SANTA ANA MOUNTAINS DEER HERD

MANAGEMENT PLAN

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California Department of Fish and Game

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I. INTRODUCTION

Deer herds throughout most of California exhibited serious long-term declines during the late 1960s and early 1970s (Longhurst et al. 1976). The Department of Fish and Game (DFG) has initiated a herd planning program to address this problem. A statewide plan for California deer was developed in 1976 (Department of Fish and Game 1976). In writing the plan, the DFG solicited ideas from a broad base; from wildlife biologists, fisheries biologists, wardens and other interested parties throughout the State. The difficulty of developing a plan for a dynamic resource was compounded by the geographical diversity of the disciplines represented with each contributor looking at "deer management" in a different way. There was unanimous approval with the Department's recommendation to manage deer on a herd basis. Emphasis was added to the program by legislative mandate (AB-1521, Sept. 1977). A new deer management policy was subsequently adopted by the DFG and the California Fish and Game Commission specifying that: 1) planning for deer be on a herd basis; 2) selected program elements be included in each herd plan; and 3) herd plan goals generally conform to the goals of the statewide plan.

Two general goals in the statevide plan form the basis for this plan. These are: 1) restore and maintain a healthy deer herd in the Santa Ana Mountains unit; and 2) provide for high quality and diversified use of this deer herd. This document is a tactical plan and is the preferred alternative for the Santa Ana Mountains deer herd (SAMDH). Specific program elements are included and it conforms with the statewide strategic plan.

This plan includes: 1) unit description and history; 2) management unit goals; 3) problems in management; 4) management programs, objectives and prescriptions; 5) alternatives; and 6) references and appendices.

This plan will be modified and expanded as additional information is obtained. Input from public agencies and individuals has been and will continue to be solicited.

The SAMDH implementation plan will be prepared following distribution of this management plan and receipt of public input.

II. DESCRIPTION OF THE DEER HERD MANAGEMENT UNIT

A. DEER HERD DEFINITION

1. Herd description and location.

Two subspecies of mule deer inhabit this deer herd unit (Longhurst et al. 1952) which includes all of Orange County and portions of Los Angeles, San Bernardino, Riverside and San Diego counties (Figure 1). The southern mule deer, Odocoileus hemionus fuliginatus, is the principal species inhabiting most of the unit, with the California mule deer, O. h. californicus inhabiting the northern portion of the unit, generally within the Los Angeles-San Bernardino and northern Orange County area.

Since these are resident (non-migratory) deer, they are treated as a single herd with designated sub-herds based upon administrative (land management) criteria. For the purpose of

Figure 1

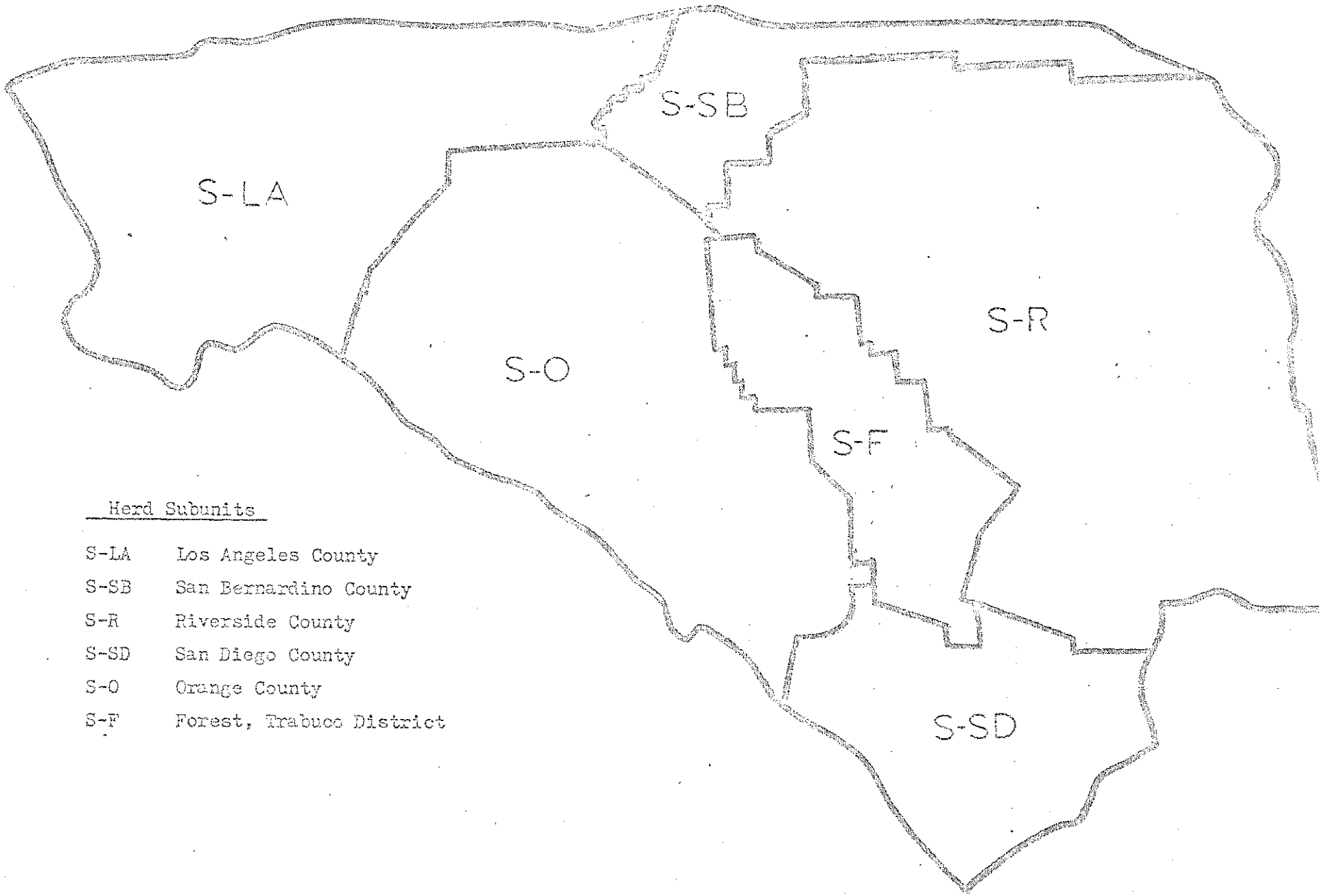
Location of the Santa Ana Mountains Deer Herd

this plan, the sub-units are described as: 1) National Forest lands (the Trabuco Ranger District) (S-F); 2) Los Angeles County (S-LA); San Bernardino County (S-SB); Riverside County private lands (S-R); San Diego County private lands (S-SD); Camp Pendleton (S-P) and Orange County private lands (S-O) (Figure 2). These designations are important in that land management objectives and potentials for resource enhancement and utilization are limited by various constraints within the sub-units.

The deer herd is located in the south coastal region of California described as Hunt Zone D-15 which includes those portions of Los Angeles, San Bernardino, Riverside, San Diego and Orange counties within a line beginning at the Pacific Ocean and Interstate 10 in Santa Monica; east on Interstate 10 to Highway 79 at Beaumont; south on Highway 79 to Hemet; south on County Road R-3 through Sage to Highway 79; west on Highway 79 to Interstate 15; south on Interstate 15 to Highway 76; west on Highway 76 to the Pacific Ocean; north along the shoreline to the point of beginning (Figure 3).

Background data for this plan were obtained primarily from the Orange County private lands (S-O), the Trabuco Ranger District of the Cleveland National Forest (S-F), and the Camp Pendleton (S-P) sub-units. Harvest records and other information used in this plan are maintained by hunt zone or county, thus

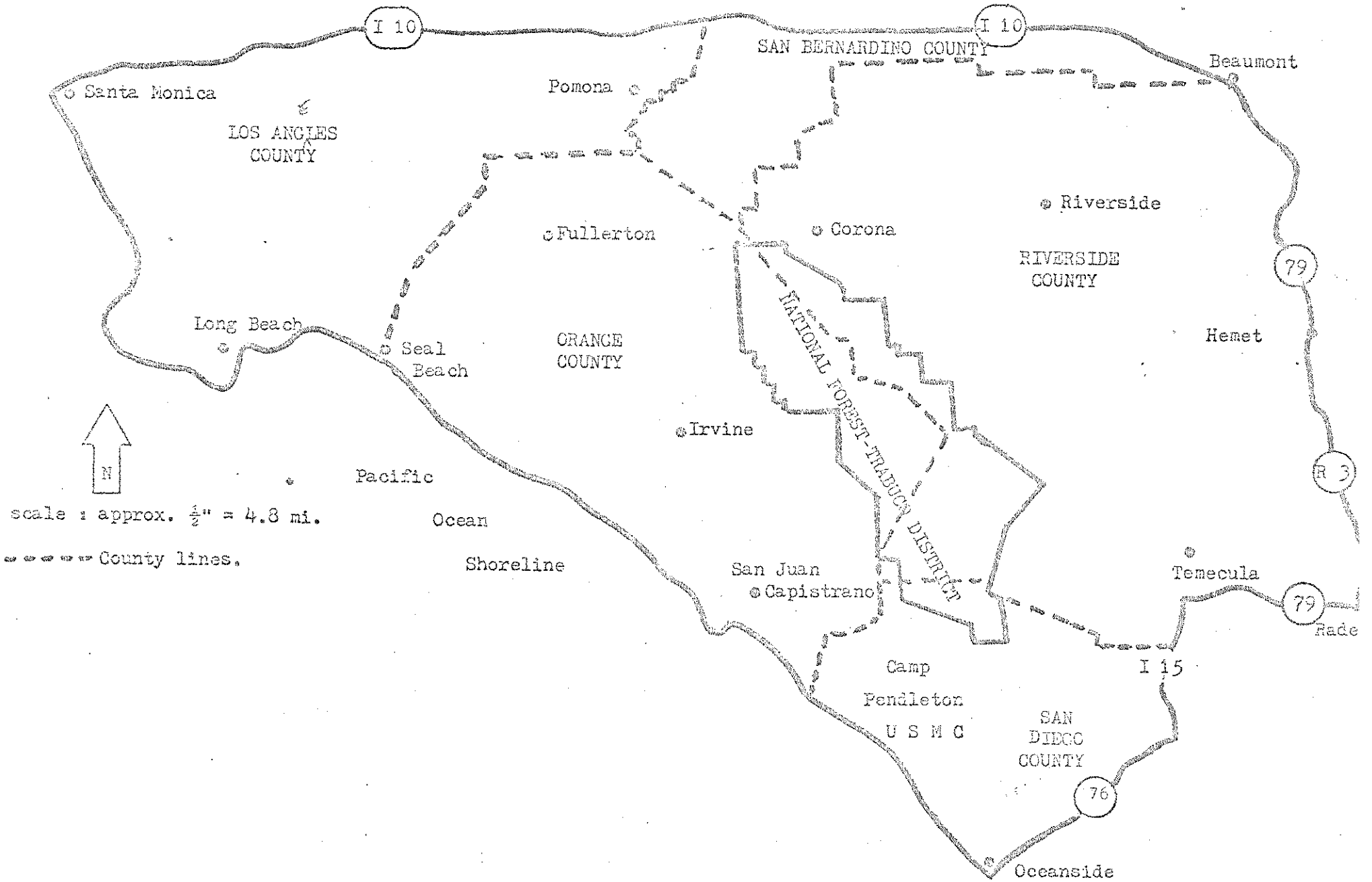
Figure 2. SANTA ANA MOUNTAINS DEER HERD ZONE D-15



Herd Subunits

S-LA	Los Angeles County
S-SB	San Bernardino County
S-R	Riverside County
S-SD	San Diego County
S-O	Orange County
S-F	Forest, Trabuco District

Figure 3. SANTA ANA MOUNTAINS DEER HERD ZONE D-15



records from the above sub-units are within the boundaries of the SAMDH. Unless specifically indicated otherwise, records for San Diego and Riverside counties refer to information from the entire county, thus they contain data from areas outside of the SAMDH boundaries.

2. Population Estimates.

Initial estimates of deer numbers in the Santa Ana Mountains were made by Longhurst et al. (1952) for the period of 1947-49. They estimated that approximately 6,000 deer inhabited the area, with an average density of 8 deer per square mile of habitat. Longhurst also described the herd range as containing 7,800 square miles of habitat, with about 240 square miles closed to hunting. The 1947 deer harvest of 225 bucks represented 0.42 deer harvested per square mile of huntable habitat. The herd range is currently estimated to consist of about 500 square miles of habitat.

It appears that deer numbers and densities reached peak levels in California in 1954-1956 and generally declined to lowest levels in the early 1970s. The SAMDH appeared to remain at higher population levels through the late 1960s and then declined in the late 1970s (Hein pers. obser.) (Appendix I).

No recent estimates of population size or density for the entire SAMDH are available.

Deer numbers and densities within this unit probably vary widely with location and habitat type. Open, mixed habitat areas (Irvine, O'Neill, and Starr Ranches) of the S-O sub-unit are believed to have higher deer concentrations than exist in other parts of the unit, including the Forest sub-unit (S-F), where dense chaparral predominates. The density of deer in the SAMDH may also be affected by cattle grazing. J. Froke (pers. comm.) reports that deer density on the ungrazed Audubon Starr Ranch is about 19 per section, whereas the deer density in the grazed San Joaquin Hills is reported to be 6 per section (M. Benner pers. comm.). Other researchers have documented the negative impacts of cattle grazing on deer habitats (Longhurst et al. 1952; Pine and Mansfield 1980; and Bowyer and Bleich 1984).

Reduced or extirpated populations in many areas of this unit are the direct result of habitat losses. This is particularly true of the Los Angeles sub-unit (S-LA) and San Bernardino sub-unit (S-SB) where urban-industrial land uses have virtually eliminated the deer population (Figure 4).

3. Herd Condition.

The southern mule deer is one of the smallest in body size of the various mule deer subspecies. The southern mule deer inhabiting this unit appear to be in a healthy condition (DFG S-F field observations). There have not been any recent field

SANTA ANA MOUNTAINS DEER HERD

DEER HERD UNIT : Includes Orange County and portions of Los Angeles, San Bernardino, Riverside and San Diego Counties.

Total destruction of deer habitat throughout most of the unit has occurred due to continued expansion of the urban - industrial - commercial land uses, illustrated above by the Interstate Freeways and major highways.

Approximate land area : 1,980,000 acres (3,093 sq. mi.)

Estimated deer range 1985 : 320,000 acres (500 sq. mi.)

Figure 4

studies of this herd, but spot checks in the S-F of harvested animals revealed that external parasites such as ticks and fleas are common, yet no evidence of disease has been observed.

Field observations on the Starr Ranch (J. Froke pers. comm.) indicate that production of twin fawns is common, suggesting that the herd in that sub-unit (S-O) is in good condition and that the range is providing nutritional forage.

Observations on the Starr Ranch following the 28,200 acre Indian Fire (S-F) in November 1980 indicate that twin fawn production was reduced in that area. Poorer range conditions immediately after the fire and a lack of nutritional forage for does impregnated during the previous rut were believed responsible.

In S-P, embryo counts were obtained from 43 adult does and 9 yearling does during the winter of 1955-56. Forty (93%) of the adult does were pregnant with a ratio of 151 fawns per 100 does. Five (55%) of the yearling does were pregnant with an embryo count of 56 fawns per 100 does (DFG 1956). The deer habitat on Camp Pendleton was at that time in a very productive state, so these reproductive data probably represent the maximum reproductive potential for the SAMDH.

4. Buck Harvest.

Buck harvest records have been collected since 1927, when 56 bucks were reported taken in Orange County. Annual seasons have continued to date, except in 1942 during World War II. Reported annual harvests of 36 to 56 bucks were common in the 1930s.

The highest reported annual buck kill occurred in 1959 when 279 were taken. A second high harvest year occurred in 1960 when 278 bucks were reported taken. These large harvests resulted primarily from increased hunter access after the 1958 Stewart Burn reduced the fire closure area on the Trabuco Ranger District. The reported buck harvest in Orange County exceeded 200 in 1955, 1961, 1968 and 1976.

The harvest from this area dropped drastically after the 1976 season. The mean reported buck kill in Orange County during the 57 years of records (1927-1984) is 123 (Appendix I).

From 1960 to 1984, over 59% of the total Orange County buck harvest has occurred on private lands (Table 1). Thus, the amount of hunter access allowed by the private ranches strongly influences total hunter success in Orange County. For example, the drop in harvest in recent years can be partially explained by the fact that the Irvine Ranch didn't allow hunting from 1982-1984.

Table 1

Orange County Buck Kill, 1960-1984

Year	Private Lands	Public Lands	Total
1960	155	123	278
1961	117	117	234
1962	92	48	140
1963	70	105	175
1964	67	57	124
1965	68	70	138
1966	97	94	191
1967	116	42	158
1968	138	73	211
1969	85	59	144
1970	118	40	158
1971	82	83	165
1972	42	45	87
1973	98	26	124
1974	79	92	171
1975	99	38	137
1976	109	95	204
1977	64	25	89
1978	57	23	80
1979	74	21	95
1980	69	13	82
1981	59	37	96
1982	38	37	75
1983	21	22	43
1984	27	16	43
Total	2,041 (59.3%)	1,401 (40.7%)	3,442

Because of reduced manpower capabilities and expanded hunter ingress and egress on public lands, hunter check stations have produced little age class data on the annual buck harvest. Check stations within this unit have not been operated since 1965. The limited information available suggests that, for the years data were collected, the harvest of bucks was not excessive because a large proportion were older age animals (Table 2).

5. Antlerless Harvest

Statewide antlerless harvests began in 1956, when 93 antlerless deer were taken in Orange County. Antlerless deer are defined as "female deer, fawns of either sex other than spotted fawns, and male deer with unbranched antlers on both sides which are not more than three inches in length."

The Orange County antlerless hunt was renewed in 1960 when 500 permits were issued and 156 antlerless deer were taken. Prior to the antlerless hunt in Orange County, deer depredation (damages) on crops was a serious problem. In 1957, for example, 170 deer were taken under the authority of depredation kill permits to reduce crop losses.

Portions of Riverside and San Diego counties were included with the Orange County special hunt in 1963, and the continued

Table 2
Age Composition of the buck harvest
from the Santa Ana Mountains.
Numbers in parentheses are percentages.

Year	Age Class 1	2	3	4+	Total Sample
1961[a]	3(6)	4(9)	17(37)	22(48)	46
1962[a]	0	11(39)	8(29)	9(32)	28
1963[a]	7(25)	2(7.1)	7(25)	12(43)	28
1964[a]	10(42)	3(12)	5(21)	6(25)	24
1965[a]	17(24)	14(20)	19(27)	21(30)	71
1977[b]	4[c](10)	16(40	13(32)	7(17)	40
1978b	2[c](7)	6(21)	9(32)	11(39)	28

a. Age data estimated from tooth wear and replacement

b. Age data from tooth cementum analysis

c. Includes spike bucks shot during the antlerless hunt

hunt was designated the Tenaja Hunt (Table 3). This annual hunt continued through 1983, after which the Riverside County portion was withdrawn.

Harvest records for the Orange County area show that 1,387 antlerless deer were taken during the 25-year period. As was the case for the buck hunt, 59% of the kill occurred on private lands in the County (Table 4).

Age composition data on the annual harvest of both sexes in S-P include a good representation of older animals, particularly among antlerless deer (Table 5).

