EVALUATING MANAGEMENT ALTERNATIVES FOR THE SANTA LUCIA DEER HERD IN MONTEREY COUNTY, CALIFORNIA

Terry M. Mansfield[1/]
Donald S. Pine
California Department of Fish and Game
King City, CA 93930

ABSTRACT.

Deer herd management planning is required by legislation and policy in California, and is intended to achieve statewide goals of restoring and maintaining healthy deer while providing diversified use of the state's most abundant big game animal. A five-step process was used to develop and evaluate management alternatives for the resident Santa Lucia herd in western Monterey County. Cooperation was obtained from major public land management agencies including the Los Padres National Forest and the U.S. Army, Fort Ord Complex in an effort to coordinate herd and habitat objectives. Results included identifying 4 subunits within the planning area and developing a range of biologically feasible alternatives for deer population size and habitat capacity. Compatible alternative harvest strategies for each potential population level were also developed. The approach and concepts described in this paper may be adapted to other deer management units to facilitate herd planning and produce realistic objectives which may guide, rather than react to, land management programs.

INTRODUCTION

Deer (*Odocoilius* sp.) management is more an art than a science involving complex relationships between habitat, deer and man. Increasing demands of modern society for all renewable resources dictate that deer and the habitat they depend upon must be more intensively managed. Public dissatisfaction with the serious long-term decline of most deer herds throughout California during the late 1960's and early 1970's contributed to a legislative mandate (Assembly Bill 1521, 1977) for herd-specific management. In 1978, both the Fish and Game Commission and the Department of Fish and Game adopted policies establishing statewide goals of restoring healthy deer herds and providing for high quality diversified use of deer resources.

Although preliminary deer herd planning efforts commenced in 1976, progress has been relatively slow towards the ultimate objective of having a strategic plan for each of approximately 100 herds identified by Longhurst, Leopold and Dasmann (1952). Concurrent with the Department of Fish and Game's commitment to plan for the future management of the state's most numerous and widely distributed big game animal was a federal mandate for land management agencies (U.S. Forest Service and Bureau of Land Management) to complete multiple-resource management plans by 1983 which will influence deer habitat. Thus it is apparent that a mechanism is needed to immediately coordinate intended herd management goals with general implications for habitat management. The obvious consequence of failing to do so is that deer herd management goals will react to, rather than guide, habitat management programs on public lands.

This paper reviews an approach used to develop and evaluate management alternatives for the Santa Lucia deer herd in Monterey County. The Santa Lucia herd was selected because: 1) reasonably complete herd performance data exist; 2) public interest in the herd and demand for sport hunting are high; 3) land ownership and administration patterns are conducive to providing diversified use of the deer resource; 4) a large segment of the range will respond favorably to currently available habitat enhancement techniques; and 5) personnel responsible for both herd and habitat management are capable and progressive resource professionals.

[1/]Present address: California Fish and Game Commission, 1416 Ninth Street, Sacramento, California 95814.

CAL-NEVA WILDLIFE TRANSACTIONS 1982.

Based on these characteristics, it was reasonable to assume that a fundamentally sound strategic plan could guide management to produce desirable increases in deer numbers and hunting harvest thereby achieving generally accepted herd goals.

The purpose of this report is to describe and discuss the concepts used in evaluating management alternatives as a crucial phase in deer management planning. We hope the systematic approach to evaluating biologically feasible alternatives presented here encourages other resource planners to adopt similar approaches to meet deer herd planning needs in other areas.

The Santa Lucia deer herd plan was prepared with funds provided by Federal Aid to Wildlife Restoration Project W-51-R, Big Game Investigations. We thank H.J. Salwasser and P.A. Dubsky for assistance and advice in developing concepts and evaluating data. We also acknowledge the assistance and cooperation of the U.S. Army (Fort Ord Complex), Department of Fish and Game Region 3 personnel and staff of the King City District of the Los Padres National Forest.

