A PHILOSOPHY OF VERTEBRATE PEST CONTROL

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ABSTRACT: Vertebrate pest problems are foremost economic, political and social rather than biological anomalies. Students are often turned away from vertebrate control, which is applied ecology, by professors who know only theory and do not understand the ecology of man-modified environments. Applied ecologists seeking alternative methods of vertebrate control benefit environment far more than the negative, anti-control approach based on half-truths that are used for self-serving purposes by many protectionist organizations and government leaders in CEQ, EPA and USDI. A healthy ethic, with deep ecological conscience, would be to appreciate the glory of death in nature, for death means life to other individuals within a species. A vertebrate control operation has benefit factors other than the individual or species being controlled, whereas the objective of wildlife management favors the well-being of local populations of the species in question. Since Land-Grant Universities are geared for research and extension support from the USDA, it is a mistake to have the responsibility for vertebrate pest control in the conservation-wildlife-management oriented Fish and Wildlife Service of USDI.

I am pleased to give this paper as a substitute for a speaker who had to cancel. Slides will be shown during half of the talk to illustrate my philosophy and give examples of consultations on rodent control overseas.

Decisions about vertebrate pest problems should be developed from a deep appreciation of the need to protect and preserve wildlife, balanced by recognition of the importance of wildlife management, and guided by a healthy understanding of the ecology of vertebrate pests in environments that man, wisely or unwisely, has modified for his own well-being. Most biologists, however, seem to lack basic knowledge about the ecology of disturbed environments.

My experiences as a consultant have widened and deepened my philosophy of vertebrate control in particular. It has been my good fortune since 1969 to have had 10 short-term consultantships with the United Nations (Food and Agricultural Organization or World Health Organization) on vertebrate pest problems involving rodents, European rabbits, deer and other introduced mammals, vampire bats, and other species. These assignments have ranged in duration from about two weeks to six months. I have also had Fulbrights to New Zealand and Australia and a second year-long assignment to New Zealand. I continue to learn much with each new assignment, not just about the people-problem aspects of vertebrate pests, but also about wildlife ecology in disturbed environments. Nature is not only all-inclusive but abounds with more confusion than many ecologists are willing to admit, in particular when it comes to problems of vertebrate pests.

Perhaps of greatest importance, my foreign experiences have dramatically demonstrated that almost all vertebrate pest problems are foremost economic, political, social, and even religious problems rather than biological anomalies. They are primarily people problems--created by people and difficult to handle mainly because of the human relation involved. I try hard to get this philosophy across to my students before they leave their academic sanctuary. Too many people, unfortunately, develop a professional syndrome in which, being highly trained in theory, they lose sensitivity to the practical world of reality. That vertebrate problems are mainly economic and political, not biological, is difficult to get across to many people. Unless students are also exposed to the practical reality of nature in man-altered environments, they usually are prone to think that vertebrate pest problems can be solved by applying textbook theories they learned in college. Unfortunately, they usually learned these theories from professors who have little understanding of the ecology of vertebrate pests because they, too, mostly were taught no more than theory.

To discuss vertebrate control logically, in this country or abroad, one must recognize some of the current misunderstandings about the ecology of animal control. Where man modifies natural environments, he changes the types of habitats present, disrupting to varying degrees the cycle of renewal of life. To fail to recognize the need in these altered environments to protect and manage some species and control others is to ignore the basic principles of the balance of nature. The holistic science of ecology has demonstrated the interdependence we and all other organisms have with each other and with various resources.

Contributions to the quality of the environment are probably much greater from those few researchers who are developing safer and more selective means of controlling offending vertebrates than from the extremists who think the best solution is to outlaw all existing rodenticides, avicides, and predacides. When such toxicants are outlawed without alternative nonlethal methods of control, it usually merely forces the public to adopt whatever "environmentally disruptive" control methods they can devise, legal or illegal, with the environment being the scapegoat.

