THE SAN BERNARDINO MOUNTAINS DEER HERD MANAGEMENT PLAN

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I. INTRODUCTION

Deer herds throughout much of California exhibited serious declines during the 1960's and early 1970's (Longhurst et al. 1976). Subsequently, the Department of Fish and Game (DFG) initiated a program designed to address the decline. This included the establishment of a select committee, the purpose of which was to examine the problem and provide restoration recommendations. Efforts of the committee, which included considerable public input, resulted in the development of a statewide strategic plan for California deer herds (DFG 1976). Emphasis was added to the deer restoration program by Legislative mandate (AB-1521, September 1977). Subsequently, a deer management policy was adopted by the State Fish and Game Commission specifying that: 1) planning for deer management be on a herd basis; 2) selected program elements be included in each herd plan; and 3) herd plans generally conform to the goals of the statewide strategic plan.

This plan is intended to fulfill the legislative mandate and DFG policy commitment to plan specifically for the management of the San Bernardino Mountains deer herd. Organization of the plan follows a format which includes: 1) a description of the San Bernardino Mountains deer herd management unit, 2) major factors regulating the deer herd, 3) management unit goals, 4) problems and constraints in management, 5) management programs, objectives, and recommended prescriptions, and 6) management alternatives.

Because both the deer population and the physical environment which constitutes its range are continually changing, this plan is

considered dynamic; periodic review and updating are considered integral parts of the planning process. The plan is intended to provide management direction for the future management of the San Bernardino Mountains deer herd. Specific details relating to the implementation of the herd management programs and prescriptions will be addressed in greater detail in a subsequent herd action plan. This will be developed in coordination with agencies having primary land management responsibility for the lands comprising the herd range.

The San Bernardino Mountains deer range is typical of many deer ranges in heavily urbanized Southern California. These are largely mountain areas, a great amount of which were placed under the administration of public land management agencies in the late 1800's early 1900's primarily for purposes of watershed protection. Subsequently, increasing demands for recreational space, opportunities for economic development, and loss of habitat values to urban-related uses accelerated with the population growth of Southern California. In more recent times, the recorded deer harvest in the San Bernardino Mountains, an indicator of the deer population status, has declined dramatically from the high levels reported in the 1950's.

II. DESCRIPTION OF THE HERD MANAGEMENT UNIT

A. HERD LOCATION

The San Bernardino Mountains are one of a chain of mountain ranges located in Southern California known collectively as the Transverse Ranges. The San Bernardino Mountains are located primarily in southwestern San Bernardino County; a small southern segment of the mountains dip into northwestern Riverside County. As part of the Transverse Ranges, the San Bernardino Mountains extend in an east-west direction bounded by Cajon Pass on the west, and extend approximately 60 miles to Yucca Valley on the east. The mountain range is defined further by the Lucerne Valley on the north and the San Bernardino Valley and San Gorgonio Pass to the south. Figures 1 and 2, respectively, indicate the geographic location and the herd boundary of the San Bernardino Mountains deer herd.

B. CLIMATE AND VEGETATION

The San Bernardino-Riverside County climate is known for its mildness, and is generally referred to as a summer-dry subtropical climate, with most precipitation occurring between November and April. Bailey and Jahns (1954) describe the San Bernardino Mountain Range as being distinguished by deep and steep-walled canyons, with a markedly variable upland surface, and several prominent peaks and ridges. Mount San Gorgonio (11,500 ft), the highest peak in Southern California, is included within the range. Bailey (1966)

Figure 1

LOCATION SAN BERNARDINO MOUNTAINS DEER HERD
SAN BERNARDINO AND RIVERSIDE COUNTIES

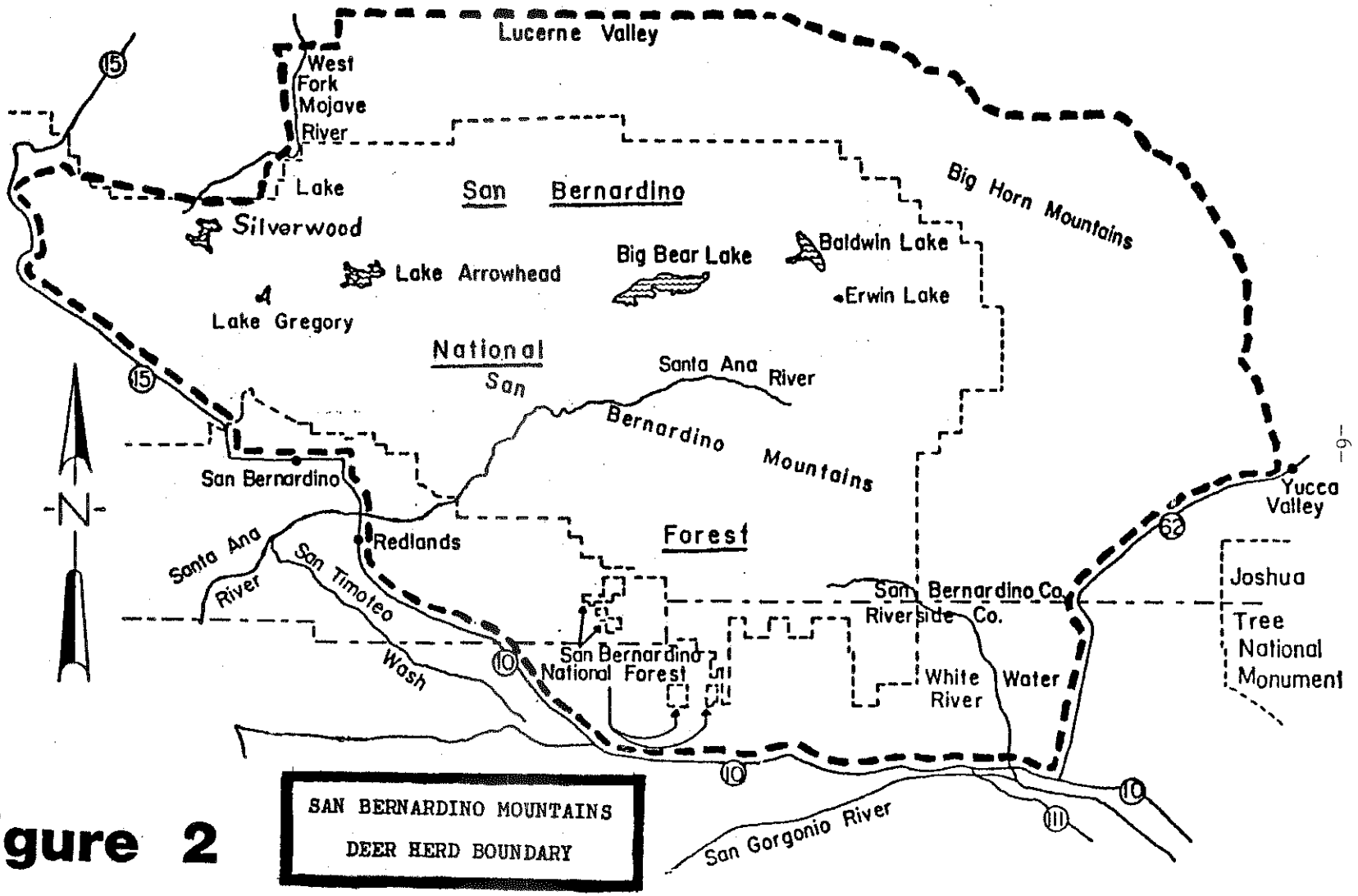


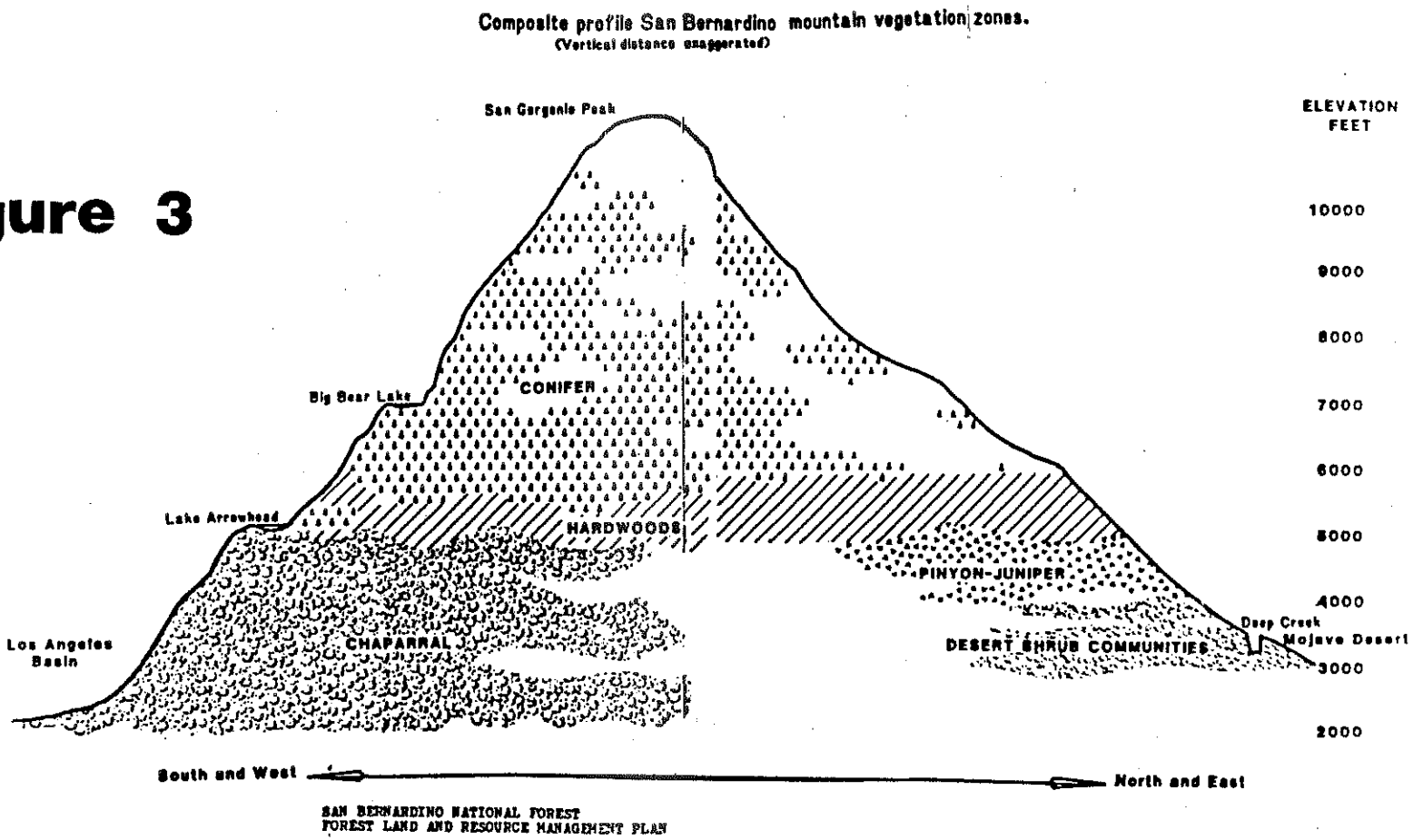
Figure 2

SAN BERNARDINO MOUNTAINS
DEER HERD BOUNDARY

indicates that the San Bernardino Mountains include three major climatic regions. An intermediate valley climate occurs only on the southwestern side of the range, and is the major climate type in that area to an elevation of 2,500 feet. Annual precipitation in the San Bernardino Valley averages about 15 inches and increases to about 40 inches at the crest of the mountain range. Transition and mountain climatic regions also occur in the mountain range. Those regions having more than 20 inches of precipitation each year are included in the mountain climatic type, and are generally surrounded by a lower elevation transition climatic type.

Figure 3 provides a composite profile of the San Bernardino Mountains vegetation zones and their relationship to elevation and slope aspect. The south and west aspects of the range above 2,000 feet support primarily chaparral vegetation; here annual rainfall ranges from 15 to 25 inches. Chaparral communities are characterized by woody shrubs often in dense, impenetrable stands. Generally the community is deficient in trees and herbaceous growth. Fire serves to regenerate the chaparral, resulting in vigorous crown-sprouting and seed germination of burned shrubs. It also results in the establishment of previously absent herbaceous vegetation growth, which subsequently declines as the shrub component matures. Increasing precipitation and winter snowfall above 5,000 feet characterize a conifer-hardwood presence up to the 8,000 foot elevation. Jeffrey pine and ponderosa pine are prominent conifer

Figure 3



SAN BERNARDINO NATIONAL FOREST
FOREST LAND AND RESOURCE MANAGEMENT PLAN

species. California black oak is a dominant hardwood constituent of the conifer-oak vegetation type. Above 8,000 feet, cold adapted conifers such as lodgepole pine and limber pine are predominant tree species.

The north and east aspects of the San Bernardino Mountains are desert facing slopes. As a transition community between the conifer-hardwood zone and the lower elevation desert shrub communities, pinyon-juniper woodland receives 12 to 20 inches of rain and some snow. The pinyon pine and juniper are predominant within this woodland community and are interspersed with mountain mahogany, desert scrub oak, and Great Basin sagebrush. Desert slopes below 4,000 feet receive 6 to 12 inches of rainfall some of which occurs as summer thunder showers. The Joshua tree is common on the lower northern desert slopes, while creosote bush and brittlebush are characteristic of the more arid desert slopes of the eastern San Bernardino Mountains (See Figure 3).

C. LAND OWNERSHIP

The San Bernardino Mountains deer herd boundary includes a land area of approximately 1,000 square miles or 640,000 acres. Figure 4 illustrates the land ownership pattern within the herd range. The San Bernardino National Forest (SBNF) comprises approximately 63% of the total land ownership of the deer range. An additional 14% (approximately 90,000 acres) of the herd range are public lands administered by the Bureau of Land Management (BLM).

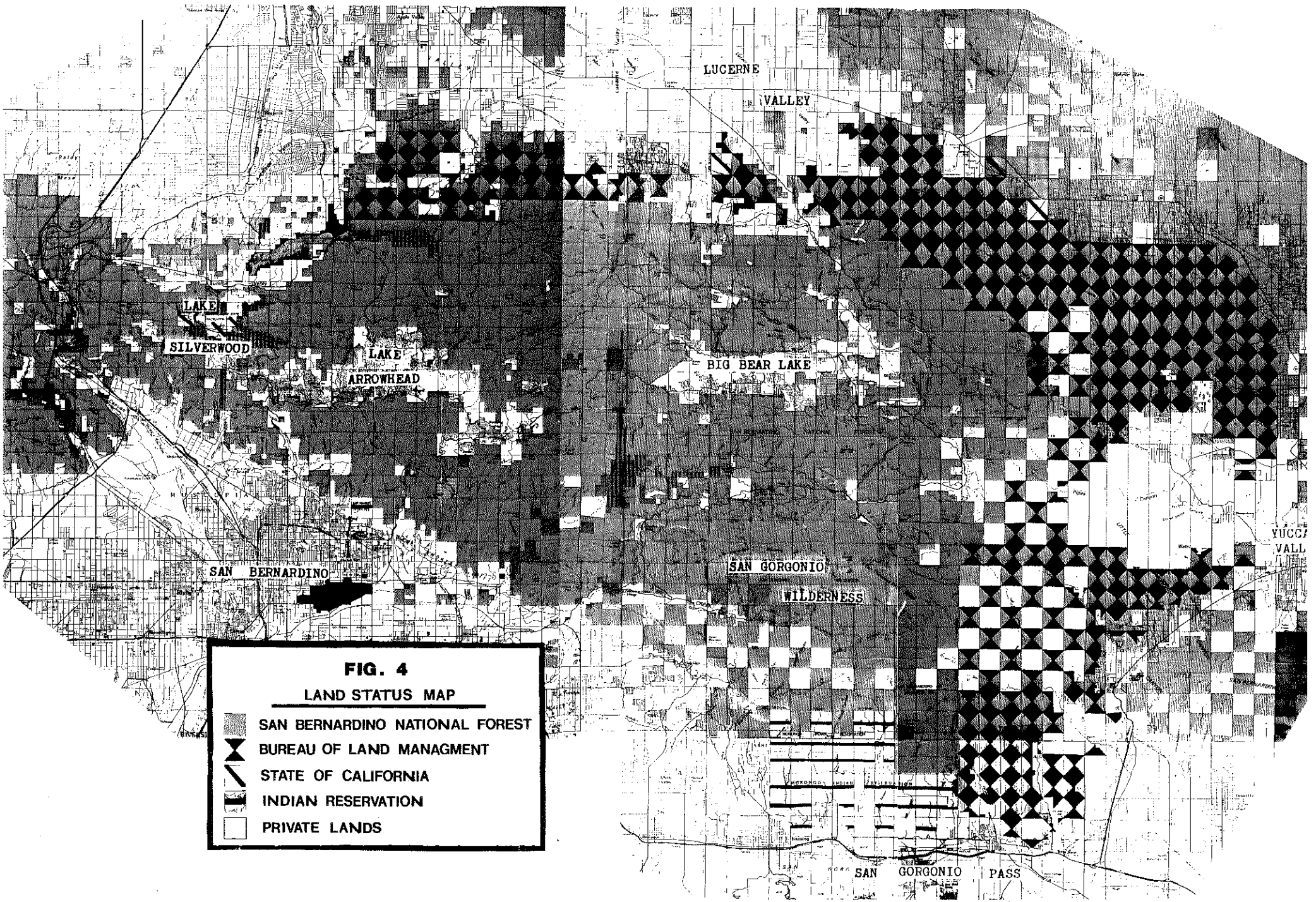


FIG. 4

LAND STATUS MAP

- SAN BERNARDINO NATIONAL FOREST
- BUREAU OF LAND MANAGMENT
- STATE OF CALIFORNIA
- INDIAN RESERVATION
- PRIVATE LANDS

BLM lands generally are contiguous with the northern and eastern National Forest boundary, and are included as part of the public lands comprising the California Desert Conservation Area. The only significant state lands included within the herd range are those surrounding Lake Silverwood State Recreation Area located in the western part of the deer range. The Morongo and San Manuel Indian Reservations are located in the southern portion of the range and in total comprise 17,280 acres.

Lands under private ownership comprise approximately 20% of the total herd range. Private lands of greatest relevance to deer management, however, are those included within the National Forest boundary, and those closely associated with BLM lands. Approximately 70,000 acres of private inholdings are included in the National Forest. The large majority of these private inholdings are associated with the urban communities of Crestline, Lake Arrowhead, Running Springs, and Big Bear Lake. BLM land on the northern and eastern herd range is associated with private lands, some of which are in a checkerboard pattern of alternating public and private sections (See Figure 4).

