



Population trends and a revised management plan for quail in California

Proceedings of the Eighth Quail Symposium

Friday July 28, 2017

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Wildlife Division / Upland Game Bird Biologist

Quail in California



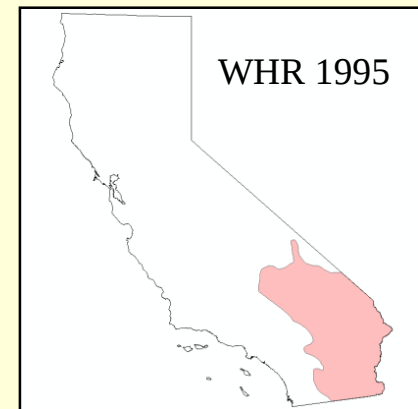
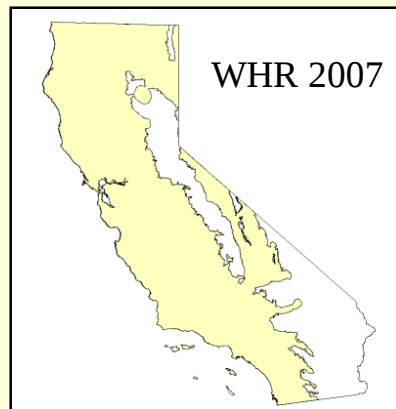
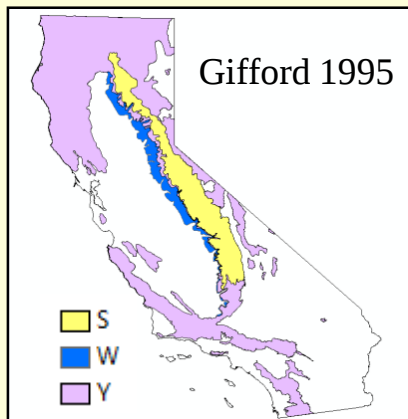
USFS 2010



Miller 2016



Miller 2007



Wildlife Branch



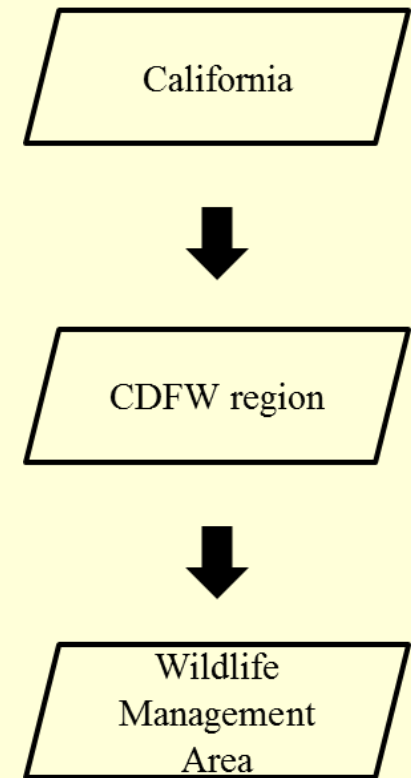
Quail management in California

Resource Assessment:

- Large-scale: trends in population.
- Regional-scale: population demographics, habitat changes, habitat corridors.
- Local-scale: population demographics, home range, covey dynamics, habitat use.

Genetics

Harvest Assessment



California



CDFW region



Wildlife
Management
Area

Large-scale: trends in
population.



Regional-scale: population
demographics, habitat
changes, habitat corridors.

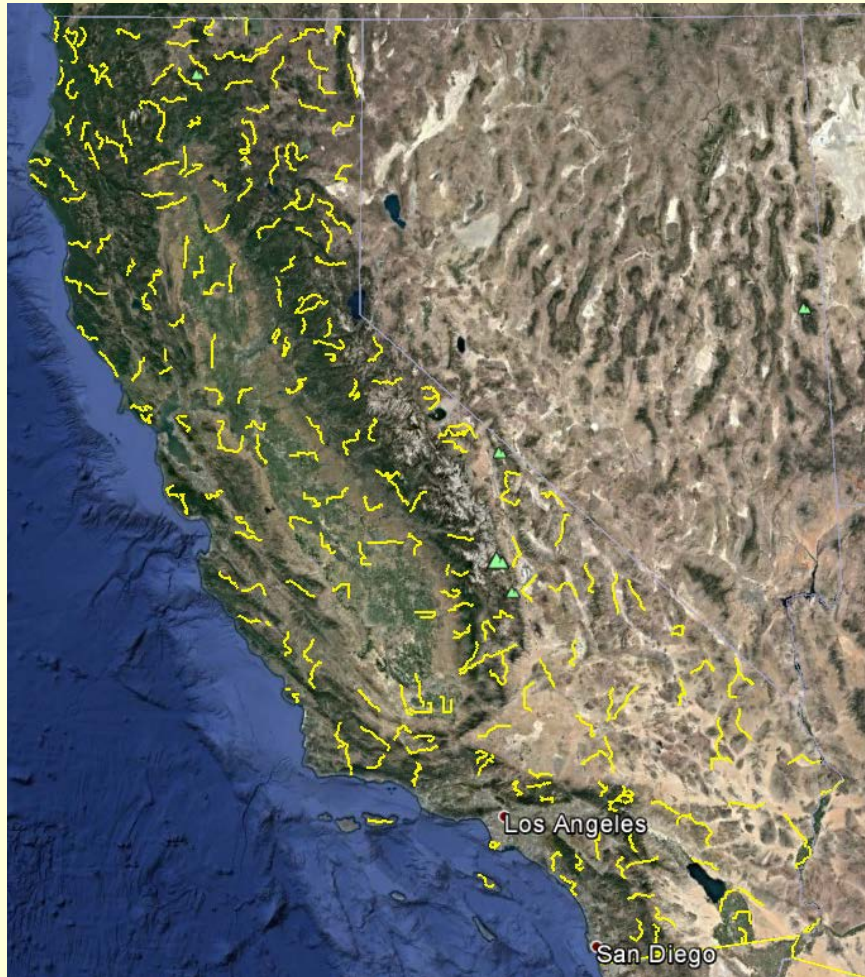
Local-scale: population
demographics, home range,
covey dynamics, habitat use.



Wildlife Branch



Breeding Bird Surveys

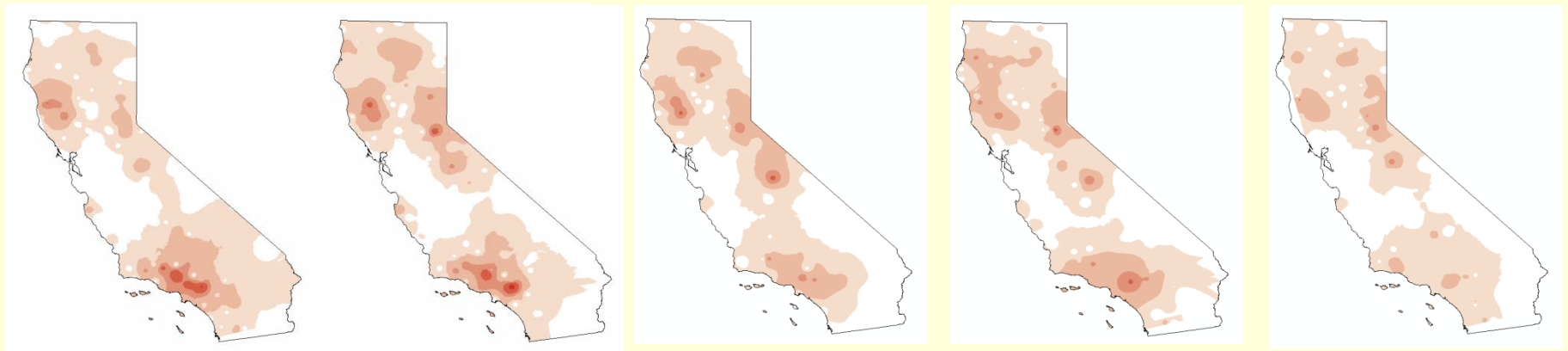


- Index of abundance
- 1971 - 2015
- Inverse distance weighting - ArcGIS.
- Boom and bust
- Mean over 5 years:

$$\frac{1972 + 1973 + 1974 + 1975 + 1976}{5}$$

- 4 km²

Mountain quail



1973

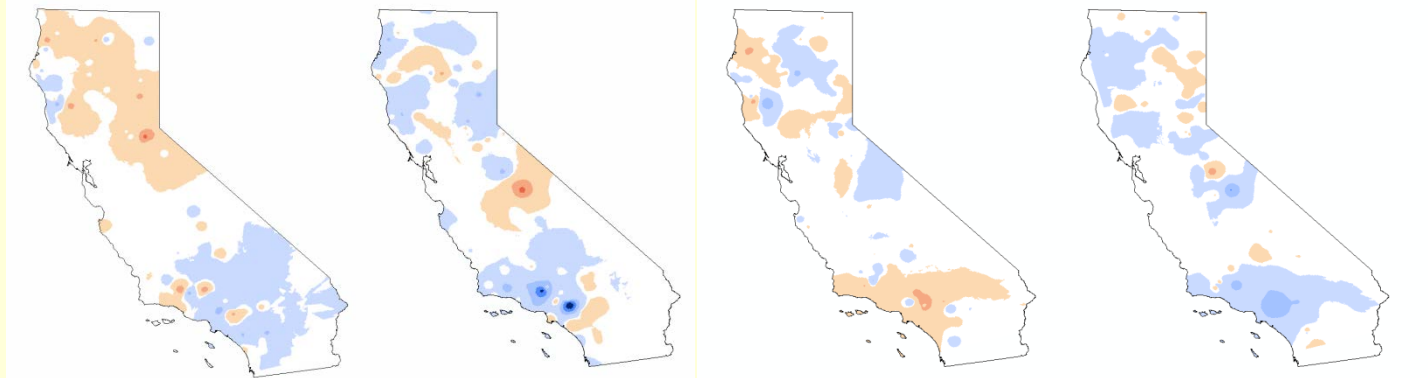
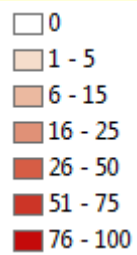
1980

1990

2000

2013

Number of
birds / transect

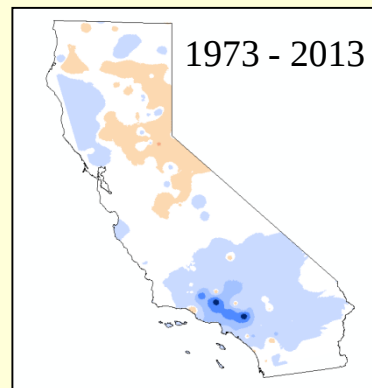


1973 - 1980

1980 - 1990

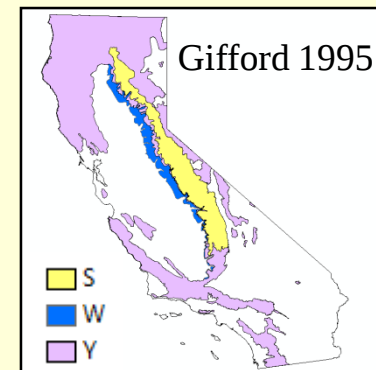
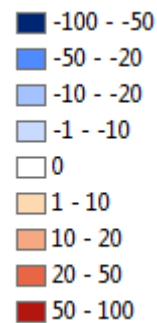
1990 - 2000

2000 - 2013



1973 - 2013

Change in number
of birds / transect



Gifford 1995

Wildlife Branch

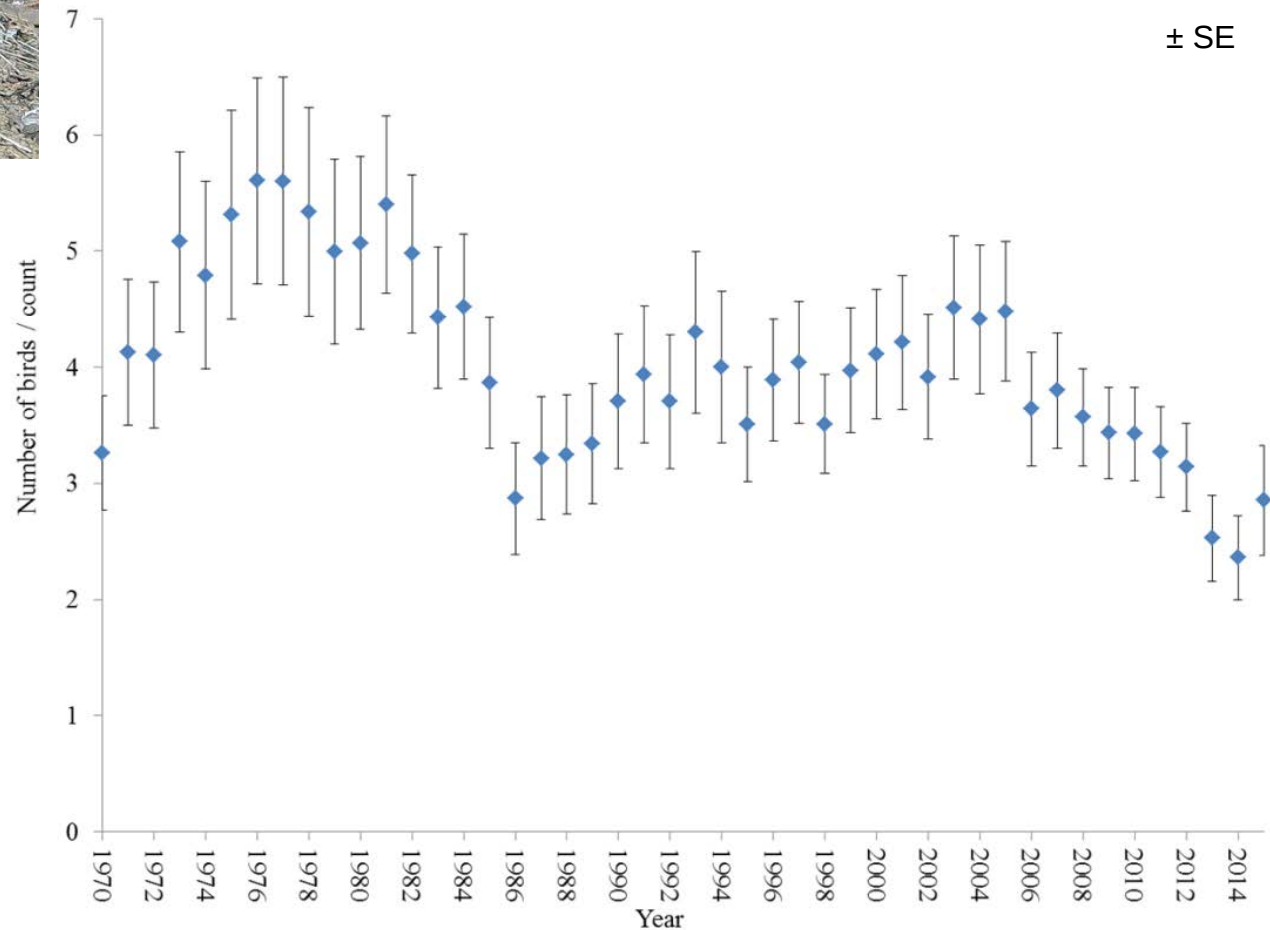




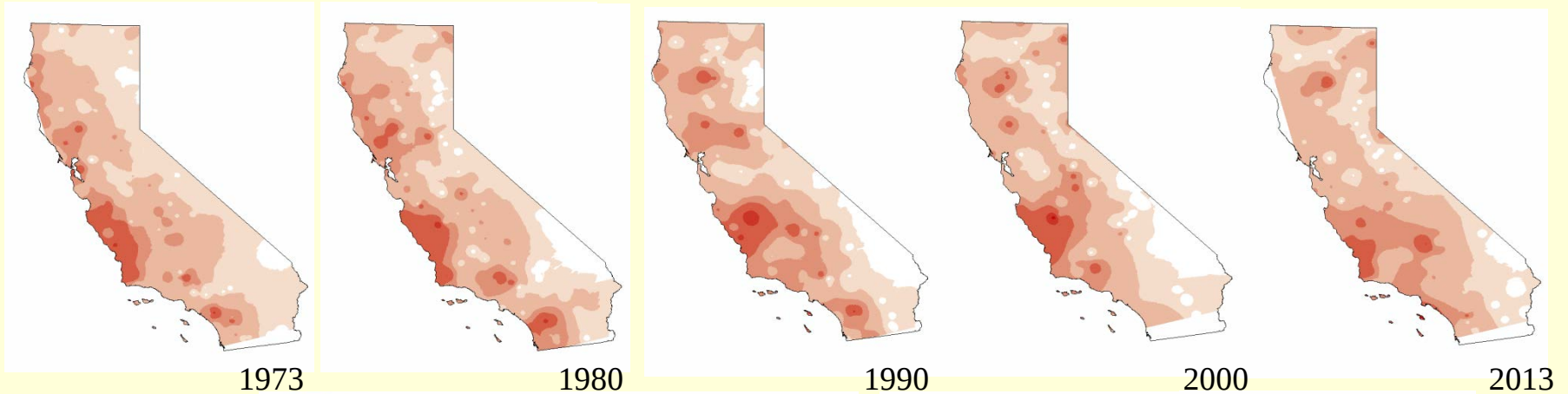
Schmierer 2006

Mountain quail

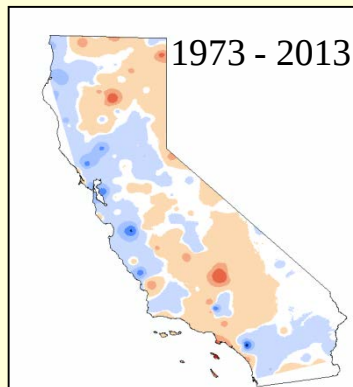
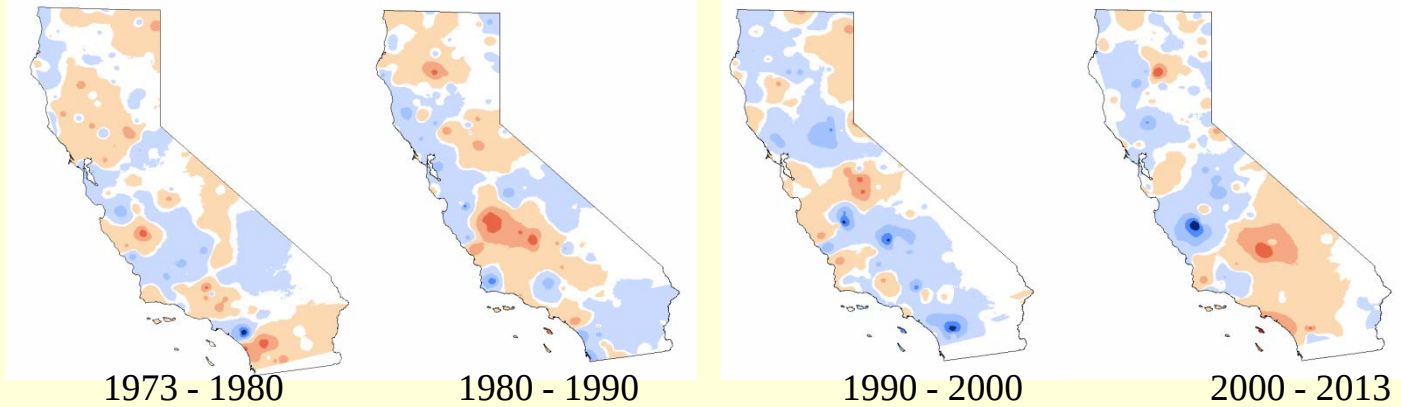
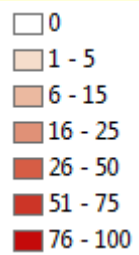
- 50 random points



