

**The creeping loss of California's once  
widespread shrublands to pampas grass and  
other aliens**

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# The California Floristic Province is a center of plant diversity and rarity:

- ❑ contains over 4000 species,
- ❑  $\frac{1}{4}$  of all plant species in U.S.
- ❑ about  $\frac{1}{2}$  are endemic
- ❑ 218 taxa are state listed as RTE

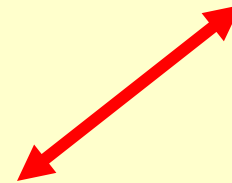
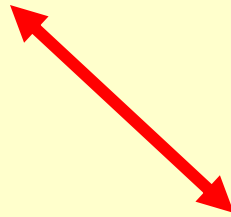


# This diversity is threatened by an Axis of Evil

Habitat Loss



Habitat modification



Non-native species

# Maritime chaparral and coastal sage scrub

- ❑ Rich in locally endemic species.
- ❑ As little as 10% left
- ❑ Relatively resistant to invasion....
- ❑ But this is changing



# Vandenberg Air force Base

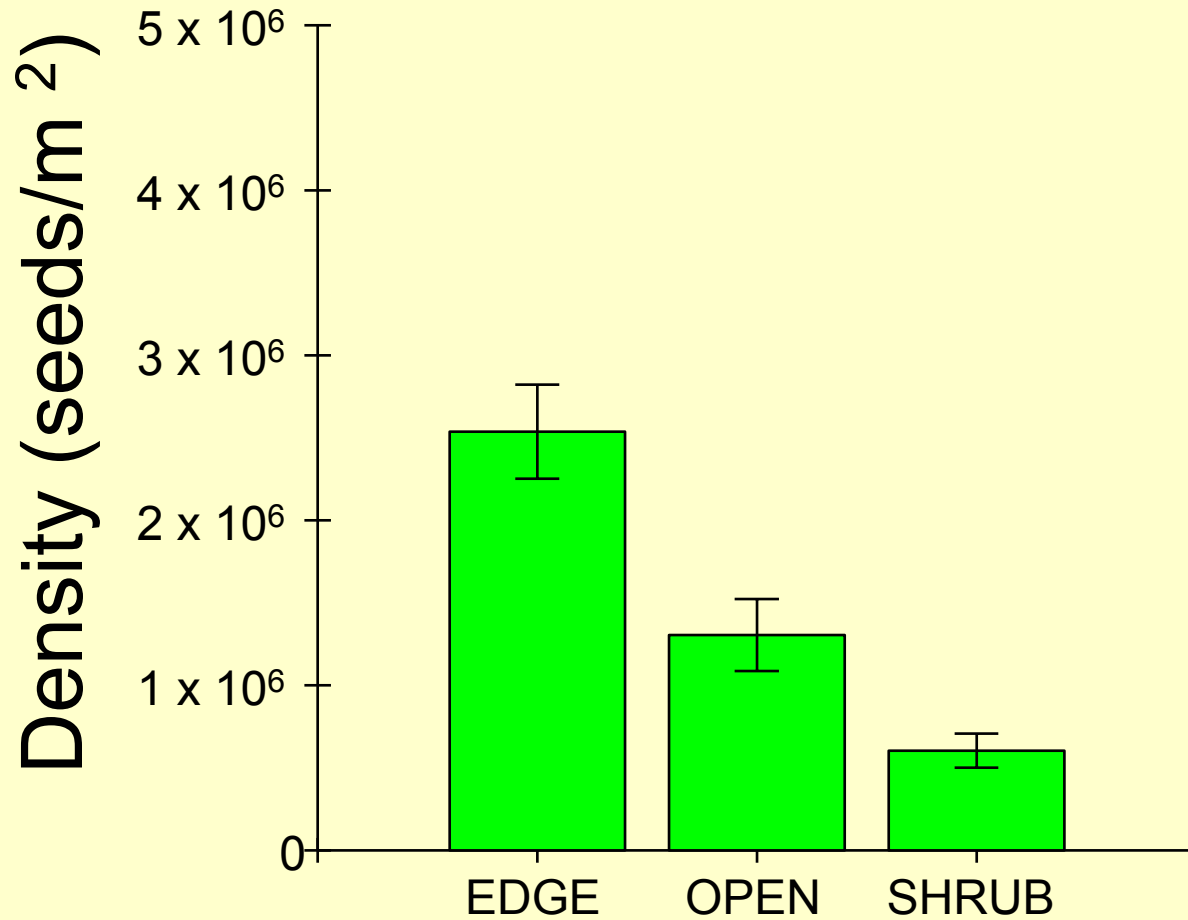
Burton Mesa Chaparral



Jubata Grassland

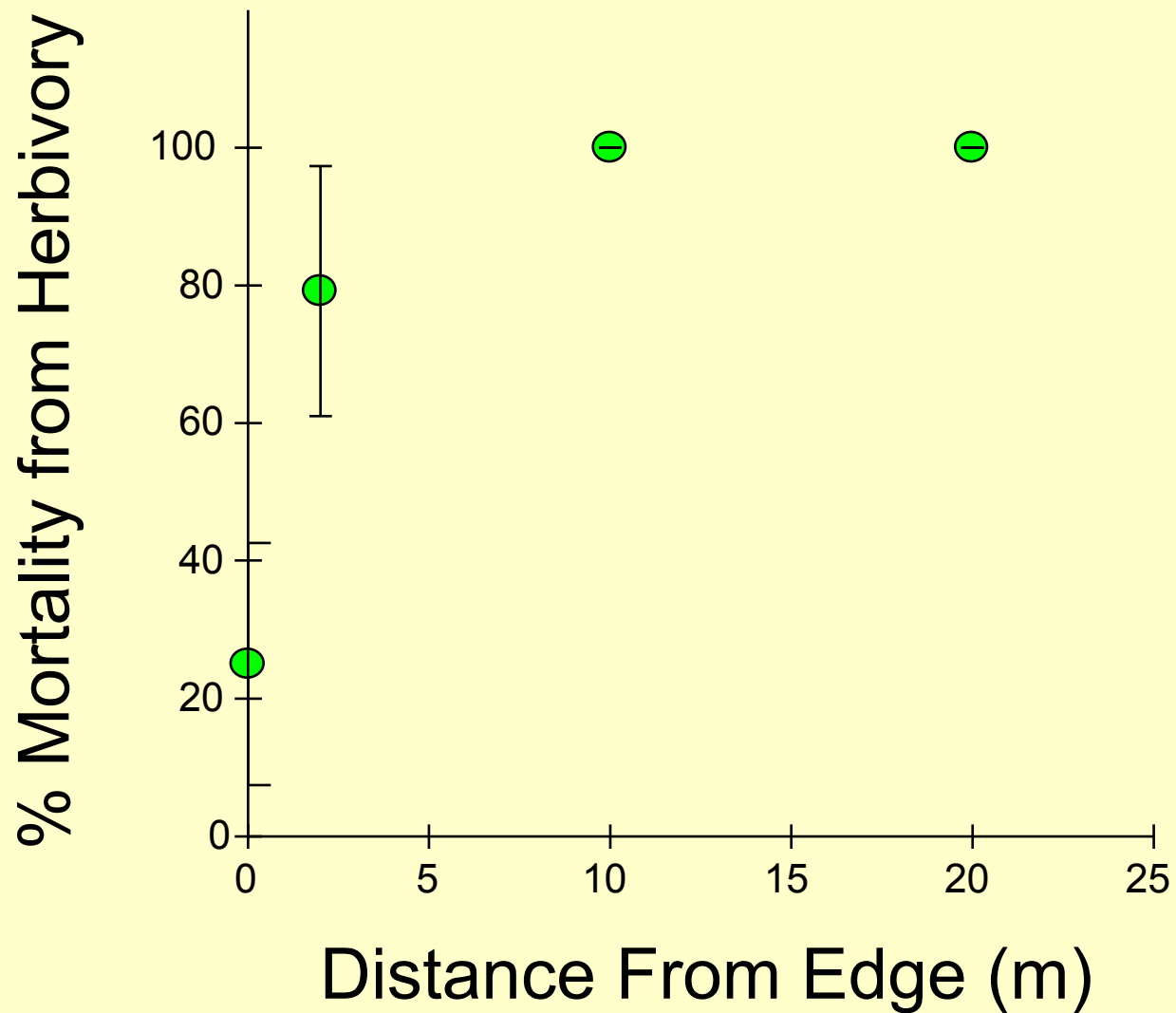


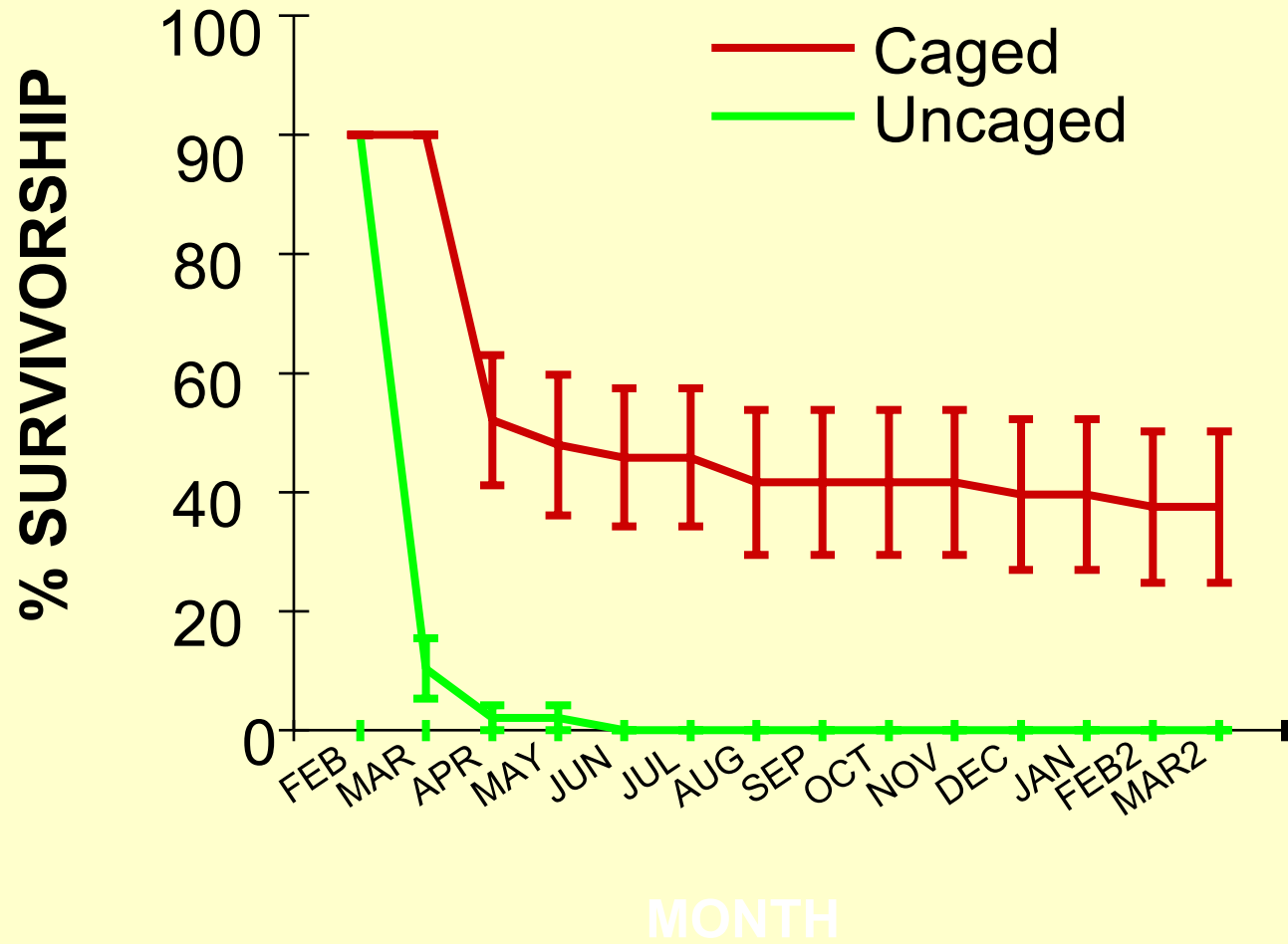
# Physical barrier to seed dispersal





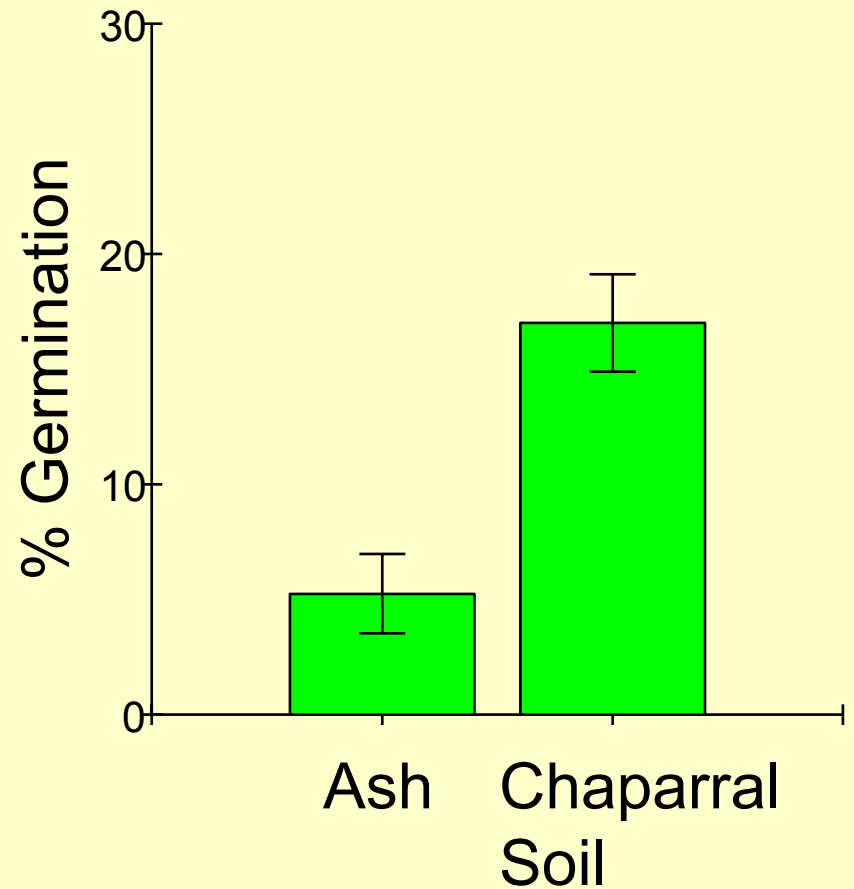
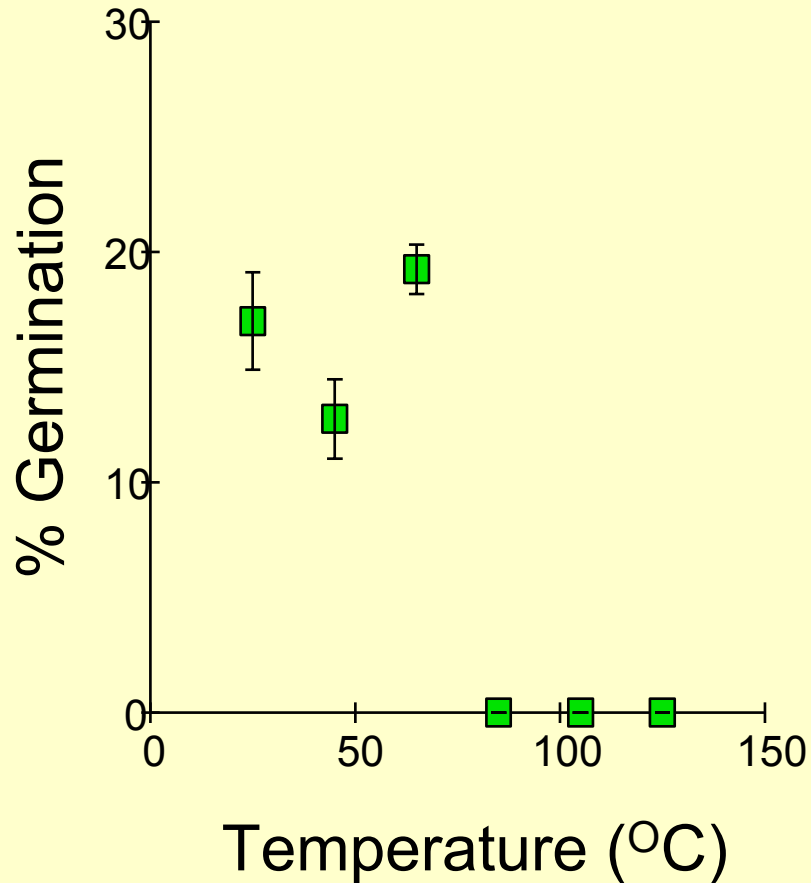
# Small mammal herbivory