6. Herd Composition

Deer herd composition counts have not been made in any area except Camp Pendleton since the 1960s, consequently the sex and age composition of this herd are unknown. In April and May of 1963, six days (12 man-days) of field work in the Stewart Burn area of the Trabuco District (S-F) resulted in the classification of 48 deer, yielding ratios of 35 bucks and 50 fawns per 100 does (35:100:50).

On September 8 and 12, 1966, 274 and 105 deer, respectively, were spot-lighted on the O'Neill Ranch (sub-unit S-O) yielding ratios of 18:100:38 and 26:100:47.

Table 3
Tenaja Hunt

Year	Permits	Total	Orange Co.	Riverside Co.	San Diego Co.
1960	500	156	156	No hunt	No hunt
1961	500	120	120	"	"
1962	500	88	88	"	"
1963	500		89		
1964	500		43		
1965	500		43		
1966	500		71		
1967	500	141	101	35	5
1968	300	124	91	28	5
1969	500	133	91	34	8
1970	200	59	43	12	4
1971	200	55	32	11	12
1972	300	67	32	25	10
1973	300	68	35	20	13
1974	250	55	33	16	6
1975	250	77	46	26	5
1976	350	64	36	22	6
1977	350	78	43	29	6
1978	350	61	31	19	11
1979	350	81	43	30	8
1980	350	61	41	15	5
1981	350	96	72	19	5
1982	350	70	37	31	2
1983	350	34	19	13	2
1984	250	42	42	No hunt	0

Table 4
Tenaja Hunt - Orange County Only, 1960-1984

Year	Private Lands	Public Lands	Total
1960	89 (57)	67 (43)	156
1961	58 (48)	62 (52)	120
1962	57 (65)	31 (35)	88
1963	61 (69)	28 (31)	89
1964	20 (47)	23 (53)	43
1965	13 (30)	30 (70)	43
1966	36 (51)	35 (49)	71
1967	54 (53)	47 (47)	101
1968			(91)
1969	70 (77)	21 (23)	91
1970	27 (63)	16 (37)	43
1971	18 (56)	14 (44)	32
1972	20 (63)	12 (37)	32
1973	22 (63)	13 (37)	35
1974	23 (70)	10 (30)	33
1975	41 (89)	5 (11)	46
1976	28 (77)	8 (23)	36
1977	38 (88)	5 (12)	43
1978	26 (84)	5 (16)	31
1979	30 (70)	13 (30)	43
1980	16 (39)	25 (61)	41
1981	32 (44)	40 (58)	72
1982	17 (46)	20 (54)	37
1983	2 (11)	17 (89)	19
1984	18 (43)	24 (57)	42
	816 (59)	571 (41)	1387

Table 5
Age Class Structure of the Kill From the Camp Pendleton Subunit

Male Kill - Percentage by Age Class

Year	Fawn	1Yr.	2Yr.	3Yr.	4Yr. & Over	Sample Size
1969	6	20	29	20	24	162
1970	5	26	30	24	15	132
1971	4	25	35	23	13	167
1972	8	25	23	22	22	129
1973	13	22	28	19	18	103
1974	0	20	41	30	9	79
1975			-NO HUNT-			
1976			-NO HUNT-			
1977	4	12	34	34	16	276
1978	5	17	41	22	15	179
1979	1	19	29	33	18	160
1980	8	19	30	31	12	144
1981	4	25	31	28	13	109

Female Kill - Percentage of Age Class

Year	Fawn	1Yr.	2Yr.	3Yr.	4Yr. & Over	Sample Size
1969	15	17	15	21	32	89
1970	9	17	25	26	4	99
1971	2	25	31	11	31	88
1972	14	22	19	11	34	84
1973	25	21	34	7	13	56
1974			-NO HUNT-			
1975			-NO HUNT-			
1976			-NO HUNT-			
1977	22	21	22	30	16	82
1978	22	35	31	5	7	55
1979	1	21	30	27	20	84
1980	11	26	17	19	26	89
1981	5	16	14	24	41	100

Recent field observations on the Audubon Starr Ranch (sub-unit S-O) indicate a buck:doe ratio of 6:100 (J. Froke pers. comm.). This low buck ratio cannot be explained and is not believed to be typical of resident deer populations in chaparral habitat with little or no hunting pressure, and, furthermore, this estimate does not seem to be consistent with densities estimated to be 19 per section.

7. Herd Movements.

The deer in this unit are non-migratory. Some elevational movement occurs with severe weather conditions such as extreme temperatures or drought. Water availability significantly affects the distribution of deer in Southern California (Bowyer 1984). This factor undoubtably affects deer distribution and densities in this unit, particularly in S-F.

B. HERD RANGE AND HISTORY

1. Land Ownership

More than half of California's 100 million plus acres is private land, where major expansions of agriculture, urban and industrial growth have occurred (Appendix II). About 93% of the SAMDH range is in private ownership and most of this is urban (Figure 4). The 135,000 acre Trabuco Ranger District of the Cleveland National Forest is the largest block of

publicly-owned deer habitat in this deer herd unit. Over 39,000 acres of the Trabuco Ranger District were designated as the San Mateo Wilderness in 1985. Camp Pendleton (125,000 acres) is the second largest block of government-owned land, most of which is deer habitat, within the SAMDH boundaries. Other parcels of publicly-owned deer habitat include about 9,300 acres in State Parks (Chino Hills, Crystal Cove) and about 10,000 acres in Orange County wilderness parks (Casper's, Arroyo Trabuco, O'Neill, Wagon Wheel and Santiago Oaks).

Large holdings of privately-owned deer habitat include the Irvine Ranch (44,000 total acres, about 20,000 acres of deer habitat), the O'Neill Ranch (40,000 total acres, about 30,000 acres of deer habitat) and the Audubon Starr Ranch (4,500 total acres). These three parcels, all located in the western foothills of the Santa Ana Mountains, probably represent the best deer habitat in Orange County.

2. Climate

Conditions vary with seasons and elevations. Mild temperatures prevail, although a range of freezing to over 100 degrees occurs annually. Long summer droughts are common. The average annual rainfall is 16 inches. The higher elevations and interior coastal plain usually receive more rainfall than the coastal zone. Snow is common in the higher elevations but usually is of short duration.

3. Early History

The American Indians hunted deer in this area for hundreds of years. Their primitive weapons probably accounted for a small harvest of available deer. When the Spaniards arrived in California, they also took deer for meat and hides.

There are few historic references to deer in this area prior to 1850. In historic journals, Pedro Fages mentions deer in the area in 1769 (Priestly 1937) and Longinos Martinez in 1772 reported that deer occurred from San Diego to Santa Barbara (Simpson 1938). From these and other sources who reported deer in the south coastal portions of California (Sullivan 1934; Maloney 1945; Ellison 1937), it appears that deer were fairly numerous in the Santa Ana Mountain's Unit.

Deer hunting for food and hides increased during the Gold Rush, being so profitable that some miners left mining for commercial hunting. Accounts indicate that one hunter "killed 120 deer in one season for the Silverado Camp" (U.S. Forest Service (USFS) 1966) and C. Miller of the USFS stated that "deer were killed by the wagonload in the Santa Ana Mountains" (Longhurst et al. 1952).

Following the California Gold Rush, there was a huge increase in domestic livestock production in California, including the Santa Ana Unit. During the latter part of the 19th Century,

deer populations apparently declined. It is believed the decline was caused by extreme competition with livestock and unregulated hunting (Longhurst et al. 1952).

Deer populations apparently increased during the very late 19th Century through the first half of the 20th Century. A variety of reasons for these increases exist, and include: 1) fire, both wild and man-caused, burned many acres of chaparral; 2) the expansion of agriculture broke up large brush-covered areas; 3) hunting regulations were established; and 4) predators were hunted to protect livestock and wildlife. The deer populations flourished under these conditions, as evidenced by the reported harvests in the 1950s and 1960s.

Deer hunting regulations were established in 1850 and restricted hunting to six months; however, there was little evidence that the regulations had any effect. Commercial deer camps continued their operations as indicated by one firm in Redding that shipped 35,000 deer hides (DFG 1976).

The bucks-only hunting law was passed in 1883. A six-week season was initiated in 1893. A three buck limit and prohibition on the sale of deer meat and hides was imposed in 1901, but enforcement of the regulations was largely ineffective.

The first controlled either-sex deer hunt occurred on Catalina Island in 1949-50. Various controlled hunts continued in 1954-56, with a general either-sex hunt conducted in 1956-57.

4. Special Use Areas (Key Habitats)

There are special areas that deer require for various uses. These areas provide all the major elements that deer need to survive (food, cover and water). Riparian habitats provide all three of these necessities and are probably the preferred special use area for this herd. Oak woodland-grasslands are also special use areas since food and cover are usually abundant and the acorn crop, available in the autumn, is of high nutritional value. Deer use of meadows is higher if cattle are absent or in small numbers (Bowyer and Bleich 1984).

Burned brushlands are also preferred by deer as the rapidly growing grasses, forbs and new brush sprouts provide abundant and nutritious food. Other special use areas are characterized by large shrubs and trees which provide thermal and hiding cover, particularly on the northerly exposures.

The USFS (1966) indicated five key deer areas in the Santa Ana Mountains: the Sierra Peak to Trabuco Peak area of the main divide; the Los Pinos Potrero; the Oak Flats area; the Sitton Peak area; and the Tenaja area.

5. Dominant Plant Species

There are various plant species utilized by deer in this unit. Those preferred include browse species of Prunus spp., Cercocarpus spp., Quercus spp., Adenostema fasciculatum and Rhamnus californica). Forbs and grasses include Lotus spp., Penstemon spp., Lupinus spp., Bromus spp., Poa spp., and Stipa spp. (Hanley and Salwasser 1980).

Riparian areas and canyon woodlands made up primarily of coast live-oaks (Quercus agrifolia spp.), willows (Salix laevigata), sycamore (Platanus racemosa) and contiguous patches of blackberry (Rubus vitilolius), poison oak (Rhus diversilosa), and wild grape (Vitis girdiana) are important cover areas for fawning and escape from oppressive heat.

6. Fire History

Uncontrolled natural wildfires or those set by the Indians generally benefited deer in this unit by altering large areas of chaparral, thereby providing interspersions of brush, open areas and vegetative regrowth. Fire suppression programs generally have decreased the number of wildfires in chaparral during the latter part of this century, but their average size has been much larger (Minnich 1983).

The Stewart Burn in 1958 consumed 66,300 acres in southeastern Orange County and northern San Diego County, and opened areas

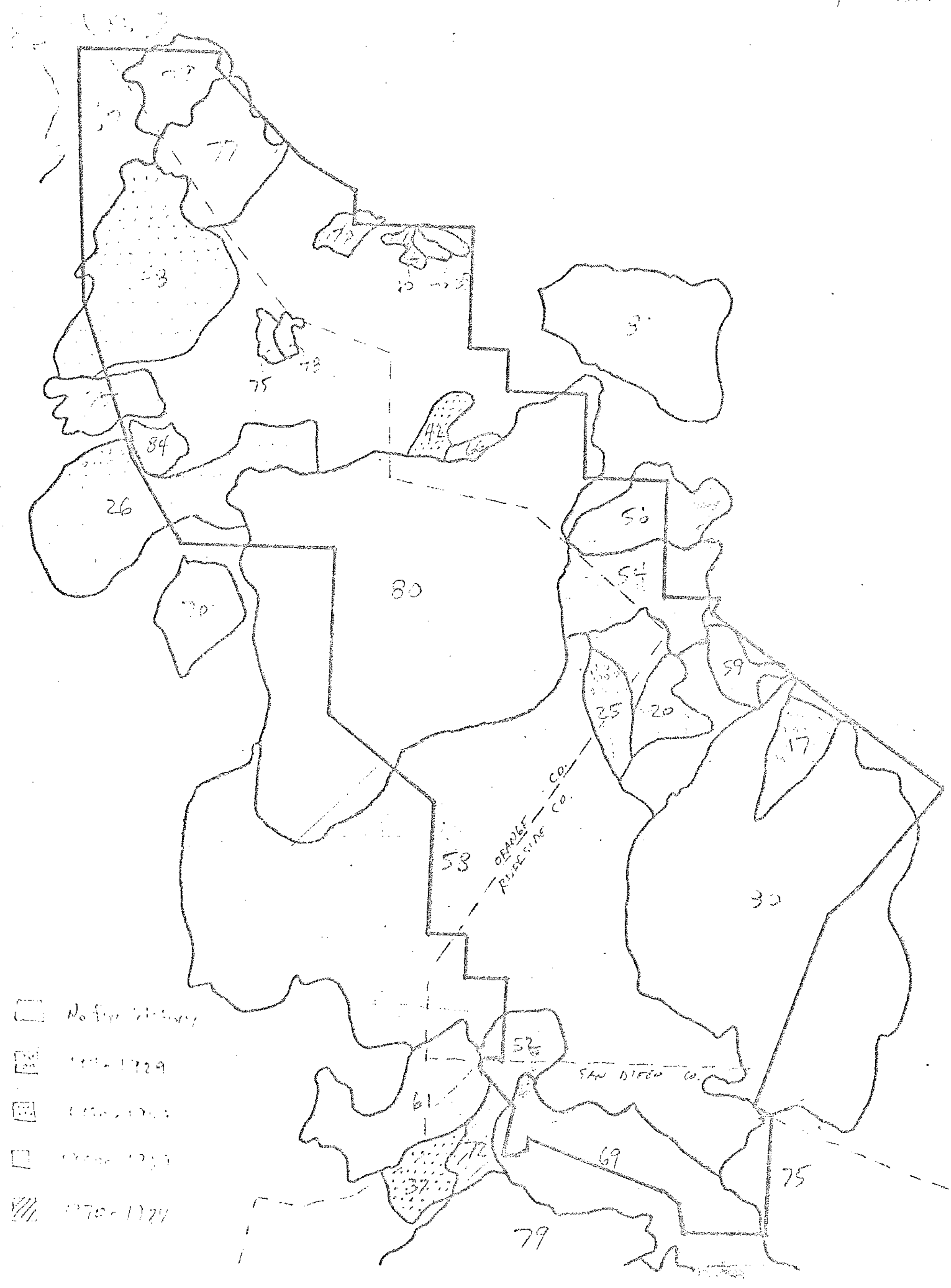
of the Trabuco Ranger District to season-long access by hunters. Prior to that time, and up until about 1975 most of the District was closed to access in early summer until after the first major rains. Beginning in 1981, fire closures could be enacted when fire danger exceeded established minimums based on live fuel moisture levels, continued high fire risk and depleted fire suppression forces.

The last major fires in the Santa Ana Mountains occurred in 1980 when three fires consumed some 62,000 acres. In 1982, the Gypsum fire burned 16,800 acres. Some areas in the Santa Ana Mountains have not burned in recorded history (Figure 5) (Appendix III).

7. Livestock Grazing

Organized livestock grazing began in the late 1700s after the San Juan Capistrano Mission was established in 1775. Up to 31,000 cattle, sheep, goats, horses and mules grazed the mission lands and a similar number of livestock utilized the five major ranchos (USFS 1966). In recent years, livestock production peaked shortly after World War II and has declined until only 251 cattle from Orange County were sold 1983.

Grazing allotments on the Trabuco Ranger District in 1982 totalled 11,623 acres, but only 620 animal unit months were allowed.



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42
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26
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ORANGE CO.
RIVERSIDE CO.
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SAN DIEGO CO.
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79

8. Habitat Conversion and Deer Loss

The spread of urban-industrial-commercial land developments have taken a tremendous toll on the deer and their habitat. These losses have been particularly dramatic in some of the sub-units such as the S-LA and S-SB where the great majority of the deer habitat has been removed. Habitat losses in the other sub-units have also been significant, where losses of 25 to 50% are estimated. The estimated deer habitat in Orange County was 318,020 acres in 1964 (DFG 1965) whereas about 160,000 acres of deer habitat exists today (1985).

These land developments have caused a drastic and direct reduction of the deer herd in this unit.

Land developments inside and adjacent to the National Forest lands also have had adverse impacts upon the deer and their range. Residential developments on private inholdings within the Forest tend to be in prime habitat areas, i.e. potreros, (meadows), oak woodlands and riparian areas. These developments eliminate habitat on those lands and secondarily reduce the value of habitat on the adjacent Forest lands.

Deer habitat on the private lands of Orange County (S-O) has long been subject to conversion for agricultural use (dry farming, grazing and orchards). Not only do these habitat

conversions result in a loss of deer habitat, they often cause a direct reduction in the number of deer when depredation complaints require that deer be removed. Orange County is a small portion of DFG Region 5, but in some years the take of deer under depredation permits in Orange County is a substantial part of the Region-wide total (Table 6). These conversions continue to occur throughout most of this unit. As urban development displaces existing agricultural uses, some of the agricultural acreage is replaced in the open-space habitat of the deer herd (Appendix IV).

The future of privately-owned deer habitat will depend heavily on county policies regarding open space. Orange County established an Open Space/Conservation Program in 1972 with the goals of preserving and productively managing natural resources, protecting the public from hazardous areas (floodplains) and providing areas for outdoor recreation (Orange County 1984). The county plan also seeks to provide a buffer from urban encroachment for the Trabuco Ranger District.

There is currently about 97,000 acres of open space in Orange County, and another 34,000 acres is proposed (Appendix V-1). This area includes the Trabuco Ranger District (55,000 acres)

Table 6
Deer Depredation

Year	State-wide	Region 5	Orange Co.	Riverside Co.	San Diego Co.
1960	1477	320	1	6	8
1961	2484	684	7	16	11
1962	1827	141	4	0	6
1963	1250	188	0	0	11
1964	2787	572	32	2	12
1965	1591	210	30	7	5
1966	1801	202	15	0	6
1967	841	81	11	0	2
1968	1410	194	41	0	9
1969	797	43	5	1	5
1970	936	84	1	0	4
1971	882	104	0	0	4
1972	936	94	21	1	1
1973	354	30	2	3	1
1974	354	93	27	27	2
1975	377	110	10	3	19
1976	462	107	8	1	0
1977	441	179	2	2	2
1978	165	52	0	0	0
1979	581	431	34	0	0
1980	493	395	42	0	0
1981	209	85	62	0	0
1982	172	65	0	0	0
1983	172	33	1	0	0
1984	262	135	2	0	0

but also includes beaches, city parks, golf courses, greenbelts and other areas that are not deer habitat. Furthermore, much of this acreage is in isolated parcels (Appendix V 2-3). Ultimately, deer habitat in Orange County will probably be confined to wilderness parks and the Trabuco Ranger District. Consumptive use of deer will be almost completely curtailed.

9. Habitat Manipulation Projects

Deer habitat improvement projects began on the Forest lands (S-F) in 1952 with the construction of 228 acres of browseways (USFS files). By 1966 a total of 290 acres of browseways had been constructed and 255 acres of type-conversion had been completed on the Trabuco District (USFS 1966). The only recent habitat projects designed specifically to benefit wildlife have been the Oak Flats and Sitton Peak prescribed burns, and the installation of three wildlife watering devices. Since 1979 the USFS has completed several projects on the Trabuco Ranger District (S-F) that, although designed for fuel modification, provided some improvement to deer habitat. About 3,000 acres were burned, 300 acres of fuel breaks were cleared, and about 1,200 acres of brush were thinned and pruned (J. Sheppard pers. comm.). A burn on Munhall Saddle, using Orange County Fish and Game Commission monies, is scheduled for 1985.

