

**California Department of Fish and Wildlife  
Resident Upland Game Bird Hunter Harvest Survey 2016-2017**



2016-2017 California Upland Game Bird Stamp Art Contest, California quail  
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## **Introduction**

From 1948-2010, the California Department of Fish and Wildlife (hereafter, the Department) conducted a “Game Take Hunter Survey” (GTHS) to estimate hunters’ harvest and participation in California. The GTHS was a mail-based survey sent to a random sample of people who purchased a hunting license. These surveys provided information on the number of each species harvested and the time spent by each hunter in the field by county, providing information on hunter success and harvest trends. The GTHS included all game, non-game, and furbearing species that can be hunted and was the only method for estimating harvest of resident upland game birds through 2010.

In more recent years, technological advances in automated license systems and changes to survey methodology have changed how biologists conduct these harvest surveys. For example, the advent of the Automated License Data System (ALDS) in the early 2000s allowed the Department to report species-specific harvest based on tag returns (big game species) and permit reports (greater sage-grouse). Hunters can now submit tags and permit reports directly through ALDS. Consequentially, the utility of the mail-based GTHS declined while postal costs increased, and after a statewide budget crisis, the survey was discontinued (the last survey was conducted in 2010). Another example of changing survey methodology is the Migratory Harvest Information Program (HIP), administered annually by the United States Fish and Wildlife Service in cooperation with CDFW. The HIP estimates the harvest of migratory game birds (waterfowl, doves, band-tailed pigeons, rails, coots and gallinules, and Wilson’s snipe). With the exception of greater sage-grouse, neither ALDS nor HIP surveys provide estimates of resident upland game bird or small game harvest.

A need remains to estimate harvest for resident upland game birds and small game mammals in California, and the Department has investigated several different approaches for conducting these surveys. In 2014, the Department contracted with Responsive Management to conduct a Survey of Upland Game Birds and Small Mammals. Responsive Management conducted both a telephone survey with a response rate of 28%, and an email survey with a response rate of 11%. Responsive Management’s harvest report, and the previous GTHS reports, are available on the Department’s Upland Game Bird Hunting website, [www.wildlife.ca.gov/Hunting/Upland-](http://www.wildlife.ca.gov/Hunting/Upland-)

GameBirds.gov. In 2017, the Department developed and conducted an internet-based survey specific to resident upland game birds.

## **Survey Overview**

The Department evaluated different survey techniques, along with their implementation costs and potential sources of bias, and ultimately chose to develop an on-line survey for a random pool of hunters with Upland Game Bird Validations. This on-line survey relies on the hunter's email address in order to direct the hunter to the survey website. The hunter is required to provide their GO-ID number to ensure that only those responses from randomly selected hunters are recorded. While all holders of hunting licenses in California are automatically assigned an individual GO-ID number in ALDS, the submission of an email address to the department is optional, thus not all upland game bird hunters in California could be randomly surveyed by email. However, there is a consistently increasing trend of hunters who use email, and in 2016-2017 44% of those hunters who purchased an Upland Game Bird Validation through ALDS voluntarily provided an email address. Because we expect that the number of hunters who provide email address will continue to increase, and because many hunters who purchased an Upland Game Validation in the 2016-2017 license year could be reached via email, we chose to use email and the internet as the technique to conduct this survey, while mindful of potential sources of bias.

Prior to drawing the random sample from the pool of hunters with email addresses on file, we addressed the concern that the use of email might introduce an age-bias among respondents, as the use of email is relatively new in comparison to recreational hunting. To investigate this potential source of bias we determined age for all hunters with Upland Game Bird validations for 2016-2017, and compared mean age between two groups, those that provided an email address and those that did not (Fig. 1).

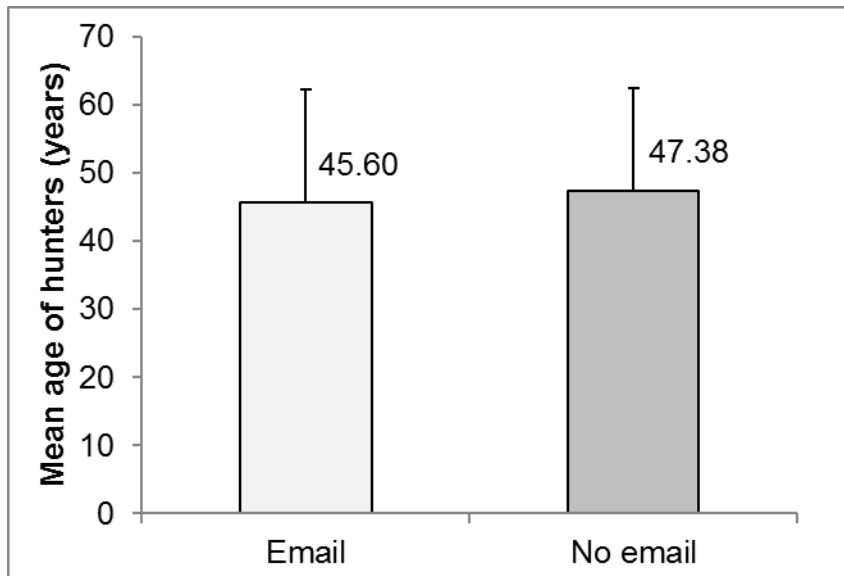


Figure 1. Mean age  $\pm$  SD for upland game bird hunters who provided email addresses vs. those who did not provide email addresses.

Due to the similarity in mean age for hunters between these groups ( $\leq 5$  years), we chose to proceed with sampling only those hunters that provided emails for our first on-line hunter harvest survey. We randomly chose 10,000 hunters with email addresses for our sample, using the equation in Dillman (2000:206).

$$Ns = \frac{(Np)(p)(1-p)}{(Np-1)\left(\frac{B}{C}\right)^2 + (p)(1-p)}$$

Where:

$Ns$  = sample size that completed the survey

$Np$  = total population of interest: 154,657 (all upland game hunters in 2016-2017).

$p$  = 0.5

$B$  = acceptable amount of sampling error (< 2 points)

$C$  = Z statistic for desired confidence interval (at 95%, 1.96)

If  $B = 0.02$ , or 2%, the findings of 95 of 100 surveys would fall within 2 percentage points of each other. For example, if we ask hunters their age, and the mean age is 52.3, then for 95 out of 100 different surveys the sample estimate would be between 50.3 and 54.3.

To obtain results with our predetermined sampling error of  $B = 0.02$ , we solved the above equation to determine the number of survey respondents required ( $n = 2,365$ ). We assumed a response rate for on-line surveys of 25%, based on communication with wildlife departments in other states. Thus, the number required for our pool of randomly selected hunters should be 9,460, which we rounded up to 10,000 hunters. We sent this random sample a link to a page on the Department website that asked them to report harvest location and number (Appendix 1).

## Results

We received 1,520 responses from our random sample. Of the respondents, 47% ( $n = 709$ ) hunted resident upland game birds, and 53% ( $n = 811$ ) did not hunt, hunted only migratory upland game birds, or only hunted on licensed game bird clubs, and were thus excluded from further analysis. We estimated the harvest and hunter effort by extrapolating the number reported by the hunters using the number of respondents ( $n = 1,520$ ) divided by the number of upland game validated hunters ( $n = 154,657$ ).

Most hunters who hunted resident upland game birds in 2016-2017 were male (Fig. 2). The mean age of hunters was 50.38, younger than those who did not hunt, but older than the mean age from the random pool of 10,000 hunters. Hunters that did not respond to the survey were younger, on average, than those who responded (Fig. 3).

