

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Proceedings of the 9th Vertebrate Pest Conference
(1980)

Vertebrate Pest Conference Proceedings collection

March 1980

PREDATOR DAMAGE CONTROL, 1980: RECENT HISTORY AND CURRENT STATUS

Dale A. Wade

Texas A&M Research and Extension Center, San Angelo, Texas

Follow this and additional works at: <http://digitalcommons.unl.edu/vpc9>



Part of the [Environmental Health and Protection Commons](#)

Wade, Dale A., "PREDATOR DAMAGE CONTROL, 1980: RECENT HISTORY AND CURRENT STATUS" (1980). *Proceedings of the 9th Vertebrate Pest Conference (1980)*. 40.

<http://digitalcommons.unl.edu/vpc9/40>

This Article is brought to you for free and open access by the Vertebrate Pest Conference Proceedings collection at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Proceedings of the 9th Vertebrate Pest Conference (1980) by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

PREDATOR DAMAGE CONTROL, 1980: RECENT HISTORY AND CURRENT STATUS

DALE A. WADE, Texas A&M Research and Extension Center, San Angelo, Texas 76901

ABSTRACT: This review summarizes executive and other actions relating to cancellation of the predacides in 1972 and related events. A chronology of these actions and events is appended (Appendix A). Predator damage control operations, and research findings over the past decade, are briefly reviewed and related political decisions are discussed.

INTRODUCTION

Major changes in the field of predator damage research and control in the United States have taken place over the past several decades, changes due largely to social and political factors. Among these are the increased urbanization and affluence of the human population coupled with a simultaneous and increasing demand for outdoor recreation. A major influence has been the growth in public interest in environmental and aesthetic wildlife values through their intensive exposure in the news media.

HISTORY

Opposition to predator control programs surfaced early in this century partially due to the increase in urban populations and a progressive decrease of those with a direct interest in and understanding of agricultural problems. Extensive change in the federal animal damage control program (ADC) operated by the U.S. Department of Interior (USDI), Fish and Wildlife Service (FWS) has occurred since its beginning in 1915 under the U.S. Department of Agriculture (USDA), Bureau of Biological Survey (BBS). Reddington (1929), Darling (1934), McCabe and Caroline (1970), Wade (1975), Wade and Beasom (1979), and others have described and evaluated many of these modifications; discussion here will be restricted primarily to events which have occurred during the past twenty years and to some of the influences related to these events.

Attached to this paper is a brief chronology of some of the major events related to cancellation/suspension of the predacides (sodium cyanide, strychnine and sodium monofluoroacetate) by the Environmental Protection Agency (EPA) in 1972.

The stage for change in the federal ADC program (USFWS-ADC) appears to have been set with emergence of the "Leopold Report" (Leopold et al. 1964) which charged the federal program with indiscriminate, nonselective and excessive predator control and recommended certain changes in the program. As a result, the USFWS Branch of Predator and Rodent Control (PARC) was renamed the Division of Wildlife Services (DWS) and given new responsibilities in wildlife enhancement and management. The DWS continued to use the major predacides, sodium cyanide, strychnine and sodium monofluoroacetate (Compound 1080). The Leopold Committee criticized the leghold trap as being nonselective and the cause for much unnecessary loss of wildlife. However, the Leopold Committee concluded that, when properly applied, Compound 1080 (sodium monofluoroacetate) meat baits were effective and humane in control of coyotes and had very little adverse effects on other wildlife.

The "Cain Committee" was appointed in 1971 by the Secretary of Interior to conduct another review of the USFWS-ADC program. The Cain Committee (Cain et al. 1971) did not agree with the Leopold Committee on the use of chemicals and leghold traps. The Cain Committee stated that the use of chemicals is likely to be inhumane and nonselective and it recommended that landowners be trained in use of the leghold trap as a major method of predator damage control. Both reports have been subject to criticism and the "Cain Report" has been largely discredited as a scientific document (Howard 1974, 1979; Wade 1975; Beck and Jackson 1977).

Despite the political genesis of the Cain Report, it was cited as the "scientific basis" for cancellation of the predacides in 1972, and a petition by environmental groups was the political instrument employed (Ruckelshaus 1972).

In response to pressures from western livestock organizations following cancellation of the chemicals in 1972, the USFWS expanded its aerial hunting effort to reduce livestock losses to predators and to compensate for loss of the chemicals (USDI 1972, 1974). In 1974, after USDI administrators discovered that mechanical methods were not adequate to solve all damage problems, the USDI requested and was granted emergency use of the M-44 sodium cyanide device by the EPA, and experimental use permits for the M-44 were also granted to several western states. Data generated through their efforts led to reregistration of the M-44 in 1975, although with an extensive list of restrictions on its use. Based on data gathered under these M-44 permits, by Executive Order in 1975, President Ford authorized the use of sodium cyanide on federal lands and in federal programs with certain additional restrictions.

An added dimension in 1975 was the euphoric support by Russell Peterson, then Chairman of the President's Council on Environmental Quality (CEQ), of the sodium cyanide toxic collar for use in protection of sheep from coyotes (Science 1975). This led to a "crash program" to insure that the sodium cyanide collar would "provide a solution" to coyote predation on sheep. Following consistent and uniform failure in repeated applications of this chemical-collar combination in field trials during 1975-76, this chemical was found to be ineffective in the collar and other chemicals were found to be

more useful. Trials with diphacinone and Compound 1080 in the toxic collar led to the choice of 1080 as the most effective, selective and safe chemical currently known for use in the collar (Wade and Connolly 1980). An experimental use permit for 1080 was issued to the USDI by the EPA in 1977. This permit has been renewed annually and currently extends through November 1980.

Continued pressure from the western livestock industry led to appointment in February 1978 of a new Advisory Committee to assist in a comprehensive review of the USFWS-ADC program (USFWS 1978a). This led to an extensive report on the program (USFWS 1978b) and an Environmental Impact Statement (EIS), an analysis of the predator damage control program. The final EIS (USDI 1979) was released in June 1979, following several draft statements and public hearings in 1978, but did not include numerous documents and evidence that were presented to the review committee (Bowns et al. 1979). The final EIS included various options/alternatives for the ADC program related to predators but a decision by the Secretary of Interior on these options was delayed until November 8, 1979, when it was issued by memorandum to the USDI Assistant Secretary for Fish, Wildlife and Parks (Andrus 1979).