PLANNING AREA

The Santa Lucia Deer herd management unit includes that portion of Monterey County west of the Salinas River (Figure 1). Deer inhabiting the area are resident Columbian blacktails (*Odocoileus hemionus columbianus*), California mule deer (*O. h. californicus*) and their hybrids. Dominated by the Santa Lucia Mountains, the region has an elevation range from sea level to 1776 m. With a total area of approximately 538,947 ha (2080 mi^2), the unit is characterized by four major land ownership and administrative categories: private lands (58%); Los Padres National Forest (23%); U.S. Army, Fort Ord Complex (17%); and Bureau of Land Management (2%). Predominant land uses include livestock grazing, intensive agriculture (row crops, vineyards and dryland grain), recreation and military training. Major vegetation/habitat types, which have potential for improvements to benefit deer (Taber and Dasmann 1958, Longhurst and Connolly 1970, Mansfield 1974) are blue oak woodland, valley oak grassland, mixed chaparral and chamise chaparral.

METHODOLOGY

A five-step approach was utilized to develop and evaluate management alternatives. This system included: 1) identifying issues, concerns and goals; 2) establishing criteria to evaluate conditions relative to goals; 3) assembling and evaluating pertinent herd and habitat data; 4) developing quantifiable objectives for biologically feasible alternatives; and 5) arraying alternatives for decision makers. Using a small team of wildlife biologists and habitat managers most familiar with the Santa Lucia herd and its habitat, steps were completed in order. Where specific data were lacking or incomplete, reasonable assumptions were made and estimates developed from appropriate literature. When possible, information and concepts were graphically displayed to convey trends and compare feasible alternatives and trade-offs.

RESULTS AND DISCUSSION

Identifying Issues, Concerns and Goals

The diversified land ownership and administration pattern (Figure 1) of the herd management unit resulted in a complex set of issues and concerns related to deer. Greatest public demand on the herd was cleraly demonstrated to be for sustained-yield sport hunting, but attitudes of specific user groups varied substantially. In an effort to address the inherent diversity, we felt it necessary to array major issues and concerns by subunits which were identified as follows:

Subunit 1 Private and Bureau of Land Management Administered Lands:
Other land and resource uses have priority over deer
Access is limited and harvest rate low
Private land owners generally harvest only mature bucks
Deer are considered a liability where they conflict with primary land uses
Little habitat is improved specifically for deer
Some private land owners are concerned that any antlerless harvest will result in serious deer decline