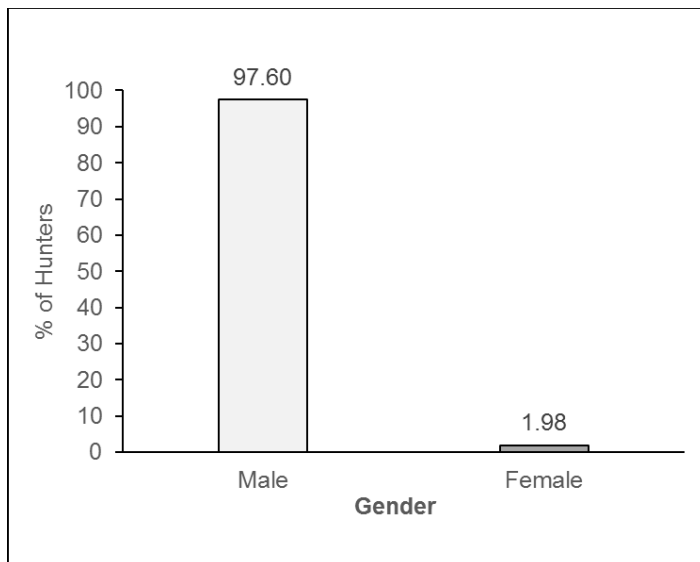


Figure 2. Gender of survey respondents.



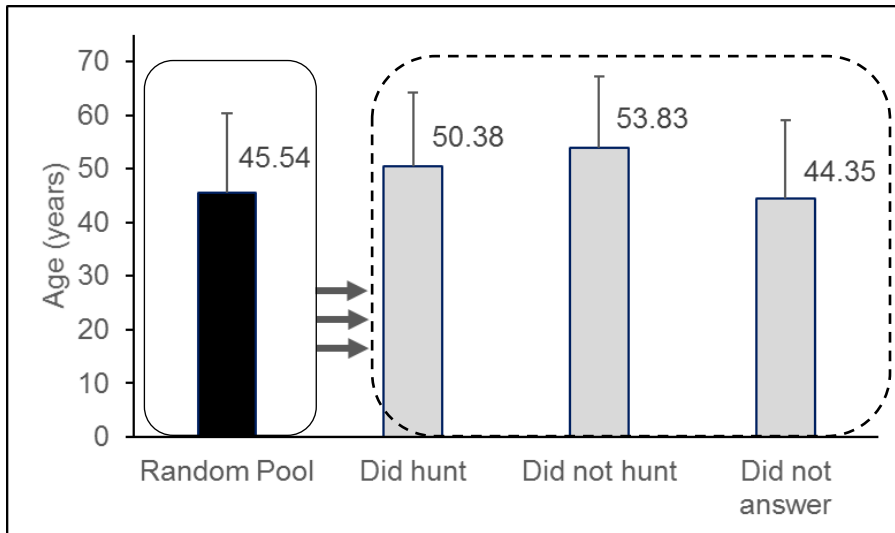


Figure 3. Mean age  $\pm$  SD of surveyed hunters who hunted, did not hunt, or did not answer the survey.

### Sample Error

We determined sampling error from a rearrangement of Dillman's (2000) equation:

$$B = \left( \sqrt{\frac{\frac{(Np)(p)(1-p)}{Ns} - (p)(1-p)}{(Np-1)}} \right) (1.96)$$

$Ns$  = sample size that completed the survey, 1,520

$Np$  = total population of interest: 154,657 (total upland game hunters in the 2016-2017 hunting season).

$$p = 0.5$$

$C$  = Z statistic for desired confidence interval (at 95%, 1.96)

$B = 0.0249$ , or, 2.49 percentage points.

Thus, we calculated that the sampling error rate for our survey is  $\pm 2.49\%$ .

## Results by species

We asked hunters to report on 9 resident upland game bird species: mountain, California, and Gambel's quail, chukar, ring-necked pheasant, ruffed grouse, white-tailed ptarmigan, sooty grouse, and wild turkey (Table 1). For wild turkey, we asked hunters to specify the hunting season in which turkey was hunted: Spring 2016 or Fall 2016. No hunter in our survey sample reported hunting white-tailed ptarmigan. Greater sage-grouse data reported here are from permits, 30 of which were issued for the North Mono hunt zone during the 2016-2017 hunting season.

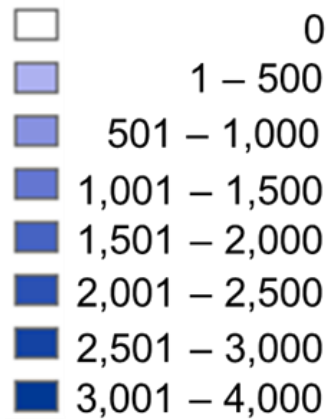
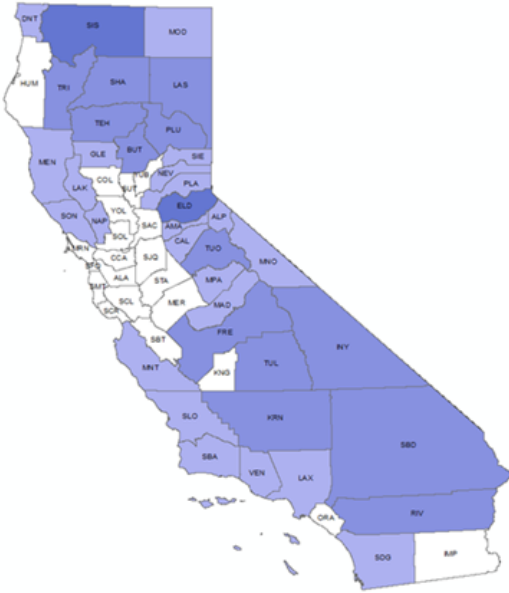
Table 1. Statewide summary of 2016-2017 Resident Upland Game Bird Hunter Harvest Survey estimated harvest and hunter effort.

	Harvest	Hunters	Avg. Seasonal Bag/ Hunter	Days Hunted	Avg. Days Hunted
Mountain quail	60,235	15,669	3.84	56,572	3.61
California quail	245,111	33,577	7.30	120,877	3.60
Gambel's quail	15,567	1,933	8.05	7,122	3.68
Chukar	16,280	6,003	2.71	16,687	2.78
Ring-necked pheasant	66,747	20,757	3.22	72,648	3.50
Ruffed grouse	305	712	0.43	2,442	3.43
Greater sage-grouse	13	13	1	11	2
White-tailed ptarmigan	0	0	0	0	0
Sooty grouse	2,137	1,623	1.32	5,901	3.64
Wild turkey Spring 2016	15,770	24,928	0.63	96,457	3.87
Wild turkey Fall 2016	7,733	16,280	0.48	45,074	2.77

## County-level results

### Mountain quail

#### Hunters



#### Harvest (number of birds)

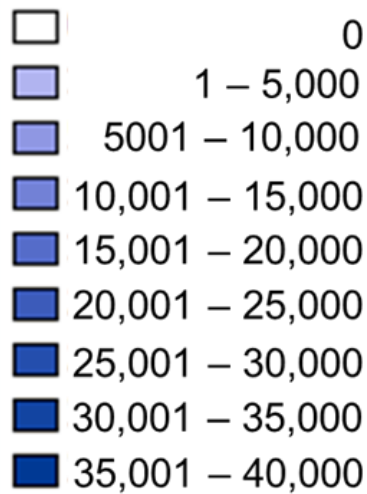
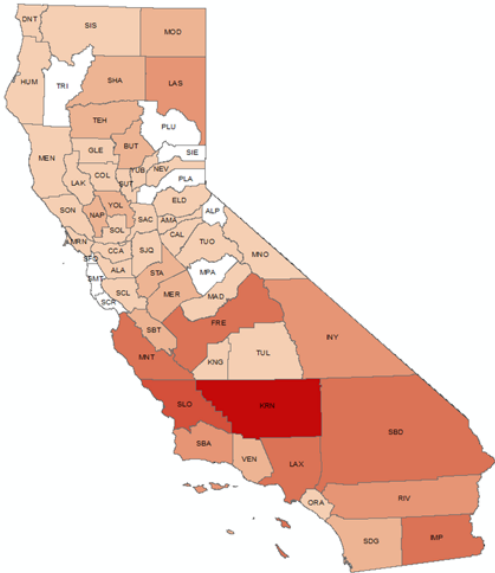
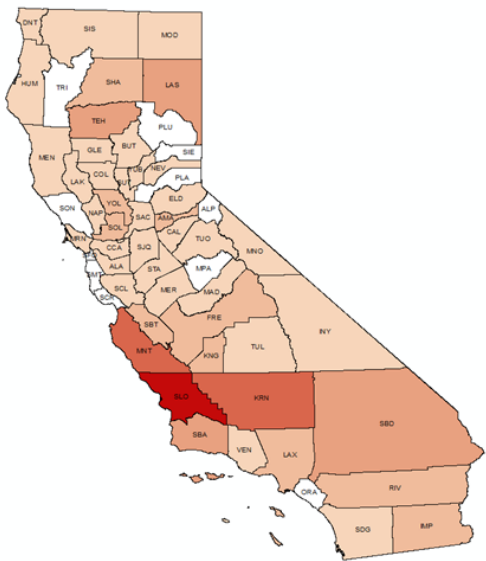
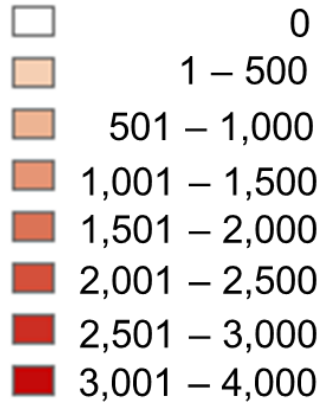


