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April 1993

## The Probe, Issue 131 - April 1993

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# A Role for Fertility Control Wildlife Management in Australia?

Mary Bomford and Peter O'Brien, Bureau of Resource Sciences, Australia

**I**ncreasing community awareness of the moral and animal welfare issues associated with conventional pest animal control in Australia has focused interest on non-lethal alternatives, such as fertility control. Animal welfare organizations have proposed fertility control as a solution to pest problems with feral horses and kangaroos.

Currently, the only cost-effective means known for wildlife population control are conventional methods that include poisoning, shooting and trapping, and to a lesser extent, biological control, habitat manipulation and exclusion. Wildlife damage control achieved by non-lethal, non-toxic and humane means would have wide appeal and application.

This paper describes the main findings of a review conducted to assess the potential role of fertility control for managing vertebrate pest damage in Australia (Bomford 1990 & 1992).

## Objectives

The objectives of fertility control are to reduce animal damage or control costs, or to achieve more humane control. Importantly, assessments of effectiveness must focus on damage control, rather than fertility control, *per se*. Treatment effects on target populations must be of sufficient magnitude, rapidity and duration to achieve the objective of damage control. Successful fertility control depends on:

1. Available drug or technique to reduce fertility
2. Effective delivery mechanism to treat wild animals
3. An end result of reduced animal damage
4. Humane and non-toxic effect
5. Target specificity
6. Environmentally acceptable
7. Cost effective

Most tests of fertility control drugs and techniques examine effects on reproduction, rather than on population dynamics. Many tests and models have not been robust enough to allow clear conclusions about the usefulness of the technique in damage mitigation.

## Drugs & Techniques

A great many drugs and chemicals are

known to cause infertility in captive animals. The application of fertility control to managing pest wildlife populations is unlikely to be advanced by the discovery and testing of more fertility control drugs.

Virally vectored immunocontraception is a new technique being investigated in Australia by Dr. Hugh Tyndale-Biscoe. It is planned to use genetic engineering to insert foreign genes into live viruses which are then released to spread through wild populations to cause infertility.

An essential requirement for this approach is the identification of a species-specific virus to use as a vector for the immunogenic material. The technique is still in the early developmental stages and there are very substantial technical problems to be overcome before it can be developed for field release. It is too early to assess its probable success, but it is high risk research.

## Delivery

The lack of practical techniques to deliver drugs to an adequate proportion of the target population is a major obstacle to using fertility control to manage wild animal populations. Many tests on caged animals, or on animals in small enclosures, have relied on drugs delivered by surgical implantation, repeated injections by hand or dart gun, or by frequent oral doses in food or drink. These options are not feasible for widespread and abundant wild populations, particularly those living in remote areas.

## Effects on Populations

When populations are artificially reduced through fertility control, compensatory responses can be expected. These may include declines in juvenile mortality, adult mortality dispersal, or increases in immigration. There may also be compensatory increases in birth rates in the remaining fertile individuals. The extent of compensation determines whether fertility control will work and how well it will work. Unfortunately precise information on the factors regulating populations is not

*Continued on page 4*

# CALENDAR OF UPCOMING EVENTS

**April 26-29, 1993: 11th Great Plains Wildlife Damage Control Workshop, Hyatt Regency Crown Center, Kansas City, MO.** For further information, contact F. Robert Henderson, Ext. Wildlife Specialist, Kansas State University, (913) 532-5654, or Robert A. Pierce II, Ext. Wildlife Specialist, University of Missouri, (314) 882-7242. *NADCA Board Meeting 2-3 p.m.; General Meeting 4:30-6 p.m. Plan to be there!*

**May 25-26, 1993: The Wild Pig in California Oak Woodland: Ecology and Economics.** Embassy Suites Hotel, San Luis Obispo, CA. Contact: Dr. William Tietje, Forestry & Resource Management, 2156 Sierra Way, Suite C, San Luis Obispo, CA 93401. (805) 549-5940.

**June 24-27, 1993: Fur Takers of America Annual Convention, Washington County Fairgrounds, Bartlesville-Dewey, Oklahoma.** For further information contact Bill or Dee Jackson, HC 73, Box 204, Pawhuska, OK 74056 or call (918) 336-8154.

