

WILDLIFE DAMAGE CONTROL AND WILDLIFE MANAGEMENT

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INTRODUCTION

It is a distinct pleasure and privilege to help kick off this conference. But, first, we want to commend the Co-chairmen, Jim Caslick, Dan Decker, and John Kelley, and the Conference Committee involved in putting this excellent and timely program together.

This conference is important not only because it provides an opportunity for interaction and discussion among resource managers and others concerned with wildlife damage control, but because the published abstracts and distribution of technical papers will extend the conference's value to a much wider audience. We hope that the full proceedings of this conference can be published, since it would constitute an excellent reference source. We must continue to disseminate information and to further educational efforts in the principles, concepts, and methodology of wildlife damage control.

It is tempting to speculate whether this will be the first in a series of conferences on this theme, similar to the distinguished series of Vertebrate Pest Conferences begun in California more than 20 years ago. The published proceedings of those conferences now represent one of the most comprehensive references of vertebrate pest control information available anywhere.

Improved wildlife resource management and increased outputs of commodity resources are related to our increasing the effectiveness of wildlife damage control. Thus, this is an important objective of wildlife management. We would like to discuss the role of wildlife damage control in wildlife management based on our experience in wildlife and fisheries management in the Forest Service and in The Wildlife Society.

WILDLIFE DAMAGE CONTROL TERMINOLOGY

Among wildlife professionals, activities concerned with wildlife damage problems are called various things such as wildlife damage control (WDC), animal damage control (ADC), vertebrate pest control, etc. For example, The Wildlife Society's position statement on wildlife damage problems is entitled, "Animal Damage Control." The Wildlife Society committee created to address this issue is called the "Vertebrate

Pest Committee." Even among persons who specialize in WDC, there is no consistency in the name given to their specialty. The public continues to receive mixed signals about what this phase of wildlife management really is about, and the inconsistencies in terminology may be partly to blame. If a generally accepted title were used, improved communication among biologists and between biologist and the public likely would occur. It is important, therefore, that we adopt a specific title for this particular specialty and that as wildlife professionals we speak in a consistent way about this important phase of wildlife management.

We concur in the title selected by the organizers of this conference. Wildlife damage control is an accurate description of this specialty area. We are attempting to prevent or control the damage caused by all types of wildlife species. Therefore, we believe we should recognize the specialty as wildlife damage control. The Vertebrate Pest Committee of The Wildlife Society has made this same recommendation to the Society (Report of the Vertebrate Pest Committee, TWS, 9-1-83).

WILDLIFE DAMAGE CONTROL IN THE FOREST SERVICE

We have responsibility for the management of habitats for more than 3,000 vertebrate species of wildlife on the 191 million acres of National Forest System lands. In addition, through our branch of State and Private Forestry, we provide technical assistance in habitat management (including WDC) through State Forestry departments, to nonindustrial private forest landowners throughout the United States. By reviewing Forest Service policy regarding wildlife damage control, the need for it on National Forest System lands, and citing examples of Forest Service involvement in WDC activities, we will try to show why it is an important function and an integral part of the wildlife and fisheries program in the Forest Service.

NEED FOR WILDLIFE DAMAGE CONTROL ON NATIONAL FOREST SYSTEM LANDS

Animals cause serious damage to forest and range resources and may constitute a hazard to public health. During stand development, tree seeds, seedlings, and older trees are subject to various kinds of damage by many animals. Rodents cause damage to range forage and predators cause losses to livestock on grazing allotments on National Forests and National Grasslands. Rodent-borne diseases, such as plague, Rocky Mountain spotted fever, leptospirosis, salmonella and tularemia, may be associated with

campgrounds and recreational sites (Marsh et al., 1981).

