

Early effects of fire on rodent communities in sagebrush-juniper habitats of the Mojave Desert

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Photo courtesy of Rob Fulton

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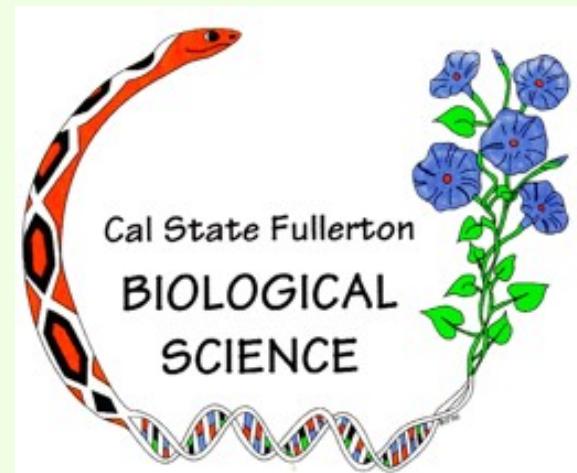
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Fire in the Mojave Desert

Low and middle elevation desert
shrubland

- Typical desert habitat
- Infrequent and localized
- Developing a regular fire regime from invasive grasses, such as *Bromus* spp. and *Schismus* spp.



Fire in the Mojave Desert

High-elevation desert shrubland

- Higher precipitation and more woody shrubs
- Sagebrush-steppe (Great Basin)
 - Normal fire return interval ≈ 30–100 years
 - With non-native annual grasses fire return interval has been reduced to as short as **five** years (Whisenant 1990)



Bipedal rodents



*Dipodomys
panamintinus*



*Dipodomys
merriami*

Quardupedal rodents



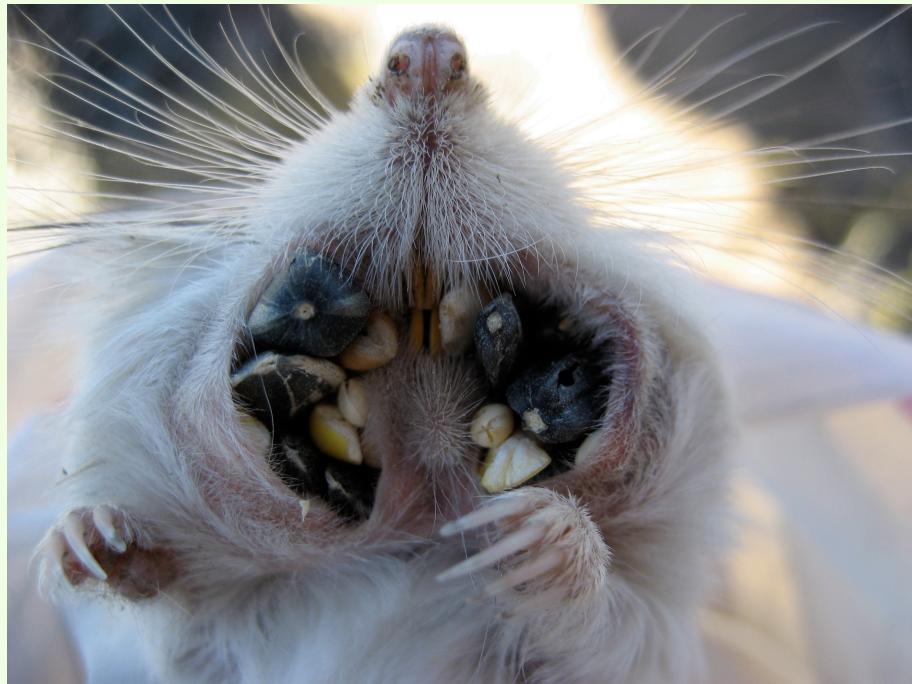
*Peromyscus
spp.*



*Neotoma
lepida*

Effects of fire on rodents

- Alters food resources and **predation risk**
 - Habitat
 - Moonlight



Objectives

- Determine how rodent abundance and diversity changes following fire
- Determine seed foraging rates in burned and unburned areas during different moon phases