**July 4-10, 1993: Sixth International Theriological Congress, Sydney, Australia.** This is an international meeting of scientists interested in mammalogy, and will include symposia and workshops including such topics as population biology of mammals, the role of disease in population regulation, and wildlife management. Will include sessions on *Management of Problem Wildlife and Predation As a Regulator of Mammal Populations*. For further information, write: The Secretariat, 6th Int'l Theriological Congress, School of Biological Science, P.O. Box 1, University of New South Wales, Sydney, Australia 2033.

**August 2-6, 1993: Bird Strike Committee—USA, Seattle-Tacoma International Airport, Seattle, Washington.** Will include two days of conference papers and a one-day field trip. Contact: James E. Forbes, USDA/APHIS/ADC, P.O. Box 97, Albany, NY 12201, (518) 472-6492.

**September 12-18, 1993: F.T.A. Professional Trappers College, Limberlost Camp, LaGrange, IN.** Contact: Charles Park, 410 S. Poplar, LaGrange, IN 46761.

**September 19-25, 1993: First International Wildlife Management Congress, Hotel Cariari, San Jose, Costa Rica** Includes session *Conflicts Between Man, Agriculture, and Wildlife*. Send abstracts before 31 March 1993 to: Dr. Paul R. Krausman, Sch. of Renewable Nat. Resources, Univ. of Arizona, 325 Biological Sciences East, Tucson, AZ 85721. For further information, contact IWMC Secretariat Director, The Wildlife Society, 5410 Grosvenor Lane, Bethesda, MD 20814, phone (301) 897-9770.

**October 3-6, 1993: 6th Eastern Wildlife Damage Control Conference, Ramada Inn, Asheville, NC.** Conference theme: "Wildlife Damage Management in the 90's: Balancing the Needs of Society." Call for papers: Authors/presenters should send a one page (or less) abstract for review by the Program Committee for consideration. Abstracts should be sent to Dr. Michael King, Extension Wildlife Specialist, Department of Forestry, Wildlife and Fisheries, P.O. Box 1071, University of Tennessee, Knoxville, TN 37901, phone (615) 974-2706. Deadline for submissions is June 1, 1993. Abstracts received after this date will not be considered. For more information, contact: Ann Coughlin, 6th Eastern WDM Conf., No. Carolina State Univ., College of Forest Resources, Box 8001, Raleigh, NC 27695-8001, (919) 515-3184.

**October 3-8, 1993: First International Congress of Vector Ecology, Hanalei Hotel, San Diego, California.** Topics include: *Changing Patterns of Vector-Borne Disease; Human Ecology and Sociology; Vector-Host Interactions; and New Approaches to Control*. For more information, contact: Secretariat, 1st International Congress of Vector Ecology, P.O. Box 87, Santa Ana, CA 92702.

**October 26-28, 1993: Symposium: Contraception in Wildlife Management, Sheraton Hotel, Denver Tech Center, Denver, Colorado.** Conference topics will include population management, theories and biology of contraception, delivery systems, potential applications, and public attitudes, policy, and regulations. Call for papers: Send an abstract of 300 words or less by May 1, 1993 to Diana L. Dwyer at the address listed below. Authors will be notified regarding acceptance of paper by May 15, 1993. Papers will be selected on the basis of relevance to symposium theme and scientific merit. For more information: Diana L. Dwyer, USDA-APHIS Denver Wildl. Res. Ctr., P.O. Box 25266, Denver, CO 80225-0266, (303) 236-7874.

**December 11-15, 1993: 55th Midwest Fish & Wildlife Conference, St. Louis, Missouri.** The theme is *New Agendas in Fish and Wildlife Management: Approaching the Next Millenium*. Features include an *Urban Deer Management Symposium*. For more information, contact: Wayne Porath, 1110 S. College Ave., Columbia, MO 65201, (314) 882-9880.