D. HERD DESCRIPTION

California mule deer (Odocoileus hemionus californicus) inhabit the San Bernardino Mountains, and are considered to be the second most abundant subspecies of deer in California. California mule deer are considered

intermedidate in size between Columbian blacktailed deer (O.h. columbianus) and Rocky Mountain mule deer (O.h. hemionus). The San Bernardino Mountains represent the southern most range extension of this subspecies in California.

In the San Bernardino Mountains, the breeding season (rutting season) begins in October and declines by the end of December. The peak of breeding activity within the range occurs in mid-November. Weeks prior to the onset of the rut, bucks shed their antler velvet, and their necks swell, and will remain so throughout the breeding season. During the period January-February, bucks normally drop their antlers and begin developing new antlers in preparation for the next breeding season.

In California, deer seldom breed before the age of 16 to 18 months. Does during their first pregnancy generally bear a single fawn; older does commonly bear twin fawns. Triplets occur, but are rare. During the breeding season does come into breeding condition multiple times. Females enter the estrus cycle approximately every 28 days until fertilization occurs. Does carry their young for approximately seven months. Fawns are born in the San Bernardino Mountains during April, May, and June. Fawns are generally weaned 60 to 90 days after birth, but remain with the doe until the next fawning season.

The San Bernardino Mountains deer herd has both resident and migratory deer. The herd range contains both high elevation summer ranges and lower elevation winter ranges on which yearlong deer use also occurs. There are no long migrations within the herd range. Movement from summer ranges by the migratory component of the population consists of down-mountain shifts to lower elevation winter ranges when snow fall blankets the higher elevations. Deer numbers are highest on winter ranges, generally below 5,000 to 6,000 foot elevation, during the winter months when both resident and migratory deer share common ranges. Light (1965) provided mapping and illustration of deer movement routes from summer to winter ranges for the San Bernardino Mountains herd (Figure 5). Much of Light's movement information is considered valid today even though herd productivity and habitat carrying capacity have been reduced from historic levels. The movement information is also useful in the discussion of summer and winter ranges and their respective roles relative to overall herd productivity and habitat carrying capacity.

It is important to note that much of the higher elevation summer range of the migratory component of the herd is associated with the mountain urban communities. Direct loss of historic fawning habitats has occurred as a result of the development of residences and recreational complexes. Currently, increasing urban populations and recreational uses

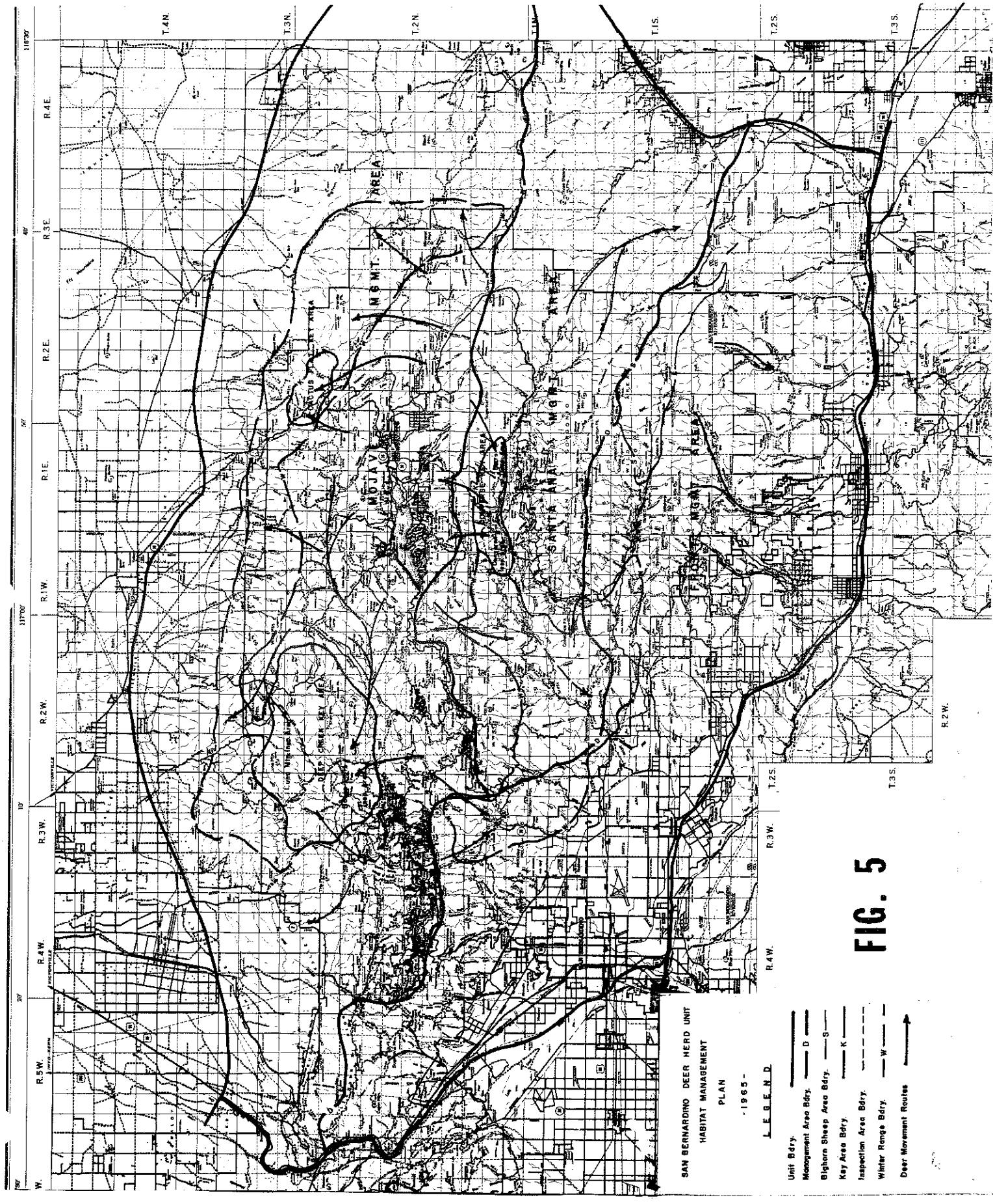

SAN BERNARDINO DEER HERD UNIT
HABITAT MANAGEMENT
PLAN
-1965-
LEGEND
Unit Bdry.
Management Area Bdry. D
Bighorn Sheep Area Bdry. S
Key Area Bdry. K
Inspection Area Bdry. I
Winter Range Bdry. W
Deer Movement Routes
MOJAVE MGMT. AREA
SANTA ANA MGMT. AREA
MGMT. AREA
T.4N.
T.3N.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
R.5W.
R.4W.
R.3W.
R.2W.
R.1W.
R.1E.
R.2E.
R.3E.
R.4E.

FIG. 5

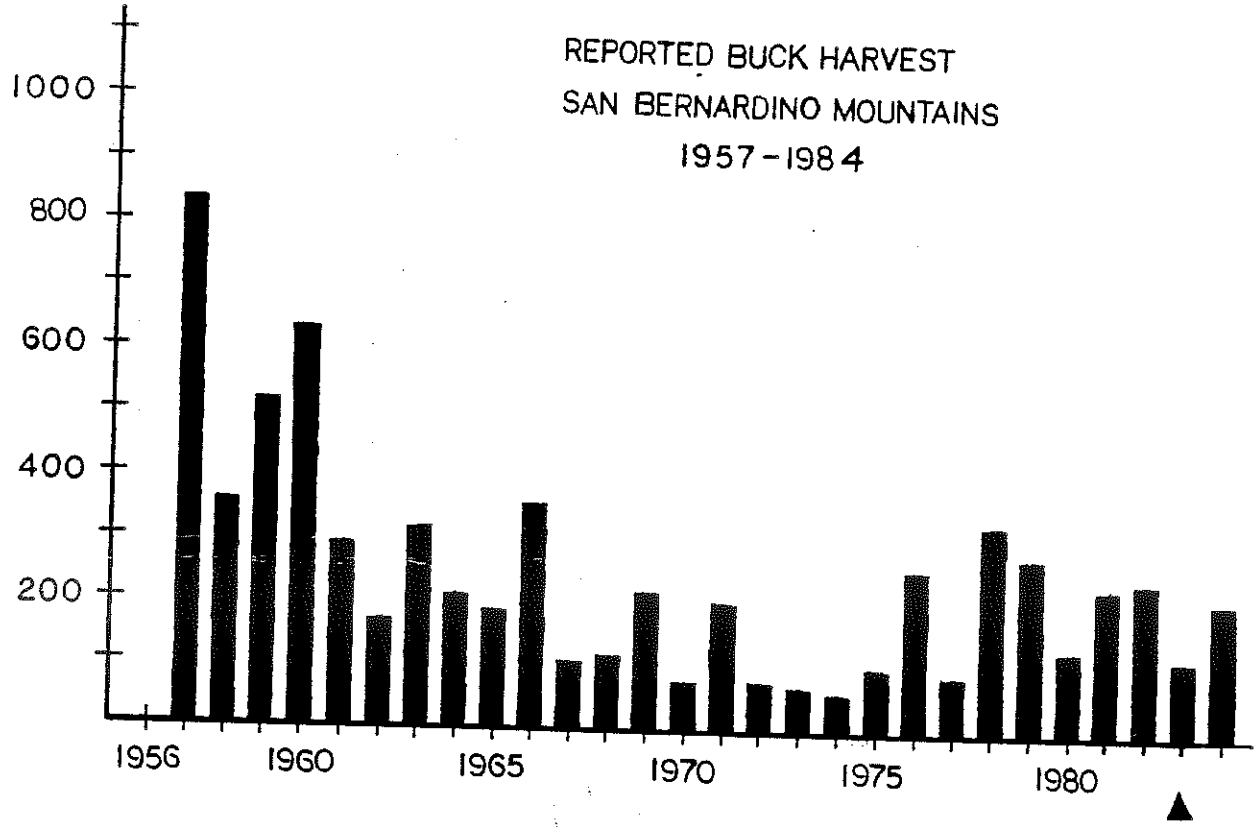
are considered to be limiting the value and therefore the productivity of much of the remaining summer range habitat. With regard to herd productivity, summer range fawning areas are a matter of great concern. These habitats are associated with mountain meadow systems, riparian zones, seeps, and springs. They must provide adequate cover, water, as well as herbaceous forage to insure successful raising of fawns. Maintaining remaining summer range fawning habitat and correcting present fawning habitat deficiencies, is considered a major management necessity for the maintenance of the migratory component of the herd.

The lower elevation habitats of the herd range must provide all of the year-round habitat requirements for the resident deer population. In addition, because the lower slopes also serve as winter range for the migratory component of the herd, they also must provide the forage and cover necessary to maintain migratory deer when snowfall requires movement to lower elevations. Maintaining the required quality and quantity of forage and cover on herd winter ranges for both resident and migratory deer is therefore also considered a major requirement for herd management. Currently, chaparral fire suppression programs, forage competition, declining forage quality particularly in chaparral ranges, and increasing dispersed recreational uses are factors which limit the productivity, and ultimately the carrying capacity of lower elevation deer ranges.

The 1957 buck harvest represented the highest reported buck take recorded for the San Bernardino Mountains. There is little doubt that deer were substantially more abundant during the 1950's; it is also likely the herd was in excess of the optimum population level. The early 1960's were a period of below average rainfall. In 1961, a year of severe drought the deer population declined dramatically. Thereafter, Light (1965) indicates the predominant factor limiting the substantially reduced deer herd was the unsatisfactory condition of the range. Light also indicates that the range condition was brought about primarily by prolonged periods of drought limiting forage production, and by past heavy use of the range by both deer and cattle. Figure 6 provides graphic illustration of the reported buck harvest in the San Bernardino Mountains from 1957 to 1984. The harvest trend illustrated indicates an abrupt decline in the population of the San Bernardino Mountains herd from the high population densities indicated for the 1950's. The decline was by no means unique to the San Bernardino Mountains; mule deer populations declined since the early 1960's throughout the western states (Connolly 1981).

Examination of Figure 6 indicates years of comparatively higher buck harvest interspersed with years of lower harvest. Some of this variation can be accounted for by changing hunting season length and dates; however, it is primarily a result of the implementation of chaparral fire closures

Figure 6


REPORTED BUCK HARVEST
SAN BERNARDINO MOUNTAINS
1957-1984
1000
800
600
400
200
1956
1960
1965
1970
1975
1980
▲ 1983 HUNT ZONE D-14 ESTABLISHED
HUNTER QUOTA - 3000

during the hunting season. Chaparral fire closures have served to restrict hunter access to approximately 40% of the deer range during many of the previous hunting seasons. Fire closures, for example, were in effect for the entire 1973 and 1975 seasons and almost the entirety of the 1972 and 1974 seasons; hence, the reported deer harvest is lower. Favorable rainfall in 1976 resulted in fire closures not being implemented; the buck harvest increased as a result of both the buck carry-over from the previous year and from the unrestricted hunter access. Once again, in 1977, fire closures were in effect during the season and the reported buck harvest was low. For this reason, only the intervening year of comparatively higher harvest are considered representative of the actual harvest trend. On this basis the present herd population level inferred is considered to be less than half the high levels recorded in the 1950's.

For the period 1978 to 1982, the average reported buck take in the San Bernardino Mountains was 245. In 1983 the San Bernardino Mountains were placed in the newly established hunt zone D-14 and a quota of 3,000 hunters was established. Monitoring of the post-harvest deer herd composition and analysis of the buck harvest age structure was begun in cooperation with the U.S. Forest Service. Sampling the age structure of the buck harvest was conducted in order to obtain a representative sample of the present buck population age structure. Table 1 provides the herd population data collected to date. The buck harvest in 1983, the first year

III. FACTORS REGULATING THE POPULATION

Successful deer herd planning and management is dependent upon the recognition of environmental factors as well as management problems affecting the productivity of the herd. A brief discussion of factors regulating the San Bernardino Mountains deer herd is provided below.

A. Weather

Both direct and indirect effects upon the deer population are a consequence of variations in seasonal weather patterns. In general, deer will avoid costly physiological climatic extremes such as high or low temperature. This is achieved primarily by behavior through which deer seek to balance habitat use with the energy cost of habitat exploitation. Deep and prolonged snow cover, however, can result in starvation losses and malnutrition. Conversely, a lack of annual precipitation can result in seasonal water shortages and limited forage availability. Often, as a consequence of drought, deer seeking limited resources are concentrated and become subject to increased vulnerability from predators, parasites, and disease.

The comparatively mild Southern California climate of the San Bernardino Mountains, and the resulting infrequency of severe prolonged snow fall, combined with deer mobility allowing migration to lower elevations, results in infrequent losses directly attributable to snow accumulation. Early winter snow accumulation at higher elevations will, however,

result in the shift of the migratory component of the deer herd to lower elevations; when this coincides with the hunting season increased hunting success can be expected. Overall, the season and quantity of precipitation with its resultant effect on forage production and water availability at lower elevations are considered major weather factors regulating the San Bernardino herd. Because of its relationship to forage production, seasonal precipitation patterns are considered to be of major importance in determining the physical condition of deer throughout the year. Annual precipitation is, therefore, also viewed as a significant factor contributing to herd reproduction.

B. Habitat

Setting aside the numerous other factors potentially regulating the deer herd, biologists would agree that the quantity and quality of habitat available for deer use are the ultimate factors regulating deer population density. This accord is embodied in the concept of range carrying capacity defined as the maximum number of deer the range can support. Deer management objectives further refine this concept to achieve a deer density representing an "optimum carrying capacity." This is defined as a stable deer population in which deer are maintained in good physical condition, on a sustained basis, without unnecessary range depletion or damage (Dasmann 1971).

Quality habitat is necessary and essential for deer herd productivity. If habitat provides only for the maintenance of the standing population, or deer energy reserves are depleted as a result of adverse weather or frequent disturbances, one should expect reduced body weights, smaller antlers, and lowered reproductive success. Numerous studies have established habitat nutritional quality as a major factor relating range carrying capacity to deer population density (Verme 1967; McCullough 1979). These studies have shown the nutritional state of does to be inversely related to fawn losses. Verme (1962), studying whitetail deer, demonstrated that well-nourished does lost only about 5% of their fawns; does fed deficient diets during winter lost about 33% while does underfed throughout their pregnancy experience a 90% fawn loss. Many fawns from underfed does were stillborn, while many live-born fawns quickly died as a result of insufficient energy reserves.

Food, water, and cover as well as the arrangement of these habitat requirements on the herd ranges are primary factors determining the carrying capacity of a deer range. The extent to which any one of these required habitat values is limited or lacking on summer, winter, or intermediate ranges will in large measure determine the contribution of the range to overall herd productivity. A major objective of deer habitat management is to provide an optimum interspersion of the necessary habitat requirements to achieve a desired herd

density. The importance of the correct interspersion of necessary habitat requirements is best illustrated by the habitat attributes required of deer fawning areas, all of which must be readily available in close proximity. Fawning areas are generally associated with wet meadows, riparian zones, or springs and seeps, fawning areas must provide habitat components necessary for successful birth and subsequent growth and development of fawns. Habitat values of importance include a readily available water source to support lactation, and quality herbaceous forage to maintain the doe and provide for fawn growth and development. In addition, the area must provide the required thermal and escape cover necessary to avoid depletion of energy needed for maintenance, fawn growth and development, and to deter predation. The loss of historic fawning areas in the San Bernardino Mountains, as well as the diversion of existing fawning habitats to other uses in a substantial portion of the deer range, is considered a significant factor limiting current herd productivity.

Consideration of the carrying capacity of the deer range must also recognize that the ability of the range to support deer is not static. Man-induced changes as well as biotic changes are continually affecting the capability of the habitat to support deer. Urbanization, recreational use, grazing and timber programs are among the more obvious man-induced changes acting upon the deer range. Plant succession, the maturation of the plant community towards a

climax condition, is perhaps the most prominent biotic factor acting to change deer range- carrying capacity. When considering biotic succession, it is important to note that the most prominent vegetative cover of the San Bernardino National Forest is chaparral vegetation or related types (SBNF 1982). Over the last several decades advancements in wildfire suppression techniques have served to reduce the ecological role of fire particularly in chaparral climax communities. Effective fire suppression, particularly in chaparral communities, tends to promote extensive areas of decadent vegetation resulting in reduced forage productivity and nutrient quality, as well as reduced water availability. Longhurst (1976) considered the decreased amount of acreage in California subject to wildfires or prescribed burning to be a major factor contributing to deer declines in the state.

