

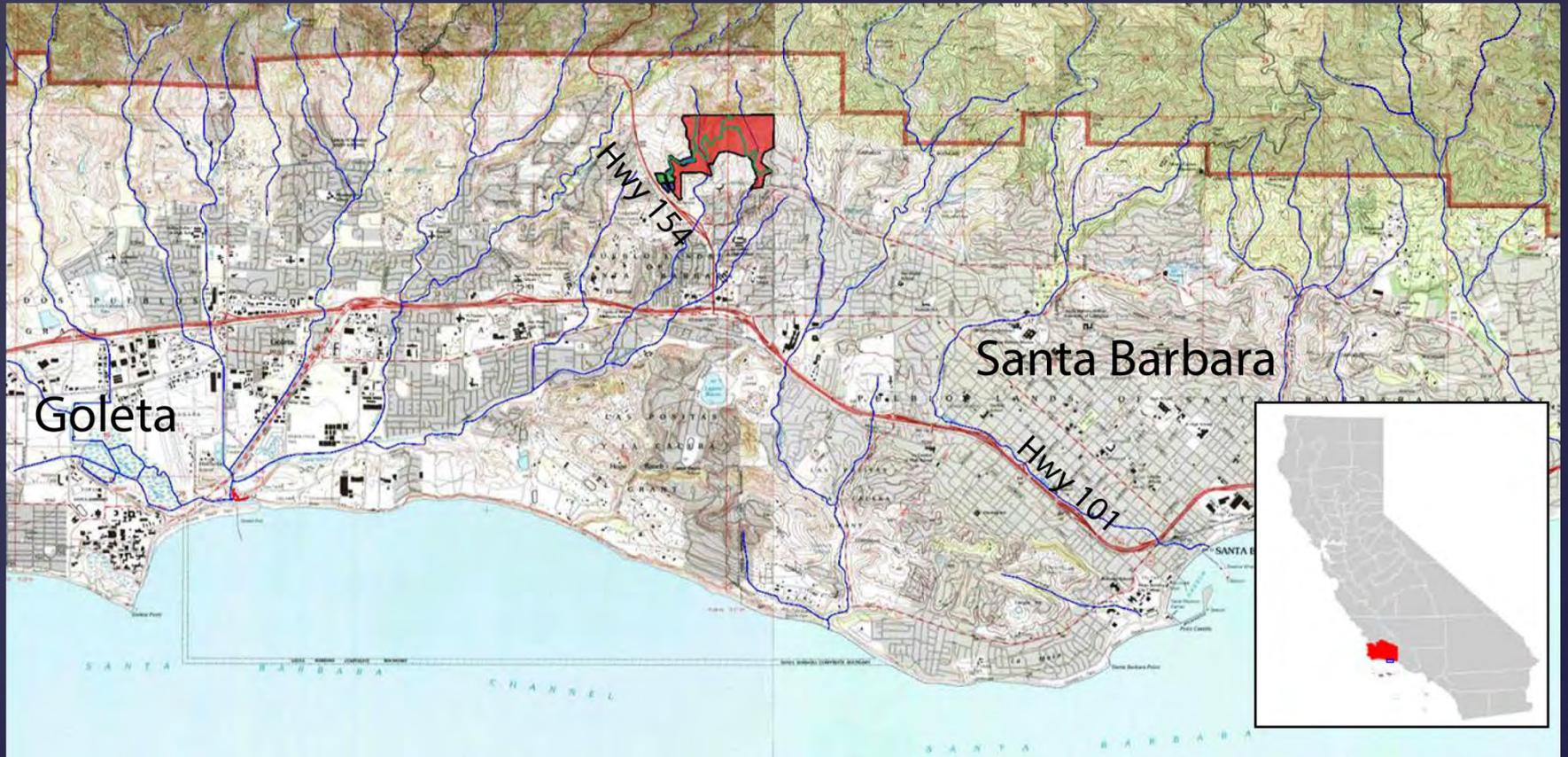


**Restoration of
Native Grasslands & Bird Populations**

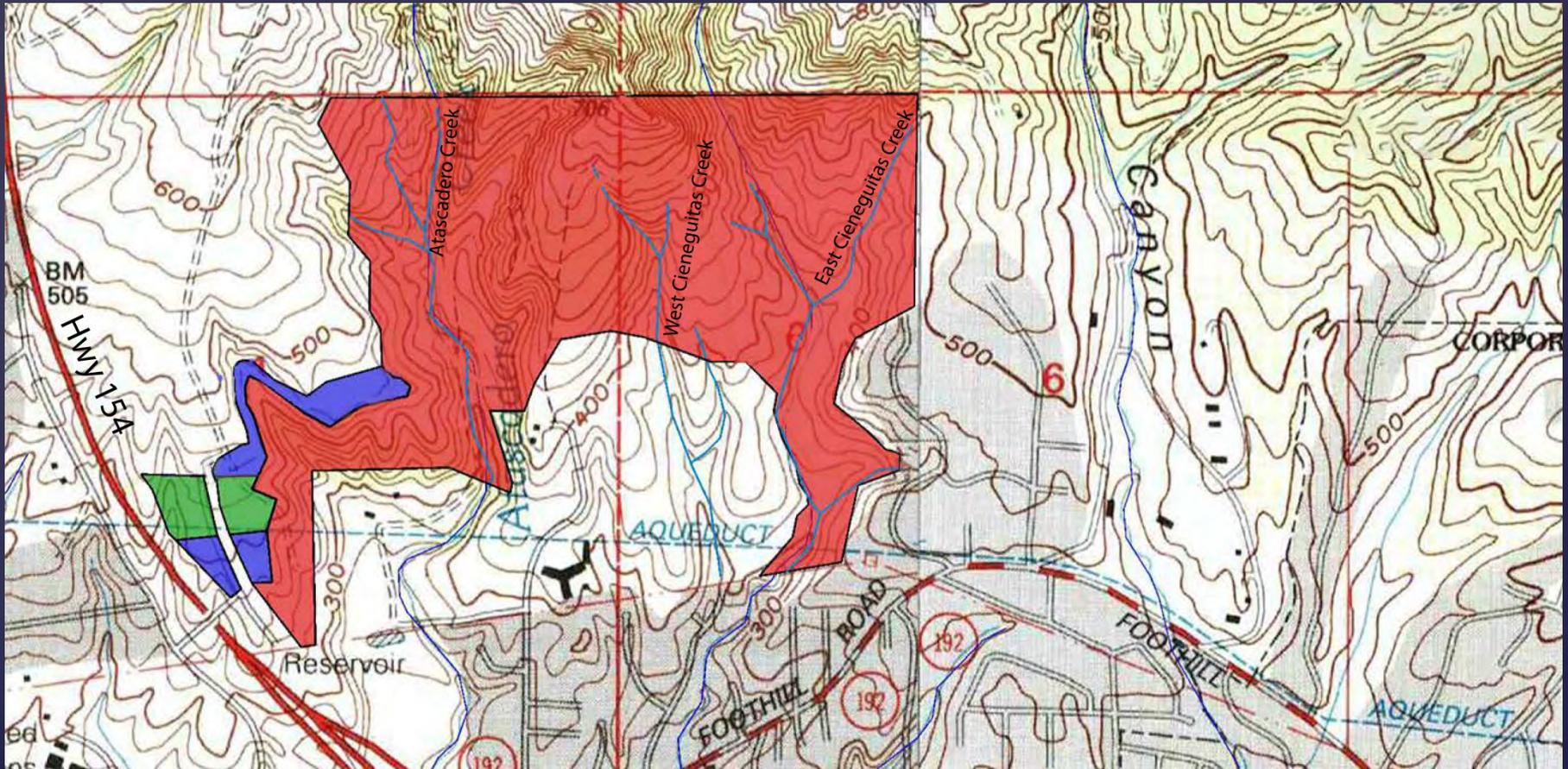
Sheep Grazing on the San Marcos Foothills

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Channel Islands Restoration
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San Marcos Foothills Preserve



San Marcos Foothills Preserve



The Preserve supports about 50 acres of grassland, some native and some non-native. Our goal is to restore all 50 acres to native grassland that supports native birds that depend on grasslands for survival including white-tailed kite, burrowing owl, western meadowlark and grasshopper sparrow. We are using sheep to do the restoration for us.