Forest animal damage, defined as the result of any animal activity that reduces or delays planned forest yield, ranks highest in economic impact, ahead of fire, competing vegetation, and other causes of loss as an impediment to reforestation. Most animal damage to reforestation on National Forest System lands occurs in the West. For example, a survey of animal damage on National Forests in the Pacific Northwest (Oregon and Washington) showed that animal damage was a serious and widespread problem (Crouch 1969). A more recent survey of animal damage on forest plantations in Oregon and Washington (more than one-third of all plantations sampled were on National Forest System lands) demonstrated that animal damage has a significant impact on survival and growth of conifers (Black et al., 1979). An economic analysis of survey results, based on tree height growth and survival models that project plantation development with varying amounts of animal damage, indicated that animal damage in Oregon and Washington would reduce the total value of the forest resource by up to \$1.8 billion (Brodie et al., 1979).

On National Forest System lands, wildlife damage control for reforestation was conducted on 82,000 acres, primarily in the West, in fiscal year 1981 (Annual Reforestation and TSI Report for FY 1981, USDA Forest Service).

LIVESTOCK LOSSES TO PREDATORS ON NATIONAL FOREST RANGES

Grazing allotments on National Forest and National Grasslands, primarily in the West, provide grazing for from 2 to 3 million head of sheep, cattle and goats each year (Gee et al., 1977). Based on reports filed by grazing permittees with the Forest Service from 1956-74, estimates of sheep and goat losses to all causes ranged from about 50 to 72 thousand per year; predators reportedly caused from 38 to 64 percent of all losses during this period. Although the number of sheep grazed on National Forest ranges has declined in the last two decades, losses of sheep attributed to predators (chiefly coyotes) increased, and the predation rate more than doubled. Sheep losses attributed to coyotes and other predators now constitutes more than 60 percent of all sheep deaths occurring on National Forest ranges.

U.S. Department of Agriculture's, Economics, Statistics and Cooperative Research Service estimates that annual losses to livestock producers attributable to coyotes are about \$53 million. Recent data show that annual financial losses to the sheep industry alone approximate \$24 million. Losses to consumers attributable to sheep or lamb predation approximate \$4 million; consumer losses due to calf predation are about \$169 million.

FOREST SERVICE POLICY ON WILDLIFE DAMAGE CONTROL

Forest Service policy on wildlife damage control (Forest Service Manual 2650 - Wildlife and Fish Damage Control) is based on the USDA Policy on Fish and Wildlife (Secretary's Memorandum 9500-3, July 20, 1983). It provides that wildlife and fish damage control will be initiated when populations threaten public health, safety, or threatened and endangered species, or cause or threaten to cause excessive damage to other resources. Wildlife and fish damage control also is called for where needed for effective management of another wildlife species. The objective of wildlife and fisheries damage control is to reduce damage and loss by wildlife on all National Forest System lands to levels consistent with management objectives.

Control measures are undertaken only when and where necessary to realize wildlife and fish management objectives and to prevent serious damage to public or private property and natural resources. Degree and significance of damage rather than animal abundance are the primary factors in determining need for controls. When feasible, control through licensed hunting, fishing or trapping, habitat manipulation, or biological suppression is favored over other methods. Every effort is made to minimize losses of nontarget wildlife and fish during control programs. Problems related to rodent-borne diseases are usually handled in cooperation with the States and the Fish and Wildlife Service.

Because of its economic and environmental advantages, the Forest Service supports and promotes the concept of integrated pest management (IPM) in all attempts to reduce economic losses caused by vertebrate animals. We regard IPM as an ecologically based approach to pest management, which follows a systematic decisionmaking process that provides for evaluation of all aspects of a problem, alternative treatments, and environmental impacts. We emphasize the selection, integration, and use of a combination of tactics on the basis of anticipated economic and ecological consequences. The goal of the Forest Service is to reduce damage where wildlife damage reduction is determined to be necessary for economic reasons and, if possible, without environmental harm. When direct control is determined to be necessary, control efforts are focused on individual offending animals, not on the species as a whole.