Opposition to the new USDI-ADC policy surfaced rapidly among livestock organizations and their congressional representatives, due to the policy's departure from recommendations of virtually all professional ADC researchers and operations staff members in the western United States (WRCC-26 1980), in addition to those of the livestock industry (Murphy 1980). A review of the policy statement by the Western Regional Coordinating Committee for Predator Research (WRCC-26) described the lack of objectivity and professional competence in and the political nature of the policy statement (WRCC-26 1980). Comments by Secretary Andrus on his policy decisions, on January 15, 1980, at the Predator Summit Conference in Austin, Texas, further clarified the political nature of those decisions (Andrus 1980).

One of the results has been a unanimous resolution of opposition to the new policy, by the National Cattlemen's Association (NCA) at its Annual Convention in January 1980. Over the past several years, since cancellation of the predicides, all western cattlemen's associations have developed positions supporting the need for predator damage control (California Cattleman 1980, Personal Communication, Ronald Michieli, NCA). These actions tend to support the premise that the limitations imposed on ADC programs have led to increased losses of cattle and thus increased concern from cattlemen's associations over the past eight years.

A further development was introduction of a bill in the U.S. Senate on January 22, 1980, by Senator John Tower of Texas which, if passed, would mandate the use of chemicals, including Compound 1080, by the USDI, in addition to extended research on chemical toxicants, the efficiency and cost of livestock husbandry techniques recommended for reduction of predator-caused losses, and other factors. There is also some support for a transfer of the entire ADC research and operations program to the USDA. Some states have proposed abandonment of the current federal-state-county cooperative ADC program in favor of state, county or private programs if the current USDI-ADC policy is not replaced by one based on professional judgment and real needs of the livestock industry. Congressional oversight hearings on this issue have been requested by the livestock industry (Anonymous, Wyoming Wool Grower 1980, Nicolayson 1980).

USDI-ADC OPERATIONS

At the present time the new USDI-ADC policy is in the process of being implemented but it is not clear to what extent and how rapidly the policy will be adopted. Congressional oversight hearings which have been proposed and major opposition to the policy may force its modification and conceivably could lead to a transfer of the entire program to the USDA.

At this date (March 6, 1980), there do not appear to be major changes yet initiated in the operational ADC program as a result of the policy, although it appears that prohibition of denning, at least on public lands, and further restrictions on aerial hunting may be imposed. Comments on the probable impact of the policy may be found in the WRCC-26 review (1980).

PREDATOR RESEARCH

Extensive efforts in several western states by many researchers have been reported annually in various publications. The most comprehensive summaries are found in the annual reports of the Western Regional Coordinating Committee for the years from 1973 to 1979 (W-123 1973, 1974, 1975, 1976; WRCC-27 1977, 1978, 1979), and in the Coyote Research Newsletters (Denver Wildlife Research Center 1973, 1974, 1975). In addition, there are monthly summaries of activities from the Denver Wildlife Research Center (DWRC) and summaries in the annual Fisheries and Wildlife Research reports from USDI. A partial list of publications is also found in the WRCC-26 response to the new USDI-ADC policy (WRCC-26 1980, Appendix C). Other recent publications are proceedings of the American Society for Testing and Materials vertebrate pest symposia (ASTM 1977, 1979) and the California Vertebrate Pest Conferences. The review here will only summarize many of these research reports with few citations. Those interested in this research area can find much additional information in the reports cited above.

RESEARCH ON LIVESTOCK LOSSES

Due to the difficult nature and costs of research on predation losses of livestock, data are slow to accumulate and much more should be developed. Much of the available information is summarized in the 1978 report on predator damage in the west (USFWS 1978b) in which conclusions on average losses were drawn as follows (pages 32, 34, 35):

Sheep

"Many studies of sheep loss to predators have been completed since 1972. Direct field assessments with normal predator control in effect have shown predators to kill 0 to 2.5 percent of the ewes and 1.3 to 7.0 percent of the lambs annually. From 76 to 100 percent of predation in different studies was due to coyotes.

Questionnaire surveys likewise show that the coyote is the main predator, and that predation losses are unequally distributed both geographically and among producers. Various local or regional surveys estimated annual predation losses at 0.1 to 2.8 percent of ewes and 0.9 to 4.7 percent of the lambs. But the most comprehensive survey to date estimated total predation losses of 3.4 and 11.4 percent respectively, of ewes and lambs in 15 Western States in 1974. Some 2.5 percent of the ewes and 8.1 percent of the lambs were reportedly killed by coyotes. Limited comparisons with other studies suggest that these estimates are substantially higher than estimates from other sources.

In conclusion, it is difficult to obtain precise overall estimates of sheep losses to predators. There are limitation and possible sources of bias with all the methods of loss assessment discussed above. Best available evidence indicates that average loss to coyotes was from 4 to 8 percent of the lambs and one to 2.5 percent of the ewes over the period 1972 to 1978 for sheep producers in the Western States.

Cattle

Predators killed less than one-tenth of one percent of the January 1 inventory of beef cattle (550 lbs. and over) in the survey populations in 1975. The highest losses were in the Southwest with a loss to all predators of one-tenth of one percent. The majority of predator losses were attributed to other than coyotes and dogs. Bob-tailing of cattle and other types of non-fatal injuries by coyotes are not included.

Losses of calves (less than 500 lbs.) to predators occur at a higher rate than losses of cattle but are minor compared to losses to other causes. Reported losses to coyotes in the Western States range from .4 percent in the Great Plains region to .8 percent in the Southwest. The highest loss to all predators, 1.1 percent, also occurs in the Southwest. By comparison, calf losses to theft, disease and other causes are substantially higher, ranging from 3.6 percent in the Southwest to 9.1 percent in the Great Plains region. The data indicate that range beef-cattle operations have the greatest predator problems. Calves in the first six to eight weeks of life are particularly vulnerable. If they can get through that period, the probability of predation decreases to nearly zero by weaning time.