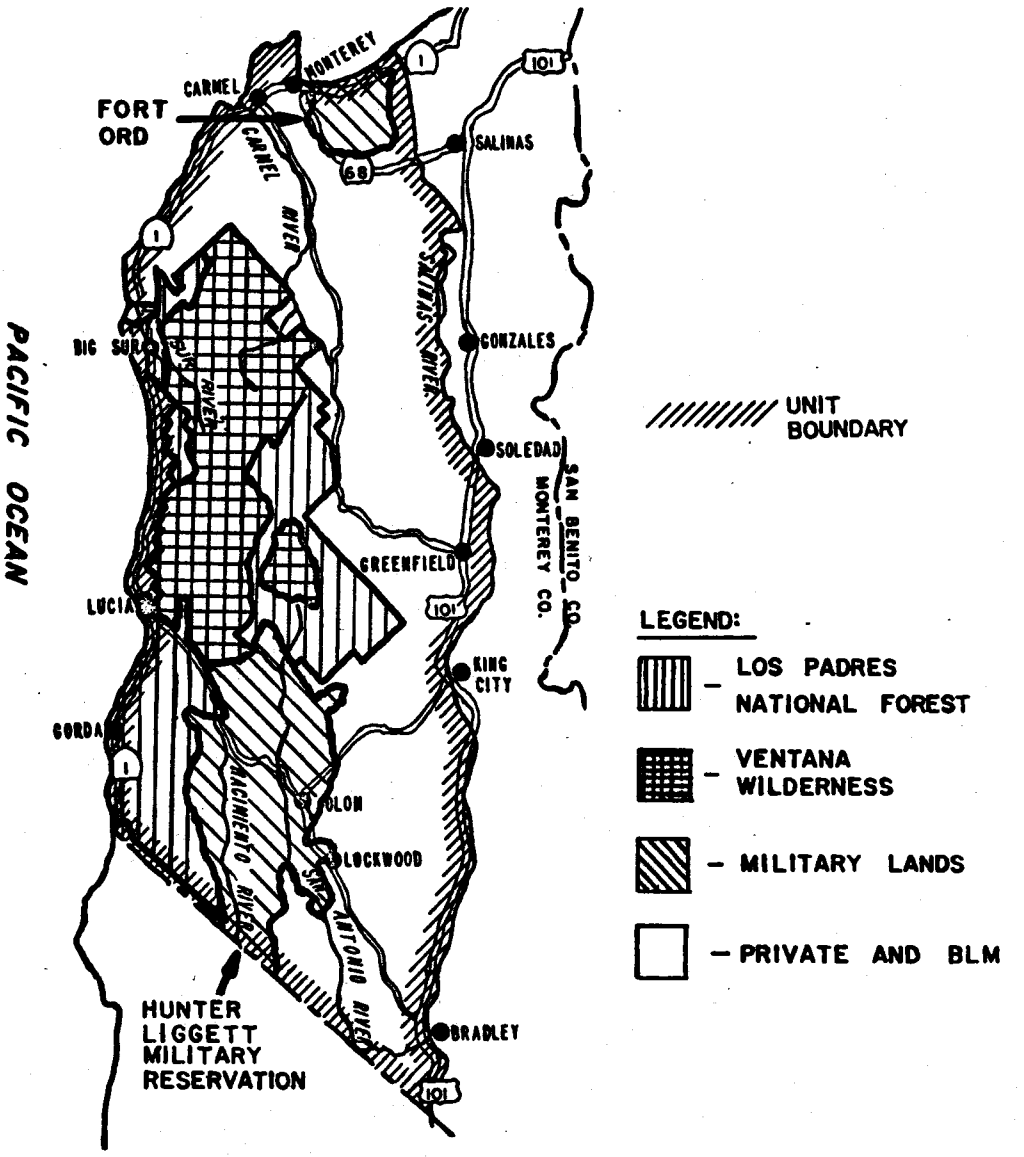

FIGURE 1. The Santa Lucia deer herd management unit, western Monterey County, California.

Subunit 2 Military Lands:
Military mission is the primary concern
A larger deer population is desired
Habitat improvement is linked to increasing deer harvest
Public access is good during designated hunting period
Liberal harvest strategies are accepted

Subunit 3 Los Padres National Forest:
Multiple resource management is mandated
Habitat improvement is conducted primarily in conjunction with other programs
Public access is generally available but difficult in some areas due to lack of roads and rugged terrain
Demand by hunters for increasing deer numbers and harvest rate
Fire hazard closures often limit hunting opportunities

Subunit 4 Ventana Wilderness:
Maintenance of wilderness values is primary concern
Access is restricted by policy and rugged terrain
Harvest is limited by poor access
Habitat improvement is severely restricted by policy
Fire hazard closures limit hunting opportunities

The California Department of Fish and Game (1976) established statewide management goals for deer which are to restore and maintain healthy deer and provide high quality, diversified use of deer resources. To achieve these goals within the Santa Lucia planning area, it is necessary to increase deer numbers and develop flexible harvest programs to utilize a portion of the additional deer produced. Although the degree of both deer restoration and utilization will vary among subunits, these general statements apply to the entire herd unit.

Evaluating Conditions Relative to Goals

To assess existing conditions within the management unit, a number of herd and habitat characteristics were preliminarily examined. All evidence indicated that the deer population was approximately 60% below historic peak levels. Reported harvest and hunter success rates were well below historic peaks. The recent trend in habitat capacity was increasing primarily as a result of above average rainfall and large wild fires which improved forage conditions over the last five years. However, maturing chaparral vegetation, removal of oaks and conversion of productive habitat to agricultural and residential developments limited net gains. It was our opinion that much of the herd's habitat could be enhanced with currently available techniques (Longhurst and Connoly 1970). The level of multiple-resource management mandated on federal lands makes it feasible to coordinate other resource programs to produce benefits for deer. Brushland fuel control and deer habitat improvement programs could be mutually beneficial. Recent interests in more intensive deer management on private lands was reflected by enactment of legislation (Assembly Bill 2581, 1980) permitting the development of private wildlife management areas within five counties including Monterey.

