

Coast Horned Lizards  
*Phrynosoma coronatum*

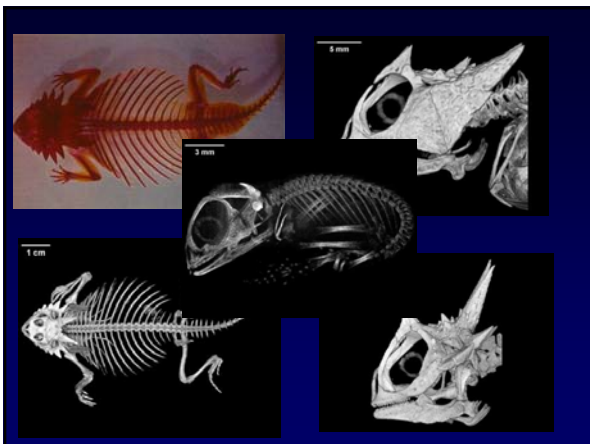
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San Diego coast horned lizard  
*Phrynosoma coronatum blainvillii*



desert horned lizards  
*Phrynosoma platyrhinos*



harvester ant - primary prey

## Horned Lizard Predators

### Reptiles

collared lizard  
leopard lizard  
sidewinder  
rattlesnakes  
whipsnakes

### Mammals

cats  
dogs  
coyotes  
foxes  
grasshopper mice  
round-tailed  
ground sqrl.  
humans

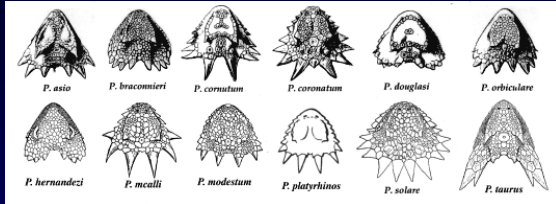
### Birds

roadrunners  
kites  
harriers  
several hawk spp.  
several owl spp.  
kestrel  
caracara  
ravens

after Brattstrom, 1996



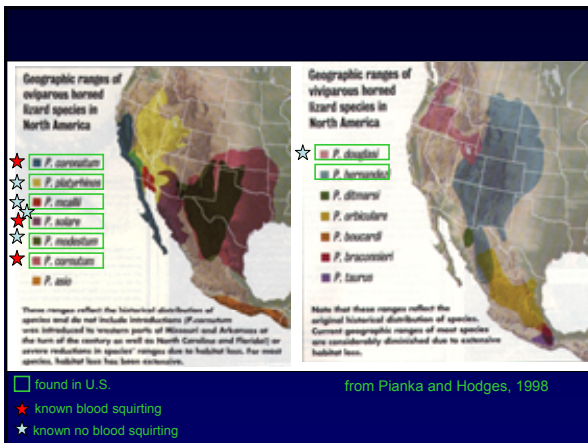
variable dorsal coloration



from Pianka and Hodges, 1998



Texas horned lizard  
Phrynosoma cornutum



## Coast Horned Lizards *Phrynosoma coronatum*

California Horned Lizard (*P. c. frontale*)

San Diego Horned Lizard (*P. c. blainvillii*)

Northern Peninsular Horned Lizard (*P. c. schmidtii*)

Central Peninsular Horned Lizard (*P. c. jamesi*)

Cedros Island Horned Lizard (*P. c. cerroense*).

Cape Horned Lizard (*P. c. coronatum*)

❖ Grismer and Mellink, 1994 and Brattstrom, 1997 suggest *P. coronatum* to be a monotypic taxon

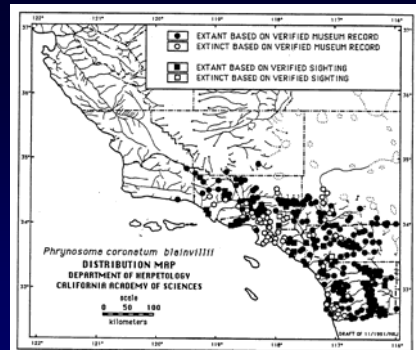


Figure 34. Historic and current distribution of the San Diego horned lizard (*Phrynosoma coronatum blainvillii*) in southern California based on 610 locations from 1054 museum records and 109 records from other sources.

from  
Jennings  
and Hayes,  
1994

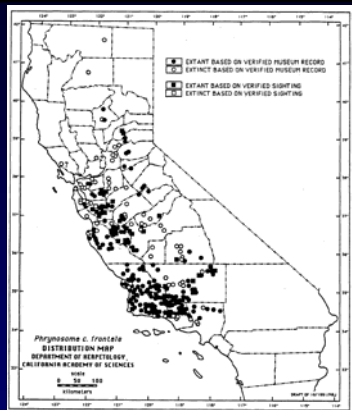


Figure 35. Historic and current distribution of the California horned lizard (*Phrynosoma coronatum frontale*) in California based on 600 locations from 979 museum records and 118 records from other sources.

