

## A MULTIPLE-SATISFACTION APPROACH TO GAME MANAGEMENT

**JOHN C. HENDEE**, *USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Seattle, Washington 98105*

*Abstract:* Traditional game-bagged and days-afield concepts are no longer adequate to measure the results of game management. A new, multiple-satisfaction approach is proposed: that the most significant direct products of game management are hunting experiences which produce human satisfactions. Six tenets of this multiple-satisfaction approach are outlined and illustrated, and suggestions are given for applying the approach.

---

The purpose of wildlife management is to provide benefits to people. This was understood by the founders of the profession when they developed the guiding principles for wildlife management, and it holds true today (Leopold 1929, 1930; Allen 1973). But the emphasis is changing; today there is more interest in managing wildlife to provide human benefits from nonconsumptive uses as well as from hunting (Hendee 1969, Thomas and DeGraaf 1973). Wildlife management is no longer just game management; it involves stewardship of a valuable and limited public resource. But while other wildlife uses have become more important, game management for sport hunting remains a vital part of wildlife management. Although this paper focuses on game management for sport hunting, the multiple-satisfaction approach also could be applied to management of all wildlife or to management of other recreational-aesthetic resources. I wish to acknowledge comment and constructive debate with my colleagues D. Potter and R. Clark in preparation of this paper.

### PERSPECTIVE

Hunting has changed. It used to be an important food-producing activity which also provided recreation for a predominantly rural population; today it has become primarily a field sport for an urban nation.

Traditionally, game management has been biologically oriented, assuming that human benefits follow as the direct result of habitat management to maintain or increase game populations. These efforts have achieved some dramatic increases in game populations, but we can no longer keep pace with the growing demands of sportsmen merely by producing more game. Managers' best efforts may do no more than maintain or slightly increase game populations in the face of demands from many more sportsmen—hunters who consequently are destined for decreasing rates of success.

The combination of ever-increasing numbers of hunters and static or dwindling game populations means that there just isn't enough game for everyone who wants it. With more and more hunters afield, the quality of hunting deteriorates, and the experience alters radically. For example, under increasingly congested conditions, the thrill of the stalk and other traditional, skill-related hunting experiences gives way to activity of such questionable appropriateness as intense competition between hunters to "get mine quick before it's gone" and a random-odds attitude that "out there in the crowd, anyone can get lucky." This is a distortion of experiences far removed from the fundamental attractions of hunting.

Today's conditions call for more explicit management in order to produce the variety

and quality of hunting experiences which are desired (Hendee 1972). We need to re-examine the objectives of game management in light of changing conditions, updating our concept of the human benefits which hunting can provide. Stewardship of resources is not enough; it must be carefully focused to produce desired results.

### TRADITIONAL THEORIES OF GAME MANAGEMENT

Two theories about hunting benefits are implicit in the evolution of game management. The first—that amount of “game bagged” is an adequate measure of hunting benefits—was appropriate when motives for hunting were primarily to obtain necessary or supplementary food. Hunters’ enjoyment of the sporting aspect was a secondary “bonus.” For nimrods of those “good old days,” the probability of success was much greater. And with fewer hunters competing for game and space, most of them could find the kind of experiences they wanted. Under those circumstances, game managers focused their efforts on increasing the amount of game available for harvest. This was logical since the human benefits which management sought to increase were equated with the amount of game harvested. Managers’ efforts were reflected by high probabilities of success, underscored by pictures of satisfied hunters loaded with game who could brag about bagging their limit year after year.

However, two limitations to the “game-bagged” theory emerged as hunting pressure increased: (1) production of hunting benefits (game bagged) was limited by the capacity of habitat for producing game; and (2) the distribution of benefits was concentrated among a minority of skillful hunters who consistently were successful. Furthermore, it became obvious that there was more to hunting than bagging game as

the scores of hunters increased despite their dwindling chances for success. Both managers and hunters began to talk more about quality of experience as an end in itself.