To date very little has been done directly to enhance deer habitat on private lands within this unit. Controlled burning

programs recently have been conducted. Most of these projects are conducted under the State's Chaparral Management Program and provide some benefit to deer by converting decadent stands of chaparral to younger age classes. The Orange County Fire Department has burned several thousand acres on Loma Ridge in sub-unit S-O. Additional burns are planned in the Blackstar-Baker Canyon area and on the O'Neill Ranch (Verdugo Canyon) during 1985. It is estimated that this burning program will affect approximately 1,800 acres per year for the next 10-15 years, with the primary goal being fire hazard reduction. These programs provide for the protection of the riparian vegetation and are planned to obtain a mosaic burn pattern.

C. MAJOR FACTORS REGULATING THE POPULATION

1. Human Influence

Loss of habitat caused by residential, commercial, industrial and recreational developments has substantially reduced deer populations on private lands. The construction of more roads and freeways has destroyed habitat and added additional constraints to deer movements to food and water sources on both private and public land (Figure 4) (Appendix VI).

Orange County was once a rural agricultural area. Major crops in the early 1900s included oranges, walnuts, apricots, peaches, beans, apples, and sugar beets. In the 1930s, production shifted from walnuts, apricots and sugar beets to

citrus, truck crops and nursery stock. Cattle production also increased. Over the last 20 years, however, the amount of land in agricultural production has been reduced by two-thirds. In 1982, 34,000 acres were in crop production (Figure 6) and approximately 29,000 were used for grazing. Today 63,000 acres of land (Figure 7) are in agricultural preserve (Williamson Act). Much of this open space is grazing land. However, since 1980, 13,000 acres have been removed from agricultural preserve for development.

Metropolitan expansions into the undeveloped areas not only destroy deer habitat as the initial impact but sustain a long-term adverse impact when those resident people, their pets and their motorized vehicles penetrate the adjacent open space lands, degrading the habitat and disturbing the deer. Off-road vehicle (ORV) activity has increased substantially in the last 20 years, often with deleterious effects upon wildlife. It is not known what degree of ORV conflict may exist with this herd. Over the past 20 years, Orange County's growth has shifted to the south. In the 1950s and 1960s development was concentrated in Anaheim, Fullerton, Orange, Westminster and Fountain Valley. In the 1970s, with the scarcity of undeveloped land in these areas, development shifted to Irvine, Mission Viejo and Laguna Niguel. This trend will continue. The south county's population is expected to grow by 93% (422,000), and this growth will impact much of the County's remaining deer habitat (Appendix VII - 1 & 2).

Figure 6. Important Orange County Agricultural Lands. (Source: Orange County Resources Element)

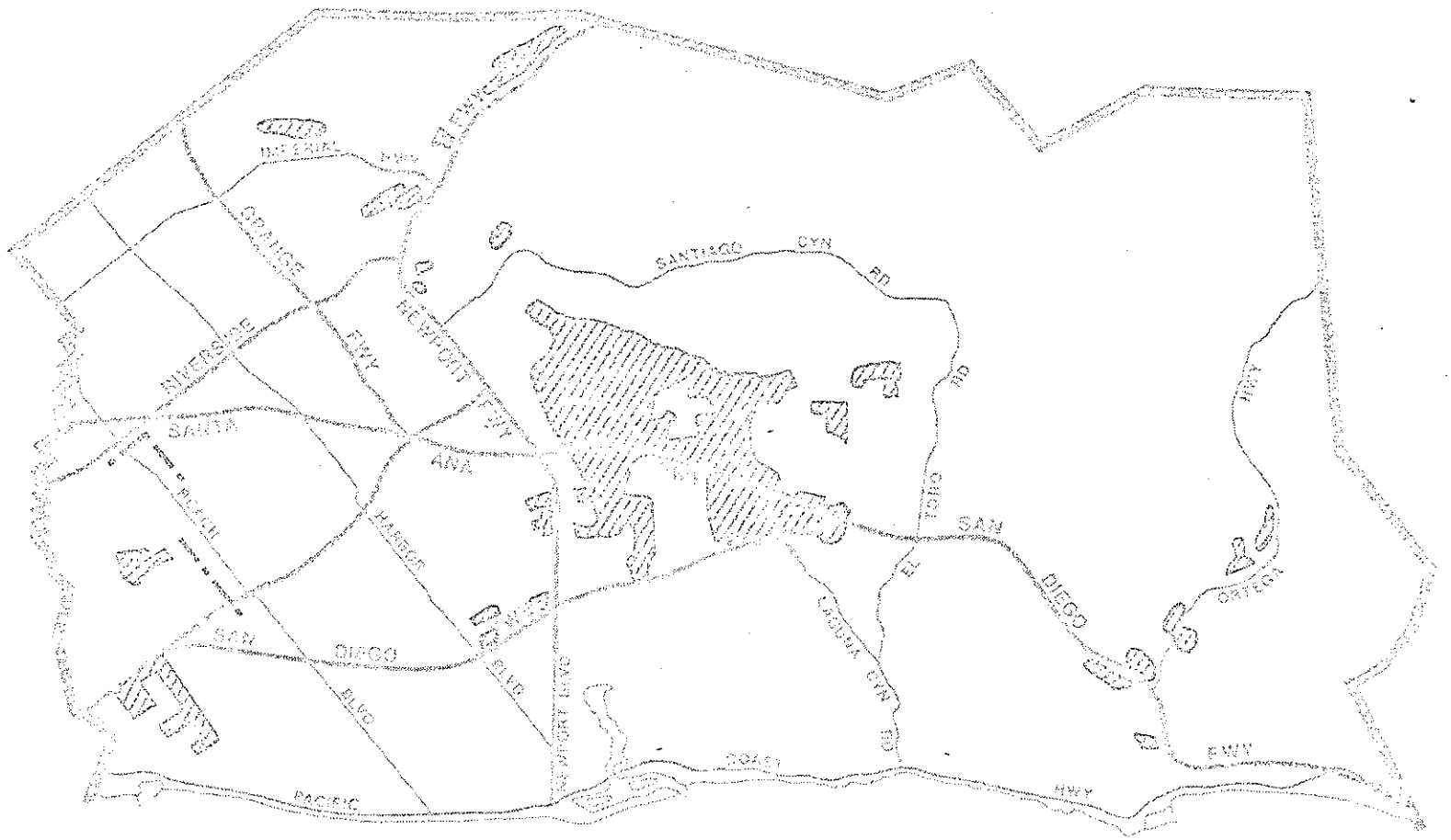
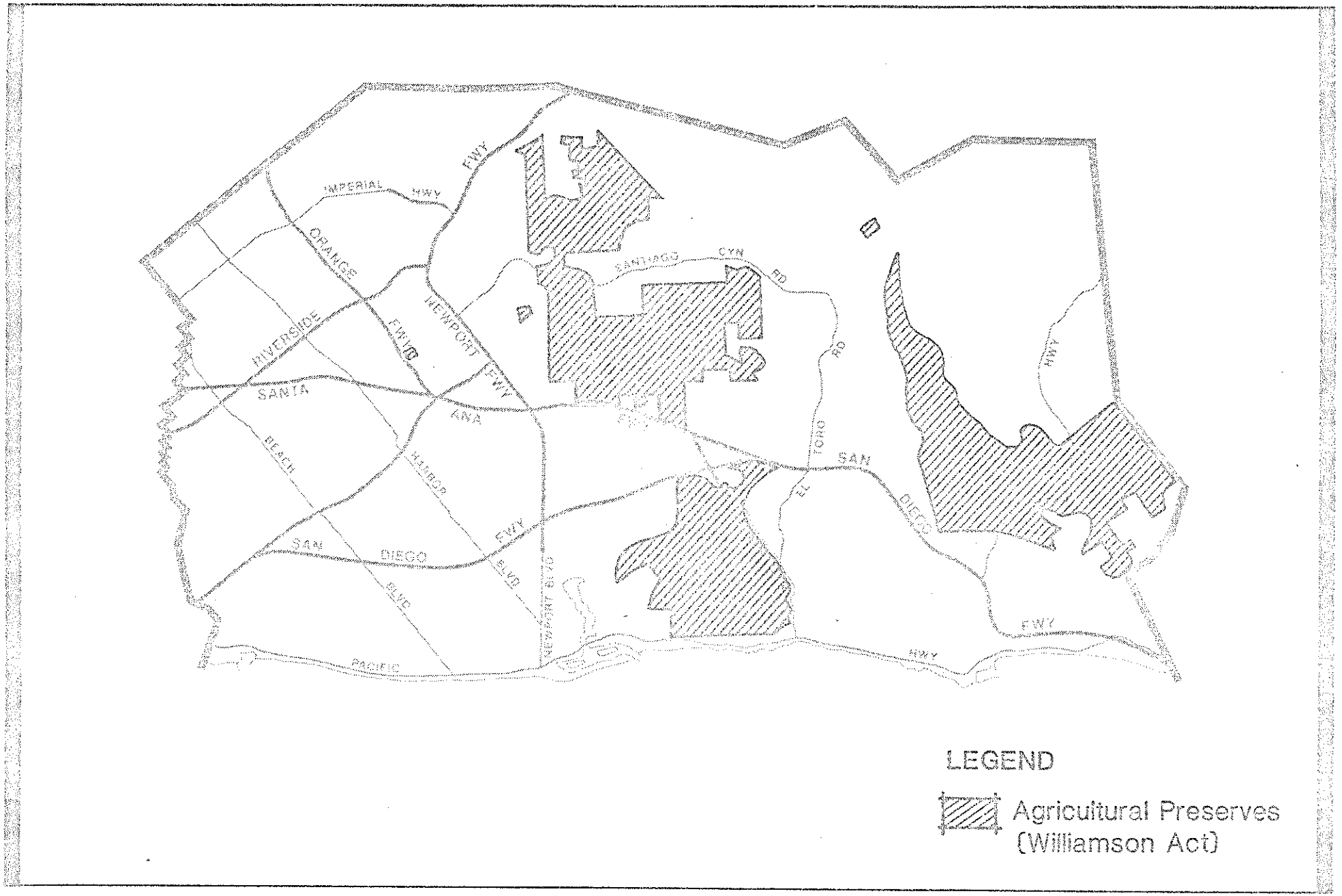


Figure 7. Orange County Agricultural Preserves. (Source: Orange County Resources Element)



however, judging by the relatively high number of daytime sightings on or near the Starr Ranch (J. Froke pers. comm.).

These measures of lion abundance appear to indicate that lion densities in Orange County are not extraordinarily high, and are probably not responsible for any changes in hunter success. No specific information is available, however, on the effects of predators on the SAMDH.

4. Illegal Take

While it is known that an illegal take of deer occurs in this unit, the amount of poaching and number of deer taken are unknown. Increased populations of people in the spreading urban areas, with more leisure time and mobility, may cause increased poaching in those remaining open areas. There has been speculation that the illegal take readily equals the legal reported harvest of deer in this unit.

5. Interspecific Competition

Cattle are the primary competitors with deer for forage resources. Bowyer and Bleich (1984) studied four meadows in the Laguna and Cuyamaca Mountains and seven meadows in the Cuyamaca State Park. They found that deer were abundant on cattle-free meadows, but very few used these areas when cattle were present. Pine and Mansfield (1980) found that cattle at

high stocking rates compete with deer for food in central coastal California. Dasmann (1971) states that cattle are important competitors with deer on heavily stocked ranges throughout the west. Bowyer (1984) also found that cattle grazing reduced cover negatively affecting fawning areas.

6. Sport Hunting

Within the SAMDH unit there is an early season archery hunt, a general buck hunt, the Tenaja antlerless hunt, and the Camp Pendleton either sex hunt. A minimum of 3,260 permits were available for the four hunts in 1985 (an unlimited number of Archery Only permits were available).

The harvest of bucks only is believed to result in a harvest of less than five percent of the herd, and yet the annual excess (animals that would die because they are in excess of the carrying capacity of the range) is believed to be about 25 percent of the population (DFG 1976). This estimate of natural annual mortality may not be correct for southern mule deer in chaparral habitats. Restricted access on private lands, where some of the highest deer densities in the SAMDH are found, and on the National Forest because of historic fire closures, has probably resulted in an underharvest of deer. However, because there are no estimates of the population size, the relationship between deer harvest and population size for the SAMDH is unknown.

7. Other Factors

The effects of disease, parasites, malnutrition, accidents and exposure on this deer herd are unknown; they are not thought to be a serious problem.

The effects of air pollution on forage production are unknown.

The effects of harassment on the deer herd by the large human population and low flying aircraft (military training) are unknown.

III. MANAGEMENT UNIT GOALS

The primary criteria used to develop goals for the SAMDH include the general goals of the statewide plan (A Plan for California Deer 1976), legislative mandate (AB 1521), Department of Fish and Game's Deer Management Policy and the concerns of various publics. A lack of specific information regarding existing herd conditions and habitat status prevents a detailed description of the conditions the plan is intended to achieve. However, sound ecological principles of deer management and currently accepted habitat improvement techniques offer an opportunity to enhance the carrying capacity of this herd unit. Social and economic constraints, as well as land use trade-offs, will ultimately determine the population level and habitat conditions prevailing at any point in time.

A. HERD GOALS

Productivity of the herd can be increased through management of both the deer and the habitat that supports them. This plan is intended to provide general guidelines that are ecologically feasible through the development of environmentally and socially acceptable management strategies. It is unrealistic to expect to attain the historic peak herd size which probably occurred in the 1950s. The management costs and land use trade-offs, as well as the destruction of habitat by deer at those levels, are not ecologically desirable and probably not socially acceptable (Hanley and Salwasser 1980).

Public concerns related to this herd primarily involve a desire to increase deer densities and improve hunter success but also include a concern for the general welfare of the deer resource by the non-hunting public. Historic estimates indicate the range was at one time capable of supporting 5-16 deer per square mile (Longhurst et al. 1952) with no specific deer habitat improvements. Harvest data from Camp Pendleton (S-P) (1953-1981) indicates that the herd can support a harvest of at least 1.12 deer per square mile on a productive range.

The herd goals for the SAMDH are:

1. Restore and maintain a population density of 5 to 15 deer per square mile of deer habitat.

2. Maintain a post-harvest buck:doe ratio of 25:100.

3. Maintain a spring fawn:doe ratio of 45:100.

4. Maintain an annual harvest of 1 deer per square mile of lands that are hunted.

B. RANGE GOALS

The achievement of range goals will ultimately determine whether deer density goals can be met. The primary range goal is the preservation of deer habitat, especially riparian, meadow and oak woodland types, particularly on the Forest sub-unit (S-F).

Large areas of deer range appear to be of low quality and may be supporting less than maximum deer densities. A second range goal is to improve the quality of the existing deer habitat. The Forest lands (S-F), Camp Pendleton (S-P), and portions of S-O contain areas suitable for habitat enhancement programs to increase the deer herd well into the future.

While some of the large private ranch holdings offer potential enhancement opportunities for deer, long term benefits would be unlikely because of other land use demands.

IV. PROBLEMS IN MANAGEMENT

1. Habitat losses caused by urban land use expansions, including highways.

2. Habitat losses caused by agricultural expansions into foothills.

3. Other Department programs, until now of a higher priority, have precluded most all deer work in this unit, which has resulted in a lack of baseline information from which to guide management strategies.

4. Recent deer data, including: 1) herd composition; 2) age class structure of harvest; 3) fawn production, survival and fawning areas; 4) illegal kill; 5) disease and parasite effects; 6) depredation problems and take; 7) effects of predators; 8) road kills; 9) impacts of domestic dogs, are not available.

5. Recent data on habitat quality are not available.

6. Habitat improvement projects are inadquately funded.

7. Establishment of the San Mateo Wilderness Area precludes wildlife habitat manipulation activities on land within the area. However, prescribed fire as provided for in USFS wilderness management policies may provide indirect habitat improvements for deer.

8. Habitat is degraded because of increased mobility of large urban populations into open space lands for recreation.

9. Habitat quality is reduced by more effective application of wildfire controls.

10. Habitat quality is degraded by off-road vehicles.

11. Habitat quality is degraded by livestock operations.

12. Human impacts identified as "harassment" are unknown.

V. MANAGEMENT PROGRAMS, OBJECTIVES AND RECOMMENDED PRESCRIPTIONS

A. INVENTORY AND INVESTIGATION

1. Objective

Collect and maintain sufficient information to evaluate the deer herd and habitat trends in order to effectively manage deer and their habitats in the SAMDH unit.

2. Recommended Prescription

The following ongoing herd performance indicators should be continued:

a) Conduct herd composition counts on the Camp Pendleton sub-unit.

1) Winter (post harvest)

2) Spring

b) Maintain deer spot kill maps.

c) Conduct hunter distribution and pressure counts.

The following herd performance indicators are recommended for additional monitorings:

a) Expand herd composition surveys to other areas within the unit where deer can be observed.

b) Collect age structure data for portions of unit other than Camp Pendleton. Mail out envelopes with deer tags for Zone D-15 for the collection of teeth to determine the age composition of the harvest.

c) Determine deer densities and trends in representative areas within the unit. Establish pellet transects and monitor annually.

d) Determine annual productivity.

The following habitat indicators are recommended for increased monitoring:

a) Inventory available forage within the unit. Browse studies should be initiated to determine utilization. Forage condition should be evaluated every two years on the Trabuco Ranger District, private lands and Camp Pendleton to determine if a correlation exists between forage and herd condition. The results will be used to guide habitat modification and deer harvest programs.

b) Survey annual oak mast yields for coast live oaks and scrub oaks to determine acorn production. These data could be used to determine if a correlation between acorn production and herd reproduction and used as a guide for oak management programs.

c) Inventories should be made of potential habitat improvement sites within the deer management unit.

d) Special habitat evaluations should be made in meadows, oak woodlands and riparian areas to determine and correlate deer, cattle and human interactions.

e) Determine the significance of deer/cattle competition.

The following are research needs within the deer management unit:

a) Identify critical habitat areas within the unit, particularly on the Trabuco District. Telemetry could be used to evaluate habitat preferences and identify fawning areas. The characteristics of those sites should be documented.

b) A study should be undertaken to determine the reproductive status of does on Camp Pendleton and, if possible, other locations within the unit.

c) One or more areas of the unit should be selected for an intensive study of the illegal kill and its effects on the SAMDH.

d) The influence of predators, disease and parasites on deer should be determined.

e) All permanent water sources on the Trabuco District should be identified, protected, and improved where necessary.

The following monitoring of public attitudes and concerns is recommended. A questionnaire should be provided to hunters contacted in the field on the opening weekend of the deer season. Input will help guide future planning efforts and provide feedback on public attitudes related to management programs. A sample questionnaire is presented in Appendix IX.

B. HERD MANAGEMENT AND MORTALITY CONTROL

1. Objective

Identify the causes of herd mortality and determine their effects on the population. Based on an evaluation of mortality factors, make recommendations to reduce mortality if it is deemed desirable for the herd.

2. Recommended Prescriptions

a) Evaluate mortality factors affecting the herd, i.e., predation, disease, parasites, hunting pressure, depredation, road kills and poaching.

1) Examine hunter-killed carcasses or institute trapping program to ascertain the condition of deer within the unit.