Non-Native Grassland on the Preserve with Native Fiddleneck Flowers



Native Grassland on the Preserve



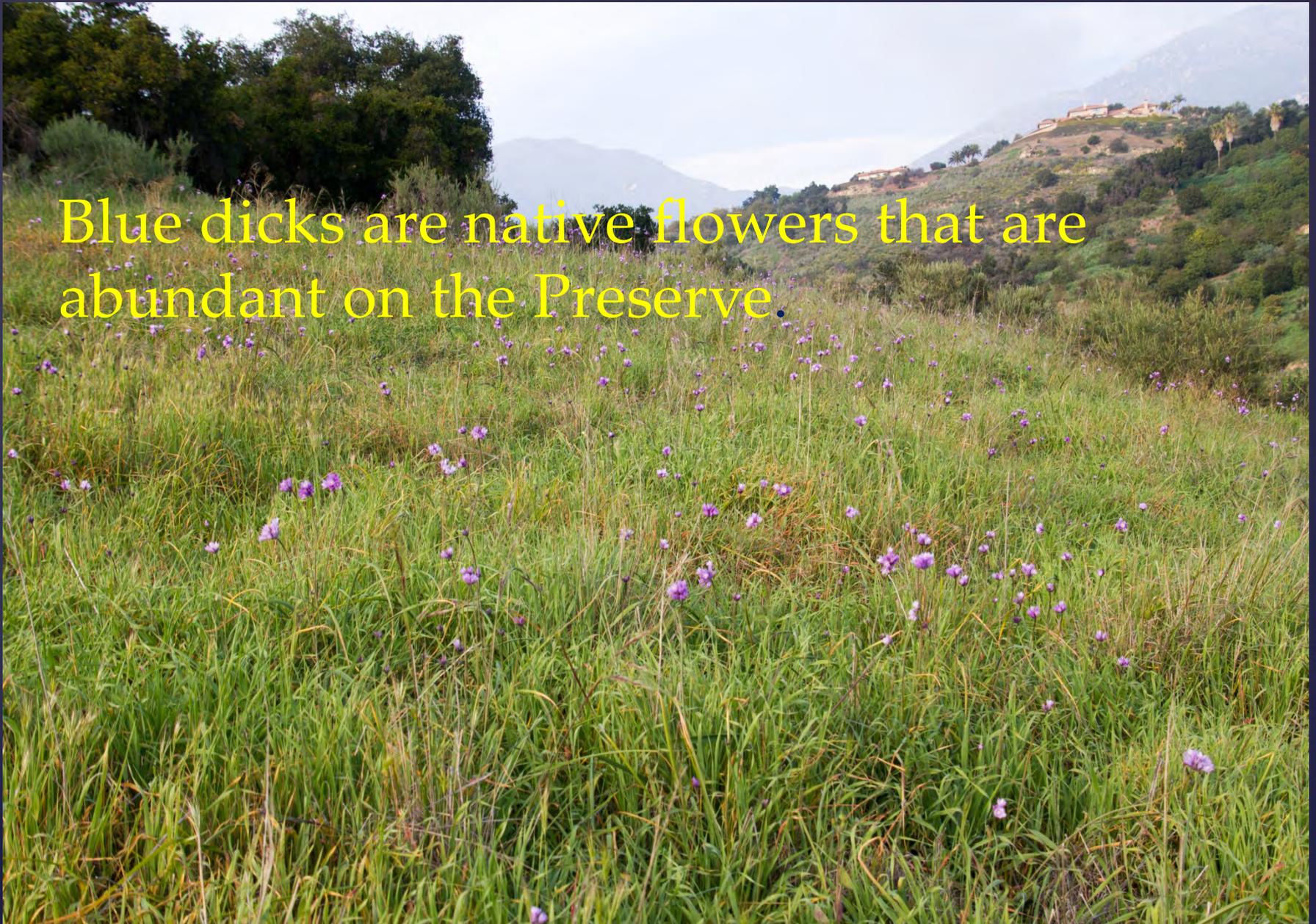
Non-Native Grassland on the Preserve



The grassland community includes shrubs that are used by birds and other animals.



Blue dicks are native flowers that are abundant on the Preserve.



Native flowers are an important part of the grasslands on the Preserve.





This slope on the Preserve is dominated by non-native mustard that has low habitat value for wildlife.



Grazing animals are part of the grassland ecosystem.
These include mule deer and others.



Tule elk used to graze on the grasslands in Santa Barbara. Photo by Lee Eastman.



Pronghorn used to graze in California. Photo by Twiga Swala.



Ground sloths, mastodons, horses, Columbian mammoths lived in the Santa Barbara region during the Pleistocene. Native grasses and flowers evolved with these large animals trampling and eating vegetation, adding nutrients to the soil by adding their waste, and disturbing the soil.