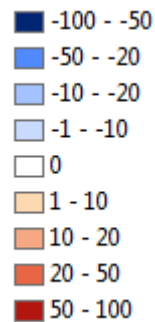
California quail



Number of
birds / transect



Change in number
of birds / transect



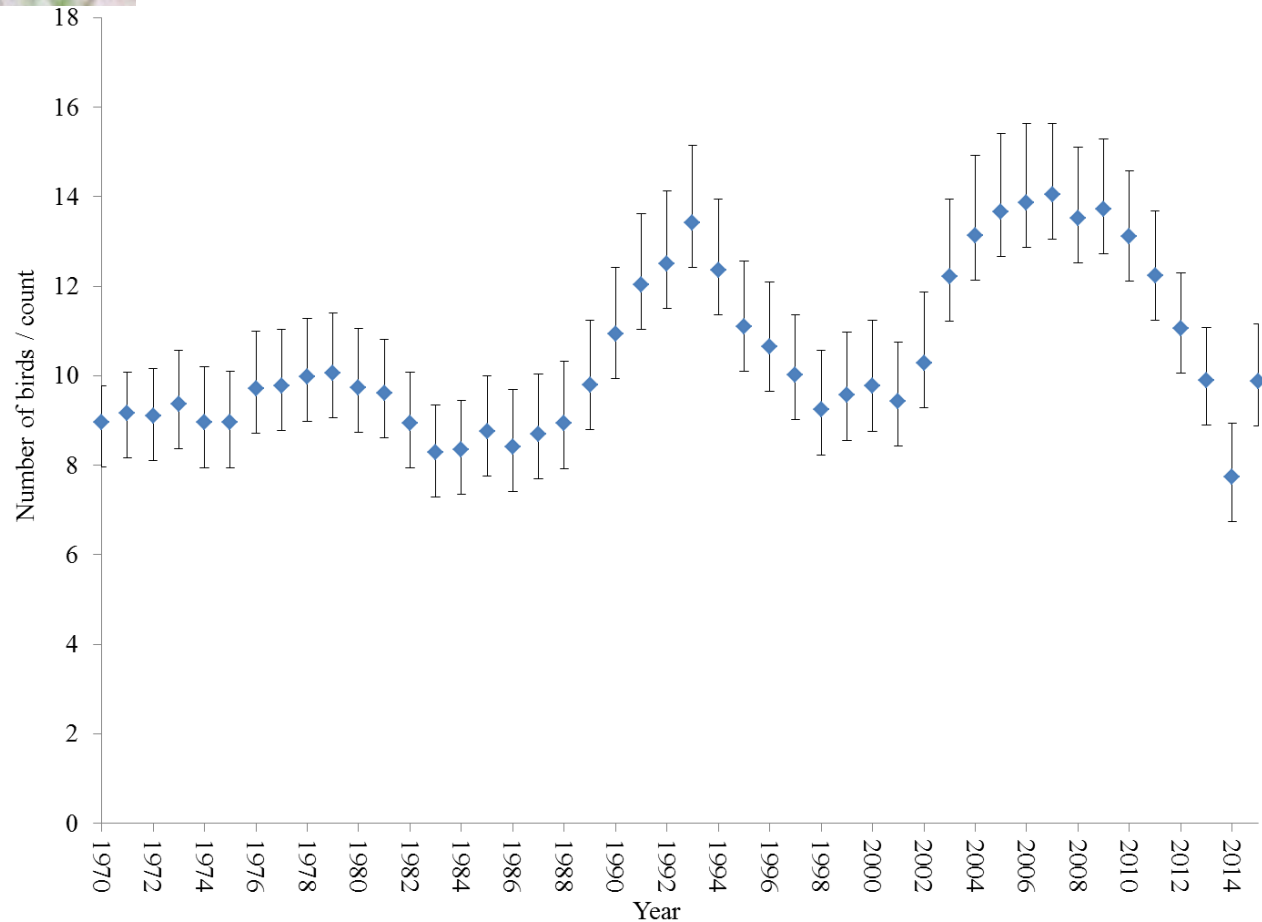
Wildlife Branch



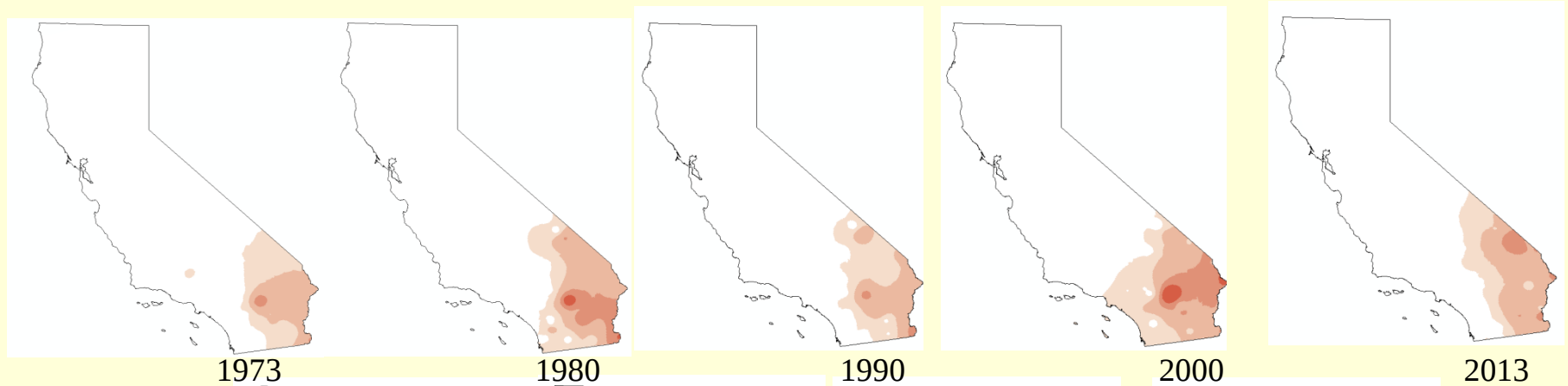


California quail

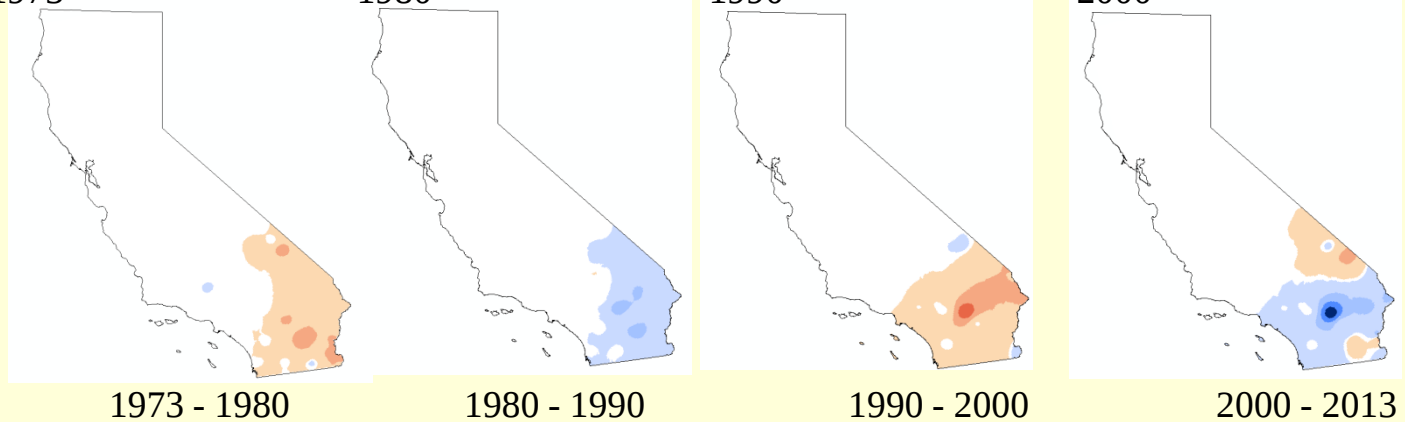
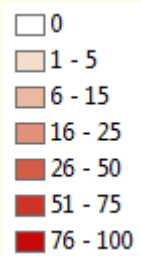
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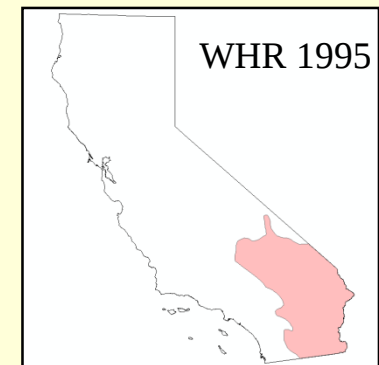
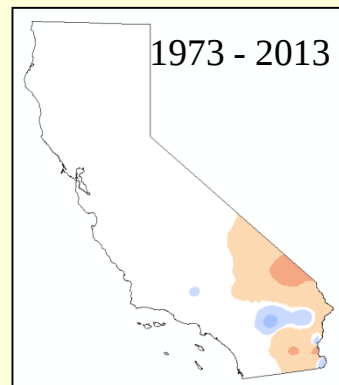
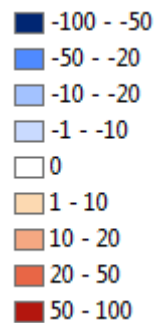
Gambel's quail