**December, 1993: 2nd International Symposium on Wild Boar (*Sus scrofa*) And On Order Suiformes, Torino, Italy.** For more information, contact: Secretariat, 2nd International Symposium on Wild Boar and on order Suiformes, c/o Prof. P. Durio, Dipartimento Produzioni Animali, Epidemiologia ed Ecologia, Via Nizza 52, 10126 Torino (Italy), Telephone 39.11 . 6503734 - FAX 39.11 . 655455.

*The Probe* is the newsletter of the National Animal Damage Control Association, published 10 times per year.

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Your contributions to *The Probe* are welcome. Please send news clippings, new techniques, publications, and meeting notices to *The Probe*, c/o Hopland Field Station, 4070 University Road, Hopland, CA 95449. If you prefer to FAX material, our FAX number is (707) 744-1040. The deadline for submitting material is the 15th of each month. Opinions expressed in this newsletter are not necessarily those of NADCA.

# ADC News, Tips, Ideas...

## No Predator Control on New Mexico State Lands

Federal Animal Damage Control authorities have been banned from state-owned lands in New Mexico. According to the November 16, 1992 *Albuquerque Journal*, New Mexico State Land Commissioner Jim Baca ordered ADC to cease all activities on state-owned property.

The action came after Baca and ADC failed to reach an agreement on the minimum number of times traps should be checked. Baca insisted that traps be checked every 48 hours, while ADC said 72 hours was more realistic. Initially Baca had wanted traps checked every 24 hours, but compromised when the New Mexico Fish and Game Commission adopted that time frame.

"I didn't like the idea of them doing their work, anyway, to tell you the truth," Baca said. He believes that ranchers' predator problems should not be solved with taxpayers' dollars.

Although ADC officials were unavailable for comment, local livestock producers expressed their concern. "We are extremely disappointed to see this happen," said Caren Bremer, of Ruidoso, executive director of the New Mexico Wool Growers Association. She added that the action would severely limit ranchers' ability to graze on state trust lands. The order affected 6 to 8 million acres of state land.

Baca has been nominated by the Clinton administration to be the new director of the Bureau of Land Management, and his confirmation is currently proceeding.

## Lab Animals Get Stiffer Protection

On February 25, a federal judge ordered the government to stiffen its regulations to protect research animals from abuse, on the grounds that the rules now seem based on "the almighty dollar" rather than the adage that "a dog is a man's best friend."

According to an article in the February 26 issue of the *Denver Post*, U.S. District Judge Charles Richey called the Agriculture Department's current regulations "arbitrary, capricious, and contrary" to what Congress ordered.

The ruling came as a result of a suit by the Animal Legal Defense Fund. Richey concluded that the rules failed to establish "minimum requirements" mandated by Congress.

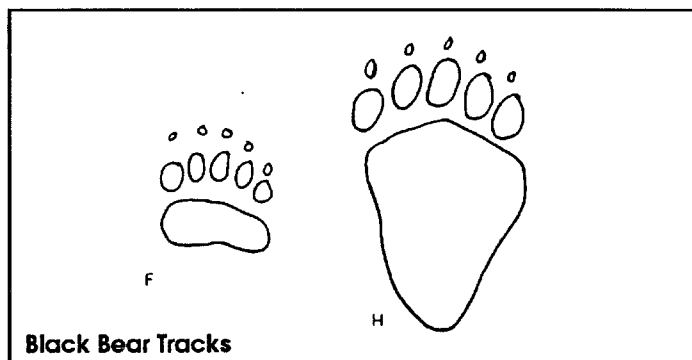
*The editors of The PROBE thank contributors to this issue: Paul Debow, Brian Archuleta, Robert H. Giles Jr., Mike Fall, J. Grant Huggins, James E. Forbes, and Wes Jones. Send your contributions to The PROBE, 4070 University Road, Hopland, CA 95449.*

## Coyotes Continue to Plague Petowners

A Denver suburb resident believes wildlife and police officials are not doing enough to stop coyote attacks on pets. According to a report in the February 2 *Denver Post*, Peter Sokoloff, who lives in Cherry Hills Village, said his dog was dragged out of a fenced yard and killed by two coyotes during daylight hours.

The article stated that a Colorado Division of Wildlife program that began in December has proven ineffective. Spokeswoman Pat O'Connor said that shooting is often difficult because of the number of homes in the area. Trapping must be selective and not harm other animals.