Too many current ecological and wildlife textbooks attempt to stress the balance of nature as if it is a delicate balance between individuals, and imply that man should let nature resolve the vertebrate pest problems. Most of them still mistakenly suggest that encouragement of natural predators is the most effective way of controlling vertebrate pest species. Many also think that biological control methods, i.e., habitat control, should be a primary goal of all vertebrate pest control. Sometimes it is a good method, but we must remember that the trade-off with habitat modification is very disrupting to all other species of vertebrates. Whenever a field vertebrate species is managed by habitat alteration the suitability of the habitat will be changed for all species, thus affecting most nontarget vertebrates far more than even the careless use of poisons, traps, or shooting, which, as our keynote speaker Dr. Gus Swanson pointed out, usually affects only a few individuals, not populations.

Many biologists fail to recognize that forest and range environments are actually quite stable as far as vertebrate species are concerned. An equilibrium has evolved between the wildlife species and the soil and vegetative complex. Removal of even a large number of individuals of one vertebrate species rarely has a measurable effect on the others. For example, if all of the deer, the dominant herbivore, were removed from North America, the effect on any other vertebrate species (except for a few wolves, mountain lions and coyotes) would be difficult to measure until the vegetation had changed through no longer being grazed and browsed by deer. Instability of an ecosystem results primarily from physically modifying the environment or introducing exotic plants and animals. Consequently, few agricultural crops or home gardens could survive if all native vertebrates were permitted free range in environments thus modified.

Control of wildlife populations in man-modified environments is often a basic tenet in ecologically wise husbandry of our wildlife heritage, producing both tangible and intangible benefits to man and the environment. Most biologists, and even the new generation of trained ecologists, commonly do not react to vertebrate pest problems objectively, as a well trained biologist should, but instead respond more frequently to their emotions than to reality and the laws of nature. As Dr. Dale A. Wade pointed out to one of my classes, political and administrative influences on the direction and effectiveness of animal control problems are often thought to be clear and obvious but usually are not. It would not be difficult to focus control efforts on a specific and clearly defined problem, but seldom can all aspects of the problem be recognized unless one considers all related ecological and political factors.

Initially it seemed to be just teachers of biology, conservation, and wildlife management who established such a critical atmosphere against vertebrate pest control that students were obligated to shun this area of training. Today, even though many students recognize the ecological significance of disturbed environments and the need for research on animal control, many preservation, conservation, and ecological organizations have joined the anti-vertebrate-control ranks. Some self-serving so-called protectionist organizations actually distort true facts to gain additional memberships or donations. Its unbelievable how much money can be raised by using these half-truths. However, we must recognize that nothing can be gained with closed minds on either side of the controversy, and a more constructive relationship is needed between control agencies and protectionists organizations. There is a lack of trust.

Too many government officials in the Council of Environmental Quality, Environmental Protection Agency, Department of the Interior, and leaders of other organizations sit in unique and protected positions where they can orchestrate all sorts of distorted facts, thus creating serious problems for the control people. A consequence is a loss of credibility among workers in vertebrate pest control that is going to be very difficult to overcome. And too many people in prominent positions do this just for their own ego rewards, or for financial support obtained by stirring the emotional pots. Unfortunately, the environment often suffers in the end. It is very difficult to attack most political and philosophical conflicts about vertebrate pest control, because even if one does survive the attack the scars rarely fade.

Another important aspect of anti-control leaders is that they rarely support the needs for research to find alternative methods of control. I personally supported the need for CEQ and EPA because existing government agencies were not sensitive to changing times in ecology and protection of the environment. However, it is most unfortunate that EPA has lost so much credibility and not been more effective in establishing a healthy environmental ethic or philosophy. Its leadership has merely thrown all actions into the courts, and today we are certainly bogged down with litigation, with little environmental progress. Court confrontations are merely a rear-guard, negative force that is slow, expensive and unreliable from an environmental point of view.

Not very many years ago, animal control was primarily the sphere of profit-motivated individuals and agencies looking only for financially beneficial methods of reducing losses to vertebrate pests. Any possible secondary or damaging effect was more or less for the public sector to solve, if solved at all. Among more recently trained professionals, however, vertebrate pest control has at last become much more than of a remedial nature only, even in the developing countries. The general ecology movement has helped bring this about, and limitations have been set so that control measures are not just to achieve a higher benefit-cost ratio in food and money. Now, the overall effects on the environment receive much more consideration, as it should be. Objectives have changed, and man recognizes that he does in fact live on an overcrowded space ship and that he must incorporate much more ecological wisdom in all his actions. It should be mentioned that vertebrate pest control practiced integrated control long before entomologists coined the term.

