

ECONOMIC CONTRIBUTION OF DEER, PRONGHORN ANTELOPE, AND SAGE GROUSE HUNTING TO NORTHEASTERN CALIFORNIA AND IMPLICATIONS TO THE OVERALL "VALUE" OF WILDLIFE

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ABSTRACT: A postcard survey of mule deer, pronghorn antelope, and sage grouse hunters was conducted for northeastern California hunt areas (Lassen, Modoc, Plumas, Shasta, and Siskiyou counties) to determine the local expenditures for goods and services in 1997. The survey was also conducted to increase our understanding of hunter demographics and provide that information to local government officials and the public. This updated information can be used for planning purposes on the local economics of hunting three wildlife species that inhabit the region. This valuation would be additive to the value of all other species that are either hunted, viewed, or otherwise enjoyed by the public. Fifty-three percent of the 9,981 northeastern California hunters were surveyed, and 42 percent responded. Hunting of mule deer, pronghorn antelope, and sage grouse resulted in an estimated \$2.26 million in expenditures in northeastern California during 1997. Almost \$1 million was spent in Lassen County, and about \$600,000 was spent in Modoc County. Vehicle-related expenses, mostly fuel, comprised the greatest expense. Grocery expenditures were second followed by dining at restaurants, supplies related to hunting/camping, expenses for lodging, other local costs such as taxidermy/meat processing, private land access fees, and costs to hunt/fish for other species, respectively. The added economic value locally for each additional hunting opportunity (tag or permit) issued was estimated to be about \$223, \$264, \$431, and \$91 for general season deer, archery/muzzleloader deer, pronghorn antelope, and sage grouse, respectively. Sage grouse hunters spent an average of \$91 during their two day season. In total, deer hunters accounted for an estimated \$2.1 million in local expenditures, antelope hunters \$204,000, and sage grouse hunters \$37,000. Few deer hunters (<5 percent of total) were from southern California, while about 15 percent of pronghorn antelope hunters traveled from the south state for the rare opportunity to hunt the species in California. Of three categories of hunters, those traveling from distant areas such as Sacramento and the Bay Area had the highest local expenses. They were followed by hunters living within the hunt areas (locals), and hunters from adjacent counties and areas, respectively. Local, or resident hunters, had the highest average hunter success. An assessment comparing the economic contribution of deer hunting in 1997 to a previous survey in 1987 was conducted. Results indicated that expenditures (not adjusted for inflation) in Lassen, Modoc, and Plumas counties have dropped significantly from \$5.4, \$4.7, and \$0.76 million, respectively in 1987, to \$0.83, \$0.55, and \$0.17 million, respectively in 1997. The survey results presented here can be used by local, state, and federal planning officials to demonstrate a minimum value of hunting these species, and are additive to the total value of wildlife in the area. Improvement of wildlife habitat on a large scale is needed to reverse the long-term declines in populations of mule deer. Livestock grazing, timber management, and fire management are three of the primary factors affecting deer habitats.

INTRODUCTION

Land use planning decisions and resulting changes to wildland habitats in California affect wildlife. These effects, whether positive or negative, have an economic influence that is most likely realized in rural communities and counties where the value of wildlife, through hunting, photography, or simply viewing is high. Unfortunately, the economic value of wildlife has not been obvious or easily definable, while values for other commodity uses such as livestock forage and timber from public and private wildlands have been developed (e.g., Loomis et al. 1991, Dep. of Interior 1994, BLM 1998). Part of the reason for this difference is attributable to the lack of significant economic enterprises relying solely on wildlife. Taxidermy, meat processing, resort operations, and guide services may rely heavily on wildlife, and therefore, will highly value wildlife. However, the value of wildlife to retail, lodging, and food service businesses is often masked because they derive economic benefit from a variety of other sources including wildlife. Additionally, the economic value of commodities that potentially compete with wildlife such as lumber and beef are set by market forces (what the public will pay) while wildlife have not been similarly valued since the days of market hunting (Kay 1988).

Northeastern California has recently been identified as a focus area for deer habitat management efforts on public lands in California where the objective is to improve habitat conditions (Loft et al. 1998). Deer populations and deer habitat conditions have declined significantly in recent decades. Deer populations in the area were estimated at 160,000, 130,000, and 35,000 in 1949, 1992, and 1996, respectively (Longhurst et al. 1952, Loft et al. 1998). Since 1957, overstory canopy of juniper and pine has increased by over 400 percent on some key bitterbrush ranges, thereby crowding and shading out of desirable browse (CDFG unpubl. data 1998). On lands administered by federal agencies such as the United States Forest Service and Bureau of Land Management (administering approximately 20 and 14 percent of California's wildlands, respectively; and 47 and 17 percent of Northeastern California, respectively) there is ongoing concern about long-term land management practices and their effects on wildlife habitat and wildlife. Primary issues are the long-term impacts of timber management, livestock grazing, and fire management on wildlife habitat.

Public Law 94-579, the *Federal Land Policy and Management Act of 1976* (FLPMA) requires the federal land management agencies to use a "...systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences..." in developing or revising land use plans. Typically, "wildlife" are lumped together as one economic consideration, despite the fact that there may be hundreds of species of fish, terrestrial animals, and native plants that could be affected positively or negatively as a response to the proposed plans. Each has its own economic value, much as different conifer species or different grazing allotments have their own value.

Development of minimum economic values of wildlife contributes to our knowledge of both biological and economic sciences. Where wildlife populations can be enhanced through land use practices (e.g., habitat improvements), economic value of that wildlife can increase. Wildlife advocates often talk about a somewhat vague "intrinsic" value rather than a dollar value, but it's a valuation made stronger when substantiated dollar values are added. The focus on northeastern California

wildlife habitats initiated a desire to learn more about the level at which paying constituents (hunters) support local enterprises through their spending habits. The purpose of the focused survey described in this paper was to assign a minimum dollar value to hunting of three species in 1997.

The objectives of the survey were to: 1) evaluate the economic contribution of hunting mule deer, pronghorn antelope, and sage grouse in the rural counties of northeastern California; 2) provide updated information for planning purposes on the economics of hunting three species of the many that inhabit the region and are either hunted, viewed, or otherwise enjoyed by the public; 3) compare 1997 local expenditures by deer hunters to Loomis et al.'s (1989) estimates for the 1987 hunting season; and 4) continue to increase our understanding of hunter demographics and provide that information to local government officials and the public.

Harvest species are only one component of the economic value of wildlife, but the one that can be most easily evaluated. Consequently, the values developed from such analyses as conducted in this study would represent a bare minimum value of wildlife to be considered. This value does not include the associated value of other fish and wildlife that are harvested, fish and wildlife that are not harvested, or habitats, soils, water quality, or other values affected by disturbances to the landscape that also directly or indirectly impact fish, wildlife, and native plants.

ACKNOWLEDGMENTS

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STUDY AREA

The study area was northeastern California, specifically Lassen and Modoc counties, but also those portions of Plumas, Shasta, and Siskiyou counties that occurred in, or adjacent to deer hunt zones X1-X6b (Fig. 1). Most of Lassen and all of Modoc counties are within these hunt zones, as are the eastern portions of Shasta and Siskiyou counties, and the eastern portion of Plumas County. Included in the survey were pronghorn antelope and sage grouse hunters because those hunt zones occurred within this same area.

The intent was to focus on expenditures occurring in rural and highly recreation-oriented communities within this region where hunting and fishing interest is high. Few other places in the state (perhaps Inyo-Mono region, the southern Sierra Nevada, and Northwestern California) are likely to be as influenced by hunter use, although they would also be highly influenced by recreational fishing. Ability to hunt the study area is by drawing only, and with the exception of some archery deer hunts, demand exceeds the availability of tags/permits.

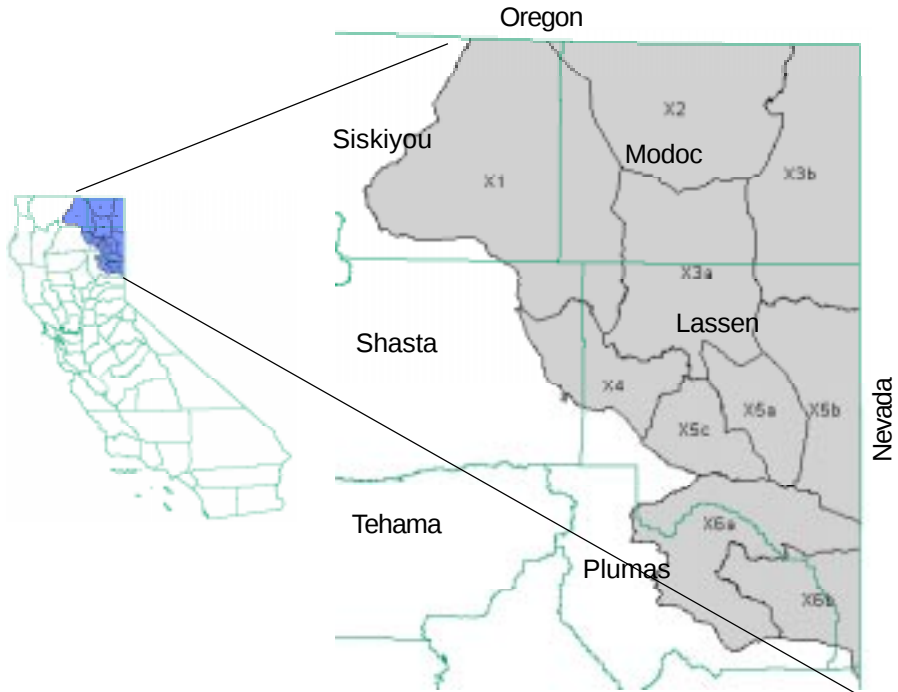


Figure 1. Study area in Northeastern California counties showing primary deer hunt zones X1-X6b. Pronghorn antelope and sage grouse hunting zones also occurred within this area.

Local Expenses Survey (circle or fill in):

1) What species did you hunt? deer / zone____ antelope / zone ____ sage grouse
 How many days? ____ How many different trips did you take? ____
 Were you successful? Yes No

2) Where/what were your estimated expenses for gasoline/fuel/vehicle repair?
 Town_____ \$____; Town_____ \$____;Town_____ \$____

3) Where/what were your estimated expenses for groceries?
 Town_____ \$____; Town_____ \$____;Town_____ \$____

4) Where/what were your estimated expenses for restaurant dining?
 Town_____ \$____; Town_____ \$____;Town_____ \$____

5) Where/what were your estimated expenses for lodging at motels/campgrounds?
 Town_____ \$____; Town_____ \$____;Town_____ \$____

6) Where/what were your estimated expenses for camp/hunting-related supplies?
 Town_____ \$____; Town_____ \$____;Town_____ \$____

7) What were your estimated expenses for hunting access to private land?
 \$_____ in Lassen County \$_____ in Modoc County

8) Where/what were your estimated local expenses to hunt any other species, or go fishing while on these trips? _____

9) Other local expenses of your hunting trip to NE California? \$_____ for... (please describe what and where; e.g., taxidermy costs, guide services): _____

Figure 2. Survey form used to estimate hunting expenditures in Northeastern California, 1997.

Table 1. Number and percent of hunters surveyed in northeastern California and summary of overall response rate, 1997.

	Number	Percentage
<u>Hunters surveyed</u>		
Deer hunters (X1-X6b, plus archery & muzzleloader	4,743 of 9,088	52%
Pronghorn hunters	242 of 493	49%
Sage grouse hunters	263 of 400	65%
Total	5,248 of 9,981	53%
<u>Surveys mailed</u>	5,248	
Returned as undeliverable	28	0.5%
Effective sample	5,220	100%
Surveys returned by 2/1/98	2,180	41.7%
Did not go hunting	74	3.4%
Inadequate data on form	102	4.7%
<u>Completion Response Rate</u>	2,004	38.3%

METHODS

A postcard survey was developed to ask hunters their actual expenditures in specific northeastern California communities during 1997 hunts (Fig. 2). To compare with expenditures from 1987, questions similar to Loomis et al. (1989) were asked. Additionally, other local expenses of the trip were asked for and summarized as a whole rather than by town or county. Postcards were mailed the week of 15 October 1997 to 65 percent of sage grouse hunters, 49 percent of pronghorn antelope hunters, 41 percent of archery/muzzleloader deer hunters, 75 percent of deer hunters in zones X2-X6b, and 17 percent of X1 deer hunters. Return postage was paid, and postcards received by 1 February 1998 were used in the analysis. No follow-up surveying was conducted. All survey data was entered into a computer spreadsheet. Survey cards with incomplete information, such as no mention of expense location or no mention of zone hunted, were not used. Expenses reported for areas outside the study area, such as Redding, Truckee, or Sacramento were not included.

While not asked for on the survey, about 90 percent of the respondents provided their return address with zip code. These represented the data set from which county of residence was determined. It was assumed that these respondents were representative of the county of residence for all hunters in the zones surveyed.