More recently, however, the use of prescribed fire as a chaparral management tool has gained renewed acceptance as a management option for improving deer ranges. The identification of additional benefits relating to improved watershed management, increased forage production, and reduced fire fighting costs have substantially improved the economic consideration of the use of prescribed fire as a means to substantially increase the carrying capacity of chaparral deer ranges (Longhurst 1978). Additionally, increased management directed at improving deer herd productivity and greater consideration of deer habitat requirements in land use

planning also offers opportunities to maintain and enhance the carrying capacity of present deer ranges.

C. Habitat Loss

The majority of lands providing habitat for deer in the San Bernardino Mountains are public lands included within the San Bernardino National Forest. Additional public lands directly north and east of the Forest boundary are managed by the Bureau of Land Management (BLM) and are included in the California Desert Conservation Area (See Figure 4). Management efforts on public lands are directed towards providing multiple use benefits. In addition to wildlife management goals, public land management objectives include providing for recreation, grazing, timber, and mineral use as well as for watershed protection. Thus, to a very great extent the success of deer management efforts are dependent upon the coordination and integration of other multiple resource objectives.

Orginally established for watershed protection, the San Bernardino National Forest is now considered primarily a recreational forest. This has resulted largely from its close proximity to the major population centers of Southern California. The majority of recreation facilities and opportunities were introduced and developed to their current levels during the period from 1950 to 1975. Providing for increasing recreational demands has brought about major improvements to transportation systems, which in turn have facilitated the development of recreational

sites such as campgrounds, ski areas, and recreational residences. Additionally, with the development of secondary roads, the recent surge in popularity of off-road vehicle use has opened numerous areas of back country land to dispersed recreation. In 1981 dispersed use on the San Berbardino National Forest accounted for approximately 3.9 million visitor days or 64% of the total recreational use (SBNF 1982). There is little doubt that the direct loss of deer habitat values have accumulated with the increasing demands for recreational use. Depending on the intensity of recreational uses, they have often resulted in the displacement of deer or resulted in limitations on deer use of necessary habitats such as fawning areas, oak groves, meadow systems, and riparian zones.

Timber management can often serve as tool for enhancing habitat conditions by promoting vegetation conditions favorable to deer; it can also substantially alter forage and cover values, substantially reducing the carrying capacity of the deer range. Unlike many northern forests, logging is not a major industry in the San Bernardino Mountains. Timber management is primarily concerned with the maintenance of the health and vigor of the forest cover. The principal utilization of wood products is fuel wood consumption. Demand for fuel wood is considered to exceed supply, and is controlled primarily by Forest Service fuel wood permits, and in some instances by lottery systems to allocate fuel wood. A significant timber impact of concern to deer management is the loss of oak resources due directly to urbanization and fuel

wood consumption and indirectly to timber treatment practices favoring conifer species. The reduction of oak resources is considered harmful to deer in that acorns are a highly nutritious and often a critically important food source. During the late summer through fall period, acorns, if available, provide an extremely valuable food source during the period of greatest deer nutritional stress. Deer actively seek out this source of high energy forage during this period (Pine and Mansfield 1980).

Large-scale mining operations and water impoundments often result in extensive land form alterations. Existing strip-mining and water impoundments within the herd range have reduced deer forage and cover values. These large-scale projects also have introduced secondary impacts resulting from road construction or other operational activities. In a similar manner, off-road vehicle (ORV) use has resulted in land form alterations of less magnitude, but with increased frequency throughout much of the deer range. ORV use has increased in popularity in recent times and has proven difficult to control. The secondary impacts of ORV use include increased disturbance and harassment of deer, and may include the displacement of deer from necessary cover and food resources. These habitat disturbances are of great concern when deer are concentrated on lower elevation winter ranges and during the fawning season. The detrimental effects of ORV use and other land form alternations often are not recognized, but can include the separation and isolation of otherwise contiguous habitats and the disruption of deer movement corridors.

Some of the largest populations of year-round residents of any National Forest are found in the mountain communities located within the San Bernardino National Forest. In addition, a great deal of the remaining privately-owned open space land within the herd range has considerable potential for residential or commercial development. To a great extent, future use and development of these private lands will be subject only to the constraints of local governments acting in accordance with approved county general plans and community development programs. One of the more prominent residential and recreational communities in the San Bernardino Mountains, the Big Bear Basin currently has a permanent population of approximately 12,000. Previous estimates have indicated as many as 50,000 people may occupy the basin at one time (City of Big Bear Lake 1983). The major implication of relevance to deer management is the recognition that the effects of urbanization and recreational development with their accompanying human activities and secondary impacts, extend well beyond the identified community boundaries.

D. Hunting

Deer hunting, in addition to the recreational opportunities it provides, is considered a necessary element of deer management. Hunting is widely considered a necessary management tool to restrict deer herds to the carrying capacity of their range, to curtail "boom or bust" population oscillations, and prevent undesirable range damage. Wildlife biologists have long believed that properly managed harvests serve to maximize productivity and

long-term viability of the deer herd, and act also to stimulate higher rates of fawn production and survival than would otherwise occur in the absence of hunting (Taber and Dasmann 1958). Most published evidence examining the population dynamics of deer populations supports this view (McCullough 1979; Connolly 1981a).

Connolly's (1981) review provides useful insights relating to the effect of regulated hunting on deer population size, turnover rates, and herd sex and age ratios. It is noted that hunting only bucks tends to produce increasing deer numbers on ranges that are not fully stocked and tends to maximize impacts of excessive deer numbers on ranges stocked to carrying capacity. Doe or antlerless hunting conversely tends to reduce deer densities on both over and under stocked ranges. In hunted herds the average age of deer declines as harvest level increases. When only bucks are hunted the average age of bucks will decrease, but that of does will not be affected. The annual rate of population turnover increases as the average age decreases. Herd sex and age ratios are affected by hunting management that is selective for specific age and sex classes. Hunting bucks only tends to reduce the ratio of bucks to does. While hunting of both sexes can raise fawn-doe ratios by selectively removing does at a greater rate than fawns, or by stimulating increased production and survival of fawns. No matter which harvest strategy is employed, deer numbers will ultimately be limited in accordance with habitat quantity and quality.

Poaching, the illegal take of deer, has not been fully evaluated locally. Local game wardens have estimated that the illegal kill approaches or exceeds the legal harvest. Poaching occurs throughout the year and is generally indiscriminate, impacting all sex and age classes. In addition to being a substantial law enforcement problem, the indiscriminate and unrecorded take of poaching activity represents a significant impediment to effective deer management.

Crippling loss occurs primarily during the legal hunting season, and includes those animals shot that are not recovered and subsequently die. Studies have indicated that on the average, cripple loss is equal to 23% of the reported kill during either-sex hunts and 27% during buck only hunts (Losch and Samuel 1976).

E. Competition

The extent of impacts to the deer herd resulting from interspecific competition with domestic livestock are unknown. Range allotments are administered on both SBNF and BLM lands within the deer herd range. Allotments occur in all vegetation types ranging in elevation from 2,500 to 8,500 feet. Forage allocations are provided for cattle and sheep and include the management of a feral burro territory. Table 2 provides a breakdown of current range allotments, seasons of use, and stocking levels.

Any assessment of the impacts of competition between deer and livestock is a difficult task subject to a great many variables. The assessment would necessarily include consideration of the relative densities of the competing animals, the availability of resources such as food, water, cover, and space as well as the degree of site-specific overlap in the use of these habitat values. A major concern of deer management is the extent to which competition limits the deer population. To a great extent the seasonal forage requirements of deer are known to overlap those of livestock. Deer and cattle compete for acorns and grasses in the fall as well as grasses and forbs in the spring and early summer (Pine and Mansfield 1980). The extent to which competition is occurring is an important factor affecting to the physical condition of the deer throughout the year. Additionally, substantial reductions of nutritionally important forage components resulting from competition or poor forage production are considered detrimental to fawn production and survival. Deer management concerns, however, should not be limited to the examination of forage competition. The assessment needs also to examine the degree to which the presence of livestock limits deer use and access to important habitats such as fawning areas, riparian zones, oak groves, and meadow systems. It should also assess the extent to which grazing alters cover values and browse availability over the long term. Range management activities such as fencing, type conversions, and water developments should also be assessed to determine how they affect deer habitat use.

TABLE 2

RANGE ALLOTMENTS
SAN BERNARDINO MOUNTAINS DEER HERD UNIT

ALLOTMENT	ADMINISTRATION	STOCK	AUM'S	SEASON OF USE	TOTAL ACRES
DEEP CREEK					
DEEP CK. UNIT MOJAVE UNIT ROUND MTN. UNIT	USFS + BLM	CATTLE	3100	ALL YEAR	56,000
LITTLE HORSETHIEF	USFS	CATTLE	30	DEC 1-JAN 31	1,720
RATTLESNAKE	BLM/USFS	CATTLE	1756	ALL YEAR	31,478
BIG BEAR BURROS	USFS	BURROS	720	ALL YEAR	35,000
SUMMIT	USFS	CATTLE/ HORSES	900	ALL YEAR	12,160
FRONT COUNTRY	USFS	SHEEP	960	APRIL-JULY	21,150
SANTA ANA	USFS	CATTLE	1100	ALL YEAR	31,347
PILOT ROCK	USFS	CATTLE	320	MAR-NOV	7,800
WHITEWATER	BLM	CATTLE	910	ALL YEAR	30,478

TOTAL AUM'S : 9796

F. Predation

Mountain lions and coyotes are considered the most significant predators acting upon the San Bernardino Mountains deer herd. Black bear, bobcats and possibly golden eagles may also take additional numbers of deer. The question of whether the deer population would be more abundant in the absence of predation is currently unresolved. One issue relevant to deer management concerns the extent to which excessive predation may be acting to limit the existing deer herd. Another issue relates to whether or not herd productivity is actually limited by other environmental factors such as habitat overuse or poor nutritional quality, either one of which would not be corrected by predator reduction.

The review by Connolly (1978) of predators and predator control provides useful insights regarding predator control and its use in deer management. It is noted that predators frequently kill young, old, diseased, or other classes of prey at rates disproportionate to their incidence in the population; predation, however, is not restricted to these classes and healthy prime animals can be taken as well. In general, predator control is justified in deer management only when it will produce substantial deer increases at reasonable cost, without undue damage to other environmental values, and when the increased deer production will be used. Control is most likely to produce substantial increases where the ratio of predators to prey is high, and where deer are not fully using available habitat resources. In no case will predator reduction be of demonstrable value to the deer herd

unless it is intensive enough to substantially reduce predator populations.

G. Disease

Infectious or parasitic diseases can result in substantial mortality in wild deer populations. Deer are subject to a wide range of viral, bacterial, and parasitic diseases, some of which can potentially threaten the welfare of the population. The potential for disease generally is considered remote in relatively stable populations occupying habitats that provide for their needs. However when deer populations occupy poor quality habitat, or when population densities are excessive, the potential for disease becomes real.

Disease in a wild population can often go undetected, or mortality arising from disease can be wrongly attributed to some other environmental factor such as adverse weather or malnutrition. Present knowledge of the occurrence of disease in the San Bernardino Mountains deer herd is lacking and disease factors resulting in mortality are unknown. Currently, disease is not considered to be limiting the deer herd. Future disease investigation would require a thorough field study, and would entail necropsy techniques and population sampling to determine the extent and existence of potential disease factors.

H. Other Factors

Deer mortality resulting from deer-vehicle collisions occurs predominately along state and county highways providing access to

the San Bernardino Mountains. Road kills occur throughout the year, most often at night, and are most common in localized areas of high deer use. At the current deer population level, road kills are not viewed as a substantial mortality factor. Increases in deer density, however, would result in increased deer-vehicle collisions and the resultant property damage and personal injury. Current management direction to limit the problem includes roadway signs to alert motorists to deer crossing areas, and deer population control.

Free-roaming and feral dogs are considered an increasingly serious hazard to deer. The extent of impacts on the deer herd are difficult to detect. Undoubtly the great majority of dog-deer interactions are not observed and go unreported. It would be reasonable to assume, however, that the interactions are most prevalent in areas closely associated with human habitation. Harrassment by dogs, as is the case with all activities resulting in frequent disturbance of deer, represents an added stress to the deer herd. In addition to direct mortality, harassment results in a drain on energy resources, which in turn can predispose deer to disease or predation as well as reduced reproductive success. Perhaps more important, harassment or frequent disturbance often results in the avoidance or abandonment of substantial areas of deer range. The resultant loss in habitat carrying capacity ultimately results in a reduction of the deer population.

IV. MANAGEMENT UNIT GOALS

A. HERD GOALS

The goals of herd management are to maintain a healthy deer population, improve and maintain habitat to accommodate more deer, and provide for high-quality hunting and other recreational uses of deer. Successful attainment of these goals will not be a benefit to deer alone because restoration and maintenance of a healthy deer herd will require habitat conditions beneficial to many other forms of wildlife. It is important to recognize that herd population density will oscillate in response to climatic conditions as well as other environmental factors, and that annual harvest levels often will not achieve desirable management objectives. The long term management goals for the San Bernardino Mountains deer herd presented below therefore represent desirable management criteria rather than absolute requirements. They should be viewed as reference points for herd monitoring which will be an ongoing part of management.

Herd Management Goals

Herd Size	4,000 - 6,000
Post Harvest Buck Ratio	20 - 30 Bucks/100 does
Fall Fawn Ratio	50 - 60/100 does
Annual Reported Buck Harvest	300 - 450
Antlerless Harvest	When conditions warrant

B. HABITAT AND UTILIZATION GOALS

Goals for habitat management are to maintain and enhance deer habitat carrying capacity throughout winter and summer ranges. Development of habitat enhancement programs, particularly chaparral management and the improvement of water distribution offer substantial opportunity to increase current habitat carrying capacity. Additionally, the review of ongoing multiple resource use programs and the subsequent identification of deer management conflicts offer an opportunity to cooperatively improve range carrying capacity. Increasing efforts to reduce illegal kill, highway mortality, and deer harassment are also considered management and enforcement actions having significant potential to improve herd productivity. The accomplishment of long-term habitat maintenance will require greater integration of deer management objectives with the land use planning efforts of county governments and public land management agencies.

Herd utilization goals include provisions for diversified recreational use of deer, including both hunting and nonhunting opportunities. Providing for future deer herd use requires consideration of current management problems, habitat conditions and constraints as well as the recognition of other multiple resource management objectives and programs. A subunit management concept is recommended for the San Bernardino Mountain herd unit. It is intended to clarify deer recreational opportunities, provide for diversified management goals relative to existing land management areas, policies, programs, and commitments.

Two herd management subunits are recommended. Subunits are defined by the exterior herd boundary and a interior subunit boundary. The interior boundary is defined by the intersection of State Highway 38 with Mill Creek continuing to Big Bear Lake; continuing from Big Bear Lake on State Highway 18 to Lucerne Valley (See Figure 7). The eastern backcountry subunit includes the U.S. Forest Service San Gorgonio Wilderness, the Bureau of Land Management proposed wilderness study area in the Mission Creek drainage and the Whitewater River Area of Critical Environmental Concern (ACEC). Northeast of Big Bear Lake, the subunit includes the Granite Peaks and Rattlesnake Canyon areas. The western dispersed area subunit includes the major urban communities within the herd boundary, and the existing extensive road network within the subunit provides ready access to adjacent public lands.

Historically the eastern backcountry subunit has experienced lower hunting pressure, and to a great extent access to much of the area is limited to foot and horseback. Deer utilization goals for the subunit include wilderness viewing and providing opportunities for quality backcountry hunting. Management and utilization goals for the western dispersed area subunit are to improve and maintain herd productivity and provide opportunities for both hunting and nonhunting use of deer.

Future herd monitoring will be structured to measure attainment of both overall herd management goals as well as the respective subunit utilization goals. Comparatively, it is

expected that the eastern backcountry subunit will continue to exhibit higher buck-doe ratios, and the buck harvest age analysis should continue to indicate higher average age data than that observed in the western dispersed area subunit. Increasing herd productivity and maintaining a sustained yield harvest on the western dispersed area subunit should be reflected by the maintenance of a comparatively lower average age buck population and a lower buck to doe ratio. Nonconsumptive enjoyment of deer will often involve chance encounters between deer and the recreational visitor; this is in contrast to the directed efforts of the deer hunter. Increasing herd population density and maintaining long-term herd productivity will therefore enhance opportunities for deer viewing, photography, nature study, and increase the likelihood for deer encounters.