On National Forest System lands, wildlife damage control efforts are planned and conducted under the terms of an agreement between the Forest Service and the Fish and Wildlife Service, USDI. There are also individual agreements with many States. Any animal damage control activities proposed on National Forest System lands must be carefully screened and evaluated before actions are approved. Where predators are involved, this requires documentation of evidence of livestock or wildlife losses and coordination of control methods with land and resource

management planning objectives. Actual control methods and their timing are outlined in a plan which is approved by the Forest Service. When a plan is approved, the control is conducted by the Fish and Wildlife Service or, in some cases, under State direction. The results of predator control activities are closely monitored by the involved Federal and State agencies. As a result of this screening and the evaluation of critical needs, predator control has been necessary on only a small percentage of the Forest Service grazing allotments.

RESEARCH

Forest Service research on wildlife damage control was curtailed in 1975 with the termination of the Animal Damage Project at Olympia, Washington. However, the Forest Service is continuing to support wildlife damage control studies in cooperation with the Fish and Wildlife Service and others. Emphasis is on studies aimed at assessing effects of silvicultural practices on wildlife habitat as related to wildlife damage. For example, the Forest Service is cooperating with the University of California, Davis, in a study of the response of pocket gopher populations to various combinations of site preparation for reforestation. In 1982, the Forest Service initiated a series of cooperative studies regarding prairie dog damage control and management.

POLICY OF THE WILDLIFE SOCIETY (TWS) ON WILDLIFE DAMAGE CONTROL

It is the policy of TWS, as outlined in its position statement on "Animal Damage Control," to recognize wildlife damage control as a positive phase of wildlife management. Thus, the TWS advocates "support of only those animal damage control programs that are justified biologically, socially, and economically." The policy of TWS, in regard to control of wildlife damage, further calls for:

"Encouraging continuing research designed to improve methods of (a) accurately assessing the damage caused by wildlife, (b) controlling and preventing animal damage, especially by nontoxic means, and (c) measuring the effectiveness of damage control programs.

"Recommending that control efforts be the minimum required to bring damage within tolerable limits.

"Supporting the use of only the most efficient, safe, economical, and humane methods to control depredating animals, and advocating effective lethal control only when other methods are unsatisfactory."

"Urging that all control programs directed at wildlife populations and species be regulated closely by State or Federal laws."

The Wildlife Society recognizes that control of wildlife damage to crops and/or threats to public health or to

the health of other wild or domestic animals is a necessary goal in wildlife management.

Essential to programs of wildlife damage control are assurances that the damage and/or hazard to public or animal health has been accurately assessed, that the techniques for control are acceptable both biologically and humanely, and that the control measures employed will effectively reduce the assessed damage.

The Vertebrate Pest Committee of TWS, in their report of September 1983, recommended that the present Position Statement on "Animal Damage Control" be rewritten to further emphasize a positive attitude by the Society toward wildlife damage control and to recognize WDC as the preferred terminology.

VERTEBRATE PEST COMMITTEE REPORT (TWS)

As President of The Wildlife Society (1982 and 1983), Dale Jones established a committee to evaluate how TWS can become more helpful to wildlife damage control professionals. He was concerned with the lack of participation by wildlife damage control specialists as members of TWS. Dr. Terrell P. Salmon, Extension Wildlife Specialist, Animal Damage Control, University of California, Davis, is the chairperson of this committee. We have drawn freely on the committee's report of September 1983 in the following discussion, which deals with how the wildlife profession can better serve and become more responsive to biologists specializing in wildlife damage control:

WILDLIFE DAMAGE CONTROL COURSES

Colleges and universities should increase their course offerings and/or emphasize wildlife damage control in their curricula. Only a few schools now offer wildlife damage control courses at the university level. Usually one, or at best, several lectures in this area are presented as part of a general wildlife management course; in some instances, courses in forest management may include instruction in wildlife damage control, primarily as it relates to wildlife-caused damage to reforestation. This is inadequate to cover such an important phase of wildlife management. As wildlife professionals, we should encourage development of sound coursework in this area. We also recognize the lack of adequate training materials on the principles and techniques of wildlife damage control. To improve this, we should encourage colleges and universities offering wildlife programs to include this phase of wildlife management in their curricula. Since any wildlife professional may be called upon to give testimony, make statements, or interpret wildlife damage control programs, all wildlife biologists should have an understanding of wildlife damage control problems and solutions.