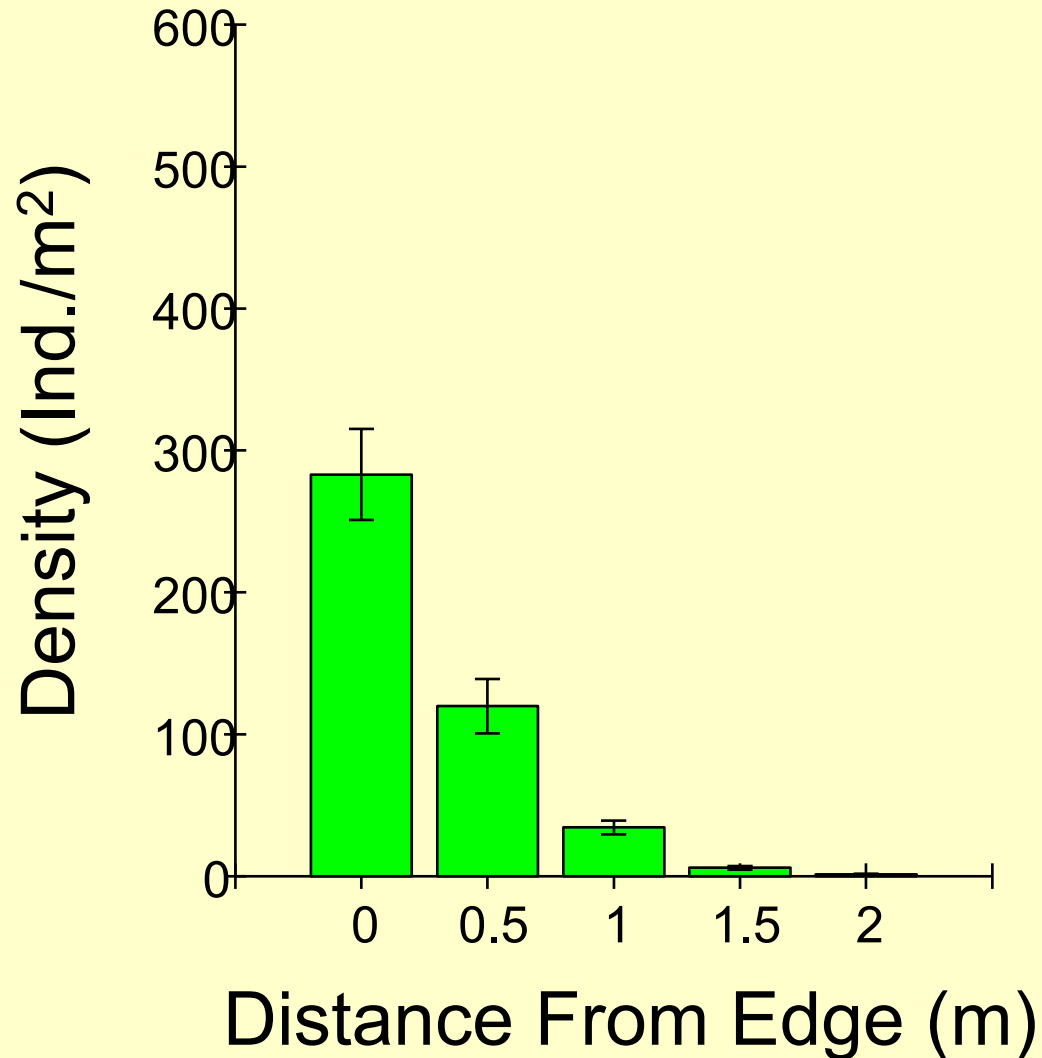




# Wildland fire is a barrier to invasion

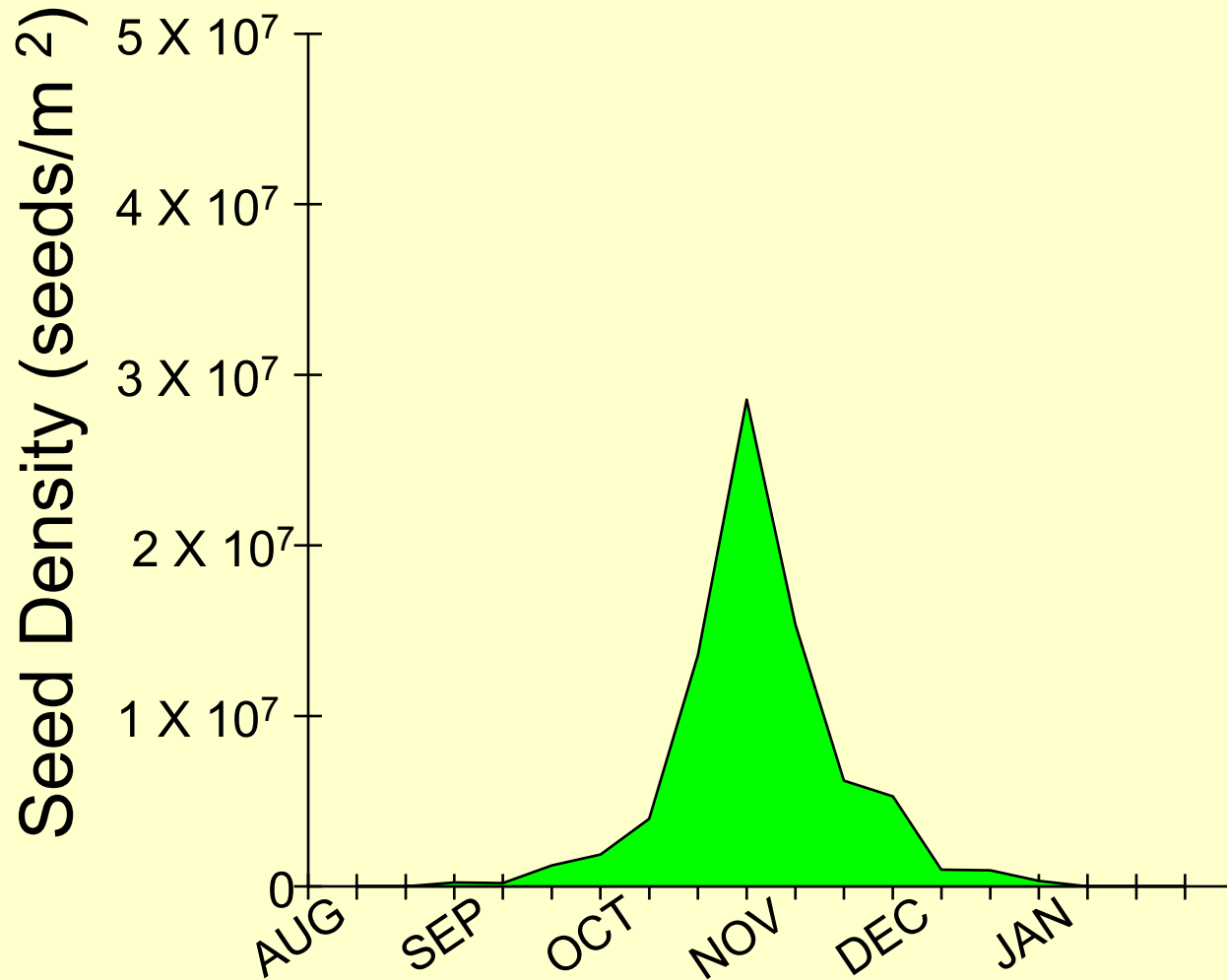