Based on averages of all surveys returned, multipliers were used to account for: undeliverable surveys (0.5 percent), incomplete responses (1.1 percent), and responses that the individual did not hunt (4.0 percent) (Table 1). These factors were accounted for in determining the effective sample and responses (after Loomis et al. 1989). General season deer, archery/muzzleloader deer, pronghorn antelope, and sage grouse hunter information were summarized independently, and were later aggregated to develop total hunting expenditures for the three species. Expenses were tabulated based on the actual respondents, then average expenditures for each community, hunt zone, and county were extrapolated to reflect the total estimated number of hunters.

Unlike previous surveys, no evaluation of willingness-to-pay (WTP) was attempted in this survey (Kay 1988, Loomis et al. 1989). Inclusion of WTP

Table 2. List of cities, towns, and places where hunting expenditures were reported. Total estimated expenditures were summarized into the 11 major areas of the counties listed (see Fig. 3), and then further summarized by county, 1997.

<u>Lassen County</u>	
Northern Lassen County:	Madeline, Termo, Ravendale, Beiber, Nubeiber, Westwood,
Susanville Area:	Johnstonville, Janesville, Litchfield, Standish, Wendel, Eagle Lake, Spaulding
<u>Susanville</u>	
Southern Lassen County:	Milford, Doyle, Herlong, Hallelujah Junction
<u>Modoc County</u>	
Western Modoc County:	Tionesta, Canby, Adin, Newell
NE Modoc County:	Davis Creek, Fort Bidwell, Cedarville, Eagleville,
Alturas Area:	Alturas, Likely
<u>Plumas County</u>	
Northern Plumas County:	Chester, Quincy, Greenville, Genesee, Taylorsville
Southern Plumas County:	Loyalton, Sierraville, Portola, Beckwourth, Chilcoot
<u>Eastern Shasta County:</u>	McArthur, Fall River Mills, Old Station, Burney, Hat Creek
<u>Eastern Siskiyou County:</u>	Dorris, Macdoel, Tulelake, McCloud

calculations, as well as non-consumptive values, increases the value of subject wildlife significantly. In that context, the survey results presented here represent a minimum valuation upon which to add WTP, and the value of other hunted species, and non-consumptive value of all wildlife.

The hunt zones encompassed all of Modoc and nearly all of Lassen County, enabling direct comparison of Modoc and Lassen County expenditure data in 1997 with Loomis et al. (1989) data for 1987. Expenditures were summarized for each county and presented for comparison. However, no modification of value based on inflation was used. Consumer Price Index (CPI) estimates indicate an inflation factor of 28.4 percent since 1987 (www.neatideas.com/economics/cpi.html). Hence, the reader could increase 1987 figures reported in this paper by 28.4 percent to compare with today's (the 1997 survey) purchasing power.

Study area towns and cities were grouped into one of 11 geographic areas for data summarization (Figure 3, Table 2). The areas were delineated to be within counties, so that county-by-county results could be developed.

RESULTS

Responses were categorized and summarized for each species, hunt, and county; and for each of the 11 geographic areas within the five counties.

Overall, 1997 hunting of mule deer, pronghorn antelope, and sage grouse resulted in an estimated \$2.26 million in expenditures in northeastern California (Table 3). Almost \$1 million was spent in Lassen County, and about \$600,000 was spent in Modoc County. Vehicle-related expenses, mostly fuel, but also vehicle parts and repair, comprised the greatest expense. Grocery expenditures were second followed by dining at restaurants, supplies related to hunting/camping, expenses for lodging, other local costs such as taxidermy/meat processing, private land access fees, and costs to hunt/fish for other species, respectively.

An estimated 384 sage grouse hunters spent an average of \$91 in northeastern California. An estimated 473 antelope hunters spent an average of \$431 over a

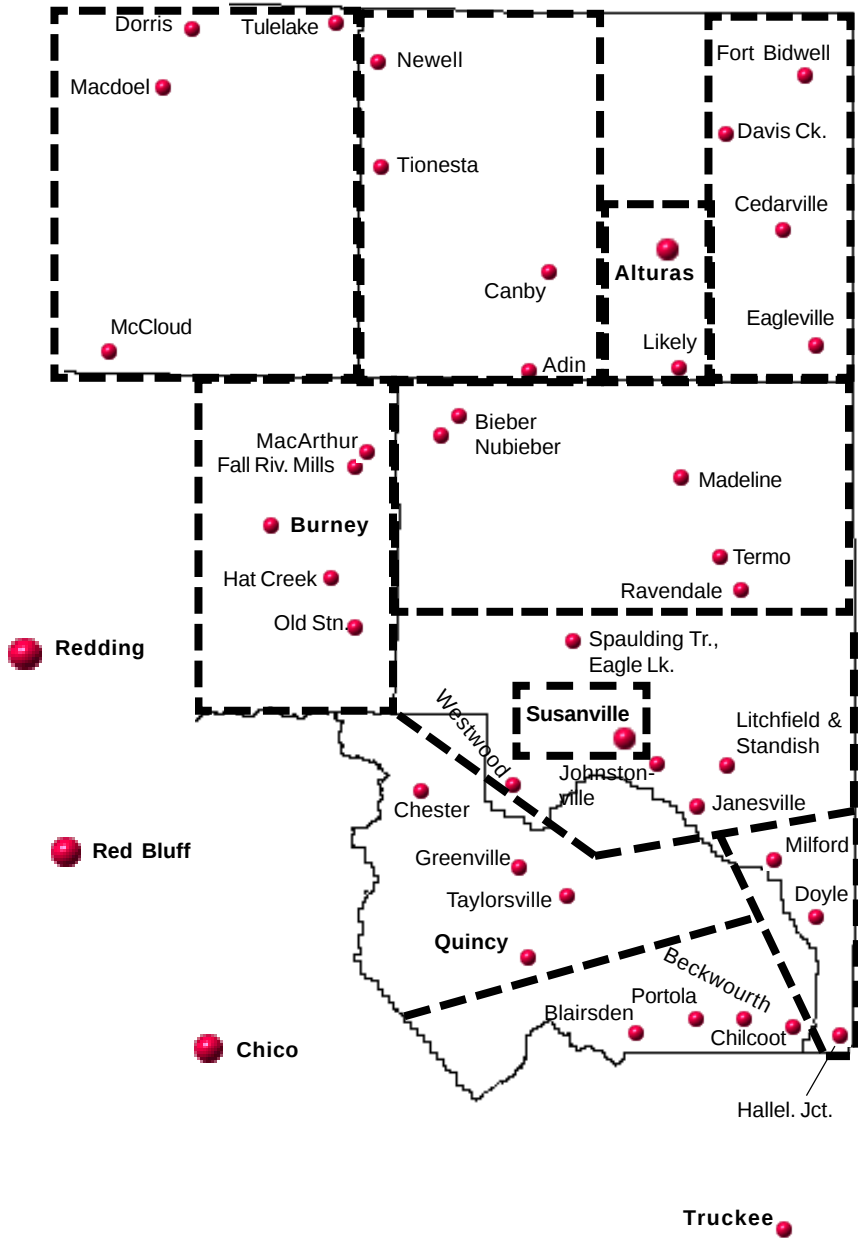


Figure 3. Cities, towns, and places where hunting expenditures were reported. Total estimated expenditures were summarized by each of the 11 areas delineated by the dashed lines, and also summarized by county (see Table 2).

Table 3. Summary by county of total estimated hunter expenditures in each county during trips in Northeastern California, 1997. *n* = estimated number of hunters for the hunts in each category. Dollar figures not listed under a county were area-wide expenses.

<u>1997 Deer Hunting X1-X6b; <i>n</i> = 6,924 deer hunters</u>	Lassen	Modoc	Plumas ¹	Shasta ¹	Siskiyou ¹	Total	Average per hunter
Expenses for vehicle (fuel, repair, tires, etc.)	\$276,844	\$174,014	\$51,516	\$63,241	\$23,792	\$589,406	\$85
Expenses for groceries	\$153,344	\$103,242	\$33,252	\$36,089	\$17,781	\$343,707	\$50
Expenses for dining out	\$65,640	\$55,014	\$19,091	\$19,556	\$5,841	\$165,142	\$24
Expenses for lodging/campgrounds/rv parks	\$53,319	\$34,139	\$14,315	\$10,424	\$5,886	\$118,084	\$17
Expenses for supplies (camping, etc.)	\$83,412	\$50,219	\$12,526	\$11,835	\$8,007	\$165,999	\$24
Expenses for access to hunt private land						\$40,183	\$6
Other local costs to hunt these zones						\$69,362	\$10
Other local costs to fish or hunt other species						\$50,406	\$7
Sub Total	\$632,559	\$416,628	\$130,700	\$141,146	\$61,307	\$1,542,290	\$223
 <u>1997 Arch./Muzz. Deer Hunting <i>n</i> = 1,790 deer hunters</u>							
Expenses for vehicle (fuel, repair, tires, etc.)	\$70,965	\$60,746	\$20,756	\$9,648	\$1,523	\$163,639	\$91
Expenses for groceries	\$49,142	\$33,198	\$12,314	\$6,982	\$1,523	\$103,160	\$58
Expenses for dining out	\$27,079	\$21,683	\$3,250	\$3,009	\$190	\$55,211	\$31
Expenses for lodging/campgrounds/rv parks	\$24,336	\$7,490	\$3,580	\$0	\$0	\$35,406	\$20
Expenses for supplies (camping, etc.)	\$28,970	\$13,965	\$2,323	\$3,859	\$0	\$49,117	\$27
Expenses for access to hunt private land						\$26,660	\$15
Other local costs to hunt these zones						\$9,877	\$6
Other local costs to fish or hunt other species						\$29,338	\$16
Sub Total	\$200,493	\$137,081	\$42,224	\$23,499	\$3,237	\$472,408	\$264

Table 3. continued.

<u>1997 Antelope Hunting <i>n</i> = 473 antelope hunters</u>	Lassen	Modoc	Plumas ¹	Shasta ¹	Siskiyou ¹	Total	Average per hunter
Expenses for vehicle (fuel, repair, tires, etc.)	\$24,032	\$16,819	\$8,253	\$1,713	\$3,944	\$54,760	\$116
Expenses for groceries	\$13,270	\$7,897	\$49	\$623	\$1,354	\$23,193	\$49
Expenses for dining out	\$12,686	\$6,488	\$98	\$551	\$460	\$20,284	\$43
Expenses for lodging/campgrounds/rv parks	\$15,818	\$5,735	\$0	\$157	\$1,021	\$22,730	\$48
Expenses for supplies (camping, etc.)	\$4,942	\$3,419	\$652	\$2,088	\$326	\$11,427	\$24
Expenses for access to hunt private land						\$20,926	\$44
Other local costs to hunt these zones						\$46,207	\$98
Other local costs to fish or hunt other species						\$4,515	\$10
Sub Total	\$70,748	\$40,358	\$9,052	\$5,131	\$7,105	\$204,042	\$431
<u>1997 Sage Grouse Hunting <i>n</i> = 384 grouse hunters</u>							
Expenses for vehicle (fuel, repair, tires, etc.)	\$11,808	\$888	\$278	\$96	\$0	\$13,070	\$33
Expenses for groceries	\$6,480	\$552	\$384	\$0	\$0	\$7,416	\$19
Expenses for dining out	\$3,883	\$312	\$408	\$96	\$0	\$4,699	\$12
Expenses for lodging/campgrounds/rv parks	\$3,024	\$0	\$216	\$0	\$0	\$3,240	\$8
Expenses for supplies (camping, etc.)	\$2,318	\$744	\$72	\$0	\$0	\$3,134	\$8
Expenses for access to hunt private land						\$312	\$1
Other local costs to hunt these zones						\$1,872	\$5
Other local costs to fish or hunt other species						\$2,808	\$7
Sub Total	\$27,514	\$2,496	\$1,358	\$192	\$0	\$36,552	\$91
Grand Total for all hunts	\$931,313	\$596,563	\$183,334	\$169,968	\$71,649	\$2,255,292	

¹ Does not include hunt expenditures for other deer zones that occur within the county (e.g., C1 in Siskiyou).

several day period compared to an average \$223 and \$264 spent by general season and archery deer hunters ($n = 6,924$ and $1,790$ deer hunters, respectively). In total, deer hunters accounted for an estimated \$2.01 million in local expenditures, antelope hunters \$204,000, and sage grouse hunters \$37,000.

Sage Grouse Hunting

Four-hundred hunters were drawn for a permit to hunt sage grouse. The hunt lasted two days (one weekend, 6-7 September 1997) and took place in Lassen County. The bag limit was two sage grouse per hunter. Surveys were randomly sent to 262 hunters and 80 hunters responded. Because of the small sample size, detailed demographic analysis of hunters' area of residence was not conducted for sage grouse. However, approximately 28 percent of the hunters were from Lassen County, with the Redding-Red Bluff area comprising the next largest group followed by hunters from the Sacramento area.

Sage grouse hunters averaged 1.65 days of hunting and reported 53 percent success (Appendix 1). Hunters spent an estimated \$36,600 in northeastern California during the sage grouse season, most of it in Susanville (\$21,800). Areas farther from the hunt zones, such as E. Siskiyou and E. Shasta counties had little money expended by sage grouse hunters. The average hunter spent \$95 in northeastern California, or approximately \$58 per day. Fuel and groceries comprised the greatest expenditures.