Figure 4: Estimated number of hunters and harvest for mountain quail (*Oreortyx pictus*).

## California quail



### Hunters



### Harvest (number of birds)

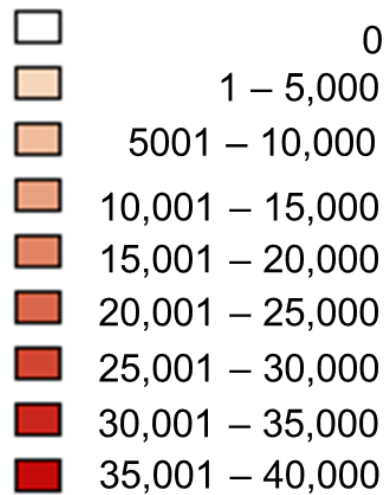


Figure 5: Estimated number of hunters and harvest for California quail (*Callipepla californica*).

## Gambel's quail

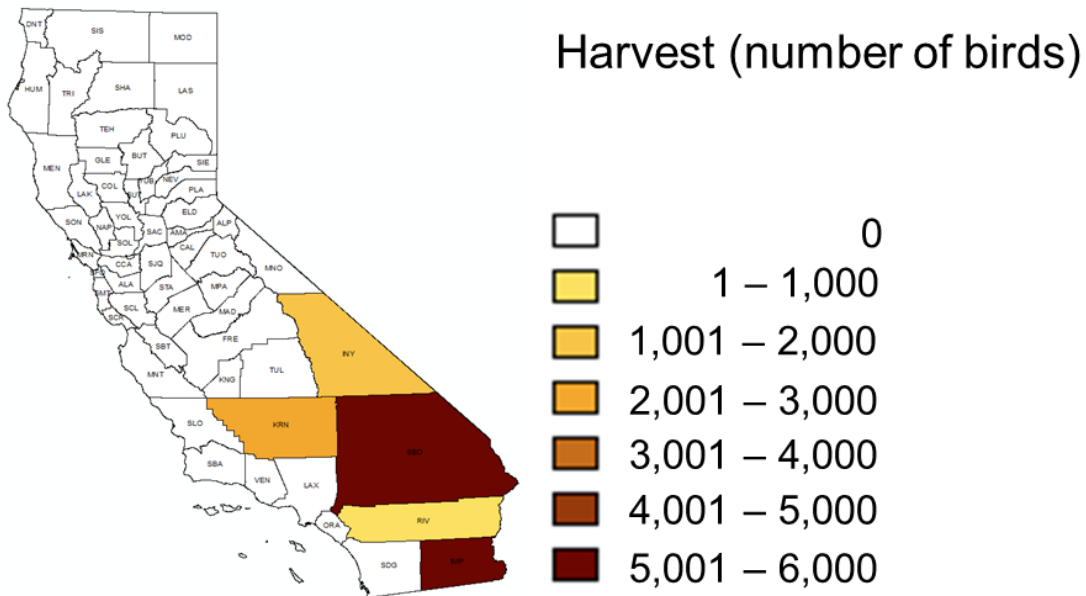
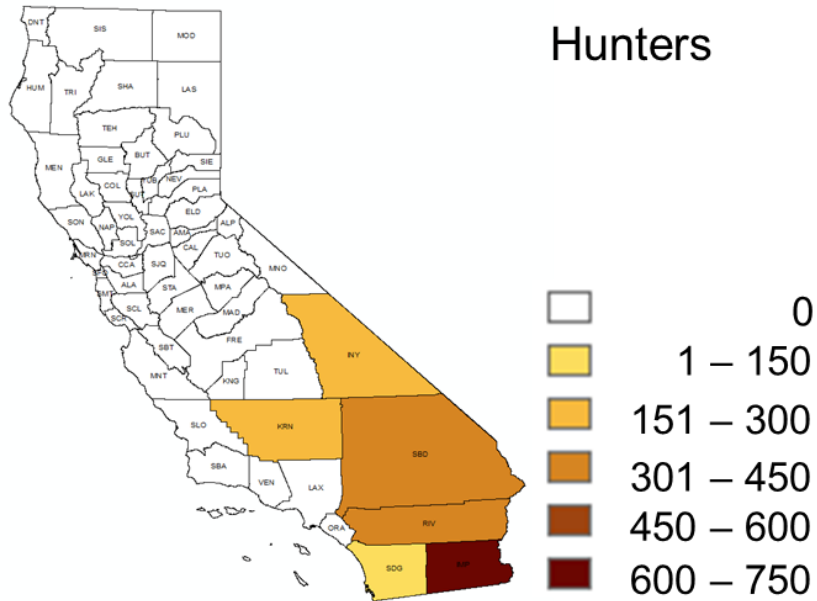


Figure 6: Estimated number of hunters and harvest for Gambel's quail (*Callipepla gambelii*).

# Chukar

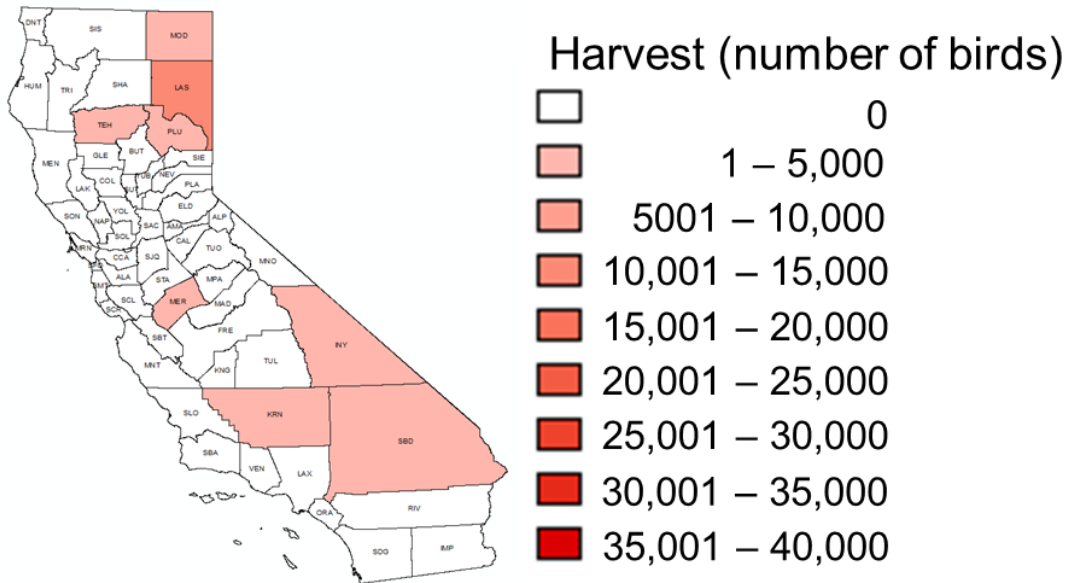
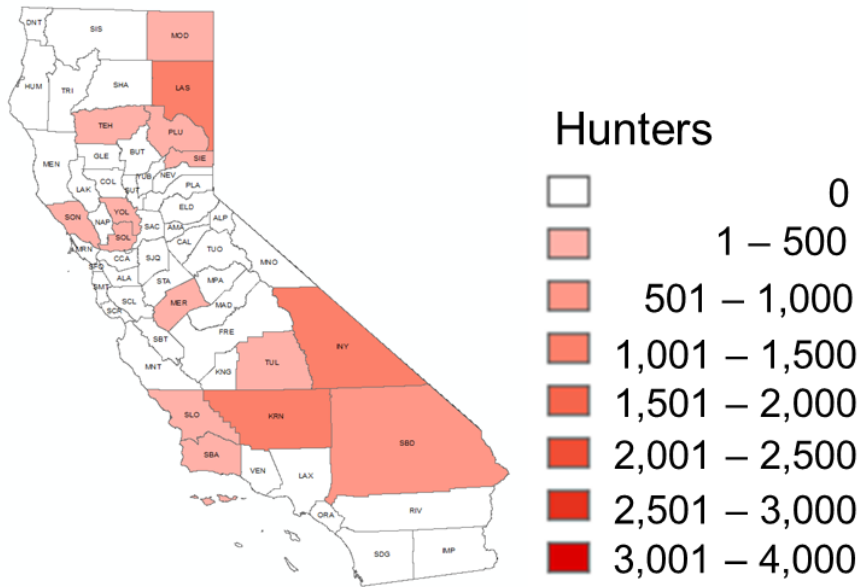