Losses of calves to coyotes and other predators are unequally distributed. In the three Western regions, the proportions of producers reporting any losses to coyotes ranged from 14 percent in the Great Plains to 27 percent in the West. Two percent of respondents in the Southwest and one percent in the West reported losses to coyotes of more than five percent of calves born.

The impact of livestock losses to coyotes on consumers are the result of reduced supplies and correspondingly higher prices of meat. In dollar terms, the estimated negative impacts on consumers due to the higher prices and reduced supplies caused by coyote predation are \$98 million for beef and \$4 million for lamb for a total impact of \$102 million. Thus, overall the greatest total economic impact of coyote predation is on consumers, not producers."

However, several reports including those by Rimbey et al. 1973; Rimbey and Wade 1974, 1976; and deCalesta 1978, were not included in the USFWS 1978 analysis or in the 1979 final EIS.

A recent report on sheep and goat losses in Texas during 1978 indicates a substantial increase in losses to predators from 25% in 1967 to 57% in 1978 (Texas Crop & Livestock Reporting Service 1979). It is not clear what the real and average livestock losses may be; however, it is those who suffer the most serious losses who are most likely to abandon such operations. Moreover, the true magnitude of loss is not expressed in the actual kills and injuries due to predators. Shelton and Wade (1979) have described some of the other factors which are major costs to producers. Wade and Connolly (1980) have estimated predation costs on a Texas Angora goat ranch for one production year in which losses, above normal loss levels, exceeded gross income by 27 percent. In this latter case, removal of a large number of killer coyotes by use of Compound 1080 in the toxic collar, and by other methods, permitted this ranch family to continue their goat operation with the potential of realizing a profit in 1980. Loss of livestock to eagles may be extremely severe at times, as confirmed by O'Gara (1978). O'Gara, Bowns and Wade (1978), Wade and Livingston (1979), and others have documented the type of injuries caused by eagles and other predators to livestock.

RESEARCH ON NONLETHAL PREDATION CONTROL METHODS

Nonlethal methods include livestock husbandry practices, the use of guard dogs, various potential repellents (auditory, olfactory, gustatory, and visual), aversive agents, attractants (for use with other methods), reproductive inhibitors, and fencing. Much of the research on these methods is reviewed in the references listed earlier in this section and in the WRCC-26 report (1980).

In general, it has been found that some husbandry practices will reduce predation if and where they can be applied; however, various factors prevent their use under some conditions. Their application is generally most difficult on open range and in large pastures and is further complicated by the presence of dense brush and timber.

Todd and Keith (1976) and others have studied coyote food habits and the effects of carrion present on livestock losses. Coyotes do readily feed on carrion but it is not entirely clear whether this may cause increased predation or whether carrion acts as a buffer to reduce predation. Todd and Keith indicated that coyote distribution in the areas they studied was largely governed by the presence or absence of carrion and they concluded (page 19) that:

"This study has shown that carrion removal, by farmers alone, is workable, and can effect major changes in coyote numbers, distribution and movements without obvious deleterious side-effects (Namely increases in vole populations or livestock depredation). Widespread carrion removal in farming areas over winter might help prevent future rabies epizootics involving coyotes and alleviate the need for other control practices."

However, the application of this concept is not physically possible in vast areas of the United States, particularly on open ranges and public lands, either for livestock or wildlife carrion. Even if it were physically possible, the labor and energy costs would be completely prohibitive to its use.

The areas studied by Todd and Keith were very small in comparison to the mobility of coyotes (.Wade 1978, p. 363) and the authors indicated that coyotes simply moved to other areas when carrion was limited. Moreover, these authors also indicated:

"However, sheep are uncommon here, and most calving occurs in late winter or spring. Moreover, most livestock in this region are over-wintered either in shelters or feed-lot corrals, hence winter depredations would likely be minimal in any event."

Therefore, the application of this approach is questionable for reduction of predation in much of the United States. Particularly in the southern and western U.S., climate, vegetation and range operations are vastly different than those found by Todd and Keith in their study areas in Alberta, Canada, during winter. Thus their conclusions are not likely to be applicable, except in theory, to large areas of the U.S. although they may be useful in intensive production areas, where small farms and poultry operations predominate. However, their studies appear much too limited in scope to justify their conclusion that this approach "might help prevent future rabies epizootics involving coyotes and alleviate the need for other control."

Guard dogs may be effective under some conditions but repellents have not been shown to be effective or may be useful only for short periods of time. Attractants are not new; they have been used extensively with traps and other methods for centuries to remove predators. Recent research has been directed to isolating, improving, and developing those that are most effective, but this research is new and is only beginning to be productive in providing assistance in depredation control. Chemical reproductive inhibitors show some promise but delivery methods must be developed and appropriate chemicals found before their potential can be fully explored even in research, and none are operational.

Conventional and electric fences of adequate construction and height have been effective in preventing or reducing predation in some locations; however, their use implies the ability and need to remove damaging predators from the areas within the fences. This is not possible in many areas of the west; it may conflict with good husbandry and range management, and also may be prohibited by laws and regulations relating to public lands.

Interest in aversive agents has been largely confined to the use of chemicals, primarily using lithium chloride in meat baits. Early reports of this technique as an effective control method have not been substantiated by more recent studies. Recent more rigorous research effort has been unable to duplicate the claims made for earlier studies. Comprehensive reviews of this method in the United States (Griffiths et al. 1978; Burns and Connolly 1980) and Canada (Bourne and Dorrance 1979) have helped to clarify some of the limitations to this approach.

To summarize, there have been no large gains made in nonlethal methods research during the past several years which would be of major help to livestock producers, other than documenting their potential and their limitations which must be considered in the application of these methods.

Livestock husbandry practices and fencing, where they can be economically applied, are perhaps the most useful of the nonlethal techniques, but will not likely provide solutions to predator problems in many areas, especially large areas of the south and west (WRCC-26 1980). Similarly, carrion removal as proposed by Todd and Keith (1976) is not likely to be a useful approach in many southern and western livestock production areas of the U.S.