Pronghorn Antelope Hunting

The opportunity to go pronghorn antelope hunting is highly regarded in California and success rates are typically above 80 percent. In 1997, there were 7,725 applicants for the 484 pronghorn antelope tags in northeastern California (7 junior, 40 archery, and 437 general season tags). Tagholders cannot reapply for a pronghorn buck tag until ten years have passed. The hunting seasons occurred between 9 and 31 August. The hunt zones encompassed Lassen and Modoc counties, and portions of Plumas, Shasta, and Siskiyou counties. The bag limit was one buck antelope (one either-sex antelope for the junior hunts).

Surveys were randomly mailed to 242 pronghorn hunters. Approximately 18 percent of hunters lived within the hunt zone areas; an additional 12 percent lived within 3 hours drive of the hunt zones (e.g., Redding, Chico, Red Bluff, and Yuba City/Marysville); 21 percent lived in the Sacramento-Stockton area; 19 percent lived in the Bay area; and about 15 percent lived in Southern California (from Fresno or Monterey south) (Figure 4). Eight percent lived in the Los Angeles-San Diego region, indicating the willingness to travel hundreds of miles and substantiating the high value of a pronghorn hunting opportunity in California.

Pronghorn hunters had the highest response rate (64 percent), likely related to their high success (79 percent reported a successful hunt) (Appendix 2). They hunted an average of 4.31 days, spending an average \$431, or approximately \$100 per day and spent about \$204,000 total. The greatest expenditures occurred in Alturas/Likely (about \$40,000) and Susanville (about \$71,000), not including local access and other trip expenses. Pronghorn hunters were more likely to pay for taxidermy, guide, meat processing (in part a consequence of their higher success), and private land access than their counterpart deer hunters. Approximately \$46,000

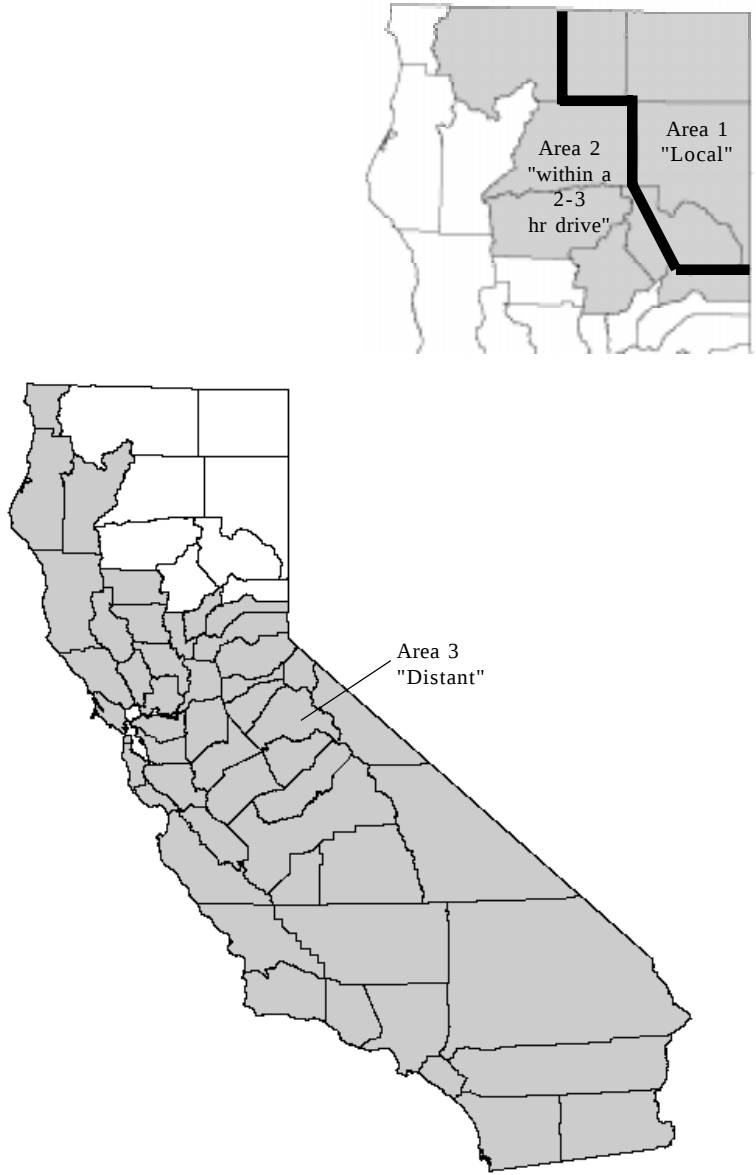


Figure 5. Areas 1, 2, and 3 (shaded portions in each image above) used for analyzing deer and pronghorn antelope hunter expenditures by location of residence. Area 1 excludes the western half of Siskiyou County and part of Plumas County. Shasta County, part of which is in the hunt zone area, was considered to be in Area 2 because the majority of hunters lived outside the hunt zones in the Redding-Red Bluff area, 1997.

Deer Hunting

Deer hunting expenditures were subdivided into one of three categories based on the county of residence of hunters (Figure 5):

- Area 1 Residents (Locals) of X1-X6b area (excluding Shasta Co. residents)
- Area 2 Residents from counties near X1-X6b area (including Shasta Co. residents and others within a 2-3 hour drive)
- Area 3 Residents from distant counties

While some Shasta County residents do reside in the hunt areas, the majority resided in the Redding-Red Bluff area so they were excluded from Area 1.

Archery and Muzzleloader Deer Hunting

There were 1,875 hunters drawn for archery season ($n = 1,730$ tags) or special muzzleloader ($n = 145$ tags) deer hunts in the areas comprising zones X1-X6b. The archery season was from 16 August to 7 September; five muzzleloader hunts occurred between 25 October and 23 November, each hunt approximately nine days in duration. The bag limits for these hunts was one buck deer. Surveys were randomly sent to 768 of these hunters and 141 completed responses were returned (19% overall response rate). This was the lowest response rate in the entire survey.

Archery/muzzleloader hunters spent more days in the field (average of 7.31 days) than their counterpart general season deer hunters, who are primarily rifle hunters (Appendix 3). Local archery hunters spent more time hunting than hunters from elsewhere in the state (Table 4). As expected with the more challenging archery method, their hunt success was lower (approx. 20 percent). The most successful archery/muzzleloaders were those from distant Area 3 counties (20 percent success¹ compared to 13 percent success for locals) suggesting that hunters willing to travel longer distances to use specialized equipment have a greater proficiency in hunting with such equipment.

The average archery/muzzleloader hunter spent \$36/day and \$264 total. Locals spent considerably more (average of \$327) to archery/muzzleloader hunt than their counterparts from Area 2 (average of \$178) and Area 3 (average of \$263) (Table 4). Fuel, groceries, and supplies for daily trips (average of 5.8 trips versus 2.3 and 1.7, respectively for area 1, 2, and 3 hunters) were the primary expenses in which locals spent more than hunters from Area 2 or Area 3. In total, archery/muzzleloader hunters spent an estimated \$472,000, the majority in the Susanville and Alturas areas.

General Season Deer Hunting

In the general deer season, there were 7,213 tags issued for zones X1-X6b through the drawing. Sixteen-day seasons occurred in the zones between the period 20 September and 19 October. The bag limits for these hunts was one buck deer.

¹Success rates reported in this paper are not official Department reported success rates for the specified hunts. They represent the success rates of survey respondents only.

Table 4. Average number of days hunted, number of trips taken, hunter success, and trip expense for deer hunters based on area of residence (Area 1, 2, or 3), 1997. Archery results include all archery hunts and do not include muzzleloader results. X-zone data are general season results only.

Zone & Area of residence		Average no. days hunted	Average no. of trips	Average hunter success ¹	Average trip expense
Archery	1	8.47	5.83	13%	\$327
Archery	2	7.44	2.33	17%	\$178
Archery	3	7.51	1.73	20%	\$263
X1	1	6.52	4.12	32%	\$205
X1	2	6.29	2.52	14%	\$204
x1	3	6.81	1.38	20%	\$201
X2	1	7.50	2.63	38%	\$206
x2	2	4.86	2.43	43%	\$205
x2	3	4.85	1.25	75%	\$320
x3a	1	6.77	5.32	74%	\$211
x3a	2	6.72	1.72	51%	\$198
x3a	3	5.28	1.37	46%	\$276
x3b	1	6.03	3.05	35%	\$375
x3b	2	6.30	1.83	26%	\$178
x3b	3	6.21	1.28	31%	\$283
x4	1	7.46	3.31	31%	\$220
x4	2	7.66	3.17	32%	\$136
x4	3	7.00	1.16	38%	\$284
x5a	1	7.00	5.53	65%	\$386
x5a	2	5.94	1.69	63%	\$298
x5a	3	5.16	1.09	47%	\$288
x5b	1	6.95	5.19	57%	\$308
x5b	2	6.38	2.13	69%	\$214
x5b	3	5.84	1.45	40%	\$208
x5c	1	6.88	6.76	45%	\$133
x5c	2	6.10	2.57	10%	\$258
x5c	3	5.58	1.42	13%	\$302
x6a	1	6.20	5.32	46%	\$180
x6a	2	4.00	2.00	44%	\$51
x6a	3	5.10	1.61	14%	\$180
x6b	1	7.00	6.67	50%	\$369
x6b	2	5.17	4.00	33%	\$96
x6b	3	5.61	1.46	32%	\$199

¹Average hunter success from survey response only. Does not reflect total hunter success as reported by the Department.

Surveys were randomly sent to 3,975 hunters and 1,402 completed responses were returned (35 percent overall response rate).

Approximately 17 percent of responding hunters lived within the hunt zone areas; an additional 26 percent lived within 3 hours drive of the hunt zones (e.g., Redding, Chico, Red Bluff, and Yuba City/Marysville); 19 percent lived in the Sacramento-Stockton area; 24 percent lived in the Bay area; and about 4 percent lived in Southern California (from Fresno or Monterey south) (Figure 6). One percent

lived in the Los Angeles-San Diego region, indicating that unlike pronghorn hunters, deer hunters were not as likely to apply for the chance to travel hundreds of miles for a deer hunting opportunity in California, but possibly, were willing to travel from Southern California to other western states.

Locals had the lowest response rate (27 percent), compared to Area 2 (31 percent) and Area 3 (32 percent) hunters (Table 5). Local hunters spent an average 6.6 days hunting, typically as "day trips", compared to an average 5.8 and 5.4 days of hunting by Area 2 and Area 3 hunters, respectively. Area 2 hunters appeared to take weekend trips, while Area 3 hunters tended to hunt in a single, but longer trip. Locals had greater hunter success (48 percent success) than Area 2 (36 percent) or

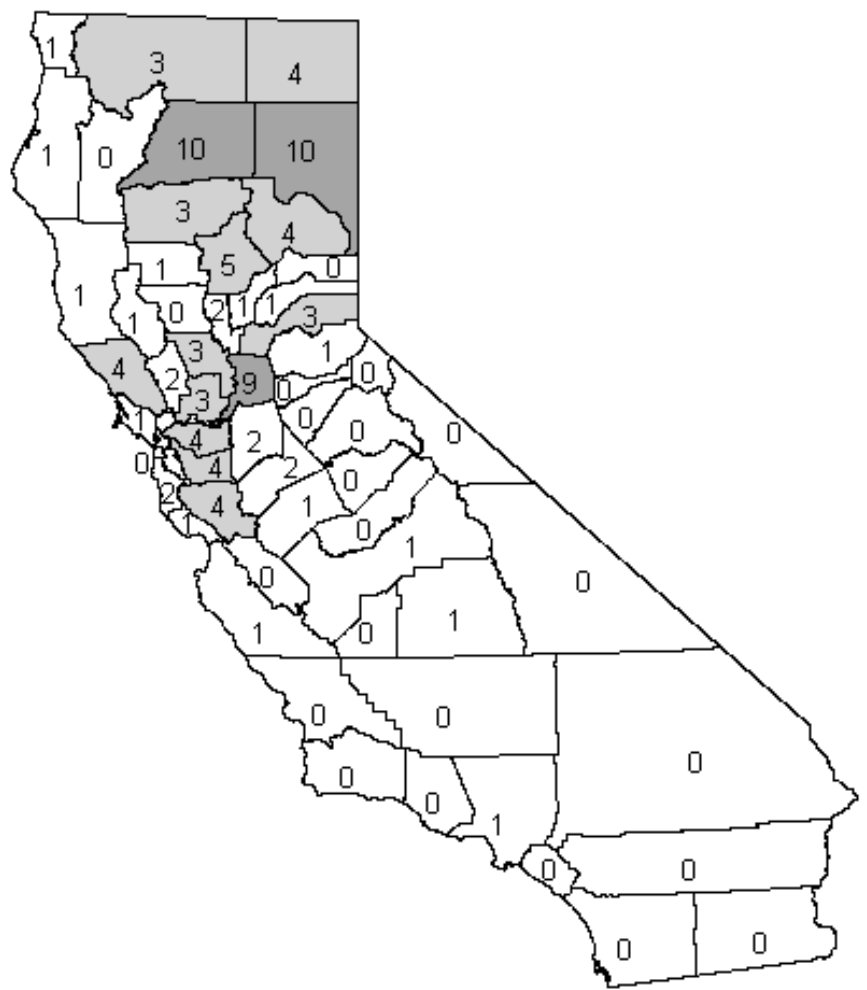


Figure 6. County of residence for X1-X6b general season deer hunters as a percentage of the total number of hunters. About 17 percent live within the hunt areas; 26 percent live within a 3 hour drive; 20 percent live in the Sacramento-Stockton area including outlying areas; 24 percent live in the Bay Area; and less than 5 percent live in all of Southern California from Fresno or Monterey south.