## The probability of establishment is low

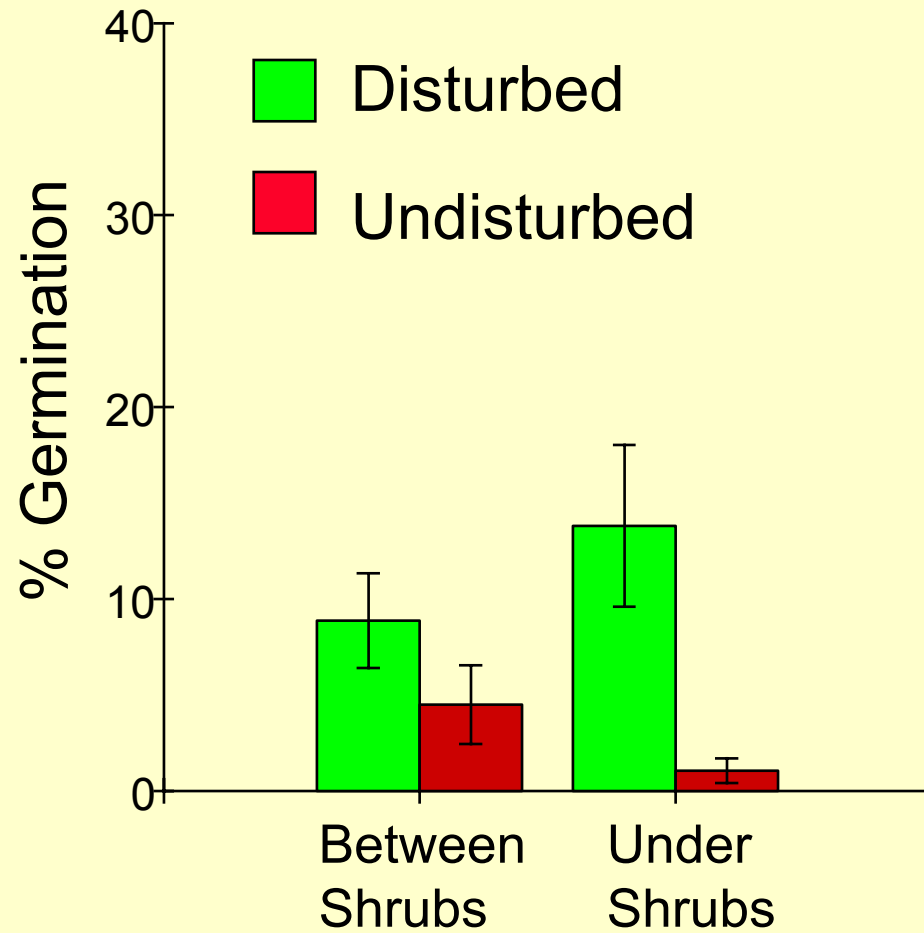




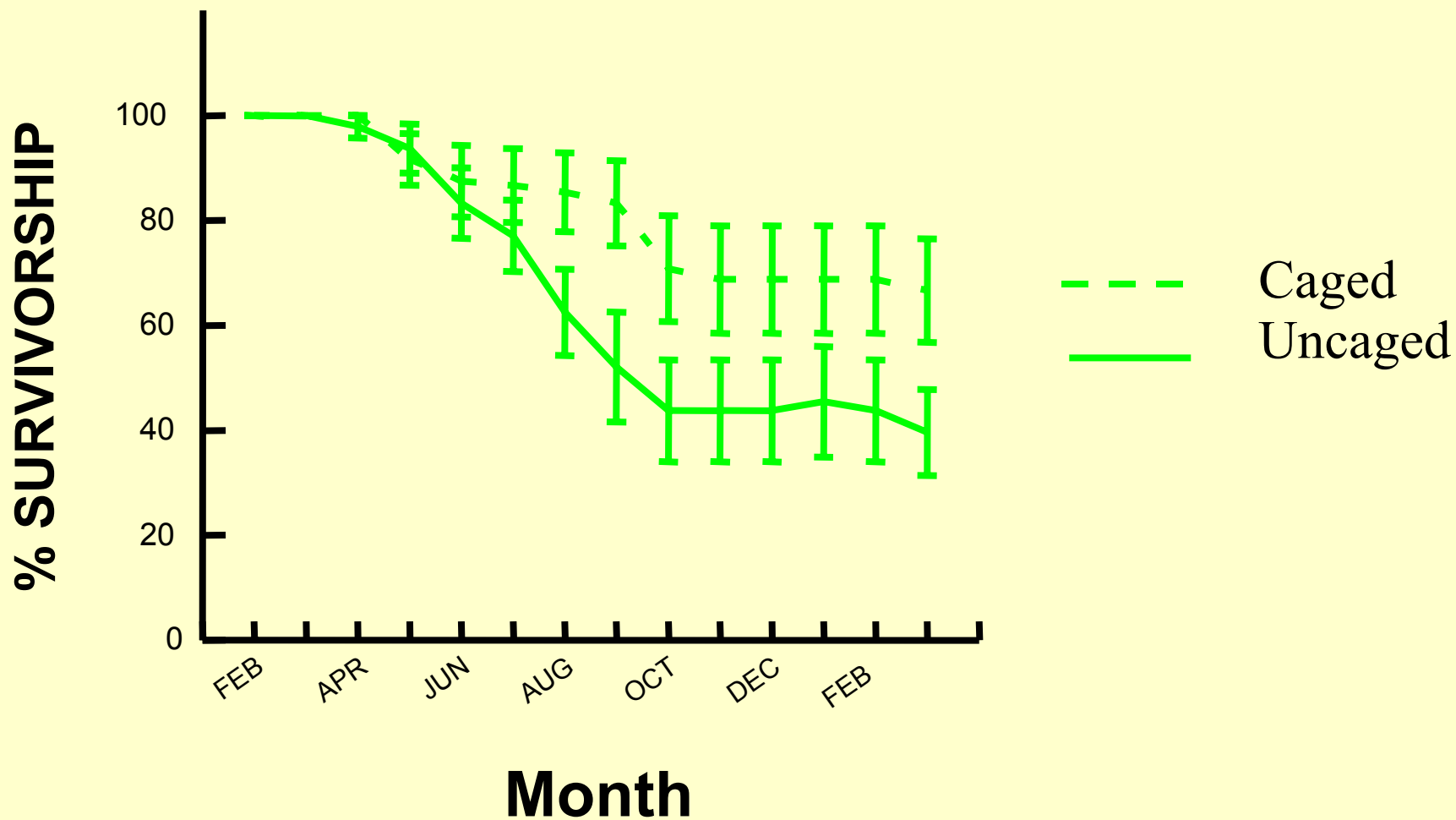
# Huge propagule pressure!