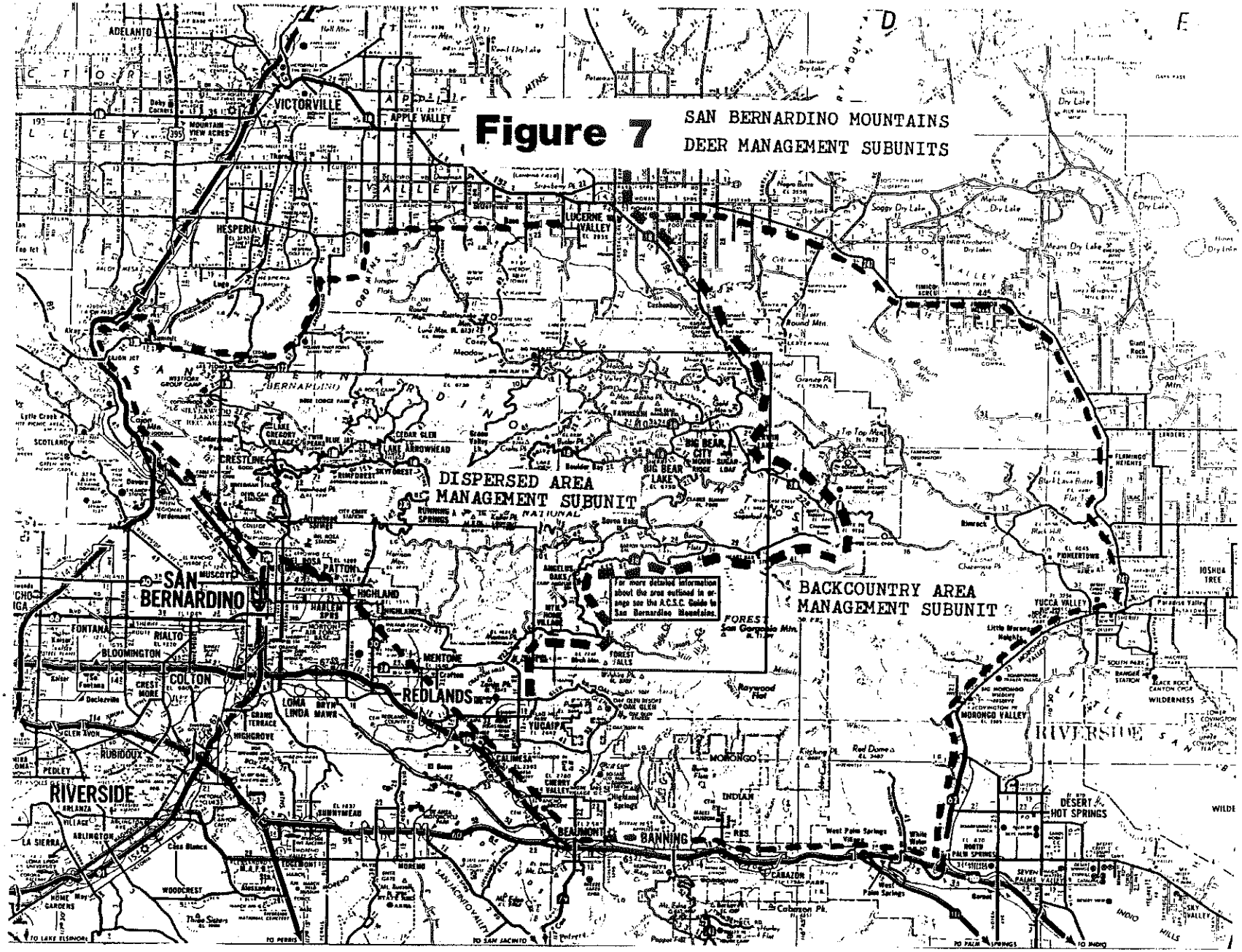


Figure 7
SAN BERNARDINO MOUNTAINS
DEER MANAGEMENT SUBUNITS
DISPERSED AREA
MANAGEMENT SUBUNIT
BACKCOUNTRY AREA
MANAGEMENT SUBUNIT
For more detailed information about the area outlined in orange see the A.C.S.C. Guide to San Bernardino Mountains.
ADELANTO
VICTORVILLE
APPLE VALLEY
HESPERIA
LUCERNE VALLEY
SAN BERNARDINO
CRESTLINE
LAKE ARROWHEAD
BIG BEAR CITY
BIG BEAR LAKE
RIALTO
FONTANA
COLTON
REDLANDS
YUCAIPA
CALIMESA
BEAUMONT
BANNING
MORONGO
INDIAN
RIVERSIDE
MORENO VALLEY
YUCCA VALLEY
DESERT HOT SPRINGS
PALM SPRINGS
CABAZON
SAN BERNARDINO NATIONAL FOREST

V. PROBLEMS AND CONSTRAINTS IN HERD MANAGEMENT

Population management of the San Bernardino Mountains deer herd is primarily the responsibility of the Department of Fish and Game. Biologically, both population management and land management are viewed as inseparable elements of a deer management program. Under ideal circumstances neither of these management elements are constrained or impeded by administrative or jurisdictional boundaries. It is important to recognize therefore that land management responsibilities for the public lands comprising the majority of the herd range are primarily administered by the San Bernardino National Forest (SBNF) and the Bureau of Land Management (BLM). Within the National Forest land management responsibilities are administered by four USFS Ranger Districts. Public lands ajoining the Forest boundary are administered by the BLM Barstow and Indio Resource Areas. For puposes of land use planning and review, private lands within the herd boundary are under the jurisdication of county and local governments. Therefore realistic as well as practical management of the San Bernardino Mountains deer herd requires a high degree of interagency as well as within agency cooperation and coordination.

Current recreational demands within the San Bernardino Mountains are diverse and are projected to increase substantially in the future. Urbanization within the range is presently considerable and is also projected to continue well into the future. Past planning and review of recreational proposals and urban related projects have often acknowledged detrimental impacts

to deer herd productivity. In large measure, however, individual projects and proposals have generally dismissed deer habitat impacts as representing only a incremental habitat loss resulting only in the displacement of deer to adjoining habitats. This approach is incorrect and has not recognized the considerable cumulative impact of the multitude of past projects and proposals on the deer herd. Addressing cumulative deer herd impacts in regional land use planning and review should thus receive a high priority in future deer herd management. Environmental review and planning for future projects should include adequate assessments of deer habitat impacts, consider project alternatives, and provide mitigation measures to avoid or reduce identified impacts to the deer resource.

Multiple use planning and environmental review on the National Forest and BLM public lands are conducted in accordance with the National Environmental Policy Act (NEPA). In a similar manner, environmental review involving state and private lands within the herd range are conducted by state, county, and local governments in accordance with the California Environmental Quality Act (CEQA). Present implementation of both these statutes is currently deficient with regard to deer management and requires improvement. Present NEPA implementation relies almost exclusively on the Environmental Assessment (EA) document; project Environmental Impact Statement (EIS) are seldom prepared. NEPA implementation relies almost exclusively on the EA document which is generally subject only to an in-house review by the preparatory agency. Opportunities for public and affected agencies to comment

on the adequacy of the document, to indicate deer management issues and concerns and, most importantly, to participate in the NEPA decision-making process are not generally included in the NEPA review. Current procedures implementing NEPA on the SBNF do not provide or generally include opportunity for DFG review and comment of NEPA documentation (EA's) prior to the circulation of the NEPA Decision Notice. This approach to interagency coordination requires review relative to the purpose and intent of NEPA (CEQ 1978). Future implementation of CEQA and NEPA needs to insure greater consideration of deer management issues and concerns in individual project proposals and regional land use decisions.

Maintenance and improvement of the existing deer resource in large measure involves the integration of deer habitat management with the full range of multiple uses and activities occurring in the San Bernardino Mountains. Grazing, ORV use, recreational developments, timber harvest, mining operations, water impoundments, and flood control improvements represent ongoing and potential deer management conflicts. Correcting or reducing existing habitat deficiencies or conflicts offers considerable opportunity to increase present habitat carrying capacity. Additional identification and mapping of key deer areas, corridors, and summer range fawning habitats are necessary for more effective deer management. Also considered an important management priority is the development of deer habitat management guidelines to avoid or reduce multiple use conflicts. It also is necessary to recognize that efforts to increase deer herd productivity by reducing poaching, disturbance on seasonal ranges,

roadway kills, predation, or potential disease factors, to be effective in the long-term, must procede in conjunction with actions to maintain and improve current habitat carrying capacity.

Greater emphasis on the importance of deer habitat quality is necessary, particularly with respect to the nutritional quality of forage and its effect on herd productivity. Chaparral vegetation comprises the major brushland community in the San Bernardino Mountains. Decades of increasingly efficient fire suppression have favored the expansion of old age class brushlands; replacing young seral chaparral stages which support a more abundant and diverse component of forbs and grasses as well as more abundant nutritious browse. In addition, the often expressed comment "cows graze, deer browse" is incorrect. Browse is certainly important to deer in winter and summer, particularly when new growth appears. Forbs and grasses appearing after autumn rains and during the winter/spring period, however, have been shown to be heavily utilized by deer, and the extent to which they are available has been correlated with herd productivity (Leach 1956). Efforts to reintroduce prescribed burning in the management of chaparral vegetation have increased in recent years and offer substantial opportunity to improve the productivity of chaparral deer ranges. Maintaining earlier serial vegetation stages beneficial to deer can also be accomplished in conjunction with timber and grazing programs. Efforts to achieve greater integration of deer management objectives with those of fire, range, and timber management currently are lacking and warrant greater consideration to achieve multiple resource benefits.

Public opinion and viewpoints regarding deer herd management are diverse. A segment of the public is opposed to hunting; others oppose the harvest of antlerless deer. Opinions on hunting season length and dates often elicit conflicting viewpoints which hinder effective management of the deer herd. Analysis of harvest data in the San Bernardino Mountains indicates that early seasons (September-October) generally serve to reduce the buck harvest when compared to the higher harvest of later seasons (November-December). Antlerless hunts have been controversial in the past; however, antlerless hunts are widely considered necessary if the management intent is to regulate the population within the bounds of habitat carrying capacity and maintain herd productivity. Selection of the appropriate harvest as well as the season dates and length should ideally be determined to obtain harvest objectives consistent with sound herd management. The hunting season must allow a carryover of bucks and does to guarantee herd reproduction, consider the condition of the deer at the time of harvest, and provide a favorable opportunity for recreational hunting success on a sustained basis. Increasing public confidence in deer management objectives and goals, encouraging communication, exchange of viewpoints, and resolving conflicts in a timely manner are necessary actions required for successful deer management.

Funding to implement deer management programs is limited and will require cooperative efforts to implement proposed deer management actions to the maximum extent practical. Department wildlife management and wildlife protection personnel are few in number. Cooperative programs with the San Bernardino National Forest and the Bureau of Land Management will be required to fully implement the herd plan.

VI. MANAGEMENT PROGRAMS, OBJECTIVES, RECOMMENDED PRESCRIPTIONS

A. INVENTORY AND INVESTIGATIVE ELEMENT

Objective

The objective of inventory and investigative programs are to collect and disseminate habitat and population data required to manage and monitor the condition and trend of the deer population. Population age structure monitoring of the harvest, and annual herd composition counts are intended to provide a basis for the determination of harvest objectives, recommendations for habitat management, and to provide a measure of the attainment of long-term deer herd goals. Additional investigative programs are recommended to document movement corridors, seasonal ranges, fawning areas, and key habitat components. These efforts are intended to provide public land managers and county land use planners necessary information regarding deer habitat requirements for use in project review and land use planning decisions. As habitat management programs and actions are implemented, initial actions should be monitored to determine deer population response. Monitoring initial mangement actions and programs is intended to provide justification for future actions, support modification or improvement of ongoing recommendations, and to assist in the eventual development of deer habitat management guidelines.

Recommended Prescriptions

1. Continue to conduct annual post-hunt herd composition counts to sample buck to doe ratios and fawn production and survival. Post-hunt composition counts should be conducted in November during the peak of breeding activity, and should be organized to monitor the population status of each management subunit.

2. Continue to monitor age structure of the buck harvest at appropriate intervals to examine population productivity, condition, and trend. The buck harvest age structure was sampled in 1983-85, the data obtained will provide the necessary baseline information to detect changes in population age structure, average age, and buck carryover.

3. Continue to prepare annual spot kill maps from deer tag returns to monitor harvest trends, and hunting pressure, and to assist in the identification of areas of high utilization, document potential land use and management conflicts, and aid in the maintenance of hunting quality.

4. Insure that population monitoring data collected is distributed to the San Bernardino National Forest and Bureau of Land Managment wildlife functions, and to Wildlife Protection personnel assigned to the deer herd unit.

5. Update and improve current information concerning winter and summer ranges, migration routes, movement corridors, and fawning areas. Habitat inventory efforts should include evaluation of meadow systems, riparian zones, oak resources, key water sources, and should include information relative to ownership, condition, current habitat deficiencies, and recommendations to correct habitat deficiencies.

6. Develop and coordinate research proposals to obtain improved understanding of deer use of seasonal ranges and migration corridors. Identify cooperative research funding support within the Department of Fish and Game, USFS, BLM, and County Fish and Game Commissions. Encourage and support university graduate level research participation directed at obtaining improved understanding of deer habitat use in the San Bernardino Mountains.

7. As additional deer habitat utilization information is developed (prescriptions 5 and 6), insure the information is distributed to public land management and county land use planning agencies for use in land use planning and review. Efforts should be directed towards the eventual development of a deer habitat map indicating the entirety of deer habitat components comprising the herd range.

8. The implementation of habitat improvement projects and management actions directed at increasing habitat carrying

capacity should include an evaluation of deer population response. Initial monitoring efforts may involve deer census, vegetation or pellet plot transects, or documentation of increased fawn production and survival. These evaluation efforts should be directed toward the eventual development of deer management guidelines for the management of key deer habitat components such as riparian zones, meadow habitats, oak resources, and fawning areas.

B. MORTALITY CONTROL ELEMENT

Objective

Reduce herd mortality factors to assist herd recovery and the attainment of herd management goals. Within the constraints of multiple use land management, maximize herd population level consistent with deer herd management goals. Implement mortality control efforts to the maximum extent practical in concert with management programs and actions directed at increasing range carrying capacity and improving habitat quality. Mortality reduction prescriptions relative to the maintenance of habitat quality and quantity as well as the reduction of illegal kill are addressed in the Habitat and Law Enforcement elements.

Recommended Prescriptions

1. Prior to consideration of measures to reduce herd mortality attributable to natural predators, determine the relationship of observed poor fawn production and/or survival

ownership. Project planning of prescribed burns to improve grazing, water yield, fire prevention, and increase recreational opportunity should include deer habitat management objectives relative to forage production and the maintenance of thermal and escape cover as a high project priority.

4. Cooperatively review the existing road network on the public lands within the herd boundary. Identify road system conflicts limiting deer habitat use, contributing to deer harassment, or degrading deer habitat components. Major emphasis should be placed on the identification of fawning habitat conflicts. Cooperatively develop for public land management agency consideration recommendations, including permanent or seasonal closures and selective rerouting, to improve deer habitat carrying capacity.

5. Review present and planned ORV regulations and designated ORV routes on the SBNF and BLM lands within the herd boundary. Cooperatively identify current conflicts with deer habitat management and develop recommendation for consideration to mitigate or correct identified deer habitat conflicts.

6. Cooperatively review present range allotments on public lands within the herd boundary. Identify areas of forage competition, impacts to riparain zones, or range practices resulting in reduced deer habitat carrying capacity.

Cooperatively develop recommendations to correct or reduce range management conflicts and to provide for greater integration and coordination of range and deer management objectives.

7. Cooperatively examine current fuelwood timber programs to determine management options to reduce deer management conflicts. Efforts should address the development of unauthorized roads, illegal cutting, impacts to oak resources, and loss of deer forage and cover values associated with fuelwood gathering. Consideration of management actions should include expansion of oak reforestation programs as well as the development of timber management practices compatible with deer habitat enhancement.

8. Continue and expand habitat enhancement and restoration projects. Primary emphasis should be placed on the stabilization of meadow systems, the enhancement of riparian zones, and the development of water sources to correct habitat deficiencies limiting deer use.

9. Improve interagency coordination in the review and planning of projects and land use proposals on public lands within the herd boundary in accordance with NEPA. Request that public land management agencies administering land within the herd boundary provide the Department of Fish and Game the

opportunity to review and comment on project proposals prior to the preparation of the project Environmental Assessment (EA). The issue of DFG review of NEPA documentation prior to the circulation of the NEPA Decision Notice requires additional coordination. Specific implementation procedures relative to DFG participation in the NEPA process will subsequently be developed and implemented by the DFG and SBNF (Reference: FSM 4/84 SIERRA NF SUPP).

10. Review San Bernardino County and Riverside County General Plans to determine effectiveness of present regional land use planning relative to the long-term maintenance of deer habitat values. Recommend actions and improvements to regional land use planning efforts to effect greater consideration of deer habitat requirements in the planning and development of private land within the herd boundary.

11. Improve interagency coordination relating to the review and planning of private land development proposals within the herd boundary in accordance with the California Environmental Quality Act (CEQA). Request that local and county land use planning agencies include notification to the Department of Fish and Game in the CEQA review of all future private land use proposals within the herd boundary.

12. Insure Department input in the environmental review of major recreational proposals, urban developments, and significant land use changes proposed within the herd boundary. Insure adequate consideration of direct and indirect impacts to deer habitat values, as well as participation in the development of potential project alternatives and the development of specific planning measures, to avoid or reduce detrimental impact to long-term deer management.

D. UTILIZATION ELEMENT

Objective:

The objective of the herd utilization element is to provide for a balance in programs for consumptive and non-consumptive use of the deer herd within the framework of herd population goals. Future deer harvest objectives will be directed towards the maintenance of a healthy productive herd, the maintenance of hunting quality, and are also intended to insure the availability of the deer resource for non-consumptive enjoyment.

Recommended Prescriptions:

1. Continue buck only hunting for the immediate future. Maintain a minimum post harvest buck to doe ratio of 20-30 bucks per 100 does. Regulate the length and timing of hunting seasons to maintain the desired buck ratio consistent with herd subunit management objectives. When supported by population monitoring data (buck/doe, fawn/doe ratios, herd

age structure and harvest trends) recommend limited antlerless hunts to enhance herd productivity, balance deer numbers with habitat capacity, and maintain hunting quality.

2. Maintain the present high buck/doe ratio in the Eastern Backcountry Management Subunit in conjunction with the existing wilderness administration and character associated with the majority of these lands. Emphasize management efforts in the Western Dispersed Area Subunit to increase herd size, productivity, and provide for sustained yield management.

3. Increase coordination with sportsmen organizations, archery groups and the deer hunting public in general to obtain input relative to deer herd utilization. Work directly with these deer user groups in development of hunting regulation proposals, to improve hunting opportunities, and maintain the quality of deer hunting.

4. Improve coordination with County Fish and Game commissions, local governments, and public land management agencies regarding shooting arms ordinances and current access restrictions. Cooperatively improve or modify present ordinances and restrictions consistant with public safety requirements, deer management goals, and the utilization of the deer resource. Insure that both the positive and negative impacts of projects and proposals affecting deer herd

utilization receive adequate consideration during planning and review procedures.

5. Review present public access opportunities and restrictions in cooperation with public land management agencies. Develop recommendations and potential road management alternatives to improve distribution of hunters, discourage road hunting, achieve desirable harvest objectives, and avoid detrimental impacts to deer habitat components.

6. Seek modification of the present San Bernardino County shooting arms ordinance to allow shooting of firearms for legal hunting in the eastern Backcountry Management Subunit. Currently a considerable segment of the Eastern Backcountry Subunit is closed to all shooting except shotguns firing shot shells. Also, request that the current restriction on the use of archery equipment for legal hunting of game be deleted from Section 22.011 Discharge of Firearms, County Ordinance Regulating Firearms.

7. Increase the awareness of various deer range user groups regarding herd management concerns and potential multiple use conflicts with deer management objectives. Insure that the public is informed regarding the purpose and justification for management actions or restrictions implemented to improve deer management. Develop additional interpretive information relating to the natural history of deer and deer habitat

requirements. Insure distribution to the public to increase awareness and improve non-consumptive enjoyment of the deer resource.

E. LAW ENFORCEMENT ELEMENT

Objective:

The objective of the law enforcment element is to reduce, to the maximum extent possible, the impacts of illegal activity on the deer herd. Reduction of poaching activity will aid in the recovery and long-term maintenance of the deer herd. A major emphasis will be directed at increasing public awarenes of the poaching problem, and at developing additional public awareness of the Department's law enforcement programs.