Assembling and Evaluating Pertinent Data

Basic information required to formulate specific deer herd management objectives includes: changes in population size, fawn production and survival; population density relative to carrying capacity; levels of deer damage to preferred forage, agricultural crops or other conflicting land uses that receive priority over deer production; observed or expected changes in range carrying capacity; and the number of deer harvested annually (Connolly 1981). Unlike many California deer herds, most of these data were available for the Santa Lucia unit. As inventory systems are refined, it is anticipated that computer simulation models for the herd and habitat capability models for land management will be utilized to help organize and evaluate pertinent information.

For the purpose of developing a strategic plan for this herd unit, we primarily relied on herd and habitat data which indicated readily identifiable trends (Figures 2 and 3). Although relatively detailed herd performance data were systematically collected since the early 1960's, a number of uncontrolled variables prevented extensive use of correlation analysis or other more sophisticated techniques to accurately measure strength of various relationships. Examples included periodic hunting area closures which influenced harvest, catastrophic fires which produced fluctuations in habitat capacities that were difficult to quantify and large scale changes in livestock grazing systems which were substantial but impossible to document on private lands.

Developing Quantifiable Objectives and Alternatives

In the diverse environment of western Monterey County, there is a great deal of difference of opinion related to deer management. Both for the unit as a whole and for each subunit considered separately, specific objectives were developed for a range of alternatives. Only

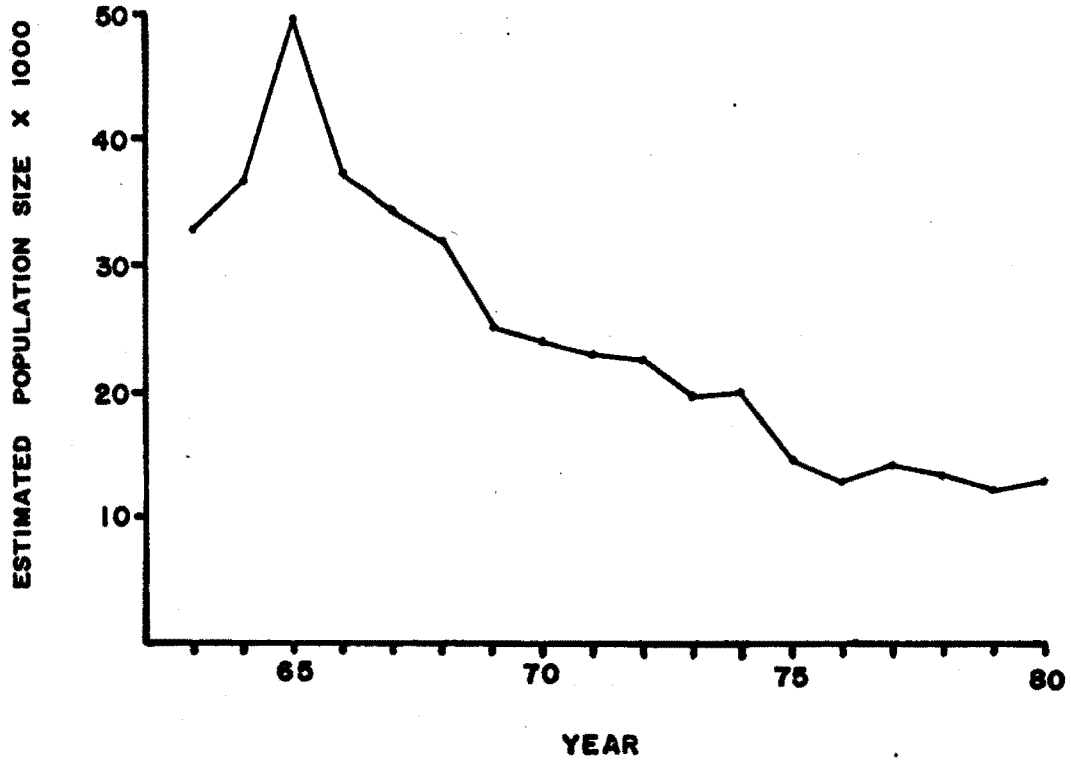

Figure 2. Estimated population size trend for the Santa Lucia deer herd during 1963-1980.