2) Conduct a telemetry study to determine causes of mortality. A large sample should be used, including bucks, does, and fawns. This study will also provide information on seasonal movements and critical habitats.

b) When fawning areas and their characteristics are identified, improve habitat on other similar areas in order to improve fawn survival.

c) Reduce deer mortality on highways by cooperative efforts with CalTrans.

d) Based on information obtained by investigation of illegal kill, work with wardens and other law enforcement agencies to decrease this mortality factor.

e) Increase or decrease the special hunt permits when monitoring programs indicate deer are either under-harvested or over-harvested.

C. HABITAT

1. Objective

Maintain optimum habitat conditions by providing nutritious forage, adequate cover and water. Habitat conditions should be able to support 5-15 deer per square mile on Camp Pendleton and on the Trabuco Ranger District. Efforts also should be made to optimize habitat on private lands where access and utilization are not restricted.

Based upon the evaluation of habitat discussed in Section A, make recommendations to maintain existing conditions or initiate necessary habitat enhancement measures.

2. Recommended Prescriptions

Manage chamise chaparral and other vegetation types to obtain 40-50% forage areas and 50-60% cover areas. The following are the optimum forage conditions:

a) 15-20% young brush (<4 years old) in long, narrow (<200 yards wide) patches. Create by prescribed burning on selected sites.

b) 15-20% annual grasses and forbs.

c) 5-10% oak/oak woodland.

d) 5-10% perennial grasses, forbs, meadow and riparian areas.

e) Permanent water available within 0.5 mile radius.

The following are optimum cover conditions:

a) 20% hiding and escape cover (>4 year old brush) in 30-50 acre patches.

b) 10% fawning cover in roughly 10-acre units with succulent forage and available water within 0.1 mile.

c) 10% thermal cover with dense canopy coverage in open stands for shade in summer. Large shrubs provide more of this type cover and north slope vegetation may provide this thermal cover with prescribed strip burning.

d) 10-20% other, may be devoted to deer hunting habitat with an increasing amount of succulent forage and plant species diversity.

Fire (prescribed burning) is the primary management tool in the chamise chaparral and sage scrub habitat found within the unit.

While the above prescription may provide the optimum habitat conditions for deer, it should be noted that economic constraints, limited manpower and multiple use factors will limit implementation to small areas on the Trabuco Ranger

District, private lands and Camp Pendleton. At the present time, burning programs are underway on the Forest and private lands. These programs are primarily for fuel modification.

Several burning areas should be selected within the Forest where management direction is to maintain high vegetative diversity with optimum forage and cover conditions. If successful, they could be used as models for other areas within the unit. Specific areas will be identified in the Implementation Plan.

Unit personnel should work with county and city planning departments to minimize or mitigate the impacts of proposed developments on deer habitat within the unit.

D. UTILIZATION

1. Objective

Provide high quality diversified use of deer in the Santa Ana Mountains unit. Recreational opportunities for both the general and hunting public should be optimized. Consumptive use should be emphasized on the Trabuco Ranger District, Camp Pendleton and on private holdings. Nonconsumptive use will occur primarily in suburbs and areas closed to hunting (State and County parks) and some private lands.

2. Recommended Prescription

Our best estimate (Longhurst et al. 1952) of the capability of the range indicates that an average deer density of 10 per square mile (range 5-16) is realistic. This will be verified through further investigation.

Historic harvest data from Camp Pendleton indicates that the deer herd has the ability to sustain an annual kill greater than one deer per square mile (1.12) while the population remains fairly stable as evidenced by age class data (Table 6). This amounts to a harvest of approximately 10% of the population annually. It is, therefore, reasonable to assume that a light to moderate harvest (10-20% of the population on lands open to hunting), including all sexes and all age classes of deer, is compatible with long-term herd maintenance. Early season archery, regular season buck hunting, antlerless and either sex hunts should be continued to achieve this type of harvest and provide additional recreational oportunities. This strategy also has the advantage of furnishing important biological information on the herd, which can be used to further refine herd management programs. Basic support for this conclusion is provided by a number of investigators (Longhurst et al. 1952; Longhurst et al. 1976; McCullough 1979; Bowyer 1981).

As habitat enhancement projects result in higher herd productivity, harvest strategies will be evaluated. Hunting regulations should be modified to provide additional recreation and harvest opportunities.

The portion of the non-hunting public that enjoy watching and photographing deer should have this opportunity. County and State parks and certain private holdings within the unit have high populations of deer which meet this need.

In order to increase the recreational opportunity for hunters and non-hunters, the following measures are recommended:

a. Work with the Cleveland National Forest to attain compatible access (hiking, horseback, etc.) through private lands to isolated public lands for the hunting public during deer season.

b. Work with private land owners through the Department's Private Land Hunting Program to increase hunting oppportunities within the unit.

E. LAW ENFORCEMENT

1. Objective

Minimize the illegal take of deer in the Santa Ana Mountains Deer Herd unit. While there is speculation that the illegal

kill of deer may exceed the legal kill, no one knows the number that are killed illegally each year. It is probable that poaching increases when unemployment and meat prices are high.

The Department's wardens, besides enforcing the hunting and fishing regulations, are required to enforce other regulations mandated by law. They enforce laws dealing with exotic species, water pollution and streambed alteration. They are required to pick up and transport injured wildlife, investigate depredation complaints and issue permits. The terrain they are expected to cover is large in size and sometimes difficult in terms of accessibility.

Wardens in the unit generally are in agreement that deer poaching is a serious problem. There is close liason with other law enforcement agencies, but few violators are ever apprehended.

2. Recommended Prescriptions

a) Increase the amount of patrol effort in suspected deer poaching areas. This could be done either by increasing the number of patrol personnel, or by reducing the number of other required activites to allow more patrol time. Night patrol, utilizing the Department's airplane, may also be effective.

b) Make the public more aware of the "secret witness" (CalTip) program, including the toll free telephone number (800-952-5400) to encourage prompt reporting of illegal take.

F. COMMUNICATION OF INFORMATION

1. Objective

Provide information on management of the SAMDH to all interested publics.

2. Recommended Prescriptions

a) Provide a deer herd management plan summary to interested publics.

b) Prepare periodic news releases regarding the herd, its habitat and management programs.

c) Provide private landowners with information related to deer and habitat management whenever possible. Prepare a concise description of habitat conditions and suggested techniques for creating and maintaining them (photos and examples).

d) Meet with local clubs, groups, governmental agencies and others to discuss deer management programs and create a greater awareness of deer management including the basis for antlerless harvest. Develop and utilize a structured slide presentation.

G. REVIEW AND UPDATE

1. Objective

Review the deer herd plan annually and update and improve the plan as additional information is obtained.

2. Recommended Prescriptions

a) Prepare an annual herd plan supplement containing additional information (herd composition counts, deer take, habitat improvement, pellet group transect information, etc.).

b) Initiate a deer plan review committee of personnel representing the Cleveland National Forest, Camp Pendleton and the DFG. This group would meet annually to discuss the plan progress and report progress to the respective groups pertaining to habitat improvement, herd composition counts, deer take, etc., and report on programs for the ensuing year pertaining to deer management.

The group would also plan programs on public lands for the ensuing year(s) concerning deer management in which specific goals would be developed including hunting seasons, hunter access to public lands, prescribed burning, wildlife water development, etc.

VI. ALTERNATIVES

The following alternatives were considered and rejected:

A. MANAGEMENT OF DEER AS IT PRESENTLY EXISTS.

This alternative would continue the current low levels of management activities. No investigative programs would be implemented and no new habitat improvement projects would be done. The deer population level would fluctuate with habitat changes, due to range losses, weather, and wildfires. Harvest levels would likely remain low. No additional efforts to reduce mortalities by predation, disease or illegal losses would be made.

This alternative was not selected because:

1. It does not comply with Legislative Mandate (AB 1521).
2. It does not comply with the Department of Fish and Game's deer policy.
3. It does not comply with the public's demands to manage and perpetuate deer populations.
4. It does not implement improvement opportunities that exist.
5. It would not provide for any current biological information on the herd.

B. MANAGE FOR MAXIMUM HABITAT PRODUCTIVITY AND SUSTAINED YIELD

This alternative would make deer and their habitat the primary management objective at the expense of other wildlife species and land uses. Species that compete with or prey upon deer would be reduced or eliminated from all of the deer range in the unit.

Biologists and wardens would concentrate their efforts in favor of the deer resource, at the expense of other management and enforcement programs. Maximum sustained yield of deer would require intensive harvests of all age and sex classes, including fawns.

This alternative was not selected because:

1. It conflicts with the multiple use policies of the USFS.
2. The resources are not available for an extensive single-species habitat management program.
3. The effects of such a program would be detrimental to other wildlife.
4. Sportsmen are unlikely to support such a narrow program and would probably be unwilling to harvest large numbers of antlerless deer and fawns.
5. Private landowners would be unlikely to support such a program on their lands because of land use conflicts and increased deer depredations.

C. NO HABITAT IMPROVEMENT AND NO HERD MANAGEMENT

This alternative would reduce the already low level of effort to manage this herd. No new management programs to improve the deer herd would be implemented. Deer hunting zones and quotas would be eliminated. No special hunts would be conducted. No additional efforts to reduce deer mortality from predation, disease or illegal

losses would be made. Deer numbers and harvest levels would likely decline further.

This alternative was not selected because:

1. It does not comply with Legislative Mandate (AB 1521).
2. It does not comply with the Department of Fish and Game's deer policy.
3. It does not comply with the public's demands to perpetuate deer populations.
4. It does not implement improvement opportunities that exist.
5. It would not provide any biological information on the species.

D. MAINTENANCE OF MAXIMUM DEER DENSITY

This alternative would make deer and their habitat the primary management objective at the expense of other wildlife species and land use. Species that compete with or prey upon deer would be reduced or eliminated from all of the deer range in the unit. Department of Fish and Game efforts would be concentrated on deer programs at the expense of other wildlife species. Consumptive use would not necessarily increase.

This alternative was not selected because:

1. It conflicts with the multiple use policies of the USFS.
2. The effects of such a program would be detrimental to other wildlife species.

3. Sportsmen are unlikely to support such a single purpose program.
4. Private landowners are unlikely to support such a program because of land use conflicts and increased deer depredation problems.
5. Such a program probably is not in the best interest of the herd.

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APPENDIX I

REPORTED BUCK KILL, TAG SALES AND HUNTER SUCCESS, 1927-84.

Year	Statewide	No. Tags	% Success	Orange Co.	Riverside Co.	San Diego Co.
1927	19,507	110,760	18.0	56	323	169
1928	21,515	105,638	20.4	69	249	232
1929	21,222	115,472	18.4	81	404	233
1930	24,132	123,999	19.0	90	629	250
1931	25,805	129,005	20.0	114	663	334
1932	18,380	96,702	19.8	87	488	263
1933	17,686	95,776	18.1	36	354	173
1934	20,805	108,913	19.0	55	307	259
1935	32,955	110,808	20.0	40	351	237
1936	25,008	126,855	19.0	54	290	263
1937	32,241	128,436	25.0	99	356	363
1938	35,045	141,590	25.0	99	309	390
1939	43,250	152,924	28.0	123	515	558
1940	46,317	163,285	28.0	80	510	547
1941	43,493	173,699	25.0	105	433	548
1942	25,902	116,121	22.0	-	-	2
1943	25,216	147,795	17.1	39	292	347
1944	36,940	178,250	21.0	148	269	504
1945	38,129	214,662	17.8	137	255	502
1946	47,419	282,060	16.8	99	433	1,180
1947	47,178	299,610	15.7	104	389	680
1948	47,789	300,405	15.9	53	334	568
1949	52,082	309,829	16.8	106	423	827
1950	47,128	312,652	15.1	112	380	767
1951	64,619	342,900	18.8	134	406	734
1952	50,667	369,149	13.7	129	658	719
1953	58,992	370,938	15.9	173	354	792
1954	75,602	397,566	19.0	171	417	904
1955	71,126	410,205	17.3	207	412	1,306
1956	70,371	448,663	15.7	181	405	1,040
1957	65,214	420,400	15.5	169	558	1,018
1958	58,699	382,588	15.3	156	411	860
1959	73,483	399,103	18.4	279	508	844
1960	75,584	419,798	18.0	278	623	878
1961	59,118	416,884	16.6	234	338	666
1962	54,909	404,872	13.4	140	275	452
1963	56,814	389,911	14.5	175	252	382
1964	66,584	405,264	16.4	124	269	466
1965	61,224	417,591	14.7	138	212	498
1966	69,118	440,838	15.7	191	254	685
1967	40,000	425,500	9.4	158	202	525
1968	51,706	*426,000	12.1	211	256	546
1969	48,288	415,000	11.6	144	198	501
1970	38,645	392,000	10.0	158	133	253

Appendix I (continued)

1971	38,907	395,500	10.0	165	216	433
1972	37,487	357,715	10.6	87	157	469
1973	30,402	400,100	7.6	124	117	434
1974	23,124	353,600	6.5	171	147	400
1975	26,314	322,400	8.2	137	103	281
1976	29,784	327,400	9.1	204	145	324
1977	36,687	312,500	11.7	89	113	511
1978	30,889	289,900	10.7	80	101	447
1979	36,379	361,489	12.0	95	148	461
1980	32,377	377,271	11.0	82	139	417
1981	42,231	380,216	11.0	96	155	407
1982	31,492	383,036	8.0	75	157	331
1983	26,006	350,731	7.0	43	142	256
1984	32,190	317,855	10.0	43	119	239

Appendix II
CALIFORNIA'S LAND OWNERSHIP ACREAGES - 1964

Private Land		51,945,135
Agricultural	36,853,851	
Commercial forest	8,025,120	
Urban - Industrial	2,744,428	
Rural homesites	1,100,000	
Unused	3,000,000	
Federal		44,529,718
State		1,940,214
City - County - Special Districts		1,938,853
		100,353,920

Source: California Fish & Wildlife Plan, October 1, 1965

APPENDIX III

Wildfire History on the Trabuco Ranger District, 1950-1984

Year	Acres	Year	Acres
1950	3,200	1967	4,575
1951	12	1968	389
1952	4,263	1969	4,914
1953	4	1970	1,188
1954	3,939	1971	0
1955	2	1972	34
1956	1,025	1973	16
1957	1,519	1974	581
1958	36,817	1975	1,608
1959	949	1976	120
1960	1,412	1977	4,726
1961	0	1978	319
1962	12	1979	2,995
1963	13	1980	47,442
1964	0	1981	2
1965	4	1982	128
1966	841	1983	0
		1984	56

APPENDIX IV. HABITAT INVENTORY 1963 AND PROJECTIONS TO 1980

Habitat Type	1963 Ac.	%	1980 Ac.	%	1963 Ac.	%	1980 Ac.	%	1963 Ac.	%	1980 Ac.	%
Pine-fir-chaparral	500	.1	n/c		59,247	1.3	58,283	1.3	55,290	2.0	n/c	
Hardwood					1,469	t	n/c					
Woodland sage	6,080	1.2	n/c									
Woodland-chaparral	4,814	1.0	n/c		12,893	.3	10,813	.2	15,570	.6	n/c	
Woodland-grass	5,107	1.0	n/c		2,122	t	n/c		85,625	3.1	n/c	
Chaparral	47,567	9.5	n/c		604,819	13.2	589,299	12.8	1,121,580	41.2	1,112,351	40.8
Inland sage									5,190	.2	n/c	
Coast sage	97,200	19.4	94,000	18.8	202,409	4.4	181,356	3.9	364,365	13.4	333,434	12.2
Juniper-pinyon					101,020	2.2	99,990	2.2	35,165	1.3	n/c	
Grassland	74,906	15.0	71,000	14.2	27,040	.6	12,000	.3	165,388	6.1	163,144	5.9
Agriculture	78,801	15.7	27,950	5.6	287,020	6.2	240,285	5.2	58,147	2.1	27,230	.9
Lakes-bays-res.	3,363	.7	4,625	.9	59,133	1.3	61,213	1.3	32,795	1.2	32,900	1.2
Marsh	1,500	.3	750	.1					1,000	t	n/c	
Seasonal marsh	650	.1	450	.1	3,636	.1	5,076	.1	1,000	t	n/c	
Riparian	3,673	.7	3,200	.6	12,088	.3	8,729	.2	5,000	.2	n/c	
Lodge pole pine					3,264	.1	3,064	.1				
Low desert					2,994,223	65.1	2,930,273	63.9	645,780	23.7		
Barren	6,600	1.3	15,570	3.1	96,257	2.1	105,301	2.3	10,950	.4	16,968	.6
Urban-industrial	169,719	34.0	218,867	43.8	127,911	2.8	285,378	6.2	122,275	4.5	189,493	7.0

1 Orange County 500,480 acres

2 Riverside County 4,594,560 acres

3 San Diego County 2,725,120 acres

% = percent of County total

Source: California Fish and Wildlife Plan, October 1, 1965

APPENDIX V-1

TOTAL OPEN SPACE - ALL SOURCES

TOTAL OPEN SPACE

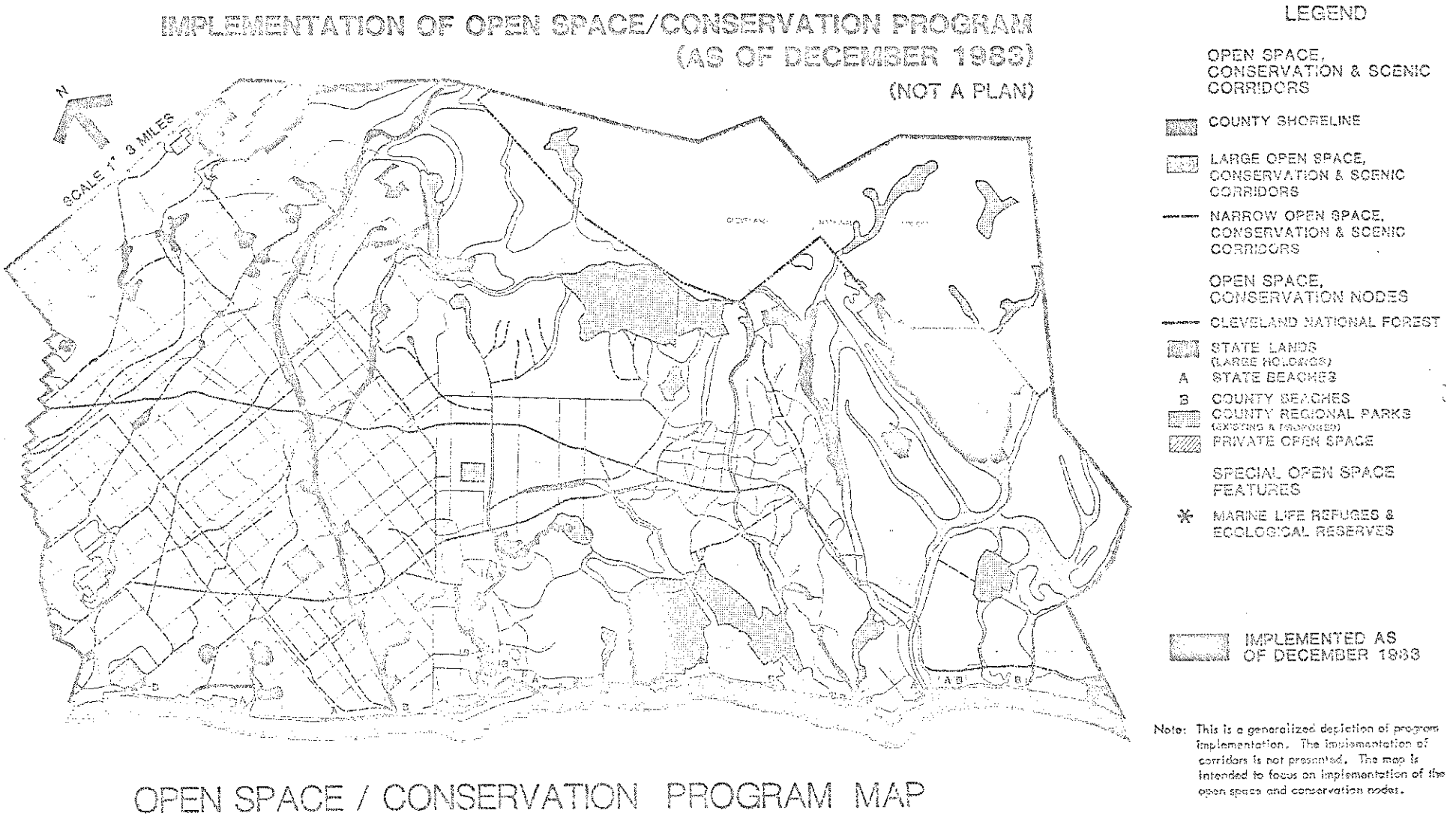
Gross Acres

RSA [1]	Existing	Proposed	Total
A	476.1	0.0	476.1
B	10,216.7	5,332.5	15,549.1
C	73,715.6	10,057.5	83,773.2
D	4,390.7	8,974.7	13,365.4
E	271.5	6,310.0	6,581.5
F	2,133.6	99.0	2,232.6
G	936.8	931.6	1,868.4
H	382.2	0.0	382.2
I	4,203.1	1,597.5	5,800.6
J	257.2	1,100.0	1,357.2
Total	96,983.4	34,402.8	131,386.3

Note: This table does not include the countywide 250 linear mile riding and hiking trail network.

