

## *BIOLOGY, LEGAL STATUS, CONTROL MATERIALS AND DIRECTIONS FOR USE*

### Waterfowl (Ducks, Geese)



Introduction: Waterfowl (ducks and geese) cause problems by depredation to crops. Health and safety problems can occur where the birds are present in large numbers around reservoirs, ponds, lakes, and at airfields and airports. Management can be achieved through a number of different methods discussed below. Woodruff et al (2004) describes how consultative approaches using community involvement can be effective where public awareness challenges exist, see also Gray (2004) who discusses cooperative community mitigation efforts at Seymour Air Force Base, North Carolina. For current information on waterfowl hazard management issues and aircraft see [FAA Wildlife Strike database](#).

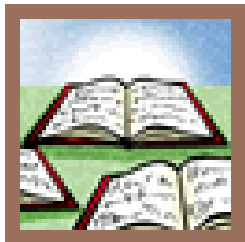


Identification: Migratory waterfowl damage crops in most of the northern and central U.S. During springtime they may graze and trample crops, such as cereal grains, soybean, and sunflowers. In autumn grains may be damaged through feeding, trampling, and fouling. Geese may damage crops such as wheat, corn, and soybean. Migrating waterfowl also may damage rice and lettuce.

In urban areas most goose problems are generally the result of Canada geese. Smith (2004) illustrates this and describes many of the issues associated with capture and roundup in Reno, Nevada. The issue is exacerbated by people welcoming geese on ponds. However, if left undisturbed they can readily turn from pet to pest, fouling ponds and damaging surrounding landscaping. Injuries to humans can result from defense of nests or young by geese or swans. Further information is available at:

[Cornell Lab of Ornithology](#)

[The Royal Society for the Protection of Birds](#)



Legal Status: Ducks and geese are classified as migratory game birds in the [U.S. Code of Federal Regulations](#). A depredation permit is required from the U.S. Fish and Wildlife Service before any person may take, possess or transport migratory

game birds. [Hunting is allowed in California](#) provided the necessary license requirements and regulations are adhered to. The U.S. Fish and Wildlife Service permit is administered concurrently with the states' hunting license requirements. No federal permit is required to scare or herd depredate waterfowl, except threatened or endangered waterfowl (i.e. Aleutian Canada goose).



Damage: During the fall, winter, and early spring, large flocks of waterfowl migrate into California where they may damage small grains and alfalfa. Damage is normally due to the grazing of alfalfa or sprouting grain. In the fall, large flocks of birds land in un-harvested rice, damaging the crop by trampling and consumption.

Aircraft collisions with birds (bird strikes) are a serious economic and safety problem. Researchers estimated wildlife strikes (97.5 percent involving birds) cost the civil aviation industry in the USA over \$400 million/year, 1990-2000. Current and further information is available at the [Federal Aviation Administration's wildlife mitigation homepage](#).

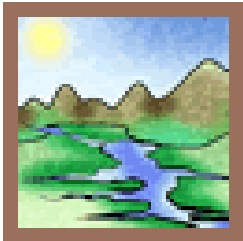


Range

[Canada Goose](#)

[Ring-Necked Duck](#)

[Ruddy Duck](#)



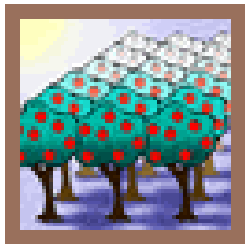
Habitat: As their name infers, waterfowl can be found near water. They may also travel large distance to specific, favorite feeding areas, including agricultural lands. Many species are very adaptable to both rural and urban environments, such as mallards and Canada geese.



Biology: Waterfowl are generally monogamous and solitary nesters (Nebraska 1994). Their size and nesting territory is determined by individual aggressiveness of paired birds. Geese and swan pairings are generally permanent until a partner dies. Ducks seek a new mate each year.

Species mortality in the first year can be as high as 70 percent but reduces in following years to 35 percent. Life spans may vary from 10 to 20 years for captive ducks and 20 to 30 years for captive geese and swans.

Ducks lay one egg each day and geese one every other day until clutch is complete. Incubation can range from 23 to 28 days (giant Canada geese, mallards). Nest sites are abandoned within 1 to two days after hatching.