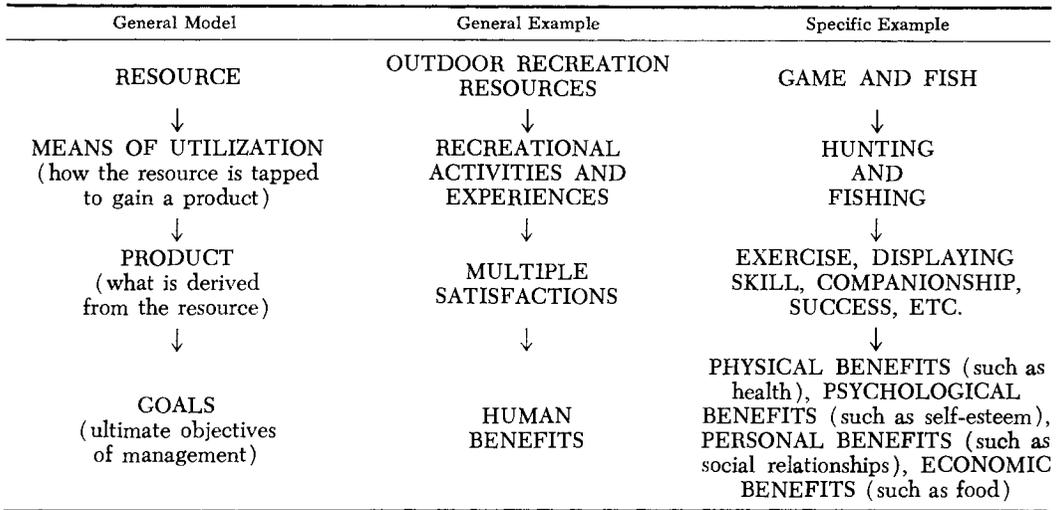
Soon the “game-bagged” notion yielded to a “days-afield” theory about hunting benefits. This approach suggests that although bagging game is still important, the human benefits from hunting are maximized by increasing the number of man-days of recreation that hunting provides (Crissey 1971). Human benefits are therefore equated with man-days of recreation, which many game departments work to maximize.

A major weakness of this concept, however, is that it assumes constant levels of benefits per hunter man-day regardless of success or quality. Carried to the extreme, it suggests that if we double or triple the number of hunters seeking the same number of animals, we will double or triple the benefits, despite the drastically altered quality of experiences.

It also suggests that the most productive hunting, in terms of number of benefits generated, is where the most hunters are. Thus, the “days-afield” objective contributes to crowded hunting conditions that are unsafe as well as unpleasant. Opening day often results in traffic jams, shotgun-pellet hailstorms, and the appearance of “search and destroy missions.”

I am critical of the “game-bagged” and “days-afield” orientations. To a degree, both orientations have their place, but they must be integrated. The multiple-satisfaction approach to game management is a logical extension of these traditional orientations; it seeks benefits to people while attempting to deal with game-harvest and participation factors. But it also incorporates our growing body of research-based information about hunting as an outdoor-

Fig. 1. The multiple-satisfaction concept of recreation resource management.



recreation activity (Hendee and Schoenfeld 1973, Potter et al. 1973a).

**A MULTIPLE-SATISFACTION APPROACH TO GAME MANAGEMENT**

The growing pressure on game managers by more numerous clients is similar to that experienced by managers of other outdoor recreation resources. The demands are not only more numerous, but also more complex.

Different kinds of experiences are sought by participants in the same activity, be it wilderness hiking, car camping, or fishing (Hendee et al. 1968, Clark et al. 1971). One may have several reasons for seeking outdoor recreation, and all or some of those reasons may differ from those which attract other participants to the same activity. The same is true of hunters. This paper proposes a multiple-satisfaction concept of recreation resource management to help guide game managers and to direct further research toward increasing the human benefits of hunting.

Previous researchers (Bultena and Klessig 1969, LaPage 1968) have used the term

“satisfaction” in reference to how satisfied a recreation visitor was with his overall experience. This approximates my use of the term “quality” as congruence between expectations and reality of a recreationist’s experience, satisfactions being separate components or dimensions of the experience.

The basic idea is that *recreation resources offer people the opportunity for a range of experiences which, in turn, give rise to various human satisfactions. These multiple satisfactions may then lead to benefits—the ultimate goal of recreation-resource management. The nature of recreational experiences, and thus the satisfactions and benefits that follow, can be shaped by management of the surrounding physical, biological and social conditions.* Figure 1 illustrates this conceptual model for recreation-resource management in general and for sport hunting in particular.