LETHAL METHODS RESEARCH

With the exception of the M-44 sodium cyanide device which was registered by the EPA in 1975, research on lethal methods has been restricted to laboratory and pen tests, and limited field testing of the toxic collar. Early field research efforts in 1975-76 using sodium cyanide in the collar were uniformly unsuccessful, probably due to the aversive taste of the chemical. Diphacinone-filled collars were successful in lethally dosing killer coyotes that punctured the collars, but the chemical is slow

to act. Some coyotes survived and killed sheep for several days after receiving a lethal dose. Connolly et al. (1976) concluded that "... a non-repellent fast acting (within 24 hrs.) toxicant is essential to successful use of the toxic collar concept. One such toxicant is sodium fluoroacetate (Compound 1080)." The EPA granted an Experimental Use Permit (EUP) to the USFWS in 1977 and a summary of numerous field tests of the 1080 toxic collar is given by USFWS (1978c) and Connolly (1979). Wade and Connolly (1980) have provided a review of three tests of the collar in Texas in 1979 and some of the limitations imposed by environmental conditions and livestock management requirements. The 1080 collar appears to have substantial application in protection of sheep and goats if it can be registered by the EPA for operational use by ranchers or others where the livestock management essential to its successful application can be accomplished. In the Texas tests described by Wade and Connolly (1980) a substantial reduction in losses of Angora goats to coyotes was accomplished by use of the W80 collar and no discernable primary or secondary hazards to humans or nontarget animals were found.

Balsler (1979) and Kun (1977, 1979) have provided further evidence which indicates that secondary hazards to nontarget animals is not likely, except under specific circumstances, from use of Compound 1080 in the toxic collar or in baits used for predator damage control. Unfortunately, Dr. Kun's work on potential antidotes for 1080 intoxication has been terminated by the administrative decision of Secretary Andrus (Andrus 1979; Kun 1979). However, the need to continue these studies in order to provide adequate methods of predator damage control has been clearly described (WRCC-26 1980), and there is interest in continuing toxic collar and 1080 research by universities if experimental use permits and research funds become available.

POLITICAL FACTORS

Andrus (1980), Beck and Jackson (1977), Cain et al. (1971), Bowns et al. (1979), Howard (1974, 1979), Leopold et al. (1964), Murphy (1980), Ruckelshaus (1972), Science (1975), Wade (1975), Wade and Beasom (1979), WRCC-26 (1980) and others have described implicitly or explicitly the political nature of major decisions made and related factors, particularly, during the past two decades, with regard to the ADC program. From these discussions and a review of other existing influences, it is highly questionable that decisions yet to follow will be based on competent objective professional judgment insofar as predator damage control and livestock production are concerned. It is clearly evident that extensive pressure will be needed to effectively permit and insure that decisions made will be based on facts other than political considerations. Howard (1979), Wade (1975), Wade et al. (1977) and Wade and Beasom (1979) have described specifically these factors and needs. Hood (1978), Matheny (1979) and others have listed and described the status of pesticides used for vertebrate control and the effects of public emotion on their registration and use. The difficulty in securing experimental use permits for vertebrate pesticides research is clearly a function of administrative response to the influence of environmental groups (Wade and Beasom 1979; Howard 1979).

There is a growing effort by the federal government to usurp common resident wildlife management authority which, heretofore, was considered a right reserved to the states. Andrus (1980, page 2) stated that "Many states classify the coyote as a predator which can be hunted without a license, and we at the Federal level, of course, recognize the primacy of State fish and game regulations and wildlife management regarding resident species such as the coyote". Andrus also took this position in February 1980 regarding aerial hunting of wolves (USDI 1980). This right was upheld by the United States District Court, Billings, Montana, in a ruling on January 11, 1979, relative to aerial hunting of coyotes in Montana (United States of America, Plaintiff vs. Helsey, et al.) which held that the states do have the authority to manage resident wildlife and to regulate hunting and fishing (Battin 1979).

However, an appeal of the District Court ruling by the plaintiff (United States of America) to the U.S. Circuit Court of Appeals for the Ninth Circuit was successful. The Court of Appeals, in reversing the District Court decision, ruled in part that "a state does not have the exclusive authority over its wildlife and other resources, . . . and federal regulation under the Commerce Clause is not prohibited" (Anonymous 1979). Thus, by executive fiat, and by administrative and judicial decree the federal government has progressively moved to preempt state and individual rights, primarily in response to environmentalist pressures as described by Howard (1979) and Wade and Beasom (1979). Wildlife specialists and other professionals in this field have described this progressive deterioration of wildlife management policy over the past two decades and the unfortunate results (Wade et al. 1977).

Urbanization, ample food and energy supplies to date, relative affluence and the concurrent demand for outdoor recreation ("the natural experience") have contributed intense pressures to satisfy both urban residents (96% of the U.S. population) and environmentalist demands. Inadequate informational and public relations programs by the agricultural sector in addition to its loss of voting power, coupled with a lack of concern for the industry in the executive, administrative and political structures have also been major factors in reaching this new low in applied wildlife management (Wade et al. 1977). Misleading and false information, used both by accident and by design, have weighed heavily in the process (Wade et al. 1977; Howard 1979; WRCC-26 1980).

Forecasting the future in this field is at least as uncertain as in any other; however, some predictions can be made without question. A growing demand, worldwide, for food, massive increases in the cost of energy and decreasing supplies of fossil fuels are certainties. The need to husband and use all of our resources wisely is essential now and is rapidly reaching a critical stage. Thus there can be no sane rationale for waste of these same resources by deliberate political/administrative decisions. There is ample scientific information available to correct the current USDI-ADC policy to one which reflects these urgent conservation needs (WRCC-26 1980).