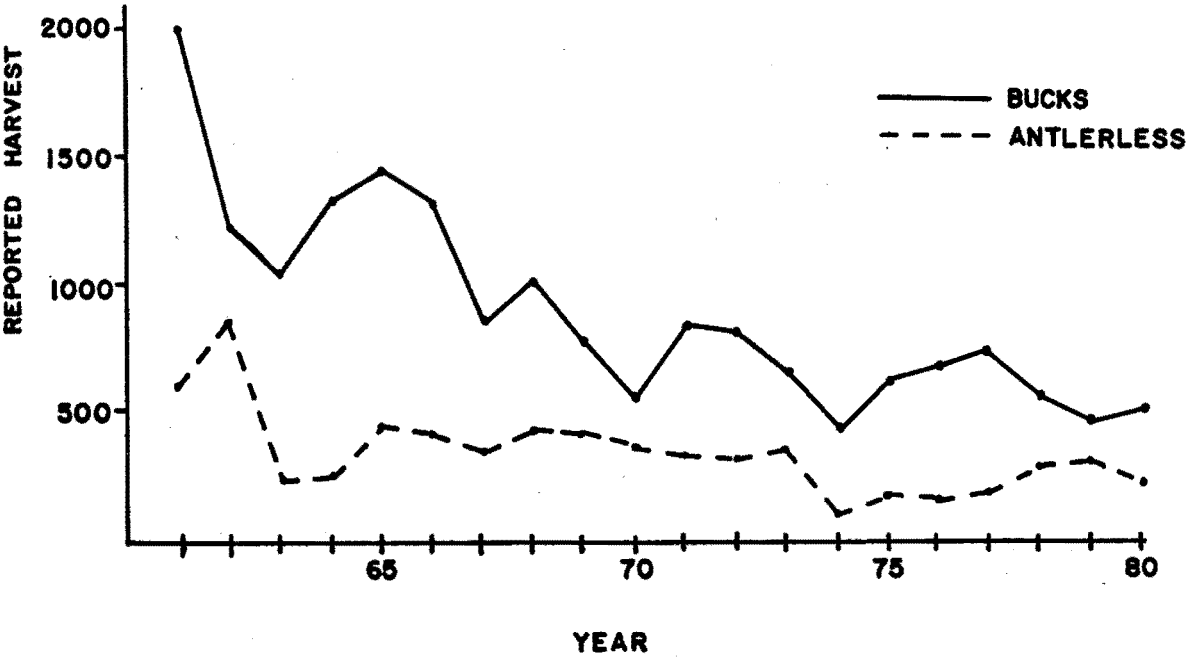

Figure 3. Reported harvest from the Santa Lucia deer herd during 1961-1980.

options which were biologically "feasible" and generally compatible with statewide goals for deer management were considered. An effort was made to determine the trade-offs between special interest groups represented in the planning unit.

Utilizing historic population size, deer density, habitat trend and harvest data to establish reasonable upper and lower limits, we developed a series of population size alternatives for the Santa Lucia herd. In doing so, we initially developed restoration potentials for each subunit then combined these estimates, with some adjustment, to establish a range of alternatives for the entire unit. Various harvest strategies which were most compatible with management objectives were then arrayed for each alternative. It is imperative to link these herd restoration levels to land management implications. We did so but that exercise goes beyond the scope of this review.

Arraying Alternatives

Objective resource management decisions are made only after evaluating a range of feasible alternatives. McCullough (1979) skillfully described optimizing benefits as a concept deer management by illustrating the need to establish specific objectives and identify trade-offs for decision makers. The role of the wildlife biologist is to develop an appropriate range of biologically feasible alternatives and recommend harvest strategies that are most compatible with herd goals (Connolly 1981).

In an effort to clearly array management alternatives for the Santa Lucia herd, we developed four biologically feasible population size and habitat capacity options (Figure 4). They represent distinct management intensities and, all but the minimum population size, adhere to the statewide goals and policy commitment for deer. In addition, we displayed three practical harvest strategies, based on estimated harvest rates derived from experience obtained from Fort Hunter Liggett, which were applied to each of the four potential population levels (Figure 5). These concepts were then arrayed in a simple matrix to summarize the evaluation of management alternatives for the Santa Lucia deer herd (Table 1).