Table 5. Comparison among general season deer hunters based on area of residence (Area 1 = locals, Area 2 = 2-3hr drive, Area 3 = distant), 1997.

	Area 1	Area 2	Area 3
Number of hunters	1,433	1,254	4,237
Survey response rate	27%	31%	32%
Hunter success	48%	36%	32%
Average days hunted	6.6	5.8	5.4
Average number of trips	5.03	2.42	1.39
Total est. expenditures	\$350,346	\$221,129	\$970,815
Average spent per day	\$37	\$31	\$42

Table 6. Comparison of specific deer hunt zone survey results, 1997.

Hunt zone	No. of tags	Response rate	No. days hunted	Average success	Total expenditure	Ave. spent per hunter ¹
X1	2000 ²	29%	6.5	21%	\$362,724	\$189
X2	80	51%	5.5	59%	\$21,291	\$277
X3a	450	46%	5.9	51%	\$108,767	\$252
X3b	1215	44%	6.2	32%	\$337,356	\$289
X4	500	38%	7.2	33%	\$116,590	\$243
X5a	173	44%	5.8	54%	\$55,548	\$335
X5b	525	43%	6.0	46%	\$106,985	\$212
X5c	350	38%	6.1	23%	\$86,168	\$256
X6a	550	40%	5.4	28%	\$91,232	\$173
X6b	370	39%	5.7	33%	\$76,833	\$216

¹Average spent per hunter based on estimated number of hunters, not number of tags.

² X1 tags total 3,000 for entire zone, however for analysis the number was adjusted to 2,000 to reflect the approximate number of hunters that would have hunted the eastern half of the zone.

Area 3 (32 percent) hunters. Area 3 hunters spent the most money per day on average, but spent slightly less than the average local hunter because of the fewer days hunted. Locals spent more on fuel, groceries, and supplies, while Area 3 hunters spent more on dining out and lodging, likely having brought groceries and supplies (for at least a few days) with them from outside the survey area. Area 2 hunters spent considerably less than Area 1 or 3 hunters.

More Area 3 hunters paid for access to private land, however, on average all three categories of hunters paid about the same for private land access. Locals spent the most in northeastern California for meat processing services. Approximately 2.75 percent of all deer hunters (est. 240 archery/muzzleloader and general season hunters) paid to access private land. The cost of that access ranged from \$10-\$1,500 and averaged \$273 (some hunters surely got access for no charge).

Susanville, Alturas/Likely, and Eastern Shasta County were the areas where hunters spent the most, respectively. In total, general season deer hunters spent an estimated \$1.54 million in northeastern California. Combined with archery/muzzleloader hunters, approximately \$2.01 million was estimated to have been spent by deer hunters in northeastern California during 1997.

Results of deer hunting expenditures by zone indicated X5a, X3b, and X2 hunters tended to spend the most locally on a per hunter basis, while X6a and X1 hunters spent the least (Table 6). Total spending was dependent on the number of tags issued and consequently, X1 and X3b hunt zones generated the most in local expenditures.

Local Resident Expenditures

Residents of Lassen, Modoc, and Plumas counties contributed substantially to their county's economy through deer hunting in zones X1-X6b in 1997 (approximately \$209,000, \$119,000, and \$97,000, respectively). An estimated 900 Lassen County residents hunted deer in the area during 1997, reporting 45 percent hunter success, including archery/muzzleloader hunts (Appendix 7). On average, they spent \$232 overall, most for fuel, groceries, and hunt-related supplies. The majority of their local expenses occurred in Lassen County, although several thousand was spent in Modoc County. Modoc County resident hunters numbered about 370 and reported 56 percent hunter success (Appendix 8). They spent an average \$322 for deer hunting, nearly all of it in Modoc County. An estimated 336 Plumas County residents hunted the survey zones, reporting 35 percent success (Appendix 9). They spent an average of \$290, mostly in Plumas County, collectively spent about \$15,000 in each of Lassen and Modoc counties, and spent about \$97,000 total.

Comparing the 1987 and 1997 Deer Hunting Season

Results from Loomis et al. (1989) for deer hunt zones X2-X6 (X1 was excluded because of boundary changes over the years) compared to the present survey demonstrated the dramatic decline in deer hunting opportunity (Figure 7). The greatest decline in number of deer tags issued occurred in X3b, X3a, and X6 zones,

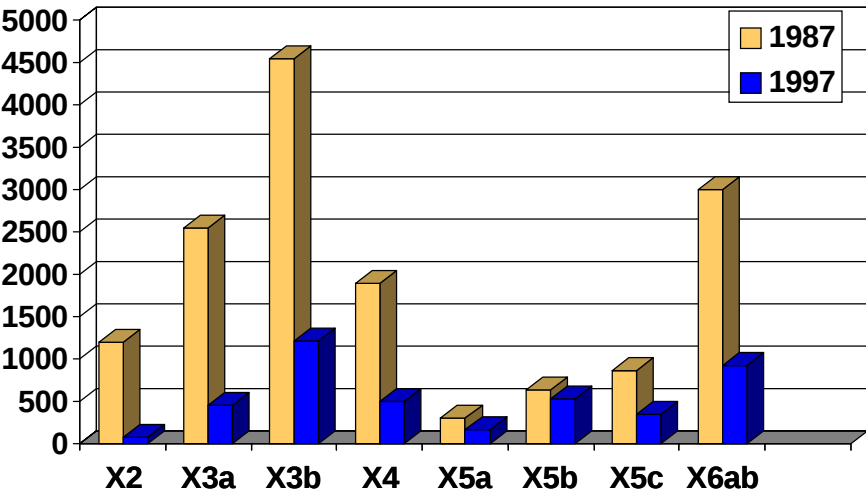


Figure 7. Change in deer tags issued in 1997 compared to 1987 for hunt zones X2-X6b ($n = 15,010$ vs. $4,213$). In 1997, the Department issued 28 percent of the number of tags issued in 1987 as a consequence of the declining deer herds.

respectively. Dollars expended locally (excluding X1 data) were estimated to be \$10.1 million in 1987 and \$1.8 million in 1997. Lassen and Modoc county data were used to compare the difference in local expenditures between 1987 and the 1997 study because all deer hunts occurring within those counties were reflected in the survey results. In Lassen County, 1997 expenditures were 18 percent of those in 1987 (Figure 8). In Modoc County, the difference was even greater with 1997 expenditures totaling about 10 percent of 1987 expenditures (Figure 9). In 1987, more money was spent in Modoc County than in Lassen County. This has reversed as a result of the greater decline in tags in the Modoc area.

Estimates for Plumas County indicated about \$758,600 was spent in 1987 compared to \$169,000 in 1997, about 22 percent of the 1987 value. The number of deer tags issued for Plumas County hunt zones X6a-6b (not counting that portion occurring in Lassen County) have declined from 3,000 to 920 in the ten-year period since 1987.

Survey Comments

A number of respondents wrote unsolicited comments or sent letters accompanying their responses (Appendix 10). Every written comment received was reprinted to help understand and relay the opinions and feelings of some of California's hunters. Additionally, a Department response to these comments is included. There were no comments received from pronghorn antelope hunters, and only one from sage grouse hunters.

Deer hunters described dissatisfaction with the Department's deer hunting program and with the Department's failure to increase deer populations or make hunting conditions better. There was criticism about "wasting" money to conduct this survey rather than improving deer habitat, and criticism that we were only trying to maximize dollar income to the Department by selling tags for nonexistent deer (yet Figure 7 illustrates that the Department is "selling" fewer tags). Mountain

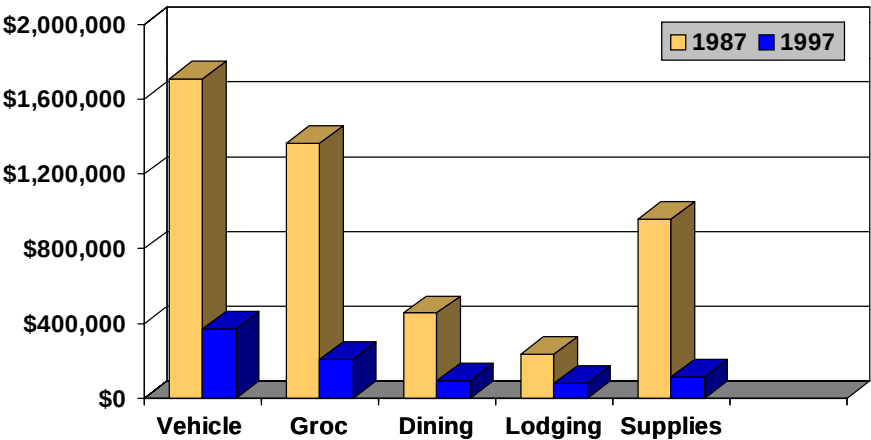


Figure 8. Estimated deer hunting expenditures in Lassen County 1987 vs. 1997. In total, expenses of \$833,000 in 1997 were about 18 percent of the \$4,726,000 expended in 1987.

lions were frequently blamed as the problem with the deer herds, and there was an inference that the Department was hiding the truth from the public. There was criticism of poor grazing management on public lands, and some confusion about the different responsibilities of the Department, USFS, and BLM. Every written comment that had a return address was saved to send a copy of this report.

DISCUSSION

Hunter expenditures support employment and the economy in the local communities through vehicle expenses (fuel and repair), food/groceries, eating establishments, lodging facilities, retail business, taxidermy, and meat processing. This survey indicated for mule deer, pronghorn antelope, and sage grouse alone, the 1997 expenditures exceeded \$2 million in northeastern California. While communities such as Redding, Truckee, Napa, Sacramento, and Yuba City were often mentioned (as well as mail orders from *Cabela's*), that data was not included in this analysis. Other expenditures reported, but not included, were license/tag fees and exceptional costs such as the purchase of land in Lassen County (\$12,000 was one example) for hunting access, cost of traffic citations, and costs of vehicle accidents (e.g., one estimated \$50,000 loss of a motor home). All these expenditures related to the hunting trips would increase the total spent in California far above that spent in northeastern California as reported here.

Each dollar spent by a hunter increases another person's income, creating a ripple or multiplier effect (IAFWA 1998). The 1996 estimated taxable retail sales in Lassen County were \$127.8 million (latest year reported, Calif. Dept. of Finance 1998), of which deer hunting expenditures in 1997 would account for about 0.62 percent of sales. In Modoc County, the estimated retail sales were \$35.4 million, of which deer hunting expenditures would account for about 1.64 percent. Ten years ago, deer hunter contributions were far more substantial. As these values represent deer only, the total hunting value of game species, as well as overall value of all

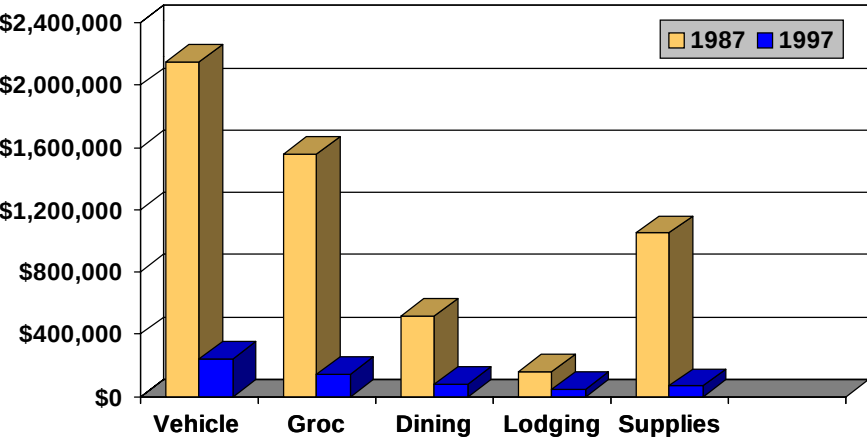


Figure 9. Estimated deer hunting expenditures in Modoc County 1987 vs. 1997. In total, expenses of \$554,000 in 1997 were about 10 percent of the \$5,433,000 expended in 1987.

wildlife, is substantially higher. It is entirely appropriate to begin "piling on" the value of deer hunting, on top of the value of sage grouse, antelope, quail, and waterfowl hunting, on top of fishing, and on top of restoring/enhancing riparian areas, other habitats, and native plant communities for the hundreds of species dependent on them. These values are all additive and of benefit to the local, as well as the statewide and national economy.