In an excellent paper at the 1982 North American Wildlife and Natural Resources Conference, Timm (1982) listed several reasons for the neglect of

vertebrate pest control education, including the view that control of vertebrate pests and pest damage does not require special training, reluctance by college advisors to encourage students to enter vertebrate pest control, and difficulty in obtaining research funds for vertebrate pest studies. Timm made a strong plea that every wildlife and natural resource manager should have at least one good course in vertebrate pest control. Such a course, he said, should teach general principles and approaches, and use specific problem situations as examples of how to apply these principles.

CONTINUING EDUCATION IN WILDLIFE CONTROL

In the area of wildlife damage control, continual updating of knowledge is essential for adequate job performance. We should encourage and promote continuing education in this field. Attendance at courses such as this should be given full continuing education credit. The availability to biologists of continuing education programs in wildlife damage control needs to be widely publicized. In the Forest Service, for example, we regularly disseminate notices regarding wildlife damage control symposia, conferences, and other training opportunities to biologists and other resource managers in all Regions of the Forest Service. And we strongly encourage participation by biologists, particularly where their responsibilities include wildlife damage control. We also recommend participation by other resource managers not directly involved in wildlife damage control, since they often are asked their opinions, etc., on proposed control programs and, therefore, are encouraged to obtain the most accurate and up-to-date information on the subject.

In support of continuing education in wildlife damage control, Miller (1981), Timm (1982), and others concluded that we must have better education in this area, if we are to have safe, effective, and well-supported programs in vertebrate pest control.

At present, there are five major conferences in the U.S. dealing with wildlife damage. They are, in addition to this conference, the Vertebrate Pest Conference (California), the Great Plains Wildlife Damage Control Workshop (Great Plains States), the Bird Control Seminar (Ohio), and the Pine and Meadow Vole Symposium (Virginia). In addition to these conferences, many other programs have sessions or individual presentations on wildlife damage control. Because there are so few training opportunities in wildlife damage control available to wildlife biologists, we should take every opportunity to encourage their attendance at these programs. Moreover, as appropriate, we should actively encourage inclusion of wildlife damage control in symposia on wildlife or forest management, or other resource management programs. In the long run, to increase understanding, reduce emotional opposition, and build support for comprehensive wildlife management programs,

including wildlife damage control, will require better public education (Miller 1982).

WILDLIFE DAMAGE CONTROL TECHNIQUES BOOK

Do we need a comprehensive, up-to-date wildlife damage control techniques book? The Wildlife Society's Vertebrate Pest Committee and others have asked this question. At present, there are a diversity of wildlife damage control manuals, handbooks, bulletins, circulars, etc., available, most of which are local or regional in scope. To cite only a few examples: "(California) Vertebrate Pest Control Manual" (Marsh and Howard, 1977-78) and "(California) Vertebrate Pest Control Handbook (Clark 1975): "Animal Damage Control in New York State," Cooperative Extension Service, Cornell University; Regions 5 and 6 of the USDA Forest Service, (California, Hawaii, Oregon, and Washington), have compiled a comprehensive "Animal Damage control Handbook (FSH 2609.22)"; the 1982 bibliography of Cooperative Extension Service literature on wildlife and forest resources, which lists more than 130 publications dealing with wildlife damage control; and The Wildlife Society's "Wildlife Management Techniques Manual" includes a chapter on "Wildlife Damage and Control Techniques" (Hawthorne 1980). An excellent revision and update of the Great Plains Wildlife Damage Control Handbook entitled "Prevention and Control of Wildlife Damage," edited by Robert M. Timm, and published by the Great Plains Agricultural Council Wildlife Resources Committee and the Cooperative Extension Service, University of Nebraska-Lincoln is the most recent handbook dealing with vertebrate pest management.

The Wildlife Society's Vertebrate Pest Committee stressed the need for more information on wildlife damage control techniques. We believed that this need could be met by TWS developing a comprehensive wildlife damage control techniques manual that would have application nationwide. Such a publication would facilitate development of coursework in wildlife damage control and, in addition, would provide a valuable and needed reference to resource management agencies and others concerned with wildlife damage control.