### Damage Prevention and Control Methods

Exclusion: Waterfowl exclusion is generally used at reservoirs, lakes, ponds, and fish rearing facilities. Where exclusion is desired in gardens and yard areas similar principles apply. Constructing overhead grids over reservoirs, ponds, and lakes is best achieved using either monofilament line or stainless steel spring wire. The line should be supported between fence posts approximately 5 feet high at 20 foot

intervals (geese) and 10 foot intervals (ducks). Install at a height that allows people and equipment to move below with ease. Try to avoid lines crossing where possible, or tie if necessary, to prevent breakage through rubbing together. Independently attach lines to posts for ease of replacement. Avoid one continuous line so as to not have to entirely rebuild if one lines breaks.

Polypropylene UV protected netting 1 to 1 ½ inches) can be used for total exclusion (e.g. contaminated oil basins). The key here is support cables as high winds can threaten the structure.

In gardens, stringing wires, aluminum foil, or Mylar tape can be effective.

Caution should be used with all types of exclusion as birds may become entangled in wire or netting and die. This may expose the owner to prosecution under the Migratory Bird Treaty Act. Martin et al (1998) reported success using Bird Balls® in containment basins to deter geese. These are small, light plastic (polyethylene) type balls which cover the entire surface and may be particularly useful in hazardous municipal or



industrial liquid storage areas.

**Habitat Modification:** Generally discourage waterfowl from using pond areas by making the surroundings unattractive will work. Reduce the ability to nest by mowing to pond edges, manage aquatic vegetation to eliminate nesting places by cutting back or using appropriate herbicides. Prohibit waterfowl feeding where possible e.g. municipal ponds. Construct or modify ponds so that there are vertical edges or surfaces that are difficult to walk on. Canada geese in particular do not like to nest where they cannot walk out of the water.

For specific information on vegetation recommendations contact your local County Cooperative Extension office at <http://www.ucanr.org>.

**Frightening Devices:** Devices such as shell crackers, bird bombs<sup>®</sup>, bird whistlers<sup>®</sup>, biosonics, and propane exploders are successful in frightening waterfowl from crops. Use of these devices should begin as soon as birds make an appearance; delays will make bird removal more difficult. No one technique is usually effective. A combination of two or more devices is often needed to alleviate the damage. These units must



be mounted on stands or poles above the crop so the sound is dispersed over a wide area. Seamans et al. (2004) reports dead goose effigies are not effective but suggests may be effective at start of an integrated pest management IPM program. Proper location of sound devices is important and a number of units may be needed to provide sound over the entire area to be protected. Observations to determine their effectiveness should be made and individual units moved to new locations if necessary.

**Fumigants:** Not an appropriate method. None registered for use.

**Repellents:** Generally repellents are not effective as standalone methods for waterfowl management and should be used as part of an integrated pest management program. However, Devers et al (1998) reports success using the repellent anthraquione dispensed as Flight Control<sup>®</sup> to control Canada geese on turf.

Shooting as a repellent or lethal method of control can be appropriate where safe and legal. Where direct threats to human health and safety exist i.e. geese at airports, permits may be available from the [U.S. Fish and Wildlife Service](#) to kill migratory birds. Glahn (2000) evaluated pyrotechnics and shooting and states that shooting was more successful for dispersing double crested cormorants from night roosts.

Radio controlled models have been used for bird dispersal. Carter (2002) states that in a study at Dover Air Force Base radio controlled aircraft were effective in dispersing gulls and radio controlled boats worked for dispersing geese.

**Toxic Bait:** There are no toxicants currently registered for control of waterfowl.

**Trapping:** Trapping for relocation is appropriate. Lethal trapping is illegal in most situations. Smith (2004) reports on the use of Alpha-Chloralose as a bird immobilizing agent



when relocating Canada geese. The advantages are easier to control geese. However, public relations challenges may arise when immobilizing geese in urban areas as people do not like to see the birds handled. Hall et al (2002) states that relocation of Canada geese was effective when pursued as a method long term.

Other: The growth of waterfowl populations can be effectively slowed by destroying nests and eggs. Ensure that the appropriate federal permit is secured before embarking on such a course of action (50 CFR § 21.41a). This method is especially effective for Canada geese.

In recent years avian contraception tools have become popular. Research shows this method may be time consuming and is most likely not effective as a standalone tool (Yoder et al 2006, VerCauteren et al. 2002). However, when used as an IPM tool (i.e. together with other methods to maintain population reduction), the need for population culling may be reduced.

## REFERENCES AND ADDITIONAL READING

Beason, Robert C., 2004. What Can Birds Hear? Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 92-96.