Number of
birds / transect



Change in number
of birds / transect



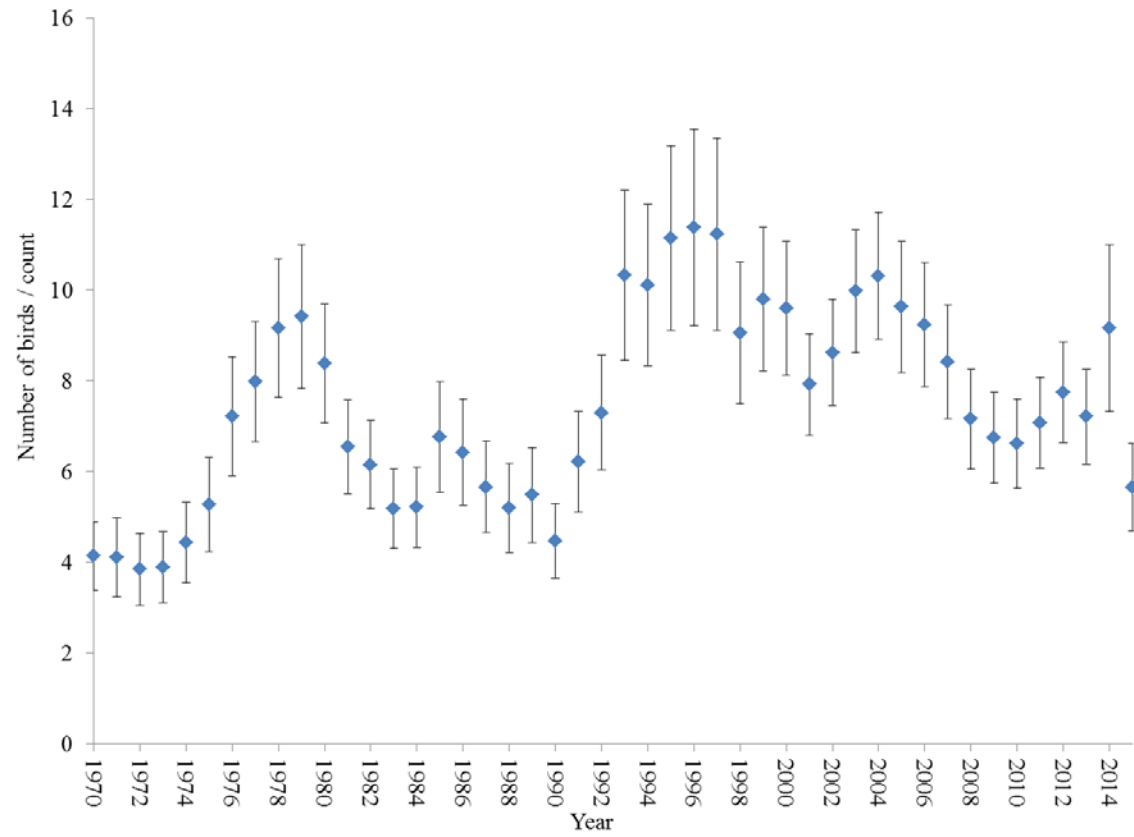
Wildlife Branch

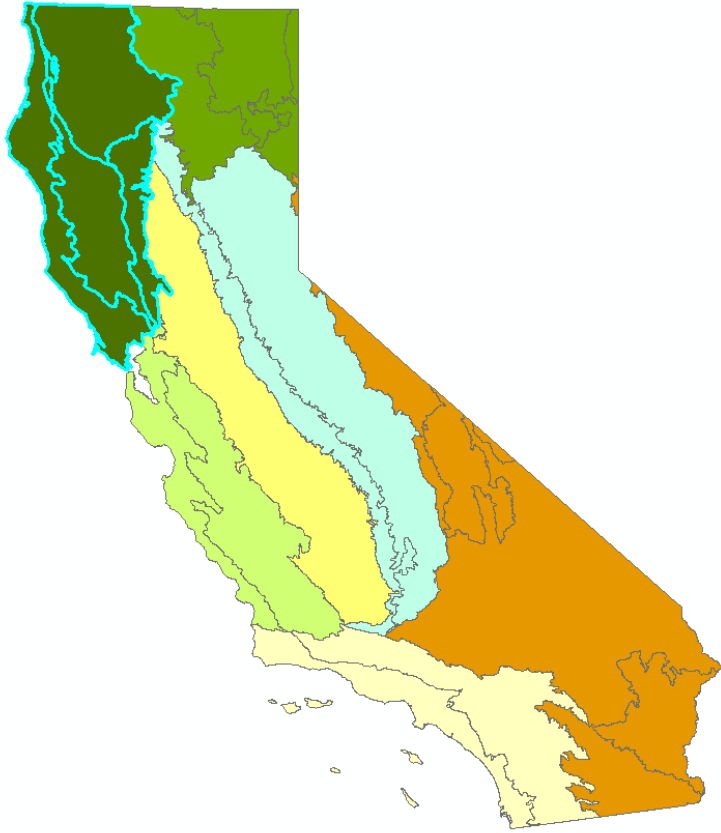




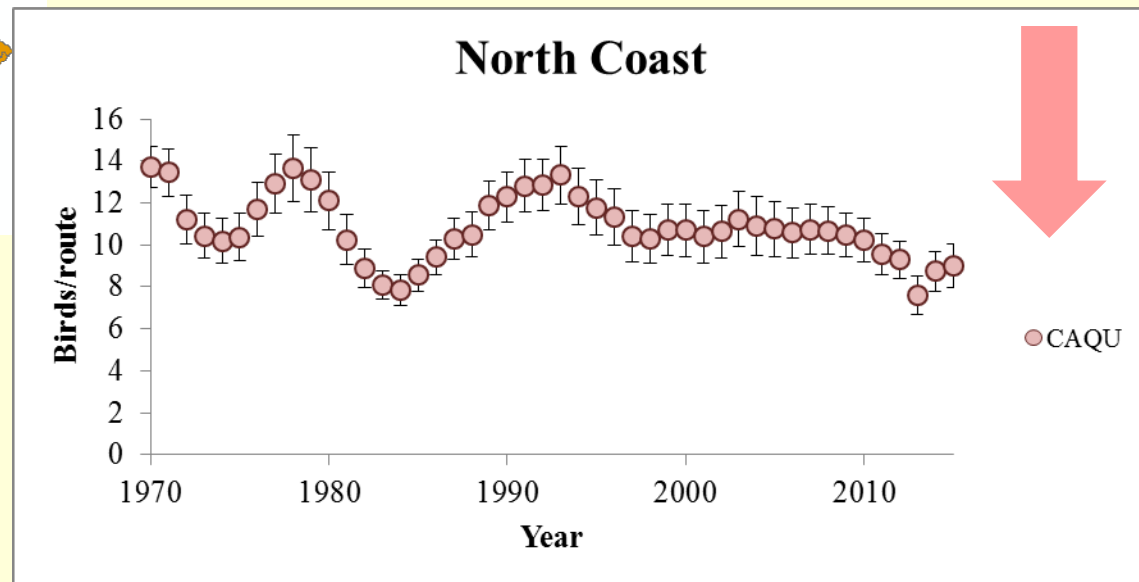
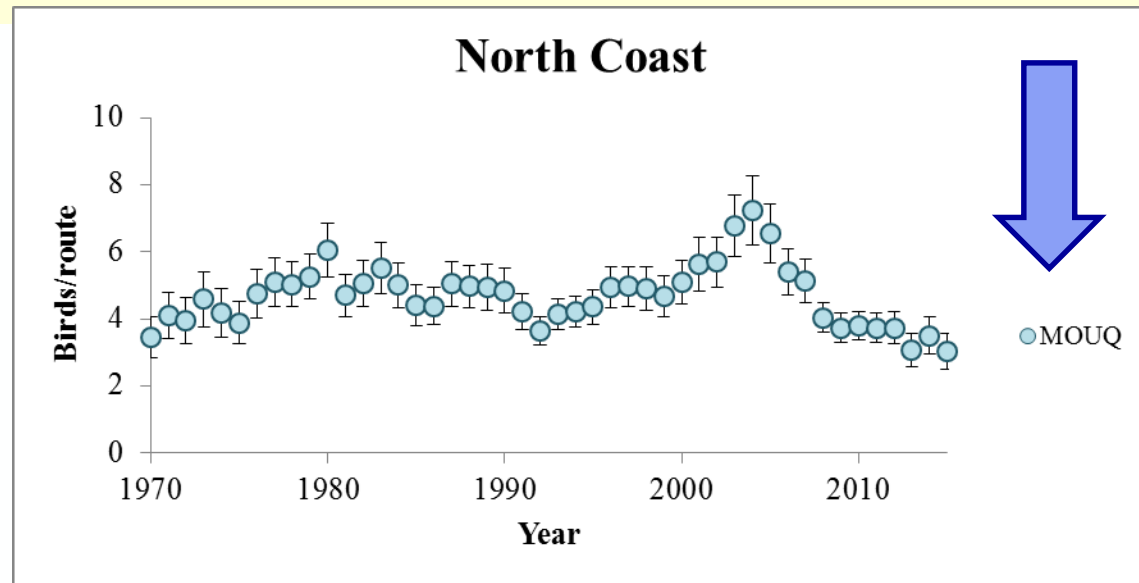
Gambel's quail

- 30 random points

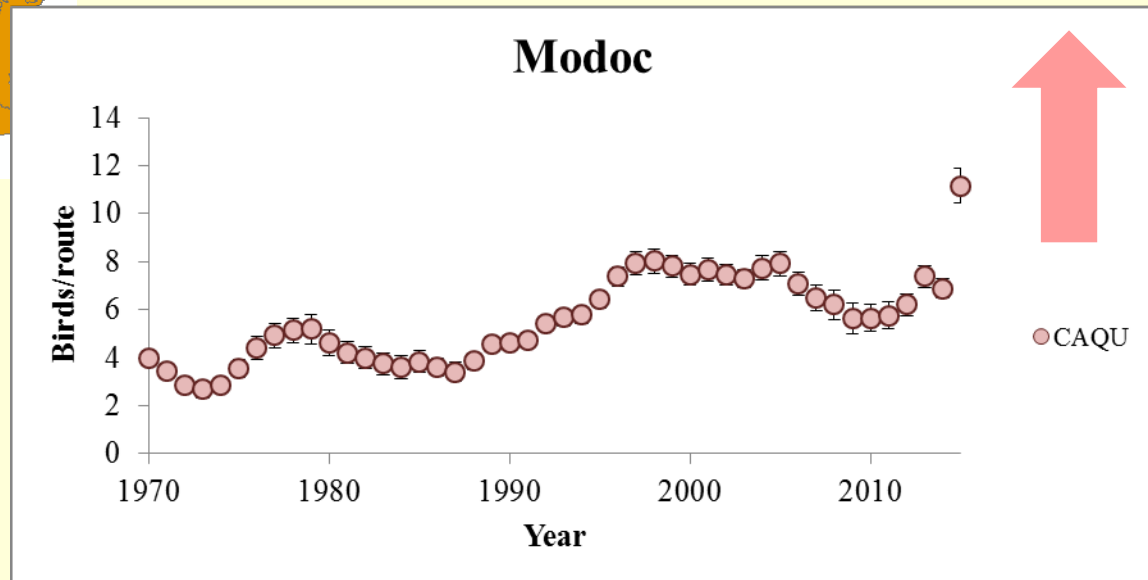
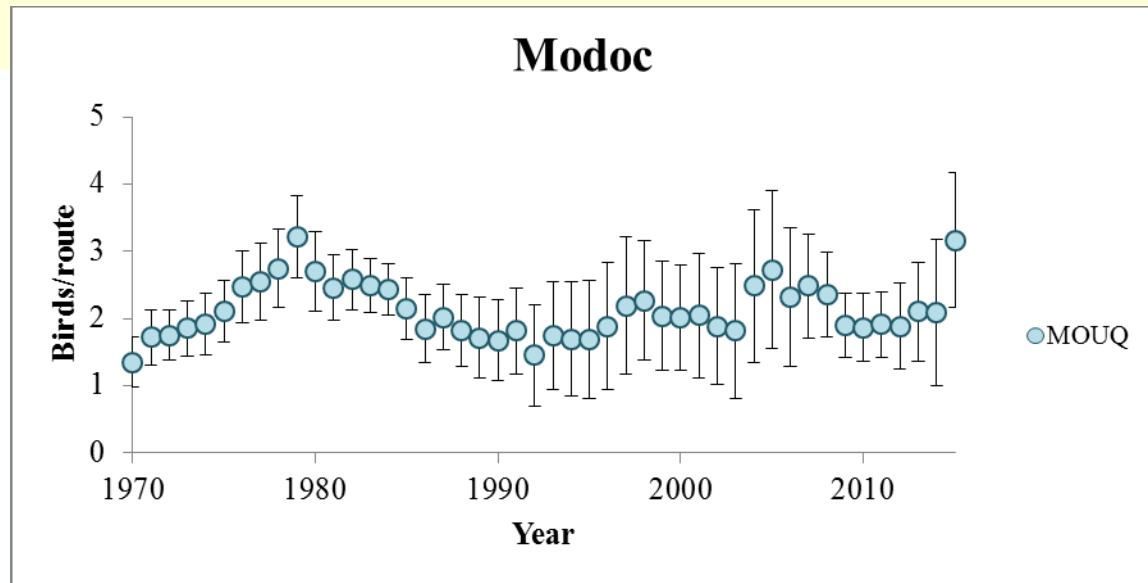
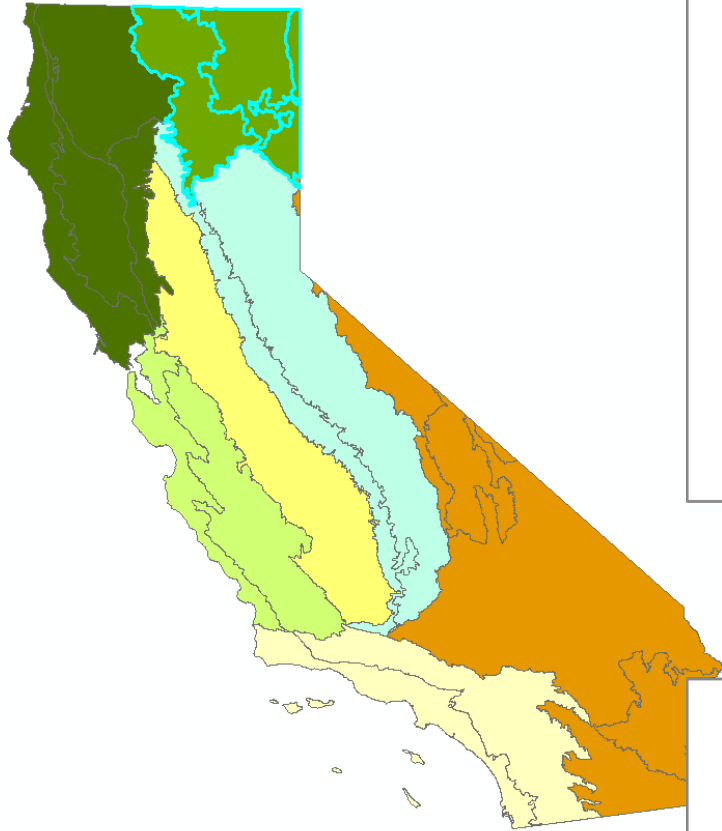




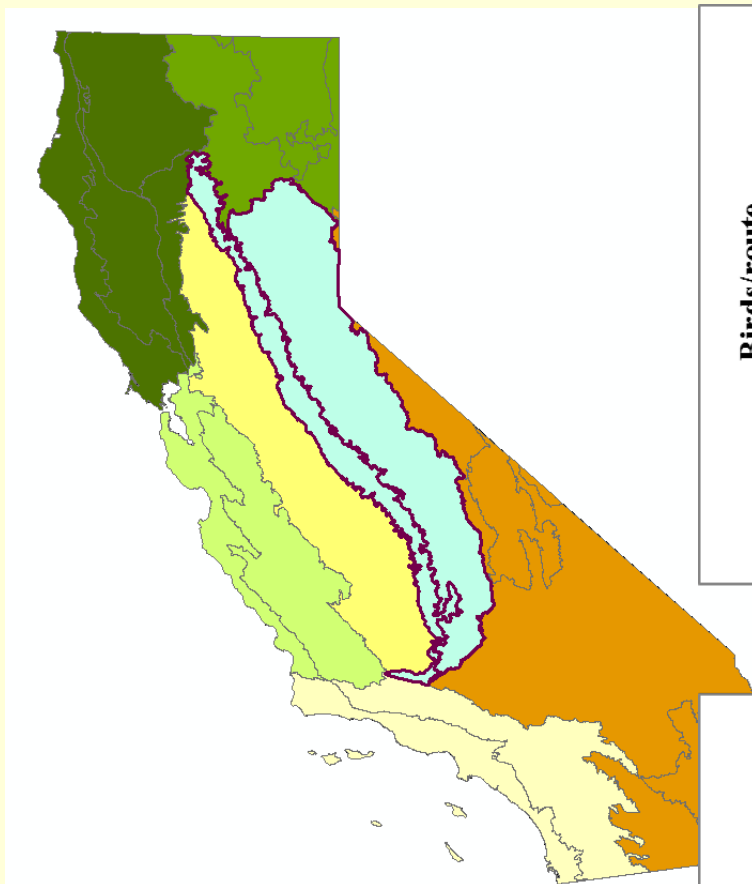
- 29 random points



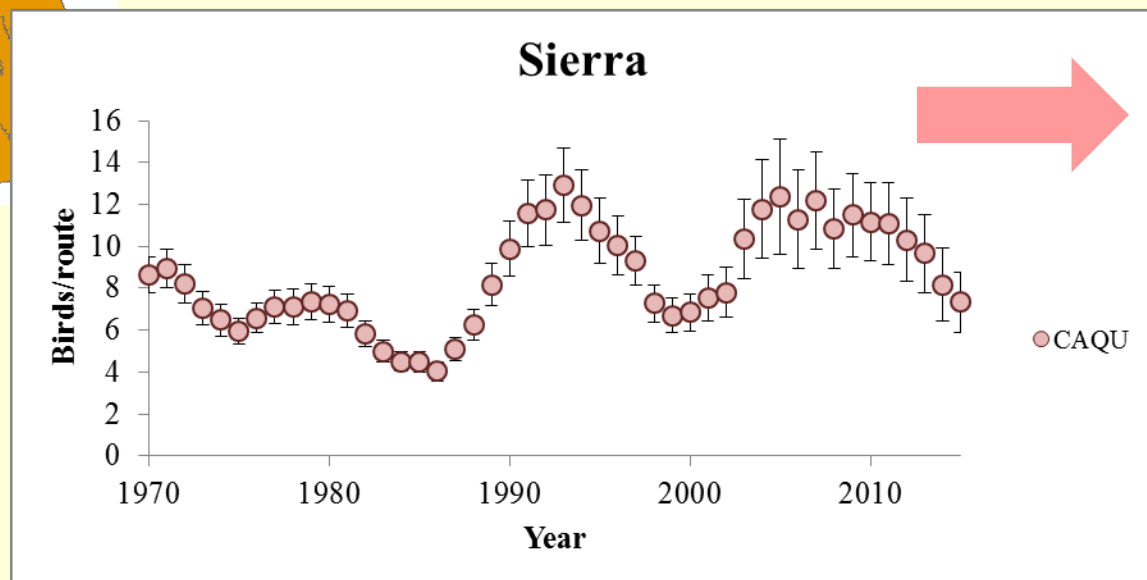
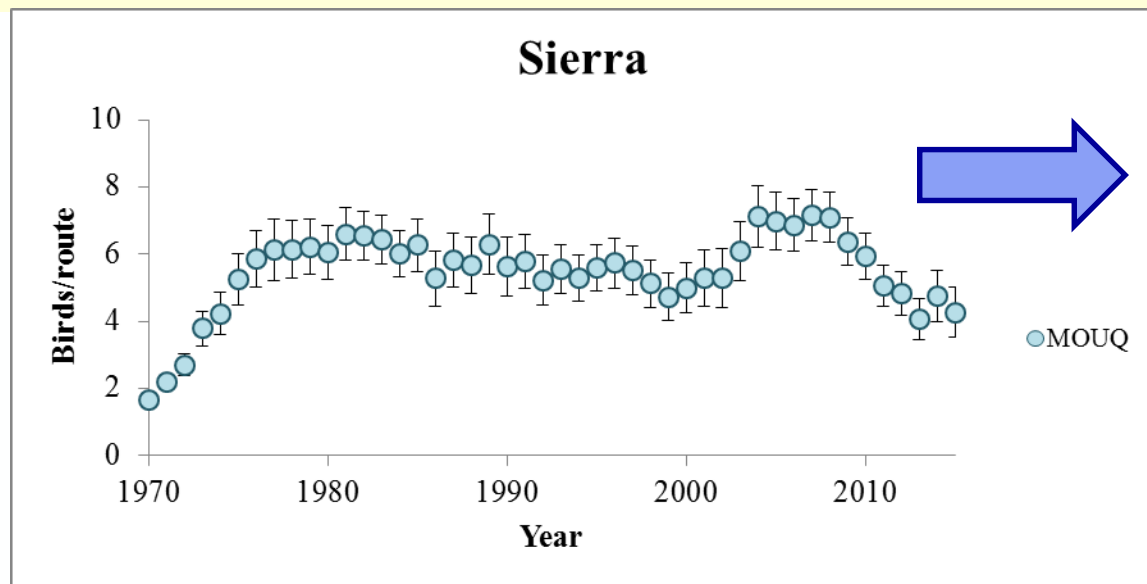
± SE