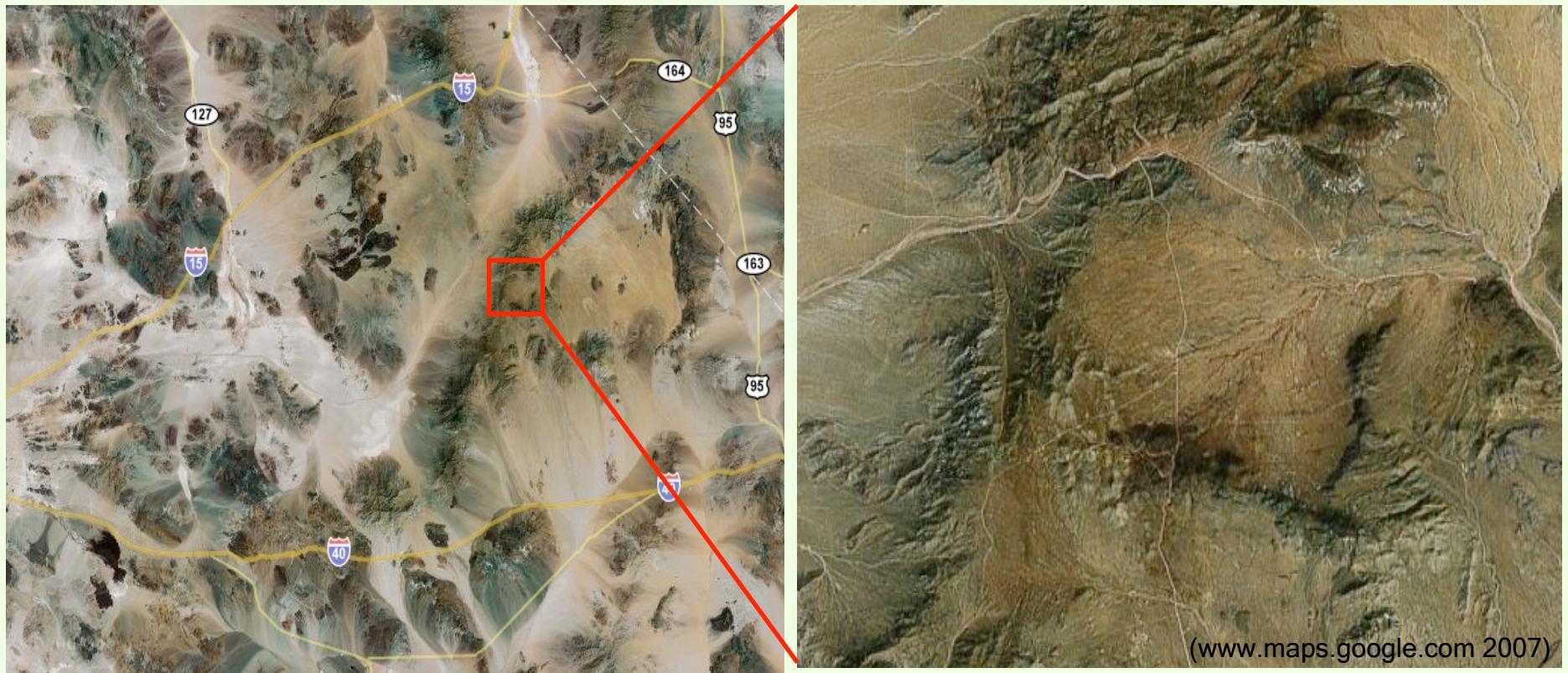


Hypotheses

- Less rodent diversity and lower abundance in burned areas
- Lower seed removal rates with higher predation risk
 - Burned areas
 - Full-moon nights

Study area

Round and Gold Valleys, Mojave National Preserve, CA



Study area

- Elevation 1,500–1,600 m
- Mean annual minimum and maximum temperature 11.3 and 22.5°C
- Mean annual precipitation 264 mm
- Dominant vegetation
 - Artemisia tridentata* (big sagebrush)
 - Juniperus osteosperma* (Utah juniper)
- Hackberry Complex Fire of July 2005