Blackwell, Bradley F., 2002. Understanding Avian Vision: The key to Using Light in Bird Management. Proc. 20th Vertebrate Pest Conf. (R.M. Timm and R. H. Schmidt, Eds.) Published at Univ. of Calif., Davis. Pp. 146-152.

Bowers, Zackary L., 2004. Protecting Canada Geese on a Wildlife Management Area in East-Central Nevada. Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 113-115.

Conover, Michael R., 1992. Ecological Approach to Managing Problems Caused By Urban Geese. Proc. 15th Vertebrate Pest Conf. (J.E. Borrecco & R.E. Marsh, Eds.) Published at Univ. of Calif., Davis. Pp. 110-111.

DeFusco, Russell P., 1998. The U.S. Air Force Bird Avoidance Model. Proc. 18th Vertebrate Pest Conf. (R.O. Baker & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 59-60.

Devers, Patrick, P. Reichert, R. Poche, 1998. Field Trial Using Flight Control as A Repellent for Canada Goose (*Branta canadensis*) Control in Fort Collins, Colorado. Proc. 18th Vertebrate Pest Conf. (R.O. Baker & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 345-349.

Dolbeer, Richard A., 2000. Birds and Aircraft: Fighting for Airspace in Crowded Skies. Proc. 19th Vertebrate Pest Conf. (T.P. Salmon & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 37-43.

Dolbeer, Richard A., P. Eschenfelder, 2002. Have Population Increases of Large Birds Outpaced Airworthiness Standards for Civil Aircraft? Proc. 20th Vertebrate Pest Conf. (R.M. Timm and R. H. Schmidt, Eds.) Published at Univ. of Calif., Davis. Pp. 161-166.

Erickson, William A., R.E. Marsh, T.P. Salmon, 1990. A Review of Falconry as a Bird-Hazing Technique. Proc. 14th Vertebrate Pest Conf. (L.R. Davis and R.E. Marsh, Eds.) Published at Univ. of Calif., Davis. Pp. 314-316.

Fairaizl, Steven D., 1992. An Integrated Approach to the Management of Urban Canada Goose Depredations. Proc. 15th Vertebrate Pest Conf. (J.E. Borrecco & R.E. Marsh, Eds.) Published at Univ. of Calif., Davis. Pp. 105-109.

Gorenzel, W.P., T.P. Salmon, A.C. Crabb, 2000. A National Review of the Status of Trapping for Bird Control. Proc. 19th Vertebrate Pest Conf. (T.P. Salmon & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 5-21.

Gorenzel, W. Paul, P.R. Kelly, T.P. Salmon, D.W. Anderson, S.J. Lawrence, 2006. Bird Hazing at Oil Spills in California in 2004 and 2005. Proc. 22nd Vertebrate Pest Conf. (R.M. Timm and J. M. O'Brien, Eds.) Published at Univ. of Calif., Davis. Pp. 206-211.

Gray, Michelle, 2004. Cooperative Mitigation of Wildlife Attractants Between an Air Force Base and the Local Community. Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 302-305.

Hadidian, John, 2002. Resolving Conflicts between People and Canada Geese: The Need for Comprehensive Management Approaches. Proc. 20th Vertebrate Pest Conf. (R.M. Timm and R. H. Schmidt, Eds.) Published at Univ. of Calif., Davis. Pp. 175-179.

Hall, Thomas C., P. Groninger, 2002. The Effectiveness of a Long-Term Canada Geese Relocation Program in Nevada. Proc. 20th Vertebrate Pest Conf. (R.M. Timm and R. H. Schmidt, Eds.) Published at Univ. of Calif., Davis. Pp. 180-186.

Martin, Lee R., S. Hagar, 1990. Bird Control on Containment Pond Sites. Proc. 14th Vertebrate Pest Conf. (L.R. Davis and R.E. Marsh, Eds.) Published at Univ. of Calif., Davis. Pp. 307-310.

Martin, Lee R., L.M. Martin, M.R. Taber, 1998. Containment Basins and Bird Exclusion-A Historical Perspective. Proc. 18th Vertebrate Pest Conf. (R.O. Baker & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 61-66.

McLean, Robert G., 2006. West Nile Virus in North American Wildlife. Proc. 22nd Vertebrate Pest Conf. (R.M. Timm and J. M. O'Brien, Eds.) Published at Univ. of Calif., Davis. Pp. 311-317.