Figure 7: Estimated number of hunters and harvest for chukar (*Alectoris chukar*).

## Ring-necked pheasant

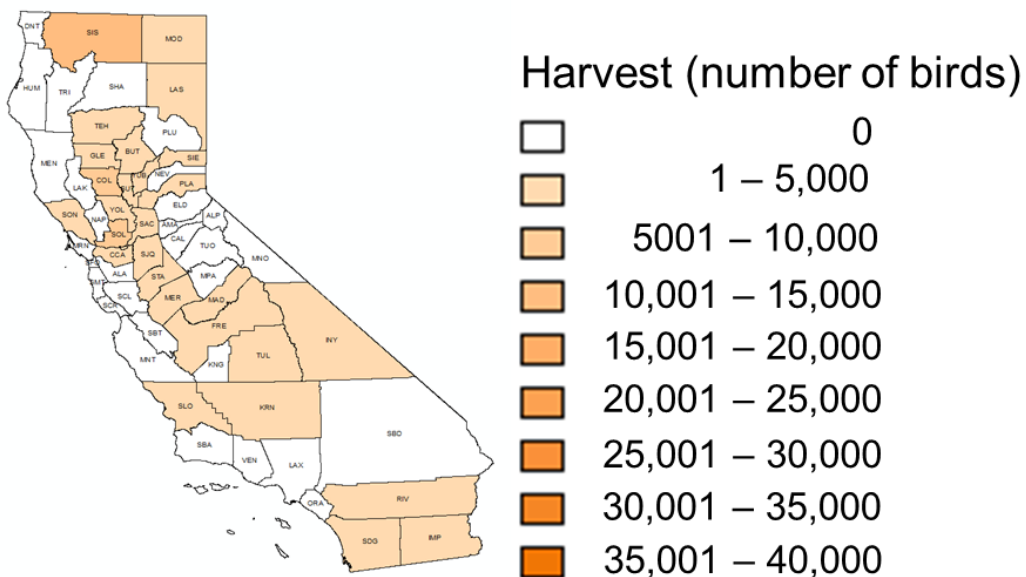
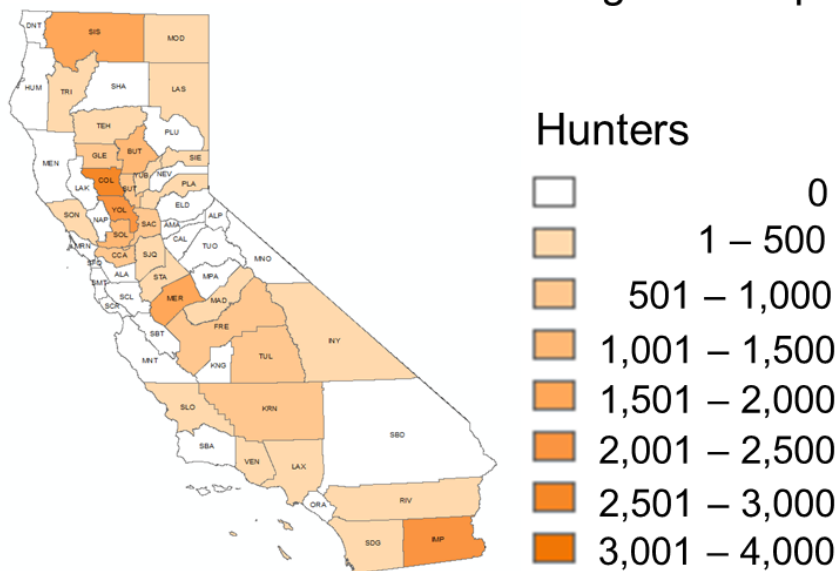


Figure 8: Estimated number of hunters and harvest for ring-necked pheasant (*Phasianus colchicus*).

## Ruffed grouse

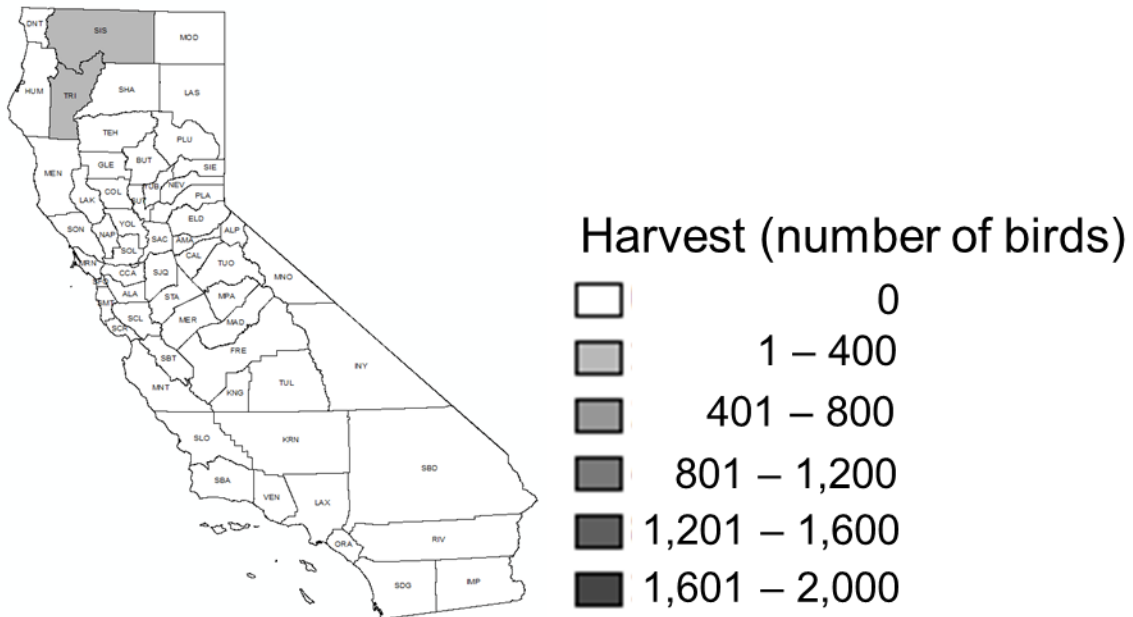
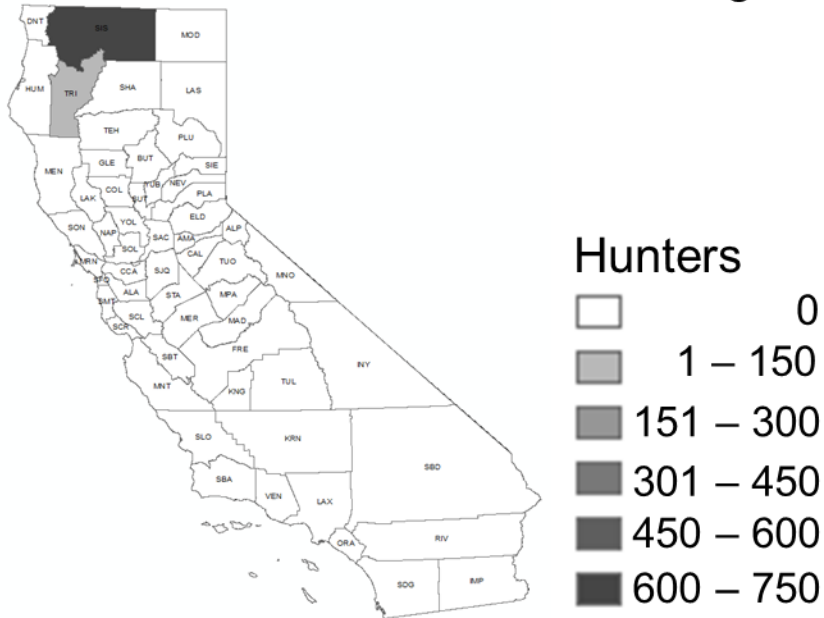