# Disturbance



# Reduced herbivory

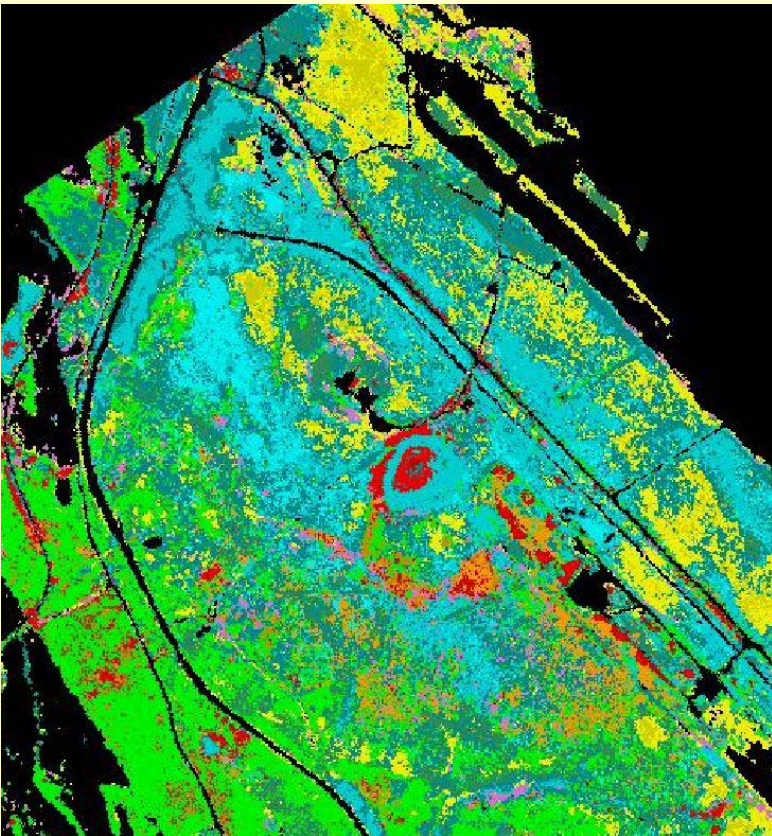


# **Established plants are resistant to herbivory and fire**