PUBLICATION OF ARTICLES ON WILDLIFE DAMAGE CONTROL IN THE JOURNAL OF WILDLIFE MANAGEMENT

Communication of information about wildlife damage control techniques and practices also would be advanced by increased publication of wildlife damage control articles in The Journal of Wildlife Management and in The Wildlife Society Bulletin. This was one of the principal recommendations of TWS's Vertebrate Pest Committee in their report of September 1983.

NEED FOR EXPERTISE IN WILDLIFE DAMAGE CONTROL—SOME CURRENT EXAMPLES

- a. Bubonic plague outbreak in New Mexico. A recent outbreak of bubonic plague in the Southwest (primarily in New Mexico), illustrates both the hazard of rodent-borne diseases and the need for informed action by resource managers. As of mid-August 1983, 18 human cases of bubonic plague had been reported in New Mexico, two of which were fatal. Although these cases were not on lands administered by the Forest Service, management of rodents and fleas was of immediate concern to land and resource managers involved, particularly on recreation areas. For example in 1983, the Bureau of Indian Affairs (USDI) conducted intensive efforts to control populations of prairie dogs and other rodents in this region to reduce the risk of transmission of the disease to humans.
- b. Rabies outbreak in the mid-Atlantic States. The current outbreak of rabies among foxes, raccoons, skunks, and other mammals in the mid-Atlantic States (see Jenkins and Winkler, Proc. this conference) provides still another example of the hazards of rodent-borne diseases to humans and domestic animals.
- c. Coyote attacks on humans in California. Recent attacks by coyotes on at least six persons in Los Angeles County, including one fatal attack, further demonstrate that we cannot afford to neglect wildlife damage control. In this situation, the public quickly recognized that protection from wild animals is appropriate and should be provided, confirming Howard's observation (1974, 1983) that each person's judgment of a species value depends upon his or her relationship with it. In this particular situation, given the necessary public support, the County was able to implement a control program involving trapping, shooting, and public education to alleviate the problem (Howell 1982).
- d. Protection of an endangered species. In some situations, management may require control of a competing or depredating species to give an endangered species an edge. For example, at Grays Lake National Wildlife Refuge, in Idaho, the Fish and Wildlife Service (USDI) has for several years obtained an emergency use permit from the EPA to use the M-44 "coyote getter" to control coyotes, which may take the eggs or nestlings of the whooping crane (an endangered species) or disturb their foster parents. Thus, careful and timely application of selective predator control techniques have contributed to the success of this unique effort to use greater sandhill cranes as foster parents to rear whooping cranes. Wildlife damage control, therefore, is an integral part of the recovery program.
- e. Deer management problem in Virginia. A recent deer management problem in northern Virginia, which we had the opportunity to review as representatives of The Wildlife Society, illustrates the sensitivity of the public to wildlife damage control and to wildlife population control activities.

It further demonstrates the importance to biologists of training in the fundamentals of WDC and of the public relations aspects involved in problems of this nature, as well as the need for better education of the public.

The National Zoo got caught up in a controversy involving the reduction in an overpopulation of white-tailed deer within a 3,000-acre, cyclone-fenced enclosure at their Conservation and Research Center in northern Virginia. Reasons given were deer damage (excessive use of alfalfa fields by deer and overbrowsing of hardwoods) and evidence of disease problems that threaten their endangered species rearing program. Controlled sport hunting was the method proposed for reducing the number of deer within the enclosure. Not surprisingly, there was an outcry from the public—the Smithsonian staff was deluged with letters from antihunters, Smithsonian members, school kids, and others.

After a review of the situation on the ground, a group of us wildlife professionals confirmed the Smithsonian's assessment and supported their plan to conduct a controlled public hunt. We concluded that such a hunt would be the least costly and most beneficial way to alleviate the problem. However, Congressman Sidney Yates, Chairman of the House Subcommittee on Interior for The Department of the Interior and Related Agencies ruled otherwise. (Congress controls the funding for the Smithsonian.) The Smithsonian withdrew their hunting option and agreed to remove the surplus deer by other means, in addition to installing a costly deer-proof fence. Subsequently, a less controversial and less expensive solution was adopted: sections of the existing 8-ft high fence were removed, allowing the deer within the enclosure to disperse.