Hunting is an activity that is fundamentally dependent on the availability of healthy wildlife habitat (e.g., Leopold 1933, IAFWA 1998). The diminished deer hunting opportunity experienced in northeastern California has been very well noticed. The most important questions to address are: how did we get to the 1997 levels in deer numbers and consequent depressed expenditures locally; and can we reverse what has happened to our deer resource? It's likely that the declines witnessed have been brought about by long-term changes to the environment. Some of the changes have been subtle and difficult to detect in the short-term, such as maturing and closing forests that result in decreasing forage for herbivores; decreasing productivity of rangelands as evidenced by the long-term declines in numbers of deer, cattle, and domestic sheep (e.g., BLM 1998); some ongoing negative impacts of livestock grazing; and aging Great Basin shrub communities and juniper encroachment (e.g., Loft et al. 1998, CDFG unpubl. data 1998). Other changes are obvious as in several years of drought between 1987-92, development on key ranges, severe winter loss as in 1992-93, and significant wildfires that removed thousands of acres of valuable shrub winter range on the east side since 1984.

Several survey respondents blamed mountain lions for low deer numbers (Appendix 10). Changes in predator numbers have undoubtedly occurred, mountain lion sightings have been on the increase, and black bear populations have been stable to increasing for the past decade or so. Coyote population status is generally unknown at the scale of the survey area, but they too are assumed to be doing well. While predator species are doing well, it is standard occurrence for adult female deer to be in poor to fair physical condition in northeastern California from late summer through winter (CDFG, NDOW reports on file). This makes reproductive success (generally defined as having fawns survive until they too, have reproductive potential) more unlikely, and predators do not dictate deer health and condition. Instead they capitalize on and take advantage of prey in poor health as a consequence of poor habitat.

Not mentioned in the survey, but also occurring in northeastern California is an increase in the number of elk (both Rocky Mountain elk, *Cervus elaphus nelsoni*, and Roosevelt elk, *C.e.roosevelti*) within the survey area (D.B. Koch, pers. comm.). While numbers are still considered low, the fact they are on the increase suggests favorable habitat conditions for elk compared to deer.

There do not appear to be any easy quick fixes to reversing what has happened to the deer resource in northeastern California. Still, this area of the state has been identified as the highest priority for fixing by the state Department of Fish and Game in cooperation with the U.S. Forest Service, and Bureau of Land Management. The repairs needed are believed to be long-term and large-scale in nature, requiring modification of land management activities to better accommodate wildlife habitat and wildlife needs. Restoring degraded habitats on Great Basin shrub ranges and on forested ranges would be a benefit. Increased accommodation and enhancement of early successional habitats on forest lands through use of fire management has

been identified as perhaps having the greatest theoretical potential to increase deer populations significantly (Loft et al. 1998). However, implementing large-scale fire management strategies for ecosystem enhancement and fire protection purposes has yet to be realized for a variety of logistical reasons.

Private lands are also important wildlife habitats, and about 20 private ranches (comprising 144,000 acres) in northeastern California are participating in the state's "ranching for wildlife" program (often called the PLM program), improving wildlife habitat, and in turn, obtaining tags which can be sold along with access for pronghorn antelope and deer hunting.

Reducing livestock grazing impacts on public lands is one of the most often discussed options to improve deer habitat conditions in the survey area (e.g., Loft et al. 1998). However, the extent to which grazing practices would need to be modified to begin to see a positive effect on deer habitat and ultimately deer and other wildlife populations is not well-documented. A recent analysis by Roach et al. (1996) compared the trade-off of increasing deer populations through more restrictive livestock grazing in the X5 zones and concluded that the benefit of existing deer populations was 16-times the benefit of current cattle grazing. If deer populations were to increase from 5,200 animals to 15,000 animals, while cattle AUMs were reduced by 4,000 AUMs, the additional deer tags that would be issued as a result of an increased deer population could increase the economic benefit to 54-times current management, even further when other game species as well as nongame wildlife values that would benefit from reduced cattle grazing are added. Other studies (Loomis et al. 1989, Loomis et al. 1991) similarly corroborate the competitive value of deer and elk in Idaho and deer in the Sierra Nevada of California compared to livestock grazing. The Bureau of Land Management has proposed to reduce over 10,000 livestock AUMs out of about 205,000 AUMs in northeastern California to begin to meet long-term goals and objectives for rangeland health (BLM 1998). The estimated impact economically would be about \$600,000 over five years (\$120,000 per year). In comparison, if those 10,000 AUMs were translated directly to more deer and/or antelope, then between \$400,000-\$750,000 increased expenditures from hunters could occur each year (or \$2,000,000-\$3,750,000 over five years) by the addition of 750 pronghorn antelope or 750 deer, or combination of both species.²

Similar to economic comparisons of hunting trade-offs with varying livestock grazing, would be to compare the economics of various timber management strategies with hunting. Management of forests for tree production can result in meager understory forage for herbivores (wild or domestic) because the understory vegetation is actively suppressed. Investigation of these relationships and potential trade-offs should be conducted to determine economically whether timber management practices could better accommodate wildlife species such as deer (as well as livestock) that rely on early successional forest communities. Loomis et al. (1995) conducted an analysis on hardwood retention in northern California conifer forests, concluding that increases in hardwood retention translated into more deer and more deer hunters, with millions of dollars of potential benefit.

²Assumes the following: a 25 percent forage overlap with cattle; cattle consume about 5x as much forage as deer or antelope; a standard 6 percent of the population is the authorized allowable kill for hunting; and antelope and deer hunter success averages 80 and 25 percent, respectively.

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Appendix 1. Estimated sage grouse hunter expenditures in 11 areas of northeastern California, 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total
W. Modoc	\$432	\$0	\$0	\$0	\$0				\$432
Alturas/Likely	\$456	\$408	\$312	\$0	\$744				\$1,920
NE Modoc	\$0	\$144	\$0	\$0	\$0				\$144
N. Lassen	\$1,128	\$240	\$216	\$192	\$48				\$1,824
Susanville	\$8,534	\$5,256	\$3,283	\$2,784	\$1,954				\$21,811
Susanville area	\$1,368	\$686	\$192	\$0	\$269				\$2,515
S. Lassen	\$778	\$298	\$192	\$48	\$48				\$1,363
E. Shasta	\$96	\$0	\$96	\$0	\$0				\$192
N. Plumas	\$86	\$96	\$336	\$216	\$72				\$806
S. Plumas	\$192	\$288	\$72	\$0	\$0				\$552
E. Siskiyou	\$0	\$0	\$0	\$0	\$0				\$0
Total	\$13,070	\$7,416	\$4,699	\$3,240	\$3,134	\$312	\$1,872	\$2,808	\$36,552
Average per hunter	\$34	\$19	\$12	\$8	\$8	\$1	\$5	\$7	\$95
Number of permits	400		Estimated number of hunters			384			
Surveys mailed	262		Completed surveys returned			80			
Overall response rate	32%								
Average number of days hunted	1.65		Average hunter success			53%			
Average expenditures per hunter	\$95		Average expenditures/hunter per day			\$58			

Appendix 2. Estimated pronghorn antelope hunter expenditures in 11 areas of northeastern California, 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total
W. Modoc	\$1,947	\$946	\$316	\$613	\$261				\$4,084
Alturas/Likely	\$20,323	\$10,318	\$11,094	\$13,932	\$4,681				\$60,348
NE Modoc	\$1,762	\$2,006	\$1,275	\$1,272	\$0				\$6,315
N. Lassen	\$2,659	\$1,386	\$1,200	\$1,060	\$65				\$6,371
Susanville	\$12,399	\$5,826	\$4,456	\$4,394	\$2,554				\$29,629
Susanville area	\$1,076	\$522	\$832	\$281	\$799				\$3,510
S. Lassen	\$685	\$163	\$0	\$0	\$0				\$848
E. Shasta	\$1,713	\$623	\$551	\$157	\$2,088				\$5,131
N. Plumas	\$522	\$49	\$98	\$0	\$652				\$1,321
S. Plumas	\$7,731	\$0	\$0	\$0	\$0				\$7,731
E. Siskiyou	\$3,944	\$1,354	\$460	\$1,021	\$326				\$7,105
Total	\$54,760	\$23,193	\$20,284	\$22,730	\$11,427	\$20,926	\$46,207	\$4,515	\$204,042
Average per hunter	\$116	\$49	\$43	\$48	\$24	\$44	\$98	\$10	\$431
Number of permits		493	Estimated number of hunters	473					
Surveys mailed		242	Completed surveys returned	145					
Overall response rate		64%	Average hunter success	79%					
Average number of days hunted		1.65	Average expenditures/hunter per day	\$100					
Average expenditures per hunter		\$431							

Appendix 3. Estimated archery/muzzleloader deer hunter expenditures in the hunt zone areas X1-X6b for 11 areas of northeastern California, 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total	Average spent per hunter each area
W. Modoc	\$5,015	\$7,300	\$6,157	\$508	\$2,539				\$21,518	\$12
Alturas/Likely	\$41,297	\$18,408	\$12,898	\$6,982	\$10,156				\$89,741	\$50
NE Modoc	\$14,434	\$7,490	\$2,628	\$0	\$1,270				\$25,822	\$14
N. Lassen	\$2,222	\$0	\$254	\$0	\$0				\$2,476	\$1
Susanville	\$47,454	\$36,739	\$21,201	\$21,480	\$26,939				\$153,813	\$86
Susanv. area	\$12,835	\$9,902	\$4,253	\$1,714	\$2,031				\$30,735	\$17
S. Lassen	\$8,455	\$2,501	\$1,371	\$1,143	\$0				\$13,469	\$8
E. Shasta	\$9,648	\$6,982	\$3,009	\$0	\$3,859				\$23,499	\$13
N. Plumas	\$10,346	\$4,253	\$1,714	\$1,143	\$736				\$18,192	\$10
S. Plumas	\$10,410	\$8,061	\$1,536	\$2,437	\$1,587				\$24,032	\$13
E. Siskiyou	\$1,523	\$1,523	\$190	\$0	\$0				\$3,237	\$2
Total	\$163,639	\$103,160	\$55,211	\$35,406	\$49,117	\$26,660	\$9,877	\$29,338	\$472,408	\$264
Average per hunter	\$91	\$58	\$31	\$20	\$27	\$15	\$6	\$16	\$264	
Number of permits	1865	Estimated number of hunters	1790							
Surveys mailed	768	Completed surveys returned	141							
Overall response rate	19%	Average hunter success	20%							
Average number of days hunted	7.31	Average expenditures/hunter per day	\$36							
Average expenditures per hunter	\$264									

Appendix 5. Estimated deer hunter expenditures in 11 areas of northeastern California by hunters residing in counties adjacent to the X1-X6b hunt zone areas (Area 2), 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total	Average spent per hunter each area
W. Modoc	\$4,687	\$1,163	\$2,351	\$814	\$1,138				\$10,153	\$7
Alturas/Likely	\$12,869	\$6,346	\$2,412	\$925	\$1,527				\$24,079	\$17
NE Modoc	\$1,643	\$1,279	\$607	\$0	\$506				\$4,035	\$3
N. Lassen	\$10,644	\$3,059	\$1,820	\$455	\$1,871				\$17,849	\$12
Susanville	\$33,818	\$16,302	\$6,897	\$4,303	\$6,396				\$67,716	\$47
Susanv. area	\$1,264	\$1,087	\$678	\$2,154	\$253				\$5,436	\$4
S. Lassen	\$556	\$0	\$0	\$0	\$0				\$556	\$0
E. Shasta	\$19,341	\$12,950	\$5,840	\$855	\$5,021				\$44,006	\$31
N. Plumas	\$2,842	\$531	\$1,785	\$187	\$319				\$5,663	\$4
S. Plumas	\$860	\$506	\$278	\$0	\$0				\$1,643	\$1
E. Siskiyou	\$5,683	\$5,046	\$784	\$76	\$1,770				\$13,359	\$9
Total	\$94,207	\$48,269	\$23,452	\$9,769	\$18,800	\$6,068	\$8,146	\$12,419	\$221,129	\$176
Average per hunter	\$75	\$38	\$19	\$8	\$15	\$5	\$6	\$10	\$176	
Number of permits		855	Estimated number of hunters			1,254				
Surveys mailed		248	Completed surveys returned			248				
Overall response rate		31%								
Average number of days hunted		5.78	Average hunter success			36%				
Average expenditures per hunter		\$176	Average expenditures/hunter per day			\$31				