Rodent community response



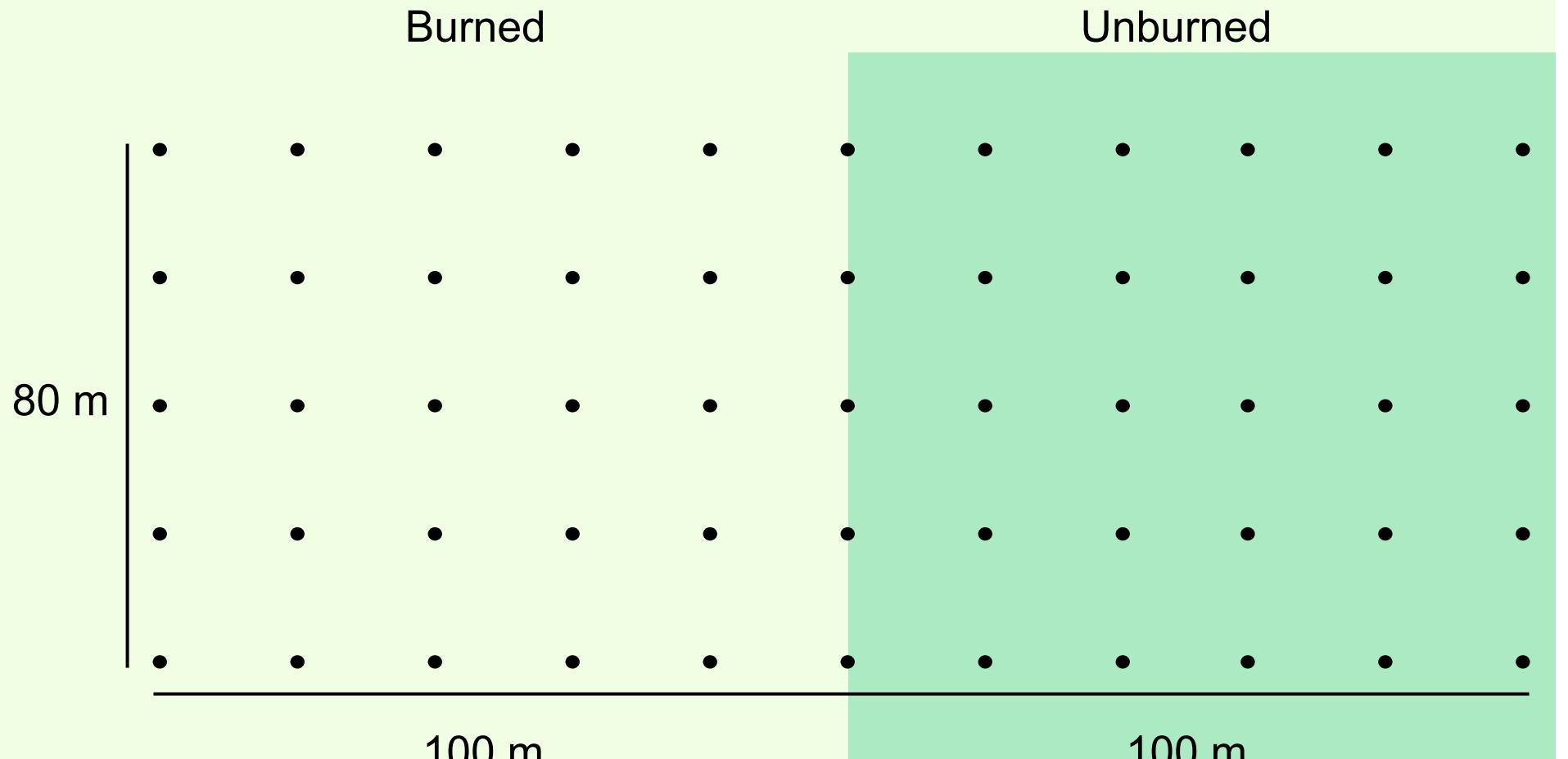
- Four grids 80 x 200 m along the perimeter of the burnline
- Trapped during full and new moon nights of June–August 2006
- Recorded number of captures, species, sex, reproductive status, age