**Tenet 1: Satisfactions Are Direct Products**

In focusing the multiple-satisfaction approach on game management, several basic

tenets emerge. First is the basic notion that *the most significant direct products of game management are hunting experiences which produce human satisfactions*. Various aspects of the hunting experience combine to produce several diverse satisfactions which hunters "harvest." These satisfactions vary with individuals, kinds of hunting, and conditions surrounding the hunt. Studies indicate that hunting satisfactions include such things as communing with nature, companionship, shooting, using one's skill, vicarious enjoyment, harvesting game, displaying success, using special equipment, physical exercise, recreation diversion, relaxation and others (More 1973, Potter et al. 1973, Stankey et al. 1973).

**Tenet 2: Satisfactions Differ From Benefits**

Second, *satisfactions are not the same as benefits but may lead to benefits*. There is a distinction between satisfactions and benefits, although they often are referred to interchangeably. Satisfactions are the more specific, immediately gratifying pleasures from certain aspects of the recreation experience. Benefits are the more general and enduring improved conditions resulting from one or more satisfactions, e.g., improved physical, psychological, and emotional well-being, a richer quality of life, better personal relationships, and so forth. *The direct products of hunting are human satisfactions, the ultimate goal is the human benefits which these satisfactions may provide.*

For example (as Fig. 1 illustrates), physical exercise is a hunting satisfaction which can lead to the physical benefit of better health. Gaining, using, and displaying skill can increase self-esteem, a psychological benefit. Hunting companionship and the sociability of camp life can improve personal relationships. The food which a suc-

cessful hunter bags can fill the home freezer with an obvious economic benefit. These are a few examples of the satisfactions hunting can yield; there are many more.

Thus the objective of game management should be to produce desired and worthwhile human satisfactions and experiences that in turn may result in a variety of benefits to people—physical, psychological, personal, and economic. These satisfactions and their resulting benefits distinguish hunting from killing; they provide a positive rationale for hunting as a sport.

**Tenet 3: Success Is Only One Satisfaction**

Third, *success is an important hunting satisfaction, but it is only one of many. Although game is the obvious thing all hunters seek, their more important "harvest" may be the other satisfactions they receive and the human benefits to which those lead.*

Some minimum probability or level of success is no doubt necessary to activate or enhance other hunting satisfactions (Hendee and Potter 1971, Potter et al. 1973, Stankey et al. 1973). But studies indicate that although harvesting game contributes to the satisfaction of almost all hunters, a majority cite other satisfactions as more important (Potter et al. 1973).

Managers should carefully monitor the probability and distribution of hunting success in search of that point where futility or inequities cause total satisfactions to decline. It is hard to display one's skill as a hunter or appreciate the thrill of chance when you have returned empty-handed several times in a row. Similarly it is difficult to appreciate nature and to enjoy companionship when frustrated by a completely unsuccessful hunt.

Managers also should strive to maintain probabilities of success that produce the greatest total human benefits from the

diverse satisfactions generated. There are few guidelines to indicate to game managers just what levels of success are necessary to activate the production of a full range of other satisfactions. Finding the answers will require astute professional judgments, careful research, and sensitive, imaginative management.

**Tenet 4: Quality Is Measured  
By Satisfaction**

Fourth, *the quality of a hunting experience is determined by the extent to which a hunter finds the mix of satisfactions which he desires (including a reasonable probability of success); "quality hunting" means different things to different hunters.* For one hunter it centers on being close to nature and pitting his skills against the quarry. To another hunter, bringing home game to feed his family and fuel his neighbor's admiration is the essence of hunting. And a third man looks forward primarily to the special quality of friendship shared by hunting partners and the good times he has with a group that has been hunting together for years.

The multiple-satisfaction approach makes it possible to define "quality hunting" more explicitly as the extent to which each hunter finds the kinds of hunting experiences he seeks. So it offers a valuable tool to game managers, for whom quality hunting is a major goal. A manager could create a virtual paradise for like-thinking nimrods if he worked to provide the particular mix of satisfactions which mean "quality hunting" to him. But many other hunters would find his domain disappointing. A full range of satisfactions must be available so each different hunter can find much of his desired mix. Diversity of opportunity—not adherence to one stereotype—is the way to provide better quality for more hunters.

By thinking about the kind of experiences

sought by hunters—and which ones they feel obliged to provide—managers may come up with a variety of new programs and ideas that yield more diversity and thus meet the quality expectations of more sportsmen. Diversification also reduces crowding by moving hunters with special interests to areas designed especially for them. Creating staggered seasons or special zones reduces conflict between different styles of hunting, and cushions their impact on game, habitat, and land.