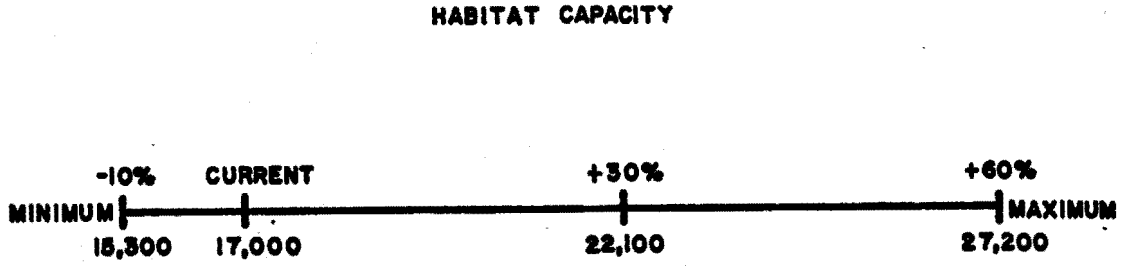

Figure 4. Potential habitat capacities and population restoration levels for the Santa Lucia deer herd.

RECOMMENDATIONS

Based on our experience in evaluating management alternatives for this resident central California deer herd, we recommend the following steps be adopted to increase the effectiveness of herd planning in California:

1) The basic five-step process for resource planning described in this paper should be refined and adapted to other herd units.