LITERATURE CITED

- AMERICAN SOCIETY FOR TESTING AND MATERIALS. 1977. Test Methods For Vertebrate Pest Control and Management Materials, STP 625, ASTM, Philadelphia, PA, 258 pp.
- AMERICAN SOCIETY FOR TESTING AND MATERIALS. 1979. Vertebrate Pest Control and Management Materials, STP 630, ASTM, Philadelphia, PA, 323 pp.
- ANDRUS, CD. 1979. Memorandum to the Assistant Secretary for Fish and Wildlife and Parks; Subject: The Animal Damage Control Program, November 8, 1979, 6 pp. (Mimeo).
- _____. 1980. Remarks of the Secretary of Interior to the Conference on Animal Damage Control, Austin, Texas, January 15, 1980, 5 pp. (Mimeo).
- ANONYMOUS. 1979. Litigation; Airborne hunting act is upheld against constitutional challenge, Current Developments, page 1653, December 14, 1979, Bureau of National Affairs, Inc.
- ANONYMOUS. 1980. If the federal government isn't going to control predators, how can we stay in the sheep business?, Wyoming Wool Grower, Vol. 53(1):7-10.
- BALSER, D.S. 1980. Draft Summary Status Report of Toxic Collar Research-1979, Section of Predator Management Research, Denver Wildlife Research Center, Denver, Colorado, January 31, 1980.
- BATTIN, J.F. 1979. Decision in the case, CR-78-91-BLG, in the United States District Court for the District of Montana, Billings Division re: United States of America, Plaintiff-vs-Sheldon C.G. Helsey, Orville B. Jones, and Jerry A. Shipman, Defendants, January 11, 1979, 10 pp. (Mimeo).
- BECK, J.R. and W.B. JACKSON. 1977. Considerations in testing vertebrate pesticides to be used in disease control activities, Test Methods for Vertebrate Pest Control and Management Materials, ASTM STP 625, W.B. Jackson and R.E. Marsh, Eds., American Society for Testing and Materials, pp. 195-205.
- BOWNS, J.E. and D.A. WADE. 1978. Physical Evidence of Carnivore Depredation, Texas Agricultural Extension Service, Texas A&M University, College Station, Texas. Slide-tape set and script (33 pp.).
- _____, D.S. deCALESTA, N.L. GATES, W.E. HOWARD and D.A. WADE. 1979. I. The predation damage problem in the Western U.S. and II. Evaluation of the USFWS-draft EIS on mammalian predator damage management for livestock protection in the Western U.S., dated November 1978 (DES 7849). Testimony at public hearing January 12, 1979, Washington, D.C. 8 pp. (Mimeo). Western Regional Coordinating Committee (WRCC-26).
- BOURNE, J. and M.J. DORRANCE. 1979. Lithium chloride aversion for coyote predation of domestic sheep, In: Western Regional Coordinating Committee WRCC-26, Minutes and Proceedings, 1979 Annual Meeting, Coeur d'Alene, Idaho.
- BURNS, R.J. and G.E. CONNOLLY. 1980. Lithium chloride baits vs. live prey, Proceedings: Ninth Vertebrate Pest Conference. (In press).
- CAIN, S.A., J.A. KADLEC, D.L. ALLEN, R.A. COOLEY, M.H. HORNOCKER, and F.H. WAGNER. 1971. Predator control-1971. Report to the Presidents' Council on Environmental Quality and the U.S. Department of the Interior by the Advisory Committee on Predator Control. University of Michigan Press, Ann Arbor. 207 pp.
- CALIFORNIA CATTLEMAN. 1980. New predator control policy, California Cattleman, January 1980, pp. 31, 43-44.
- CONNOLLY, G., R. STERNER, P. SAVARIE, R. GRIFFITH, D. ELIAS, M. GARRISON, B. JOHNS and I. OKUNO. 1976. The Toxic Collar for Selective Control of Sheep-killing Coyotes, Final Progress Report to the E.P.A. September 1, 1975-August 31, 1976. U.S. Fish and Wildlife Service, Denver Wildlife Research Center, Denver, Colorado. 119 pp. (and appendices).
- CONNOLLY, G.E. 1979. The Toxic Collar for Selective Removal of Coyotes That Attack Sheep; Fourth, Fifth, and Sixth Progress Reports under EPA Experimental Use Permit No. 6704-EUP-14, June 7, 1978-March 1, 1979. U.S. Fish and Wildlife Service, Denver Wildlife Research Center, Denver, Colorado, 47 pp.
- DARLING, J.N. 1934. The Biological Survey's predatory animal policy, The National Wool Grower, October 1934:21-22.
- deCALESTA, D.S. 1978. Documentation of Livestock Losses to Predators in Oregon, Special Report No. 501, Oregon State University, Extension Service, Corvallis, 20 pp.
- DENVER WILDLIFE RESEARCH CENTER. 1973. Coyote Research Newsletter Vol. 1(1), 35 pp. (Mimeo).
- _____. 1974. Coyote Research Newsletter Vol. 2(1), 20 pp. (Mimeo).
- _____. 1975. Coyote Research Newsletter Vol. 3(1), 43 pp. (Mimeo).
- GRIFFITHS, R.E. JR., G.E. CONNOLLY, R.J. BURNS and R.T. STERNER. 1978. Coyotes, sheep and lithium chloride, Proceedings: Eighth Vertebrate Pest Conference, pp. 190-196.
- HOOD, G.A. 1978. Vertebrate control chemicals: current status of registration, rebuttable presumptions against registrations, and effects on users, Proceedings: Eighth Vertebrate Pest Conference, Sacramento, California, March 7-9, 1978, pp. 170-175.
- HOWARD, W.E. 1974. Predator control: whose responsibility? Bioscience 24(6):359-363.
- _____. 1979. Political and sociological aspect of wildlife damage control, Proceedings, Fourth Great Plain Wildlife Damage Control Workshop, Manhattan, Kansas. (In press).
- KUN, E. 1977. Molecular toxicology of fluorocitrate, Proceeding: VIII Conference on Environmental Toxicology, Dayton, Ohio, October 4-6, 1977. University of California, San Francisco.
- _____. 1979. Fourth (Summary) Report on research concerned with the long-range project: development of an antidote to fluoroacetate poisoning (December 9, 1979), University of California at San Francisco, Surge Building 101, San Francisco 94143.
- LEOPOLD, A.S., S.A. CAIN, CM. COTTAM, I.N. GABRIELSON, and T.L. KIMBALL. 1964. Predator and rodent control in the United States, Transactions, North American Wildlife Conference, Vol. 29:27-49.
- MATHENY, R.W. 1979. Federally registered pesticides for vertebrate control, December, 1979, Proceedings: Fourth Great Plains Wildlife Damage Control Workshop, December 4-6, 1979, Manhattan, Kansas, (23 pp.) (In press).
- MC CABE, R.A. and M. CAROLINE. 1970. Predatory mammals that become pests, Vertebrate Pests, Problems and Control. National Academy of Science, Wash., D.C.
- MURPHY, D. 1980. Senators call Andrus policy "totally unacceptable", National Wool Grower, Vol. 70(1):4.