Recommended Prescriptions:

1. Initiate selective coordination of Fish and Game wardens to provide a more visible patrol presence within the San Bernardino Mountains and allow for staggering of work shifts to increase enforcement coverage.

2. Increase effectiveness and coordination of enforcement efforts by utilization of the Department's aircraft for both day and night patrols. Initiate selective enforcement concepts in areas of high illegal activity. Obtain additional enforcement equipment necessary to improve radio communications, improve night vision and patrol efforts, compile and distribute information relative to poaching activity, and increase effectiveness of undercover enforcement activities. Update training and provisions for field forensic evidence methodology.

3. Initiate cooperative cross-training of Class I peace officers, California Department of Forestry, SBNF and BLM enforcement personnel. Cross-training efforts will emphasize the recognition of deer violations, deer tag validation, and the coordination of law enforcement efforts.

4. Increase the promotion of hunter ethics and sportsmanship in Hunter Safety classes. Initiate contacts with sportsmen organizations, conservation groups, and the public regarding the CalTIP anti-poaching program and solicit citizen cooperation.

5. Increase public awareness of wildlife enforcement problems by developing press releases concerning poaching activity, the apprehension of poachers, and the ultimate court disposition of poaching violations. When necessary, consult with local judicial councils to gain appropriate and uniform enforcement of Fish and Game violations.

F. COMMUNICATION ELEMENT

Objective

The objective of the communication element is to keep all interested individuals and agencies informed concerning the status of the San Bernardino Mountains deer herd. Communication efforts will seek to inform the general public regarding the deer population status, management issues and concerns, and will encourage public involvement and input in the management of the deer herd.

Recommended Prescriptions

1. A summary of the herd management plan will be developed for public distribution.

2. A summary and explanation of herd population monitoring data will be continuously updated and distributed to interested publics, County Fish and Game commissions, the SBNF, and the BLM Indio and Barstow Resource Area offices.

3. A slide presentation will be developed addressing deer management issues and concerns, deer population dynamics, and management problems and potential solutions. The presentation will be used to develop additional avenues of communication with the public by encouraging both involvement and feedback concerning the management of the deer herd.

4. Additional press releases regarding the status of herd management programs, and deer related recreational opportunities will be developed to solicit public input and viewpoints.

G. REVIEW AND UPDATE

Objective

Annual review of the herd plan will allow regularly scheduled assessments of the progress towards implementation of the herd plan. Periodic updating of the plan is intended to

provide for the incorporation of newly acquired information, public input, and changes in management emphasis.

Recommended Prescriptions:

1. Continue to encourage public involvement and input in the deer management decision process and the implementation of the herd plan.

2. The Department, SBNF, BLM, and County Fish and Game commissions should annually review the progress of the herd plan. A summary of implementation progress, management issues and problems, and recommendations for future actions will subsequently be prepared and forwarded to participating agencies for review and to insure interagency coordination.

VII. MANAGEMENT ALTERNATIVES

A range of deer management alternatives were recognized during the development of the San Bernardino Mountains herd plan. Potential deer management alternatives examined are indicated below along with a brief rationale for rejecting the alternative in favor of the preferred deer management plan reported herein.

A. No Action:

The no action alternative would not comply with Department policy and the Legislative mandate to maintain a healthy deer population, to improve and maintain habitat to accommodate more deer, and to provide for high-quality hunting and other recreational uses of the deer resource. Under the no action alternative consideration of deer management in regional land use and multiple use planning and review would be minimized. Actions to improve deer habitat carrying capacity and recreational use of the deer resource would not be pursued. Additional decline of the deer population and the recreational use of the wildlife resource would be anticipated.

B. Close Hunting Season:

Some individuals, both hunters and nonhunters, have suggested closing the deer hunting season for a period of 1 to 5 years would allow the herd to recover. This alternative does not consider that deer population density from year to year is primarily dependent on

the quality and quantity of habitat available for deer use. Also, the harvestable surplus (number of deer in excess of habitat carrying capacity) the population normally produces each year would be lost to natural mortality in the absence of hunting. The closure would serve to increase the ratio of bucks to does in the population, but this likely would be at the expense of fawn production. In addition, it is likely that the harvest would appear improved upon reopening the hunting season. Subsequent harvest, however, would soon return to pre-closure levels due to the absence of change or increase in habitat carrying capacity. This alternative was thus rejected because it would unnecessarily reduce recreational use of the deer resource. More importantly, the alternative would serve to defer management actions addressing the maintenance and improvement of habitat carrying capacity.

C. Management for Maximum Sustained Yield:

Managing the deer herd for maximum sustained yield would require increasing herd productivity to the maximum extent possible and subsequently harvesting deer at a level approaching the annual recruitment rate. Maximum sustained yields would require annual harvest of both bucks and antlerless deer. In turn, this would require a high level of population management as well as a substantial land management commitment to achieve maximum productivity. To a great extent, deer management actions would predominate over other land management uses and activities. Such

an approach would not be consistent with multiple use land management policies governing public lands. In addition, the approach would de-emphasize non-hunting recreational use of the deer herd by maximizing hunter opportunities to the detriment of non-consumptive recreational use.

D. Management for Trophy Bucks:

Deer management for trophy bucks would require the maintenance of a high buck to doe ratios and the increasing of the average age of the buck population. Achievement of this objective would likely require limiting hunting opportunity or restricting the harvest of young bucks. Justification for deer management would be reconciled with the reduced level of recreational opportunity provided by this alternative. Considering the close association of the San Bernardino Mountains deer herd to the urban centers of Southern California management for trophy bucks can not be justified with the present high demand for recreational hunting. This approach would serve to facilitate alternating periods of high and low population densities marked by intervals of poor fawn production and survival.

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State of California — The Resources Agency

Memorandum

To : Wildlife Management Supervisor
Region 5

Date: September 29, 1986

From : Department of Fish and Game
Tom Paulek

Subject: San Bernardino Mountains Deer Herd Plan Update

The San Bernardino Mountains are included in Hunt Zone D-14, established for the 1983 deer season. Located in southwestern San Bernardino County, the majority of the herd range is included within the San Bernardino National Forest. Since the establishment of Zone D-14 in 1983, a hunter quota of 3,000 tags has been in effect. The 3,000 quota for tag sales has always been met, generally several months prior to the season opener. Hunter success has improved from approximately 4% in 1983 to 7% for 1984 and 1985. An extended split-season was in effect for the eastern herd area during the 1983 season; it was eliminated during the 1984 season and reestablished for the 1985 and 1986 deer seasons (see attachment).

The San Bernardino Mountains Deer Herd Plan proposes to manage the deer herd in accordance with substantially different population parameters indicated for two herd subpopulations. Historically, the eastern herd subpopulation has received light hunting pressure due to limited access and steep terrain. The herd goal for the eastern range is to maintain quality backcountry hunting. The subpopulation is characterized by high buck-to-doe ratios and the average age of bucks harvested has remained approximately 5 years old since 1983. Historically the western herd subpopulation has received greater hunting pressure and the buck/doe ratio as well as the average age of the buck harvest is substantilly lower than observed for the largely wilderness eastern herd range. The management goal for the western subpopulation is to increase herd productivity. Harvest trend and herd population data collected for the two herd subpopulations are indicated on the attachment.

Habitat improvement projects, "Hill Bill", were begun in 1984/85. These are planned as multi-year projects; the intent of which is to improve habitat productivity on the western herd range. Projects include prescribed burning in the Santa Ana River drainage and meadow restoration/protection and burning in the Cienega-Shay Mountain area. Additionally, water source improvements in the Granite Peak area are proposed for 1986 using County Fish and Game Commission funds.

Post-harvest herd composition counts and buck harvest age data will be collected in 1986. Herd composition count efforts in 1986 will concentrate in the western herd range and attempt to obtain a sample size of 200 animals. Depending on the results of monitoring data collected in 1985, management recommendations for the 1987 season could include adjusting the present hunter quota and/or eliminating the current split-season situation.

Other habitat improvement projects potentially affecting deer are listed below.

Project	Area Affected	Funding Source
1. Lone Pine Canyon	150 acres	Sikes Act
2. Road Closure Big Bear	10-12 miles	U.S.F.S.
3. Road Closure Arrowhead	5-10 miles	U.S.F.S.
4. Saddle Flats Fencing	75 acres meadow	U.S.F.S.
5. 2 Spring Developments	Pilot Rock Allotment	U.S.F.S.

Tom Paulek

Tom Paulek
Associate Wildlife Biologist
Region 5

cc: J. Davis
D. Yparraguirre

Attachment

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

SAN BERNARDINO MOUNTAINS (D-14)
BUCK HARVEST 1978-85

YEAR	SACRAMENTO REPORTED BUCK KILL	HUNTER QUOTA	SEASON WESTERN/EASTERN
* 1978-1982	245	none	
** 1983	112	3000	Oct 1-30 / Oct 1-Nov 20
1984	219	3000	Oct 13 - Nov 12
1985	219	3000	Oct 5-Nov 3/Oct 5-Nov 17

* 5 Year Average
** D-14 Established

BUCK HARVEST AGE ANALYSIS 1983 - 85
SAN BERNARDINO MOUNTAINS (D-14)

AVERAGE AGE OF SAMPLES (Entire Sample)

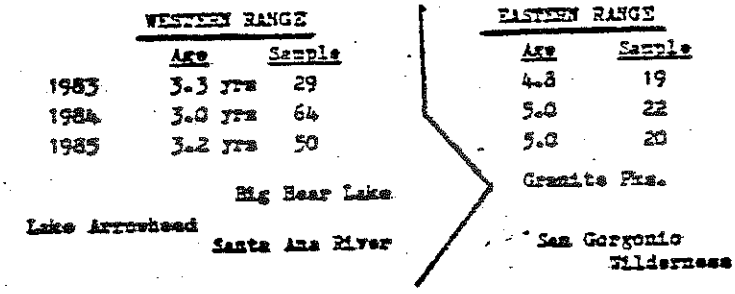
1983 : 3.9 Years — Sample Size : 48
1984 : 3.5 Years — Sample Size : 86
1985 : 3.7 Years — Sample Size : 70

AGE STRUCTURE OF HARVEST

	1 yr.	2 yrs.	3 yrs.	4+ yrs.	Sample
1983	15%	29%	19%	37%	48
1984	26%	31%	15%	28%	86
1985	23%	33%	16%	28%	70

AVERAGE AGE BY RANGE (Sample Breakdown)

	WESTERN RANGE Age	WESTERN RANGE Sample	EASTERN RANGE Age	EASTERN RANGE Sample
1983	3.3 yrs	29	4.8	19
1984	3.0 yrs	64	5.0	22
1985	3.2 yrs	50	5.0	20



SPOT KILL MAP RESULTS
* Number/(% Total Harvest)

	WESTERN RANGE	EASTERN RANGE	Sample
1983	58 (49%)	61 (51%)	119
1984	154 (72%)	59 (28%)	213
1985	140 (68%)	65 (32%)	205

* Deer Tag Returns To Unit Biologist

POST HARVEST COMPOSITION COUNTS
SAN BERNARDINO MOUNTAINS 1982-85

WESTERN RANGE (Primary Sample Area)

Year	Bucks	Does	Fawns	Sample
1982	13	100	34	129
1983	23	100	35	144
1984	24	100	40	102
1985	17	100	38	102

EASTERN RANGE (Helicopter Survey)

* Jan. 1985	47	Bucks/100	Antlerless	109
* Dec. 1985	71	100	12	142

* Whitewater-Mission Creek Winter Range

1987 DEER HERD PLAN UPDATE
SAN BERNARDINO MOUNTAINS DEER HERD

INTRODUCTION

The San Bernardino Mountains Deer Herd is included within Hunt Zone D 14. This zone, with a quota of 3,000, was established in 1983. The deer herd range is separated into two components: a western, intensively hunted portion and an eastern, less intensively utilized area characterized by steep terrain with little vehicle access. Overall goals for the herd are to achieve a herd size of 4,000 - 6,000 animals, maintain a fall buck:doe ratio of 20-30:100, fall fawn ratios of 25-60:100 does, and a reported harvest of 300 - 450 bucks. It is expected that buck:doe ratios will be higher on the eastern ranges, but fawn:doe ratios will be lower. The higher productivity on the western range should result in a lower age distribution from the buck harvest compared to the eastern range. The older bucks from the eastern range should be better trophies. Changes in harvest strategy and habitat improvement through prescribed burning of chaparral and the improvement of water distribution are the primary tools available to achieve the herd population parameter goals.

BIOLOGICAL INFORMATION

A. Buck Harvest

Year	Quota	Tag Sales	Harvest
1983	3,000	3,000	112
1984	3,000	3,000	219
1985	3,000	3,000	219
1986	3,000	3,000	223

B. Herd Composition Counts

	Bucks	Does	Fawns	Sample
Western Range (12/86)	35	100	26	263
Eastern Range (12/85)	71	100	12	142

C. Age Composition of the Buck Harvest

Year	Age, percent of sample				Sample
	1	2	3	4+	
1983	15	29	19	37	48
1984	26	31	15	28	86
1985	23	33	16	28	70
1986	20	33	19	28	89

Age Composition (average) by Range

Year	Western	Eastern
1983	3.3 yrs	4.8 yrs
1984	3.0	5.0
1985	3.2	5.0
1986	3.3	3.9

The decline in average age of bucks taken from the eastern range, combined with an increase in the percentage of the take from the eastern range (from about 30 percent to 40 percent) may be indicative of increasing hunter interest in this area of the herd. It will be important to monitor the age structure of the harvest and to conduct herd composition counts to determine if the herd population parameters are deviating from desired goals.

HABITAT IMPROVEMENT PROJECTS

Prescribed burning to rejuvenate chaparral was again used in 1987 near Cleghorn Ridge, Mile Creek, and the Cienega Larga areas. Water availability in the Granite Peaks area will be enhanced through drinkers funded by the San Bernardino County Fish and Game Commission. More prescribed burning funded through the Hill Bill is planned for other areas in the Santa Ana River watershed in 1988.

OTHER CHANGES TO THE DEER HERD PLAN

None recommended at this time.

te of California

Memorandum

J. DAVIS

To : Earl Lauppe
Wildlife Management Supervisor

Date December 16, 1988

From : **Department of Fish and Game**

Tom Paulek

Subject : San Bernardino Mountains Deer Herd Plan Update - 1988

I. Biological Information:

The San Bernardino Mountains deer herd is included in hunt zone D-14 established in 1983. The zone has a hunter quota of 3,000 tags; each year since established all tags have been issued well before the start of the hunt season. For the 1987 hunt, the zone had a split season for the western subpopulation and the eastern (East Highway 38) subpopulation. The respective rifle seasons were as follows: Western, October 3 - November 1 and Eastern October 3 - November 15 (1986 season: October 4 - November 2 and October 4 - November 16). On the basis of tag returns, a total of 184 bucks were taken during the 1987 season. The attachment provides a summary of previous post harvest composition counts, buck harvest age monitoring results, and harvest trends for the San Bernardino Mountains deer herd along with the results of herd monitoring obtained after the 1987 hunt season.

II. Habitat Improvement Projects

Hill Bill funding efforts were directed towards establishing a multi-year prescribed burning effort in the Santa Ana River drainage. The San Gorgonio Ranger District, SBNF initiated additional burning in the Mile Creek area and efforts to encourage long-term prescribed burning projects on large management areas are being pursued. Big game guzzlers were installed in the Cleghorn Ridge area (Arrowhead R.D.) and the Granite Peak area (Big Bear R.D.). The contract (Hill Bill) for a two-year deer habitat use study was advertised and filled with the University of Alasaka, Fairbanks (Terry Bowyer Ph.D., September 1988). We anticipate capturing and collaring 20 does in the Santa Ana River drainage winter range in January 1989.

III. Management Recommendations:

After the 1987 season, members of the public expressed concerns that the eastern subherd was experiencing high hunter pressure and the eastern zone quality was deteriorating (moving away from herd plan management objective). Monitoring of this subpopulation has indicated that both buck ratios and average age were declining and harvest levels had increased since establishment of D-14. The

Department subsequently recommended that the Commission eliminate the split season in zone D-14, and that the 1988 season run from October 8 to November 6, 1988. It is anticipated that this action will reduce the buck take in the eastern subherd, allow buck ratios and average age to increase, and aid in maintaining the eastern herd area as a quality back country hunt area. Hunter success and herd productivity in the western subunit remain static. The establishment of an antlerless hunt in the western subunit of D-14 warrants future consideration.

Tom Paulek

Tom Paulek
Associate Wildlife Biologist

TP:lp

Attachment

cc: J. Davis

HARVEST TREND

Year	Quota	Tag Sales	Harvest	Success
1983	3000	3000	112	4%
1984	3000	3000	219	7%
1985	3000	3000	219	7%
1986	3000	3000	223	7%
1987	3000	3000	184	6%

AGE CLASSES OF BUCKS HARVESTED

Year	1 yr	2 yr	3 yr	4 yr	Sample Size
1983	15%	29%	19%	37%	48
1984	26%	31%	15%	28%	86
1985	23%	33%	16%	28%	70
1986	20%	33%	19%	28%	89
1987	25%	34%	12%	29%	68

AVERAGE AGE
(Entire Zone)

Year	Age	Sample Size
1983	3.9 years	48
1984	3.5	86
1985	3.7	70
1986	3.5	89
1987	3.4	68

SPOT KILL MAP RESULTS
Number (% of Total Harvest)

Year	Western Ranges	Eastern Ranges	Sample
1983	58 (49%)	61 (51%)	119
1984	154 (72%)	59 (28%)	213
1985	140 (68%)	65 (32%)	205
1986	124 (60%)	84 (40%)	208
1987	96 (53%)	87 (47%)	183

AVERAGE AGE BY RANGE

Year	Western Ranges Age	Western Ranges Sample	Eastern Ranges [1] Age	Eastern Ranges [1] Sample
1983	3.3 yrs	29	4.8 yrs	19
1984	3.0	64	5.0	22
1985	3.2	50	5.0	20
1986	3.3	58	3.9	31
1987	3.4	38	3.4	30

[1] = Areas south and east of Highways 38 and 18.