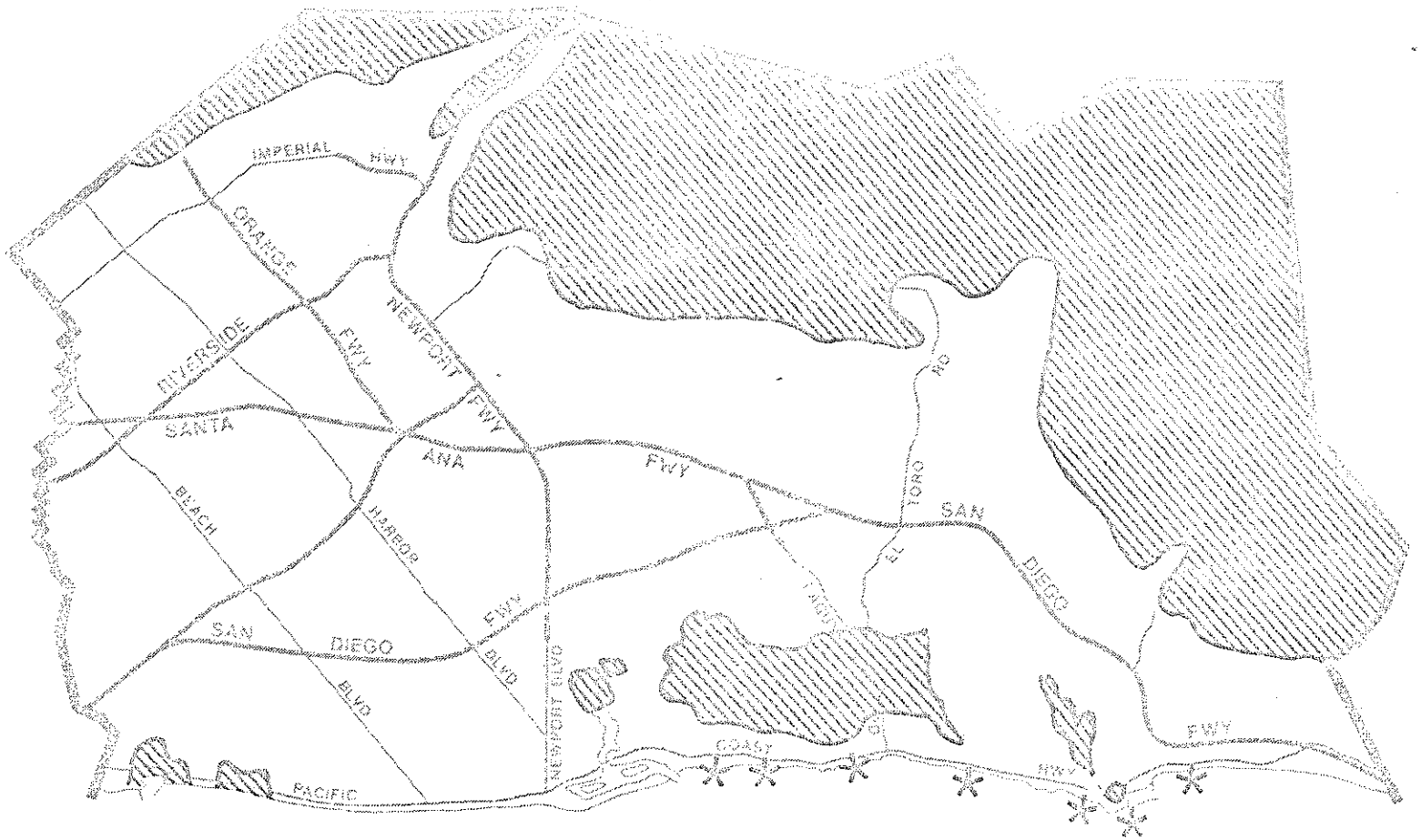
1. RSA = Regional Statistical Area - see Appendix VII-I for identification.

Appendix V-2. Orange County Open Space. (Source: Orange County Resource Element)



OPEN SPACE / CONSERVATION PROGRAM MAP

Appendix V-3. Wildlife Habitat Areas. (Source: Orange County Resource Element)



d) Oak Savannah - A unique vegetation type, this habitat is similar to the grassland habitat except that a higher percentage ranging from 10 percent to 30 percent is forested. Walnut trees may occur in conjunction with a grass understory.

e) Southern Oak Woodland/Forest - The differentiation between woodland and forest is based on the presence of oak trees. A woodland contains between 30 percent to 70 percent oak trees with scrub and/or grass understory while a forest contains greater than 70 percent oak trees. The tree canopy is low to medium height, generally open and containing Live Oaks, and California Bay trees. This habitat is most often found along valleys and lower north facing slopes where more abundant moisture is available. This habitat provides a good foraging area for most animal wildlife.

f) Riparian Woodland/Forest - Riparian habitat is perhaps the most valuable wildlife habitat because of the presence of water. This habitat type is characterized generally by a dense narrow vegetation band along a stream course. Live Oak, Sycamore, Willow and Alder trees dominate low brush.

g) Conifer Woodland/Forest - This habitat is generally found at higher elevations between 4,000 and 5,000 feet but may be found at elevations as low as 900 feet. Big Cone Spruce, Coulter Pine and Oak dominate a brush understory. An area near the northwestern tip of the Cleveland National Forest contains a stand of Tecate Cypress unique to this habitat type. This vegetation habitat makes good wildlife habitat for nearly all mammals and birds. The majority of this habitat lies within the boundaries of the Cleveland National Forest.

h) Marsh - Marsh habitat may be either freshwater or saltwater. Freshwater marsh areas are characterized by shallow standing or slow moving water with tule, cattail, rushes, sedges and pond weeds. The habitat generally abounds with wildlife including various waterfowl, ducks, geese and coots. Saltwater marshes occur along tidal areas away from direct surf and wave action. Vegetation types include salt grass, pickle weed and other salt-tolerant plants. These areas have critical waterfowl and waterbird including gulls, terns and plovers with nesting and wintering areas. Further salt marshes are critical to many fish and marine organisms.

The Master Environmental Assessment assists this section and the County's ability to protect wildlife habitat through the sensitivity mapping of rare and endangered species and rare and unique plant life. Seven rare and endangered bird species identified by the State Department of Fish and Game may be found in Orange County. They

APPENDIX VI

Projected Land Use Changes in California, 1963 to 1980

Loss	Habitat Type	Acres	% Change
x	Woodland - grass	329,682	5.4
x	Woodland - chaparral	91,599	3.3
x	Coast sage	103,457	6.0
x	Hardwood	61,264	5.0
x	Saltbush - buckwheat	100,358	14.0
x	Seasonal marsh	23,514	10.9
x	Marsh	23,514	10.9
x	Valley mesquite	47,160	11.0
x	Tidelands	1,900	6.3
x	Pine Fir - chaparral	98,891	0.8
x	Riparian	52,663	13.3
Increase			
x	Agriculture	677,824	6.4
x	Urban - Industrial	1,409,023	51.3
x	Barren	102,683	6.0

Source: California Fish & Wildlife Plan, October 1, 1965

APPENDIX VII-2

PROJECTED POPULATION GROWTH TRENDS
NORTH COUNTY vs. SOUTH COUNTY
1980 - 2000

	North County a/			South County b/			County Total		
	1980	2000	Change	1980	2000	Change	1980	2000	Change
Total Population	1,478,851	1,800,200	+22%	453,858	876,700	+93%	1,932,709	2,676,900	+39%
Pct. of Total Population	77%	67%	-10%	23%	33%	+10%	100%	100%	-
Growth	-	-	321,349	-	-	422,842	-	-	744,191
Pct. of Growth	-	-	43%	-	-	57%	-	-	100%
Average Household Size	2.79	2.67	-0.12	2.37	2.42	+0.05	2.68	2.58	-0.10

Notes: a/ Includes RSAs 35-J, 36-A, 37-H, 38-I, 41-B and 42-G
b/ Includes RSAs 39-F, 40-D, 43-C and 44-B

Sources: 1980 Census
County of Orange: OCP-III Projections
Orange County EMA/Advance Planning Division

APPENDIX VIII

Yearly rainfall by month for the Silverado Ranger Sttion, Elevation 1,095 feet
(Rainfall years are July 1 to June 30.)

YEAR	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTAL
1950-51	0.0	0.0	0.0	0.0	1.7	0.0	2.5	1.1	0.5	2.6	0.2	0.0	8.6
51-52	0.0	0.2	0.2	1.1	1.0	0.0	8.7	0.4	5.5	1.7	0.0	0.0	18.8
52-53	0.0	0.0	0.3	0.0	3.4	3.3	0.8	0.8	1.2	1.3	0.0	0.0	11.1
53-54	0.0	0.0	0.0	0.9	1.1	0.4	7.7	3.4	4.2	0.1	0.0	0.1	17.9
54-55	0.1	0.0	0.0	0.0	1.5	0.9	4.0	1.9	0.2	1.5	0.4	0.0	10.5
55-56	0.0	0.0	0.0	0.0	1.3	0.9	9.5	0.5	0.0	2.9	0.4	0.0	15.5
56-57	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.9	1.1	1.2	0.1	3.8
57-58	0.0	0.0	0.0	1.7	1.0	3.8	3.6	5.6	6.5	6.0	0.1	0.1	28.4
58-59	0.0	0.0	0.3	0.4	0.3	0.0	1.5	4.6	0.0	0.6	0.1	0.0	7.8
59-60	0.1	0.0	0.0	0.0	0.3	1.8	2.9	3.5	0.9	1.9	0.1	0.1	11.6
60-61	0.0	0.0	0.0	0.6	2.7	0.3	0.8	0.1	1.9	0.0	0.0	0.0	6.4
61-62	0.0	0.2	0.1	0.1	1.7	2.6	3.7	8.9	1.5	0.1	0.8	0.1	19.8
62-63	0.0	0.0	0.0	0.1	0.1	0.1	0.3	3.4	2.2	2.5	0.0	0.1	8.8
63-64	0.0	0.1	3.0	0.8	3.5	0.1	2.6	0.4	2.6	0.3	0.2	0.2	13.8
64-65	0.0	0.0	0.2	0.2	1.8	1.7	0.8	0.4	2.8	6.3	0.0	0.1	14.3
65-66	0.1	0.1	0.4	0.0	10.6	5.4	1.0	1.4	0.6	0.2	0.1	0.0	19.9
66-67	0.0	0.0	0.3	0.1	1.9	0.0	4.3	0.0	2.4	4.2	0.1	0.1	13.4
67-68	0.0	0.0	0.1	0.0	3.5	2.3	0.9	0.5	3.3	1.1	0.1	0.0	11.8
68-69	0.1	0.0	0.0	0.4	0.5	1.7	15.4	16.2	1.5	1.5	0.4	0.1	37.9
69-70	0.1	0.0	0.1	0.0	2.3	0.3	1.8	1.6	5.3	0.1	0.1	0.1	11.8
70-71	0.0	0.0	0.0	0.2	3.5	4.2	1.1	0.8	0.5	0.6	0.9	0.1	11.9
71-72	0.0	0.0	0.0	1.1	0.3	6.9	0.0	0.2	0.0	0.9	0.2	0.3	9.9
72-73	0.0	0.4	0.1	0.3	2.8	0.8	4.2	6.3	5.1	0.0	0.0	0.0	19.2
73-74	0.0	0.0	0.0	0.1	2.1	0.3	6.5	0.7	4.3	1 1	0.1	0.1	15.3
74-75	0.0	0.0	0.0	0.8	-	4.2	0.3	2.4	-	-	0.0	0.0	-
75-76	0.0	0.0	0.0	0.2	0.9	0.6	0.0	4.7	2.9	1.2	0.2	0.3	11.0
76-77	0.0	0.0	0.0	0.0	0.6	0.7	3.2	1.0	1.6	0.0	2.6	0.0	9.7
77-78	0.0	1.9	0.0	0.0	0.0	4.8	9.1	7.6	10.1	1.3	0.1	0.0	34.9
78-79	0.0	0.1	2.0	0.1	1.9	2.5	5.3	3.9	6.3	0.0	0.1	0.1	22.3
$\bar{x}$	0.1	0.9	0.2	0.3	1.9	1.8	3.5	2.8	2.6	1.5	0.3	0.1	16.3
Max.	0.1	1.9	3.0	1.7	10.6	6.9	15.4	16.2	10.1	6.3	2.6	0.3	37.8

APPENDIX IX-1

Sample Hunter Questionnaire

Fellow Deer Hunters:

The Department of Fish and Game is studying the Zone D-15 deer herd and asks for your assistance. All Zone D-15 permittees are being asked to provide information which could be important in the herd's management and we ask for your cooperation.

With this in mind, please fill out the questionnaire as carefully and completely as possible. If you cannot remember exact figures, please provide your best estimate.

Enclosed with the questionnaire is a small envelope, please carry it with your deer tag. If you kill a deer, follow the instructions for removing the teeth and return teeth along with the questionnaire.

This form is for you as an individual, so please do not consider the success or observations made by your friends or other members of your hunting party. Your information will be held entirely confidential.

Your cooperation is appreciated in providing essential information for the management of the mule deer populations.

APPENDIX IX-2

QUESTIONNAIRE ZONE D-15

1. Your name and address_____

Phone No.

_____( )_____

area

2. Where did you hunt deer in Zone D-15?
County: San Bernardino, Los Angeles, Riverside, San Diego, Orange (circle) any and all that you hunted.
Other Location_____

3. How many days did you hunt: 0 1 2 3 4 5 6 7 8 9 10 or more (circle)

4. How many hours of hunting per day (average)? 0 1 2 3 4 5 6 7 8 9 10

5. Did you kill a deer? Yes No (circle)

6. If you killed a deer: Buck Antlerless (circle)
a. Where was it taken?
1) County:_____ 2) Other Location:_____

7. Please estimate the number of each sex and age class deer that you observed while hunting in Zone D-15:

a. Adult males_____ b. Adult females_____

c. Yearlings_____ d. Fawns_____

8. How do you feel about the present deer season in Zone D-15 with regard to:

a. Dates of season:_____

_____

b. Length of season:_____

c. Antlerless hunting:_____

_____

_____

Please return this questionnaire along with the attached "Tooth Envelope" in the enclosed prepaid, self-addressed envelope. Thank you.

State of California — The Resources Agency

Memorandum

To : Wildlife Management Supervisor, Region 5 Date: June 4, 1986

From : Department of Fish and Game --North Orange County Unit Manager

Subject: Santa Ana Mountains Deer Herd Plan Update

During 1985, several changes were make in the management of the Santa Ana Mountains Deer Herd (SAMDH). The deer herd was subjected to more uniform management by the creation of Zone D-15, which coincides with the herd boundaries. The hunting season was moved up and shortened in length, and the Tenaja antlerless hunt was limited to two days. Efforts to assess the herd composition were reinitiated, after a 20-year period in which no counts were conducted. Incisors were collected for an analysis of the age composition of the harvest. No major deer habitat improved projects were conducted, but fuel management projects on the Trabuco District probably provided some improvement to deer habitat.

I. Biological Information

A. Harvest

The creation of the new hunting zone makes comparison of the 1985 harvest with previous years difficult. In Orange County, the total buck harvest in 1985 was 79, up 36 over 1984. This was due primarily to hunting that took place on the Irvine Ranch where hunting hadn't occurred in the last several years. However, even the harvest on public lands was up from 16 to 25 bucks. As in past years, about 70% of the harvest occurred on private lands. Overall, over 200 bucks were taken from D-15, including 100 from Camp Pendleton.

The Tenaja antlerless hunt consisted of only two days, and the number of permits was reduced to 100 from 250. A total of 33 antlerless deer were taken, 32 of which were harvested in Orange County. In 1984 when the Tenaja hunt ran concurrently with the general buck hunt, 42 antlerless deer were taken. Only five antlerless deer were taken from public lands, down from 24 in 1984.

These harvest levels do not appear to be excessive. However, continued study of the impact and need of the antlerless hunt is warranted.

B. Age Composition of the Harvest

Incisors were collected from 57 bucks and 28 antlerless deer. Cementum analysis was conducted on 56 of the bucks and 26 of the antlerless deer. Results were:

	f/0	1/11	2/21	3/9	4+/15
Bucks					
Antlerless	2	8	9	4	5

The average age of the bucks was 3.2 years, and the average age of the antlerless deer was 3.1 years. This compares favorably with previous years, but more consecutive years of data are needed to assess the degree of hunting impact on the herd.

C. Herd Composition Counts

Herd composition counts were conducted by helicopter with the financial assistance of Hill Bill monies and by vehicle and foot. A total of 130 deer were classified and the resulting buck:doe:fawn ratios were 28:100:47. These ratios generally meet the goals of the deer herd plan (25:100:45). However, buck:doe ratios were low on the Irvine Ranch (19:100) and fawn:doe ratios were very low on the Trabuco Ranger District (23:100). Sample sizes were too low to ascertain whether or not this data represents the overall herd conditions.

II. Habitat Improvement Projects

No specific projects to improve deer habitat were conducted in 1985, but almost 1,300 acres on the Trabuco Ranger District were treated to reduce fire hazards.

III. Other Changes to the SAMDH

The goal of spring fawn:doe ratios of 45:100 (page 30) should be changed to a fall ratio since most fawn mortality in Southern California chaparral probably occurs in late summer and fall, and not over winter.

Dan Yparraguirre

Dan Yparraguirre
Wildlife Biologist

DY:lp

cc: Hein
Davis

APPENDIX I

REPORTED BUCK KILL, TAG SALES AND HUNTER SUCCESS, 1927-84.

