

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

2 - Second Eastern Wildlife Damage Control  
Conference (1985)

Eastern Wildlife Damage Control Conferences

---

September 1985

## UTILIZING A COMPUTERIZED FISH AND WILDLIFE INFORMATION SYSTEM TO SOLVE ANIMAL DAMAGE CONTROL PROBLEMS

Jefferson L. Waldon

*Multi-State Fish and Wildlife Information Project, Blacksburg, Va.*

Charles T. Cushwa

*Multi-State Fish and Wildlife Information Project, Blacksburg, Va.*

Peter T. Bromley

*Virginia Polytechnic Institute and State University, Blacksburg, Va.*

Follow this and additional works at: <https://digitalcommons.unl.edu/ewdcc2>



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

---

Waldon, Jefferson L.; Cushwa, Charles T.; and Bromley, Peter T., "UTILIZING A COMPUTERIZED FISH AND WILDLIFE INFORMATION SYSTEM TO SOLVE ANIMAL DAMAGE CONTROL PROBLEMS" (1985). 2 - *Second Eastern Wildlife Damage Control Conference (1985)*. 46.  
<https://digitalcommons.unl.edu/ewdcc2/46>

This Article is brought to you for free and open access by the Eastern Wildlife Damage Control Conferences at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in 2 - Second Eastern Wildlife Damage Control Conference (1985) by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

UTILIZING A COMPUTERIZED FISH AND WILDLIFE INFORMATION  
SYSTEM TO SOLVE ANIMAL DAMAGE CONTROL PROBLEMS

by Jefferson L. Waldon,<sup>1</sup>  
Charles T. Cushwa,<sup>2</sup>  
and Peter T. Bromley<sup>3</sup>

INTRODUCTION

Animal damage control professionals are faced with the monumental task of absorbing an enormous amount of literature about animal species. For example, one person cannot become an expert on all facets of dozens of species, much less the 1000 or more fish, reptiles, amphibians, mammals, and birds that fall under the wildlifer's jurisdiction. An important new aid to the wildlife damage control specialist is the computerized fish and wildlife information system (CFWIS). A CFWIS is a tool for systematically compiling and managing information about animal species which reside in a state. Cushwa and Kopf (1984) summarized the development of state CFWISs from the 1970's through 1984. At present 11 states are implementing a CFWIS using a variety of hardware and software. Categories of information in CFWISs generally follow the "Procedures" system (Mason et al. 1979). Currently,

Virginia, Colorado, Missouri and Pennsylvania have working Procedures-type CFWISs. Illinois, Kentucky, Tennessee, and Wyoming are in the implementation stage, and decisions are pending in many other states.

As more states implement a CFWIS, new applications of the systems are being identified and evaluated. The objectives of this paper are to demonstrate the use of a CFWIS to animal damage control professionals and to solicit ways to increase the usefulness of these systems to animal damage control programs.

A CFWIS as implemented in Virginia contains 190 categories of information on each of 978 species. It can be used in the following general types of animal damage control problems:

1. Species list within a geographic area, i. e. county, habitat, type or watershed.
2. Direct management of a problem species or its habitat.
3. Indirect management or biological control
  - a. competitor, predator, parasite, or disease

<sup>1</sup> Research Specialist, Multi-State Fish and Wildlife Information Project, Blacksburg, Va. 24061

<sup>2</sup> Senior Research Associate, Multi-State Fish and Wildlife Information Systems Project, Blacksburg, Va. 24061

<sup>3</sup> Associate Professor, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061

- b. habitat of competitor, predator, parasite, or disease

Other types of information in a CFWIS that may be of use to animal damage control professionals include legal status of the animals in question, beneficial and adverse management practices, life history, environmental associations, and information on the effects control efforts will likely have on non-target species.

#### APPLICATIONS

The following hypothetical animal damage control problem has been addressed using the CFWIS of the Virginia Commission of Game and Inland Fisheries. Virginia's system is not expressly designed for animal damage problems, but information required in animal damage control is generally the same biology, ecology, and habitat information required by any other aspect of the complex operations within wildlife management. Consequently, animal damage problems can be addressed by the Virginia system.

#### Problem -

A rice farmer in Chesapeake County, Virginia has lodged a complaint about grackles in his rice fields. The farmer wants to know the best way to reduce the damage.