- NICOLAYSON, J. 1980. Where the hell are we now, Cecil?, Wyoming Wool Grower, Vol. 53(1): p.7.
- O'GARA, B.W. 1978. Sheep depredation by golden eagles in Montana, Proceedings: Eighth Vertebrate Pest Conference, pp. 206-213.
- REDDINGTON, P.G. 1929. Policy of the U.S. Biological Survey in regard to predatory mammal control. Journal of Mammology, Vol. 10(3):276-279.
- RIMBEY, C.W., M.W. CUMMINGS and L. NELSON, JR. 1973. Predation on Domestic Stock and Wildlife, Lassen County, California, 1973, Cooperative Extension Service, University of California, Davis, California, 6 pp.
- _____ and D.A. WADE. 1974. Predation on Domestic Stock and Wildlife, Lassen County, California, 1974, Cooperative Extension Service, University of California, Davis, California, 5 pp.
- _____. 1976. Predation on Domestic Animals and Wildlife, Lassen County, California, 1976, Cooperative Extension Service, University of California, Davis, California, 5 pp.
- RUCKELSHAUS, W.D. 1972. Notice to manufacturers, formulators, distributors and registrants of economic poisons and finding of fact, Environmental Protection Agency, Pesticide Regulation Division, PR Notice 72-2, 9 pp.
- SCIENCE. 1975. CEQ relaxes stand on predator poisoning - biter beware. Science 189(4200):361. August 1975.
- SHELTON, M. and D.A. WADE. 1979. Predatory losses: a serious livestock problem, Animal Industry Today, Vol. 2(1):4-9.
- TEXAS CROP AND LIVESTOCK REPORTING SERVICE. 1979. 1978 Texas Sheep and Goat Death Losses and Marketing Practices, Texas Department of Agriculture, Austin, Texas, 12 pp.
- TODD, A.W. and L.B. KEITH. 1976. Responses of Coyotes to Winter Reductions in Agricultural Carrion, Wildlife Technical Bulletin, No. 5, 1976, Fish and Wildlife Division, Alberta Recreation, Parks and Wildlife, Edmonton, Alberta, Canada, 32 pp.
- U.S. DEPARTMENT OF INTERIOR, BUREAU OF SPORT FISHERIES AND WILDLIFE. 1972. Fact Sheet - predator control, U.S. Department of the Interior, Washington, D.C., June 8, 1972, 3 pp. (Mimeo)
- U.S. DEPARTMENT OF INTERIOR, DIVISION OF WILDLIFE SERVICES. 1974. Coyote damage control by mechanical techniques, U.S. Department of the Interior, Washington, D.C., January 25, 1974. 28 pp., attachments I, II, and Appendix 1 (3 pp.).
- U.S. DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICE. 1978. Animal damage control study underway; advisory group established, News Release, U.S. Department of Interior, Fish and Wildlife Service, Albuquerque, New Mexico, February 15, 1978. 2 pp.
- U.S. DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICE. 1978b. Predator Damage in the West: A Study of Coyote Management Alternatives, U.S. Department of Interior, Washington, D.C., 168 pp.
- U.S. DEPARTMENT OF INTERIOR. 1978c. Animal damage control, In: Fisheries and Wildlife Research Annual Report, U.S. Fish and Wildlife Service, Washington, D.C., pp. 16-23.
- _____. 1979. Final Environmental Impact Statement - ADC Program. U.S. Department of Interior, Washington, D.C., June 1979, 789 pp.
- _____. 1980. News Release: Citing Court Decision, Andrus Lifts Closure of Federal Lands to Aerial Wolf Hunts in Alaska, February 15, 1980, 1 pp. (Mimeo)
- WADE, D.A. 1975. Political factors in animal damage control, Proceedings: Advancements in Pesticides, Helena, Montana, Reprinted, California, Livestock News, Vol. XLX(11):12-19, November 1975.
- _____, O.T. SANDERS, J.E. MILLER, G.C. HALAZON, and M.J. CAROLINE. 1977. Vertebrate animal damage control, summary of panel discussion and committee review, National Extension Wildlife and Fisheries Workshop, San Antonio, Texas, April 25-28, 1977, In: Proceedings: Fourth Great Plains Wildlife Damage Control Workshop, Manhattan, Kansas, December 4-6, 1979. (In press)
- _____. 1978. Coyote damage: a survey of its nature and scope, control measures and their application, In: Coyotes: Biology, Behavior and Management, Academic Press, Inc., New York. pp. 347-368.
- _____ and S.L. BEASOM. 1979. The effects of environmental-political factors on predator research. Vertebrate Pest Control and Management Materials, ASTM STP 680, J.R. Beck, Ed., American Society for Testing and Materials, pp. 294-303.
- _____ and C.W. LIVINGSTON, JR. 1979. Lamb and kid necropsies and mortality factors found in Operation Dead Lamb - 1978-79, Research Reports; Sheep and Goat, Wool and Mohair, 1979, Texas Agricultural Experiment Station, Texas A&M University, College Station, Texas, pp. 73-75.
- _____ and G.E. CONNOLLY. 1980. Coyote predation on a Texas goat ranch, Texas Agricultural Progress, Winter, 1980, pp. 12-16.
- WESTERN REGIONAL PROJECT W-123. 1973. Minutes and Proceedings, 1973 Annual Meeting. Hopland, California.
- _____. 1974. Minutes and Proceedings, 1974 Annual Meeting. Cheyenne, Wyoming.
- _____. 1975. Minutes and Proceedings, 1975 Annual Meeting. Uvalde, Texas.
- _____. 1976. Minutes and Proceedings, 1976 Annual Meeting. Idaho Falls, Idaho.
- WESTERN REGIONAL COORDINATING COMMITTEE, WRCC-26. 1977. Minutes and Proceedings, 1977 Annual Meeting, Logan, Utah.
- _____. 1978. Minutes and Proceedings, 1978 Annual Meeting, San Angelo, Texas.
- _____. 1979. Minutes and Proceedings, 1979 Annual Meeting, Coeur d'Alene, Idaho.
- _____. 1980. Predation on Domestic Animals: A Response to Secretary of Interior Andrus Policy Statement, Pertaining to the Animal Damage Control Program, A report developed by the Western Regional Coordinating Committee, WRCC-26. Published by the Utah Agricultural Experiment Station, Utah State University, Logan, Utah. February 15, 1980. 91 pp.