Appendix 6. Estimated deer hunter expenditures in 11 areas of northeastern California by hunters residing in counties (Area 3) distant from hunt zone areas X1-X6b, 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total	Average spent per hunter each area
W. Modoc	\$13,263	\$6,055	\$2,957	\$3,807	\$3,856				\$29,938	\$21
Alturas/Likely	\$76,202	\$52,589	\$30,162	\$16,933	\$21,180				\$197,067	\$138
NE Modoc	\$20,853	\$16,171	\$7,702	\$4,799	\$8,410				\$57,935	\$40
N. Lassen	\$24,493	\$11,450	\$5,776	\$4,335	\$1,896				\$47,951	\$33
Susanville	\$93,722	\$66,692	\$30,079	\$24,718	\$32,581				\$247,794	\$173
Susanv. area	\$27,147	\$9,319	\$8,474	\$11,958	\$2,976				\$59,875	\$42
S. Lassen	\$11,812	\$5,728	\$2,957	\$4,227	\$1,026				\$25,749	\$18
E. Shasta	\$43,167	\$22,886	\$13,180	\$9,451	\$6,729				\$95,413	\$67
N. Plumas	\$15,775	\$8,552	\$5,014	\$2,155	\$2,126				\$33,622	\$23
S. Plumas	\$14,832	\$10,292	\$8,713	\$9,124	\$2,776				\$45,737	\$32
E. Siskiyou	\$11,225	\$8,870	\$3,787	\$5,811	\$5,166				\$34,859	\$24
Total	\$352,492	\$218,604	\$118,802	\$97,319	\$88,723	\$23,565	\$40,601	\$30,710	\$970,815	\$229
Average per hunter	\$83	\$52	\$28	\$23	\$21	\$6	\$10	\$7	\$229	
Number of permits	4414	Estimated number of hunters				4,237				
Surveys mailed	4237	Completed surveys returned				867				
Overall response rate	32%									
Average number of days hunted	5.41	Average hunter success				32%				
Average expenditures per hunter	\$229	Average expenditures/hunter per day				\$42				

Appendix 7. Estimated deer hunter expenditures by residents of Lassen County, California, 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total	Average
W. Modoc	\$1,393	\$867	\$0	\$407	\$108				\$2,776	\$3
Alturas/Likely	\$4,424	\$1,572	\$786	\$542	\$813				\$8,138	\$9
NE Modoc	\$976	\$434	\$976	\$1,220	\$81				\$3,687	\$4
N. Lassen	\$5,498	\$2,695	\$992	\$0	\$683				\$9,867	\$11
Susanville	\$57,427	\$32,481	\$6,056	\$2,006	\$31,923				\$129,893	\$144
Susanv. area	\$11,554	\$6,522	\$2,358	\$607	\$6,858				\$27,900	\$31
S. Lassen	\$2,386	\$1,247	\$298	\$0	\$434				\$4,364	\$5
E. Shasta	\$0	\$0	\$163	\$0	\$0				\$163	\$0
N. Plumas	\$1,529	\$732	\$461	\$0	\$190				\$2,911	\$3
S. Plumas	\$0	\$0	\$0	\$0	\$0				\$0	\$0
E. Siskiyou	\$0	\$0	\$0	\$0	\$0				\$0	\$0
Total	\$85,186	\$46,551	\$12,090	\$4,782	\$41,091	\$440	\$18,352	\$460	\$208,952	\$232
Average per hunter	\$95	\$52	\$13	\$5	\$46	\$0	\$20	\$1	\$232	
Number of permits		937	Estimated number of hunters							
Surveys mailed		474	Completed surveys returned							
Overall response rate		37%								
Average number of days hunted		6.70	Average hunter success							
Average expenditures per hunter		\$232	Average expenditures/hunter per day							

Appendix 8. Estimated deer hunter expenditures by residents of Modoc County, California, 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total	Average spent per hunter each area
W. Modoc	\$7,167	\$1,918	\$290	\$0	\$905				\$10,279	\$28
Alturas/Likely	\$47,280	\$21,518	\$7,058	\$0	\$21,581				\$97,437	\$263
NE Modoc	\$588	\$588	\$181	\$0	\$0				\$1,357	\$4
N. Lassen	\$0	\$0	\$0	\$0	\$0				\$0	\$0
Susanville	\$0	\$0	\$0	\$0	\$0				\$0	\$0
Susanv. area	\$452	\$0	\$0	\$0	\$0				\$452	\$1
S. Lassen	\$0	\$0	\$0	\$0	\$0				\$0	\$0
E. Shasta	\$0	\$0	\$0	\$0	\$0				\$0	\$0
N. Plumas	\$0	\$0	\$0	\$0	\$0				\$0	\$0
S. Plumas	\$0	\$0	\$0	\$0	\$0				\$0	\$0
E. Siskiyou	\$0	\$0	\$0	\$0	\$0				\$0	\$0
Total	\$55,487	\$24,025	\$7,529	\$0	\$22,486	\$724	\$208	\$8,886	\$119,344	\$322
Average per hunter	\$150	\$65	\$20	\$0	\$61	\$2	\$1	\$24	\$322	
Number of permits	386	Estimated number of hunters	371							
Surveys mailed	193	Completed surveys returned	41							
Overall response rate	23%									
Average number of days hunted	6.07	Average hunter success	56%							
Average expenditures per hunter	\$322	Average expenditures/hunter per day	\$53							

Appendix 9. Estimated deer hunter expenditures by residents of Plumas County, California, 1997.

Area of County	Expense for vehicle	Expense for groceries	Expense for dining out	Expense for lodging	Expense for supplies	Expense for priv. land access	Other local costs to hunt this zone	Other costs to fish/hunt other sp.	Total	Average spent per hunter each area
W. Modoc	\$2,100	\$420	\$175	\$0	\$0				\$2,695	\$8
Alturas/Likely	\$4,865	\$2,520	\$1,505	\$5,390	\$392				\$14,672	\$44
NE Modoc	\$0	\$210	\$770	\$0	\$0				\$980	\$3
N. Lassen	\$350	\$175	\$0	\$0	\$280				\$805	\$2
Susanville	\$5,425	\$5,411	\$1,113	\$0	\$2,275				\$14,224	\$42
Susanv. area	\$315	\$70	\$0	\$175	\$0				\$560	\$2
S. Lassen	\$140	\$0	\$0	\$0	\$0				\$140	\$0
E. Shasta	\$910	\$315	\$105	\$147	\$105				\$1,582	\$5
N. Plumas	\$13,076	\$9,100	\$0	\$0	\$2,905				\$25,081	\$75
S. Plumas	\$9,513	\$7,245	\$3,500	\$3,535	\$5,985				\$29,778	\$89
E. Siskiyou	\$700	\$280	\$175	\$0	\$0				\$1,155	\$3
Total	\$37,394	\$25,746	\$7,343	\$9,247	\$11,942	\$0	\$3,003	\$2,800	\$97,475	\$290
Average per hunter	\$111	\$77	\$22	\$28	\$36	\$0	\$9	\$8	\$290	
Number of permits	350		Estimated number of hunters			336				
Surveys mailed	177		Completed surveys returned			48				
Overall response rate	29%									
Average number of days hunted	8.08		Average hunter success			35%				
Average expenditures per hunter	\$290		Average expenditures/hunter per day			\$36				

Appendix 10. Unsolicited comments received from survey respondents, including zone they hunted, number of days hunted, number of trips taken, whether they were successful, and where they were from. Where possible, a reply is presented in response to the comment.

zone	days	trips	succ	city/town	comment	see response #
<u>Miscellaneous comments</u>						
X1	4	1	0	Oregon	Don't fear, Calif. got plenty of my money.	2
X3b	4	1	0	Berkeley	Speeding ticket, by highway patrol officer with too much time on his hands and not enough real work to do.	1
X6a	1	1	1	Fresno	For the question: What were your expenses for access to private lands? The best response was: "Having a mother-in-law."	2
X6a	5	-	0	-	Whoever is responsible for the decision to poison Davis Lake should be shot.	3
X5b	11	-	1	Stockton	(Antelope tag also) \$50,000 motor home accident after antelope hunting.	4
X6b	6	1	0	San Anselmo	Poisoning Davis Lake ruined our trip. Tags wasted.	5
grouse	2	1	0	Ukiah	I avoid spending money in Lassen County because of their anti-DFG attitude.	6
<u>Survey complaints</u>						
-	-	-	-	-	B.S. survey, spend this money on saving deer herds, not this _____. I spend plenty on hunting. Stop the geothermal operations at Medicine Lake.	7
-	-	-	-	Sac area	This has nothing to do with managing our deer herds. Get rid of the lions in the X zones.	8
X5b	6		0	Chico	What is the expense of this survey and why is this money not spent on increasing the pathetic deer herds in NE Calif?	9
X5b	11	10	0	Susanville	Recommend: think in terms of deer herd health, not dollars.	10
X3a	6	2	0	Burney	Why is DFG wasting \$ on surveys. Spend it on habitat and big game.	11
X5c			1	Susanville	Need to ask how many days hunted. How many deer seen.	12
X5c				Livermore	No deer, big joke, time for new biologist, rip off, 4 deer seen. If you were more concerned about deer instead of money, I'd be a little happier. Tell the biologist to get out and quit counting deer on his front lawn.	13
X6a	8	8	0	-	None of your business.	14
X1	14	14	1	Tulelake	You forgot Tionesta. Go back to 3 pt. or better and move season of X1 to equal X2 opening date. No doe hunts! Survey has nothing to do with wildlife mgt. or increasing deer herds. Your last survey resulted in me not being able to draw a local tag near home because most people expressed a pleasure in traveling to a hunting zone. Locals need to be able to draw local zones.	15
<u>Want three point or better hunting</u>						
X3a	10	3	0	Davis	Please bring back three-point or better.	16
X3a	10	3	0	Vina	Take X zones back to 3 point or better	17
X3a	10	3	0	Vina	I would like to see 3 pt. or better back in X zones. We saw lots more bucks then.	18
<u>Want doe, either-sex hunts, special hunts</u>						
M8	6	3	1	Anderson	We want doe hunts- muzzleloader and junior	19

zone	days	trips	succ	city/town	comment	see response #
X3b	5		0	Sacramento	I wish you would have either-sex hunts. it would help out the deer herds.	20
<u>Change season opening dates</u>						
-	20	5	0	-	No deer, it was too hot. Season is too early, poor management.	21
M8	4	3	0	Ceres	Season is to early	22
X1	5	2	0	Danville	The X1 season is open a month to early. There are no deer in the area. Why is this?	23
X1	13	-	-	Danville	The X1 season is open to early. Opening in Sept. is a win-win for the Dept. sell the tags and collect the money knowing a handful of deer occupy the area in Sept.	24
<u>Drawing, preference system</u>						
X3a	16	30	0	Termo	I've hunted for 8 years. Usually get drawn for a zone far away. Now that I've been drawn here, no deer. I doubt I will apply next year.	25
X3a	9	3	0	Janesville	I have been an unsuccessful antelope applicant since 1978.	26
A11	24	24	0	Susanville	Something needs to be done with the deer and draw system in CA.	27
X5c	7		0	Palo Cedro	Give up the draw	28
M4	9	1	1	Sutter	I have applied for antelope for 33 years. you should have preference points.	29
<u>PLM- Private Lands Management Program</u>						
X5b	5	1	0	Fresno	The PLM land is too costly to hunt. Only those with money to burn can afford them.	30
X5b	12	2	1	Willows	The BLM 580 program sucks, they've locked people out of 1000s of acres of BLM land, namely McDonald Pk., Observ. Pk. and Express Cyn. area.	31
<u>Cut the quotas</u>						
X1	7	1	0		Did not even see a legal buck please stop selling more tags than need be.	32
X1	10	1	0		Seen no deer. Don't sell more tags than deer please.	33
X3a	4	2	0	Red Bluff	We saw very few deer in X3a, should reduce quota all x-zones.	34
X3b	6	1	0	Napa	You need to stop all hunting for 3-5 years. Help out the deer herds up north.	35
<u>Overall quality of hunt, numbers of deer</u>						
X1	12	12	0	Dorris	No deer- no bucks only deer seen in farm fields/posted land.	36
X1	11	11	0	Shasta Co	We saw over 63 does and many fawns. Only 1 buck. some days we spent 10 hours in the brush and trees.	37
X1	15	10	0	McCloud	There are almost no bucks	38
X1	8	1	0	Pioneer	This represents my share of expenses of a party of 3. No deer left. We quit.	39
X1	10	1	0	Sacramento	No deer- no tracks	40
X1	10	1	0	Sacramento	When is the DFG going to get on the ball and create better hunting and fishing conditions?	41
-	9	2	0	Sac. area	What is happening to our deer herds? Where is our money being spent?	42
X1	9	1	0	Hayward	I am very upset with the state of hunting in Calif., after 25 years, I don't think I'll bother next year unless some drastic changes (which I doubt). I will go out of state where I can count on a quality experience. I hunted X1 for the 3rd straight time, and for the 3rd time it was too damn early!! Other states have seasons that open later so at least you have an opportunity to	43