Year	State-wide	No. Tags	% Success	Orange Co.	Riverside Co.	San Diego Co.
1927	19,507	110,760	18.0	56	323	169
1928	21,515	105,638	20.4	69	249	232
1929	21,222	115,472	18.4	81	404	233
1930	24,132	123,999	19.0	90	629	250
1931	25,805	129,005	20.0	114	663	334
1932	18,380	96,702	19.8	87	488	263
1933	17,686	95,776	18.1	36	354	173
1934	20,805	108,913	19.0	55	307	259
1935	32,955	110,308	20.0	40	351	237
1936	25,008	126,855	19.0	54	290	263
1937	32,241	128,436	25.0	99	356	363
1938	35,045	141,590	25.0	99	309	390
1939	43,250	152,924	28.0	123	515	558
1940	46,317	163,285	28.0	80	510	547
1941	43,493	173,699	25.0	105	433	548
1942	25,902	116,121	22.0	-	-	2
1943	25,216	147,795	17.1	39	292	347
1944	36,940	178,250	21.0	148	269	504
1945	38,129	214,662	17.8	137	255	502
1946	47,419	282,060	16.8	99	433	1,180
1947	47,173	299,610	15.7	104	389	680
1948	47,789	300,405	15.9	53	334	568
1949	52,082	309,829	16.8	106	423	827
1950	47,128	312,652	15.1	112	380	767
1951	64,619	342,900	18.8	134	406	734
1952	50,667	369,149	13.7	129	658	719
1953	58,992	370,938	15.9	173	354	792
1954	75,602	397,566	19.0	171	417	904
1955	71,125	410,205	17.3	207	412	1,306
1956	70,371	448,663	15.7	181	405	1,040
1957	65,214	420,400	15.5	169	558	1,018
1958	58,699	382,588	15.3	156	411	860
1959	73,483	399,103	18.4	279	508	844
1960	75,584	419,798	18.0	278	623	878
1961	59,118	416,884	16.6	234	338	666
1962	54,909	404,872	13.4	140	275	452
1963	56,814	389,911	14.5	175	252	382
1964	66,584	405,264	16.4	124	269	466
1965	61,224	417,591	14.7	138	212	498
1966	69,118	440,838	15.7	191	254	685
1967	40,000	425,500	9.4	158	202	525
1968	51,706	*426,000	12.1	211	256	546
1969	48,288	415,000	11.6	144	198	501
1970	38,645	392,000	10.0	158	133	253

Appendix I (continued)

1971	38,907	395,500	10.0	165	216	433
1972	37,487	357,715	10.6	87	157	469
1973	30,402	400,100	7.6	124	117	434
1974	23,124	353,600	6.5	171	147	400
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1982	31,492	393,036	8.0	75	157	331
1983	26,006	350,731	7.0	43	142	256
1984	32,190	317,855	10.0	43	119	239
1985	31,651	314,810	10.0	78	119	158

Age Composition of the Harvest - 1985

	F	1	2	3	4+
Buck	0	11	21	9	15
Antlerless	2	8	9	4	5

Average Age Buck - 3.2 years
Average Age Antlerless - 3.1 years

Herd Composition Counts - 1985

	Buck	Doe	Fawn
Public Land	27	100	23
Private Land	30	100	64
Combined	28	100	47

State of California

The Resources Agency

Memorandum

To : Wildlife Management Supervisor
Region 5

Date : September 30, 1987

From : Department of Fish and Game - Orange County Unit Managers

Subject : Santa Ana Mountains Deer Herd Plan Update

The 1986 deer season marked the second year of establishment of zone D15. Data gathered in subsequent years (87-88) will help in making recommendations regarding management of the herd. Herd composition counts were conducted for the second year in a row after a lapse in data of 19 years. Age analysis was also conducted on a portion of the harvested deer for a second year. Age analysis data were last gathered in 1977 and 1978. No specific burn projects occurred, though one wildfire consumed approximately 7,000 acres on the east slope of the Santa Ana Mountains between Santiago and Bedford Peaks. This particular area had not experienced much hunter success in the past. A controlled burn further south in the vicinity of Chiquito Spring is still pending due to weather, vegetation fuel moisture, and manpower constraints. A parabolic guzzler utilizing Hill Bill funds has been proposed and awaits approval.

I. Biological Information

A. HARVEST

In Orange County the total buck harvest in 1986 was 73 which is comparable to the harvest of 79 in 1985. As in 1985, hunting took place on the Irvine Ranch. The harvest on public (USFS) land continued to increase, and was up from 25 to 34 bucks. Unlike years past where as much as 70% of the harvest occurred on private lands, only 51% of the 1986 harvest was on private land.

Overall, 94 bucks were taken from zone D15, with an additional 88 bucks taken from Camp Pendleton.

As in 1985, the Tenaja antlerless hunt was held on the last two days of the general season. The number of permits remained at 100. A total of 22 antlerless deer were taken, 18 of which were harvested in Orange County. An additional 55 does were taken on Camp Pendleton. Additional years of data should reveal trends from which further recommendations can be made.

Table 1 D-15 BUCK HARVEST 1984-1986

LOCATION	1984*	1985	1986
Trabuco District (USFS)	16 (37%)	33 (32%)	47 (50%)
Irvine Co. Ranch	3 (7%)	30 (29%)	19 (20%)
Rancho Mission Viejo	21 (49%)	20 (20%)	17 (18%)
Other Private Lands	3 (7%)	17 (17%)	10 (11%)
Unknown Location	----	2 (2%)	1 (1%)
Total	43	102	94

* Zone D15 not established

No hunt on Irvine Ranch

Table 2 Orange County Buck Harvest 1984-1986

YEAR	Private Lands	Public (USFS) Land	Total
1984 *	27 (63%)	16 (37%)	43
1985	54 (68%)	25 (32%)	79
1986	39 (53%)	34 (47%)	73

* Zone D15 Not established

No hunt on Irvine Ranch

Table 3 Tenaja Antlerless Hunt, Take By County, 1984-1986

YEAR	# Permits Issued	Total Harvested	Orange Co.	Riverside Co.	San Diego Co.
1984*	250	42	42	No Hunt	0
1985	100	33	32	1	0
1986	100	22	18	4	0

* Antlerless season concurrent with general buck season.
Antlerless season on the last 2 days of the general buck season.

Table 4 Tenaja Antlerless Hunt, Take by D15 Zone Locations 1984-1986

LOCATION	1984**	1985	1986
Trabuco District (USFS)	24 (57%)	2 (6%)	10 (45%)
Irvine Co. Ranch	0*	20 (61%)	9 (41%)
Rancho Mission Viejo	17 (40%)	7 (21%)	2 (9%)
Other Private Lands	1 (3%)	0	0
Unknown locations	0	4 (12%)	1 (5%)
TOTAL	42	33	22

* No hunt on Irvine Ranch

** Antlerless season concurrent with general buck season

Table 5 Age and Sex Distribution
of Tenaja Antlerless Harvest 1984-1986

	1984	1985	1986
Adult Female	36 (86%)	28 (85%)	8 (36%)
Fawn Female	1 (2%)	4 (12%)	9 (41%)
Fawn Male	5 (12%)	1 (3%)	5 (23%)
Total	42	33	22

B. Age Composition of the Harvest

In 1986, incisors were collected 65 bucks and 19 antlerless deer. Cementum analysis was conducted on 63 of the bucks and 17 of the antlerless deer.

As can be seen in Table 6 no significant change in age composition of the bucks harvested occurred between 1985 and 1986. The average age of the antlerless deer dropped from 3.1 to 2.1 years. Admittedly, the sample sizes are small, but since the harvest also dropped from 33 to 22, careful monitoring of the effect of the antlerless hunt is necessary.

Table 6 Age Composition of Bucks and Antlerless Deer 1985-1986

	BUCKS		ANTLERLESS	
	1985	1986	1985	1986
Fawn	---	---	2 (7%)	2 (12%)
1 year	11 (20%)	14 (22%)	8 (29%)	9 (53%)
2 year	20 (37%)	25 (40%)	9 (32%)	3 (18$)
3 year	9 (17%)	13 (21%)	4 (14%)	2 (12%)
4+ year	14 (26%)	11 (17%)	5 (18%)	1 (5%)
Sample Size	54	63	28	17
Average Age (years)	3.2	3.2	3.1	2.1

C. Herd Composition Counts

Herd composition counts were conducted in December 1986 with the financial assistance of Hill Bill funds. Five hours of helicopter time resulted in 123 deer being classified (Table 7).

This sample size was considered too low for management purposes, and thus no funding from Hill Bill was approved for 1987 composition counts. An attempt will be made to obtain these critical data by driving roads throughout the zone and gathering the information from key deer use areas.

Insufficient data are available from the previous years to ascertain the significance of the dramatic increase in the buck to doe ratio between 1985 and 1986.

The large variability of the buck:doe:fawn ratios presented in Table 8 between areas and years indicates the need for a larger sample size.

Table 7 D15 Herd Composition 1985-1986

(Post Season Counts, Herd Goal 25:100:45)

DATE	BUCKS:DOES:FAWNS	SAMPLE SIZE
October 1985	28 : 100 : 47	130
December 1986	45 : 100 : 47	123

Table 8 D15 Herd Composition by Location 1985-1986

	1985		1986
USFS	27 : 100 : 23	USFS	69 : 100 : 100
Irvine Ranch	19 : 100 : 53	Private (hunted)	10 : 100 : 47
O'Neill	58 : 100 : 91	Private (non-hunted)	56 : 100 : 25
Total	28 : 100 : 47		45 : 100 : 47

II. Habitat Improvement Projects

No specific habitat improvements for deer were conducted in 1986.

Many controlled burns are pending as listed:

	Name	Fund Source	Acreage
1.	Chiquito Spring	Hill Bill, USFS, Orange Co. Fish & Game Commission	952
2.	Casper's Park	VMP and Orange Co. Parks	700
3.	Black Star	VMP, Edison Co.	1200
4.	Emerald Canyon	VMP	1100

A parabolic tank has been proposed for Chiquito Spring and/or Lion Canyon.

In September of 1987, an arson-caused fire began in Silverado Canyon and spread east across the North Main Divide road. The fire burned on the steep eastern slope of the Santa Ana Mountains between Bedford Canyon and the Coldwater Trail consuming approximately 7000 acres. Mostly chaparral species of plants were burned through some timber stands in the Maple Springs area were also affected. This area of steep and rugged terrain has not produced substantial hunter success in the past. Therefore, monitoring of hunter take in the next 2-5 years could provide valuable information on the effects of such wildfires on deer use and harvest.

III. Other Changes to Santa Ana Mt. Deer Herd Plan

Large scale habitat loss from urbanization is expected to continue on private lands in Zone D15. Consequently, management agreements with the larger landholders including the Irvine and Rancho Mission Viejo companies will play a vital role in retaining deer habitat and hunter opportunity.

At the same time, habitat enhancement measures to increase deer productivity on the Trabuco District continue to be highly recommended.

It would be advantageous to work more closely with the biologist at Camp Pendleton to combine data and assist in interpretations for the benefit of the deer resource within the whole D15 zone. Camp Pendleton is geographically connected to the Santa Ana Mts. and thus this integration is logical and biologically sound.

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1989 Deer Herd Management Plan Update

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Deer Herd: Santa Ana Mountains
(Santa Ana Mountains Deer Herd Management Plan completed in November 1985.)
* D15 hunt zone established in 1985.

The deer herd unit includes all of Orange County, and portions of Los Angeles, San Bernardino, Riverside and San Diego counties.

A. 1. Herd Condition

Overall, the herd is in good to fair condition based on general field observations (CDFG biologists), and limited field data collected by the Orange County Cooperative Mt. Lion Study under the direction of Mr. Paul Beier. Field observations include numerous twin fawns even in the 3rd year of drought, normal antler growth, sizable antler growth (height and width), good visceral fat deposits (from examination of hunted and poached deer), and good general "look" of the deer (ribs not showing, large body size).

Ten femur marrows have been analyzed for percentage of fat by Paul Beier. The femurs were collected from deer killed by lions, generally in the Rancho Mission Viejo, Starr Ranch and Casper's Park area. For 7 deer killed by lions in the dry season (June-December), the average percent fat was 38%, with a standard error of 11%. For 3 deer killed by lions in the wet season (January-May), the average percent fat was 57%, with a standard error of 6%. These percentages are fair to low (personal communication, Paul Beier). The sample size is extremely low and represents lion-killed animals. Percentages could differ substantially with a larger sample size composed of both hunted and lion-killed deer.

Condition information has not been collected by the Department since the 1950's, when embryo counts were conducted on the Camp Pendleton subunit (Santa Ana Mountains Deer Herd Management Plan, 1985). Accurate and current condition information is greatly needed for a more reliable estimate of condition.

A. 2. Population Size

The Department has not conducted estimates of population size or density of the deer herd. Initial estimates of deer numbers in the Santa Ana Mountains were made by Longhurst et. al. (1952), for the period of 1947-1949. They estimated that approximately 6,000 deer inhabited the area, with an average density of 8 deer per square mile of habitat. Longhurst also described the herd range as containing 7,800 square miles of habitat, with about 240 square miles closed to hunting. The 1947 harvest of 225 bucks represented 0.42 deer harvested per square mile of huntable habitat. The herd range is currently estimated to consist of about 500 square miles of habitat (Santa Ana Mountains Deer Herd Management Plan, 1985). If this entire area was hunted, we could potentially achieve 210 deer harvested per year (500 sq. mi. x 0.42 deer harvested/sq. mi.= 210). However, it appears the deer population density has declined significantly since the 1947 era. The largest take of bucks since D15 was established occurred in 1985, when 102 bucks were harvested. Both Irvine Ranch and Rancho Mission Viejo hunted that year, and yet the harvest was only half of what could potentially occur. Loss of habitat to development, fragmentation of habitat due to development, and degradation of remaining habitat have been the major reasons for the deer population decline. Lack of wildfires on the Trabuco District and overgrazing on private lands of the foothills are the most serious elements of the habitat degradation (Habitat Assessment for the Trabuco District, CDFG 1989).

Personnel from the Orange County Cooperative Mt. Lion Study have conducted spotlight surveys in an attempt to estimate deer density (personal communication, Paul Beier). The "Transect" model was used to obtain a density estimate. However, it has been difficult to meet all the assumptions of the model, and the sample sizes have been low, therefore, the accuracy of the data is questionable. The latest data (September 1989) for the Starr Ranch, Casper's Park, Rancho Mission Viejo, and the Coal/Gypsum/Weir Cyn. complex areas reveal a density of 5.5 deer per square mile. Hunting is not allowed on Starr Ranch, Casper's Park, or Rancho Mission Viejo at this time. Light hunting pressure occurs on Irvine Ranch property in the Coal/Gypsum/Weir Cyn. complex. Additional animals are removed through poaching on these areas.

Jeff Froke (personal communication) estimated a deer density on Starr Ranch of 19 per square mile; Michael Benner (personal communication) estimated the deer density in the overgrazed San Joaquin Hills at 6 per square mile (Santa Ana Mountains Deer Herd Management Plan, 1985).

Current data are sorely needed for deer density estimates, and population size estimates for the deer herd. Department personnel have been unable to devote sufficient time to investigating deer numbers. Also, the Trabuco District lacks a district biologist, and Orange County does not have a wildlife biologist to monitor the deer herd.

A. 3. Herd Statistics
(includes A.1.b. Herd Health)

Harvest data is difficult to evaluate for zone D15 due to the complexity of land ownership and management strategies. The major landholders in Orange County are the Irvine Ranch (IR) and Rancho Mission Viejo (RMV). Both have chosen to limit or completely curtail all deer hunting activity on their land in the past years. Most notably, since completion of the deer herd plan, RMV stopped hunting in 1987, and has continued this policy thru the 1989 season. Irvine Ranch allowed a limited hunt in 1988, but did not allow hunting during 1989. During 1982, 1983, and 1984 IR did not allow hunting (Santa Ana Mts. Deer Herd Management Plan, 1985). As stated earlier, hunting is not allowed at Casper's Wilderness Park or the Audubon Starr Ranch. However, hunting occurs adjacent to these 2 areas on USFS land, and some poaching also occurs. Hunting is not allowed at Chino Hills State Park, though some hunter trespass occurs and deer are occasionally taken. Poaching also occurs within the park.

The USFS often closes the majority of the access gates to the Trabuco District when fire danger is extreme. This occurred last in 1987 when the gates were closed halfway thru the season due to the Silverado Fire.

For these reasons, the 55 bucks taken in 1988 (see Table 1) may not represent a significant decline in harvest as might be initially inferred. If one were to add an additional 20 bucks each for IR and RMV, the total would be 95. This figure is comparable to 102 bucks in 1985, and 94 bucks in 1986. For the Trabuco District at least, based on hunter take, the deer herd appears stable from 1985 through 1988. Data is not yet in for the 1989 season, but results from the tag returns will likely provide valuable information from which to make projections and recommendations for the herd.

However, it appears highly likely that hunting will not be allowed on RMV in the future, and it is doubtful that IR will ever resume the full scale hunt it allowed in the past. Irvine Ranch land is rapidly being developed, and additional development plans are imminent.

Without habitat improvement on the Trabuco District, it appears that between 30 and 50 bucks will be harvested on a yearly basis from the D15 zone outside of Camp Pendleton. In the future, fewer bucks will be taken from private land, and the Trabuco District will provide the majority of hunting opportunity. This trend is evident in Table 2.

The age composition of harvested bucks is presented in Table 3. Sample sizes have dwindled since private lands stopped hunting, and the low sample sizes make projections difficult. The average age has remained stable, but may be increasing slightly. The relatively high average age (3.2-3.9 yrs.), indicates a stable to slightly decreasing level of hunting pressure.

Opening day car counts of deer hunters on USFS lands are conducted by Department biologists yearly. As can be seen from Table 4, hunter pressure has been declining on both the Northern and Southern routes. The decline has been most substantial the last 2 years, 1988 and 1989. This is most likely due to the drought, and the hot, dry weather which has persisted to opening day. Most of the hunters contacted complained of the heat, the high brush, and the lack of deer. This general decline in hunter pressure, and stable to increasing average age of bucks, could change in the years ahead due to the recent fires, and especially if a few good rainfall years occur.

Deer hunters need to be educated as to the value of the age data gathered from the deer teeth. If more hunters were made aware of the importance of providing the incisors, a larger sample size could be obtained and recommendations for the herd more accurately made. Ideally, for the biologist, tooth returns should be mandatory for each successful hunter.

The Tenaja (S9) Antlerless hunt occurred on the last 2 days of the general buck season during 1985-1988. In 1989, the hunt occurred on the weekend following the closure of the general buck season. The distribution of the take can be seen in Table 5. Interpretation of this data is the same as for the bucks, i.e. private landowners have limited the hunting thus causing a decrease in the number of deer taken. Just as with the bucks, hunting of antlerless deer will occur primarily on public land in the future.

From Table 6 it can be seen that adult does are taken in larger numbers than fawn females or males. There is no consistent relationship between the number of fawn females and fawn males taken.

The age composition of the antlerless deer is presented in Table 7. The extremely small sample size (2) for 1988 makes any trend difficult to interpret. Another confusing factor is the "lumping" of the males, females, and fawns as presented in this table. Possibly, just the age structure of the adult females is most important and critical here. However, sample sizes must increase before reliable conclusions can be drawn. Once again, hunters should be educated to provide the incisors so that a complete biological analysis of the herd can occur. The 1989 data will also prove interesting since the hunt was held on a later weekend than previous years and primarily confined to the USFS land.