from  
Jennings  
and Hayes,  
1994



Desert horned lizard  
*Phrynosoma platyrhinos*



## Current Status

- both "subspecies" are state and federal species of special concern
- listed in many species and habitat plans
- estimated *P. c. blainvillii* extirpated in 25-45% of range (Brattstrom, 1992; Jennings & Hayes, 1994)
- estimated *P. c. frontale* extirpated in 35% of historical range (Jennings & Hayes, 1994)

## *P. coronatum* Life History Traits

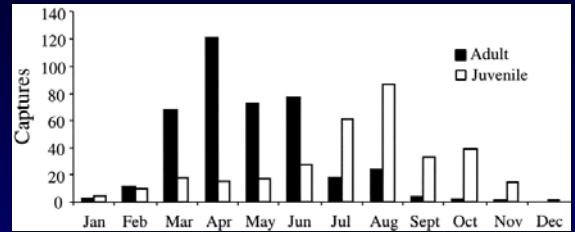
- may live several years in wild (seen 8)
- females (95 mm SVL) typically larger than males (80 mm SVL)
- oviparous - generally only one clutch per year
- takes about 1½ years to reach maturity
- not territorial, have variable "home" ranges





## Horned Lizard Seasonal Activity

- adult males typically emerge first, seen late March early April, active until July
- females emerge April, active until Sept.
- April - June peak adult activity months
- hatchlings appear July/Aug, active until Nov.
- have seen adults during warm winter weeks



Fisher et al., 2002

monthly capture totals for pit-fall trap arrays in so. California

## Horned Lizard Daily Activity

- activity varies seasonally
- unimodal in early spring, late summer
- bimodal late spring, early summer
- soil temp. range 21 to 54 C, mean 40 C
- mid-morning early summer best catching!!

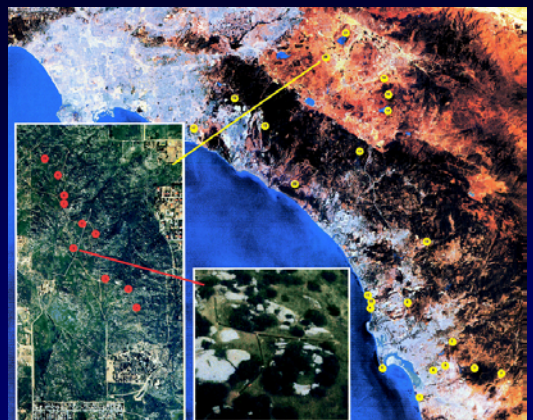
## Typical Search Methods

- visual
  - pros: no setup time, fairly efficient, can vary strategy (random vs. systematic)
  - cons: w/o volunteers can be costly
- pitfall and funnel trapping
  - pros: one person, tacit monitoring, permanent (with repair)
  - cons: costly, time to put in, maintain, remove
- road-cruising
  - pros: one person, great if roads on site - efficient
  - cons: risk of road mortality

Capture Success of Texas horned lizards, *P. cornutum* by different methods

Month	Pitfall	Funnel	Search	Road	Total
Total	7	5	12	2	26
Hours	470	470	224	4	1168
Effort	0.015	0.011	0.054	0.526	0.022

from Fair and Henke (1997)



example of pit-fall trap array design and distribution for USGS

## Fisher et al., 2002 study

- 21 sites, 256 arrays, 2-3 years bimonthly
- caught 578 lizards
- most important factors:
  - soil type,
  - presence of Argentine ants
  - percent chaparral

## Horned Lizard Capture Rates

- 1995 activity season – 31 adults, 3 juveniles, 150 hatchlings
- 1996 activity season – 19 adults, 61 juveniles, 56 hatchlings
- 2000, 2001, 2002 activity seasons, 20 adults, 18 juveniles, 5 hatchlings (16 ha)
- 1990, 1991 activity seasons – 11 adults, 2 juveniles, 12 hatchlings (4 ha) (from Hager, 1992)

capture by hand success from three study sites of P. coronatum - note both site and year differences