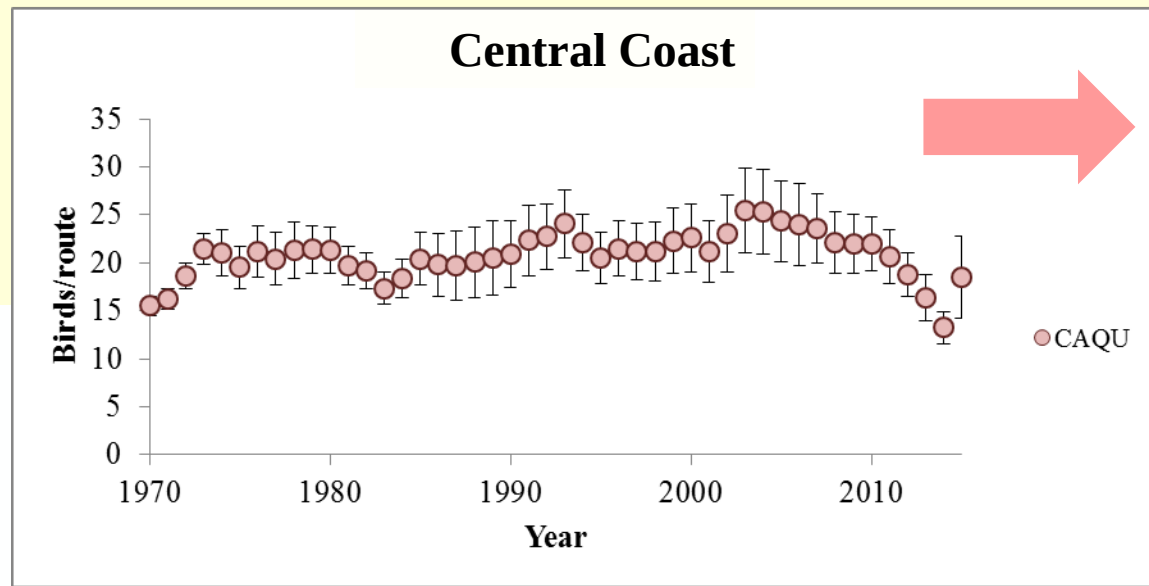
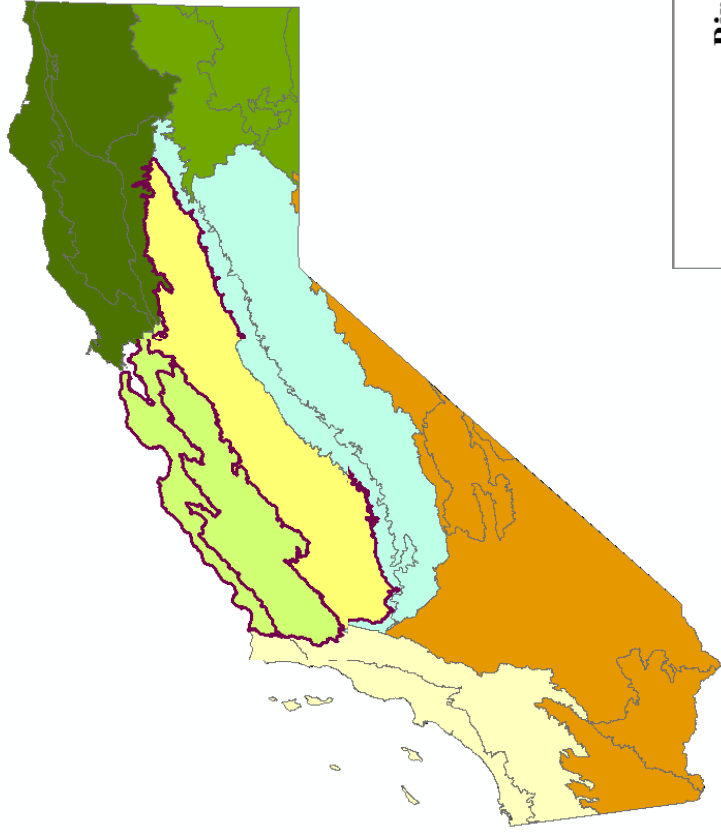
- 17 random points



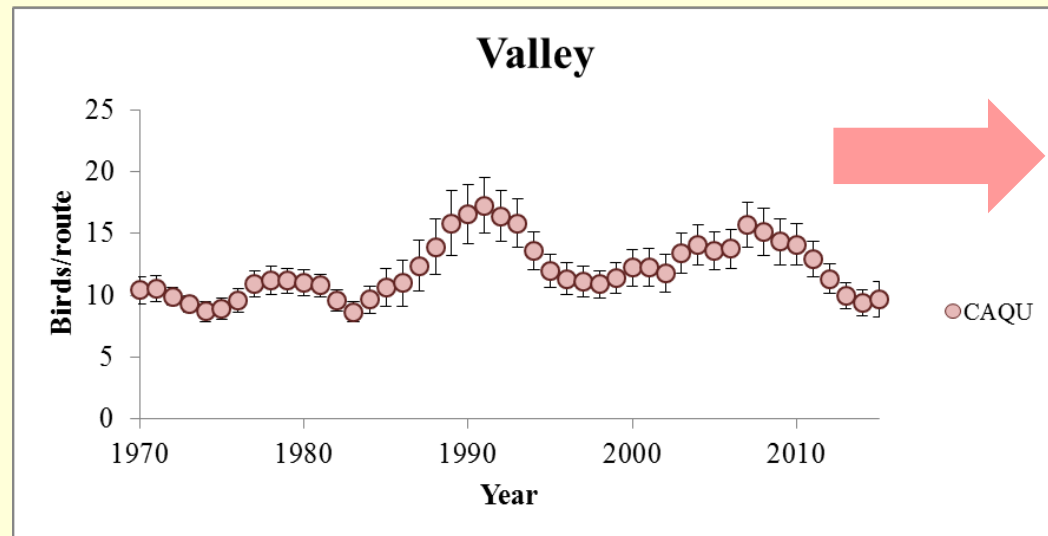
- 32 random points

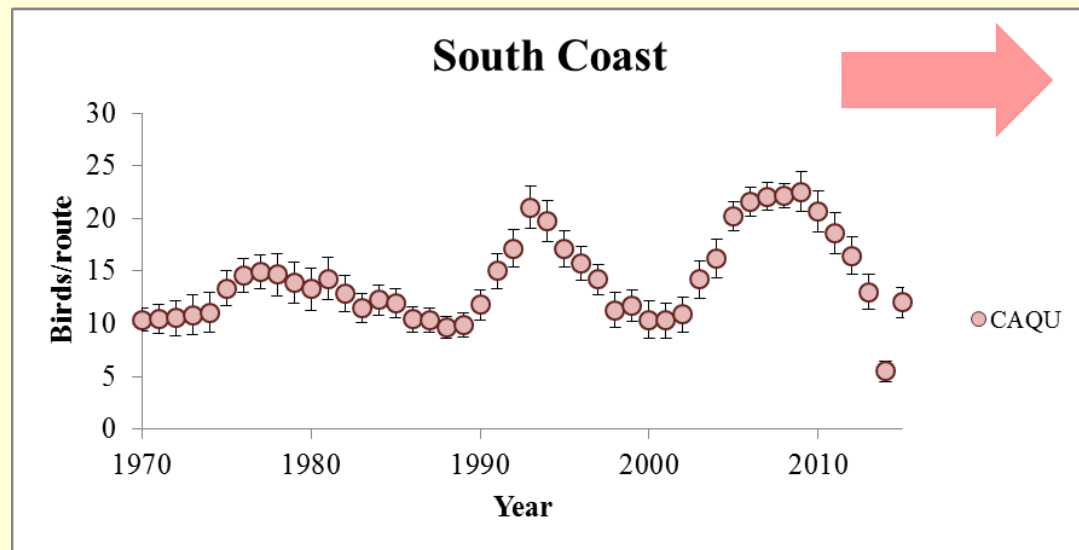
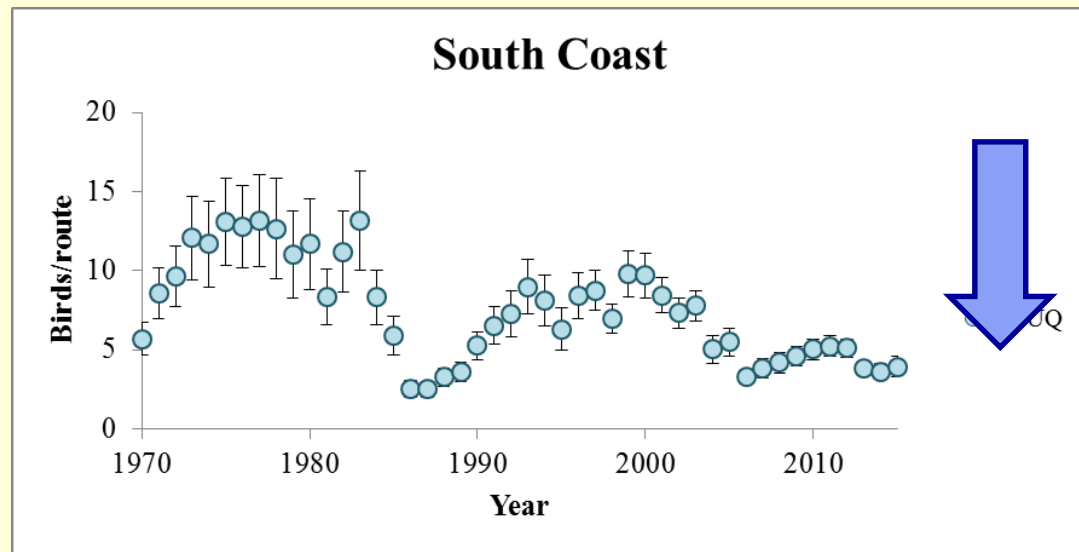
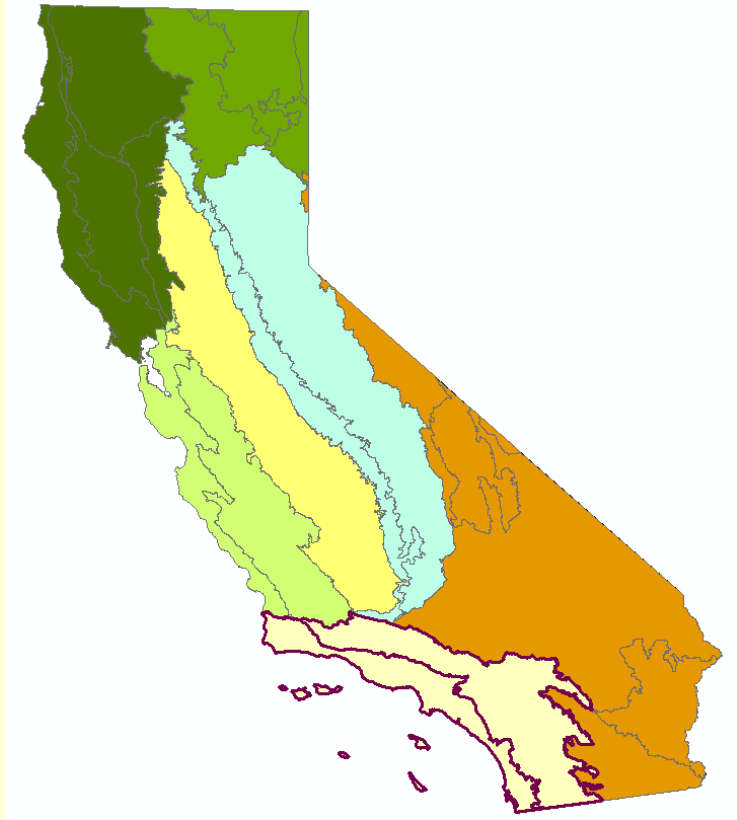


- 15 random points

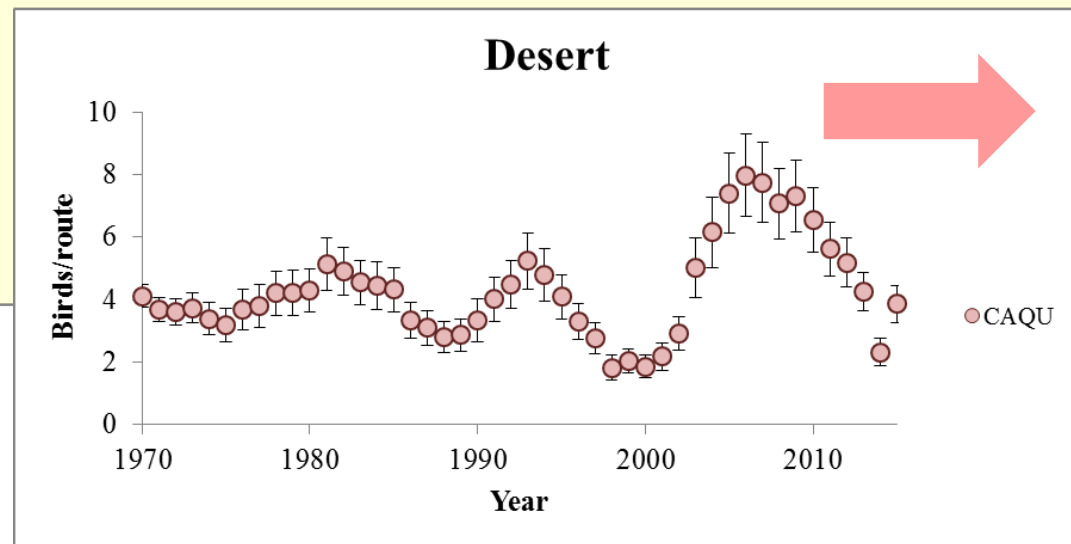
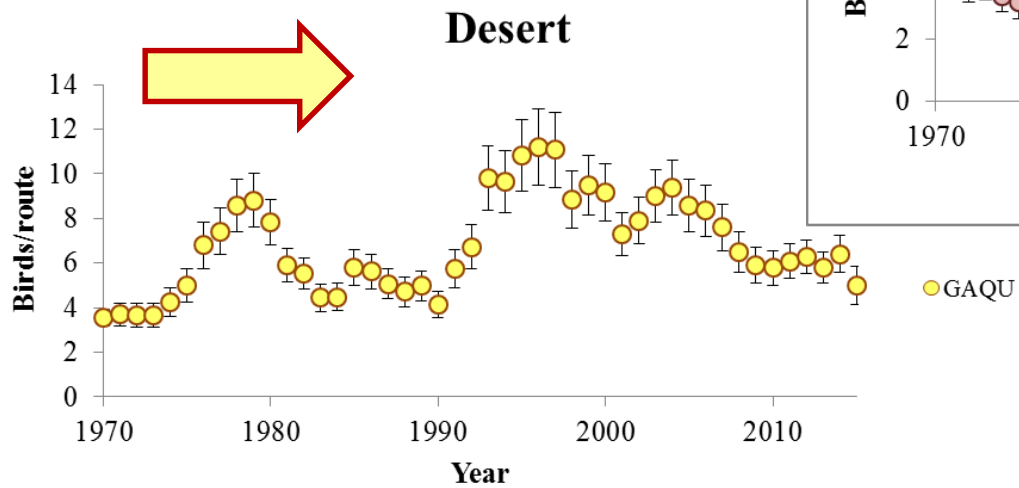
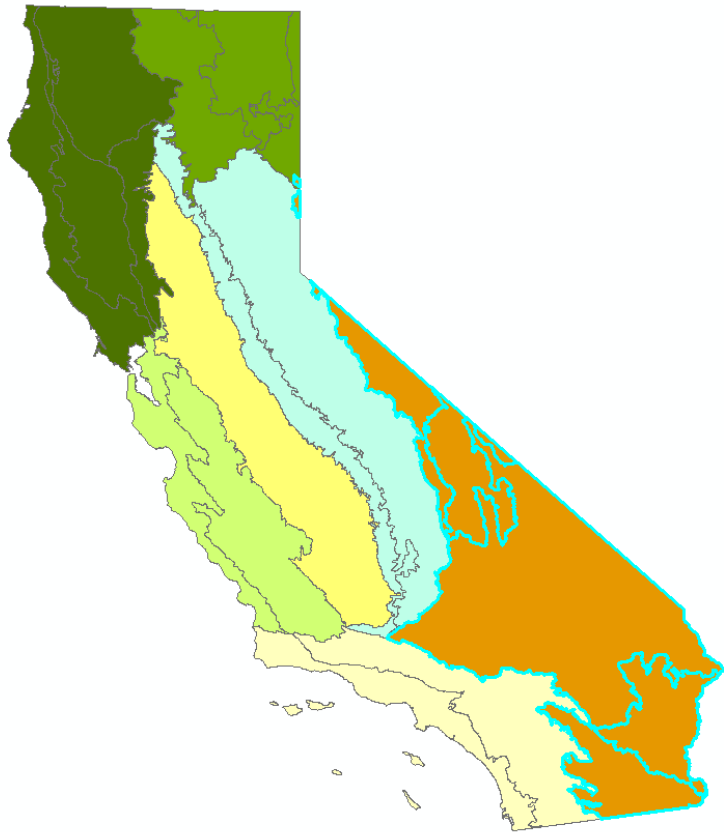


- 20 random points





- 17 random points

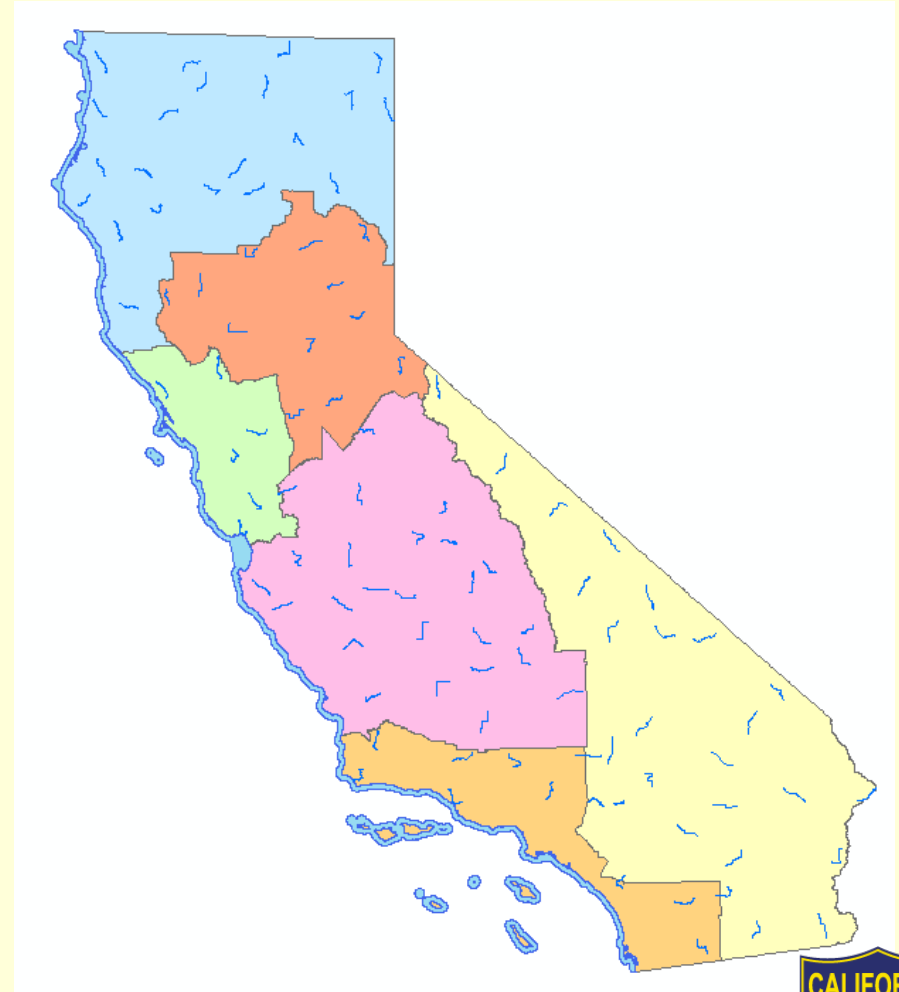


- 40 random points

Fall Roadside Cruise Counts

Goals:

- 1) Annual abundance.
- 2) Hunting forecast for the public in early Sep.
- 3) J:A / productivity.
- 4) Relatively easy



California



CDFW region



Wildlife
Management
Area

Large-scale: trends in
population

Regional-scale: population
demographics, habitat
changes, habitat corridors



Local-scale: population
demographics, home range,
covey dynamics, habitat use

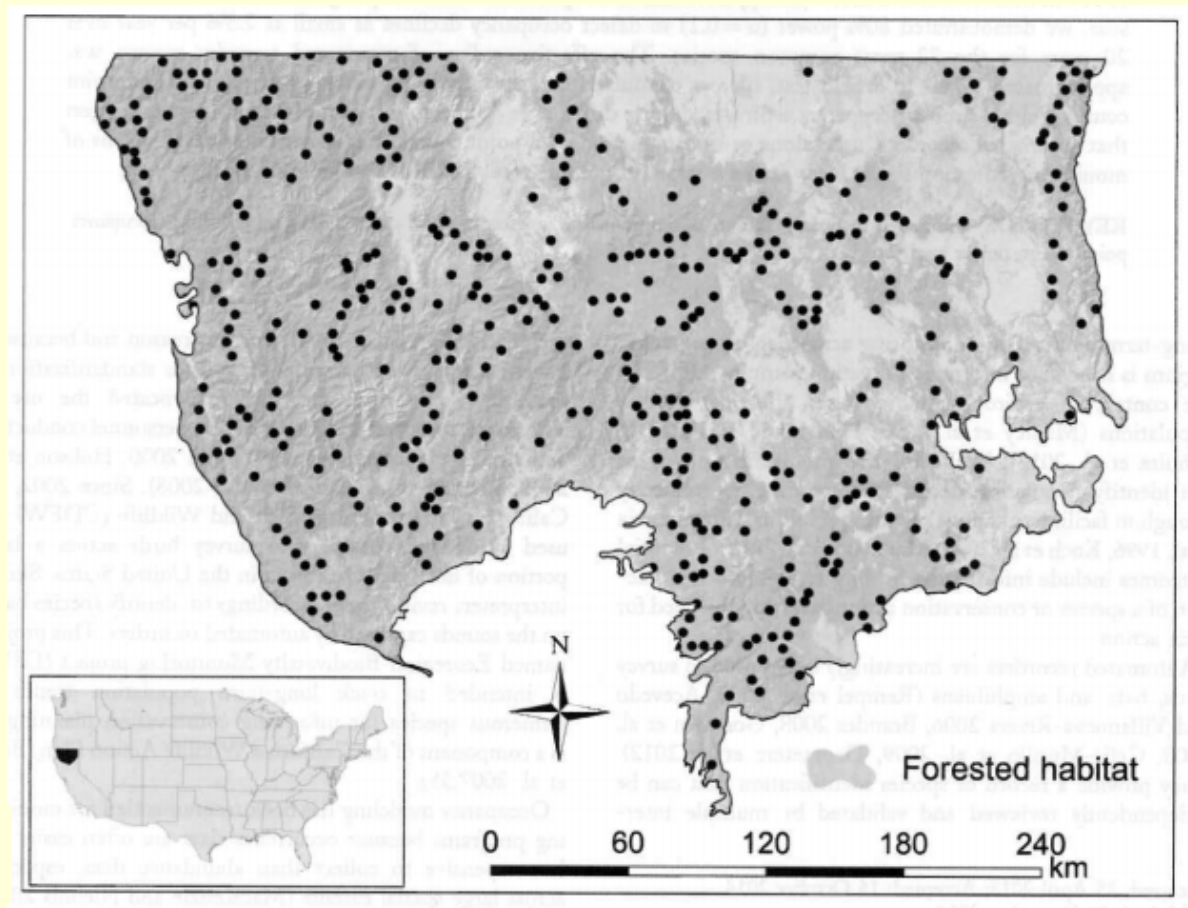


Wildlife Branch



Regional analyses

- EBM: Ecoregion Biodiversity Monitoring



Furnas and
Callas 2015

California



CDFW region



Wildlife
Management
Area

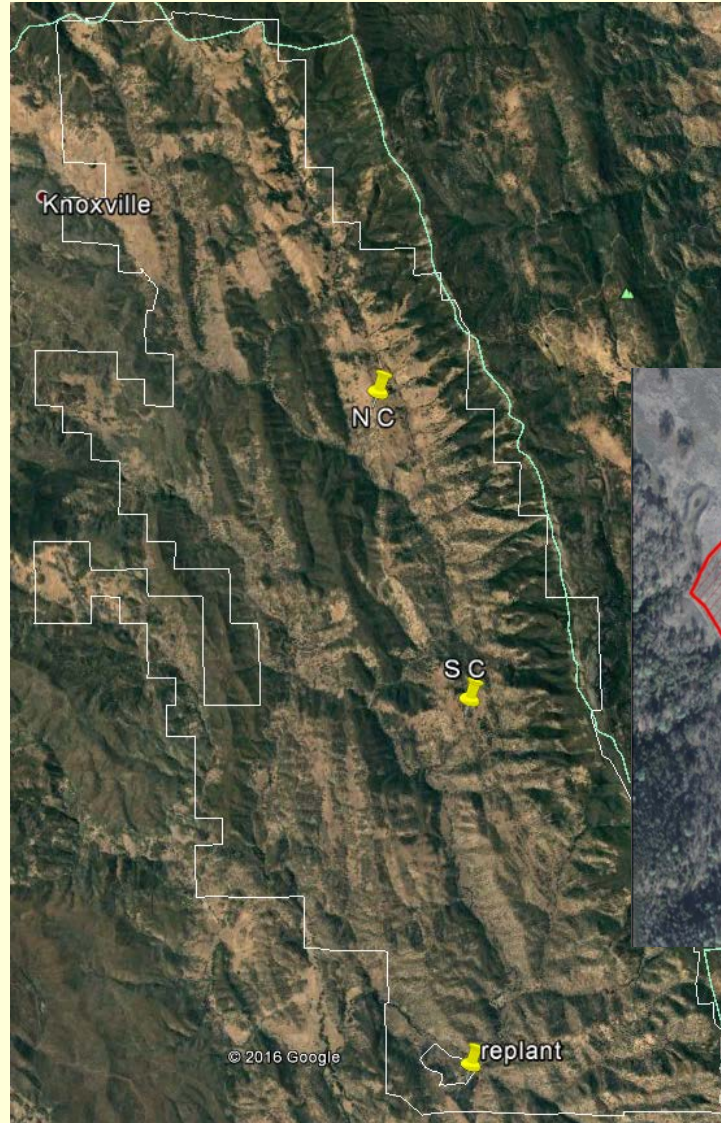
Large-scale: trends in
population

Regional-scale: population
demographics, habitat
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demographics, home range,
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Local, or fine, spatial scale



Local, or fine, spatial scale

- Guzzlers
- Mojave
- Gambel's quail



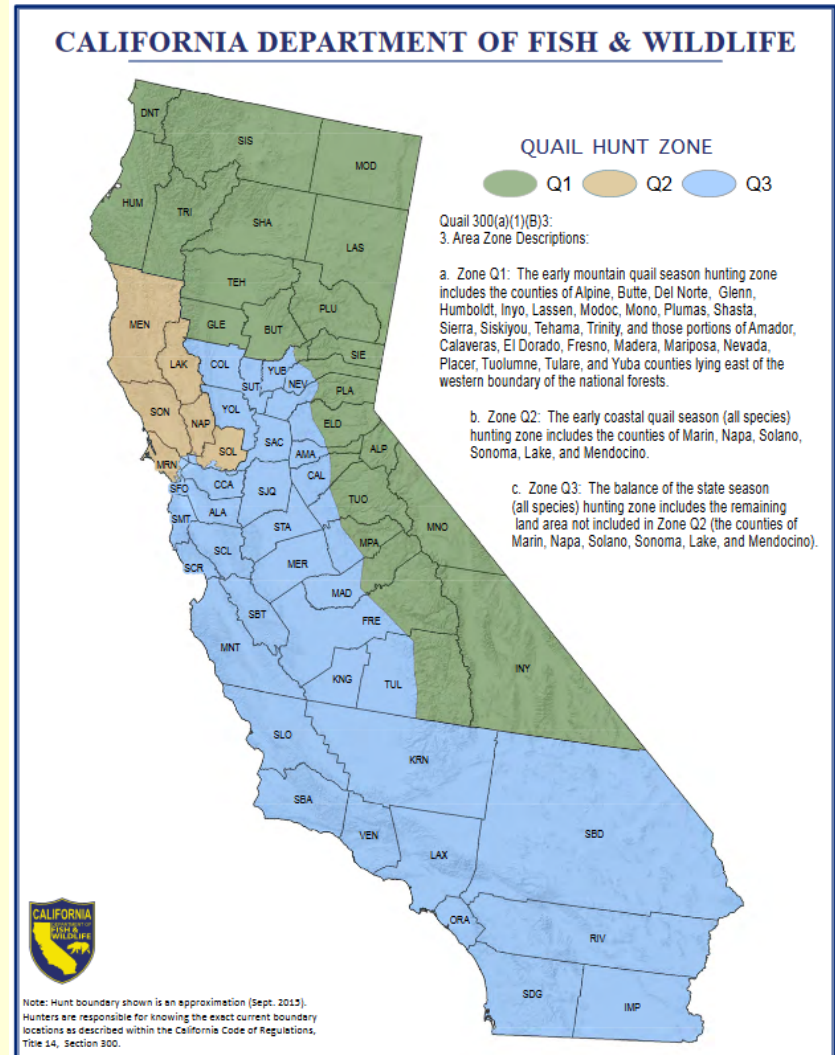
Genetics

- mtDNA
- Genetic diversity
- Population structure
- Wing barrels
- Hunter-harvest mail-in
- Fine-scale telemetry studies



Harvest

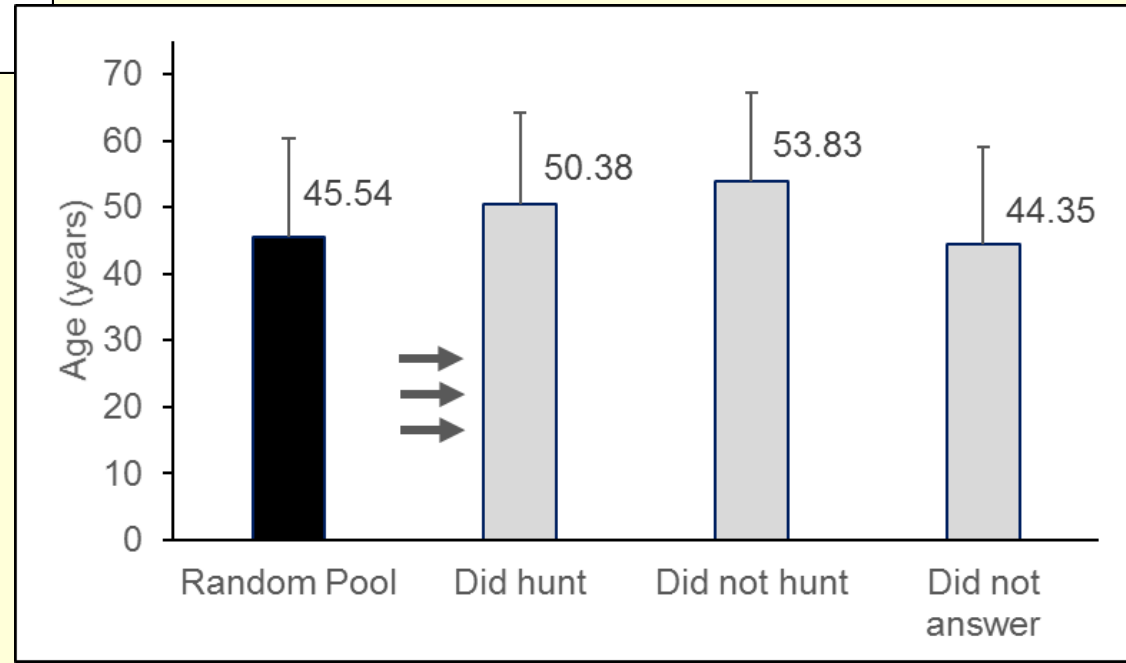
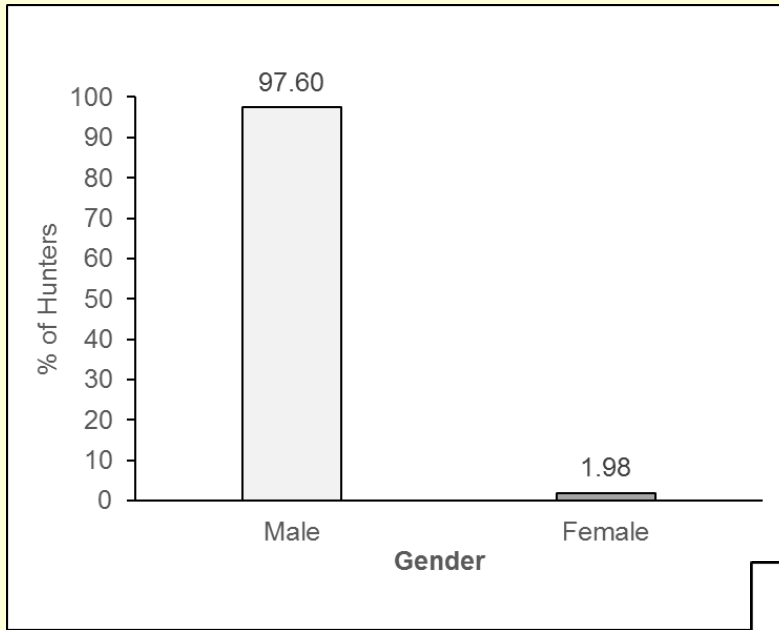
- Bag: 10 daily.
- Possession: 30
- If/when mortality shifts (compensatory becomes additive).
- Game Take Harvest Survey
- 1948
- 1992



A New Hunter Harvest Survey

- Assessment of harvest pressure.
- On-line, ALDS.
- **Resident** upland game birds.
- Random sample of 10,000 hunters.
- Response rate 15%.
- Hunters comprised 46% of respondents.