Figure 9: Estimated number of hunters and harvest for ruffed grouse (*Bonasmus umbellus*).



## Sooty grouse

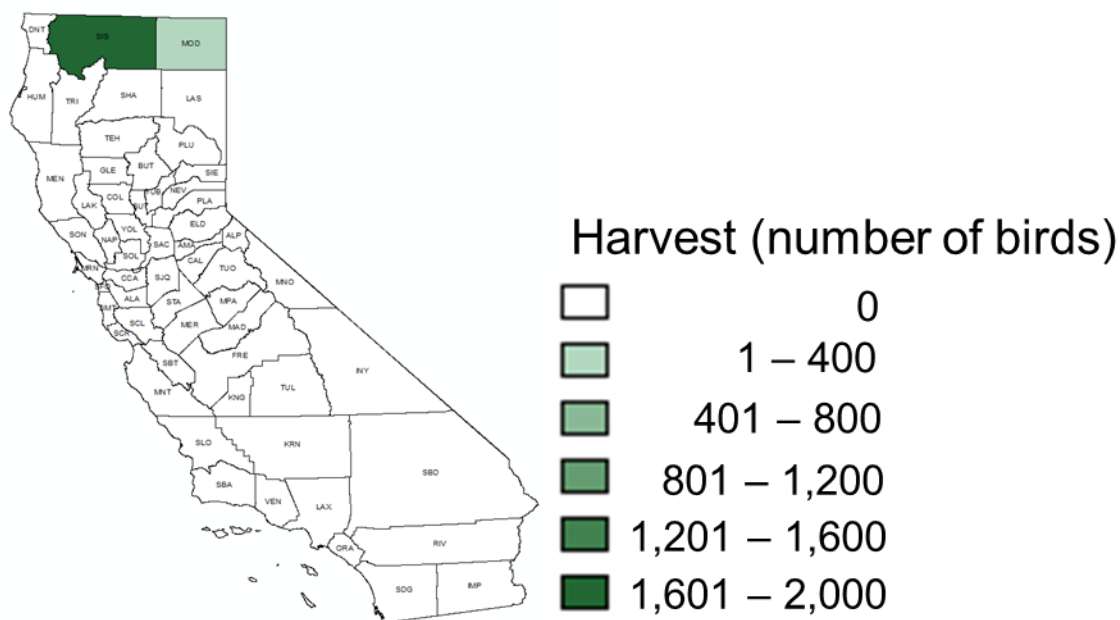
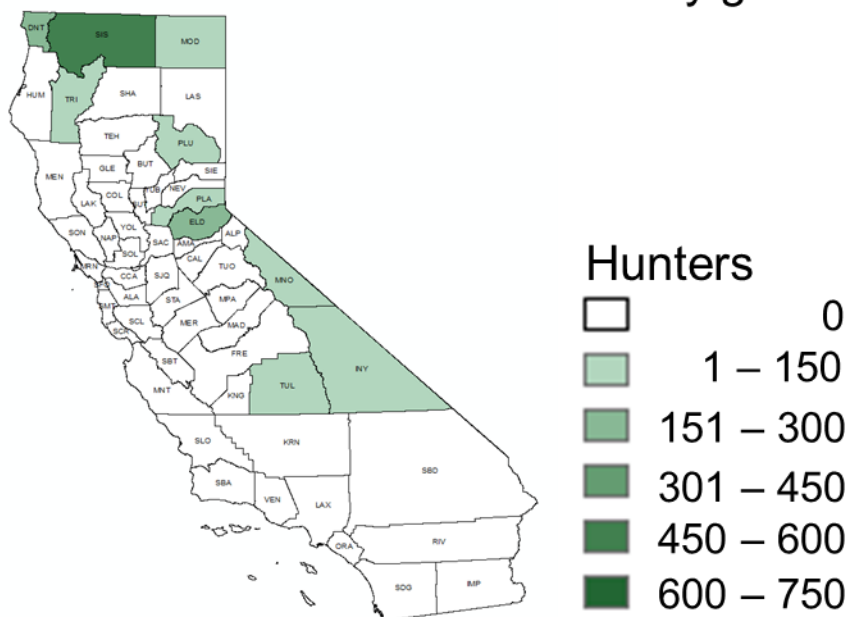


Figure 10: Estimated number of hunters and harvest for sooty grouse (*Dendragapus fuliginosus*).