Greg Schechter



Several birds of prey hunt for prey on the grasslands.

Northern Harrier (Ken Owen)

Red-Tailed Hawk (Ken Owen)

American Kestrel (Ken Owen)

White-Tailed Kite (Greg Schechter)

Burrowing Owl (Kirk Swenson)

Photographers are noted.



These small mammals are a part of the grasslands on the Preserve.
CA Mouse (R.J. Adams)
CA Ground Squirrel (Jesse Rorabaugh)
Brush Rabbit (Gena Bentall)
CA Vole (J. Maughn)
Botta's pocket gopher (Stevie Kennedy-Gold) Photographers noted.

**Table 5
Bird Guilds on the Preserve***

Guild	Common Name	Presence During the Breeding Season	Presence During the Non-Breeding Season
Seed Eating Guild	Grasshopper Sparrow	formerly present. Not present since 2007	not present
	Black-headed Grosbeak	present	present
	Lark Sparrow	present	present
	Lazuli Bunting	present	present
	Rufous-Crowned Sparrow	present	present
	Vesper Sparrow	not present	present
	Savannah Sparrow	not present	present
	Western Meadowlark	not present	present
Birds of Prey	Red-tailed Hawk	present	present
	Red-Shouldered Hawk	present	present
	Cooper's Hawk	present	present
	American Kestrel	present	present
	White-tailed Kite	present	present
	Loggerhead Shrike	not present	present
	Sharp-shinned Hawk	not present	present
	Northern Harrier	not present	present
	Western Screech-Owl	present	present
	Burrowing Owl	not present	present
	Barn Owl	not present	present
	Great Horned Owl	not present	present
Short-eared Owl	not present	present	

Source:
Holmgren, Stone
and Kelly 2001

Western Meadowlark

48% cumulative decline in
North America since 1966.

In the Santa Barbara area during
non-breeding season:

1981:	900
1994 and beyond:	400

Uncommon breeder in the Santa
Barbara-Goleta area by 1990.
Probably extirpated by 2005.



Nests on the ground, often in a small depression.
Eats seeds, ants, beetles, grasshoppers, crickets, worms.

Grasshopper Sparrow

California Bird Species of Special Concern (breeding)
Cumulative Decline in North America since 1966: 75%

Next to the Preserve

12 May 2001: 25 singing males, 3 pairs,
4 visuals and 2 fly-over individuals

2000 or 2001: 40 pairs
of individuals now: 0

These high numbers occurred while the property was grazed by cattle. Once the cattle were removed, grasshopper sparrows disappeared from the property.



Nests well concealed on the ground.
Eats mostly insects, especially grasshoppers.

Burrowing Owl

33% decline in North America since 1966.

In 1886 and 1912 in Santa Barbara it was a Common Breeding Species.

Now, nearly completely extirpated.

Now, # of wintering birds in the region: 1-3.



Inhabits extensive, dry/sparse grasslands.
Often associated with a high density of ground squirrels.
Nests in a burrow in areas with high density of burrows.
Eats grasshoppers, crickets, moths, beetles, voles, mice, etc.

Avian Responses to Livestock Grazing

Burrowing Owl

Livestock grazing reduces thatch, which means more bare ground, which lead to more squirrel burrows (CDFW, Rancho Jamul 2018). More squirrel burrows may support increased presence of burrowing owls.

Livestock grazing can be designed to decrease the height of the grasses which means increased visibility across the landscape. Low and open vegetation structure is critical for burrowing owl (San Diego Zoo Institute for Conservation Research (2017)).

Avian Responses to Livestock Grazing

Grasshopper Sparrow

Livestock grazing can be designed to create patchy areas, decreasing vegetation height and thinning vegetation which supports grasshopper sparrow (Dechant et al 1988).

Cattle grazing on the San Marcos Foothills supported 47 individuals and multiple breeding pairs. After the cattle were removed, grasshopper sparrows disappeared from the property (Holmgren, pers. comm. 2017).

Grasshopper sparrow are positively associated with native bunchgrasses in a patch grassland structure (Goerissen 2005) that includes occasional shrubs to perch and sing (Dobkin and Granholm 1988).

Avian Responses to Livestock Grazing

Western Meadowlark

Livestock grazing reduces litter and creates bare patches which results in a vegetation structure preferred by western meadowlarks (Gennet et al 2017).