Sokoloff also criticized local police for not informing homeowners of the dangers from predators. He let his dog out only in daylight and was unaware that coyotes would hunt except at night. Denver police and wildlife officials estimate that 60 to 70 dogs and cats have been killed in Greenwood Village and Cherry Hills Village in the past year.



## New Hampshire Jogger Suffers Black Bear Attack

According to a report sent in by Paul Debow to the Northeast Association of Wildlife Damage Biologists newsletter, a Sugar Hill, NH, jogger recently suffered an attack by a black bear. The man found the black bear cub on a trail while jogging with his dog in November, 1992. His dog, a Labrador cross, ran ahead and treed the cub. Subsequently, a protective female bear came onto the path and chased the dog back past its owner. The bear then knocked over the jogger and bit him in the groin area. After retreating into the woods, the bear returned to knock the man down two more times as he attempted to get to his feet.

The man survived the attack but suffered wounds to his arms, thighs, groin and sides. Although there is only a remote chance the female bear was rabid, the jogger was given post-exposure rabies prophylaxis.

## **Fertility Control Wildlife Management in Australia ...**

available for most pest species and we know even less about the effect of fertility control on wild populations.

If damage mitigation rather than lower reproductive success is the objective, fertility control may not be an advantage. It may even be counterproductive, if it allows large numbers of non-breeding individuals to remain in a population. Fertility control is more likely to slow the rate of recovery of the population after some other factor (such as poisoning, shooting, drought or disease) has reduced numbers. Sterilizing males would be largely ineffective for most vertebrates unless a very high percentage of males were treated.

We assessed the validity of some published theoretical models for fertility control to reduce populations of rats, pigeons, brushtailed possums, horses and kangaroos. All predicted that sterilizing animals would cause a far more sustained population suppression than killing equal numbers. Unfortunately, all these models are based on assumptions that have been unequivocally demonstrated to be false by other research. When these assumptions are corrected in the models, the predicted advantages of fertility control are lost. Many models assume the use of a technique or sterilant that causes permanent sterility in both sexes without affecting libido or social behavior. Other than surgical sterilization, no such technique or drug is known. More sophisticated models, based on good field data, are needed.

## **Tree Squirrel Video Available (FREE!)**

**I**t is ironic that tree squirrels, which have planted vast numbers of pecan trees due to their nut burying habit, also inflict significant pecan production losses. The Noble Foundation's Red River Demonstration and Research Farm studied the depredation and management of fox squirrels in native pecan groves in south-central Oklahoma from 1989-1992.

A video titled *A Bigger Piece of Your Pecan Pie* summarizes this research for application by pecan growers and animal damage control agents. It gives insight into growers' perceptions of the problem, estimates of losses, and options for management. Specifically, it discusses hunting, habitat modification, fencing, and trapping.

Single copies (VHS only) are available free from the J. Grant Huggins, The Samuel Roberts Nobel Foundation, P.O. Box 2180, Ardmore, OK 73402.

### **Cost**

Cost is another major obstacle in the use of fertility control as a wildlife management technique. Although the technology for fertility control of individuals does exist, it can be prohibitively expensive for widespread and abundant pests. Most of the more expensive techniques for fertility control, such as those requiring surgery, implants or frequent or continuous dosing over extended periods, are only likely to be cost-effective for small numbers of valuable animals, such as those in exhibition parks or small private collections.

### **Conclusion**

The present role of fertility control in wildlife management in Australia is extremely limited. No drugs produce permanent sterility in wildlife and there is no delivery technique suitable for numerous pests. The longer-term potential of fertility control will depend on the successful outcome of future research, development and extension. It also requires an assessment of the economic, environmental and welfare implications of using fertility control for wildlife management. Fertility control drugs can affect animal health. Some have unpleasant side effects and some are toxic. Unfortunately, few fertility control drugs are species specific in their action.