Pochop, Patricia A., R.J. Johnson, D.A. Agüero, K.M. Eskridge, 1990. The Status of Lines in Bird Damage Control-A Review. Proc. 14th Vertebrate Pest Conf. (L.R. Davis and R.E. Marsh, Eds.) Published at Univ. of Calif., Davis. Pp. 317-324.

Sanborn, Wendy A., R.H. Schmidt, H.C. Freeman, 1994. Policy Considerations for Contraception in Wildlife Management. Proc. 16th Vertebrate Pest Conf. (W.S. Halverson & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 311-316.

Seamans, Thomas W., G.E. Bernhardt, 2004. Response of Canada Geese to a Dead Goose Effigy. Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 104-106.

- Smith, Arthur E., S.R. Craven, 1998. A Techniques Manual and Video for the Management of Problem Urban Canada Geese. Proc. 18th Vertebrate Pest Conf. (R.O. Baker & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 313-314.
- Smith Mike A., 2004a. Capturing Problematic Urban Canada Geese in Reno, Nevada: Goose Roundups vs. Use of Alpha-Chloralose. Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 97-100.
- Smith, Mike A., 2004b. Capturing Nuisance Urban Canada Geese Using the Bird Immobilizing Agent Alpha-Chloralose in Reno, Nevada: What We Learned. Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 101-103.
- Sterner, Ray T., K.L. Tope, 2002. Repellents: Projection of Direct Benefit-Cost Surfaces. Proc. 20th Vertebrate Pest Conf. (R.M. Timm and R. H. Schmidt, Eds.) Published at Univ. of Calif., Davis. Pp. 319-325.
- Tobin, Mark E., 2002. Developing Methods to Manage Conflicts between Humans and Birds- Three Decades of Change at the USDA National Wildlife Research Center. Proc. 20th Vertebrate Pest Conf. (R.M. Timm and R. H. Schmidt, Eds.) Published at Univ. of Calif., Davis. Pp. 91-96.
- VerCauteren, Kurt C., D.R. Marks, 2002. Feasibility of Administering an Oral Reproductive Inhibitor to Resident Canada Geese. Proc. 20th Vertebrate Pest Conf. (R.M. Timm and R. H. Schmidt, Eds.) Published at Univ. of Calif., Davis. Pp. 187-193.
- Vogt, Peter F., 1994. ReJeX-IT AG-36 As Bird Aversion Agent for Turf And Agriculture. Proc. 16th Vertebrate Pest Conf. (W.S. Halverson & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 275-278.
- Wenning, Krista M., M.J. Begier, R.A. Dolbeer, 2004. Wildlife Hazard Management at Airports: Fifteen Years of Growth and Progress for Wildlife Services. Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 295-301.
- Woodruff, Roger A., J. Sheler, K. McAllister, D.M. Harris, M.A. Linnell, K.L. Price, 2004. Resolving Urban Canada Goose Problems in Puget Sound, Washington: a Coalition-Based Approach. Proc. 21st Vertebrate Pest Conf. (R.M. Timm and W.P. Gorenzel, Eds.) Published at Univ. of Calif., Davis. Pp. 107-112.
- Woronecki, Paul P, R.A. Dolbeer, T.W. Seamans, 1990. Use of Alpha-Chloralose to Remove Waterfowl from Nuisance and Damage Situations. Proc. 14th Vertebrate Pest Conf. (L.R. Davis and R.E. Marsh, Eds.) Published at Univ. of Calif., Davis. Pp. 343-349.
- Woronecki, Paul P., R.A. Dolbeer, T.W. Seamans, W.R. Lance, 1992. Alpha-Chloralose Efficacy in Capturing Nuisance Waterfowl and Pigeons and Current Status of FDA Registration. Proc. 15th Vertebrate Pest Conf. (J.E. Borrecco & R.E. Marsh, Eds.) Published at Univ. of Calif., Davis. Pp. 72-78.
- Woronecki, Paul P., R.D. Dolbeer, 1994. Alpha-Chloralose: Current Status, Restrictions and Future Uses for Capturing Birds. Proc. 16th Vertebrate Pest Conf. (W.S. Halverson & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. Pp. 255-258.

Yoder, ChristiA., L.A. Miller, 2006. Avian Contraception Tools: One Size Does Not Fit All. Proc. 22nd Vertebrate Pest Conf. (R.M. Timm and J. M. O'Brien, Eds.) Published at Univ. of Calif., Davis. Pp. 110-115.