Vertebrate control now recognizes all values, including the nonconsumptive uses of all wildlife. Control decisions include a safety factor to allow for unknown eventualities in the not-too-well-understood environment. Those who have a better understanding of the ecology of man-changed environments recognize the need of espousing a policy that incorporates animal control so that the complicated environmental web-of-life will not be jeopardized in these modified environments.

Is vertebrate control conservation? Who befriends the wild creatures the most, a preservationist or an "applied ecologist" working in the area of integrated vertebrate pest control? Who really does more good toward sustaining balanced ecosystems--inflammatory journals and organizations that raise millions of dollars with half-truths, or the conscientious applied ecological researcher operating with little financial support? In most instances, surprisingly, it is the one trained in applied ecology doing vertebrate pest control research who finds more suitable alternative methods of control. Unfortunately, the need for control of wild vertebrates in disturbed environments is not readily apparent to opponents of man-sponsored reductions of any population.

We have come a long way--and with little support--in our sincere efforts to design ecological situations which require less need for control and in developing more environmentally sound and desirable methods of vertebrate pest control. Even so, obstacles remain. Even in the developed countries, one finds a growing local majority who are so anti-control that they fail to recognize that the only constructive solution to finding viable answers to vertebrate pest control problems is through good research to develop more acceptable alternative methods. Such research must determine what controls are really necessary, and how more desirable alternatives to curb poisoning programs can be developed. Unfortunately, an admirable love of nature and wildlife and an honest disgust toward any killing by man prevents many highly concerned preservationists from making meaningful progress in protection of the environment. Overprotection in man-modified environments can clearly work against the very goals being striven for, with the protected species destroying its own habitat or that of other desirable species.

Research toward developing suitable alternative controls can do more in improving environmental quality, i.e., reducing harm to nontarget species from various vertebrate control programs, than all the lobbying against by preservationist groups. Both society and the environment need a positive approach toward wildlife problems, rather than the negative approach taken by most anti-preservationists and lobbying conservation organizations.

Many conservation organizations can be credited with being necessary watchdogs, but too often I'm afraid some, for self-serving purposes, must find issues of controversy even if they must create nonexistent issues. Financially they must remain in the public eye, even at the risk of going off half-cocked. These organizations cannot afford to be structured so that all knowledgeable members within the organization can advise on policy and action, for that might expose them as hypocritical for selfish empire-building purposes. They must avoid being put in a position that shows they were exposed to the true facts, for it is controversy they seek.

It appears to me that my colleague, Mr. Rex E. Marsh, and I have been able to make greater contributions toward reducing environmental contamination by developing more selective means of controlling pest species of vertebrates than have those organizations that claim that a ban on toxicants is the only answer. Passing such laws does not stop the killing; it only forces landowners to break the law or go broke, and the price of food to rise. Until alternative methods of control (not management) are developed, it is often helpful to the environment to use toxicants, especially if safer ones can be found.

In recent decades, most human societies have developed a phobia against death, and treat human deaths as obscene and illegal. That attitude must not be applied to all wild animals too! A healthy ethic, with deep ecological conscience, would be to appreciate the glory of death in nature, for death means life to other individuals within a species. Populations are dependent upon the death of individuals. Biotic pyramids are a consequence of food chains where all organisms feed upon others and, in turn, are usually eaten. All creatures have high rates of natality, and hence must also have high rates of mortality. However, if one thinks it is better to be born (the right-to-life), even if only to die prematurely, then one might ask, is vertebrate pest control by birth prevention really better than pest control by an orderly premature death? But remember, nature's way of causing premature deaths is not pleasant. Recycling by nature necessitates that a surplus of animals be born and that few reach old age. Nature has no homes for the aged.