POST HARVEST COMPOSITION COUNTS

	Bucks	Does	Fawns	Sample Size
Western Ranges				
Fall 1982	13	100	34	129
Fall 1983	23	100	35	144
Fall 1984	24	100	40	102
Fall 1985		100		
Fall 1986	35	100	26	263
Fall 1987	29	100	27	290
Eastern Ranges				
Winter 1984/85		47 Bucks per 100 antlerless		109
Winter 1985/86	71	100	12	142
Winter 1986/87		Not Done		
Winter 1987/88	36	100	29	152

1989 Deer Herd Management Plan Update

County: San Bernardino

A. Description of the Deer Herd Management Unit

1. Herd condition

Excellent Very Good Good Fair Poor Very Poor

a. Individual animal condition

Condition of animals is considered fair to good based on observation of harvested bucks and road-killed animals. Animals observed in general exhibited subcutaneous and/or abdominal cavity fat reserves indicative of good nutritional status.

b. Herd health

The San Bernardino Mountains deer herd is currently managed for a buck-only harvest. Hunting of the antlerless segment of the herd does not occur. This has resulted in a lower buck-to-doe ratio in the herd. Herd management objectives call for the maintenance of a post-harvest ratio of 20-30 bucks per 100 does in order to meet reproductive needs. Monitoring of buck population age structure, composition, and harvest trend indicate that this objective is being met under the current management program.

Monitoring of fall fawn production since 1982 has indicated a fawn-to-doe ratio of 25-40 fawns. This is viewed as poor fawn production, and is considered to be indicative of a herd at carrying capacity of the habitat. Based on the results to date of an ongoing deer herd study and past disease sampling, there is no indication that natural predation or disease are significant factors limiting this deer herd.

2. Population size

The 1957 buck harvest of over 800 animals represents the highest reported buck take recorded for the San Bernardino Mountains. There is little doubt that deer were substantially more abundant during the 1950's; it is also likely that the herd was in excess of the optimum population level. The early 1960's were a period of below average rainfall. In 1961, a year of severe drought, the deer population declined substantially.

For the period 1978 to 1982, the average reported buck take in the San Bernardino Mountains was 245. In 1983 the San Bernardino Mountains were placed in the newly established hunt zone D-14 and a quota of 3,000 hunters was established. Since 1985 an annual harvest of 180 to 220 has been maintained. This is substantially less than the harvest of the 1950's. This is consistent with a reduction in herd carrying capacity due to increasing urbanization, recreational activity, fire suppression, and other competing land uses, resulting in the current lower herd density. Herd management objectives call for the maintenance of a herd population of 4,000 to 6,000 animals.

3. Herd statistics

Table 1 summarizes herd harvest trends, age structure monitoring, and herd composition data.

4. Deer hunting

a. Past and current hunting strategies' effects on:

1. Deer numbers

Deer numbers are primarily a function of habitat quantity and quality. Buck-only hunting has minimal effect on herd size due to the polygynous breeding strategy of deer. Current maintenance of an adequate post-harvest buck-to-doe ratio insures fertilization of all estrous does.

2. Herd composition

The current buck-only harvest has served to reduce the buck-to-doe ratio. This is largely a function of hunting intensity; in general, higher hunting intensity results in a lower buck-to-doe ratio. Current management objectives for the herd call for maintaining a high buck-to-doe ratio and average age for the buck population in the eastern subherd unit. This approach is consistent with the maintenance of the area for high-quality back-country hunting opportunity. This contrasts with the western subherd unit management objective, which is to increase the western subherd (west of Highways 18 and 38) productivity. A lower buck ratio and average age are consistent with this management objective for the western subherd.

3. Herd health

Annual fawn production has ranged from 25-40 fawns per 100 does in the fall since 1982. This level of recruitment in addition to stable harvest levels is thought to indicate a population which has reached the carrying capacity of its range. In the absence of buck hunting, buck ratio would be expected to increase and fawn production would be expected to decrease to a lower level consistent with range carrying capacity. Future herd composition would reflect a more equal buck-to-doe ratio and lower recruitment of young animals into the population. The expected lower recruitment would increase the average age of the population, and further reduce population turnover/productivity. Currently herd population density is largely regulated by range carrying capacity, and the present practice of buck-only hunting is having minimal effect on herd density.

b. Future and proposed hunting strategies' effects on:

1. Deer numbers

Current management plans call for continuation of buck-only hunting for the San Bernardino deer herd for the foreseeable future. Antlerless hunting remains a management option when conditions warrant. Buck-only hunting tends to maintain or increase deer density when the herd is at or near carrying capacity, while antlerless hunting serves to reduce deer herd density below carrying capacity and increase herd productivity.

2. Herd composition

Current buck-only hunting will continue to result in an uneven sex ratio and limit herd fawn production. Future antlerless hunts could be utilized to adjust sex ratios and increase fawn production.

3. Herd health

Under current hunting strategies, herd health will continue to be largely a function of habitat quality rather than hunting. Antlerless hunting could be used in the future to reduce

deer numbers to compensate for a change in habitat carrying capacity, to maintain herd health, or to increase herd productivity (fawn production).

5. Illegal harvest

Poaching occurs throughout the year and is generally indiscriminate, affecting all sex and age classes. Poaching, the illegal take of deer, has not been fully documented in the San Bernardino Mountains. Local game wardens have estimated that the illegal kill approaches or exceeds the legal harvest each year. Herd monitoring accounts for poaching losses as well as hunting and other mortality factors. Currently, illegal harvest is not considered a primary limiting factor for the San Bernardino deer herd.

6. Other

Crippling loss occurs primarily during the legal hunting season. Previous studies have indicated that on the average, crippling loss is equal to 23% of the reported kill during either-sex hunts and 27% during buck-only hunts.

Deer mortality resulting from deer-vehicle collisions occurs predominantly along state and county highways providing access to the San Bernardino Mountains. Crippling loss and road kill mortality are also accounted for in the current herd monitoring program, and are not considered significant mortality factors.

B. Non-human Effects on Deer

1. Weather

a. Drought

Currently the San Bernardino deer herd is experiencing the third consecutive year of drought conditions. This has resulted in a reduction in available water and limited forage production. This has likely contributed to reduced recruitment of fawns into the yearling age class and lowered overall deer density. Drought serves to temporarily reduce range carrying capacity. Monitoring of herd harvest trends, buck harvest age structure, and herd composition to date does not indicate a need for change in the buck-only harvest strategy.

b. Early storms

The comparatively mild southern California climate of the San Bernardino Mountains and the resulting infrequency of severe prolonged snow fall, combined with deer mobility allowing migration to lower elevations, results in infrequent losses directly attributable to snow accumulation. Early winter snow accumulation at higher elevations will, however, result in the shift of the migratory component of the deer herd to lower elevations; when this coincides with the hunting season, increased hunting success can be expected. Current deer hunting season dates generally precede the onset of snowfall in the San Bernardino Mountains.

c. Mild winters

The season and quantity of precipitation with its resultant effect on forage production and water availability are considered major weather factors regulating the San Bernardino herd. Because of its relationship to forage production, seasonal precipitation pattern is considered a significant factor in determining the physical condition of deer throughout the year. Ultimately, annual precipitation is a major factor in herd reproduction.

2. Predators

Mountain lions and coyotes are considered the most significant predators acting upon the San Bernardino Mountains deer herd. Black bears, bobcats and possibly golden eagles may also take additional numbers of deer. The ratio of predators to prey within the herd is not considered excessive, and predators are not known to be unduly limiting the deer herd. Herd monitoring data collected to date indicates that predation does not excessively limit the deer herd.

3. Disease and parasitism

The occurrence of disease in the San Bernardino deer herd is not fully documented. Deer blood samples collected in 1988 indicated a general absence of disease in the herd, and disease is not considered a significant mortality factor. The potential for problems resulting from disease and/or parasites increases when deer occupy poor quality habitat, or when population densities are excessive.

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

1. Effects upon Species of Special Concern

a. Changes in local populations

It is not anticipated that deer hunting will adversely impact any known threatened, endangered, or sensitive species within the San Bernardino deer herd range.

b. Changes in regional and statewide populations

Not applicable.

2. Effects upon other wildlife species

a. Changes in local populations

Deer are a major prey item for a number of species, such as mountain lion, coyote, and black bear. Maintenance of a healthy and productive deer herd is necessary and beneficial to these predator species. Hunting is considered a management tool contributing to this objective. Buck-only hunting is not considered to significantly reduce deer numbers, and therefore is not anticipated to have a major effect on prey availability.

b. Changes in regional and statewide populations

None anticipated.

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

Hunting is not expected to result in changes in the health, condition, or age class structure of predator populations. Long-term hunting management relies upon the maintenance and utilization of an annual harvestable surplus of deer. The harvestable surplus is defined as those prey animals in excess of the needs of predator species. The impact of hunting on prey abundance is minimized due to buck-only hunting and restrictions on hunter activity (seasons, hunter quota, bag limit).

d. Changes in mortality factors

No changes in mortality factors for other wildlife species are anticipated (see "c" above).

3. Changes in public use/recreation

a. Hunting

None anticipated.

b. Nonconsumptive

None anticipated.

c. Nonhunting

None anticipated.

4. Effects upon human populations

a. Housing

Operation of a deer hunting season will not affect the stock of available housing.

b. Transportation

The presence of hunters during past seasons has not impacted the existing road system. The dispersed nature of hunting makes future impacts unlikely.

c. Public Services

The need for law enforcement will increase above normal levels during the deer hunt. However, much of this increased demand will be supplied by Wildlife Protection personnel. The increase will be temporary and will not adversely affect public safety.

d. Energy

The deer hunt will generate some additional trips to the National Forest by hunters. This will increase consumption of gasoline. The anticipated increase will be small relative to trips generated by other forms of mountain recreation such as skiing.

e. Human Health

No adverse impacts to public health are anticipated.

f. Aesthetics

Hunting activities are not expected to impact Forest aesthetics. Revenues generated by the sale of hunting licenses, deer tags, and hunting equipment contribute to the long-term conservation of the deer herd and its habitat.

g. Cultural Resources

No adverse impacts to cultural resources are anticipated.

D. Range Landownership

According to the San Bernardino Mountains Deer Herd Management Plan, the San Bernardino Mountains deer herd boundary encompasses an area of approximately 1,000 square miles. Approximately 80% of this land is in public ownership. The San Bernardino National Forest comprises approximately 63% of the deer range. The Bureau of Land Management (BLM) administers 14 % of the range; these lands are contiguous with the northeastern boundaries of the National Forest, and are part of the California Desert Conservation Area. The Morongo and San Manuel Indian Reservations account for approximately 3% of the deer range. State-owned lands surrounding the Lake Silverwood State Recreation Area and within the proposed Baldwin Lake Ecological Reserve are the only significant state holding within the deer herd range.

The remaining 20% of the deer herd range is in private ownership. The most significant private lands from the standpoint of deer herd management are the 70,000 acres of private inholdings within the National Forest. Most of these lands are associated with the urban communities of Crestline, Lake Arrowhead, Running Springs, and Big Bear Lake.

No significant changes in this pattern of land ownership are anticipated.

E. Range Vegetation

Man-induced changes as well as biotic changes continually modify the capability of the habitat to support deer. Losses of vegetative cover due to urbanization, recreational use, and livestock grazing are among the more obvious man-induced changes acting upon the deer range. Plant succession, the maturation of the plant community towards a climax condition, is perhaps the most prominent biotic factor acting to change deer range carrying capacity. It is important to note that the most prominent vegetative cover of the San Bernardino National Forest is chaparral vegetation or related types. Over the last several

decades advances in wildfire suppression techniques have served to reduce the ecological role of fire, particularly in chaparral climax communities. Effective fire suppression tends to promote extensive areas of decadent vegetation, resulting in reduced forage productivity and nutrient quality, as well as reduced water availability. The decreased amount of acreage in California subject to wildfires or prescribed burning is considered to be a major factor contributing to a reduction in deer herd carrying capacity. Currently there is a need to increase the use of prescribed burning to rejuvenate decadent chaparral stands and improve habitat for deer. There is also a need to place greater management emphasis on improving habitat quality, and to provide greater consideration of deer habitat requirements in land use planning.

Table 1. Herd statistics for San Bernardino Mountains deer herd.

YEAR	SEASON		HARVEST TREND			
	Western	Eastern	Quota	Tag sales	Total harvest	Success
1983	10/1 - 10/30	10/1 - 11/20	3000	3000	112	4%
1984	10/13 - 11/12	10/13 - 11/12	3000	3000	219	7%
1985	10/5 - 11/3	10/5 - 11/17	3000	3000	219	7%
1986	10/4 - 11/2	10/4 - 11/16	3000	3000	223	7%
1987	10/3 - 11/1	10/3 - 11/15	3000	3000	184	6%
1988	10/8 - 11/6	10/8 - 11/6	3000	3000	181	6%

YEAR	BUCK AGE CLASS					AVG. AGE (Entire zone)	
	1 yr.	2 yr.	3 yr.	4 yr.	Sample	Age	Sample
1983	15%	29%	19%	37%	48	3.9	48
1984	26%	31%	15%	28%	86	3.5	86
1985	23%	33%	16%	28%	70	3.7	70
1986	20%	33%	19%	28%	89	3.5	89
1987	25%	34%	12%	29%	68	3.4	68
1988	7%	39%	26%	28%	61	3.3	61

SPOT KILL MAP RESULTS

	Western ranges		Eastern ranges		Sample
Year	Number	% total	Number	% total	
1983	58	49%	61	51%	119
1984	154	72%	59	28%	213
1985	140	68%	65	32%	205
1986	124	60%	84	40%	208
1987	96	53%	87	47%	183
1988	137	76%	44	24%	181

AVERAGE AGE BY RANGE

	Western ranges		Eastern ranges	
Year	Age	Sample	Age	Sample
1983	3.3	29	4.8	19
1984	3.0	64	5.0	22
1985	3.2	50	5.0	20
1986	3.3	58	3.9	31
1987	3.4	38	3.4	30
1988	3.4	44	3.0	17

POST-HARVEST COMPOSITION (Ratio)

	Western ranges				Eastern ranges			
Year	Bucks	Does	Fawns	Sample	Bucks	Does	Fawns	Sample
1982	13	100	34	129	----------not done----------			
1983	23	100	35	144	----------not done----------			
1984	24	100	40	102	47	100 (antlerless)		109
1985	--------not done---------				71	100	12	142
1986	35	100	26	263	----------not done----------			
1987	29	100	27	290	36	100	29	152
1988	17	100	24	260	44	100	35	127

THE SAN BERNARDINO MOUNTAINS DEER HERD MANAGEMENT PLAN
1990 UPDATE

County: San Bernardino

A. Description of the Deer Herd Management Unit

1. Herd Condition

Excellent Very Good Good Fair Poor Very Poor

a. Individual animal condition

Condition of animals is considered fair. Inspection of harvested bucks and one doe collected in December indicated low levels of subcutaneous fat. Lower mandibles were collected from 11 animals and will be analyzed for fat content.

b. Herd health

Fall composition counts have indicated low fawn production in this herd since 1982. Counts have ranged from 22-40 fawns per 100 does. This may reflect a shortage of high-quality fawning habitat in the San Bernardino Mountains. The meadow and riparian habitats normally considered good fawning habitat are subject to pressure from other uses such as grazing and recreation. The negative effects of the extended drought on forage quality and water availability may also be a factor.

No information is available on age structure of the antlerless segment of this herd. An attempt to collect does in December 1990 was unsuccessful. Given the low rate of fawn production and the absence of antlerless hunting, average age of the antlerless segment is expected to be higher than for bucks.

2. Population Size

The 1957 buck harvest of over 800 animals represents the highest reported buck take recorded for the San Bernardino Mountains. There is little doubt that deer were substantially more abundant during the 1950s; it is also likely that the herd was in excess of the optimum population level. The early 1960s were a period of below average rainfall. In 1961, a year of severe drought, the deer population declined substantially.

For the period 1978 to 1982, the average reported buck harvest in the San Bernardino Mountains was 245. In 1983 the San Bernardino Mountains were placed in the newly established hunt zone D-14 and a quota of 3,000 hunters was set. Since 1985 an annual harvest of 180 to 220 has been maintained. This is

substantially less than the harvest of the 1950s. This is consistent with a reduction in herd carrying capacity due to increasing urbanization, recreational activity, fire suppression, and other competing land uses, resulting in the current lower herd density.

Composition counts completed in December 1990 indicated that both total number of deer and number of deer per survey hour were significantly lower than for other years in which helicopter surveys have been done. Returns of incisor samples from harvested bucks are also lower than in past years, which may indicate a lower than normal harvest. It appears that herd numbers may be declining. If this reduction is genuine, it is probably the result of several years of poor fawn production due to declining habitat quality resulting from the drought and pressure from other land uses. The herd range does not show obvious signs of overuse, indicating that range capacity may not be the only factor limiting this deer herd.

3. Herd Statistics

Table 1 summarizes herd harvest trends, age structure monitoring, and herd composition data.

4. Range Landownership

According to the San Bernardino Mountains Deer Herd Management Plan, the deer herd boundary encompasses an area of approximately 1,000 square miles. Approximately 80% of this land is in public ownership. The San Bernardino National Forest (SBNF) comprises approximately 63% of the herd range. The Bureau of Land Management (BLM) administers 14% of the range; these lands are contiguous with the northeastern boundaries of the SBNF, and are part of the California Desert Conservation Area. The Morongo and San Manuel Indian Reservations account for approximately 3% of the herd range. State-owned lands surrounding the Lake Silverwood State Recreation Area and within the Baldwin Lake Ecological Reserve are the only significant state holdings within the herd range.

The remaining 20% of the deer herd range is in private ownership. The most significant private lands from the standpoint of deer herd management are the 70,000 acres of private inholdings within the SBNF. Most of these lands are associated with the urban communities of Crestline, Lake Arrowhead, Running Springs, and Big Bear Lake.

No significant changes in this pattern of land ownership are anticipated.

5. Range Vegetation

a. Fire

There has not been an intensive program of prescribed burning in the San Bernardino Mountains, and no significant wildfires in the past two years. Limited portions of the range appear to have burned within the past several years, and show regeneration of chaparral species.

b. Livestock Grazing

Cattle grazing on the SBNF has not been of sufficiently high intensity to cause significant changes in vegetation. Any reduction in deer numbers due to grazing would be the result of competition for forbs and grasses. Ranges generally appear to be in good condition.

c. Logging

There is no significant commercial timber harvest on the SBNF. Firewood sales are planned with wildlife input from Forest biologists and the Department, and are designed to thin decadent stands.

d. Drought

Southern California is currently entering its fifth consecutive year of drought. The most visible effect on vegetation is a failure of disturbed areas to recover. Areas such as fuel breaks which would normally produce young chaparral are converting to annual grassland. Production of forbs and new shoots is also restricted, and the nutrient content of available forage declines under drought conditions.

