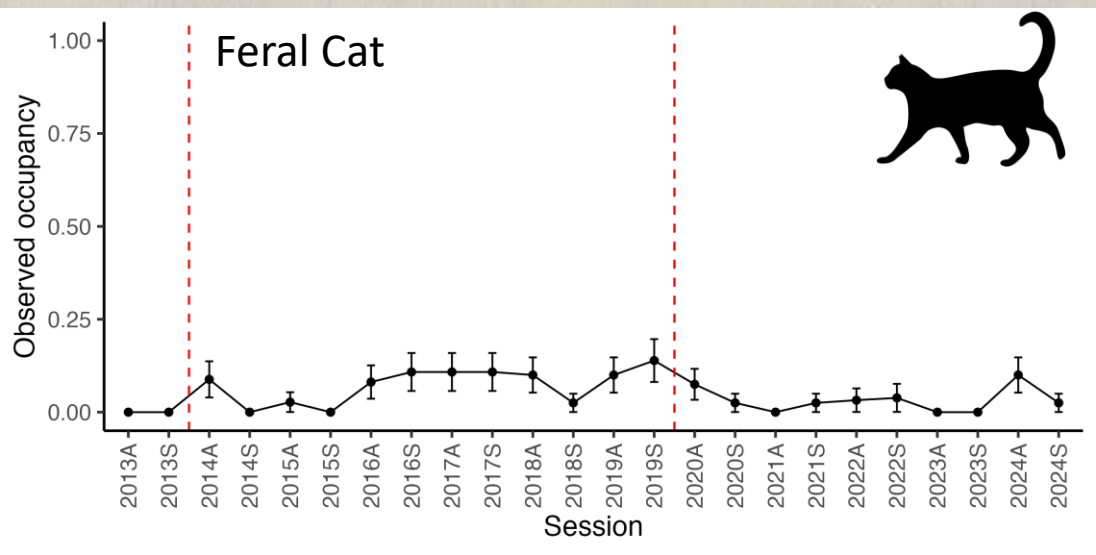
Feral animals







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Lessons learnt from first fire analysis

- Most habitat components will recover relatively quickly
  - Provided obligate seeders can replenish seedbank between fires
  - HCS not sensitive enough post fire
- Most small mammal populations recover post fire within 6 years
  - Responses species specific – Common Dunnart ↑, Dusky Antechinus ↓
  - Swamp Rats – survive first fire, maybe not second due to peat destruction
- Need to account for habitat differences across fire extent
- Detectability increase post fire
- Abundance ↓, Species Richness same, diversity ↑
- New Holland Mouse – locally extinct
- Greater Glider – no decline at higher altitude

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Update from more recent fire analysis

- Most habitat components will recover relatively quickly
  - Can be compounding effects from multiple frequent fires
  - Structure often remains despite burning of the habitat
- Most small mammal populations recover post fire within 6 years
  - Responses species specific – ST Quoll/Agile Antechinus/Scarlet Robin ↑, Dusky Antechinus/Flame Robin ↓
  - May be interplay with climatic variables such as La nina cycles, and predator prey cycles
- There is no need to supplemental feed/water species as they generally survive on their own in unburnt refugia
- Fire may suppress feral predators
- Mammal abundance/SR ↓ , Simpson's same,
- Bird/Reptile diversities show little change with fire
- Greater Glider – temporary suppression but no decline

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2025 PRACTISING MEMBER

Questions on Windfarm Research

- The Federal Government has earmarked **$134.2 million** to streamline environment and heritage approvals, including the establishment of the **Renewables Environmental Research Initiative (RERI)**.
- RERI has already contracted **16 projects** (over **$8 million**) to tackle critical, unanswered questions on renewables impacts
  - Bird and bat flight heights and collision risk
  - Underwater noise and light pollution
  - Develop best-practice guidance and data standards.
- RERI aims to
  - Reduce assessment complexity and uncertainty
  - Speed up approvals
  - Improve environmental outcomes.