A New Hunter Harvest Survey



A New Hunter Harvest Survey

	Harvest	Hunters	Avg. Seasonal Bag/ Hunter	Avg. Days Hunted
Mountain quail	60,235	15,669	3.84	3.61
California quail	245,111	33,577	7.30	3.60
Gambel's quail	15,567	1,933	8.05	3.68
Chukar	16,280	6,003	2.71	2.78
Ring-necked pheasant	66,747	20,757	3.22	3.50
Ruffed grouse	305	712	0.43	3.43
Greater sage-grouse	13	13	1	2
White-tailed ptarmigan	0	0	0	0
Sooty grouse	2,137	1,623	1.32	3.64
Wild turkey Spring 2016	15,770	24,928	0.63	3.87
Wild turkey Fall 2016	7,733	16,280	0.48	2.77

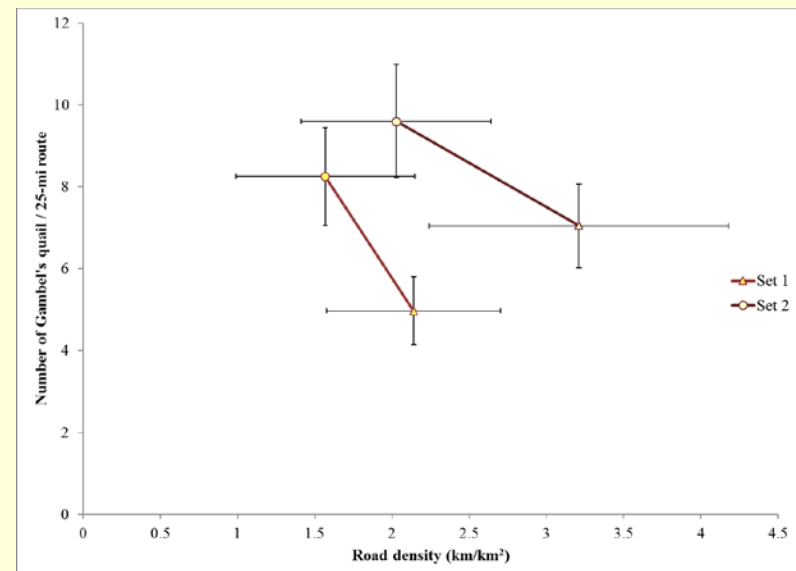
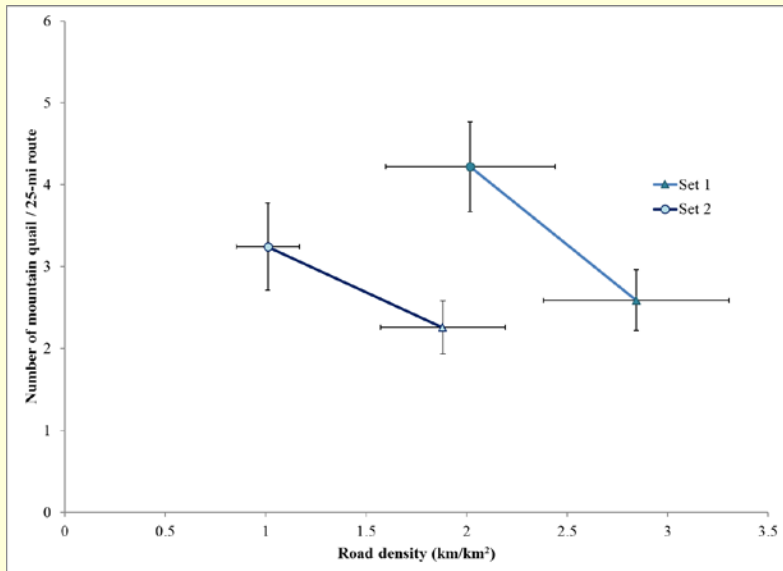
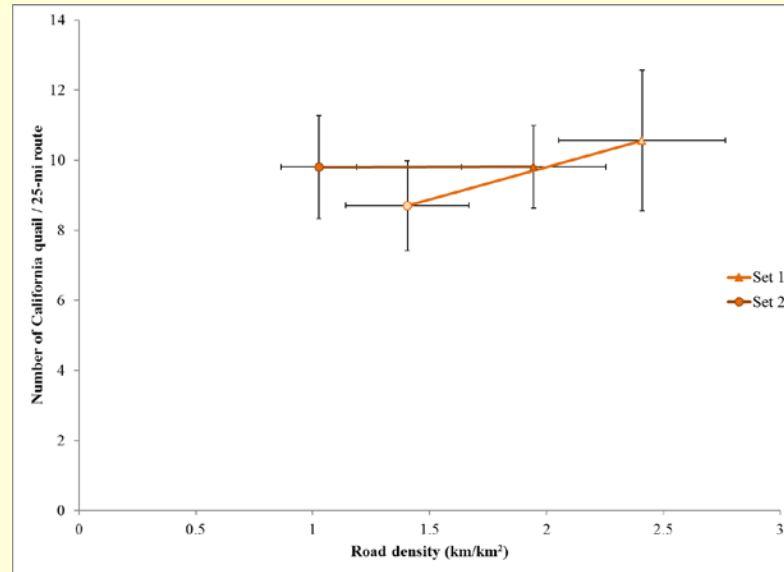
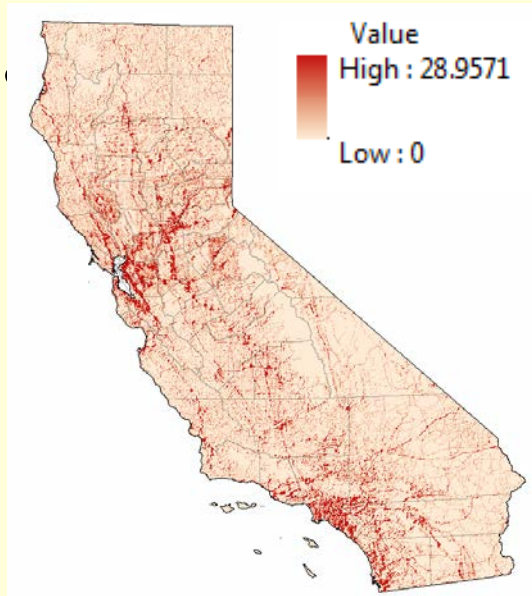
It's a process. . .

- Research through collaboration with universities, USGS.
- Management through collaboration with NGOs, USFS.
- Headquarters and Regions.
- Adaptive management.

Questions?

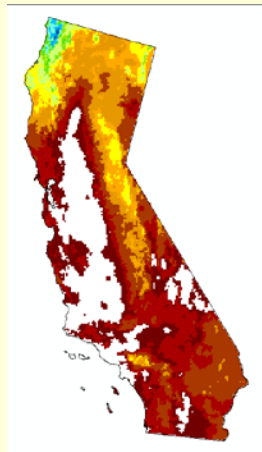
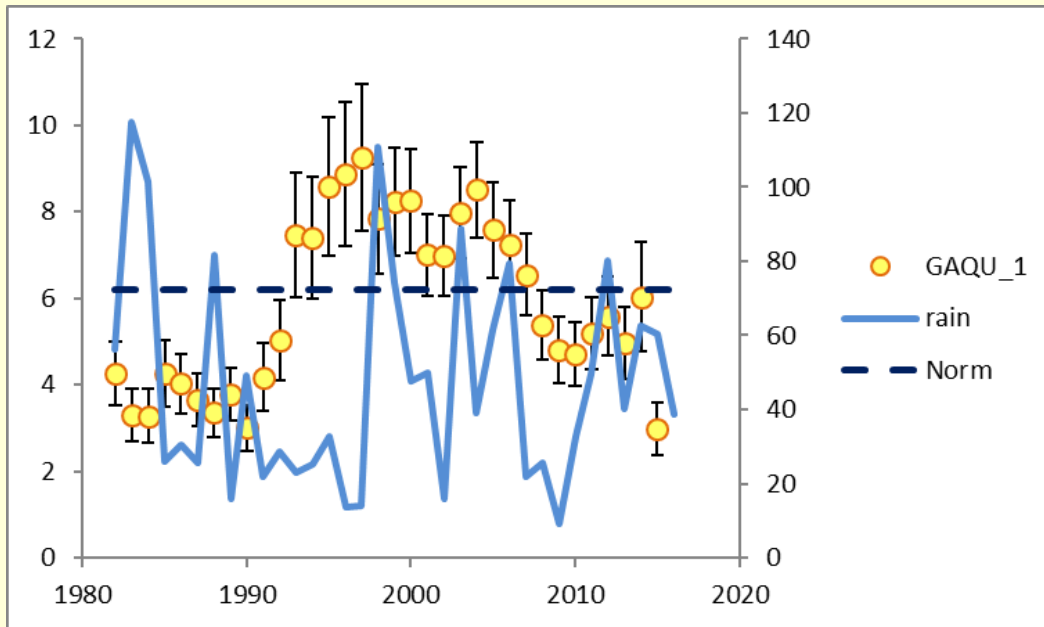


Changes to the landscape:

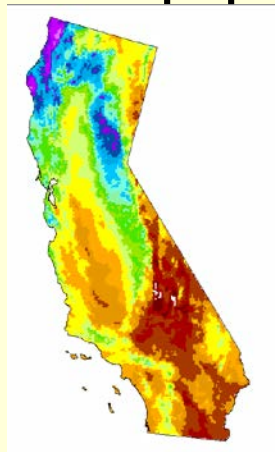


Gambel's quail

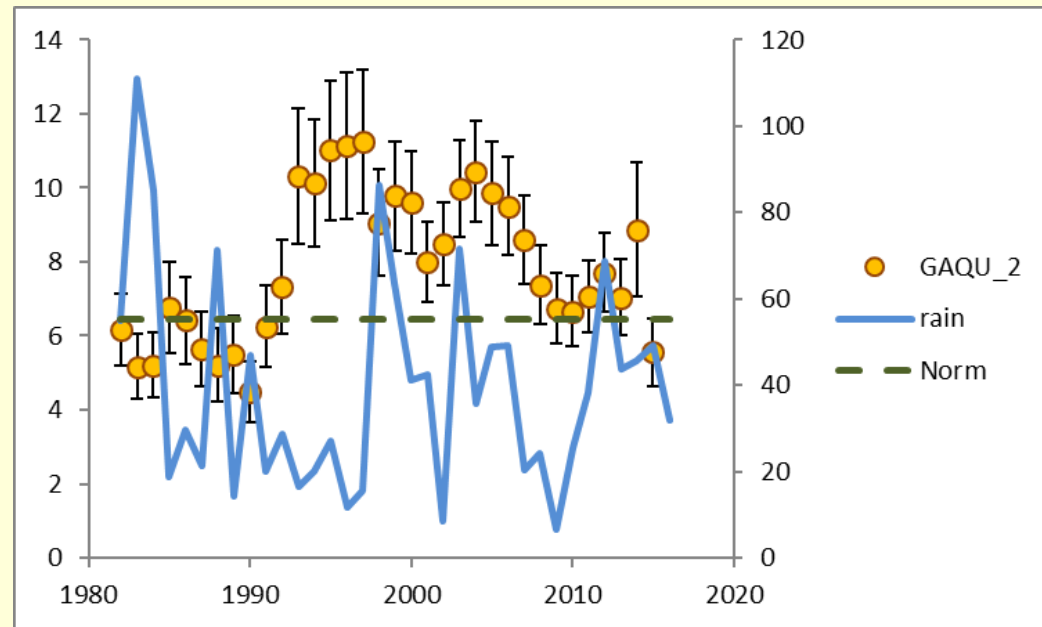
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2008

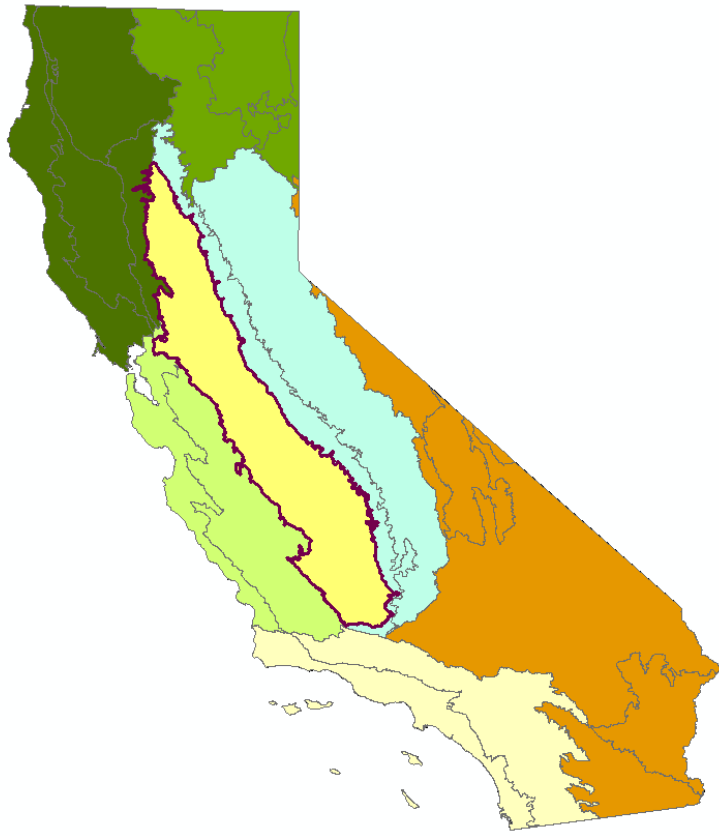


2012

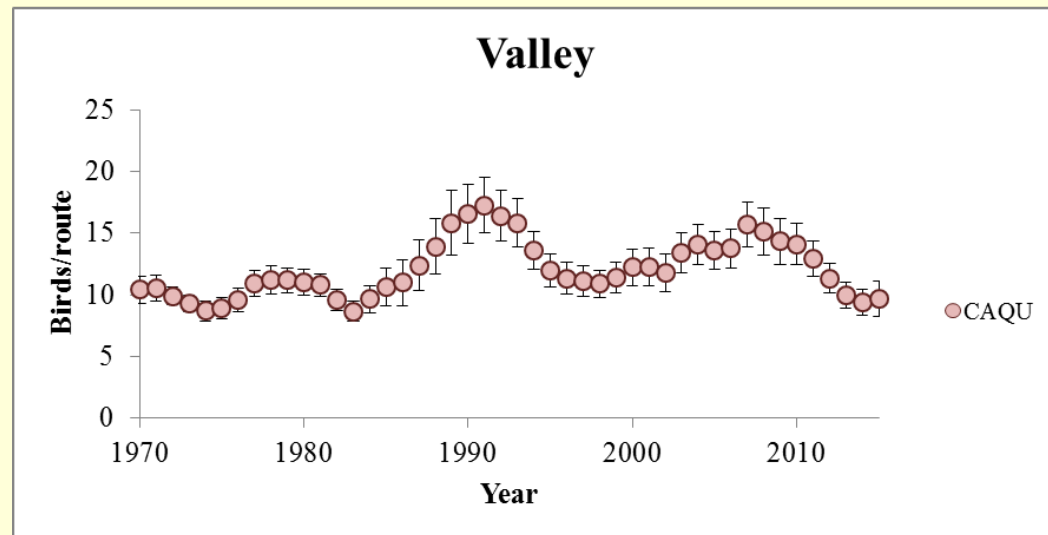
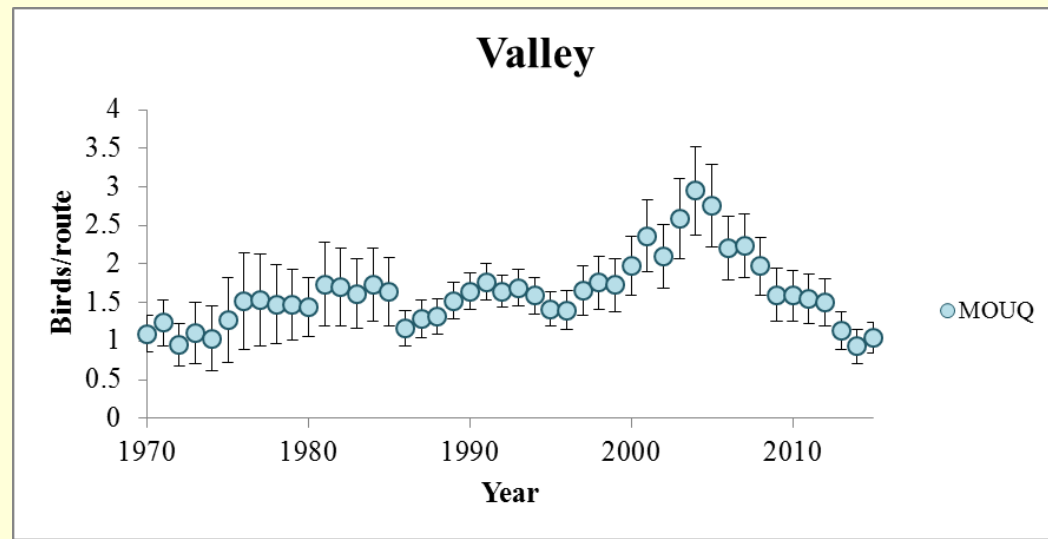