zone	days	trips	succ	city/town	comment	see response #
					be successful. It's ok with me if you cut back on permits, which you've already done, but at least let me hunt in a timeframe conducive to good hunting. I've applied for antelope for 19 years. Get a bonus pt. system so those of us putting in year-after-year have a better chance of getting drawn than a 1st-timer. I've spent a huge amt. of money over the years and it's about to end. I've got to tell you a lot of hunters feel the same as me. If things don't change we will put a lot of you out of work because our money won't be there for you!	
X2	2	1	0	Sacramento	No kill-- next year?	44
X3b	5	1	0	Santa Barb.	The area we hunted was very poor, hardly any deer population. It was a big letdown.	45
X3b	10	2	0	Redwood V.	No deer!	46
X4	8	1	0	Lakeport	Deer hunting was very poor.	47
X5b	4	1	0	L.A. area	Deer herd is down greatly in the Observation Pk. area.	48
X5b	7	1	0	Hayward	Very poor herd	49
X5b	9	2	0	Sacramento	Hunting was rotten- no deer in area	50
X5b	7	3	0	Redding	No deer- too many hunters	51
X5b	3	1	0	Benecia	Hunting was zero- saw 2 deer/3days.	52
A6	5	1	0	Sacramento	Very few deer (20 does, 1 buck sighted)	53
X5c	9	3	0	Oakland	There are no deer. I feel I was taken. Waste of my time and effort. Very disappointed.	54
X5c	5	1	0	Magalia	No herd, no tracks, worst seen in hunting area in 37 years.	55
X6a	20+	16	0	Portola	Why don't you ask where are all the deer. There are none! 9 deer spotted in 6 weeks. Poor game management!	56
X6a	3	2	-	Galt	DFG is going to lose revenue if hunting is not improved. Deer hunting is poor in CA, herds are at an all time lows from what I've seen.	57
M4	4	1	0		We saw 1 buck, 13 does in 4 days. Very poor hunting.	58
Arch.	8	1	0	Tulare	No deer and no bear.	59
X3a	4	1	0	Pine Grove	I've hunted in Modoc County for 37 years. Since the drawing was initiated, I've been drawn twice for my favorite area. In 1995 I saw 4 does in 4 days. In 1997 I saw none. In the past I would see 50-100 deer in the area of Knox Mt. on opening day. It was disappointing to see this once great deer herd suddenly diminish to practically nothing. My sons grew up hunting with me, it is sad what we see today. I am hopeful that DFG will come up with a program to improve the deer environment. Where are all these vast herds disappeared to? Or are we losing to vast numbers of poachers? Are too many cattle being allowed to graze our national forests. How about the increase in the coyote population? I do sadly miss our ever-loving hunting area of Knox Mt.	60
<u>The problem is mountain lions</u>						
X1	4	2	1		Not your business- Go fix the lion problem instead of wasting time on this.	61
X3a	3	1	1	Wrightwood	Too many predators have weakened the deer population.	62
X3a	16	30	0	Termo	Zone should be closed for 3 yrs. Too many mountain lions.	63
X3a	7	1	1	Santa Rosa	Too expensive to compete with lions. I was 1 of 6	64

zone	days	trips	succ	city/town	comment	see response #
					who got lucky. Start managing wildlife, open a season on mountain lions.	
X3b	5	1	0	-	Area has major problems with mountain lions.	65
X3b	-	-	0	Tehachapi	37 mountain lions- not 1 buck.	66
X3b	7	1	0	Cazadero	Three couples took our horses and went for 7 days. Trip was fun but disappointing when you see more lion sign than deer. We saw maybe 2-3 does per day, only 1 buck and two spikes. We saw lion tracks in fresh snow twice and found a lion killed doe. I am sure this letter is just going to be thrown away because nobody gives a _____, but we feel the signs we saw proves there is a problem. Maybe Wildlife Management should start figuring out what is really extinct- deer or lions? It's going to get worse before people open their eyes. I don't mean to sound rude, but we've had sheep killed at my barn right across from the house. The day before I had 5 little kids playing right there. I have my eyes open now.	67
X3b			0	Orangevale	The deer situation near Likely is depressing. The size of the herd is about 1/3 of normal and hunters seem to be taking forked-horn deer instead of mature deer. The locals and game warden admit that mountain lions are probably responsible for the lack of deer. There is plenty of forage and water; what deer are taken appear healthy but not fat. In 16 years, this is the worst I have ever seen. The deer are smaller in size and their habitat not as widespread. We suppose winter kill from lack of proper diet and overcrowding of their winter range from other species has a lot to do with it. What is the DFG doing about the poor condition of the deer herds? What are you spending the money on if there is no results in the field? It is obvious the mountain lion situation is out of hand and it will not be long before hunters and ranchers will take it upon themselves to eliminate the lion problem. I saw six coyotes, this may be part of the problem. I think the sportsmen deserve a good explanation of what is wrong and what is being done about it.	68
X3b		2	1	McKinleyv.	Lots of lion tracks-not many deer. Herds seem smaller than 2 years ago. Please take action soon. Lions kill a deer a week. Make your stand, like Davis Lake!	69
X5a	10	3	0	Herlong	There is no deer, You need to seek legislation to control the predators.	70
X5a	2	2	1	Westwood	If DFG doesn't do something about mountain lions, there won't be any NE deer left. I saw two and found a covered kill.	71
X5a	7		0	Santa Rosa	Need to do something about mountain lions!!	72
X6a	10	10	0	Susanville	The cougar have killed all the deer. A sad hunter wishing I lived where the DFG main concern was wildlife, instead of what a hunter spends.	73
X6a	5	1	0	Santa Rosa	The locals say bad hunting due to many cats. I won't be back for many a year-- heading out of state.	74
<u>Conditions on public lands</u>						
X4	12	12	0	Westwood	Between the BLM and USFS and the cattlemen, they have ruined the deer hunting in NE Calif. Sage hen, chukar, quail, everythings gone.	75
X5b	10		1	Vacaville	The land management is no good. It takes our BLM	76

zone	days	trips	succ	city/town	comment	see response #
X5b	14	1	1	Vacaville	land and does injustice to the deer in the late season. The land mgt. in this area is for the birds. No good. Some changes should be made. I am writing F&G.	77
X6a	12	12	0	Susanville	Very few deer! I'm losing my interest. It's to the point I'd rather watch a sporting event. Decrease the deer tags or close some zones. Your going to lose the interest of young hunters in this state unless you improve the quality of hunting on BLM and national forest land.	78
X6a	14	12	0	-	No deer on BLM and forest land. Lousy job DFG. Lousy hunt unless you are willing to pay to hunt private land. Close the X zones, there is no quality hunting in these zones period. Create quality hunting for fathers and sons who don't own land or have big bucks to hunt private property.	79

No more hunting in California

A6	6	1	0	Rohnert Pk.	I have seen a steady decline in the deer population in X3b. It has become a poor hunting experience. Drastic measures are necessary to bring this herd back. I will not be hunting in Calif. for some time.	80
X3a	3	1	0	Yuba City	Deer have been managed into extinction. Last deer hunt in Calif. Next year, MT or CO.	81
X5	15	4	0	Susanville	No deer in Lassen Co. Next yr., out of state. No more CA money.	82
X5b	6	6	0	Susanville	Next year-out of state hunting. My opinion, stop playing politics and manage the game	83
X5b	4	1	0	Manteca	Deer herd down- will not hunt CA any longer. Will go out of state.	84
X5c	10		0	Vina	Had lots of bad weather, snow, but there are no deer left. Will go out-of-state next year.	85
X5c	9		0	Santa Rosa	Saw 3 doe, hiked 4 days. Won't hunt Calif. again, going out-of-state I'll pay \$500 more, but at least I'll see deer. Hunted for 30 yrs. Deer in worst shape I've seen--Good job F&G!	86

They weren't all mad

X3a	5	1	0	San Leandro	This took me 5 years to be drawn for. I hope to be drawn again next year.	87
X3a	10	2	0	Tulare	Took 5 shots. I hope we get same zone next year.	88
X3a	4	1	1	San Jose	I've been hunting/fishing in Modoc Co. for 58 yrs. We have watched the deer herd decline in quantity and health. When X zones were put in place, we felt left out and were upset at not drawing a tag every year. However, in the last several years, we have noticed a great change in population of deer and especially quality. After totally disagreeing with the X zone limitations, I must say that it seems to be a good improvement from the past. We will never see what we used to, but I now agree with the steps you have taken, and hope you continue this success. I got a 4x3 27" after seeing many healthy forked and 3pt deer.	89
X3b	5	2	0	Willows	I enjoyed hunting & fishing NE Calif. very much. Thank you.	90
X3b	1	1	1	Winters	Got a 5x5 deer.	91
X3b	3	1	0	Redding	I passed up 2 forked horn bucks.	92
X4	15	1	0	Yuba City	Great trip. saw 230-250 deer, 1 bear-3 cubs. Super!	93
X5a	8	3	1	Janesville	Thank you for finally drawing me for X5a = 6x6 31" spread.	94

zone	days	trips	succ	city/town	comment	see response #
X5a	1	1	1	Cotati	3x3 buck thanks!	95
X5b	7	6	0	Chico	Was a pleasure to hunt in this zone- keep up the good work.	96
X6a	1	2	1	Milford	By the way, we had a lot of fun	97
M8	7	7	1	Janesville	I live here, and drew M8!!	98

Responses to Survey Comments (refer to numbered list at the right margin of comments)

Note: the following responses should not necessarily be construed as an official department response or position on the comment received. Here's a place where separating science from providing the public information and department policy is difficult. The intent of printing the comments and responses was to increase the exchange of information between the public and the department. While the printed responses are based on the authors knowledge and experience along with input from Department colleagues, the Department should be contacted if the reader would like to verify whether the stated response accurately represents an official department position.

1. MISCELLANEOUS COMMENTS. Sorry you got a ticket. It appears you violated the law. At least two other survey respondents got a traffic ticket, or got a citation from DFG. These costs were not counted in the survey.
2. Good one.
3. We hope you are not serious. We also hope that people do not place non-native species in our waterways to compete with what is left of our native stocks. There were alternatives to the Lake Davis area for deer hunting.
4. Sorry to hear this. This was the single largest expense claimed in the survey. It was not counted. There were two major vehicle accidents reported in the survey.
5. see response 3.
6. Lassen County government does have its differences with DFGs hunting proposals on many occasions. It is interesting to see that you hold the county accountable for their actions.
- 7-11. SURVEY COMPLAINTS. On the surface, you may ask "what's this got to do with improving deer herds?" Here's what: Approximately 43,000 square miles of deer habitat is administered by the Forest Service and BLM. These agencies must evaluate environmental and economic consequences of their proposed actions such as livestock grazing, timber harvest, reforestation, etc. Traditionally, wildlife have been regarded as not having a real, or quantifiable dollar value, or a value as a consumptive use (initially, this was the primary reason for the survey). This survey provides a minimum estimate of the economic contribution of hunting these three species alone. Add to this value, other hunted species, fishing value, wildlife viewing, and so on, to arrive at a true value of wildlife in these rural counties. Land management decisions are made annually by the USFS and BLM that can negatively or positively affect these wildlife values over much of northeastern California. That is why the survey was conducted. The Department has spent millions of deer hunter tag dollars on habitat improvement efforts. While these efforts have improved conditions, they are generally of such small size that they do not have a significant effect on improving deer habitat. Influencing decisions about long-term land management is needed and economic data on hunting contributes to illustrating the value of wildlife. Additionally, private lands, subject to local and county government planning commissions, would benefit from a greater understanding of the economic benefit to maintaining wildland. The hunting opportunities described here generate income for the local communities. The results of this study provides additional information that can be used in the decision-making process

about whether to develop wildlands.

9. Survey expense- The author entered all the tag data at home during evenings occasionally with his son's help (during Seinfeld reruns), hence there was little additional cost to department. Mailing 5,000 survey cards probably cost about \$4,000 for printing and mailing effort (to and from mailing of survey cards). Author's time for analysis and write-up while at work probably cost about \$5,000-9,000 (additionally, about 40% of the effort was done at home, largely independent of the work day). Was the cost worth the effort to try and get greater accommodation of wildlife value on millions of acres of northeastern California? Can't answer that, time will tell. One benefit we see in the deer program around the state is improved understanding of hunter attitudes and desires. We don't like to see hunters paying \$100s per trip and coming home unsuccessful and frustrated either. DFG wins nothing that way.
12. There were a few questions we came up with after the surveys came back. The most important would have been: "How much effort did you put into the hunt (did you road hunt, hike a 1/4 mile, 1/2 mile, or less from roads, or hike a mile or more from roads)?" A lot of unsuccessful respondents either spent a short time hunting, or spent a lot of time driving as evidenced by their vehicle costs. However, effort would be difficult to quantify.
13. You should look at the graph in Figure 7. If we (CDFG) were more concerned about the money, the number of tags wouldn't be reduced as much as they are; also read the response to 7-11 above to see why the economic information is important. Why can't biologists count deer on their front lawn (that information is not used in setting regulations)?
14. I suppose many hunters said "none of your business," however, having that information provides good arguments to improve and maintain high quality deer habitats in California. If hunters were more open on this issue (and a lot were judging by the survey response), and realized they can influence land management decisions as users of the resource, then conditions could improve (see response 7-11 above).
15. Tionesta was included, we did not mention every town on the survey card and assumed hunters would tell us the other towns where they spent money. See response 16 for three-point issue. See response 19-20 for doe hunts. See response 7-11 for relevance to wildlife management/deer herds. Unfortunately for locals, every hunter has equal opportunity to be drawn for the X zone hunts. There are more hunters from elsewhere in the state, but very few from southern California travel to your area, and when they do, they bring money and generally go home empty-handed! It is too bad that we don't have a system that allows us to maintain better local hunter support in deer management and still be fair to hunters statewide (hint: we are open to new ideas). See response 25-29 on preference points.
- 16-18. WANT THREE-POINT BUCK HUNTS. You folks saw a lot more bucks when there were three-point or better hunting because there was a lot more deer! There are still about the same proportion of three-point or better deer in the population, but because the overall numbers are lower, you don't see them very often. Three-point or better was tried in the past, and resulted in many illegally killed animals (forked horn) being left in the field to waste; and it resulted in greater hunting pressure on large-antlered bucks. If you want more bucks, we recommend that hunters advocate improving habitat conditions on public and private wildlands. see response 80-86 for antler-size classes.
- 19-20. ANTLERLESS/DOE HUNTS. The department considers antlerless (doe) hunts an integral component of total deer population management and strives to propose them where they are appropriate. However, all county fish and game commissions in northeastern California (*check out: <http://www.dfg.ca.gov/wmd/veto.html>*) have the capability to stop a department proposal for antlerless deer hunts. Because of this, there are times when the department does not propose doe hunts, knowing that the likely backlash of such a proposal would result in greater harm to department credibility and local relations, than the proposed hunt would provide benefit to the deer population or the public. As most other states in the country realize, using doe hunts increases hunter opportunity, results in