Measuring seed removal rates

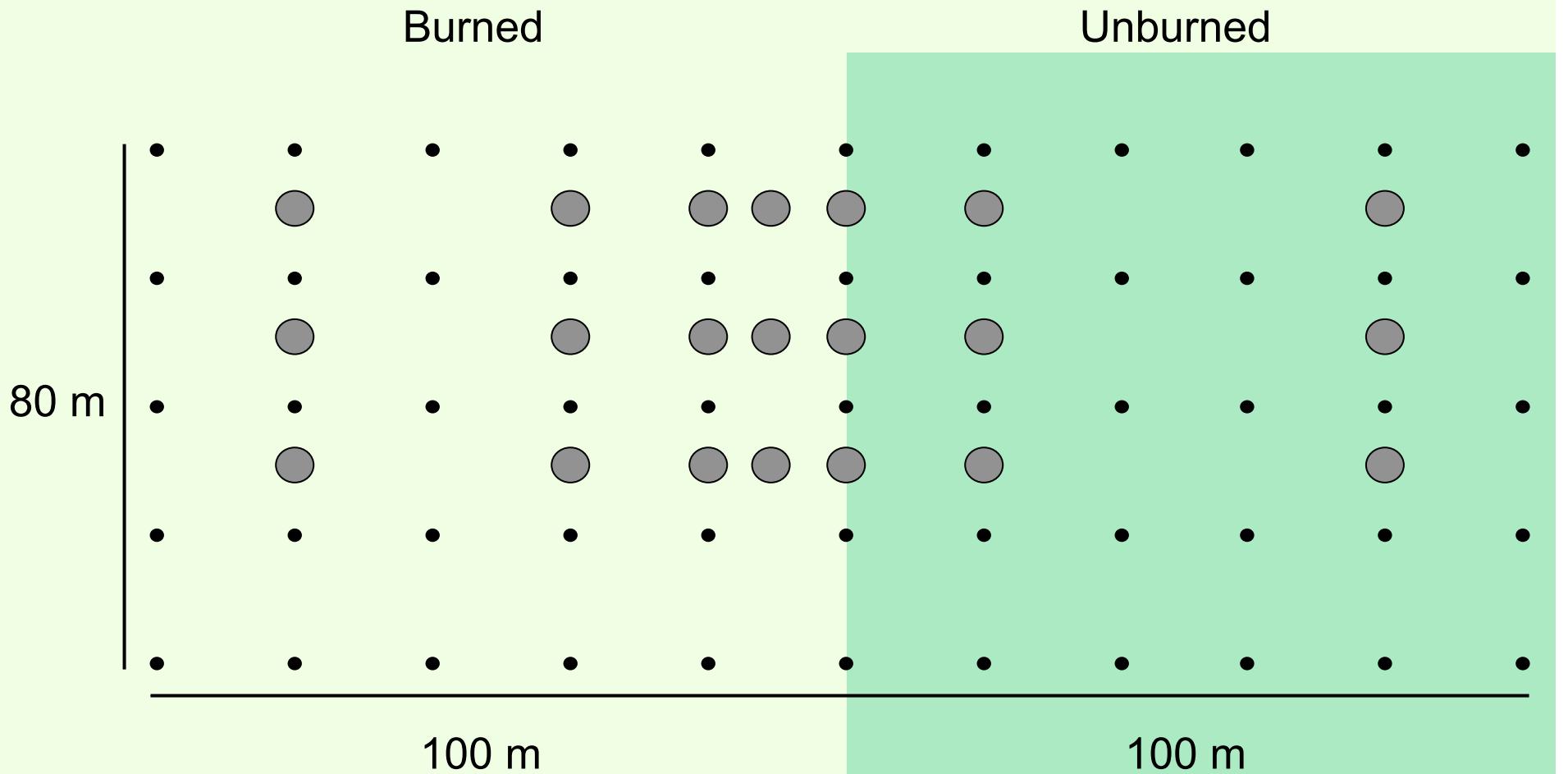
- Artificial seed trays
 - 2.0 L sand
 - 4.0 g millet
- Measure the amount of seed remaining per night
- Recorded during full and new moon nights of June–August 2006