Delivery of drugs to widespread and abundant populations, and achieving population regulation and animal damage control that is cost-effective are major problems, and these are the areas where we believe research should be targeted. There is promise of payoff in research on drugs or techniques which act on animals with short breeding seasons, slow the recovery growth of populations already reduced by other means, such as lethal control, or use genetically engineered viruses to spread sterility-inducing genes through wild populations. Virally vectored immunocontraception is the only technique that shows any real potential to overcome the problems of delivery and cost for widespread and abundant pest populations. But research on such viral sterilants is in the early developmental stages and has a limited chance of a successful outcome.

Bomford, M. 1990. A role for fertility control in Wildlife Management? Bureau of Rural Resources Bulletin No. 7. Australian Government Publishing Service, Canberra. 50 pp.

Bomford, M. 1992. A role for fertility control in Wildlife Management in Australia? Proc. 15th Vertebrate Pest Conf. (J.E. Borrecco & R.E. Marsh, Editors) Published at University of Calif., Davis.

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# In My Opinion

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## Faunally-Related Damage in a Production System

Robert H. Giles, Jr., Professor, Wildlife Resource Management, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061-0321

I admit to having some great frustration about animal damage, but without much focus. Perhaps all targets such as universities, agencies, pco's, NADCA, or the Wildlife Society are due attention, but I do not have enough energy for that. My concerns are for a long list of ideas for which I do not see much agreement or use. I shall present them with brief comment and with anticipation of constructive communications. In summary, the core of my frustration is an apparent insufficient theoretical basis for our work together and a small scope of interest and involvement with clients.

I am so biased by general systems theory and the power of a "systems approach" to everything that I cannot securely conduct an alternative analysis. That analysis is as follows:

1. Clear objectives are not readily available. Evolving from "controlling animals" to "controlling damage" there is a need for people in the damage field to move to the next stage of evolutionary fitness.
2. There is a need for a multi-objective approach. These include (for example and in no order) animal preservation, reduced risks, increased life quality, increased profit, cultural and community stability and diversity, ecosystem stability, recreational opportunity, and a constraint-like objective, namely humane treatment of animals.
3. A primary objective (but not solitary) of many land owners is to maximize profit [not interest in sheep *per se* but profit from sheep.] Profit (P) is simply gross returns (R) minus costs (C). Not so simple, however, is the computation of *all* of the expected benefits over a long planning period. Not so simple is estimating the numbers of animals (e.g., sheep) that will be produced or their annual market price; not so simple is discounting to the present all costs of production including land taxes, fencing, and labor. Profit is achieved by working with R *and* with C, *and* the interactive pair, R and C.
4. The success of any system is partially seen in the sum of achievement of the weighted objectives. The large complex system which is cropland or livestock (etc.) may have physical losses to animals but sooner or later someone had to compute the *real* value of the losses and compute the *full* probable cost and then subtract the two to estimate profit.
5. Damage is as much a function of current prices as of animals killed, crop consumed, or grain spoiled. If the "bottom falls out" on a commodity and it is almost valueless, to the rational financial person there can have been no monetary loss of that commodity due to animals, thus no damage.
6. Perhaps it is asking too much for the "financial person" to be involved in farming and ranching decisions for there are so many not-for-profit objectives of land owners. Eventually, however, this must become at least one of the major processes for deciding success. Once the financial and monetary basis of "success" is defined, a discipline (profession, etc.) may develop a body of relevant knowledge and mature.
7. Increasingly, I sense that "significant damage" cannot be judged separately or independently but only within the context of a *whole production system* such as a farm, ranch, or agricultural enterprise.
8. "Animal control" has evolved to "pest control" to "pest damage control" to "integrated pest management" to "integrated pest damage management." Now it is time to lay these aside and to discuss and develop the comprehensive theory and practice of TPS, total production systems.
9. Of course, the role of vertebrates in such systems is important. The full accounting of their role under TPS can then be done—from land rental for

*Continued on page 6*

### NADCA Annual Meeting

Annual Meeting of Membership, NADCA

Monday, April 26, 1993, 4:30 - 6:00 p.m.

Hyatt Regency Crown Center Hotel,  
Kansas City, Missouri

(In conjunction with 11th Great Plains  
Wildlife Damage Workshop)

(NADCA Board of Directors will meet 2:00 - 3:00 p.m.)