Western meadowlarks were observed most often on plots with higher levels of native plant cover and flat terrain, and a slight increase in meadowlark presence with more bare ground that is a result of livestock grazing (Gennet et al 2017).

Harrison et al (2010) found that low intensity grazing over a long period of time resulted in no net change in overall abundance of western meadowlark. They did find that the meadowlark population increased in response to increased bare ground.

Primary Goal

Restore populations of grassland-dependent birds on the Preserve by restoring 50 acres of grassland to native perennial grassland.

Secondary Goals

- ⌘ **Ecosystem:** Create and sustain habitat for common and special-status species.
- ⌘ **Water:** Increase the amount of water that is stored under ground and slowly released and decrease runoff.
- ⌘ **Climate:** Increase ability of animals to survive effects of climate change.
- ⌘ **Climate:** Increase carbon sequestration.
- ⌘ **Culture:** Provide opportunities for gathering of native plants.
- ⌘ **Recreation:** Provide public access.
- ⌘ **Participation:** Provide educational opportunities and public participation in monitoring.

Vegetation Goals

- ⌘ Native grassland should have a minimum of 10 percent native grass cover and a maximum of 50 percent cover of native grass, a presence of several native forb species, and some bare ground ranging from 10 to 50 percent of the total amount in the grassland.
- ⌘ Native grassland should have structural diversity including some tall grass and some short grass and forbs in order to provide shelter for grassland-dependent birds.
- ⌘ Create and maintain a mosaic of grassland in which some areas have bare ground between native grasses, and other areas have some thatch between grasses with which ground nesting birds can build and hide nests.
- ⌘ Recognize that it is impossible to remove non-native grasses from the grasslands. Nevertheless, time the livestock grazing so that the seed stocks of non-native grasses are depleted.

Grazing Prescription In “Normal” Years

50 acres

400 - 450 Sheep

Average 2 acres per day

25 – 30 Days

Twice per Year: Dec/Jan & March



The sheep will be kept in fenced pastures to control where they graze and for how long.



Sheep vs. Cattle?

Sheep break blades of grass between their gums and lower teeth. Cattle use their tongues to pull up the grass.

Sheep graze closer to the ground than cattle.



Timing and Spacing?

Grazing in tall forage often results in higher bites.

Grazing in short forage usually results in bites closer to the ground.

In tight spaces we can get them to clean up the whole cell.

In wider spaces we can get them to leave more residual.

Forbs might be more sensitive to seasonal timing.

It's never perfectly consistent.



What's for Lunch?

Controlling what they eat and what they don't.

We will use fenced pastures to control where.

We will use all of the sheep in one pasture at a time for a short time.

This high intensity heavy impact will occur over a short duration. This is expected to cause the grasses and wildflowers to regenerate with renewed vigor.

This is expected to provide improved habitat for native grassland birds.



This is a simplified illustration of how the sheep will be managed, moving them from one pasture to the next. Sensitive areas will be excluded from grazing areas.





The sheep will be kept inside electric fencing with guard dogs to protect them.





The riparian areas such as the one in the middle of this photo will be fenced to keep the sheep out.

We will bring in temporary infrastructure and remove it when we're done for the season.