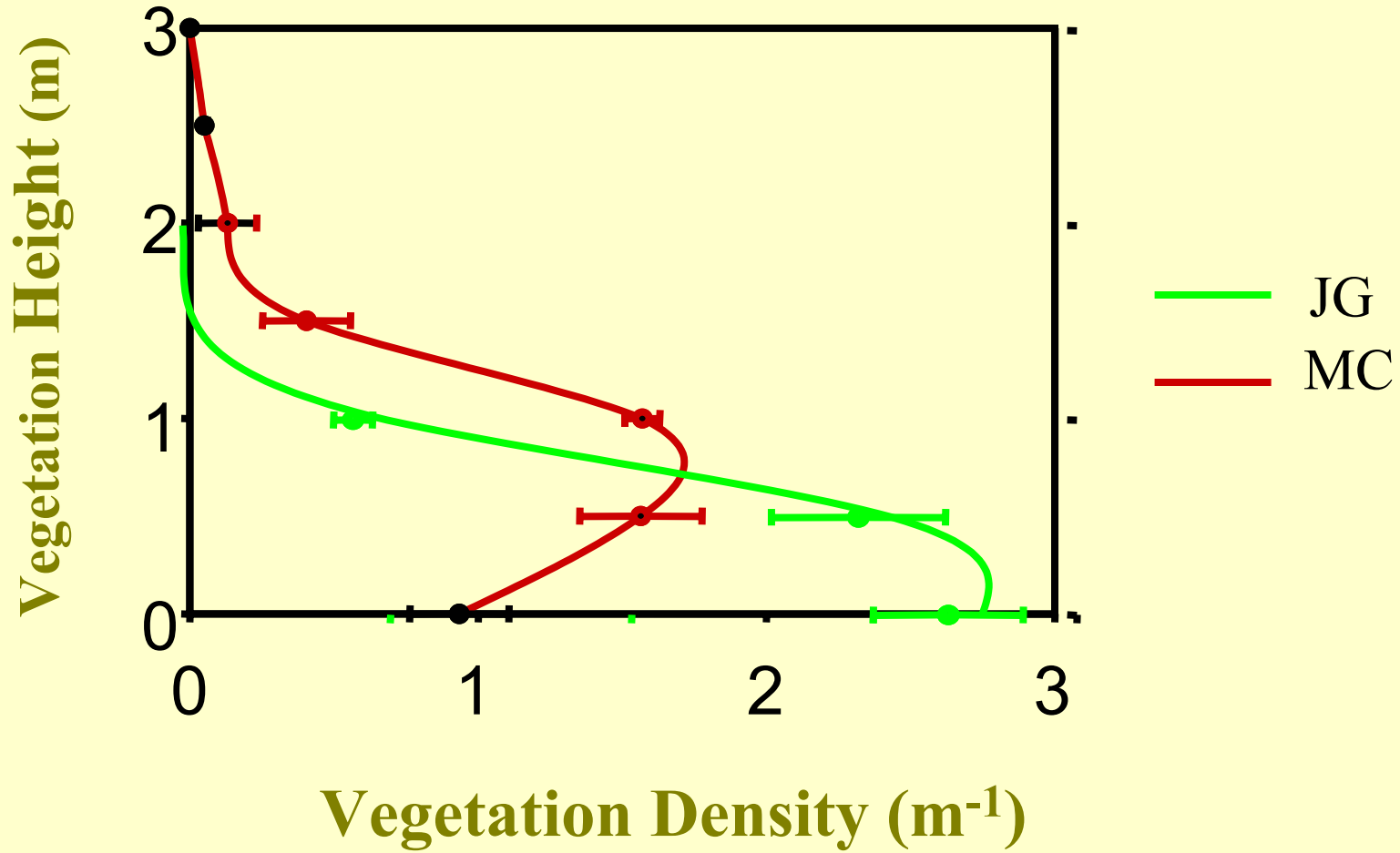


Since the 1980's there has been  
a creeping expansion of meadows

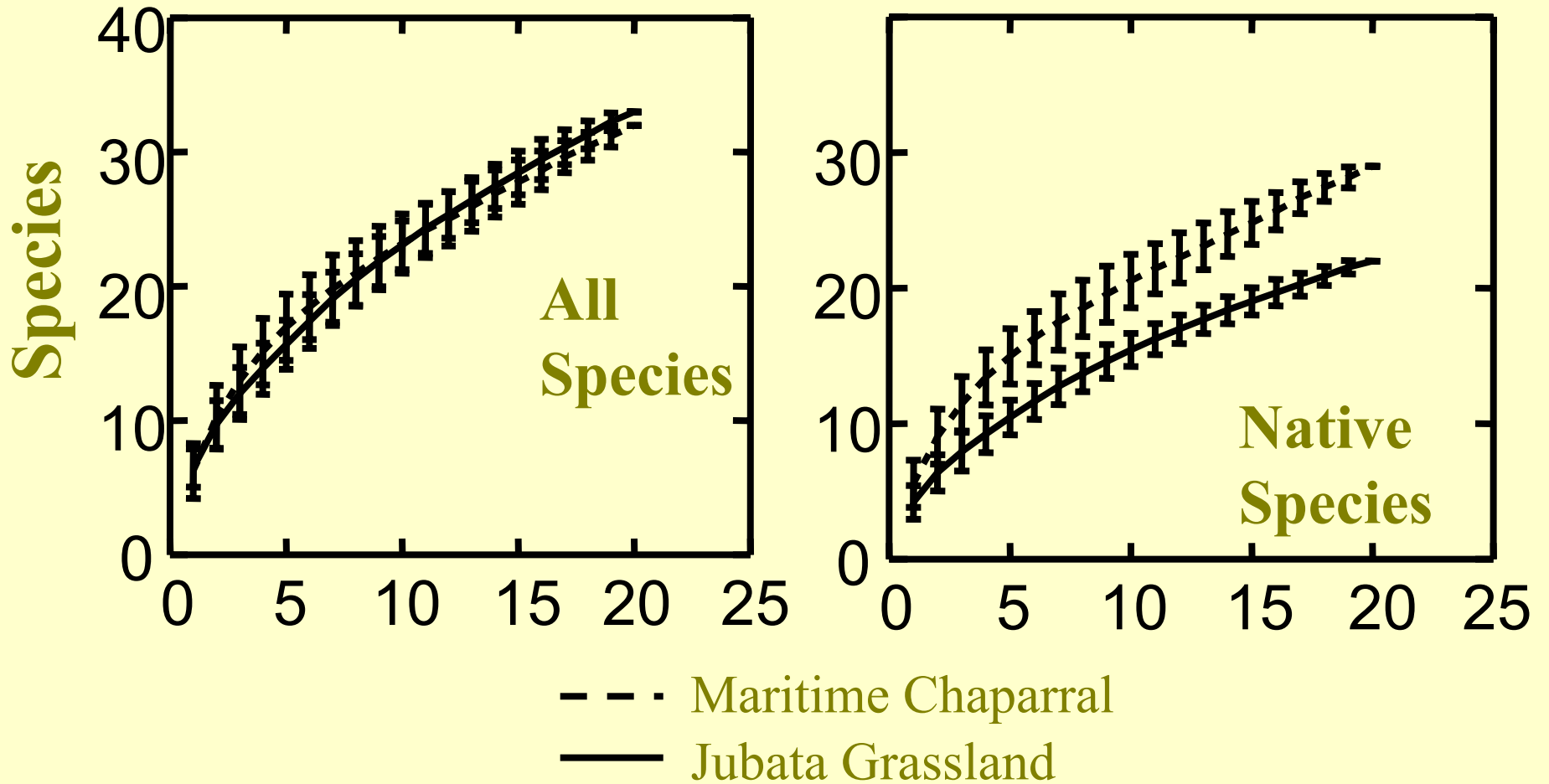