*A reasonable probability of success plus a full continuum of opportunities for other satisfactions are keys to quality hunting.*

**Tenet 5: Conditions Affecting  
Satisfactions Can Be Managed**

Fifth, *hunting satisfactions vary with the conditions under which hunting takes place, and these conditions can be managed.* The experiences and satisfactions available depend a great deal on conditions surrounding the hunt. They are the product of complex interrelationships between the ecosystem and the social system that regulates human harvest of game. The ecosystem includes a full spectrum of biological factors—all of the flora and fauna making up the habitat (including the presence of game). The social system includes such things as land-use patterns, laws, regulations, enforcement policy, access, and all other conditions resulting from human activity.

Under a multiple-satisfaction approach, all these ecosystem and social factors can be coordinated for their total impact. Some important manageable factors include probability of success, maps and information, use of adjacent land, roads and/or other access, scenery, camp sites, congestion, and law enforcement.

*There is an obvious need for close collaboration between game managers and land managers; they each control factors which*

affect hunting satisfactions. Their cooperative, coordinated efforts can produce high-quality total experiences leading to optimum human benefits. By working together they can broaden and enhance hunting experiences. For example, roads closed to traffic can provide excellent access for hunters on foot. Specially designated camping locations will put hunters where managers want them.

There is also a need for more research-based information on how surrounding conditions affect hunting satisfactions and benefits.

**Tenet 6: Hunting-dependent Satisfactions Should Be Stressed**

Sixth, under a multiple-satisfaction approach, *game management should produce those satisfactions that are most dependent on hunting for their realization and are not readily obtainable from other recreational activities.* Some satisfactions are unique to hunting, such as stalking or outsmarting game, making a difficult shot, working a bird dog, participating in the ecological process, and bringing home game for food.

Other satisfactions important to many sportsmen are not derived from hunting alone and are available from other recreation activities as well. Among these are using such equipment as all-terrain vehicles or guns, camping, target practice, companionship, and sociability.

Managers faced with resolving conflicts between uses can maintain or enhance the quality of sport hunting by favoring those activities which lead to hunting-dependent satisfactions that cannot be obtained elsewhere. For example, target practice is a common and accepted activity in many hunting camps. When its occurrence is infrequent, it generally creates no conflict. But as hunters in an area become more numerous, the impact of target practice and

“plinking” may affect nearby game and annoy hunters who are seriously attempting to pursue their quarry or who may be ducking bullets. In such situations, we urge game managers to foster hunting-dependent satisfactions by restricting the activity not dependent on hunting. In this case, favor the hunters over the target shooters. To do otherwise would disenfranchise those persons seeking satisfactions unique to sport hunting for the sake of activity that could be pursued elsewhere.<sup>1</sup>

Congestion and a carnival atmosphere develop at many popular hunting locations. When the carnival atmosphere becomes part of the attraction, congestion should be reduced to protect the primary experience of hunting. Similarly, when road hunting pre-empts any opportunity for those on foot to carry out a skillful stalk, road access might be curtailed. This would favor those hunters seeking satisfactions unique to the sport.

The integrity of sport hunting has its foundations in hunter ethics and sportsmanship. To preserve its fundamental attractions there is need for continuing emphasis on those values. Responsibility for leadership rests with the sporting industry, game managers, and sportsmen's groups in cooperation with public and private landowners. A strong code of ethics and effective law enforcement are necessary to keep sport hunting from becoming just “outdoor recreation with guns.”

**IMPLEMENTING A MULTIPLE-SATISFACTION APPROACH**

The multiple-satisfaction approach is a conceptual tool. That is, it intends to be a

<sup>1</sup> For a discussion of the theoretical issues underlying choices between resource-dependent and non-dependent uses and the total welfare implications to participants, see Harry et al. 1972. For an example in wilderness, see Hendee and Stankey 1973.

Fig. 2. A multiple-satisfaction model of deer hunting in an hypothetical western state.

Type of Deer Hunting and Satisfactions Produced	Number of Hunters	Percent Success	Total Man- days	Current Allocation: Acres	Congestion: Acres Used per Man-day
Back-country Hunt	—	—	—	—	—
Solitude					
Companionship					
Escapism					
Nature appreciation					
Outdoor skill					
Trophy					
Exercise					
General-season Party Hunt	—	—	—	—	—
Sociability—camp life					
Escapism					
Equipment					
Harvesting game					
Exercise					
Meat Hunt	—	—	—	—	—
Harvesting game					
Small party, family					
Skill					
Road hunting					
Special-skill Hunts	—	—	—	—	—
(Archery, ball and cap)					
Outdoor skill					
Equipment					
Vicarious (story telling)					
Nature appreciation					
Escapism					

point of view or orientation which reveals and facilitates new applications of existing knowledge. The most specific, down-to-earth applications of this approach are likely to come from game managers who are willing to look at their job as one that produces human satisfactions through hunting experiences rather than one that simply increases the amount of game bagged or the number of man-days afield.