APPENDIX A

A brief chronology of some major events related to cancellation/suspension of the predacides (1080, strychnine, sodium cyanide) by the Environmental Protection Agency in 1972.

- 1964: The Leopold Committee report on "Predator and Rodent Control in the United States", to the U.S. Department of Interior was made public. The report charged the U.S. Fish and Wildlife Service - Animal Damage Control program with indiscriminate, nonselective and excessive predator control. However, the report stated that Compound 1080 is a relatively humane and effective method of coyote damage control.
- 1971: March: Civil actions were filed by counsel for the Defenders of Wildlife, Sierra Club, and the Humane Society of the United States, against the USDI, et al., in the U.S. District Court, District of Columbia, requesting an injunction prohibiting the use of toxic chemicals for wildlife damage control, and certain other relief.
- April: Appointment of the Cain Committee, by USDI Secretary Rogers Morton, which began its review of the USFWS - ADC program of predator and rodent damage control.
- November: A stipulation regarding the above mentioned civil actions was filed under seal in the U.S. District Court, District of Columbia, in which the USDI, et al., agreed to end the use of chemicals for predator damage control prior to February 15, 1972. Plaintiffs in the civil action named above agreed not to pursue the injunction requested of the District Court prior to February 15, 1972. The stipulation was signed by counsel for the plaintiffs and the defendants.
- December: The Cain report, "Predator Control - 1971", was completed and published by the USDI. The report was highly critical of the ADC program and recommended prohibition of the use of toxic chemicals.
- 1972: January: The Cain report was released to the public by the USDI.
- February 8: Issuance of Executive Order No. 11643 by President Nixon, cancelling use of toxic chemicals on federal lands and in federal programs, except for emergency use by prior agreement of the Secretaries of USDI, USDA, HEW, and the Administrator of the EPA.
- February 10: The USDI issued a news release stating that it had ceased use of toxic chemicals in the USFWS - ADC program for control of birds, rodents, and other species, and was removing all such chemicals from the field as rapidly as possible.
1972. March 9: The EPA issued cancellation and suspension notices for Compound 1080, strychnine, sodium cyanide, and thallium sulfate. (1080 registration as a predacide was held only by the USDI-FWS.) A thirty-day period was provided, for appeal/hearing, in the notice of cancellation, but no hearing was requested by the agencies or organizations.
- March and May: Stipulations of dismissal of the Civil actions by Defenders of Wildlife, et al., vs. USDI, et al., were filed with the U.S. District Court, District of Columbia. The stipulations were signed by counsel for plaintiffs and defendants.
- 1972 to 1974: A series of U.S. Congressional hearings were held on the USDI-ADC program, the pros and to cons of ADC and predacides, rodenticides, and related factors. 1974:
Numerous repeated requests and applications by several western states for reregistration of the predacides (1080, strychnine, and sodium cyanide) were denied by the EPA.
- 1974: February: Experimental use of sodium cyanide (.in the M-44) was granted to the State of Texas.
- 1974: March to February 1975: Experimental/emergency use of sodium cyanide (in the M-44) was granted to Montana, California, South Dakota, Idaho, Nebraska, Kansas, Texas A&M University, and the USDI-ADC.
- 1974: May: A Civil action was filed by the State of Wyoming, et al., against the EPA and USDI, et al., seeking injunctive relief from EPA Order PR 72-2, etc., and requesting operational use of the predacides in the USDI-ADC program on all classes of land in Wyoming.
- 1975: June: U.S. District Court, Cheyenne, Wyoming, granted the State of Wyoming, et al., preliminary injunctive relief from EPA Order PR 72-2 which canceled registration of the predacides and suspended their legal interstate shipment.
- June: The preliminary injunction granted the State of Wyoming, et al., by the U.S. District Court, Cheyenne, was appealed to the 10th Circuit Court of Appeals by the EPA and USDI, et al.

July 22: Issuance of Executive Order No. 11870 by President Ford authorizing experimental use of sodium cyanide in federal programs and on federal lands.

August: The EPA authorized experimental use of sodium cyanide in toxic collars to be used on the necks of sacrificial lambs for removal of sheep-killing coyotes. (This chemical-collar combination was consistently ineffective in all field trials, 1975-1976.)

1975: August: The Wyoming Department of Agriculture conducted pesticide applicator training and certified a number of applicants for the use of Compound 1080 in meat baits for predator damage control under a Wyoming state label registration.

September: The EPA reregistered sodium cyanide for use (in the M-44) in predator control by the USDI-ADC and several western states, including Texas.

October: The 10th Circuit Court of Appeals reversed the U.S. District Court, Cheyenne, ruling which granted injunctive relief from EPA Order PR 72-2, thereby reinstating the federal cancellation/suspension of Compound 1080 for predator control.

November: Wyoming Department of Agriculture certified pesticide applicators began use of 1080-treated meat baits for predator control on private and state lands in Wyoming. These were used into Spring 1976, and again November 1976-Spring 1977.

1976: February: The State of Wyoming, et al., filed for review of the 10th Circuit Court of Appeals' October 1975 decision by the U.S. Supreme Court.

May: The U.S. Supreme Court refused the request for review by the State of Wyoming, et al., thus upholding the 10th Circuit Court of Appeals' decision reinstating federal cancellation/suspension of Compound 1080.

May 28: Issuance of Executive Order No. 11917 by President Ford authorizing operational use of sodium cyanide in federal programs and on federal lands with certain restriction.

September: A Civil action was filed against the Wyoming Department of Agriculture, et al., by the EPA in the U.S. District Court, Cheyenne, Wyoming, alleging misuse of Compound 1080 by inshipment from out-of-state and by use in meat baits for predator control.