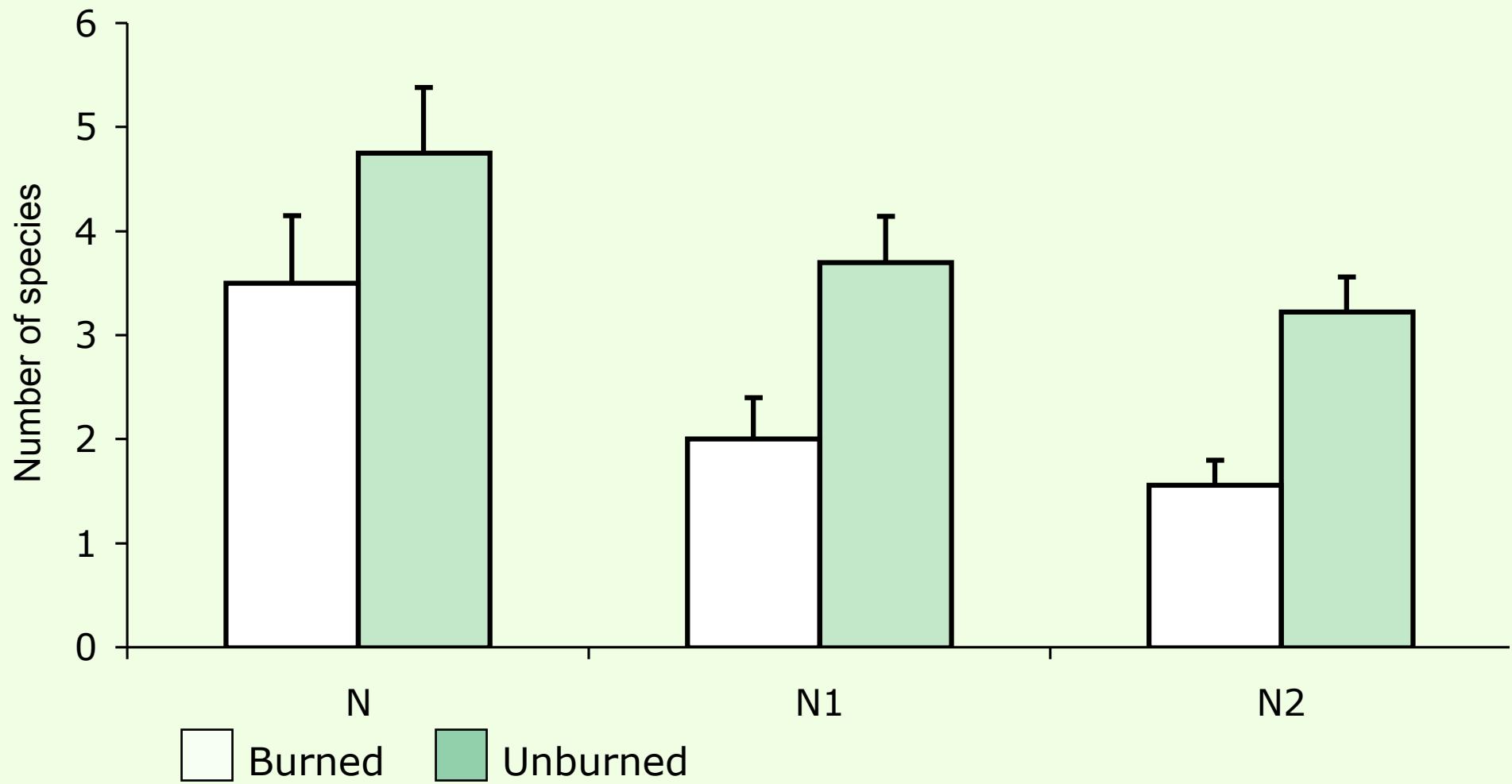
Trapping grid placement



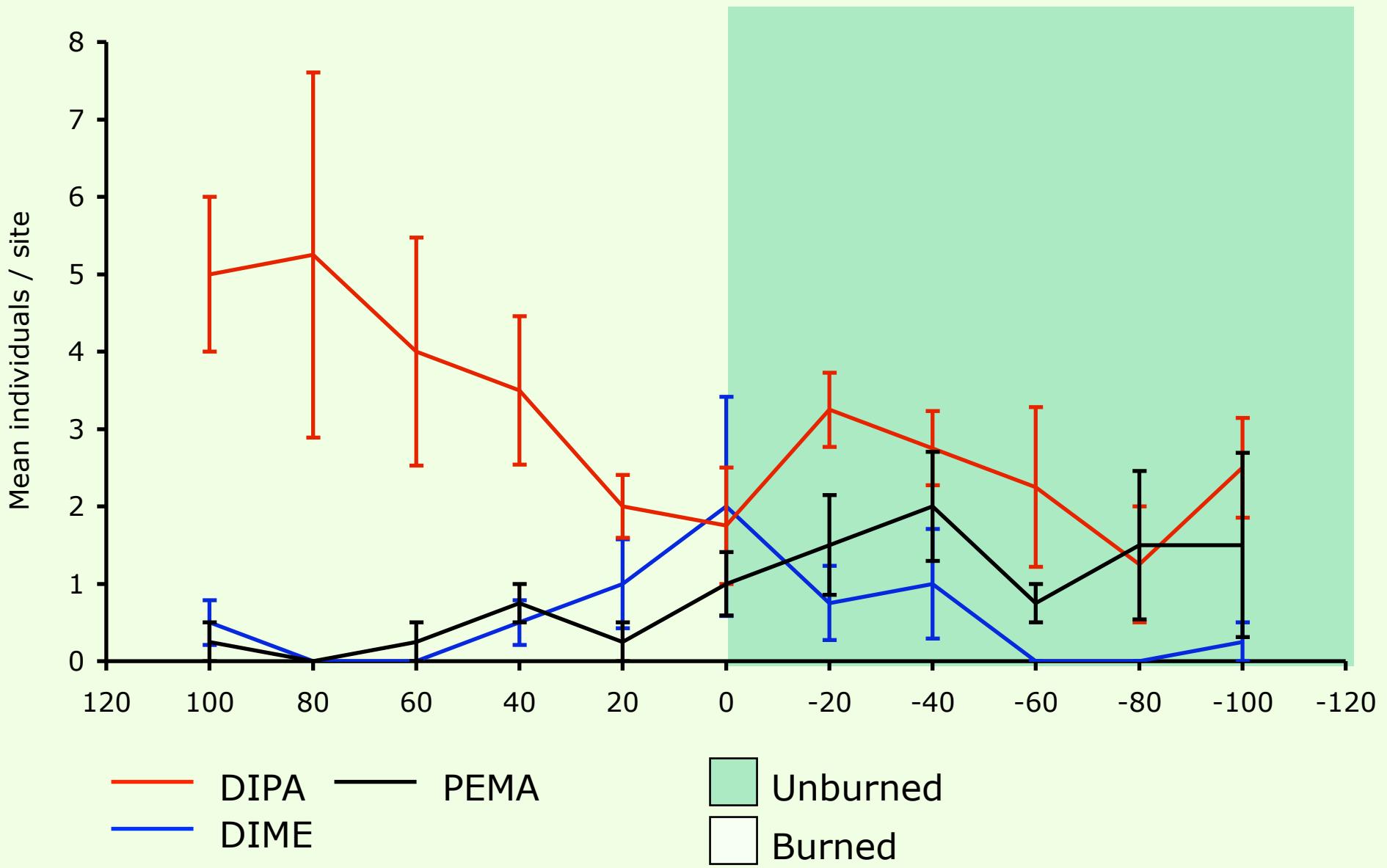
Trapping grid and seed tray placement



Rodent diversity one year post-burn

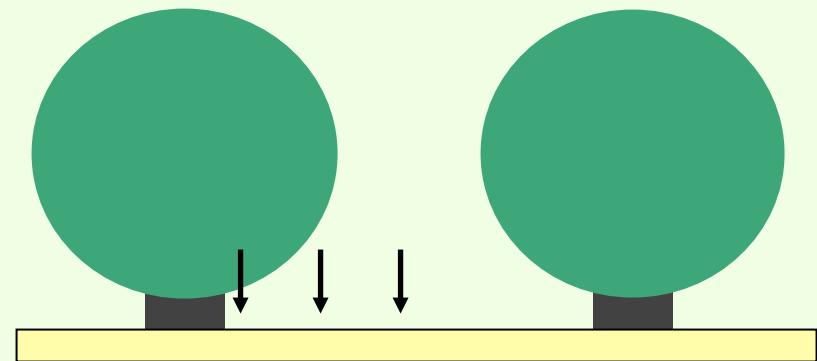