In applying the multiple-satisfaction model to deer hunting (Fig. 2) and steelhead fishing (Fig. 3) in a hypothetical western state, for example, the generic activities of deer hunting and steelhead fishing are broken down according to the different kinds of experiences they provide so

that pertinent information can be related to them. Information might include the amount of resources used to produce those experiences, extent of participation, typical harvest, congestion levels, etc. These figures do not describe all kinds of deer hunting or steelhead fishing; the satisfactions listed for each sport are not comprehensive, nor are they ranked in the proper order to fit every situation. They are simply examples developed from discussions with game managers in one western state.

Such a breakdown could be useful for several purposes:

1. It helps the manager analyze the kinds of sporting activities his programs offer, focusing on specific segments of his client-

Fig. 3. A multiple-satisfaction model of steelhead fishing in an hypothetical western state.

Type of Steelhead Fishing and Satisfaction Produced	Number of Fishermen	Success per Man-day	Total Man-days	Miles of Stream	Congestion: Stream Use per Man-day
Fly Only	-	-	-	-	-
Skill					
Nature appreciation					
Success					
Vicarious (story telling)					
Exercise					
Equipment					
Cast-drifting	-	-	-	-	-
Skill					
Nature appreciation					
Exercise					
Equipment					
Success					
Boat Drifting	-	-	-	-	-
Companionship					
Success					
Equipment					
Nature appreciation					
Skill					
Plunking	-	-	-	-	-
Companionship					
Vicarious					
Equipment					
Success					

tele. This information is much more useful than generalizations about the “average” hunter or fisherman. The back-country hunter has preferences, characteristics, and behavior quite different from those of the general-season party hunter. Likewise, the fly fisherman is a breed apart from the steelhead plunker.

2. By breaking down a game management program according to the various kinds of experiences it provides, a manager can appraise the extent of resources invested in each one, comparing that with results (in terms of game harvested, days of participation, and other data). Given an accurate picture of what their programs are producing, managers can make more knowledgeable allocations among programs in order to optimize resource use or respond to demands. A clear picture of the resources

invested in various sub-programs—and the resulting use, harvest, and congestion—would help managers define and set standards to protect hunting quality.

For example, the multiple-satisfaction approach might show a particular manager that a relatively low chance of success is adequate to satisfy his back-country hunters as long as congestion does not increase beyond a certain point. This might suggest that he try restricting the number of participants in a back-country hunt. The approach might further indicate that he need not apply that restriction across the board. His general-season party hunters may not be bothered by the degree of congestion which spoils a back-country hunt, but they do require a higher probability of success.

Finally, looking at a game-management

program in terms of the multiple-satisfaction model would help in studies vital to evaluating and improving management efforts and resource investments (Bell and Thompson 1972). Many questions could be pursued: What elements of the program are serving particular sub-categories of sportsmen? What kinds of experiences are important to each kind of client (such as the special-skill deer hunter or the boat-drifting steelhead fisherman)? What investments in habitat improvement, game population, facilities, and research would contribute most to overall program objectives? The author is eager to hear from managers who apply the framework to their programs; reports from the field are invaluable to ongoing research.

### SUMMARY AND CONCLUSIONS

A multiple-satisfaction approach to game management makes it possible to increase human benefits, even where game populations are fixed or declining, through better management of hunter-wildlife relationships and surrounding conditions. The approach is a way of looking at game management from the standpoint of hunting experiences and the human satisfactions they produce. The key to implementing the approach is perceptive judgment by managers of what hunting or fishing experiences and satisfactions their clients seek and the managers feel they should provide.

The six basic tenets of the multiple-satisfaction approach can be valuable tools to game managers making these judgments. The tenets suggest an aggressive approach to producing satisfactions desired from sport hunting—solving problems by design, before they occur. The alternative, *laissez-faire* approach, would have managers move in with restrictions and controls only after problems and conflicts have developed. Under that kind of management, the diver-

sity of experience and unique attractions of hunting easily could disappear.