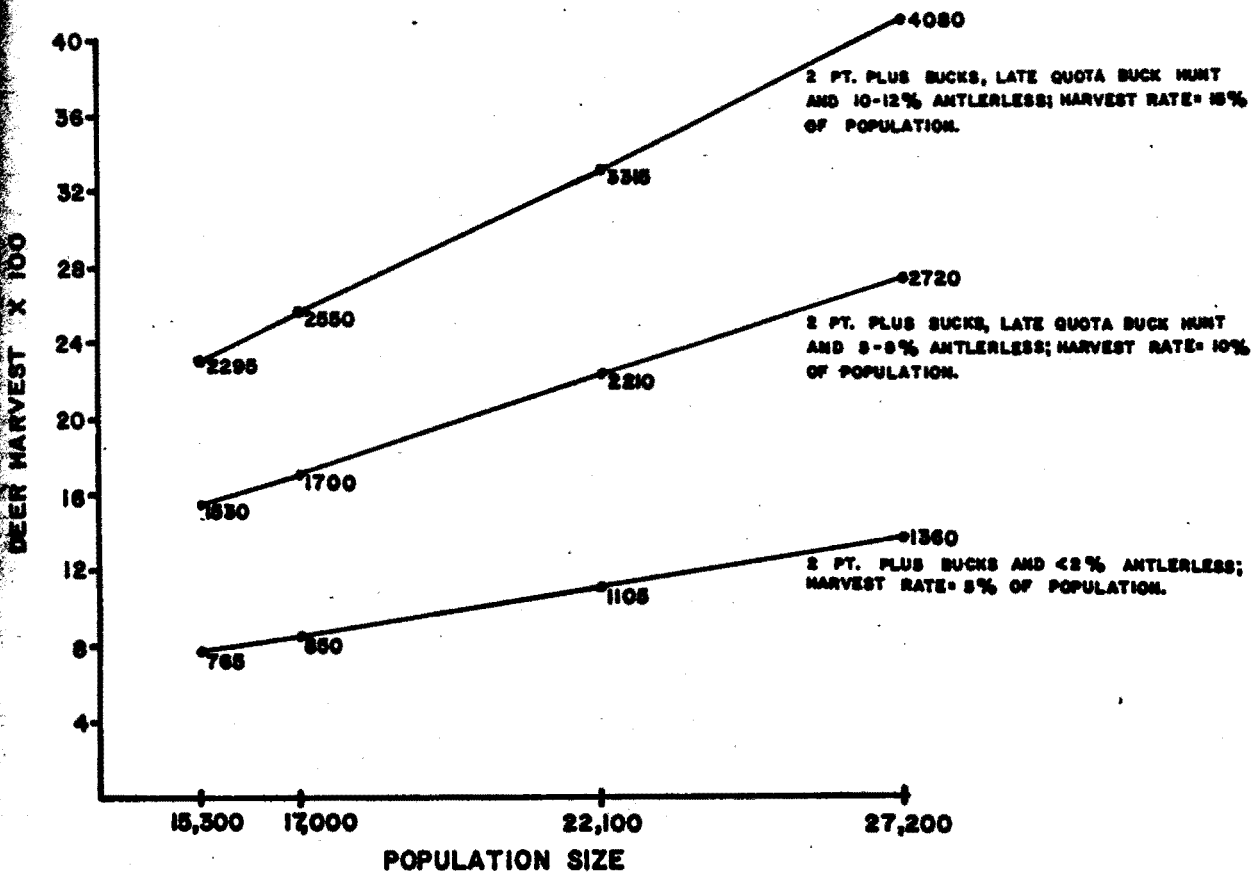

Figure 5. Potential population restoration levels and alternative harvest strategies for the Santa Lucia deer herd.

Table 1. Matrix of alternative management strategies for the Santa Lucia Deer Herd.

ALTERNATIVES	POPULATION SIZE	HABITAT CAPACITY	HABITAT MANAGEMENT IMPLICATIONS	ESTIMATED ANNUAL HARVEST
1. Minimum Population	15,300	10% Decrease	Continued Losses to Agricultural and residential development, maturing chaparral vegetation reduces forage quality, livestock competition reduces available forage and cover.	Bucks 2 points or better, 2% antlerless take, total harvest approx. 765 animals.
2. 1980 Population	17,200	Static	1% of chaparral vegetation burned annually, livestock grazing results in no net habitat losses, residential development impacts mitigated through habitat improvement projects.	Bucks 2 points or better, 2% antlerless take, total harvest approx. 850 animals.

Table 1. Continued.

ALTERNATIVES	POPULATION SIZE	HABITAT CAPACITY	HABITAT MANAGEMENT IMPLICATIONS	ESTIMATED ANNUAL HARVEST
3. Preferred Alternative	22,100	30% Increase	3-5% of chaparral vegetation burned annually, livestock grazing limited to avoid summer competition with deer, residential development discouraged in important deer habitat areas.	Bucks 2 points or better, late season quota buck hunt, 5% antlerless take, total harvest approx. 2210 animals.
4. Maximum Population	27,200	60% Increase	5-7% of chaparral vegetation burned annually, livestock grazing controlled to produce benefits for deer, limitations placed on residential development in important deer habitat, water sources developed.	Bucks 2 points or better, late season quota buck hunt, 8-10% antlerless take, total harvest approx. 4080 animals.

2) Herd management planning should be initiated by a team of wildlife and land management professionals working in cooperation.

3) Strategic herd management plans should be based on currently available data and supported by sound ecological concepts.

4) Deer management plans which provide direction for both deer and habitat management intensity are needed immediately if herd goals are going to direct, rather than react to, land management programs and resource allocation decisions.

LITERATURE CITED

California Department of Fish and Game. 1976. A plan for California deer. Sacramento. 15 pp.

Connoly, G.E. 1981. Limiting factors and population regulation. In: Wallmo, O.C. (ed.) Mule and black-tailed of North America. Univ. of Nebraska Press. 605 pp.

Longhurst, W.M. and G.E. Connolly. 1970. The effects of brush burning on deer. Calif.-Nev. Sect. The Wildlife Soc. Trans. pp 139-155.

_____, A.S. Leopold and R.F. Dasmann. 1952. A survey of California deer herds. Calif. Dept. Fish and Game, Sacramento. Game Bull. No. 6. 136 pp.

Mansfield, T.M. 1974. A comparison of black-tailed deer fawns from oak woodland and chaparral vegetation types. M.S. thesis, Univ. Calif., Davis. 60 pp.

McCullough, D.R. 1979. The George Reserve deer herd. Univ. Michigan Press. 271 pp.

Taber, R.D. and R.F. Dasmann. 1958. The black-tailed deer of the chaparral. Calif. Dept. Fish and Game, Sacramento. Game Bull. No. 8. 163 pp.