Rodent abundance one year post-burn

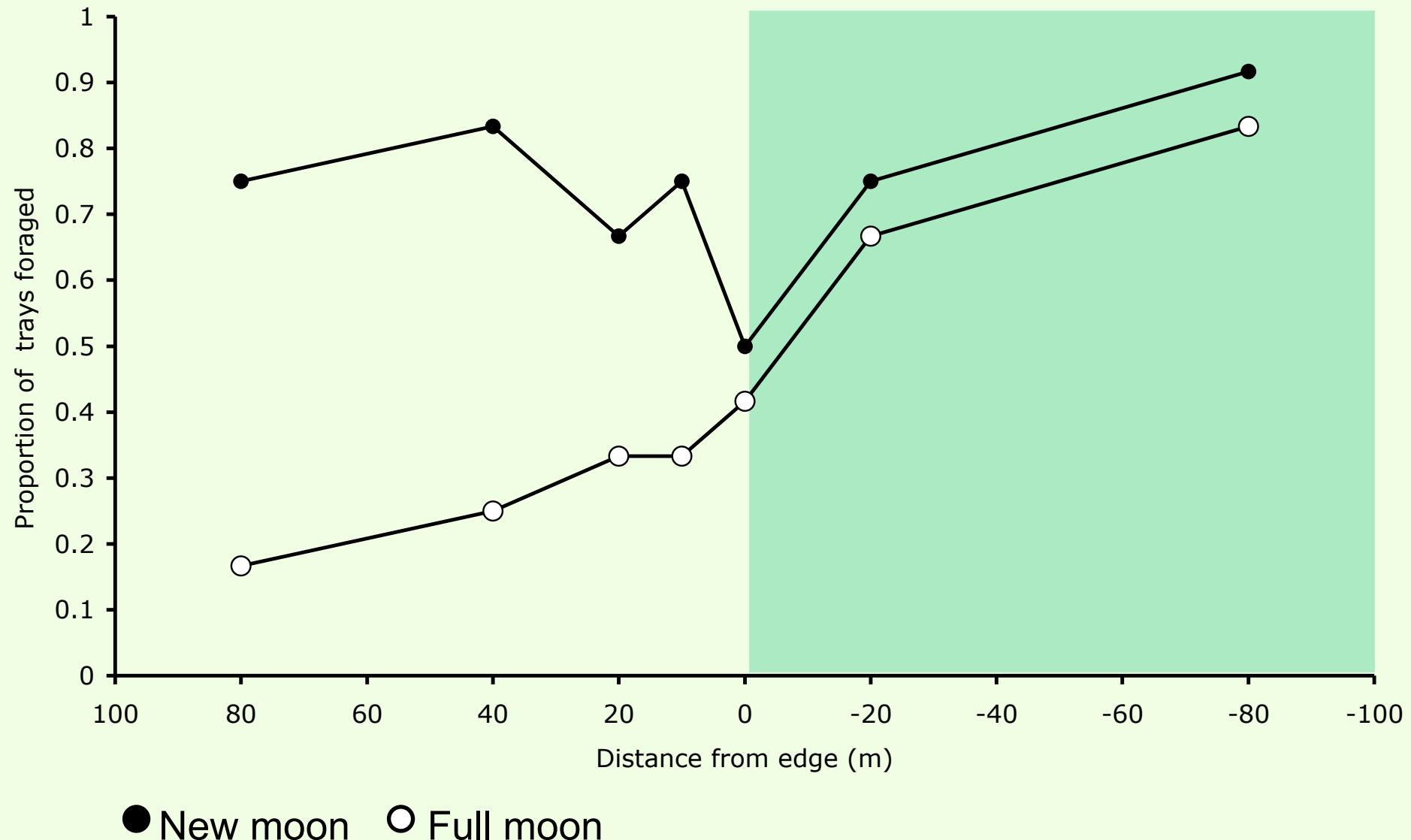


Summary of rodent response to fire

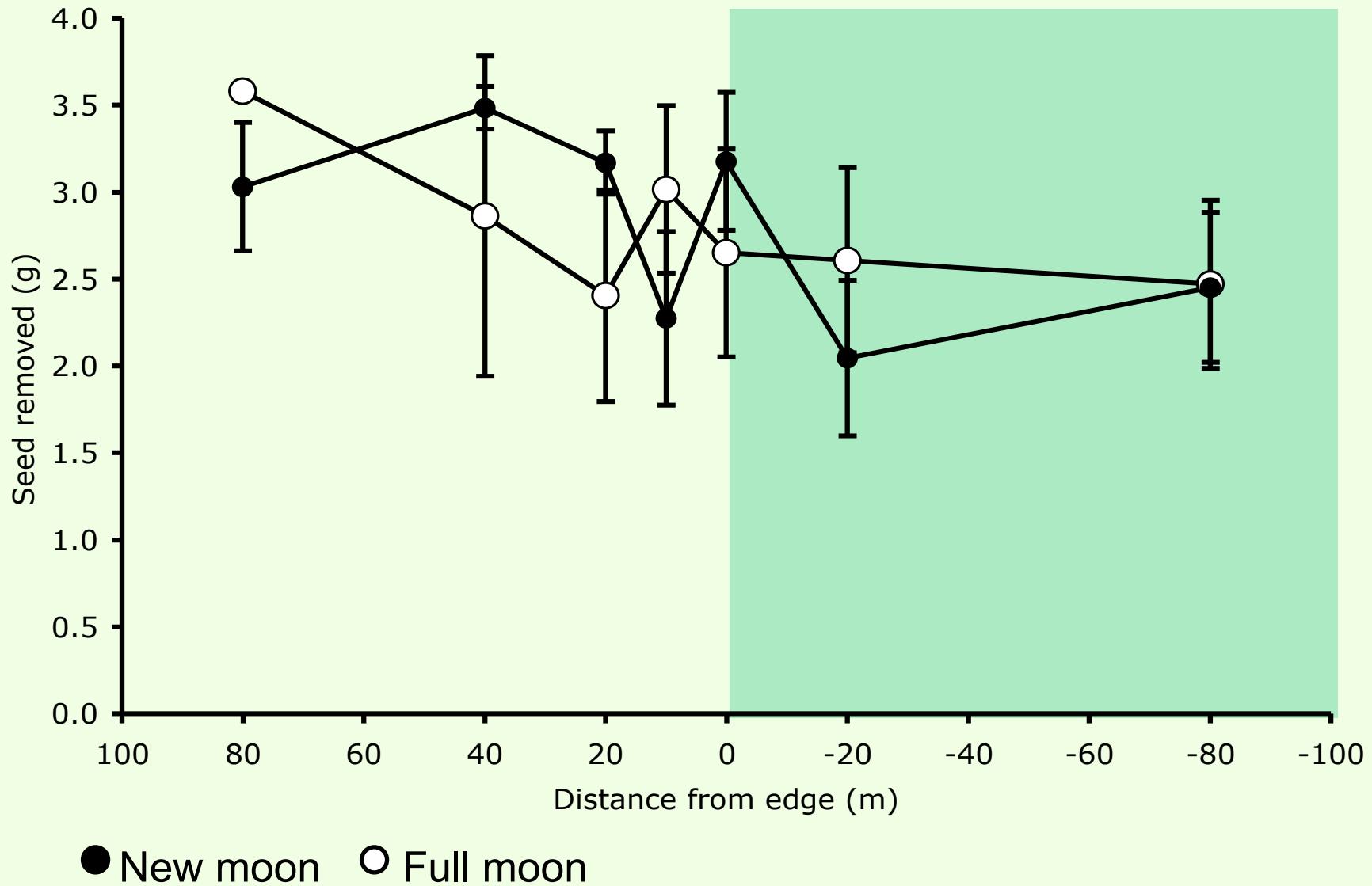
- Habitat use is similar to microhabitat use
 - *D. panamintinus* recolonized the burned area
 - Cricetid rodents use areas with more cover
- Community more diverse in unburned areas



Proportion of trays foraged one year post-burn



Seed removal rates one year post-burn



Significant findings

- In disturbed areas, kangaroo rats may influence plant recovery
- Further studies to determine their effects directly



Future results . . .

Exclosures

- No rodent access
- Rodent access

Exclosure locations

- Burned interior
- Burnline



Thank you

Questions / Comments