The small amount of antlerless harvest which is occurring on the Trabuco District (7 antlerless deer for 1988), has not had a significant effect on the deer population as a whole. In fact, since the season is only 2 days long, the hunt's effect on the herd will most likely prove to be only mildly beneficial in the long term. It appears that too few does are being removed to stimulate higher reproductive success in the remaining animals. The herd is most likely at carrying capacity on Trabuco District land. Therefore, it would benefit the herd to increase the antlerless harvest and thus increase the reproductive rate and health of the deer. This could be achieved by extending the season, probably to 1 week, and perhaps to 2 weeks.

Herd Composition

Post-season composition counts were conducted by helicopter in 1985 and 1986. Both USFS and private lands were censused, but the largest numbers of deer were seen on private land where more suitable habitat exists. Funds to conduct helicopter surveys have not been available since 1986.
Helicopter censusing is the most efficient method employed by the Department for censusing deer, however, small sample sizes were obtained as depicted in Table 8. Even smaller sample sizes were obtained in 1987 and 1988 when car routes were utilized for the composition counts (see Table 8). Wardens, USFS personnel, State and County Park Rangers, and volunteers participated in these car counts along with Department biologists. A total of 78.5 man hours was expended just to obtain the sample of 37 deer in 1988.
Thirty-five percent of the deer were observed in Casper's Park. The Casper's Park/Starr Ranch areas also had the highest deer numbers in the 1987 count with 49% of the deer. The Gypsum/Weir/Coal Cyn. complex was second with 28% of the deer in 1987.

It has been extremely difficult to find and observe deer on USFS land due to the old age brush and generally lower densities, even though tracks and pellets can be found on field assessments. For this reason, the composition counts for 1985-1988 were combined for the hunted USFS land and non-hunted (or lightly hunted) private lands in order to obtain a larger sample size.

It is unknown to what extent the herd composition differs on the USFS land from the private lands. One would suspect that the buck ratios are higher on the private land due to the limited hunting of bucks. Also, the deer can easily move between the two land ownerships, but the habitat types are markedly different. Deer may be confined to certain 'critical habitat' areas and not wander far from these locations. For these reasons, it is probably not reasonable to "lump" the deer numbers from hunted and non-hunted lands. Yet, it is highly unlikely that an adequate sample size (200 animals) could be obtained entirely on USFS land, though the chances are greater in the next 2-3 years due to the recent large fires. More likely, an extensive helicopter survey could attain at least 100 animals on the USFS land.

Spotlight surveys conducted by the Orange County Cooperative Mt. Lion Study provided the data for 1989 as listed in Table 8. A total of 70 deer were classified from Casper's Park, Starr Ranch, RMV, and the Coal/Gypsum/Weir complex. The survey was conducted during the hunting season, and yielded a buck:doe:fawn ratio of 29:100:76. This is the highest fawn ratio which has ever been obtained, but it is also the earliest census which has been conducted. Mortality of fawns is probably greatest between birth and the winter rainy season, thus the high fawn ratio may not be inaccurate for September. However, as always, the sample size was low, and probably not all deer present are counted, and additional animals are unclassified (personal communication, Paul Beier). In contrast, the low fawn ratio for 1987 (15 per 100 does), is probably due to observer error since less experienced personnel participated in the count.

Exhaustive effort should be expended in 1990 to obtain more precise composition data. The effort should attempt to determine if a significant difference in composition exists between deer on USFS land and private lands. The method employed should be helicopter survey with experienced personnel.
This critical piece of data is especially needed due to the imminent development threats to the deer herd, primarily the 3 major freeways which are proposed in Orange County. Future hunting regulation changes for bucks could be made more accurately.

A.4. Deer Hunting

a. Past and current hunting strategies' effects on:

1. DEER NUMBERS

There is no evidence to indicate that hunting of deer in the past or present has caused a significant decline in deer numbers. The decline in harvest level and general overall decline is more a result of habitat loss, fragmentation and degradation coupled with increased human harassment.

2. HERD COMPOSITION

The herd composition has remained satisfactory from a biological perspective despite hunting records dating from 1960.

3. HERD HEALTH

Specific health indices are not available. However, management of deer populations for maximum sustained yield requires controlled removal of some individuals to keep the population within the carrying capacity of the environment. Such management avoids significant impacts to the environment from overbrowsing by deer. Long term herd health is maximized under a carefully monitored hunting program. Antlerless hunting is a key component in the program. Such a program also considers the effects of man (development), predation, depredation take, poaching loss, road kills, disease, and environmental factors such as prolonged drought and habitat degradation. The herd health would improve with habitat improvement and a higher level of antlerless harvest.

4.b. Future and proposed hunting strategies' effects on:

1. DEER NUMBERS

For the USFS land of D15, future hunting strategies should provide more hunting opportunity by increasing deer numbers. This can be most easily accommodated in the short term by increasing the antlerless harvest. The goal would be to simultaneously increase the carrying capacity of the environment through controlled burn projects. An overall increase in deer density would be desirable to both hunters and non-hunters.

Most hunters contacted during the car counts and subsequent field checks complained of the lack of deer seen (including does), and the lack of field sign. Personal conversations with a variety of citizens and resource managers have indicated a decline in deer sightings on both USFS and private lands. Ranger Richard Dyer at O'Neill Regional Park believes the bridge over Arroyo Trabuco (Creek), and subsequent habitat fragmentation was the most recent beginning of the deer decline in the Arroyo Trabuco area (personal communication). Hunters on USFS land rightly attribute the deer decline to the lack of fires.

A later hunting season (November) could also be initiated to provide a more enjoyable experience for the hunters. Early September, on Labor Day weekend has proved to be extremely hot and uncomfortable. Deer movement has been minimal, and most hunters only hunt the early morning. Potential conflicts between hunters and non-hunters would be reduced by having a later hunting season in the cooler months outside of the 'normal' vacation periods. Labor Day weekend openers invite conflicts and potentially fatal accidents between hikers, bird-watchers, picnickers and hunters.

Fawns could possibly benefit significantly by having a longer time period of union with the does if the hunting season occurred during November rather than September. Undoubtedly, a small level of doe mortality occurs during the general buck season leaving fawns to fend for themselves during the critical dry months of late summer and early fall. Having the Tenaja hunt in late November would allow fawns additional time for gaining independence from the does.

Rutting activity has been observed in September and early October by Department biologists (personal communication Greg Gerstenberg and Tom Paulek). A later hunting season would not interfere with the rut, and the deer would still have antlers into November and even December.

Eventually, if habitat conditions improved greatly, the Tenaja hunt could perhaps be expanded to run two weekends or 2 weeks. This would increase hunter opportunity and benefit the deer population by stimulating greater reproductive success in the remaining does.

2. Herd Composition

Future strategies should not significantly affect the herd composition.

3. Herd Health

Monitoring of herd health should occur on a yearly basis in order to more accurately assess and predict effects of hunting changes on the herd. Hunters could be required to turn in the entire lower jaw of harvested deer so that percentage of marrow fat could be determined as well as age. Additionally, femurs could be analyzed from road kills and possibly hunter taken deer. Hunters would not initially like the increased regulatory environment, but such biological information is necessary to properly manage the herd.

A goal for D15 should be that herd health will improve in the future under any changes initiated in the hunting season. Health should be good to excellent, rather than good to fair.

A reduced or non-existent hunting season would not improve herd health, though deer numbers may increase initially. Habitat enhancement on both private and public land is the key.

4.c. Proposed Changes in Hunting Regulations

As discussed above, consideration should be given to a later season for buck and antlerless hunting, preferably in November. Buck hunting regulations should not change, but tag return (successful and unsuccessful) and incisor tooth return should be mandatory (antlerless & bucks). Serious consideration should also be given to requiring that mandibles be submitted to the Department for marrow fat analysis; at least for the adult does of the Tenaja hunt. The Tenaja antlerless hunt should remain at 100 permits but the length of the season should increase to (2) weekends. The effects on the deer herd produced by these proposed changes should be well monitored.

A serious shortcoming is the lack of personnel and time to perform the necessary monitoring. Mandatory return of tags and incisors will aid the Department in monitoring the herd, with minimal additional manpower expended.

A.5. Illegal Harvest/Poaching

The illegal take of deer is common in Orange County, and local wardens believe the take is on the increase (personal communication, Marty Maytorena). Illegal take occurs both during the season and outside the hunting season. Local law enforcement agencies have been very helpful in reporting and apprehending poachers. Currently, patrol of the inland portions of Orange County is minimal. Opening day receives the most attention, but even that is minimal due to other deer openers and dove opener on September 1st. Enforcement of commercial fishing violations has been a higher priority for Orange County wardens as directed. Illegal take is potentially quite high, and it would be advisable to increase the level of patrol and enforcement.

The major poaching areas are along Live Oak Cyn. Road, Coto de Caza, Santiago Peak, and along the 91 freeway in the vicinity of Coal, Gypsum and Weir canyons. Prior to 1985, the usual number of poached deer was 2 per year discovered by wardens on patrol when inland patrol was routine. Gut piles discovered out-of-season were the usual evidence discovered (personal communication, Marty Maytorena). For the last 3 years (87-89), the illegal take which has been discovered has been 3-4 deer/year, see Table 9.

Development continues to encroach on prime deer habitat such as Anaheim Hills, Dove Cyn./Starr Ranch, and the Plano Trabuco. Such proximity of humans to deer areas could easily lead to increased, undetected poaching. Sherry Meddick (personal communication) of the Rural Canyon Resident's Association has heard rumors of poaching around Irvine Lake and Black Star Canyon utilizing off-road vehicles. USFS patrol officers report a large amount of vehicle activity at night along the North Main Divide road on the Trabuco District. Few violations are made, but more are suspected. Without increased patrol the exact extent of deer lost to poaching will remain unknown. It is probably at least 2x that which is discovered, and may be 3-4x greater.

A.6. Depredation

Record keeping has been less than adequate for depredation take of deer in D15. The regional office in Long Beach does not keep records for take by county (personal communication, Gordan Cribbs). Data is compiled in the Sacramento Wildlife Management Division from tags returned. It is apparent that not all permits issued end up reporting whether deer were taken. The figures obtained are minimal, and a higher level of taken probably occurs (personal communication, Rich Callas). Wardens contacted in Orange County recalled from memory the permits issued since 1985 (personal communication John Fallan, Marty Maytorena, Jan Yost). Warden Maytorena recalls that prior to 1981, 200 permits per year were issued to the Irvine Ranch for alleviating damage to avocado and citrus tree orchards. The highest figure available for depredation take is 62 deer in Orange County in 1981 (Santa Ana Mts. Deer Herd Management Plan, 1985). However, Warden Ralph Sugg (personal communication), recalls at least 80 deer taken during 1 year around 79-80, and believes it may have been as high as 100-120 deer. It is also rumored that employees of Irvine Ranch were paid $10/deer during this same time period as part of the depredation take. The deer were taken by spotlighting and shooting (personal communication, Marty Maytorena).

The majority of the deer were taken in the Loma Ridge/Limestone Canyon area between Irvine Blvd. and Santiago Cyn. Rd. Lately, the depredation take has been in the Coto de Caza area, around General Lyon's estate; and from the plant nursery by Oso Reservoir. The most recent take is listed in Table 10.

All deer taken by depredation permit should be retained and examined by Department biologists. Data should be gathered for condition analysis, age, sex, weight, reproductive and general condition, location of kill and time of year. In this way, additional data of use to the overall herd health can be obtained rather than lost. Issuance of depredation permits should be strictly controlled and generally discouraged.

A.7. Road Kill Mortality

Road kill mortality occurs throughout the county due to the large number of roads. Ortega Highway, Live Oak Cyn. Road, and Santiago Canyon Road are the main mortality roads (personal observation). The exact extent of the mortality is not known, but approximately three deer per year have been reported to Department biologists. The mortality can be expected to increase since plans exist for development around Live Oak Cyn. Road and also for widening Santiago Canyon Road. Additionally, 3 major freeways are planned in the county. Hopefully, mortality will not be substantial since Department personnel have been involved in the planning process. Most importantly, the Department has requested a radio-telemetry of the deer in the area of the Eastern Transportation Corridor (ETC), the major freeway which will run through the northern portion of the county adjacent to the Trabuco District. Mitigation measures to minimize road kills and maintain critical habitat areas should be implemented as a result of the study. The Department has also requested that Orange County participate in the study to broaden the scope and further reduce impacts to the deer herd from development projects.

B. NON-HUMAN EFFECTS ON DEER

1. Weather
   a. Drought

The drought has probably reduced the amount of available forage although quantitative data are not available. Acorn production has been decreased and deer have probably suffered to some degree from this reduction (personal observation). However, springs were still active in the summer of 1989 and no unusual deer mortality was reported. The deer appear to be well-adapted to dealing with the drought situation.

b. Early Storms

Early storms would be beneficial to the deer herd in this region of the state due to the low average annual rainfall. Sizable early storms have not occurred in at least the last 3 years.

c. Mild Winters

Winters are usually very mild in this part of the state. No effect on the deer herd is apparent. High rainfall years would lead to greater plant growth and positively benefit the herd.

B.2. Predators

The most significant predator on the deer herd is the mountain lion. Coyotes and bobcats also take some deer, though their effect does not seem to be as pronounced as lion predation. Orange County has had a radio-telemetry study of the lion population for the last 3 years. The study only recently expanded from the Casper's Park/RMV area and now includes the northern canyon area where the ETC freeway is planned. If indeed the deer telemetry study gets under way, and if the lion study is extended as requested, a golden opportunity will exist for the study of the interaction of lions and deer. This information will be extremely useful for long term planning for the deer and lion populations.

A total of 31 lion-killed deer carcasses have been examined by personnel from the CO-OP lion study (personal communication, Paul Beier). The age and sex distribution of the deer is listed in Table 11. From the sample size of 31 animals, it appears the lion take is slightly greater on fawns but not of a significant magnitude. The distribution of take of older (1 year plus) deer appears evenly distributed. Lions perform a valuable ecological role in the Santa Ana Mountains region in keeping deer populations within the carrying capacity of the environment. This role is probably most beneficial in the unhunted lands of the foothills. The lion population is reproducing successfully though mortality from road kills and predators (lions) is high. Female lions from the foothills also utilize to Trabuco District, and one lion has traveled over 24 air miles from her capture site (Beier and Barrett, Quarterly Report, CO-OP Mt. Lion Study, November 1989).

Lion predation on deer is substantial, and this mortality factor must be considered in planning for the deer herd. Ideally, the lion study will be extended and perhaps expanded onto the Trabuco District. Then, if the deer telemetry study occurs as planned, extremely valuable data will be available for consideration relative to long-term herd health. The lion and deer studies should be one of the top priorities for Department biologists in the area.

B.3. Disease and Parasitism

Blood or tissue samples have not been taken of the deer, thus, the extent of disease and parasitism can only be generally assessed. Lion-killed deer have not shown outward signs of any severe disease or parasite load (personal communication, Paul Beier). Department biologist, Greg Gerstenberg (personal communication), has examined hunter killed deer from the USFS land adjacent to Starr Ranch. The deer have large tick loads, louse flies and bot flies, but appear healthy from gross examination. Approximately 30-40 ticks each were removed from 2 deer and examined by Orange County Vector Control for Lyme Disease. The results were negative. At this time there appears to be no significant problems with disease or parasitism in the herd.

C. EFFECTS OF CURRENT DEER HUNTING AND PROPOSED HUNTING STRATEGIES

1. Effects upon Species of Special Concern

a. Changes in local populations

No effect.

b. Changes in Regional and Statewide Populations

No effect.

2. Effects Upon Other Wildlife Species

a. Changes in local populations

No effect.

b. Changes in regional and statewide populations

No effect.

c. Changes in Health, Condition and Age Class Structure of Populations

No effect.

d. Changes in Mortality Factors

No effect.

3. Changes in Public Use/Recreation

a. Hunting

Increasing the antlerless hunting season should increase hunter success and thus satisfy a larger proportion of antlerless hunters. Overlapping the buck harvest dates with the antlerless harvest dates provides hunters with 2-deer tags the opportunity to take a buck or a doe on the same day. This increased opportunity for success would be desirable.

Changing the buck season to a later month (November), should increase hunter satisfaction (due to the cooler weather), and may slightly increase hunter numbers. This would be desirable since hunter pressure has been declining. The decline could also change with additional fires on the forest and increased rainfall. A more accessible habitat and larger deer numbers would satisfy the hunters and invite more individuals to participate.

Deer hunters would also have less of a chance of USFS gate closures by hunting later in the year when fire danger is lower.

Hunters who pursue other species in the zone such as quail, band-tailed pigeons and doves should not be affected by the season change. Only a very low level of hunting pressure occurs on the district for these species.

C.3.b. Non-Consumptive Users

Bird watchers, hikers, mountain bikers, horseback riders, photographers and picnickers should benefit from a later hunting season. Interactions and potential conflicts between recreationists and hunters will be reduced. The more common recreational times occur in the warmer months of summer and fall, therefore, having a later hunting season should separate the user groups and prove beneficial to both.

C.4. Effects Upon Human Populations

a. Housing

No effect.

b. Transportation

Transportation is a major problem in the county and local planners and legislators are always active in trying to improve transportation. An unfortunate result of new roads and freeways is increased housing and commercial development. Developers are basically allowed to build high density residential units on their property in exchange for paying for the road and transportation improvements. Wildlife suffers from both the increased roads and increased development. Large mammals such as deer and mountain lions which require large areas of land are most vulnerable to this fragmentation.

The 3 major freeways proposed in the county could potentially have devastating effects on the deer herd. As mentioned previously, the Department has pursued a radio-telemetry study of the deer herd in the area of the ETC freeway. Currently, the indications are favorable that the study will be initiated in January 1990 or shortly thereafter. Additionally, Orange County will most likely participate in the study to help assess potential impacts of additional proposed projects in critical deer areas. The widening of Santiago Canyon Road could significantly affect deer numbers through direct mortality, but the cumulative impacts of the ETC, Santiago Rd. widening and the Irvine Lake development are much more significant. Department biologists have been active in county planning in an attempt to secure adequate quality and quantity of wildlife corridors to insure viable large mammal populations. Constant vigilance is necessary in Orange County where the economic development environment is favorable at the expense of vast areas of open space.

c. Public Services

The potential exists for a landfill site to be located in either Gypsum, Blind or Fremont Canyons. Loss of any of these watersheds to a landfill would be a significant impact to deer and a host of other wildlife. The Department has gone on record to the Orange County Board of Supervisors against the consideration of Fremont Canyon in particular. Dedication of a canyon watershed is desired as part of the mitigation package, should one of these canyons be chosen for the landfill site.

A dam is proposed for Verdugo Canyon on Rancho Mission Viejo property in the south part of the county to provide an additional domestic water supply for current and future development. The project will impact deer habitat directly, but may potentially provide a vital water source for wildlife. Mitigation measures could possibly turn this project into a vital spot for wildlife.

d. Energy

No significant effect.

e. Human Health

According to Larry Shaw of Orange County Vector Control (personal communication), there have been no reported cases of Lyme disease in Orange County. Maintaining deer below the carrying capacity of the environment through hunting should lower the potential for disease transmission. Deer populations below carrying capacity have higher quality and quantity of forage available, and are therefore healthier and less prone to disease.

f. Aesthetics

Sightings of deer by Orange County residents are important in that it increases the quality of their outdoor experience. Under a carefully monitored hunting program a healthy deer herd will remain for public enjoyment. The urban setting of Orange County has alienated the majority of the citizens from the natural world, thus, a good segment of the public is opposed to hunting of any animal. The public needs to be educated of the value of hunting and the basic biological principles behind this wildlife management technique.

g. Cultural Resources

No significant effect.