## Wild turkey Spring 2016

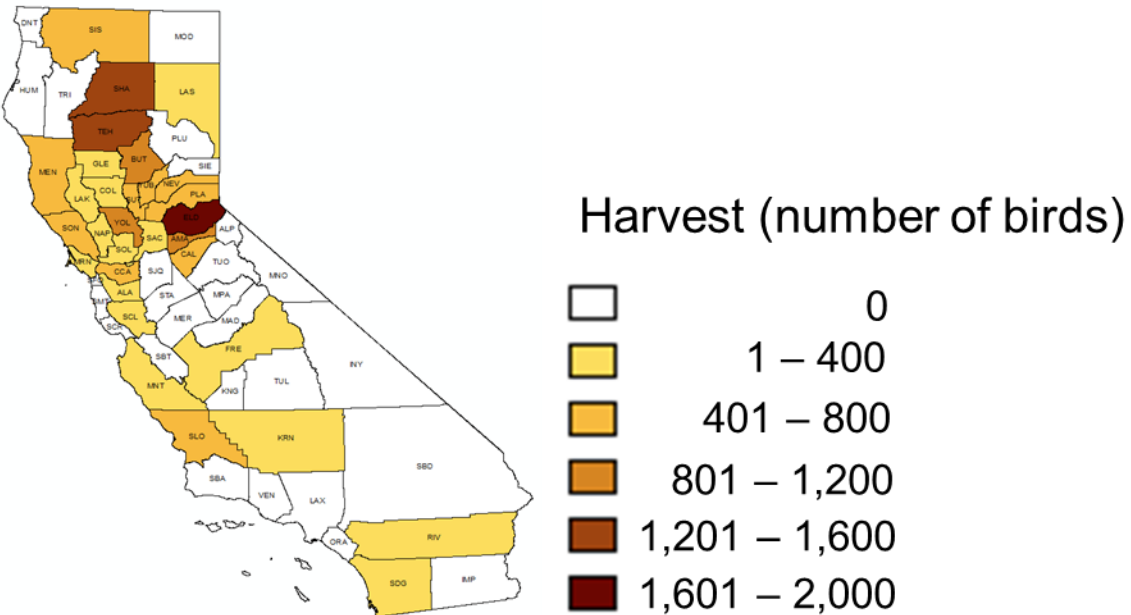
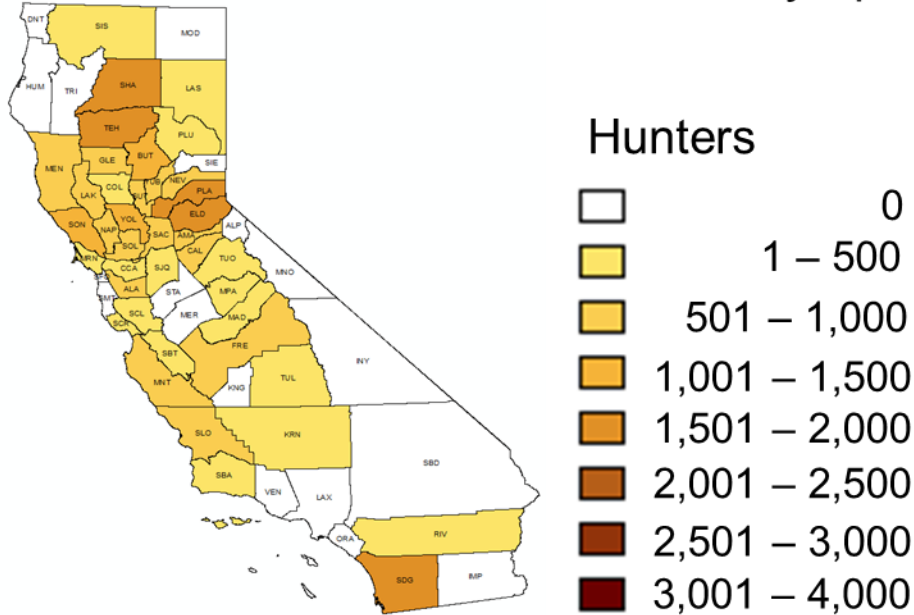
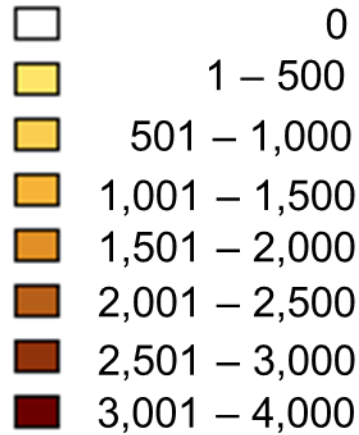


Figure 11: Estimated number of hunters and harvest for wild turkey (*Meleagris gallopavo*) in Spring 2016.

## Wild turkey Fall 2016



### Hunters



### Harvest (number of birds)

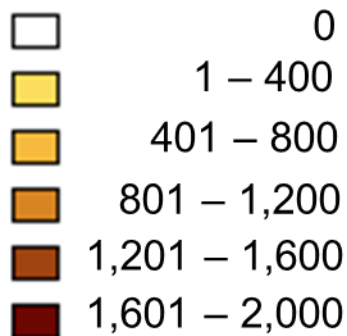


Figure 12: Estimated number of hunters and harvest for wild turkey (*Meleagris gallopavo*) in Fall 2016.

Table 2. Estimated harvest, number of hunters, and number of days hunted for each species by county.

County	Mountain quail			California quail			Gambel's quail		
	Harvest	Hunters	Days	Harvest	Hunters	Days	Harvest	Hunters	Days
Alameda	0	0	0	203	102	102	0	0	0
Alpine	0	102	509	0	0	0	0	0	0
Amador	102	305	610	5,087	102	1,017	0	0	0
Butte	1,119	509	1,323	2,035	509	916	0	0	0
Calaveras	1,628	407	2,137	610	203	407	0	0	0
Colusa	0	0	0	2,238	203	1,017	0	0	0
Contra Costa	0	0	0	1,323	203	305	0	0	0
Del Norte	407	102	509	1,526	102	2,035	0	0	0
El Dorado	15,160	1,017	5,800	407	203	610	0	0	0
Fresno	814	814	2,035	9,056	1,831	6,105	0	0	0
Glenn	1,628	203	509	1,221	305	610	0	0	0
Humboldt	0	0	0	1,526	102	305	0	0	0
Imperial	0	0	0	5,596	1,628	4,579	5,291	712	3,052
Inyo	712	509	1,628	4,986	1,424	4,070	1,323	203	814
Kern	102	916	1,831	23,402	3,561	11,701	2,238	203	407
Kings	0	0	0	5,087	203	610	0	0	0
Lake	2,137	102	509	407	407	509	0	0	0
Lassen	1,017	509	1,017	11,701	1,017	3,561	0	0	0
Los Angeles	0	305	407	5,901	1,526	5,901	0	0	0
Madera	407	305	1,119	102	305	1,323	0	0	0
Marin	0	0	0	102	102	102	0	0	0
Mariposa	203	102	203	0	0	0	0	0	0
Mendocino	1,017	407	509	2,645	407	2,645	0	0	0
Merced	0	0	0	4,477	712	1,628	0	0	0
Modoc	0	102	203	3,561	610	1,526	0	0	0
Mono	610	203	712	1,017	203	1,119	0	0	0
Monterey	203	203	203	22,995	1,628	9,463	0	0	0
Napa	0	102	102	1,933	712	1,424	0	0	0
Nevada	1,323	407	1,119	1,933	407	916	0	0	0
Orange	0	0	0	0	102	102	0	0	0
Placer	2,035	203	407	0	0	0	0	0	0
Plumas	4,273	610	3,358	0	0	0	0	0	0
Riverside	2,340	712	1,933	5,189	1,323	4,680	814	407	1,323
Sacramento	0	0	0	814	407	1,424	0	0	0

County	Mountain quail			California quail			Gambel's quail		
	Harvest	Hunters	Days	Harvest	Hunters	Days	Harvest	Hunters	Days
San Benito	0	0	0	7,936	916	2,340	0	0	0
San Bernardino	610	916	3,052	12,108	1,628	8,954	5,901	305	1,323
San Diego	0	203	407	3,765	916	2,544	0	102	203
San Francisco	0	0	0	0	0	0	0	0	0
San Joaquin	0	0	0	407	102	203	0	0	0
San Luis Obispo	1,424	203	509	36,426	2,137	11,599	0	0	0
San Mateo	0	0	0	0	0	0	0	0	0
Santa Barbara	3,459	305	712	12,108	1,221	4,375	0	0	0
Santa Clara	0	0	0	1,017	305	610	0	0	0
Santa Cruz	0	0	0	0	0	0	0	0	0
Shasta	712	712	1,323	9,463	712	2,544	0	0	0
Sierra	0	203	407	0	0	0	0	0	0
Siskiyou	6,105	1,119	6,817	203	305	1,017	0	0	0
Solano	0	0	0	5,087	305	1,831	0	0	0
Sonoma	203	102	102	0	102	305	0	0	0
Stanislaus	0	0	0	3,154	610	1,628	0	0	0
Sutter	0	0	0	1,119	305	1,323	0	0	0
Tehama	1,628	610	1,730	10,684	814	2,645	0	0	0
Trinity	1,424	610	4,477	0	0	0	0	0	0
Tulare	3,256	509	2,035	203	203	203	0	0	0
Tuolumne	4,070	712	5,800	2,340	203	1,017	0	0	0
Ventura	102	305	509	2,645	916	2,849	0	0	0
Yolo	0	0	0	8,547	916	3,154	0	0	0
Yuba	0	0	0	814	407	1,017	0	0	0