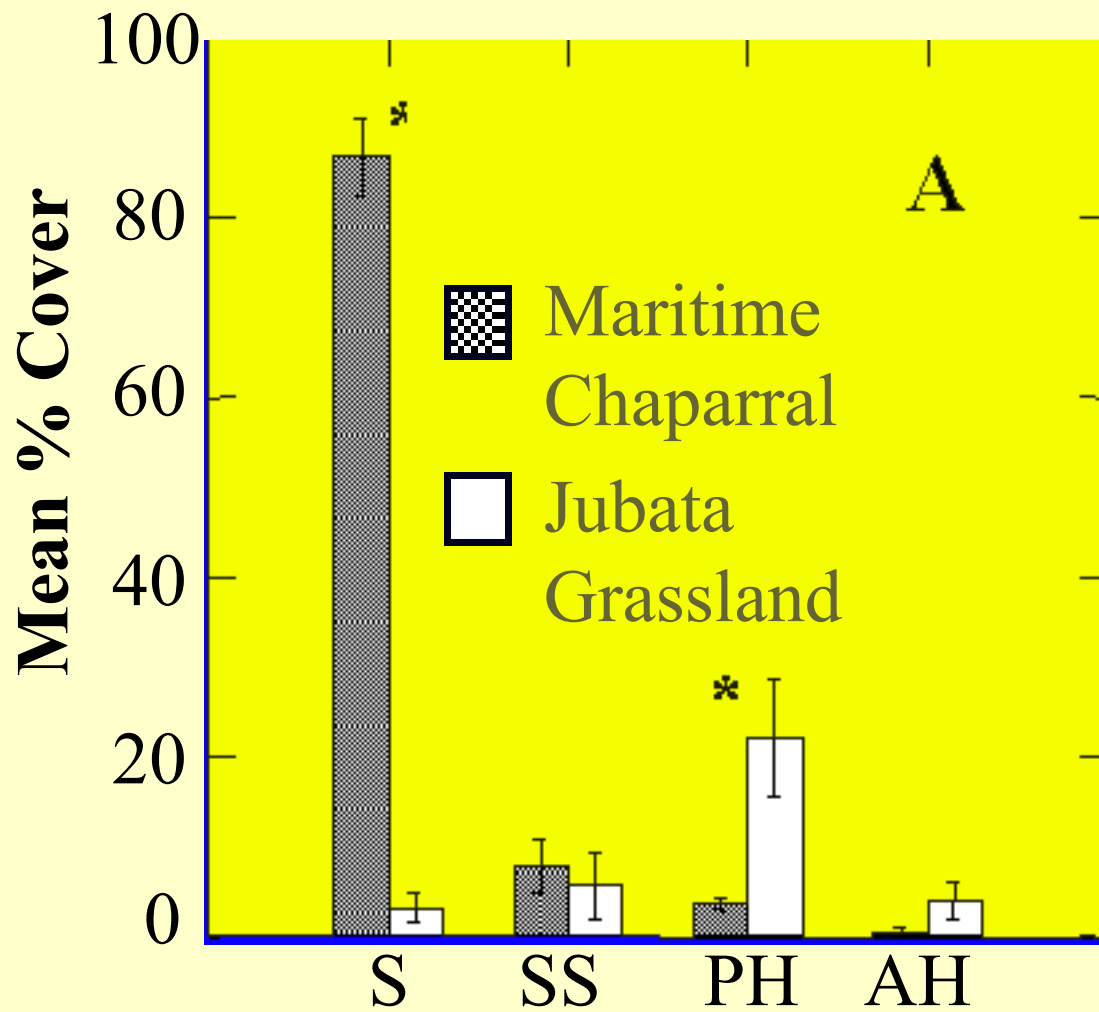
Courtesy CSTARS, UC Davis

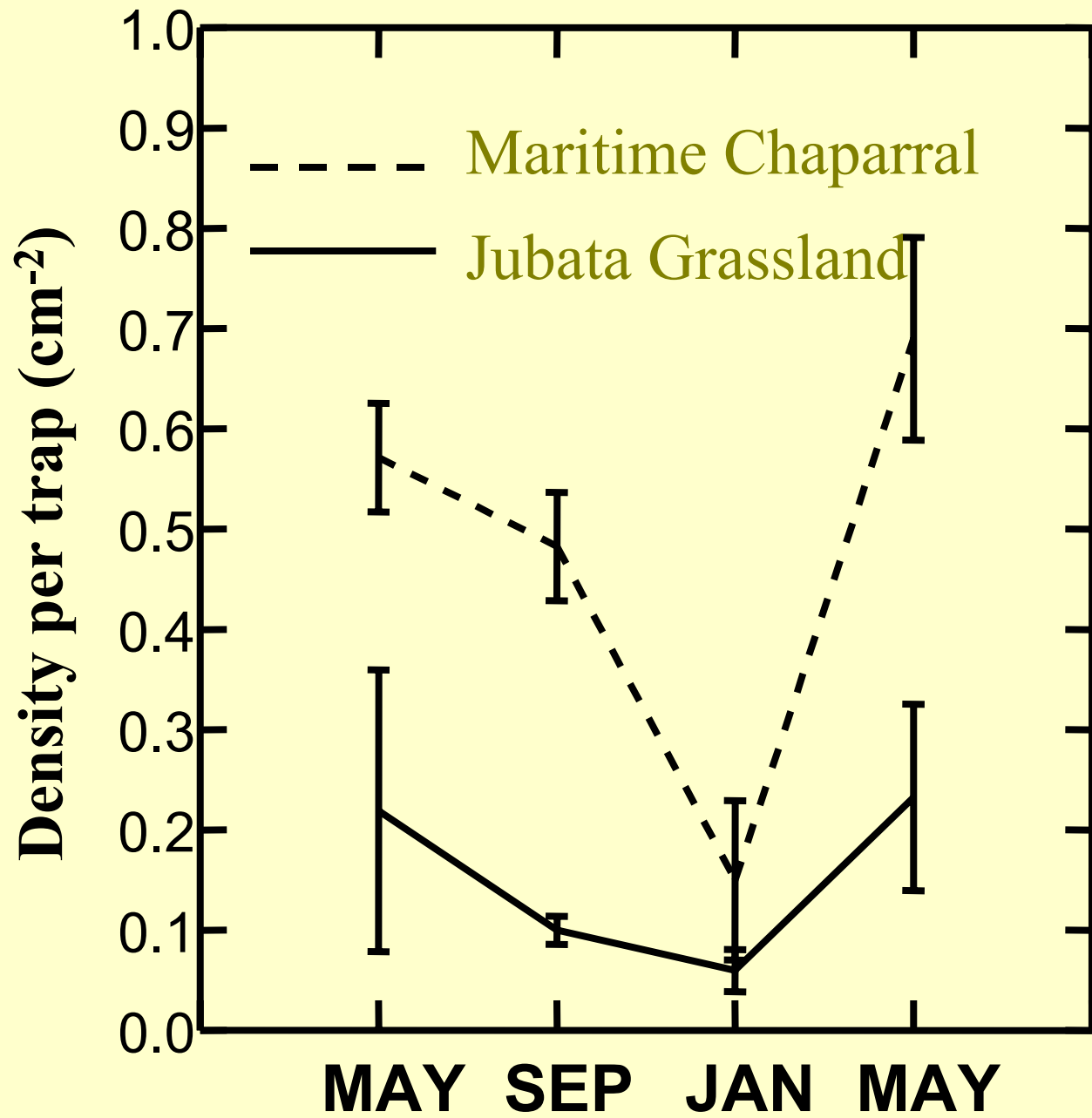
# Jubata grassland is structurally less complex than chaparral