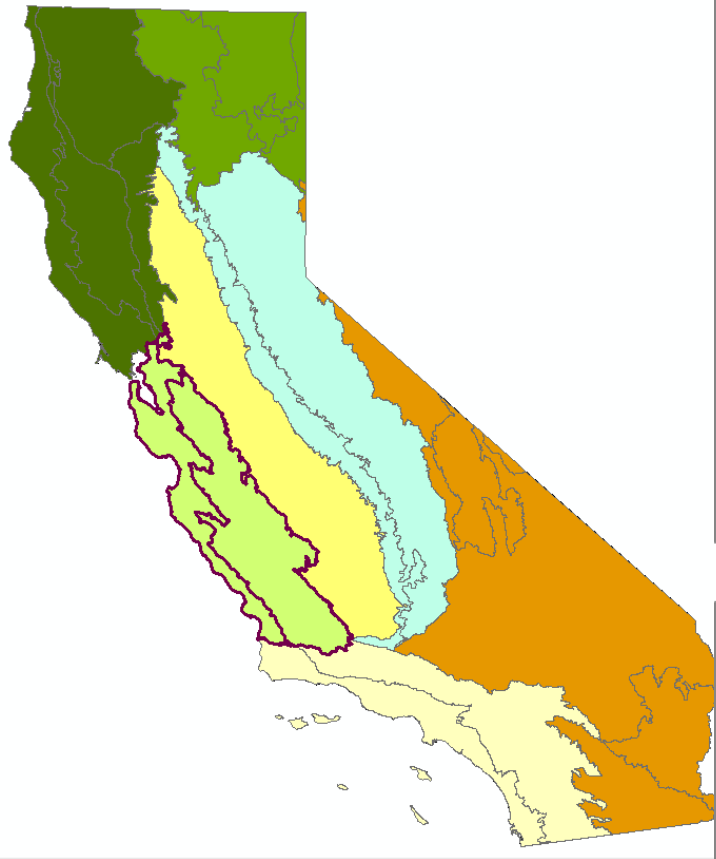
Wildlife Branch



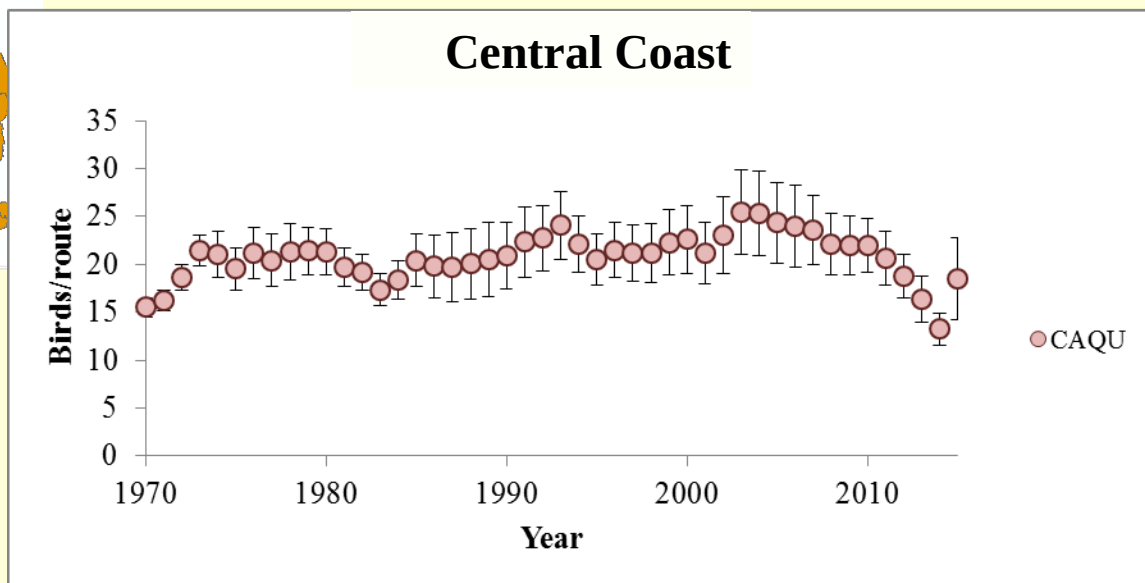
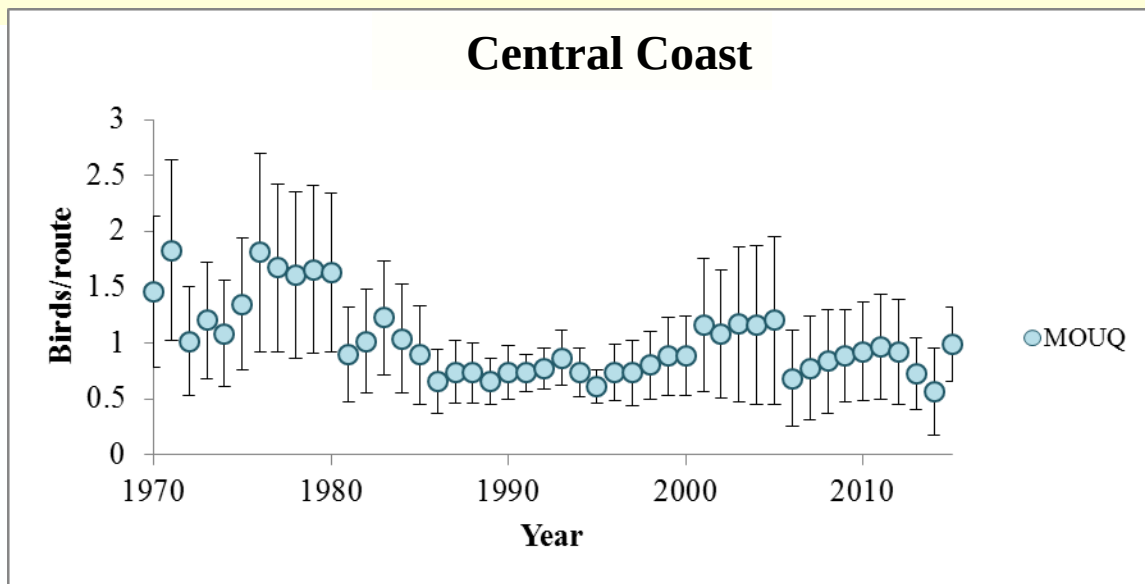


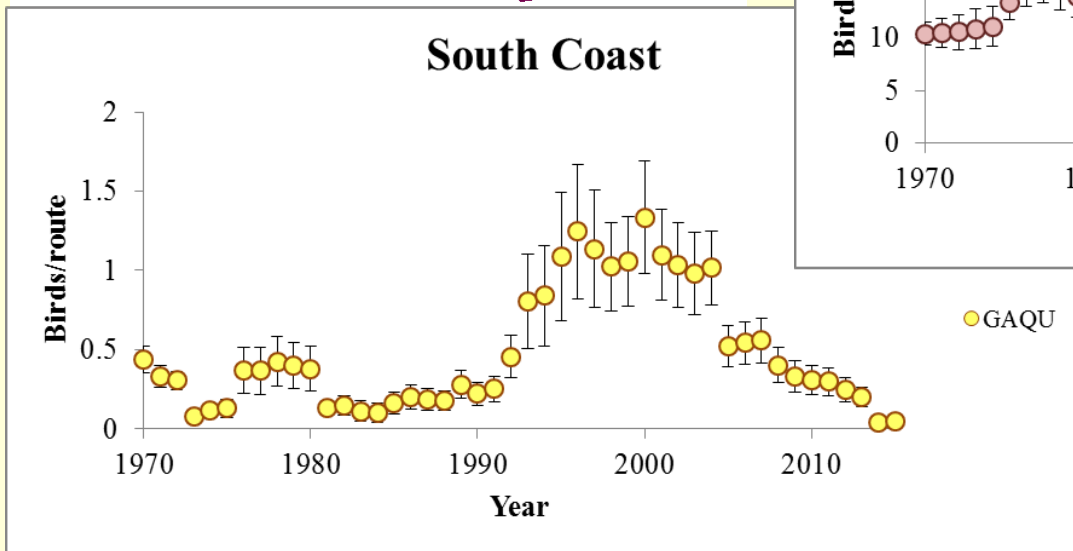
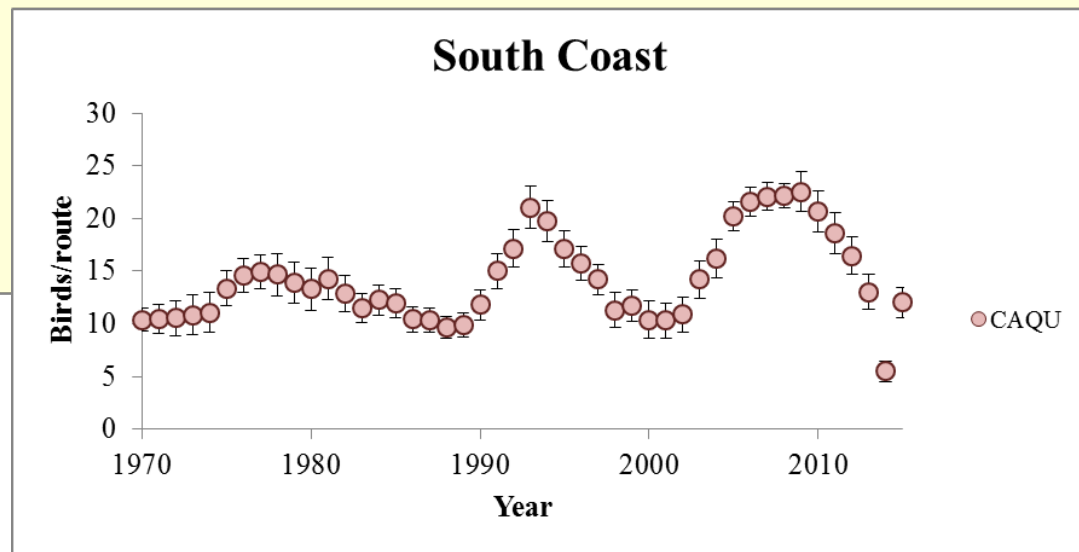
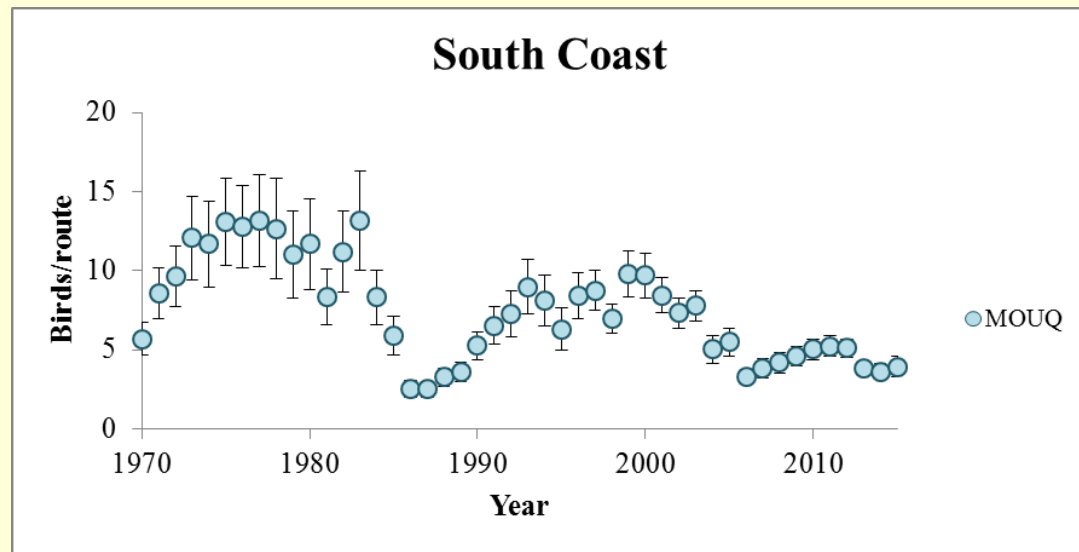
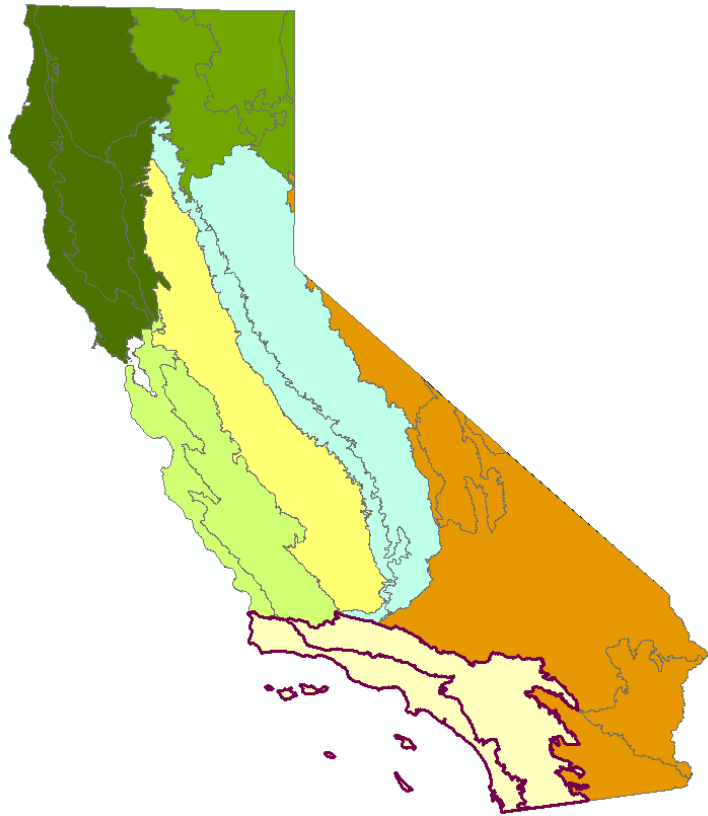
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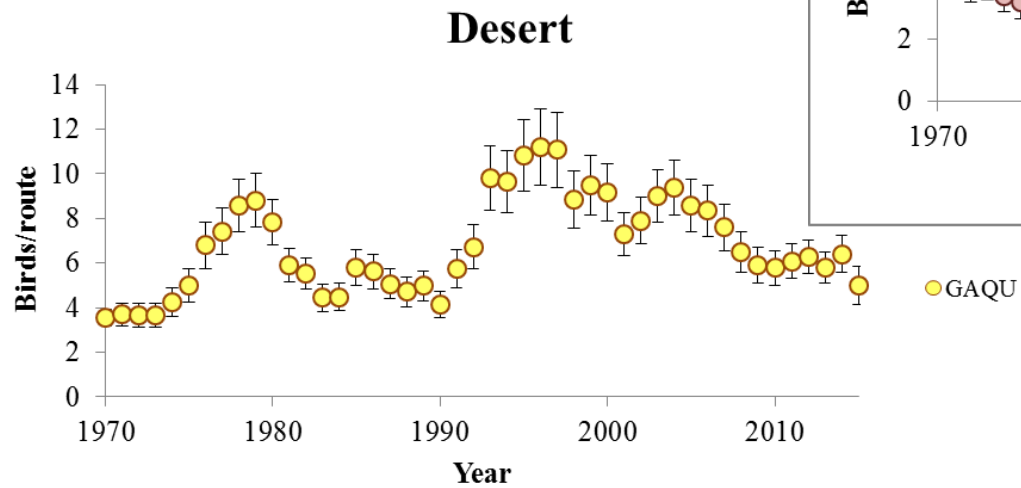
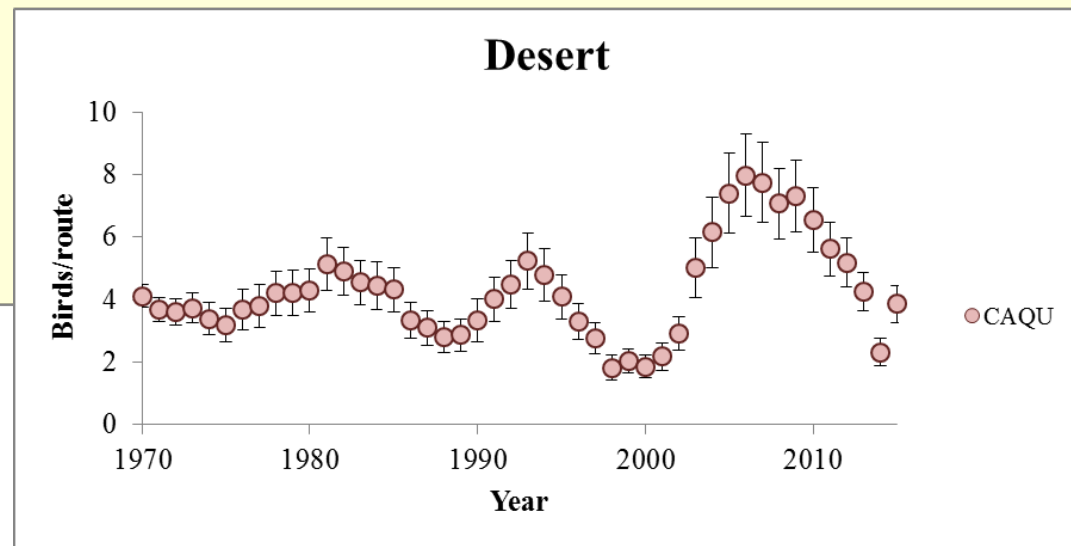
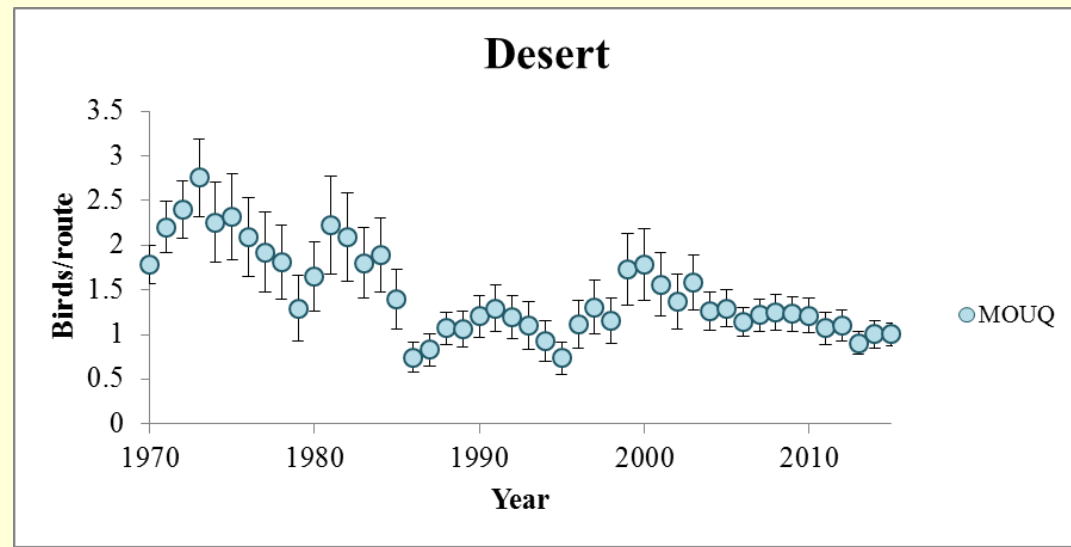
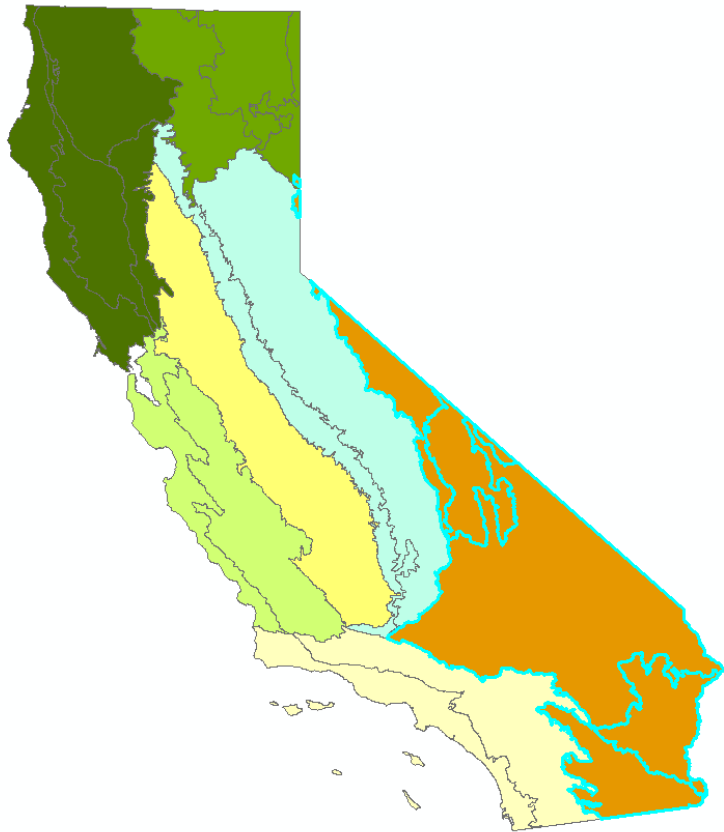