County	Chukar			Ring-necked pheasant			Ruffed grouse		
	Harvest	Hunters	Days	Harvest	Hunters	Days	Harvest	Hunters	Days
Alameda	0	0	0	0	0	0	0	0	0
Alpine	0	0	0	0	0	0	0	0	0
Amador	0	0	0	0	0	0	0	0	0
Butte	0	0	0	2,849	1,119	4,273	0	0	0
Calaveras	0	0	0	0	0	0	0	0	0
Colusa	0	0	0	6,614	2,645	8,140	0	0	0
Contra Costa	0	0	0	2,747	712	2,544	0	0	0
Del Norte	0	0	0	0	0	0	0	0	0
El Dorado	0	0	0	0	0	0	0	0	0
Fresno	0	0	0	305	509	1,628	0	0	0
Glenn	0	0	0	712	610	1,323	0	0	0
Humboldt	0	0	0	0	0	0	0	0	0
Imperial	0	0	0	4,579	2,442	7,936	0	0	0
Inyo	1,119	1,017	3,459	102	102	102	0	0	0
Kern	916	1,424	2,849	916	509	1,221	0	0	0
Kings	0	0	0	0	0	0	0	0	0
Lake	0	0	0	0	0	0	0	0	0
Lassen	10,989	1,119	6,105	3,968	407	1,730	0	0	0
Los Angeles	0	0	0	0	102	0	0	0	0
Madera	0	0	0	203	102	102	0	0	0
Marin	0	0	0	0	0	0	0	0	0
Mariposa	0	0	0	0	0	0	0	0	0
Mendocino	0	0	0	0	0	0	0	0	0
Merced	509	102	305	2,035	1,526	3,358	0	0	0
Modoc	102	407	610	2,035	407	2,035	0	0	0
Mono	0	0	0	0	0	0	0	0	0
Monterey	0	0	0	0	0	0	0	0	0
Napa	0	0	0	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0
Orange	0	0	0	0	0	0	0	0	0
Placer	0	0	0	1,526	407	814	0	0	0
Plumas	305	102	203	0	0	0	0	0	0
Riverside	0	0	0	305	102	203	0	0	0
Sacramento	0	0	0	1,119	509	2,442	0	0	0

County	Chukar			Ring-necked pheasant			Ruffed grouse		
	Harvest	Hunters	Days	Harvest	Hunters	Days	Harvest	Hunters	Days
San Benito	0	0	0	0	0	0	0	0	0
San Bernardino	2,137	814	2,951	0	0	0	0	0	0
San Diego	0	0	0	610	305	610	0	0	0
San Francisco	0	0	0	0	0	0	0	0	0
San Joaquin	0	0	0	610	407	509	0	0	0
San Luis Obispo	0	102	102	203	102	102	0	0	0
San Mateo	0	0	0	0	0	0	0	0	0
Santa Barbara	0	102	0	0	0	0	0	0	0
Santa Clara	0	0	0	0	0	0	0	0	0
Santa Cruz	0	0	0	0	0	0	0	0	0
Shasta	0	0	0	0	0	0	0	0	0
Sierra	0	102	0	610	102	305	0	0	0
Siskiyou	0	0	0	12,108	1,730	9,768	203	610	2,238
Solano	0	102	0	7,835	1,221	7,122	0	0	0
Sonoma	0	102	0	305	102	203	0	0	0
Stanislaus	0	0	0	814	203	916	0	0	0
Sutter	0	0	0	610	712	3,052	0	0	0
Tehama	203	102	102	3,765	305	916	0	0	0
Trinity	0	0	0	0	102	0	102	102	203
Tulare	0	102	0	3,663	610	3,256	0	0	0
Tuolumne	0	0	0	0	0	0	0	0	0
Ventura	0	0	0	0	102	0	0	0	0
Yolo	0	305	0	4,375	2,137	5,901	0	0	0
Yuba	0	0	0	1,221	407	2,137	0	0	0

County	Greater sage-grouse			Sooty grouse		
	Harvest	Hunters	Days	Harvest	Hunters	Days
Alameda	0	0	0	0	0	0
Alpine	0	0	0	0	0	0
Amador	0	0	0	0	0	0
Butte	0	0	0	0	0	0
Calaveras	0	0	0	0	0	0
Colusa	0	0	0	0	0	0
Contra Costa	0	0	0	0	0	0
Del Norte	0	0	0	0	203	102
El Dorado	0	0	0	0	203	203
Fresno	0	0	0	0	0	0
Glenn	0	0	0	0	0	0
Humboldt	0	0	0	0	0	0
Imperial	0	0	0	0	0	0
Inyo	0	0	0	0	102	203
Kern	0	0	0	0	0	0
Kings	0	0	0	0	0	0
Lake	0	0	0	0	0	0
Lassen	0	0	0	0	0	0
Los Angeles	0	0	0	0	0	0
Madera	0	0	0	0	0	0
Marin	0	0	0	0	0	0
Mariposa	0	0	0	0	0	0
Mendocino	0	0	0	0	0	0
Merced	0	0	0	0	0	0
Modoc	0	0	0	305	102	712
Mono	13	13	11	0	102	407
Monterey	0	0	0	0	0	0
Napa	0	0	0	0	0	0
Nevada	0	0	0	0	0	0
Orange	0	0	0	0	0	0
Placer	0	0	0	0	102	102
Plumas	0	0	0	0	102	102
Riverside	0	0	0	0	0	0
Sacramento	0	0	0	0	0	0



County	Greater sage-grouse			Sooty grouse		
	Harvest	Hunters	Days	Harvest	Hunters	Days
San Benito	0	0	0	0	0	0
San Bernardino	0	0	0	0	0	0
San Diego	0	0	0	0	0	0
San Francisco	0	0	0	0	0	0
San Joaquin	0	0	0	0	0	0
San Luis Obispo	0	0	0	0	0	0
San Mateo	0	0	0	0	0	0
Santa Barbara	0	0	0	0	0	0
Santa Clara	0	0	0	0	0	0
Santa Cruz	0	0	0	0	0	0
Shasta	0	0	0	0	0	0
Sierra	0	0	0	0	0	0
Siskiyou	0	0	0	1,831	509	3,154
Solano	0	0	0	0	0	0
Sonoma	0	0	0	0	0	0
Stanislaus	0	0	0	0	0	0
Sutter	0	0	0	0	0	0
Tehama	0	0	0	0	0	0
Trinity	0	0	0	0	102	407
Tulare	0	0	0	0	102	509
Tuolumne	0	0	0	0	0	0
Ventura	0	0	0	0	0	0
Yolo	0	0	0	0	0	0
Yuba	0	0	0	0	0	0

County	Wild turkey Spring 2016			Wild turkey Fall 2016		
	Harvest	Hunters	Days	Harvest	Hunters	Days
Alameda	305	509	1,628	203	509	1,831
Alpine	0	0	0	0	0	0
Amador	916	712	2,238	203	407	1,221
Butte	814	1,119	4,986	305	610	2,747
Calaveras	407	509	1,831	102	407	1,526
Colusa	102	203	305	203	407	1,017
Contra Costa	407	407	1,526	102	305	509
Del Norte	0	0	0	0	0	0
El Dorado	1,730	1,730	6,817	509	1,119	3,052
Fresno	102	509	1,628	203	712	1,628
Glenn	203	509	1,730	610	814	1,730
Humboldt	0	0	0	0	0	0
Imperial	0	0	0	0	0	0
Inyo	0	0	0	0	0	0
Kern	102	407	1,119	203	305	1,119
Kings	0	0	0	0	0	0
Lake	305	814	2,645	0	305	712
Lassen	102	203	610	0	203	407
Los Angeles	0	0	0	0	0	0
Madera	0	305	712	0	203	305
Marin	305	102	305	203	102	203
Mariposa	0	203	610	0	102	102
Mendocino	407	509	3,256	203	712	1,831
Merced	0	0	0	0	0	0
Modoc	0	0	0	0	0	0
Mono	0	0	0	0	0	0
Monterey	102	712	3,561	0	102	305
Napa	305	610	1,119	203	305	814
Nevada	712	916	4,070	509	712	1,628
Orange	0	0	0	0	0	0
Placer	610	1,526	6,614	305	712	1,933
Plumas	0	203	712	305	203	1,017
Riverside	102	102	509	102	102	509
Sacramento	305	610	2,442	203	305	1,526