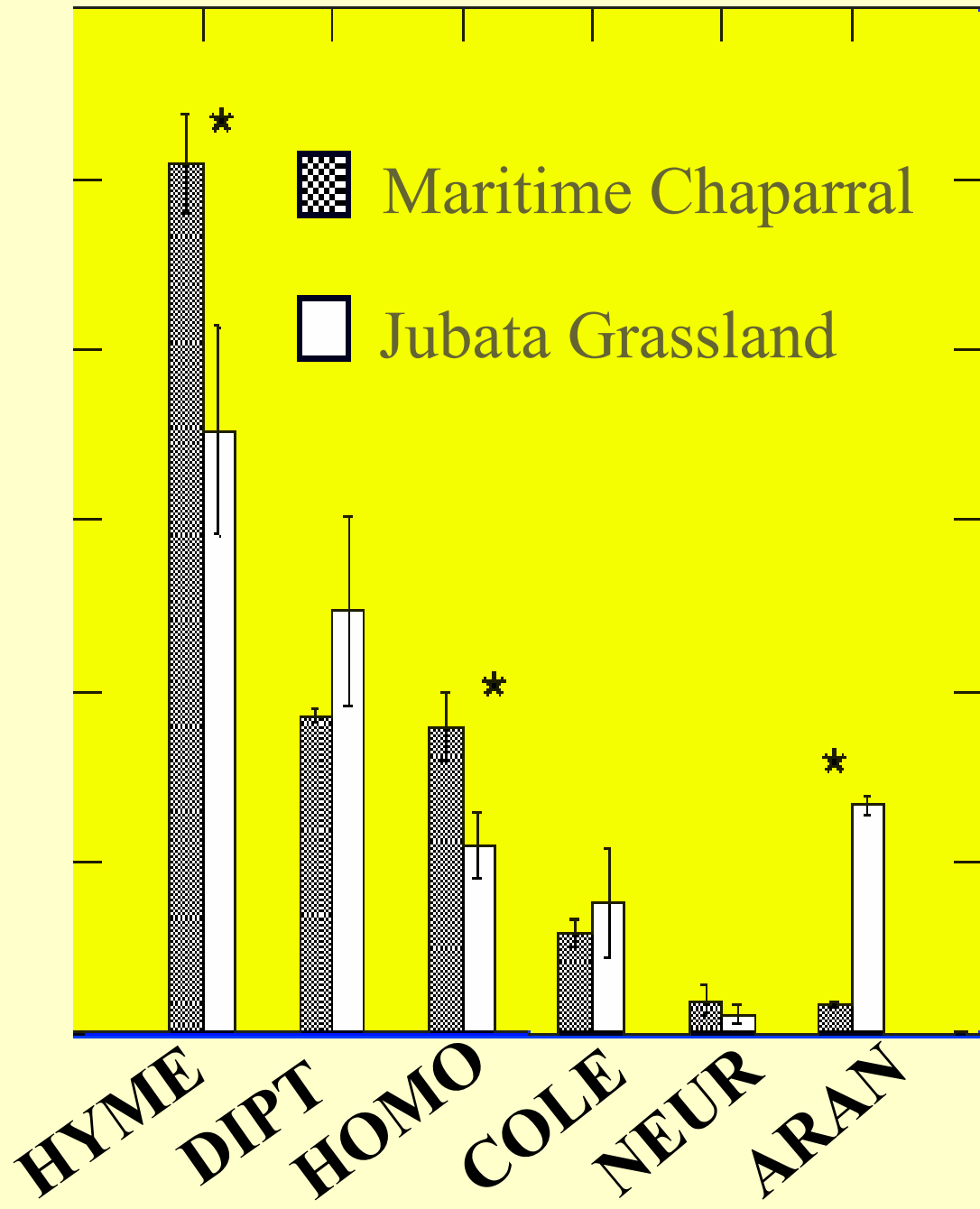
# Reduced native species diversity







**% of Arthropods Trapped**

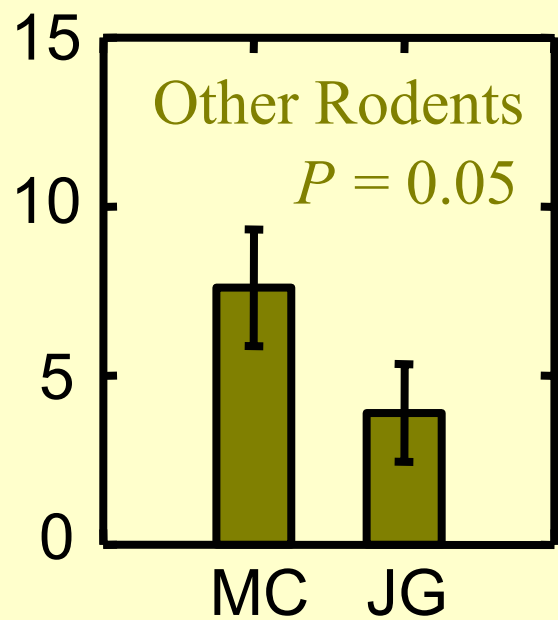
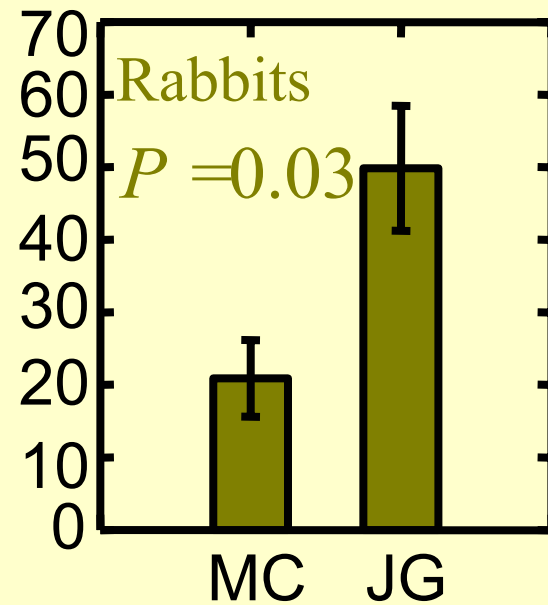
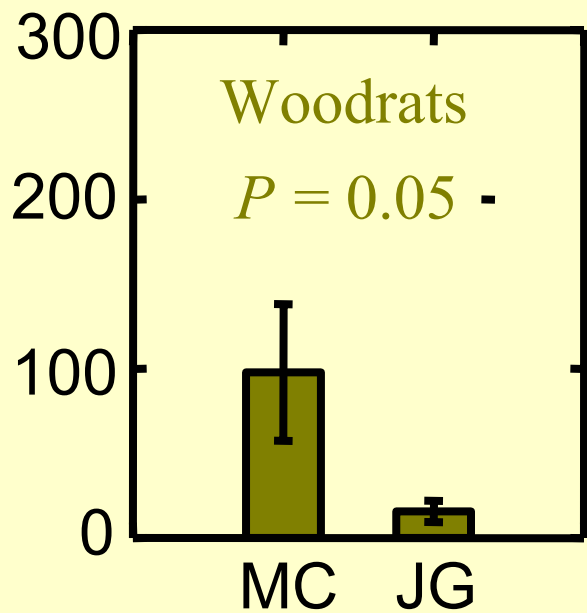


Absent from  
Jubata Grassland:

Hemiptera  
Orthoptera

Odonata  
Opiliones

Scat Density ( $\text{m}^{-2}$ )





***Cortaderia selloana* in coastal sage scrub**



# Conclusions

- ❑ Propagule pressure and community resistance interact to influence invasion dynamics.
- ❑ Long lived non-native perennials can slowly change native community properties even in the absence of other extrinsic disturbances.
- ❑ The generalized processes of fragmentation, disturbance, and propagule availability may be as important as the individualistic properties of non-native species or native communities.