Thus, this multiple-satisfaction approach provides a new concept of game management. While further refinement and research are needed to better define relationships and to provide specific management guidelines, there may be immediate policy implications for managers willing to look at their jobs from this new perspective.

### LITERATURE CITED

- ALLEN, D. L. 1973. Report of the committee on North American wildlife policy. *Trans. N. Am. Wildl. Nat. Resour. Conf.* 22pp. Typescript.
- BELL, E., AND E. THOMPSON. 1972. Planning resource allocation in state fish and game agencies. *Trans. N. Am. Wildl. Nat. Resour. Conf.* 37:369-377.
- BULTENA, G., AND L. L. KLESSIG. 1969. Satisfaction in camping: a conceptualization and guide to social research. *J. Leisure Res.* 1(4):348-354.
- CLARK, R. N., J. C. HENDEE, AND F. L. CAMPBELL. 1971. Values, behavior, and conflict in modern camping culture. *J. Leisure Res.* 3(3):143-159.
- CRISSEY, W. F. 1971. Some thoughts on wildlife research and management objectives. *Wildl. Soc. News* 134:27-28.
- HARRY, J., J. C. HENDEE, AND R. STEIN. 1972. Sociological criterion for outdoor recreation resource allocation. *Am. Sociol. Soc. Ann. Meet.* 17pp. Typescript.
- HENDEE, J. C. 1969. Appreciative versus consumptive uses of wildlife refuges: studies of who gets what and trends in use. *Trans. N. Am. Wildl. Nat. Resour. Conf.* 34: 252-264.
- , W. R. CATTON, JR., L. D. MARLOW, AND C. F. BROCKMAN. 1968. Wilderness users in the Pacific Northwest—their characteristics, values, and management preferences. *USDA For. Serv. Res. Pap. PNW-61. Pac. Northwest For. and Range Exp. Stn., Portland, OR.*

- , AND D. R. POTTER. 1971. Human behavior and wildlife management: needed research. *Trans. N. Am. Wildl. Nat. Resour. Conf.* 36:383-396.
- . 1972. Management of wildlife for human benefits. *Proc. Western Assoc. Game Fish Commissioners.* 175-181.
- , AND C. SCHOENFELD, eds. 1973. Human dimensions in wildlife programs; reports of recent investigations. *Wildl. Manage. Inst., Washington, D.C.* 191pp.
- , AND G. STANKEY. 1973. Biocentricity in wilderness management. *Bio-science* 23(9):535-538.
- LAPAGE, W. F. 1968. The role of customer satisfaction in managing commercial campgrounds. *USDA For. Serv. Res. Pap. NE-105*, 23pp. Northeast For. Exp. Stn., Upper Darby, PA.
- LEOPOLD, A. 1929. Report of the committee on American wildlife policy. *Proc. Am. Game Conf.* 16:196-210.
- . 1930. The American game policy in a nutshell. *Proc. Am. Game Conf.* 17: 281-283.
- MORE, T. A. 1973. Attitudes of Massachusetts hunters. In J. C. Hendee and C. Schoenfeld, eds. *Human dimensions in wildlife programs: reports of recent investigations.* *Wildl. Manage. Inst., Washington, D.C.* 191pp.
- POTTER, D. R., J. C. HENDEE, AND R. N. CLARK. 1973. Hunting satisfaction: game, guns, or nature? In J. C. Hendee and C. Schoenfeld, eds. *Human dimensions in wildlife programs: reports of recent investigations.* *Wildl. Manage. Inst., Washington, D.C.* 191pp.
- , K. M. SHARPE, AND J. C. HENDEE. 1973. Human behavior aspects of fish and wildlife conservation: an annotated bibliography. *USDA For. Serv. Gen. Tech. Rep. PNW-4*. 288pp. Pac. Northwest For. and Range Exp. Stn., Portland, OR.
- STANKEY, G. H., R. C. LUCAS, AND R. R. REAM. 1973. Relationships between hunting success and satisfaction. In J. C. Hendee and C. Schoenfeld, eds. *Human dimensions in wildlife programs: reports of recent investigations.* *Wildl. Manage. Inst., Washington, D.C.* 191pp.
- THOMAS, J. W., AND R. M. DEGRAAF. 1973. Non-game wildlife research in megalopolis: the Forest Service program. *USDA For. Serv. Gen. Tech. Rep. NE-4*. 12pp. Northeastern For. Exp. Stn., Upper Darby, PA.