Among items for discussion at meeting: possible dues increase; membership recruitment; content of **THE PROBE**; potential for group insurance coverage; fund-raising ideas. If you have additional agenda items, please suggest them to your Regional Director or any of the officers prior to the meeting.

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# Hats, Hats, Hats...

We are pleased to report that we are well on the way to having some NADCA hats available for members. You will be pleased with the high quality of these caps. They are an Oxford Classic of two-ply dacron/cotton fabrication, all cloth, with reinforced seams and a braid. We have ordered a selection of Royal, Navy, Teal, Tan, and (what else but!) Black. A plastic stiffener inside the front keeps the logo from collapsing. The appropriately colored embroidery is directly on the hat—it is not just a patch. Size adjustment is via a leather strap and buckle.



We expect to have these caps ready for debut at the 11th Great Plains Wildlife Damage Control Workshop in Kansas City, MO, the last week of April. At the last teleconference meeting of the Executive Committee, we established a member price of \$10.00 when delivered at a membership meeting.

Those of you not attending the above meeting are not left out, but we must charge an additional amount for shipping and handling. Boxes will be purchased so that the hats can be mailed without crushing. With the current cost of postage, it appears that we will have to assess an additional amount not to exceed \$3.00 per box. Watch this newsletter for that detail. Maybe you can talk a friend that will be attending the meeting into bringing one back for you if you are not one of the fortunate individuals that will be participating.

Wes Jones



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Continued from page 5

## In My Opinion...

hunting all the way to loss due to animals in the current net return from using land for soybean production. Such accounting can include mammalian control of rodent-related crop losses, enhanced site index for forests, reduced flood peak costs related to animal-soil interaction, as well as reduced grade of apples, reduced confidence (risk valuation) in money management, reduced direct losses, and reduced zoonoses transmission.

10. I have seen bits and pieces of these ideas in the literature for over 35 years. They are not new. The newness is that now the ideas can be pulled together, computer models created, premises and theories consolidated, operational regional models developed, law and policies included in such models, expert systems employed in the field, and a basis created for reasonably beginning to integrate the complex areas of economics, ecology, energetics, and esthetics.
11. "Animal damage" now means to me a statistically significant loss in the expected net present value of an agricultural (or similar) production system with at least a 20-year (preferably 60 or more years when forecasts are included) planning horizon, a loss attributable to animals, and one compared to the *optimum* returns computed for the system as well as to the median value of returns based on numerous computer simulations of the operation of the total system. It is not an idea quickly handled over a calf carcass.
12. Because plants are life and wildlife includes plants and animals, and because insects are animals and there are already many people and agencies actively working them, I prefer to suggest a subsystem of concentration, namely faunally-related damage. People so engaged, including many in the NADCA, may participate in developing ways to estimate and reduce losses and, more importantly, emphasizing their effective role creating and managing total production systems.

# Cormorant Scientific Symposium

Brian Archuleta, Wildlife Biologist, USDA/APHIS/ADC — reprinted from NEA-WDB Technical Notes, newsletter of Northeast Association of Wildlife Damage Biologists

Local support for a double crested cormorant control program to protect local fish stocks in the Great Lakes Region of the United States and Canada provided the impetus to convene an international double crested cormorant symposium to review current knowledge of this species and to discuss potential management options. A group of Lake Ontario charter boat captains calling themselves "Concerned Citizens Against Cormorants" (CCAC) voiced strong concern over the potential impact cormorant populations were having on sport fisheries in Lake Ontario.

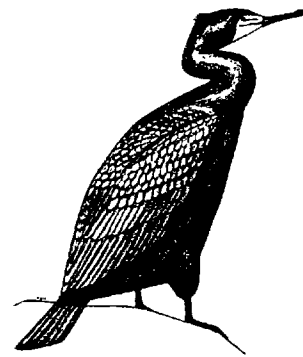
To address growing public concern, the Lake Ontario Cormorant Scientific Symposium was held in November of last year at Wellesley Island State Park in Alexandria Bay, New York. The informal symposium was attended by biologists from the United States and Canada representing the New York State Department of Environmental Conservation; Cornell University; Canadian Wildlife Service, Ministry of Natural Resources; U.S. Fish and Wildlife Service; and the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control program.