County	Wild turkey Spring 2016			Wild turkey Fall 2016		
	Harvest	Hunters	Days	Harvest	Hunters	Days
San Benito	0	102	509	0	102	102
San Bernardino	0	0	0	0	0	0
San Diego	203	1,628	6,410	102	916	2,747
San Francisco	0	0	0	0	0	0
San Joaquin	0	102	203	0	203	407
San Luis Obispo	610	610	1,831	203	712	1,323
San Mateo	0	0	0	0	0	0
Santa Barbara	0	102	407	0	102	203
Santa Clara	102	203	916	203	203	407
Santa Cruz	0	102	203	102	102	102
Shasta	1,526	1,831	8,649	509	1,017	3,256
Sierra	0	0	0	0	0	0
Siskiyou	509	407	4,477	102	203	509
Solano	305	509	1,730	0	0	0
Sonoma	610	1,119	2,849	305	305	712
Stanislaus	0	0	0	0	0	0
Sutter	610	814	3,459	0	203	407
Tehama	1,323	1,526	5,596	712	712	2,544
Trinity	0	0	0	0	0	0
Tulare	0	203	916	0	102	407
Tuolumne	0	102	305	102	509	1,526
Ventura	0	0	0	0	0	0
Yolo	1,119	1,323	3,358	610	916	1,831
Yuba	509	814	3,663	102	305	916

## **Discussion and Improvements to the survey**

Both the sampling error rate and the value used to extrapolate the harvest and hunter effort are dependent on the sample size. Our goal for a sampling error of  $\leq 2\%$  required a sample of 2,365 respondents, and we received responses from 1,520 hunters, which increased the sample error to 2.49%. To increase the response rate and reach the target sample size of respondents, and thus decrease the error, we are considering increasing the length of time the survey is available, increasing the number of hunters in our random pool, and encouraging responses through follow-up emails. Our response rate was higher than that of the previous GTHSs, and lower than that of Responsive Management and the HIP.

With respect to upland game birds, we found that hunters were confused about reporting dove harvest, specifically mourning and white-winged dove and band-tailed pigeon. We chose to focus our first on-line survey on resident upland game birds (quail, chukar, ring-necked pheasant, grouse, and wild turkey) because the HIP survey already assesses hunter effort and harvest for doves and other migratory upland game bird species. We responded to each hunter that reached out to us accordingly.

Hunters were also confused regarding the reporting of wild turkey in the spring 2017 season. We hoped that conducting the survey in the early spring would maximize the accuracy with which hunters recall their fall and winter harvest. Therefore, we ended the survey on March 25<sup>th</sup>, 2017, to coincide with the start of the spring turkey season (March 26<sup>th</sup>, 2017), expecting that hunters tend to recall their harvest for spring turkey from the previous year (i.e. Spring 2016). Four hunters reported that they purchase the upland game bird validation solely for turkey and did not have anything to report because spring turkey for 2017 had not opened. Of the four, three reported that they did not hunt in Spring 2016, and one reported that they did and were unsuccessful. This person's data was incorporated into the turkey dataset for Spring 2016. We are considering conducting the survey from May-June to include current year spring turkey hunters in subsequent surveys.

California has a small population of white-tailed ptarmigan, an upland game species with a short general season (1 week) and small bag limit (2 birds). While no hunter reported hunting white-tailed ptarmigan in 2016-2017, we expect that harvest

may have occurred, but was not represented in our survey sample. It is worth noting that extrapolations of the raw data for this species could suggest an overestimation of the true harvest, given our small sample size, response rate, and number of ptarmigan hunters. We are considering re-phrasing the questions on white-tailed ptarmigan to target these hunters more directly, and if any hunter reports hunting effort or harvest of white-tailed ptarmigan, following up with them directly for more information.


### **Acknowledgments**


This survey would not have been possible without the help of the License and Revenue Branch (LRB) and the Database and Technology Division (DTD). Tony Straw and Damien Sivak (LRB) provided upland game bird validation lists necessary for our random sample, and Angie Barlow and Amita Patel (DTD) worked with Upland Game Program staff to design the survey on the California Fish and Wildlife website.

### **Literature Cited**

Dillman, D. A. 2000. Mail and Internet Surveys. John Wiley and Sons, New York, USA.

# Appendix 1. On-line Hunter Harvest Survey





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**Harvest Survey**

## Resident Upland Game Bird Hunter Harvest Survey 2016-2017

You have been randomly selected to complete this survey because you purchased a CDFW upland game bird hunting validation. Please complete this survey, *whether you hunted game birds or not*. The information you provide is kept confidential by the Department and will be used only for the purpose of conducting this survey. Your response is important to the survey effort, and the information you provide helps the Department estimate harvest and improve our management of the species you hunt.

The following resident upland game birds are included in this survey:

- Mountain quail
- California quail
- Gambel's quail
- Chukar\*
- Ring-necked pheasant\*
- Ruffed grouse
- White-tailed ptarmigan
- Sooty grouse
- Fall wild turkey (2016)\*
- Spring wild turkey (2016)\*

\* We are collecting information on wild birds; please **do not include** those birds harvested on Licensed Game Bird Clubs.

### Instructions

**Step 1:** Please enter your GO ID, a unique 10-digit number printed on your hunting license. This will ensure that a single response is recorded for those participants that have been randomly selected in the survey sample.

**Step 2:** Did you hunt?  
Tell us whether you hunted in license year 2016/2017 (July 2016 to June 2017). If you answer No, you can scroll to the bottom of the page and click Submit: you're done!

**Step 3:** Provide your harvest information:  
If you answered Yes in Step 2, please continue the survey. The Department is collecting harvest information by species and county. Providing your total harvest by county allows the Department to have a better understanding of the distribution of harvest for each species throughout the state. For each species, please enter the number you harvested by county, and the number of days hunted. If you hunted a species in multiple counties, use the subsequent Entries to enter the information. Please include upland game birds opportunistically harvested while on hunting trips for waterfowl, upland game, etc. (days hunted = 1) **Please include upland game bird species which you hunted even if you were unsuccessful; this will improve our estimation of hunter effort.**

**For example:** If you hunted quail in Inyo County for 2 days and you harvested California quail, but were unsuccessful at hunting Gambel's quail, and harvested wild turkey during the spring season in San Luis Obispo, you would make three entries (as below) for each combination of species and county where you hunted.

**Entry 1: Species/County**  
**Species:** California quail  
**County:** Inyo  
**Number of Days Hunted:** 2  
**Number Harvested:** 2


**Entry 2: Species/County**  
**Species:** Gambel's quail  
**County:** Inyo  
**Number of Days Hunted:** 2  
**Number Harvested:** 0

**Entry 3: Species/County**  
**Species:** wild turkey (spring)  
**County:** San Luis Obispo  
**Number of Days Hunted:** 3  
**Number Harvested:** 2

GO ID Number

Did you hunt in license year 2016/2017 (July 2016-June 2017)?

Yes  No



Learn more about...

- [Pheasant](#)
- [Band-tailed Pigeon](#)

Related Information

- [Search for a Licensed Guide \(Fishing and Hunting\)](#)
- [Upland Game Management](#)

Contact Us

If you have questions, or problems completing the survey, please contact:

**Katherine Miller**  
**Email:** [katherine.miller@wildlife.ca.gov](mailto:katherine.miller@wildlife.ca.gov)

Select the species hunted, the county in which you hunted, and the number of days hunted and the number of birds harvested. Include hunting effort even if you were unsuccessful. Do not include species harvested on Licensed Game Bird Clubs.

**Entry 1: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 2: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 3: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 4: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 5: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 6: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 7: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 8: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 9: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 10: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 11: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested



**Entry 12: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 13: Species/County**

---

Species

County

Number of Days Hunted

Number Harvested

**Entry 14: Species/County**

---

Species

Species

County

Number of Days Hunted

Number Harvested

**Entry 15: Species/County**

---

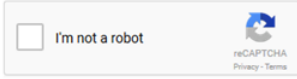
Species

County

Number of Days Hunted

Number Harvested

Please provide any additional comments:



Submit

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