We have described this problem, not because it is unique, but because it illustrates the complexity of dealing with wildlife control problems in terms of biology, control techniques, and public relations. Because the population of deer on the property, if unmanaged, posed a threat to the herd and its habitat, and increased the risk of transmission of diseases and/or parasites to the exotic species maintained there, an effective means had to be devised to alleviate the damage problems and the threats to the exotic species at the Center. Further, as was amply demonstrated, this required that the management plans not only must be technically sound but acceptable to diverse publics. This called for knowledge of the principles and approaches to wildlife damage control, in addition to an understanding of the principles of wildlife management. In brief, this was applied ecology and, therefore, should be regarded as an integral part of wildlife management.

Common to each of these examples is the clear link between wildlife damage control and sound wildlife management. They demonstrate, if further demonstration is needed, the inseparability of wildlife damage control from wildlife management.

In a review of the principles of predator control, Berryman (1972) stressed the need for an interdisciplinary approach, coordination among involved agencies and landowners/managers, and that decisions be based on accurate data. He also emphasized that predator control decisions are inseparable from other resource management plans. Berryman concluded that predator management was an integral part of wildlife management: "the principles of (wildlife) management apply to any form of control regardless of the species and the damage caused."

DISCUSSION OF ALTERNATIVES TO EFFECTIVE WILDLIFE DAMAGE CONTROL

In the following discussion of the alternatives available to landowners/resource managers faced with significant wildlife damage problems, we have drawn freely on ideas developed by James E. Miller, Wildlife and Fisheries Program Leader, USDA Extension Service (Personal communication, August 12, 1983).

Miller pointed out the need for landowners/resource managers to have efficient, cost-effective, and legal means available to control wildlife damage. Without such tools and the knowledge of how to use them safely and effectively, several unsatisfactory choices are available:

1. Take no action and hope that the amount of damage will be tolerable.
2. Use less effective alternatives.
3. Change cropping or husbandry practices, or discontinue farming, ranching, etc.
4. Use unregistered toxicants or other unacceptable control practices, which may be ineffective and/or hazardous to nontarget wildlife or to people.
5. Completely change land use, eliminating habitat for both the pest species and desirable wildlife.

Miller emphasized that because of restrictions on the use of pesticides and other wildlife damage control tools, landowners are making changes in land use daily across the Nation. He cited several examples that demonstrate that alternatives to adequate wildlife damage control may have disastrous consequences for wildlife habitat, e.g., (1) ditchbanks or levees cleared of vegetation with herbicides or burning because no cost-effective means of controlling rodent damage was available, and (2) shrubs, trees, and cover eliminated from croplands and rangelands to reduce destructive blackbird and rodent populations.

SUMMING UP

Who should plan, coordinate, and/or conduct wildlife damage control? Wildlife biologists trained in vertebrate ecology and knowledgeable about population dynamics and the relationships of wildlife population to habitat changes are the professionals best equipped to handle this subject. As wildlife

professionals, we would prefer that wildlife biologists and wildlife agencies assume this responsibility rather than assign it to others less qualified in wildlife management. Although such persons, both professionals and nonprofessionals, may have adequate expertise in control techniques, safe use of pesticides, etc., there is less assurance that appropriate consideration will be given to long-term impacts on wildlife habitat, to threatened and endangered species, to maintaining viable populations of all native and desired non-native vertebrate species, and to protection of the environment. In closing, we would, again, like to congratulate those involved in presenting this conference, which will make an important contribution to the advancement of knowledge of wildlife damage control. The conference also has provided an opportunity to demonstrate to wildlife professionals and to the public that wildlife damage control is an important element in wildlife management. We do not advocate that all wildlife managers become experts in wildlife damage control, but it is essential that they have a working knowledge of the principles and approaches to it. Continued improvement in the status of wildlife damage control will benefit the entire field of wildlife and natural resource management.

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