Discussions were centered around historic and current cormorant population levels, cormorant diet, forage fish population dynamics, and perceived impact of cormorants on sport fisheries as well as a review of cormorant management options and responsibilities.

During the early part of the 20th century, cormorant population in the Great Lakes Region were declining as a result of a variety of impacts including egg collecting and nest destruction. Also, in the 1950's and 1960's organochlorine pesticide contamination resulted in eggshell thinning and subsequent reproductive failure pushing cormorant populations further towards extirpation. Fortunately, a ban on chlorinated hydrocarbons in the U.S. and Canada and protection under the Migratory Bird Treaty Act in 1972 resulted in a stabilization of cormorant populations in many areas of its range. Local cormorant populations continued to increase throughout the 1970's and 1980's. Concurrently, anglers in the Great Lakes Region began to notice a decrease in their catch rate and began to voice concern over the impact of cormorants on sport fish populations.

Cormorants eat a variety of fish species including alewives, trout, perch, yellow perch and white perch on Lake Ontario. One study indicates that the fish consumption rate of cormorants in the Great Lakes Region is 5Kg/bird/day. More research is warranted to determine the impact of cormorants on local and Great Lake fisheries at this time.

Negative public perception of the impact of cormorants may be driven by isolated cases of heavy predation by birds (cormorants and gulls) during fish stocking operations. Bird hazing techniques during stocking operations could potentially be employed to alleviate this loss in the future. Brian Archuleta from USDA, APHIS, ADC informed the Symposium participants that ADC biologists trained in damage control operations are available through cooperative agreements if requested by state and other federal agencies or appropriate organizations.



## PROBE Questionnaire Results

Responses to the questionnaire in the December PROBE (issue #128) indicate that our membership is reasonably well-satisfied with our newsletter in its present form. A total of 13 responses were received from NADCA members (not counting a response from one Regional Director); our assumption is that these respondents are representative of the entire membership.

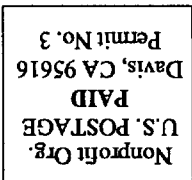
A suggestion was made by a number of respondents to give more emphasis to practical, "how-to" type information in *The PROBE*, particularly new methods and techniques, or hints helpful to those working in the field.

To the question, "The part of *The PROBE* that I always read is...", 8 of 13 respondents replied "all of it." It appears that our newsletter is a useful and important means of communicating among our membership.

Please keep your input, suggestions, criticisms, letters to the editor, etc. coming!

R.M.T., R.H.S. (The Editors)





Terrell P. Salmon  
DANR-North Region  
University of California  
Davis, CA 95616-8575

**Membership Application**

**NATIONAL ANIMAL DAMAGE CONTROL ASSOCIATION**

Mail to: Wes Jones, Treasurer, Route 1 Box 37, Shell Lake, WI 54871

Name: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ Home

Address: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ Office

Additional Address Info: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP \_\_\_\_\_

Dues: \$ \_\_\_\_\_ Donation: \$ \_\_\_\_\_ Total: \$ \_\_\_\_\_ Date: \_\_\_\_\_

Membership Class: Student \$7.50 Active \$15.00 Sponsor \$30.00 Patron \$100

(underline one)

Check or Money Order payable to NADCA

Select one type of occupation or principal interest:

- |   |   |
|---|---|
| <input type="checkbox"/> Agriculture                        | <input type="checkbox"/> Pest Control Operator  |
| <input type="checkbox"/> USDA - APHIS - ADC or SAT          | <input type="checkbox"/> Retired                |
| <input type="checkbox"/> USDA - Extension Service           | <input type="checkbox"/> ADC Equipment/Supplies |
| <input type="checkbox"/> Federal - not APHIS or Extension   | <input type="checkbox"/> State Agency           |
| <input type="checkbox"/> Foreign                            | <input type="checkbox"/> Trapper                |
| <input type="checkbox"/> Nuisance Wildlife Control Operator | <input type="checkbox"/> University             |
| <input type="checkbox"/> Other (describe) _____             |   |