D. RANGE LANDOWNERSHIP

As discussed earlier, the 2 major landowners in the county, Rancho Mission Viejo and Irvine Ranch have stopped or curtailed deer hunting in the past few years. Irvine Ranch land has a variety of major development proposals on the board for many important wildlife areas such as Gypsum Canyon and Irvine Lake area. The native plant society is working with The Nature Conservancy to acquire the Tecate Cypress forest between Coal and Gypsum Canyon, but the cypress trees are mainly on the slopes rather than the more important canyon bottoms utilized by deer; though does have been seen in the chamise vegetation scattered throughout the cypress forest (personal observation). Additional habitat acquisition should be pursued in order to secure critical habitat areas for deer.

Orange County still intends to acquire and develop regional parks, however, once again, some level of development will be allowed in exchange for granting the parkland. If the parks are developed for active recreational use, their value to wildlife in general will be low. Weir Canyon, Limestone Canyon, Black Star Canyon and Trabuco Canyon have excellent potential as wildlife areas, if left in a near-natural state. The Department should pursue designating these areas as Wilderness parks so that wildlife values can be maximized. Alternatively, canyons such as Black Star and Trabuco should become part of the Trabuco District of the USFS, and be managed by the USFS rather than by the County. Hunting is not allowed within even a Wilderness Park, while hunting could be allowed under USFS management.

The USFS is currently engaged in land exchange negotiations with private landowners in an effort to consolidate forest lands into contiguous areas, and eliminate the patchwork of private inholdings (personal communication, Mike Rogers). This could have a beneficial effect on wildlife in the future since fragmentation of habitat and human disturbance would be reduced.

E. RANGE VEGETATION

1. Fire

See discussion of fire history in the Habitat Assessment for the Trabuco District, Cleveland National Forest (Oct. 30, 1989).

F. SUMMARY

There is a need for a radio-telemetry study of the deer herd in the face of ever-increasing development pressure and habitat degradation. Important habitat elements must be identified and protected. Condition analysis is important in determining herd health, and current data is needed. Combined with the extended and perhaps expanded lion study, important data should be obtained which will greatly aid the deer herd management process. Habitat improvement on the Trabuco District is also of prime importance. Controlled burns should be pursued, but must be large enough and numerous enough to provide significant benefits.

Habitat acquisition is also of vital importance to long term herd health. Black Star Canyon and Fremont Canyons are top candidates.

The radio-telemetry study, habitat improvement and habitat acquisition are key components of the deer herd plan, right along with the hunt program. There is a bright future for deer of the Santa Ana Mts. herd if advance planning is pursued and carried out as outlined in this document and the accompanying Habitat Assessment.

Table 1 Buck Harvest by Landowner

	YEAR			
LOCATION	1985	1986	1987	1988
Trabuco District	33	47	26[‡]	37
Irvine Ranch	30	19	27	8['']
R.Mission Viejo	20	17	*	*
Other Private Land	17	10	15	10
Unknown	2	1	0	0
Total	102	94	68	55

(") Limited hunt on Irvine Ranch
(*) No hunting on Rancho Mission Viejo
(‡) USFS gates closed halfway thru season due to Silverado Fire.

Table 2 Orange County Buck Harvest 1985-1988
Private vs. Public Lands

YEAR	Private Lands	Public Lands	TOTAL
1985	54 (68%)	25 (32%)	79
1986	39 (53%)	35 (47%)	74
1987	35 (71%)	14 (29%)	49
1988	10 (31%)	22 (69%)	32

Table 3

Age Composition From Tooth Cementum Analysis
D15 Bucks 1985-1988

YEAR	1-2 years	2-3 years	3-4 years	4+ years	Sample Size	Average Age
1985	11 (20%)	20 (37%)	9 (17%)	14 (26%)	54	3.2 yrs.
1986	14 (22%)	25 (40%)	13 (21%)	11 (17%)	63	3.2 yrs.
1987	1 (4%)	9 (41%)	3 (14%)	9 (41%)	22	3.9 yrs.
1988	2 (20%)	2 (20%)	3 (30%)	3 (30%)	10	3.5 yrs.

TABLE 4

D15 Hunter Car Counts, Opening Day Buck Season,
Santa Ana Mts. 1983-1989

YEAR	DATE CONDUCTED	S.ROUTE	N.ROUTE	TOTAL
1983	October 8	103	135	238
1984	October 13	119	84	203
1985	September 7	75	30	105
1986	September 6	64	---	64+
1987	September 5	90	44	134
1988	September 3	46	23	69
1989	September 2	16	23	39

--- Route not covered

TABLE 5 Antlerless (S-9) Take by Landowner, 1985-1988

LOCATION	YEAR			
	1985	1986	1987	1988
Trabuco District	2	10	6**	7
Irvine Ranch	20	9	19	1*
Rancho Mission Viejo	7	2	no hunt	no hunt
Other Private Land	0	0	2	1
Unknown Locations	4	1	0	0
TOTAL	33	22	27	9

* Limited hunt on Irvine Ranch

** USFS gates closed halfway thru season due to Silverado Fire

TABLE 6 Age and Sex Distribution of Antlerless (S-9) Harvest, 1985-1988

	1985	1986	1987	1988
Adult Female	28	8	15	6
Fawn Female	4	9	4	1
Fawn Male	1	5	3	2
TOTAL	33	22	22	9

NOTE: 1987 and 1988, no hunt on Rancho Mission Viejo

1987 USFS gates closed halfway thru season due to Silverado Fire

1988 Limited hunt on Irvine Ranch

TABLE 7 Age Composition From Tooth Cementum Analysis, Antlerless (S-9) Deer 1985-1988

YEAR	Fawn	1-2 years	2-3 years	3-4 years	4+ years	Sample Size	Average Age
1985	2	8	9	4	5	28	3.1 yrs
1986	2	9	3	2	1	17	2.1 yrs
1987	1	4	6	1	6	18	3.0 yrs
1988	0	1	1	0	0	2	2.0 yrs

Table 8 Orange County Herd Composition 1985-1989
(Herd Goal 25:100:45)

DATE	BUCKS:DOES:FAWNS	SAMPLE SIZE
October 1985	28 : 100: 47	130
December 1986	45 : 100: 47	123
October 1987	38 : 100: 15	72
December 1988	35 : 100: 50	37
September 1989	29 : 100: 76	70

1985 and 1986 by helicopter.
1987 and 1988 by car.
1989 by spotlighting

TABLE 9 POACHED DEER FROM SANTA ANA MTS. DEER HERD, AS REPORTED BY FISH & GAME WARDENS 1986-1989

YEAR	# DEER	SEX	ANTLERS	LOCATION/TIME
1986	1	Doe	n/a	Anaheim Hills-Weir Cyn./Out of season
	1	Doe	n/a	San Joaquin Hills/Out of season
Total	2			
1987	1	Buck	3x3	Coal Cyn/In season
	1	---	---	Coal Cyn/In season
	1	---	---	S.Main Divide(USFS)/Out of season
	1	---	---	Silverado Cyn./Out of season
Total	4			(USFS reported shots and crippled deer running)
1988	1	Buck	3x2	Gypsum Canyon/In season
	1	Buck	2x2	Bell Cyn./In season
	1	---	---	Trabuco Canyon/Out of season
Total	3			
1989	3	---	---	Coto de Caza/Out of season
	1	Buck	3x2	Irvine Park, Weir Cyn./Out of season
Total	4			

TABLE 10 (PART 1) NUMBER OF DEER TAKEN ON DEPREDATION PERMITS ORANGE, RIVERSIDE AND SAN DIEGO COUNTIES, 1985-1989*

YEAR	ORANGE CO. Issued	ORANGE CO. Returned	RIVERSIDE CO. Issued	RIVERSIDE CO. Returned	SAN DIEGO CO. Issued	SAN DIEGO CO. Returned
1985	0		0		0	
1986	4	0	2	0	0	
1987	9	0	1	0	0	
1988	0		0		0	
1989	0		0		0	

* Data from CDFG, Wildlife Management Division, Sacramento

TABLE 10 (Part 2) NUMBER OF DEER TAKEN ON DEPREDATION PERMITS IN ORANGE COUNTY, AS REPORTED BY LOCAL GAME WARDENS* 1986-1989

YEAR	# DEER	SEX	LOCATION OF TAKE
1985	No depredation permits issued.		
1986	2	Unknown	Nursery by Oso Reservoir
1987	1	Female	Lyon's Estate, Coto de Caza
1988	3	Female	Lyon's Estate, Coto de Caza
1989	No depredation permits issued.		

* Data from Orange County Fish & Game Wardens

Table 11 Age and Sex Distribution of Lion-Killed Deer in Orange County 1989

	Age of Deer						
	Fawn	1 year	2 years	3-5 years	6+ years	Unknown	Total
Males	3	3	2	6	1	1	16
Females	2	1	1	1	4	0	9
Sex unknown	5	0	1	0	1	1	8
Total	10	4	4	7	6	2	33

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1990 HERD COMP.

DEER HERD	AMOUNT AVAILABLE	AMOUNT SPENT
SANTA ANA MTNS. OCT. 22-24 1990	$5,000	$4,741.40

HUNTED LANDS

BUCK	DOE	FAWN	
6	22	12	N = 40
27 :	100 :	54	

UNHUNTED LANDS

16	23	11	N = 50
70 :	100 :	48	

CAMP PENDELTON OCT. 22-21 1990	$3,000	$639.20

BUCK	DOE	FAWN	
10	41	11	N = 62
24 :	100 :	27	

VANDENBURG AFB OCT. 30-31 1990	$3,000	$3,893

BUCK	DOE	FAWN	
24	110	39	N = 173
21 :	100 :	35	

BURRO SEPT. 20-22 1990	$10,000	$4,522.90

BUCK	DOE	FAWN		
13	23	3	2 YRL.	N =41
57 :	100 :	13		

CMAGR

4	23	9	N = 36
17 :	100 :	39	

COMBINED

17	46	12	N = 75
37 :	100 :	26	

State of California

Memorandum

To : Bob Schaefer

Date : August 2, 1995

From : Department of Fish and Game - Scott Harris

Subject : Santa Ana Mountains Deer Herd Plan Update

The Santa Ana Mountains Deer Herd (SAMDH) is included in hunt zone D-15. During the 1994 deer season, there was an early archery buck hunt(August 6 through August 28), a general buck hunt (September 3 through October 2), the Tenaja antlerless hunt (December 3 through December 18), the Camp Pendleton either-sex hunt (October 1 through November 20), and the San Diego archery either-sex hunt A-22 (November 4, 1994 through January 31, 1995). Not including Archery hunt A-22, a minimum of 2,015 tags were available for the five hunts. A total of 1,294 permits were issued for the season which resulted in a general season reported success rate of 6%.

I. Biological Information

A. Harvest

Based on 1994 tag returns, the Orange County general season buck harvest was 26 compared to a buck harvest of 23 in 1993. Overall, 50 bucks were reported taken during the general season from Zone D-15 compared to 42 in 1993. The 1994 general season estimated buck harvest in Zone D-15 was 106 with an estimated success rate of 15% when the non-reported harvest was taken into account. An additional 57 bucks were reported taken from Camp Pendleton. The 1994 Tenaja antlerless hunt permit quota was 35, with a total of six does and one buck reported taken. An additional 47 does were taken from Camp Pendleton. Five deer were also taken in D-15 during the additional San Diego archery either-sex hunt.

Incisors were collected from a sample of the harvested deer for age analysis. Results of analysis were not available at the date of this report. Herd composition counts were not conducted in 1993 or 1994.

II. Habitat Improvement Projects

No habitat improvement projects were conducted in 1994. The Trabuco District of the U.S. Forest Service is considering the possibility of conducting controlled burns in 1996. One wildfire consumed approximately 120 acres of mixed grassland/chaparral on the west slope of the Santa Ana Mountains near Vulture Crags above Santiago Canyon.

III. Other Changes to the Santa Ana Mountains Deer Herd

Available deer habitat and public hunting opportunities on private land continues to shrink due to the continuation of widespread urbanization. In response to this condition, efforts need to be established to estimate the D-15 deer population and initiate habitat improvement measures within remaining areas of the range which have the capability of sustaining a healthy deer population. These efforts will be especially challenging considering existing available resources and a general hesitancy to improve deer range utilizing prescribed burns in areas adjacent to encroaching urbanization.

Scott Harris
Wildlife Biologist
Region 5

cc: Larry Sitton
John Massie
Slader Buck (Camp Pendleton)
Mary Thomas (USFS - Trabuco District)

1995 Deer Herd Management Plan Update
for the Camp Pendleton Herd (G10)

A. Description of the Deer Herd Management Unit

I. Herd Condition

Overall, the herd is in good condition.

a. Individual animal condition

Fat indices are not available. Body weight of harvested animals has been collected for bucks and does (including antlerless males). Data from check station statistics are as follows:

	#Taken	Avg. Wt.	Wt. Range
Bucks	53	93 #	64-135 #
Does	37	76 #	60-96 #
Buck Juvenile	13	43 #	28-60 #
Doe Juvenile	9	44 #	37-54 #
All Males	66	83 #	28-135 #
All Females	46	70 #	37-96 #
Total	112	78 #	28-135 #

b. Herd health

Statistics on juvenile survival rates are not available and statistics on age structure of the deer herd will be available in January or February when cementum analysis data are returned.

2. Population size

Herd size has not changed significantly in recent years. The overall population has declined in the last 30 years from increased development (i.e. habitat loss).

Harvest results

	1994	1993	1992	1991	1990	1989	1988
Total deer reported taken	112	90	114	120	112	153	154
Bucks	53	34	46	41	28	74	81
Does	37	31	45	48	70	79*	73*
Juveniles	22	25	23	31	14	*	*

*Does and Juveniles were combined into Antlerless class

Hunter success based on: Tags = 30.8%, Actual Hunters = 41%

Note: In 1990 the timing of the hunt was pushed later in the year to after the rut and tag type was changed from buck only and

antlerless only to either sex. Prior to this change, some hunters could take both a buck and antlerless deer. After the change, hunters could only take one deer with a rifle (either sex). This and unknown other factors have lead to an overall decrease in hunter effort. Buck kill numbers dropped at this time. Archery hunting success has increased with the season change which now has the archery only season occurring towards the end of the rut.

3. Herd statistics

Herd composition counts are conducted pre season by helicopter. This allows final adjustment of hunting strategy before rifle season begins. Results from 1994 composition counts performed by helicopter.

Bucks								
1X1	2X2	3X3	4X4	Uncl.	Does	Juveniles	Uncl.	Total
10	25	8	1	1	67	38	3	153

Juvenile/Doe ratio = 60:100, Buck/Doe ratio = 70:100

4. Deer Hunting

a. Past and current hunting strategies' effects on:

1. Deer numbers

No effect on deer numbers due to past and current hunting strategies.

2. Herd composition

Herd composition has remained stable.

3. Herd health

Herd health has remained stable.

b. Future and proposed hunting strategies' effects on:

1. Deer numbers

Deer numbers should remain stable as no changes are permitted to hunting regulations. Future proposed changes to regulations will add one week to the season for archery hunting. Low numbers of deer harvested by archers will have little effect on population size and may increase harvest from archery only areas.

2. Herd composition

Herd composition should remain stable.

3. Herd health

No change is anticipated in herd health. Health should remain stable.

5. Illegal harvest

Illegal harvest occurs but at an unknown level.

6. Road kill

The number of road killed deer ranges from 20-30 animals.

B. Non-human effects on deer

1. Weather

a. Rainfall

There has not been drought for the last three years; rainfall has been at or above normal. Deer are doing well on increased forage quality based on size and general appearance.

b. Early storms

Approximately one early storm occurs each year. Early storms are beneficial, providing more dispersed water sources and earlier green up from dry summer/fall periods.

c. Mild winters

In general, mild winters are common here, so there is no effect on the deer herd.

2. Predators

Mountain lions appear to be increasing throughout San Diego county, based on increased attacks, depredations and sightings. This may have a regional effect on deer through increased kills. Camp Pendleton has had mountain lions for a long time however, and territoriality may limit the lion population increases' effect on the deer herd size. Without focussed studies to evaluate lion predation on Camp Pendleton deer, we must rely on hunter kill numbers and composition count numbers to watch for significant population declines.

3. Disease and Parasitism

No significant disease problems were noted during the 1994 season. A 1992 collection did not reveal any significant parasitism and none was noted in 1994, although internal parasite data were not available as carcasses were field dressed prior to inspection.

C. Effects of Current Deer Hunting and Proposed Hunting Strategies on Other Species.

1. Effects on Species of Special Concern

a. Changes in local populations

Endangered/sensitive species on the Base include California least tern, Stephens' kangaroo rat, California gnatcatcher, least Bell's vireo, arroyo Southwestern toad, Southwestern willow flycatcher, tidewater goby, Pacific pocket mouse, Western snowy plover, California brown pelican, American peregrin, light-footed clapper rail, San Diego button celery, and Riverside fairy shrimp.

Deer hunting occurs out of reproductive season, so the only impact would occur from hunters damaging habitat needed by these species. However, hunting does not occur in habitats utilized by many of these species and hunter use in habitats which the remaining species utilize is very limited, so any effect would be negligible. Many populations of rare and endangered species have increased in recent years in conjunction with the long history of hunting on base. Additionally, cutting of vegetation and offroad vehicle operation is prohibited while hunting.

b. Changes in regional and statewide populations

There would be no negative effects on regional or statewide populations because of deer hunting on Camp Pendleton.

c. General Statement Concerning C. 1-4:

Impacts of deer hunting are really negligible compared to military training activities which involve tanks, vehicles, large numbers of people, and often result in fire. On Camp Pendleton there are year-round activities and continuous human access into areas used by wildlife.

2. Effects upon other wildlife species

   a. Changes in local populations

      The only changes to other wildlife species would be if incidental or illegal take occurred (e.g. a hunter shooting a bobcat during hunting activities).

   b. Changes in regional and statewide populations

      Camp Pendleton deer are non-migratory, so there would be no effects on regional/statewide populations of other wildlife.

   c. Changes in health, condition, and age class structure of populations.

      There would be no effect/changes in health, condition, or age class structure of other populations.

   d. Changes in mortality factors

      This would only occur if incidental or illegal take occurred during hunting activities.

3. Changes in public use/recreation

   a. Hunting

      Civilian and military access for hunting is held at a conservative level. The number of access permits issued each season fluctuates with the condition and number of animals harvested for each area of the base.

   b. Nonconsumptive

      Deer hunting occurs concurrently with limited other uses, so no change would occur.

c. Nonhunting

No changes would be anticipated.

4. Effects upon human populations

In general, because Camp Pendleton is a military base, all access is controlled and all areas have specific use constraints.

a. Housing

Hunting is not allowed within 150 yards of housing; however, all housing areas are geographically separated from deer hunting areas.

b. Transportation

None.

c. Public Services

None.

d. Human Health

None.