greater efficiency of use of the deer population, and helps keep buck:doe numbers in a more desirable, if not stable, balance. Department surveys and questionnaires have indicated that the majority of deer hunters support doe hunts when biologically appropriate, but a vocal minority who is dead-set against them fight antlerless hunt proposals every year. For those familiar with livestock ranching- think about whether you would ever need to remove some cows from a herd in a fixed size pasture. There's only room for so many animals, and removing only some of the bulls each year wouldn't work- because there are both male and female animals born. Soon there would be a lot of cows, and not much room for bulls. Same works for deer. It's interesting to Department biologists that our pronghorn antelope program is held in such high regard in California and is so successful in part because it is a program that fully uses doe hunting when it is appropriate. Similarly, some of our best deer hunts are on military lands that allow doe hunting. Yet some California deer hunters continue to fight total deer population management.

21-24. **SEASON IS OPEN TO EARLY.** Season dates are set to consider herd conditions, terrain, weather patterns, probable hunter success and other factors. Opening adjacent zones on the same dates is done where feasible, but not where it would be inconsistent with deer her plans and population objectives. That's the bureaucratic response to this frequent complaint. Unfortunately for us in the Department, this issue is almost a "damned-if-you-do-damned-if-you-don't" problem, particularly when we are in long-term declines in deer numbers. Sure, no one wants to be out there when it is hot and dusty, and the deer haven't arrived in great numbers. But modifying season-opening dates is one of the means to manipulate hunter harvest of migratory deer herds. An allowable buck harvest (ABH) is established each year. Factors such as season-length, season dates, historical success rates, and weather patterns are considered. We do not want to exceed ABH, hence are generally conservative in season-dates, quotas, or both. As most deer hunters in California want a "chance" to go hunting (more so than the desire to actually kill a deer), we typically favor modifying opening dates as opposed to reducing quotas to control harvest. The alternative to early season dates is to open the season later when hunting conditions are excellent. This would result in far fewer tags being issued and higher hunter success. At this point, we probably need to revisit what the hunting public wants. Of course, if habitat conditions were on the increase, we could have later seasons and have higher quotas. Some in the Department believe it would be better to keep season dates consistent, so that hunting conditions are reasonably good from year-to-year, and modify the quota to achieve ABH. Others believe adjusting the opening/closing dates to help control harvest and only minimally changing quotas is preferred. One argues for hunting quality over opportunity, the other argues for hunting opportunity over quality. One generates less revenue than the other.

25-29. **DRAWING & PREFERENCE SYSTEMS.** Many hunters are frustrated about not getting drawn for X zone deer and antelope. The Department has been conducting an in-depth review and analysis of various preference drawing systems currently employed in other western states. A Department Big Game Draw Working Group (BGDWG) is currently preparing a report on various approaches to a preference system for Directorate and Fish and Game Commission (Commission) review and approval. Here is a synopsis of what they are currently evaluating: The BGDWG found that many western states were disappointed in the performance and operation of their preference draw system. Operational problems that were unexpected have occurred due to various statistical realities and hunt selection behavior of hunters. Some preference systems are not adequately accomplishing the goal of allocating tags to those hunters who have applied multiple years and have not successfully drawn a tag. This is due in part to the limitations of the approaches themselves as well as the high applicant per available tag ratios existing in many states. Regardless of the problems found in other states, the BGDWG committee is currently evaluating the following preference systems and how they might perform in California:

- 1) Equal Probability Drawing (our current system)
- 2) Straight Preference point system
- 3) Bonus Point System
- 4) Modified Preference System (e.g., tags for each hunt & zone split between an Equal Probability and Preference Draw)

These systems are being evaluated in the context of the following Department goals for a preference draw system: 1) To improve the odds of a hunter receiving a premium tag who has been vigilant in the draw (e.g., a hunter who has applied each year, but hasn't drawn a tag); 2) To encourage new hunters to participate in big game hunting; 3) a system that is easily trackable; and 4) a system that is easy to understand. The BGDWG goal is to have a preference proposal available for review by the Commission in fall of 1998. No preference system is expected to be in place before the year 2000-2001 hunting season.

30-31. PLM PRIVATE LANDS HUNTS. PLM did not create fee hunting as landowners have always had that right. Sure the PLM landowners can charge money for hunting on their lands, but the PLM program is the one means we have to significantly manage wildlife at no cost to hunters or taxpayers- it is self-supporting. PLM operators can charge what they desire for hunting opportunity, or they can give tags away to family members, or donate them for fund-raising events. The point is, a landowner ought to be allowed to gain some benefit for helping maintain and improve wildlife habitats in California. In 1997, an estimated 31,700 bucks were estimated to have been killed on public lands. PLM lands killed only 420, of which 82 were 4-pt. or better. Public land hunters killed 4,438 4-pt. or better deer. PLM kill is nonsignificant, but PLM lands provide valuable habitat managed for wildlife. Many of those deer raised on PLM ranches are likely killed each year on public lands. The program has nothing to do with the BLM or BLM lands which are public, and only has to do with private lands. Landowners can either allow or exclude hunters from hunting on their land. Express Canyon is in Nevada.

32-35. REDUCE QUOTAS. We have cut the quotas dramatically since 1987 (see Figure 7 graph), and continue to do so as dictated by deer population data. The thinking that hunting is responsible for the poor deer numbers is incorrect. Again, we generally hunt bucks only, with insignificant doe hunts. Does have fawns, bucks do not, and about 1/2 of the fawns are bucks. If habitat conditions are not suitable, the population will not increase. The Forest Service and BLM manage most of the deer habitat in northeastern California. They have not been working to improve conditions for deer very much. Stopping hunting for a period would increase the proportion of bucks in the population, but would not increase the population. When hunting is resumed, expect higher hunter success for a few years, then back to the same conditions as before. It is not a long-term solution to the problems faced by deer populations. Nearly all hunting in northeastern California is "bucks-only" hunting. Bucks comprise only 10-15 percent of the deer population in most herds, hence the death of a small number of deer (30-80 percent of the buck population and about 6 percent of the total deer population) has little if any effect on the total population. Fawns are recruited to replace lost bucks. Closing a buck-only season would not likely increase a deer population, but it would increase the buck ratio. But this can also be done by modifying the quotas and seasons.

36-60. OVERALL POOR DEER HUNTING CONDITIONS. We know there have been poor conditions out there. We recently (February 1998) completed a statewide assessment in cooperation with the USFS and BLM to evaluate deer habitat and populations (<http://www.dfg.ca.gov/wmd/rept.html>). Northeastern California was identified as being in the worst shape in terms of deer decline, and identified as the highest priority to try and fix things. This economic survey is part of the overall interest in northeastern California-- to illustrate the deer hunting value up and determine whether it is competitive with other uses such as livestock grazing that continue to degrade valuable deer habitat in many areas. One

of the interesting perceptions we got from this survey was that hunters who got drawn for these X-zone hunts may have thought they would have a "slam-dunk" easy hunt. Perhaps that is based on the historical perception that these are "premier" and "trophy" zones with deer all over the place. That clearly is not the case now, if it ever was. Those hunters who work hard for their deer, and get away from the roads and populated areas are more likely to be successful. X2 had the highest success and lowest hunter density. We could increase hunter success in the X zones by offering fewer tags, such as cutting them in half, but we do not know what the best tradeoff in opportunity versus success is for deer hunting. Still, we are attempting to provide the desired opportunity to hunt, constrained by what the deer population can take, as best we can.

42. Most of the deer hunter dollars are spent in support of Department positions for collecting deer population data, working on habitat issues, and developing hunting proposals and regulations. Previously, approximately \$1 million was spent each year on habitat improvement projects, most going to the USFS and BLM as burning projects. Because of limited success of these projects (primarily because they were too small in scale), we have modified how we allocate deer program funds. Of highest priority is large-scale projects that are funded by multiple agencies, but these are few and far between because available lands are either private or owned by BLM/USFS. A report to the legislature detailing where deer program funds go is prepared every other year if interested.
43. See also response 21-24. If we cut back on permits, you might not get drawn. see response 25-29 on preference system. If the hunters quit deer hunting in California, the employees in the deer program around the state would be funded to do other work under another program in the department or go elsewhere. If the deer problem were easy to fix, we'd have done it by now. We don't understand why do some hunters think the Department has reduced deer herds.
60. See previous responses and recommend you get a copy of our deer habitat and population assessment report which is on-line at <http://www.dfg.ca.gov/wmd/rept.html>. You are correct in that several factors are impacting deer habitat and populations at the same time.
- 61-74. Predators don't weaken deer populations, but poor habitat conditions do. Look at the discussion in the report on predators. Lions are an easy blame for poor deer numbers, however, deer in many herds are generally in poor body condition (does more so than bucks because they are attempting to raise 1-2 fawns each year). That is habitat-related not predator-related, although predators will take advantage of such a situation. Lions are fully protected in California now as a result of Proposition 117 passed in June of 1991. Lions had been "protected" since the early 1970's anyway. Sure lions kill deer, but so what, they always have and always will. If habitat conditions on California deer ranges were "good to excellent" instead of "poor to fair" lions would largely be irrelevant. Think about whether the increase in observations of mountain lions may be a consequence of low deer numbers influencing lions to be active more during the day in their search for food, and out of necessity, being in closer contact with humans. A statewide survey done in the late 1940s indicated that nearly all of California's deer ranges were in poor-fair condition, not much has improved, except in localized areas as a consequence of large fires or other disturbance to the habitat. Some of us may have never seen excellent deer range in California on a large-scale!
66. You wrote thirty-seven mt. lions? This is hard to believe.No, it is unbelievable. Is that what you meant to write?
73. Please read response 7-11 for why we are interested in what you spend.
- 75-79. CONDITIONS ON PUBLIC LANDS. Suggest you folks get the deer habitat assessment report mentioned previously. Contact the author to get a copy or from the DFG website. We believe the greatest opportunity for deer in California is to better accomodate deer habitat needs on public lands. This would benefit deer, as well as hundreds of other species requiring similar habitats. If you have problems with land management, write to the land management agency who administers that land. Improving the "quality of

hunting" on BLM and USFS land requires the BLM and USFS (not CDFG) to improve the quality of the deer habitat-- tell them. We have been for decades. As an example, the USFS is right now (summer 1998) initiating a new effort on 10 national forests encompassing the Sierra Nevada (www.r5.fs.fed.us/sncf/index.html). So far, this effort hardly mentions deer as an issue or a priority. Nor do we believe the current direction they outline will benefit the habitats on which deer and possibly hundreds of other species, likely depend. Public comment and involvement are invited by the USFS from now until next May when they plan to issue their final document.

79. We have failed to get the land management agencies and private landowners to focus on deer as their top priority. Of course, deer are not their top priority, nor are deer the Department's top priority. However, they, and more importantly, the habitats that deer represent, are very important and deserve better accommodation in land management planning than they are getting. We are working on that, this survey is one means to accomplish it.

80-86. NO MORE HUNTING IN CALIFORNIA. Sorry the experience for you folks in 1997 was so bad. Some of these comments seem overly dramatic. There are deer left. There may not be as many deer as we desire, and they may not be as easy to hunt as expected, but they are there. The final results for X1-X6b deer hunting in 1997 was:

Zone	Estimated Kill	Percent success
X1	635	21
X2	36	45
X3a	223	50
X3b	354	29
X4	130	26
X5a	46	27
X5b	170	32
X5c	56	16
X6a	145	26
X6b	86	23

1997 reported kill by county:

	Does	2-pt	Antler points			Total
			3-pt	4-pt	>4-pt	
Lassen	0	214	221	157	32	625
Modoc	0	242	190	104	17	555
Plumas	16	185	114	52	6	373

(Reported are those tags returned to the Department. Many successful hunters do not return tags. Includes all but PLM hunts.)

87-98. THEY WEREN'T ALL MAD. Congratulations to you successful hunters. Good work.