A Civil action was filed against USDI, USDA, HEW, EPA, et al., by the State of Wyoming, et al., (including the State of Texas), in the U.S. District Court, Cheyenne, Wyoming, requesting the Court to authorize and order the registration and use of Compound 1080, strychnine and sodium cyanide on private, state, and federal lands, and to invalidate orders by the EPA denying registration of 1080 to the States of Wyoming and South Dakota. (Plaintiffs and intervenors in support included the states of Wyoming, Montana, Idaho, New Mexico, Utah, South Dakota, and Texas, and the National Wool Growers' Association, the National Cattlemen's Association, et al.)

November: (to Spring 1977): Wyoming Department of Agriculture certified pesticide applicators applied 1080-treated meat baits for predator control on private and state lands in Wyoming.

1976: December 1: Federal Register notice of intent was filed by the EPA to proceed with RPAR action against Compounds 1080 and 1081 and strychnine for all uses and all purposes (primarily field rodent and bird damage control at present).

1977: October: A permit for experimental use of Compound 1080 in toxic collars on the necks of sacrificial sheep to remove sheep-killing coyotes was granted to the USDI by the EPA. This permit extended to October 1978, and was renewed to October 1979. Results have been generally effective in certain selected cases, but the method is not consistently or universally effective.

1978: February: The Civil action by the EPA against the Wyoming Department of Agriculture, et al., alleging misuse of 1080 for predator control was dismissed by the U.S. District Court, Cheyenne, Wyoming, in accord with an agreement reached by counsel for prosecution and defense.

February: The "Animal Damage Control Policy Study Advisory Committee" was appointed by the Secretary of the Interior to review the USDI-ADC program, policies, and the use and interpretation of data regarding predator damage/control, with advisory duties only, to terminate in July 1978.

Late May: The first draft report, Predator Damage Management in the West, released by USDI.

May 22-31: Public hearings on the draft report and related factors were held at Boise, Idaho; Casper, Wyoming; San Angelo, Texas and Washington, D.C.

June 12: The second draft report, Coyote Management in the West: A Study of Alternatives, was prepared by USDI and released to the public in January 1979.

December: The final report Predator Damage in the West, A Study of Coyote Management Alternatives, was prepared by USDI and released to the public.

1979: January: A draft option paper regarding USFWS-ADC predator damage management options/alternatives was supposedly provided to the Secretary of the Interior by U.S. Fish and Wildlife Service-ADC Staff.

Decisions by the Secretary, on the options/alternatives originally scheduled for January 1979, were repeatedly postponed until November 8, 1979.

1972 to 1979: All applications/requests for registration of 1080 and strychnine by several western states to were denied by the EPA. Occasional emergency uses of strychnine for rabies control were 1979: permitted in several western states by the EPA and emergency permit for use of 1080 in control of 1974 Columbian ground squirrels was granted to the State of Montana.

to 1979: The Civil action against EPA, et al., filed in the U.S. District Court, Cheyenne, Wyoming, to by the state of Wyoming, et al., was repeatedly continued/postponed.

1979: June 12: The Tenth Circuit Court of Appeals granted a petition by Cecil D. Andrus, (USDI) and Douglas Costle, (EPA) and issued a writ of mandamus compelling the United States District Court, District of Wyoming, to carry out the mandate of the October 1975 decision by the Tenth Circuit Court of Appeals, thus effectively closing the case by the State of Wyoming, et al., vs. EPA, et al., filed in May 1974.

October: Intervenors and plaintiffs, other than the State of Wyoming, reached agreement to dismiss the suit by Wyoming, et al., vs. EPA, et al.

Mid-October: USDI 1080 toxic collar permit was renewed through November 30, 1980 by the WE

November 8: Secretary of the Interior Cecil D. Andrus issued his long-delayed ADC policy statement in a memorandum to the Assistant Secretary for Fish, Wildlife and Parks. The document generally ignored recommendations contained in numerous position statements from ADC professionals in research and operations, and those from the agricultural sector.

Major points in the new policy include prohibition of denning and all further research/development/use on Compound 1080, added restrictions on aerial hunting, emphasis on "non-lethal noncapture methods directed at offending animals", and emphasis on livestock husbandry methods, in addition to phasing out of lethal control methods.

1980: January: Opposition to the new USDI-ADC policy appeared to be growing in the agricultural sector. USFWS and other professionals in ADC research and operations indicated the lack of factual considerations, and objectivity, other than political, in the policy.

January 15: A predator Summit Conference was held in Austin, Texas. In his discussion, USDI Secretary Andrus reiterated his perception of society's opposition "to denning and the use of Compound 1080 as repulsive and inhumane practices". However, he did receive "new information" regarding secondary hazards on January 15 and indicated that he might reconsider the prohibition of all further research/development/use of Compound 1080.

January 22: Senate Bill S-2195 was introduced by Senator John Tower of Texas. The bill would require the Secretary of Interior, in cooperation with the Secretary of Agriculture, to implement certain procedures relating to ADC, including the use of Compound 1080, and extensive research relating to chemical toxicants, their efficacy, hazards, costs, benefits, etc.

1980: January 30: Telephone communication from USFWS administrators to USFWS research staff gave permission to continue the 1080 toxic collar tests at Meridian, Texas. Confirmation of this permission by memoranda was requested from the USFWS staff in Washington, D.C.

February 20: USDI Secretary Andrus met with a delegation of western senators regarding the ADC program and new USDI policy.

February 21: By telephone, the Denver Wildlife Research Center staff were informed that as agreed upon by USDI Secretary Andrus and western senators, the 1080 toxic collar tests in Texas would be permitted to continue, in accord with the agreement between the researchers and the rancher, but no other 1080 toxic collar tests would be permitted by USDI staff and that written confirmation of these elements would be provided to toxic collar research staff and the rancher.

February 28: RPAR action by EPA against 1081 was terminated. With certain label modifications, registration of 1081 is continued.

February 29: No further information has been provided to toxic collar researchers or the rancher where the 1080 toxic collar tests are being conducted.

February 29: The RPAR action by EPA against strychnine and 1080 is continuing with decisions still pending.

Dale A. Wade
February 29, 1980