Water



Fencing



Predator Control

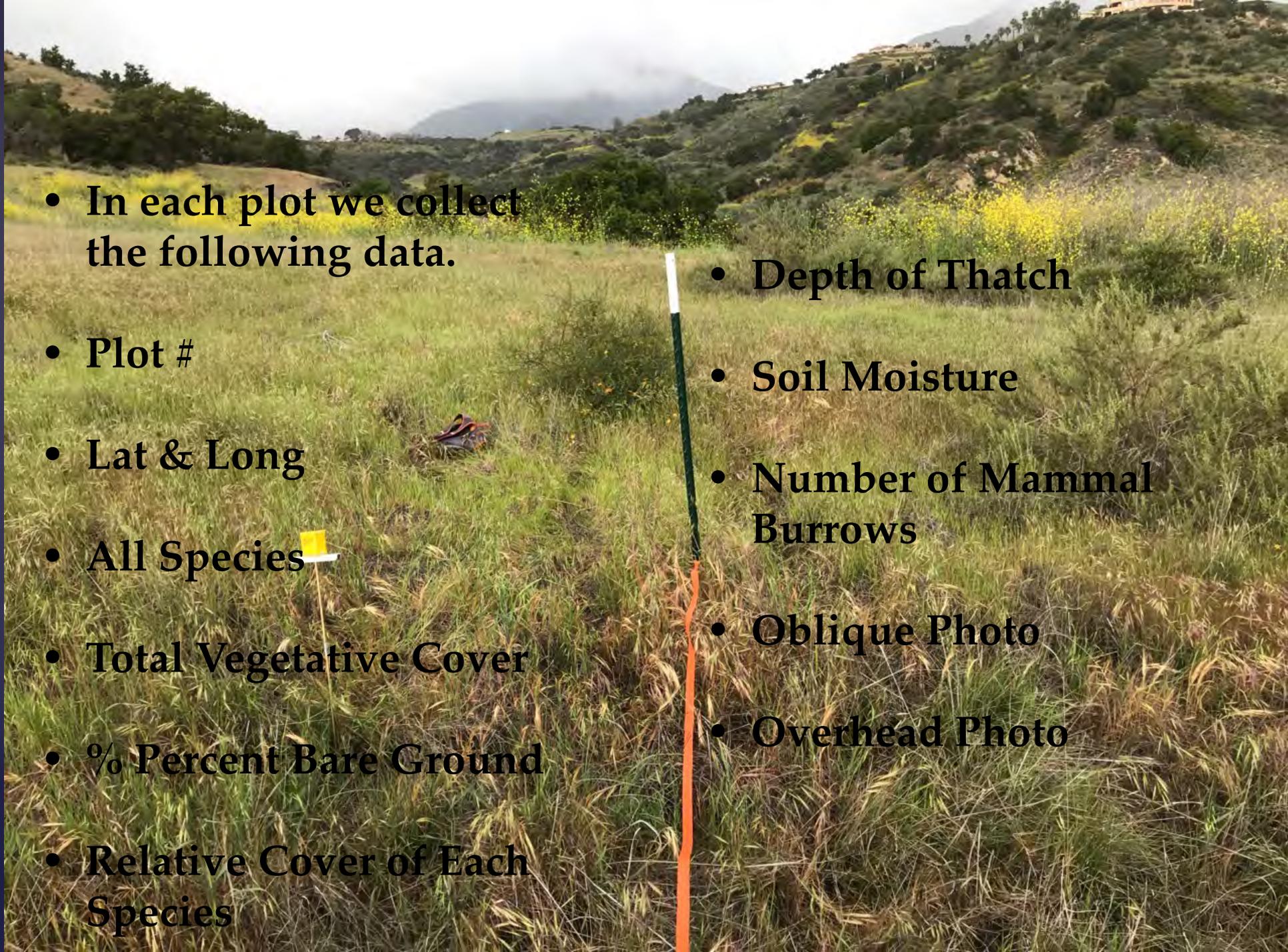


Grassland Monitoring

We have established
29 Monitoring Plots.



Grassland Restoration
Monitoring
Site 6-B
Channel Islands Restoration
(805) 444-8175

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- A photograph of a grassy field with a survey marker in the foreground. The marker is a white post with a yellow flag and a white tag. The background shows rolling hills with sparse vegetation and some buildings in the distance. The sky is overcast.
- In each plot we collect the following data.
 - Plot #
 - Lat & Long
 - All Species
 - Total Vegetative Cover
 - % Percent Bare Ground
 - Relative Cover of Each Species

- Depth of Thatch
- Soil Moisture
- Number of Mammal Burrows
- Oblique Photo
- Overhead Photo

Here is an example of two comparison vegetation plots.



Plot 6d Percent Cover

<i>Bromus diandrus</i>	62%
<i>Brachypodium distachyon</i>	20%
<i>Stipa pulchra</i>	10%
<i>Avena</i> sp.	8%



Plot 4a Percent Cover

<i>Erodium botrys</i>	65%
<i>Stipa pulchra</i> :	25%
<i>Brachypodium distachyon</i>	7%
<i>Bromus diandrus</i>	3%



We will be monitoring the bird populations hoping that population numbers will increase in response to the structural changes in the grassland that will result from the livestock grazing. Perhaps some of these species will begin breeding on the Preserve again.



“All flesh is grass.” – Isaiah 40:6



What else should we be thinking about?

Bobcat (Ken Owen)
Coyote (Ken Owen)



How can I help?
Bird Monitoring
Docents
Financial Support

Thank You

Santa Barbara County

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California Department of Fish and Wildlife

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Ken Owen

Tanner Yould

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