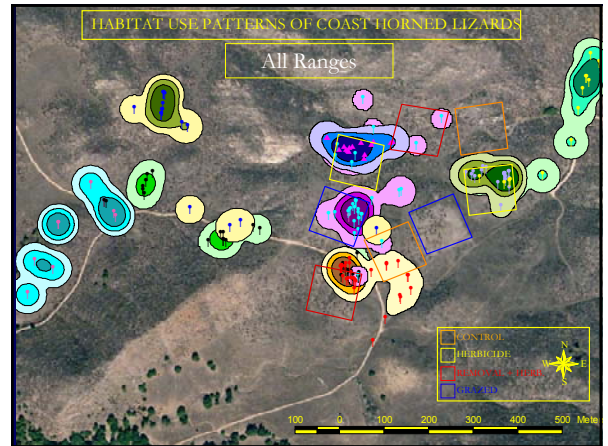
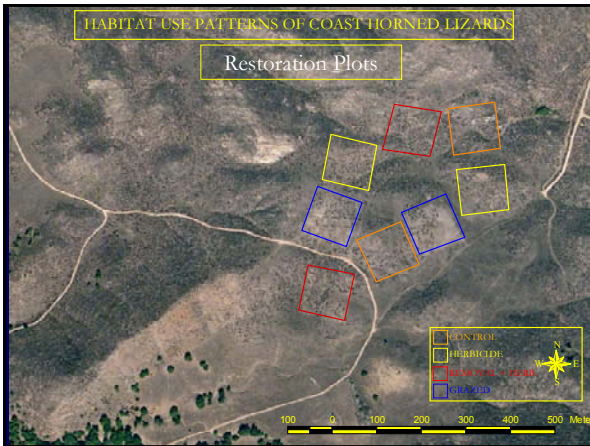


radio-telemeter backpack on P. coronatum



sheep grazing as part of experimental removal of exotic grasses





examples of observed home range sizes  
(adaptive kernel method)

## Home Range Comparisons *P. coronatum*

	N	Mean daily distance (m)	Home Range 50% Kernel (m <sup>2</sup> )	Home Range MCP (m <sup>2</sup> )
Plot	4	55.6* (26.1)	3,038.3** (910.7)	16,593*** (16,934.8)
Non-plot	6	109.1* (42.7)	5,216.3** (1851.3)	42,129.2*** (28,969)

## Habitat Usage of *P. coronatum*

	Undisturbed	Burned	Grazed
Home Range Size (m <sup>2</sup> )	17,136 ± 4,001	20,906 ± 5,048	31,260 ± 6,086
# Conspecifics Overlapped	1.1 ± 0.2	1.0 ± 0.5	3.5 ± 1.2

Alberts, Grant and Lemm, 1995, 1997, 1998

smaller home range sizes on plots treated to remove exotic grasses

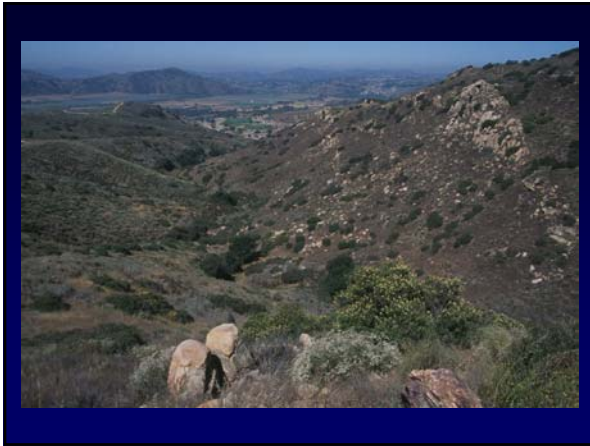


burrow dug by female for eggs,  
note antenna sticking out

## Major Plant Associations

Daily Cover	Summer Aestivation	Overwintering
<i>Salvia mellifera</i> (black sage)	<i>Salvia mellifera</i> (black sage)	<i>Salvia mellifera</i> (black sage)
<i>Eriogonum fasciculatum</i> (Ca. buckwheat)	<i>Eriogonum fasciculatum</i> (Ca. buckwheat)	<i>Eriogonum fasciculatum</i> (Ca. buckwheat)
<i>Lotus scoparius</i> (deerweed)		
<i>Rhus ovata</i> (sugar bush)		
<i>Keckiella antirrhinoides</i>	<i>Rhus ovata</i> (sugar bush)	
<i>Artemisia californica</i>		
<i>Salvia apiana</i>		





## Threats to Horned Lizards

- habitat loss, fragmentation, degradation (grazing agriculture)
- Argentine ant (*Linepithema humile*)
- introduced predators (cats, dogs, children)
- road kill – dirt and asphalt
- past – curio and pet trade



agamid lizard from Uzbekistan -  
convergent evolution of body  
morph for another ant specialist  
Phrynocephalus



digimorphs of Australian ant  
specialist Moloch horridus, note  
spines on body/head not bone