It is common practice to speak of insect control, weed control, or birth control of humans, but with reference to control of wild vertebrates many people find the word control repugnant. Consequently, the word management (to benefit the species in question) is frequently used erroneously when the objective is actually control (to alleviate an animal problem), rather than management.

The objective of control is to reduce a problem, such as depredation to a crop or other resource, whether the method be with frightening devices, repellents, chemosterilants, traps, guns, or toxicants. At times the goal of reduction may be zero individuals, as with rats in a house, moles in a lawn, or pocket gophers in a citrus orchard. When a need for reduction is indicated, the level of density considered tolerable is the density which is fully consistent with the factors that raised the particular vertebrate species to a pest in that situation.

Whereas wildlife management has largely been based on "use syndromes," wildlife control is more a consequence of health and economic survival. An objective of management is to ensure that the species survives in adequate numbers to play its role in maintaining the health and stability of the ecosystem, and that harvest may occur where consistent with the above primary objective. Management is complicated by the need to understand and estimate carrying capacities, whereas control is usually the reduction of a local population to a tolerable level, as determined by the welfare of the factors that the control is undertaken to protect.

When vertebrates are <u>managed</u>, the objective favors the well-being of local populations of the species in question, whereas a vertebrate <u>control</u> operation has primary benefit factors other than the individual or species being controlled. Rat control in a home or warehouse is not concerned with the welfare of rats. The main objective of deer control in a forest plantation is to protect the new trees, although the control procedures adopted will, of course, need to incorporate deer management considerations. The optimum control procedure in such instances is one that will have the least adverse effect on the species being controlled. An overpopulation of deer that are damaging their own range, on the other hand, may have to be managed, i.e., their numbers may have to be reduced for their own welfare as well as for the good of the range. In such a situation a range manager may want to control a deer population to protect the range, while a conservationist or game official will want the same action taken for proper management of herd welfare.

Even though I have said little about how to solve the people problem, I strongly urge that the consultant or whoever is in charge learn humility and be willing to seek advice from local people. One should seek information and cooperation from as many individuals in government organizations as possible that have even the remotest vested interest in the proposed control program. Only after that has been done can a truly realistic and effective control program be designed that will have the minimum of objections from others. It is a compliment when you seek advice from others, and that also makes it much more difficult for them to complain later.

Another important aspect of a successful vertebrate pest control program is to have the proper political structuring of the government organizations involved. For a vertebrate pest control program to be successful, responsibility for the control must be vested in a government structure that is proper and the most effective.

Mr. Dale E. Alsager of Alberta pointed out in his paper how important it is to have universities doing research in the field of vertebrate pest control. I could not agree more, and it is the improper federal structuring of vertebrate pest control in the United States that is the main reason why more such university work is not being done. Land-Grant Universities are geared for research support from the U.S. Department of Agriculture, not the Department of the Interior. In 1939 the federal responsibility of predator, rodent, and bird control was transferred from the USDA to the Fish and Wildlife Service of the USDI. This action caused Land-Grant Universities to terminate research and extension on animal control. Today, I think there are only six active extension specialists in vertebrate control in all of the United States. Responsibility for vertebrate pest control in the United States should be in the Department of Agriculture, not the conservation-wildlife-management-oriented Fish and Wildlife Service of the Department of the Interior.

Control of the population densities of field rodents, coyotes, deer, birds, and other wild vertebrates is an emotionally charged area. There are several reasons: these animals manifest emotions that people can identify with; it involves a methodology that is not sophisticated and based too heavily on the use of poisons; most solutions to the problems are not based upon extensive research; the administrative base of animal control is improperly structured and managed at the federal level; few good economic studies have been made to document the magnitude of the losses attributed to these species; and the ecology of man-disturbed environments is not well understood by most biologists.

In conclusion, we must recognize that those doing control work, unfortunately, are always going to be suspect because their efforts are usually not to benefit the species being controlled but, rather, designed to protect man, his resources, or some other species. Also, it is paramount that we all help educate others that most control methods do not approach the cruelty of nature's ways, and that what is needed most is to find better alternative methods of coping with vertebrate pest problems, rather than spending so many millions of dollars annually on the negative anti-control approach to vertebrate pest control.