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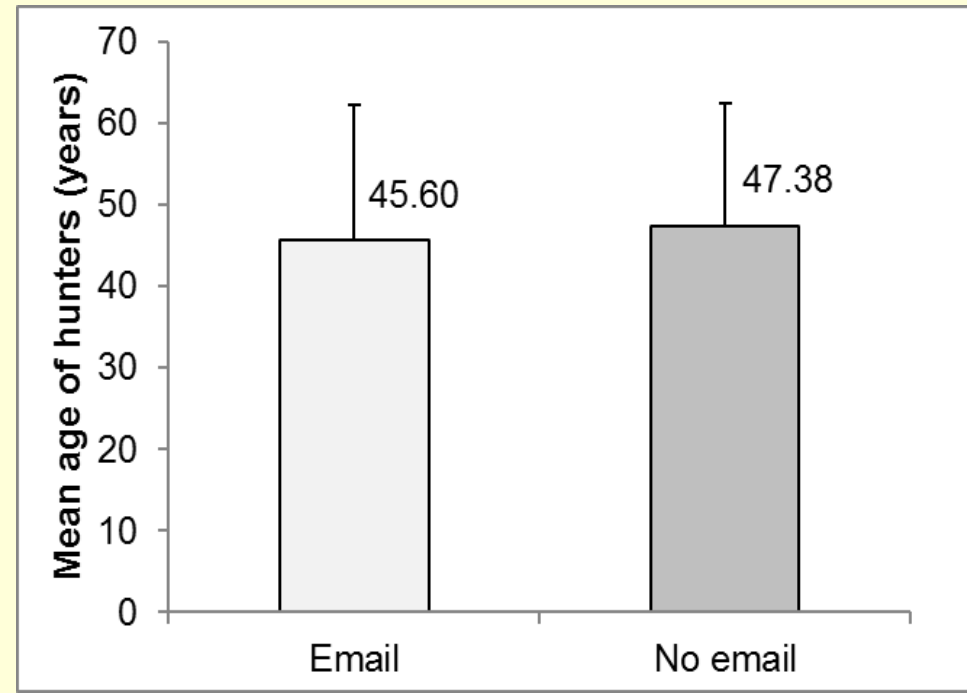
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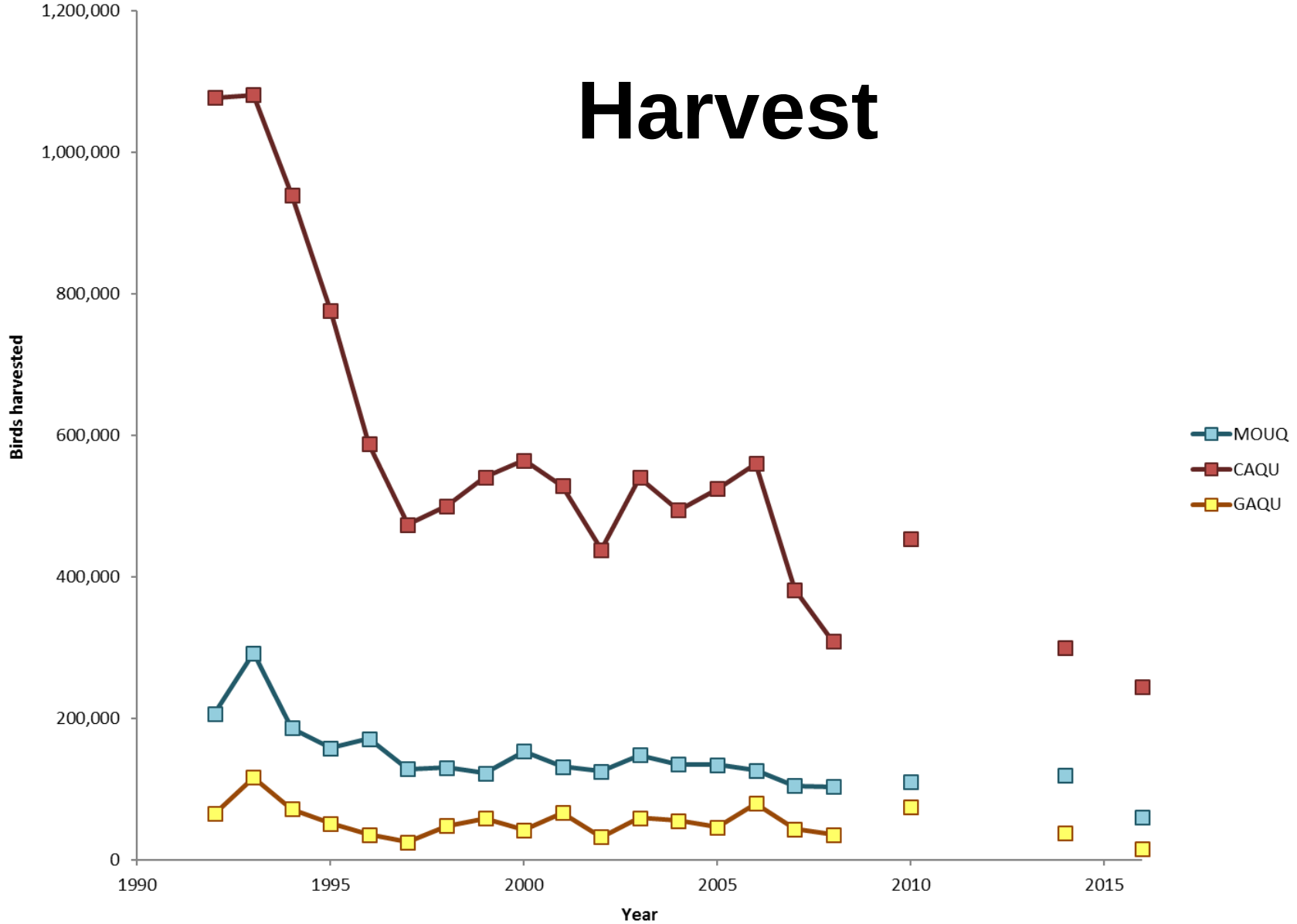
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A New Hunter Harvest Survey

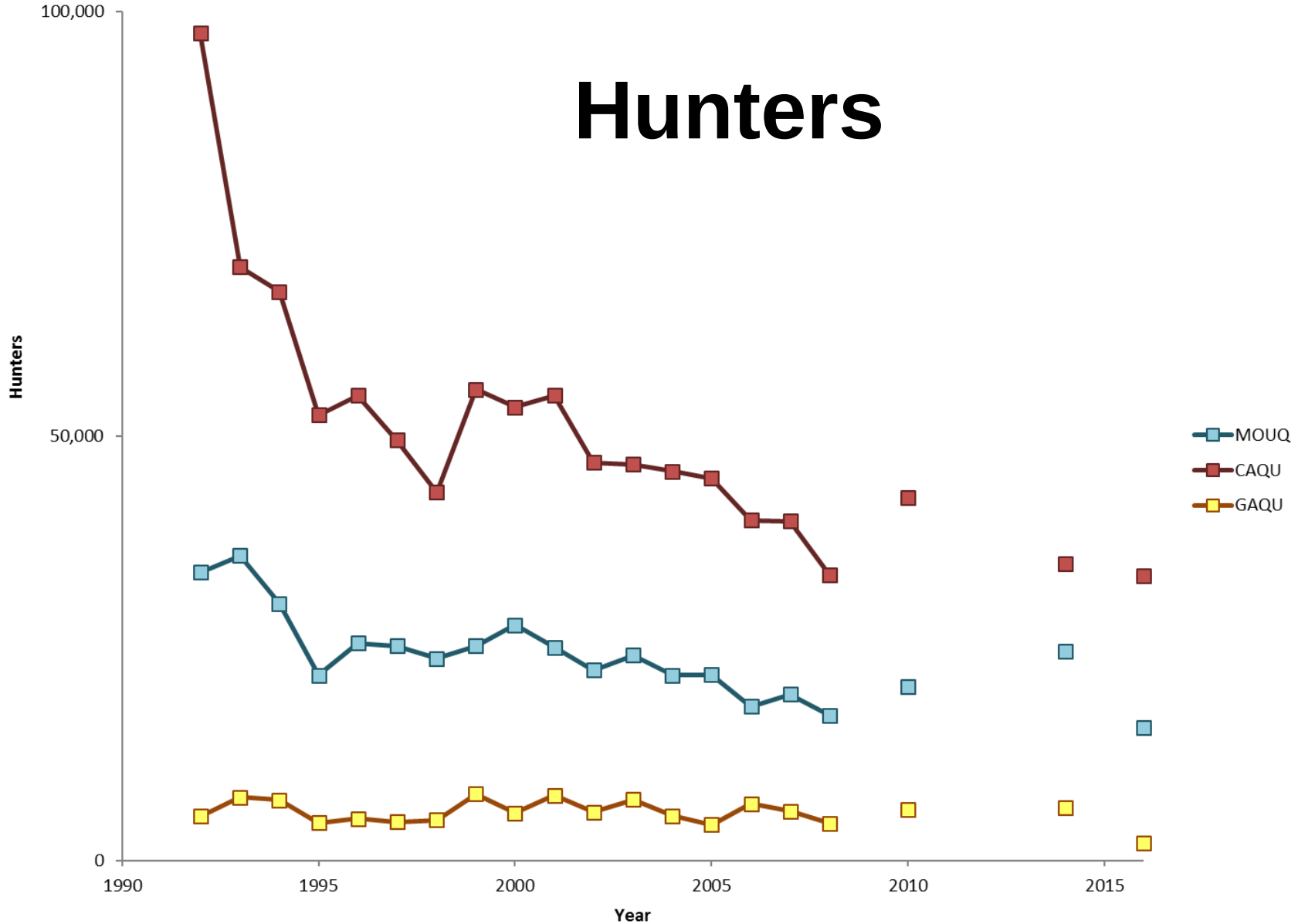
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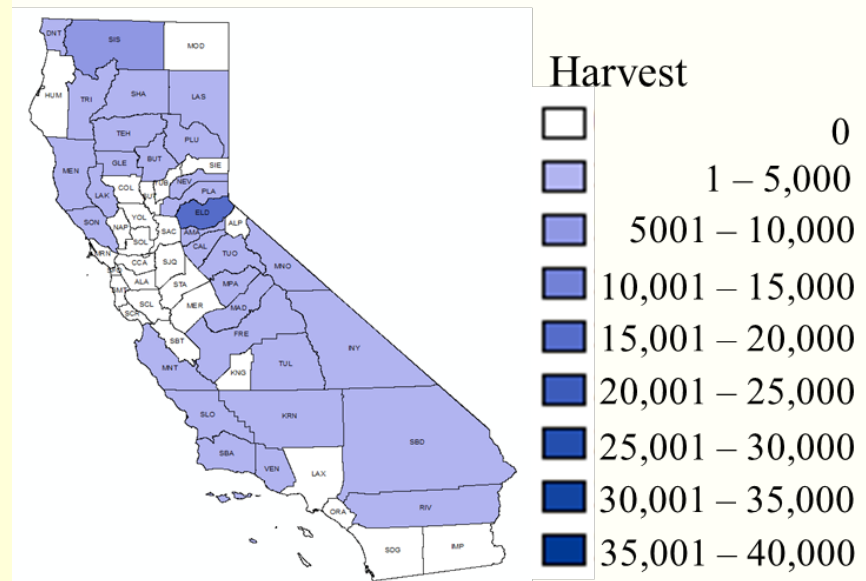
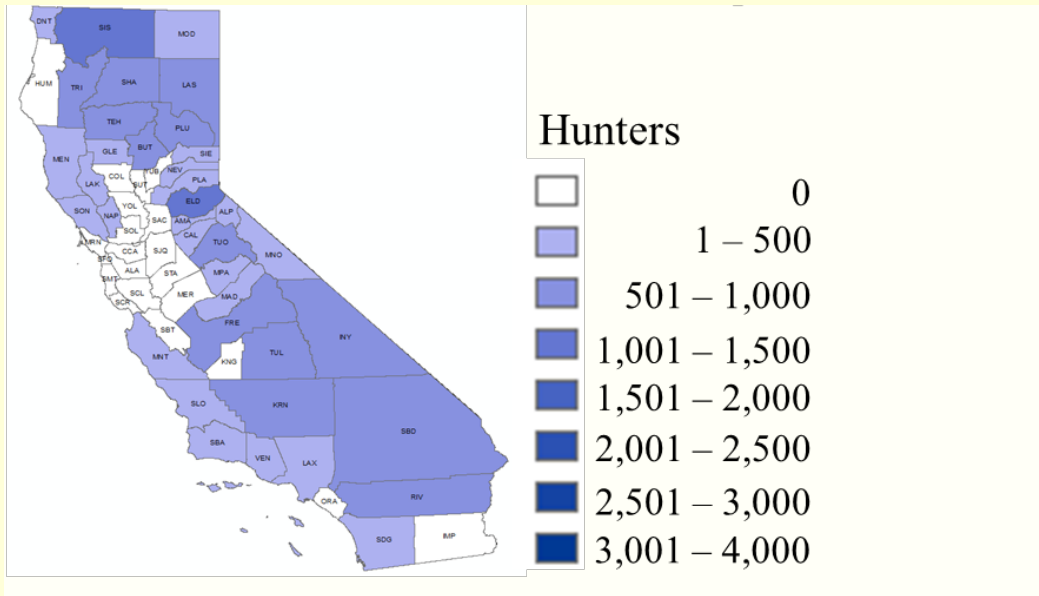
Harvest



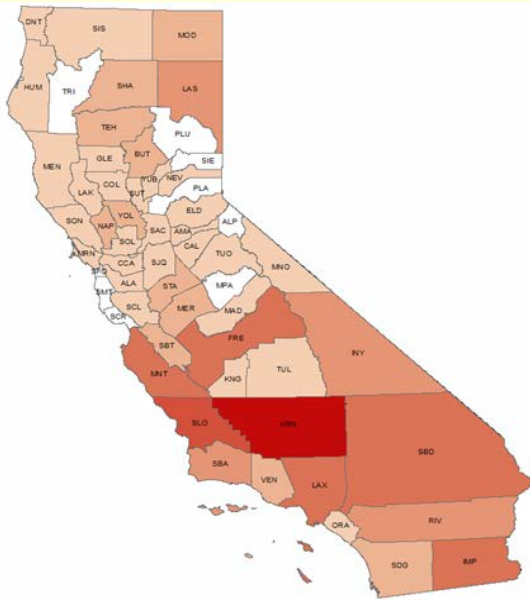
Hunters



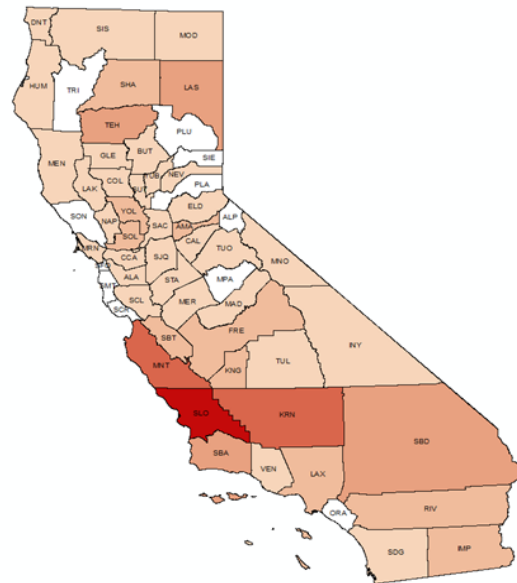
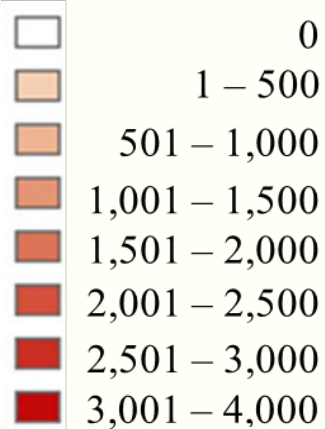
Mountain quail



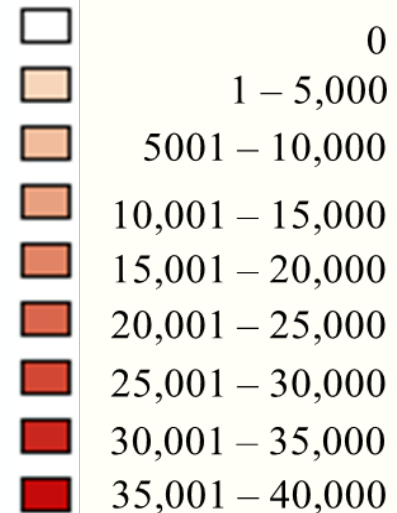
California quail



Hunters



Harvest



Gambel's quail