B. Major Factors Affecting the Deer Population

1. Human Factors

a. Subdivision and Development

New development in the mountains is confined to existing communities, with little or no expansion beyond present boundaries. Of greater concern is the expansion of foothill development up to SBNF boundaries. This restricts the area of winter habitat available to deer and increases the probability of depredation complaints.

b. Grazing

Grazing on the SBNF has undoubtedly reduced the

carrying capacity for deer to some extent. Allotment management plans are written to include deer in the allotted Animal Unit Months (AUMs). These plans need to be reviewed and adjusted annually to respond to changes in range capacity. Ranges do not presently show signs of overuse.

c. Logging

Current logging practices on the SBNF may be advantageous to the deer herd by creating openings and encouraging the growth of forbs and grasses. No changes in current timber harvest levels are anticipated.

d. Fire and Fire Suppression

Fire suppression has led to the development of large expanses of decadent chaparral on much of the SBNF. This vegetation is of low value to deer. The situation could be improved by appropriate use of prescribed burning to create openings and stimulate the growth of younger, more nutritious forage. Two ranger districts in the San Bernardino Mountains have attempted to develop burn programs, but with little success to date. Weather conditions have blocked burning during most of this year.

Prescribed burning may become impractical in the near future due to the actions of the U.S. Fish and Wildlife Service. The Service has begun to more stringently enforce the provisions of the Migratory Bird Treaty Act. Such enforcement would delay burning until September, when fire danger is too high to allow safe burning. Unless this issue can be resolved with the Service, other (less cost-effective) methods will need to be used to rejuvenate chaparral stands.

e. Recreation

The SBNF is considered primarily a recreational forest due to its proximity to southern California's major population centers. Recreation facilities on the SBNF are generally sited in areas of woodland and conifer stands. Five ski areas presently operate in the San Bernardino Mountains. Substantial expansion of these areas is planned for the next decade, and the Forest Service is actively encouraging summer use of the ski areas. Other developed recreational uses include summer homes, lodges, and camps.

Dispersed recreation on the SBNF has been increasing, and this trend is expected to continue. Popular dispersed activities include hiking, snow play, cross-country skiing, remote camping, horseback riding, recreational shooting, and off-highway vehicle (OHV) use. Recreational demand for all

activities combined is projected to increase to over 10 million visitor days per year by 2030.

This heavy use is undoubtedly detrimental to the deer herd, although the level of impact cannot be quantified. Developed recreational facilities directly eliminate habitat, often in crucial areas such as meadows. Summer activity on ski areas will reduce or preclude deer use of these areas, which are currently known to provide summer habitat. Dispersed recreation increases the potential for disturbance of deer and their possible exclusion from vital fawning areas. OHV activity has a particularly high potential for disturbance as well as habitat destruction.

f. Deer Hunting

1. Past and Current Hunting Strategies' Effects on:

a. Deer numbers

Deer numbers are primarily a function of habitat quantity and quality. The current buck-only hunting strategy has minimal effect on herd size due to the polygynous breeding patterns of deer. Maintenance of an adequate post-harvest buck to doe ratio (20-30 bucks per 100 does) will insure fertilization of all estrous does. The existing hunter quota of 3,000 has resulted in maintenance of an adequate buck to doe ratio. The apparent decline in numbers in this herd is due to poor fawn survival rather than excessive harvest.

b. Herd composition

Buck-only harvest reduces the buck to doe ratio below the 1:1 that would be expected without hunting. The degree of reduction is largely a function of hunting intensity. The 1986 Deer Herd Management Plan divides the herd into two subunits (Figure 1) with different management objectives. The objective in the eastern subunit is to maintain a high ratio of bucks to does and a high average buck age in order to provide a high-quality backcountry hunting experience. The objective in the western subunit is to increase productivity and harvest levels. If these goals were met, the buck to doe ratio and average age of bucks would be lower in the western subunit. Instead, average age and buck to doe ratio in the eastern subunit, which were higher in 1985, have declined to the same level as the western subunit.

c. Herd health

Under current hunting strategies, herd health will continue to be primarily a function of habitat quality rather than hunting. The present state of the herd does not appear to warrant a change in hunting strategy.

2. Future and Proposed Hunting Strategies' Effects on:

a. Deer numbers

Current management plans call for continuation of buck-only hunting for the foreseeable future. Antlerless hunting remains a management option if warranted by conditions. This would occur if the herd reached or exceeded the carrying capacity of its range.

b. Herd composition

Buck-only hunting will continue to result in an uneven sex ratio. If range capacity was limiting the herd, antlerless hunting would reduce density and increase fawn production.

c. Herd health

The maintenance of current hunting strategy will have little effect on herd health, which will continue to be more affected by habitat quality.

g. Illegal Harvest

Poaching occurs throughout the year and is generally indiscriminate, affecting all sex and age classes. Poaching, the illegal take of deer, has not been fully documented in the San Bernardino Mountains. Local game wardens have estimated that the illegal kill approaches or exceeds the legal harvest each year. Herd monitoring accounts for poaching losses as well as hunting and other mortality factors. Currently, illegal harvest is not considered a primary limiting factor for this herd.

h. Other

Crippling loss occurs primarily during the legal hunting season. Previous studies have indicated that on the average, crippling loss is equal to 23% of the reported kill during either-sex hunts and 27% during buck-only hunts.

Deer mortality resulting from deer-vehicle collisions

occurs predominantly along state and county highways providing access to the San Bernardino Mountains. Crippling loss and road kill mortality are also accounted for in the current herd monitoring program, and are not considered significant mortality factors.

2. Non-human Effects on Deer

a. Weather

1. Drought

Currently southern California is entering its fifth consecutive year of drought. This has resulted in a reduction in available water and limited forage production. This has likely contributed to reduced recruitment of fawns into the yearling age class and lowered overall deer density. Drought serves to temporarily reduce range carrying capacity. Monitoring of herd harvest trends, buck harvest age structure, and herd composition to date does not indicate a need for change in the buck-only hunting strategy.

2. Early Storms

The comparatively mild climate of the San Bernardino Mountains and the resulting infrequency of severe prolonged snow fall, combined with deer mobility allowing migration to lower elevations, results in infrequent losses directly attributable to snow accumulation. Early winter snow accumulation at higher elevations will, however, result in the shift of the migratory component of the deer herd to lower elevations; if this coincided with the hunting season, increased hunting success could be expected. Current deer hunting season dates generally precede the onset of snowfall in the San Bernardino Mountains.

3. Mild Winters

The season and quantity of precipitation with its resultant effect on forage production and water availability are considered major weather factors regulating the SAn Bernardino herd. Because of its relationship to forage production, seasonal precipitation pattern is considered a significant factor in determining the physical condition of deer throughout the year. Ultimately, annual precipitation is a major factor in herd reproduction.

b. Predators

Mountain lions and coyotes are considered the most significant predators acting upon the San Bernardino Mountains deer herd. Of a total of 29 deer collared for a radiotelemetry study in the Santa Ana River drainage, two are known to have been taken by mountain lions. An additional four mortalities were classed as "cause unknown"; some of these may have been due to predation. Coyotes had at least scavenged on several of these carcasses. Black bears and bobcats may also take additional numbers of deer. The ratio of predators to prey within the herd is not considered excessive, and predators are not known to be unduly limiting the deer herd.

c. Disease and Parasitism

The occurrence of disease in the San Bernardino deer herd is not fully documented. Deer blood samples collected in 1988 indicated a general absence of disease in the herd, and disease is not considered a significant mortality factor. The potential for problems resulting from disease and/or parasites increases when deer occupy poor quality habitat, or when population densities are excessive.

C. Effects of Current Deer Hunting and Proposed Hunting Strategies

1. Effects upon Species of Special Concern

a. Changes in local populations

It is not anticipated that deer hunting will adversely impact any known threatened, endangered, or sensitive species within the San Bernardino deer herd range.

b. Changes in regional and statewide populations

None anticipated or probable.

2. Effects upon Other Wildlife Species

a. Changes in local populations

Deer are a major prey item for a number of species, such as mountain lion, coyote, and black bear. Maintenance of a healthy and productive deer herd is necessary and beneficial to these predator species. Hunting is considered a management tool contributing to this objective. Buck-only hunting is not considered to significantly reduce deer numbers, and therefore is not anticipated to have a major effect on prey availability.

b. Changes in regional and state populations

None anticipated or probable.

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

Hunting is not expected to result in changes in the health, condition, or age class structure of predator populations. Long-term hunting management relies upon the maintenance and utilization of an annual harvestable surplus of deer. The harvestable surplus is defined as those prey animals in excess of the needs of predator species. The impact of hunting on prey abundance is minimized due to buck-only hunting and restrictions on hunter activity (seasons, hunter quota, bag limit).

d. Changes in mortality factors

No changes in mortality factors for other wildlife species are anticipated (see "c" above).

3. Changes in Public Use/Recreation

a. Hunting

None anticipated.

b. Nonconsumptive

None anticipated. Measures taken to maintain a healthy deer population also provide viewing opportunities for nonconsumptive users.

c. Nonhunting

None anticipated (see "b" above).

4. Effects Upon Human Population

a. Housing

Operation of a deer hunting season will not affect the stock of available housing.

b. Transportation/Circulation

The presence of hunters during past seasons has not impacted the existing road system. The dispersed nature of hunting makes future impacts unlikely.

c. Public services

The need for law enforcement will increase above normal

levels during the deer hunt. However, much of this increased demand will be supplied by Wildlife Protection personnel. The increase will be temporary and will not adversely affect police response time or public safety.

d. Energy

The deer hunt will generate some additional trips to the SBNF by hunters. This will increase consumption of gasoline. The anticipated increase will be small relative to trips generated by other forms of mountain recreation such as skiing.

e. Human health

No adverse impacts to public health are anticipated.

f. Aesthetics

Hunting activities are not expected to impact Forest aesthetics. Revenues generated by the sale of hunting licenses, deer tags, and hunting equipment contribute to the long-term conservation of the deer herd and its habitat.

g. Cultural resources

No adverse impacts to cultural resources are anticipated.

Table 1. Herd statistics for San Bernardino Mountains deer herd.

HARVEST TREND

Year	Season		Quota	Tag Sales	Total Harvest	Success Rate
	Western	Eastern				
1986	10/4 - 11/2	10/4 - 11/16	3000	3000	223	7%
1987	10/3 - 11/1	10/3 - 11/15	3000	3000	184	6%
1988	10/8 - 11/6	10/8 - 11/6	3000	3000	181	6%
1989	10/14 - 11/12	10/14 - 11/12	3000	3000	209	7%

BUCK AGE CLASS

AVERAGE AGE (Entire zone)

Year	1 yr.	2 yr.	3 yr.	4 yr.	Sample	Age	Sample
1986	20%	33%	19%	28%	89	3.5	89
1987	25%	34%	12%	29%	68	3.4	68
1988	7%	39%	26%	28%	61	3.3	61
1989	6%	24%	26%	44%	62	4.1	62

SPOT KILL MAP RESULTS

Year	Western ranges		Eastern ranges		Sample
	Number	% Total	Number	% Total	
1986	124	60%	84	40%	208
1987	96	53%	87	47%	183
1988	137	76%	44	24%	181
1989	141	68%	66	32%	209

AVERAGE AGE BY RANGE

Year	Western ranges		Eastern ranges	
	Age	Sample	Age	Sample
1986	3.3	58	3.9	31
1987	3.4	38	3.4	30
1988	3.9	44	3.5	17
1989	4.1	52	4.3	10

POST-HARVEST COMPOSITION RATIOS

Year	Western ranges				Eastern ranges			
	Bucks	Does	Fawns	Sample	Bucks	Does	Fawns	Sample
1986	35	100	26	263	----------not done----------			
1987	29	100	27	290	36	100	29	152
1988	17	100	24	260	44	100	35	127
1989	-------not done----------				----------not done----------			
1990	27	100	26	184	24	100	16	91

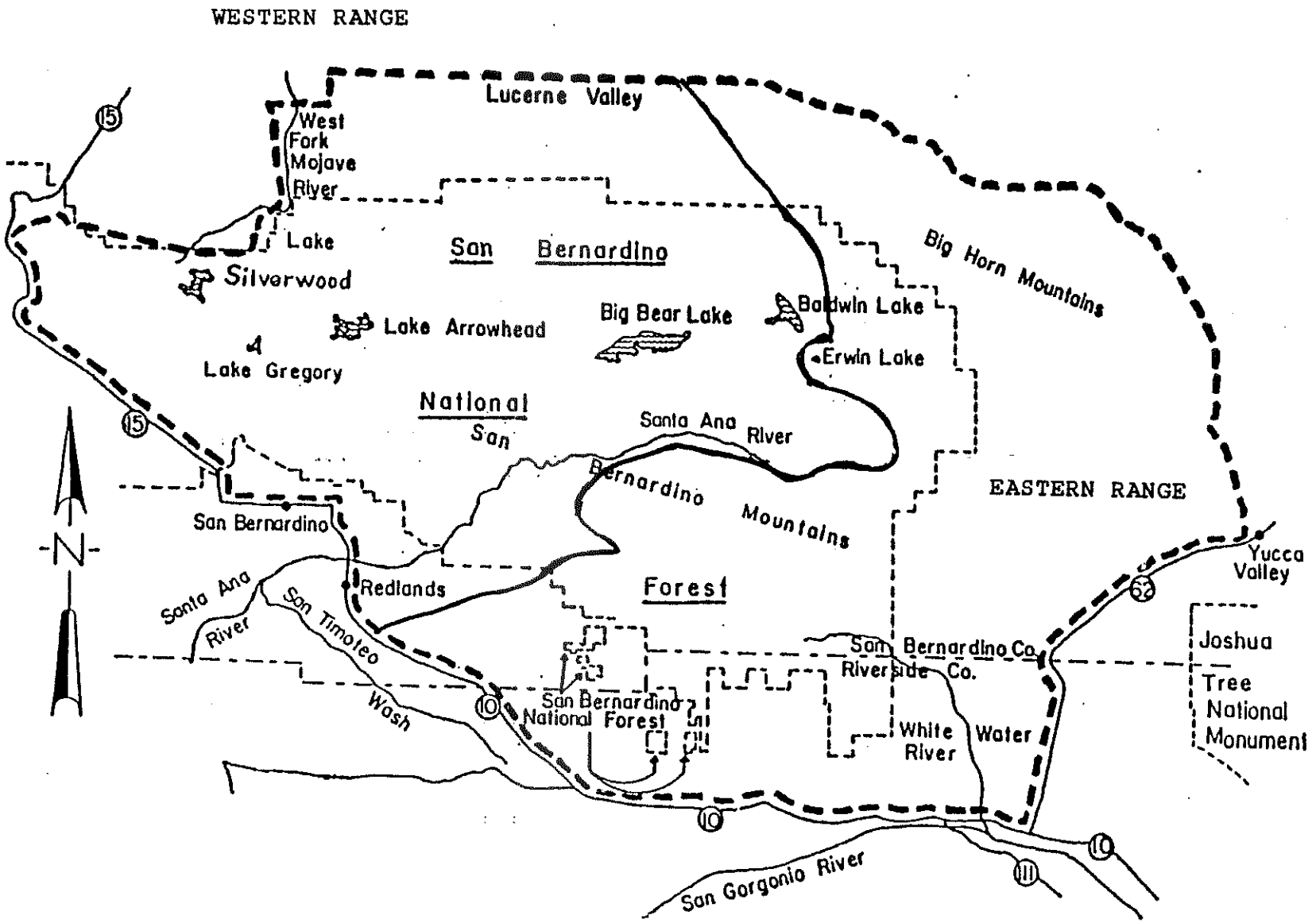


Figure 1. San Bernardino Mtns. deer herd range

SAN BERNARDINO MTS. DEER HERD PLAN
Annual Update

July 17, 1990

Summary

Hunter pressure and success for this herd have remained virtually constant since 1984. Tag sales have reached the quota of 3000 every year since 1983. Harvest levels have been consistently near 200 for the same period. This herd has been managed as two distinct subunits, with differing objectives. The eastern subunit incorporates ranges east of Highway 38, including the San Gorgonio Wilderness. Objectives for this subunit have been to maintain a high-quality backcountry hunting experience, with lower numbers of hunters and a higher ratio of bucks. The western subunit includes the rest of the San Bernardino Mountains east of Interstate 15. Objectives for this subunit include high harvest levels and high productivity. These objectives have not been met; herd statistics indicate that buck ratios and average ages for the two subunits are converging. Hunt seasons for both subunits have been identical for the past two years, with an open season of approximately 30 days timed to precede the peak of rutting activity. In past years, the eastern subunit remained open for two weeks or more after the western subunit closed. This presumably resulted in increased pressure on the eastern subunit, as unsuccessful hunters concentrated there after closure of the western subunit. These changes in season are reflected in the relative proportions of bucks taken on the eastern and western subunits.

1. Biological Information

Average age continues to rise slowly, while recruitment into the yearling class has been low for the past two years. Further evidence of low productivity comes from the low number of fawns recorded for does in the Santa Ana River telemetry study. The low percentage of yearlings in the harvest may be partly due to depression of antler development resulting from poor range conditions related to the drought. However, the 1988 drop in yearlings was followed in 1989 by a decline in the 2-year-old class, indicating an actual reduction in the size of that cohort relative to previous years. Representation of older age classes (3.5 years and up) has increased, comprising more than 50% of the harvest in 1988 and 1989. These changes in population age structure combined with an apparently steady population size (as evidenced by consistent hunting pressure and harvest levels) indicate that the herd is at or very near the carrying capacity of its range.

Herd composition counts indicate buck-to-doe ratios consistent with the herd plan goal of 20-30 bucks per 100 does. The eastern subunit has a higher ratio than the western subunit, although it

has declined significantly since 1985. Fawn ratios for both subunits are well below the herd objective of 50-60 fawns per 100 does, indicating low productivity. This is probably due to a combination of poor forage conditions related to the drought and underutilization of adult animals. Composition counts will be done again this fall to obtain current information.

II. Habitat Improvement Projects

Habitat improvement planning for this herd has been done on a year-by-year basis, and few of the projects which have been proposed have actually been carried out. This has been partly due to recent turnover of personnel on all four Ranger Districts in this zone. The districts involved should be encouraged to develop long-range plans similar to the San Jacinto District's ten-year plan. This has been highly effective in accomplishing habitat improvements in Zone D-16.

Year	Project	Type	Vegetation	Acres	Funding
1988	Cleghorn Ridge	Guzzlers	Chaparral	----	Hill Bill

III. Changes to the San Bernardino Deer Herd Plan

None recommended at this time.

