Lizard Abundance in Managed Central California Grasslands





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East Bay Regional Park District

Provides habitat for:

- 23 threatened & endangered species
- 57 species of special concern





Livestock grazing studies in the West

Positive correlations between grazing and some lizard species.

> (Busack & Bury, 1974) (Jones, 1981a)





BLM livestock grazing study

- California's southern San Joaquin Valley:
 - Heavy growth of non-native grasses depress populations of
 - Blunt-nosed leopard lizard





(Germano, Rathbun and Saslaw, 2001)

Lizards as indicators of grassland health





- Western Fence Lizard:
 - California's most common lizard
 - Important prey species for State & Federally threatened Alameda Whipsnake



Lizard Abundance

- Grazed and ungrazed grassland communities.
- Relation to differing RDM levels.
- Western fence lizard size class abundance in grazed and ungrazed grassland communities .



Study Sites

- Garin Regional Park, Hayward CA
- Sunol Regional Wilderness, Sunol CA







Treatment sites

- Grazed all year
- Seasonal grazed
 - December to June.
- Ungrazed
 - More than 15 years.









Measuring Residual Dry Matter

- RDM: 3 samples at each trap array.
- RDM calculation:
 Grams per sample x conversion
 factor = lbs per acre (1 acre = 0.4 hectares).





Grazing Levels & RDM:

- Light > 1000 lbs per acre.
- Moderate 1000 to 750 lbs per acre.
- Heavy < 750 lbs per acre.





Sampling Method

- Three drift fences (24 feet).
- 4 four gallon buckets per trap array.
- Jones (1981a & b) design





Sampling Method

- Pitfalls sheltered from direct sunlight.
- Trap-cover locking system.
- Damp nontoxic sponge.
- "Safe-houses".





Sampling Period

- Traps checked every 24 hours.
- Maximum of three consecutive days.
- Three field seasons June thru August.





Permanent Marking Methods

- Toe Clipping: Lizards between 40-80 mm SVL (sub-adults and adult WEFE).
- Recaptures provided:
 - Natural growth rates
 - Population estimates





Temporary Marking Methods

- Color tattooing: Lizards between 20-80 mm SVL (Tinkle, 1967)
- Recaptures provided:
 - Lizard abundance
 - Individual recognition



"A perfect 10"



Results





Four species trapped



Western Skink



Western Fence Lizard





Northern Alligator Lizard



California Whiptail Lizard

Results Lizard Species Totals 2002 to 2004



Mann-Whitney U (n=616, Tied p-value <0.001) for Western Fence Lizard & Western Skink, and (Tied p-value <0.01) for Alligator lizard. No significant difference for California Whiptail .



Results

Significant difference in Western fence lizard and Western skink abundance in grazed versus ungrazed grasslands.





Results Lizard Abundance & RDM



Bivarariate Regression value = .128.

Results

Significant relationship between RDM and lizard abundance.







Kruskal-Wallis (Tied p-value <0.001) for male & female. Juvenile no significant difference.



Results

Adult size classes were more abundant in grazed versus ungrazed treatments.





Western fence lizard

Conclusion

Lizard abundance tends to be higher in managed, grazed grasslands than in ungrazed grasslands at our study sites.





Management Implications



Local research will help us shape vegetation management strategies to maintain grassland communities.



Management Implications

Maintaining biological diversity in Central California grasslands may depend on a mosaic of different vegetation types.





In-depth, local, long-term monitoring and multidisciplinary studies are needed to better understand and manage special status grassland dwelling species.



Acknowledgments Wildlife Volunteers

- To date more than **408** dedicated wildlife volunteers have helped.
- To date more than **2800** hours of volunteer service on this research effort.
- Cost savings to the District of \$84,000.



"Lizard Legionnaires"



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