Prepared by:

Jeannine M. DeWald
Wildlife Biologist

HARVEST TREND

Year	Season Western	Season Eastern	Quota	Tag sales	Harvest	Success
1978-82	----------	----------			*245	
1983	10/1 - 10/30	10/1 - 11/20	3000	3000	112	4%
1984	10/13 - 11/12	10/13 - 11/12	3000	3000	219	7%
#1985	10/5 - 11/3	10/5 - 11/17	3000	3000	219	7%
1986	10/4 - 11/2	10/4 - 11/16	3000	3000	223	7%
1987	10/3 - 11/1	10/3 - 11/15	3000	3000	184	6%
1988	10/8 - 11/6	10/8 - 11/6	3000	3000	181	6%
1989	10/14 - 11/12	10/14 - 11/12	3000	3000	209	7%

* Mean harvest over 5-year period 1978-82
\# Zone D-14 established

BUCK HARVEST AGE CLASSES

Year	1 yr.	2 yr.	3 yr.	4 yr.	Sample
1983	15%	29%	19%	37%	48
1984	26%	31%	15%	28%	86
1985	23%	33%	16%	28%	70
1986	20%	33%	19%	28%	89
1987	25%	34%	12%	29%	68
1988	7%	39%	26%	28%	61
1989	6%	24%	26%	44%	62

AVERAGE AGE

Year	Age (yrs.)	Sample
1983	3.9	48
1984	3.5	86
1985	3.7	70
1986	3.5	89
1987	3.4	68
1988	3.8	61
1989	4.1	62

SPOT KILL MAP RESULTS

Year	Western ranges Number	Western ranges % total	Eastern ranges Number	Eastern ranges % total	Sample
1983	58	49%	61	51%	119
1984	154	72%	59	28%	213
1985	140	68%	65	32%	205
1986	124	60%	84	40%	208
1987	96	53%	87	47%	183
1988	137	76%	44	24%	181
1989	141	68%	66	32%	209

AVERAGE AGE BY RANGE

Year	Western ranges Age (yrs.)	Western ranges Sample	Eastern ranges Age (yrs.)	Eastern ranges Sample
1983	3.3	29	4.8	19
1984	3.0	64	5.0	22
1985	3.2	50	5.0	20
1986	3.3	58	3.9	31
1987	3.4	38	3.4	30
1988	3.9	44	3.5	17
1989	4.1	52	4.3	10

POST-HARVEST COMPOSITION COUNT
(Ratio per 100 does)

	Year	Bucks	Does	Fawns	Sample
Western ranges	1982	13	100	34	129
	1983	23	100	35	144
	1984	24	100	40	102
	1985	--	---	--	---
	1986	35	100	26	263
	1987	29	100	27	290
	1988	17	100	24	260
	1989	--	---	--	---

	Year	Bucks	Does	Fawns	Sample
Eastern ranges	1984/85	(47 bucks per 100 antlerless)			109
	1985/86	71	100	12	142
	1986/87	--	---	--	---
	1987/88	36	100	29	152
	1988/89	44	100	35	127
	1989/90	--	---	--	---

San Bernadino Mts. Deer Herd Plan
Annual Update

October 6, 1993

Summary:

Hunter pressure and success for this herd (D-14) have remained constant since 1984. Tag sales have reached the quota of 3000 every year since 1983. Harvest levels have been near 200 bucks/year over the same period. This year, however, only 157 tags were returned. This herd has been managed as two distinct subunits, with different management objectives. The eastern subunit encompasses ranges east of Highway 38, including the San Gorgonio Wilderness. Management objectives for this subunit include high harvest levels and high productivity. These objectives have not been met; herd statistics indicate that buck ratios and average ages for booth subunits are converging. This years composition counts revealed that this trend may be reversing. Hunt seasons for both subunits have remained the same for the last four years, with an open season of approximately 30 days timed to precede peak rutting activity in early November.

1. Biological information

Average age for the herd is at its lowest level in ten years. Recruitment into the yearling class appears to be increasing as evident in the composition counts. The percentage of yearlings in the harvest has increased slightly but his may be an artifact of the small sample size. Recent weather patterns and abundant precipitation may be contributing towards better range conditions and consequently, increased productivity within the herd. Representation of older age classes (3.5 years and up) have declined for the first time since 1988. This apparent change in age composition may also be an artifact of small sample size.

Herd composition counts indicate buck to doe ratios consistent with the herd plan goal of 20-30 bucks per 100 does. The eastern subunit has a higher ratio than the western subunit, and appears to be increasing after seven years of decline since 1985. Fawn ratios for both subunits also appear to recovering to the herd objective of 50-60 fawns per 100 does, indicating good productivity. This is probably due to a combination of improved forage conditions related to increased rainfall and the end of the drought. Composition counts will be done again this fall to obtain current information.

II. Habitat Improvement Projects.

Habitat improvement planning for this herd has been done on a year to year basis, and few of the projects which have been proposed have actually been completed. This has been partly

due to recent turnover in personnel on all four Ranger Districts in this zone. The districts involved should be encouraged to develop long-range plans similar to the San Jacinto Ranger District's ten year plan. This has been successful in accomplishing habitat improvements in Zone D-19.

III. Changes to the San Bernadino Deer Herd Plan

None recommended at this time.

Zone D-14: San Bernadino Mountains

Year	Season		Tag			
	Western	Eastern	Quota	Sales	Harvest	Success
1983	10/1 - 10/30	10/1 - 11/20	3000	3000	112	4%
1984	10/13- 11/12	10/13- 11/12	3000	3000	219	7%
1985	10/5 - 11/3	10/5 - 11/17	3000	3000	219	7%
1986	10/4 - 11/2	10/4 - 11/16	3000	3000	223	7%
1987	10/3 - 11/1	10/3 - 11/15	3000	3000	184	6%
1988	10/8 - 11/16	10/8 - 11/16	3000	3000	181	6%
1989	10/14- 11/12	10/14- 11/12	3000	3000	209	7%
1990	10/13- 11/11	10/13- 11/11	3000	3000	127	4%
1991	10/12- 11/10	10/12- 11/10	3000	3000	143	5%
1992	10/11- 11/9	10/11- 11/9	3000	3000	157	5%

Buck Harvest Age Classes

Year	1 yr.	2 yr.	3 yr.	4 yr.	Sample
1983	15%	29%	19%	37%	48
1984	26%	31%	15%	28%	86
1985	23%	33%	16%	28%	70
1986	20%	33%	19%	28%	89
1987	25%	34%	12%	29%	68
1988	7%	39%	26%	28%	61
1989	6%	24%	26%	44%	62
1990	7%	30%	32%	32%	44
1991	---------- not available ----------				
1992	12%	50%	12%	25%	16

Average Age

Year	Age (yrs.)	Sample
1983	3.9	48
1984	3.5	86
1985	3.7	70
1986	3.5	89
1987	3.4	68
1988	3.8	61
1989	4.1	62
1990	4.3	44
1991	-- not available --	
1992	3.0	16

Spot Kill Map Results

Year	Western ranges Number	Western ranges % total	Eastern Ranges Number	Eastern Ranges % total	Sample
1983	58	49%	61	51%	119
1984	154	72%	59	28%	213
1985	140	68%	65	32%	205
1986	124	60%	84	40%	208
1987	96	53%	87	47%	183
1988	137	76%	44	24%	181
1989	141	68%	66	32%	209
1990	32	73%	12	27%	44
1991	97	68%	45	32%	142
1992	110	70%	47	30%	157

Average Age by Range

Year	Western ranges Age (yrs.)	Western ranges Sample	Eastern Ranges Age (yrs.)	Eastern Ranges Sample
1983	3.3	29	4.8	19
1984	3.0	64	5.0	22
1985	3.2	50	5.0	20
1986	3.3	58	3.9	31
1987	3.4	38	3.4	30
1988	3.9	44	3.5	17
1989	4.1	52	4.3	10
1990	4.3	30	3.4	12
1991	---------- not available ----------			
1992	---------- not available ----------			

Post-Harvest Composition Count
(ratio per 100 does)

	Year	Bucks	Does	Fawns	Sample
Western ranges	1983	23	100	35	129
	1984	24	100	40	102
	1985	--	---	--	---
	1986	35	100	26	263
	1987	29	100	27	290
	1988	17	100	24	260
	1989	--	---	--	---
	1990	27	100	26	163
	1991	--	---	--	---
	1992	31	100	73	170

Post-Harvest Composition Count
(ratio per 100 does)

	Year	Bucks	Does	Fawns	Sample
Eastern ranges	1984/1985	(47 bucks per 100 antlerless)			109
	1985/1986	71	100	12	142
	1986/1987	--	---	--	---
	1987/1988	36	100	29	152
	1988/1989	44	100	35	127
	1989/1990	--	---	--	---
	1990/1991	24	100	16	112
	1991/1992	--	---	--	---
	1992/1993	58	100	75	96

State of California **The Resource Agency**

M E M O R A N D U M **Date:** July 26, 1994

To: Bureau of Land Management
Needles Resource Area
101 W. Spike Road
Needles, CA 92363

Attn: Richard Fagan, Area Manager

From: Department of Fish and Game - Desert Unit Manager

Subject: 1993 Buck Kill-Northeastern San Bernardino Co. (D-17)

Date of Kill	Antler Pts L/R		Reported Location of Kill
10/09/93	3	3	Midhills
10/09/93	2	2	1 mi. N Hole-in-Wall Camp
10/09/93	unknown		E side Fourth of July Cyn.
10/09/93	3	2	Clark Mtn.
10/09/93	3	3	5 mi. SW Midhills
10/09/93	6	5	Mescal Mtns.
10/09/93	2	2	Pinto Mtn.
10/09/93	3	3	Keystone Cyn.
10/09/93	3	3	1 mi. S Rock Sprs.
10/09/93	1	2	Lycer Well
10/09/93	0	2	Cedar Cyn.
10/09/93	2	2	Lycer Well
10/09/93	unknown		New York Mtns.
10/09/93	2	3	1 mi. N Mexican Hat Spr.
10/09/93	2	2	1 mi. SE Rock Sprs.
10/09/93	2	2	Globe Cyn.
10/09/93	3	3	Clark Mtn.
10/09/93	3	4	.5 mi. E Midhills Camp
10/09/93	4	4	Clark Mtn.
10/10/93	2	2	5 mi. N Mtn. Pass
10/10/93	unknown		.5 mi. NE New York Mtn.
10/10/93	2	1	Chicken Water Spr.
10/10/93	3	3	Hart Peak
10/10/93	2	3	Clark Mtn.
10/10/93	2	3	Mescal Mtns.
10/10/93	3	3	Midhills
10/11/93	2	2	4 mi. E Midhills Camp
10/14/93	4	4	Clark Mtn.
10/14/93	2	2	E side Clark Mtn.
10/14/93	2	3	NE side Clark Mtn.
10/16/93	2	2	Woods Wash
10/17/93	2	3	Teutonia Peak
10/19/93	1	2	5 mi. S New York Mtn.
10/22/93	2	2	Midhills

Date of Kill	Antler Pts L/R		Reported Location of Kill
10/23/93	3	3	Mescal Mtns.
10/23/93	2	4	Cottonwood Cyn.
10/24/93	3	3	Clark Mtn.
10/25/93	3	3	Caruthers Cyn.
10/25/93	unknown		New York Mtn.
10/26/93	3	3	Teutonia Peak
10/27/93	2	2	New York Mtn.
10/28/93	3	0	1 mi. W Caruthers Cyn.
10/29/93	2	2	Clark Mtn.
10/30/93	3	4	NE Kessler Peak
10/31/93	2	2	Gold Valley Ranch
10/31/93	2	2	Clark Mtn.
10/31/93	3	3	Clark Mtn.

Total 1993 tag returns were 47, up 4% from the 45 tags returned in 1992. Opening weekend made up 55% of the total kill. An airplane car count flown on opening morning showed hunter pressure almost identical to the 1992 season.

County of Residence	Successful Hunters	% of Total
San Bernardino	31	66
Riverside	4	9
Los Angeles	3	6
Orange	3	6
San Diego	2	4
Yolo	1	2
Napa	1	2
Yuba	1	2
Clark, NV	1	2

Year	2pts	%	3pts	%	4pts+	%	Total Kill
1989	9	31	17	59	3	10	29
1990	7	27	14	54	5	19	26
1991	13	46	6	21	9	32	28(+3unk)
1992	16	42	16	42	6	16	38(+7unk)
1993	18	42	19	44	6	14	43(+4unk)

No antlerless hunts have been held in zone D-17 since 1964.

Andy Pauli
Associate Wildlife Biologist

cc: WLM-Region 5, V. Bleich, B. Schaefer, Lt. Colby,
Wdn. Jackson, Wdn. Davis, unit file

San Bernadino Mts. Deer Herd Plan
Annual Update

July 16, 1995

Summary:

Hunter pressure and success for this herd (D-14) have remained constant since 1984. Tag sales have reached the quota of 3000 every year since 1983. Harvest levels have been near 200 bucks/year over the same period. This year, however, only 158 tags were returned while actual harvest was estimated to be 240. This herd has been managed as two distinct subunits, with different management objectives. The eastern subunit encompasses ranges east of Highway 38, including the San Gorgonio Wilderness. Management objectives for this subunit include high harvest levels and high productivity. Hunt seasons for both subunits have remained the same for the last four years, with an open season of approximately 30 days timed to precede peak rutting activity in early November.

1. Biological information

Average age for the herd remains low and recruitment into the yearling class appears to be increasing. The percentage of yearlings in the harvest has increased slightly but this may be an artifact of the small sample size. Successive wet springs and ample snow fall since the spring of 1989 have contributed towards better range conditions and consequently, increased productivity within the herd. Representation of older age classes (3.5 years and up) also remains low.

Herd composition counts indicate buck to doe ratios consistent with the herd plan goal of 20-30 bucks per 100 does. The eastern subunit has a higher ratio than the western subunit, and appears to be increasing after seven years of decline since 1985. Fawn ratios for both subunits also appear to be recovering towards the herd objective of 50-60 fawns per 100 does, indicating good productivity. This is probably due to improved forage conditions over the last six years. Composition counts will be conducted this fall to obtain current information.

II. Habitat Improvement Projects.

Habitat improvement planning for this herd has been done on a year to year basis, and very few projects which have been been completed. This has been partly due to recent turnover in personnel on all four Ranger Districts in this zone. The districts involved should be encouraged to develop long-range plans similar to the San Jacinto Ranger District's ten year plan. This has been successful in accomplishing habitat improvements in Zone D-19.

III. Changes to the San Bernadino Deer Herd Plan

None recommended at this time.

Zone D-14: San Bernadino Mountains

Year	Season		Tag			
	Western	Eastern	Quota	Sales	Harvest	Success
1983	10/1 - 10/30	10/1 - 11/20	3000	3000	112	4%
1984	10/13- 11/12	10/13- 11/12	3000	3000	219	7%
1985	10/5 - 11/3	10/5 - 11/17	3000	3000	219	7%
1986	10/4 - 11/2	10/4 - 11/16	3000	3000	223	7%
1987	10/3 - 11/1	10/3 - 11/15	3000	3000	184	6%
1988	10/8 - 11/16	10/8 - 11/16	3000	3000	181	6%
1989	10/14- 11/12	10/14- 11/12	3000	3000	209	7%
1990	10/13- 11/11	10/13- 11/11	3000	3000	127	4%
1991	10/12- 11/10	10/12- 11/10	3000	3000	143	5%
1992	10/11- 11/9	10/11- 11/9	3000	3000	157	5%
1993	10/9 - 11/7	10/9 - 11/7	3000	3000	143	5%
1994	10/8 - 11/6	10/8 - 11/6	3000	3000	158	9%

Buck Harvest Age Classes

Year	1 yr.	2 yr.	3 yr.	4 yr.	Sample
1983	15%	29%	19%	37%	48
1984	26%	31%	15%	28%	86
1985	23%	33%	16%	28%	70
1986	20%	33%	19%	28%	89
1987	25%	34%	12%	29%	68
1988	7%	39%	26%	28%	61
1989	6%	24%	26%	44%	62
1990	7%	30%	32%	32%	44
1991	---------- not available ----------				
1992	12%	50%	12%	25%	16
1993	---------- not available ----------				
1994	---------- not available ----------				

Average Age

Year	Age (yrs.)	Sample
1983	3.9	48
1984	3.5	86
1985	3.7	70
1986	3.5	89
1987	3.4	68
1988	3.8	61
1989	4.1	62
1990	4.3	44
1991	-- not available --	
1992	3.0	16
1993	-- not available --	
1994	-- not available --	

Spot Kill Map Results

Year	Western ranges Number	% total	Eastern Ranges Number	% total	Sample
1983	58	49%	61	51%	119
1984	154	72%	59	28%	213
1985	140	68%	65	32%	205
1986	124	60%	84	40%	208
1987	96	53%	87	47%	183
1988	137	76%	44	24%	181
1989	141	68%	66	32%	209
1990	32	73%	12	27%	44
1991	97	68%	45	32%	142
1992	110	70%	47	30%	157
1993	98	68%	45	32%	143
1994	110	70%	47	30%	158

Average Age by Range

Year	Western ranges Age (yrs.)	Sample	Eastern Ranges Age (yrs.)	Sample
1983	3.3	29	4.8	19
1984	3.0	64	5.0	22
1985	3.2	50	5.0	20
6	3.3	58	3.9	31
1987	3.4	38	3.4	30
1988	3.9	44	3.5	17
1989	4.1	52	4.3	10
1990	4.3	30	3.4	12
1991	---------- not available ----------			
1992	---------- not available ----------			
1993	---------- not available ----------			
1994	---------- not available ----------			

Post-Harvest Composition Count
(ratio per 100 does)

	Year	Bucks	Does	Fawns	Sample
Western ranges	1983	23	100	35	129
	1984	24	100	40	102
	1985	--	---	--	---
	1986	35	100	26	263
	1987	29	100	27	290
	1988	17	100	24	260
	1989	--	---	--	---
	1990	27	100	26	163
	1991	--	---	--	---
	1992	31	100	73	170
	1993	--	---	--	---
	1994	--	---	--	---

Post-Harvest Composition Count
(ratio per 100 does)

	Year	Bucks	Does	Fawns	Sample
Eastern ranges	1984/1985	(47 bucks per 100 antlerless)			109
	1985/1986	71	100	12	142
	1986/1987	--	---	--	---
	1987/1988	36	100	29	152
	1988/1989	44	100	35	127
	1989/1990	--	---	--	---
	1990/1991	24	100	16	112
	1991/1992	--	---	--	---
	1992/1993	58	100	75	96
	1993/1994	--	100	--	--