1. Access the system and find what species of animals are potentially associated with rice fields (search for species associated with shallow inland non-forested wetlands in Chesapeake County)?

-Result: 47 SPECIES (see Appendix A)

These 47 species comprise the animal community that the manager must be aware of. One of the most useful aspects of a CFWIS to the animal damage control professional is its ability to identify non-target species that may be affected by various management actions. This first list is a starting point for the rest of the analysis.

2. What is the status of these (47) species?

- 4 Unclassified
- 5 Sensitive
- 12 Pest/Crops
- 8 Nongame-Protected
- 23 Game [consumptive]
- 2 Furbearer
- 39 Federal migratory
- 3 Commercial
- 2 Biological indicator

The manager now has a list of the animal species that may ultimately be affected by management actions in the rice fields. None of the 47 animals associated with these habitat types are classified as federally threatened or endangered species, but five species are classified as sensitive and should be given special consideration when a final management plan is prepared. Forty-two federal migratory species are potentially associated with this habitat type. These animals are protected by federal law, and special care should be taken concerning them as well.

3. Of these 47 species in Chesapeake County, which species are known to eat rice?

-Result: 16 SPECIES (see Appendix B)

These 16 species are known to eat rice. They may be dependent on rice as a food source, or they may be causing additional damage to the rice fields, or both.

The species doing the damage has already been identified as the common grackle. Since this is the target species, any information the manager could obtain about this species would be helpful.

4. What environmental, ecological, or life history information is available for the common grackle?

LIFESTAGE= General;

22 environmental associations (with plants, wetlands, point habitat types, etc...)

Comments on Environmental Associations -

Breeding, nesting, roosting, and foraging information.

MANAGEMENT= Beneficial;

9 beneficial management practices

4 adverse management practices

Comments on Management Practices -

Includes comments on land conversion and other man-made disturbances.

Life History -

Includes origin, physical description, reproduction, be-

havior, and aquatic/terrestrial associations.

The common grackle normally gathers in large communal flocks in the fall along with cowbirds, redwing blackbirds, and starlings. Because of this, direct control may be efficient, but non-target birds will also be affected. The data base does list "draining wetlands" as an adverse management practice for grackles. Consequently, draining and harvesting the fields before the birds congregate may be the best solution if agriculturally feasible. Avicides, wetting agents, and dispersal are not specifically mentioned in the management practices. The manager at this point must realize that there are no pesticides registered for use against blackbird damage in wetlands so the cultural methods of control may be the only management alternative aside from scare tactics (Dolbeer 1983).

5. Which of the 47 species would be affected adversely by pesticide application in this habitat type in Chesapeake County if an avicide does become available?

-Result: 27 SPECIES (see Appendix C)

This particular type of information may be helpful in heading off problems with non-target species in a case where pesticide applications are a viable solution to the problem.

6. What is the status of these species?

2 Unclassified  
4 Sensitive  
1 Pest/Crops  
6 Nongame-Protected  
18 Game [consumptive]  
23 Federal migratory  
1 Commercial  
2 Biological indicator

If for instance, the manager anticipated problems with a particular non-target species, information could be called up on that species for the purpose of planning mitigation or altering the management recommendations. The river otter was identified as a sensitive species and is used in this example:

7. What information is available specifically on the river otter?<sup>4</sup>

NAME = Otter, river;

Comments on occurrence = "Rare or disappeared from most parts of VA by early 1900's, reoccupied many areas east of Blue Ridge after 1940's, but remains nearly extirpated west of the Blue Ridge; headed for extirpation by excessive fur harvest, stream pollution \*154\*<sup>5</sup>";

Comments on status = Scarce where waters polluted, residues of pesticides, including Hg,

DDT, and metabolites, mirex reported from tissues, highly susceptible to overharvest as travel extensively in restricted avenues of waterways \*57\*;

HARVEST;

ANNUAL. HARV = 1-10;

ANNUAL. HARV. FIP =  
Chesapeake;

LAND. USE = Forest land;

LAND. USE = Deciduous forest  
land;

LAND. USE = Evergreen forest  
land;

LAND. USE = Mixed forest  
land;

LAND. USE = Water;

LAND. USE = Streams and  
canals;

LAND. USE = Lakes;

LAND. USE = Reservoirs;

LAND. USE = Bays and  
estuaries;

LAND. USE = Wetland;

LAND. USE = Forested  
wetland;

---

<sup>4</sup> The information on the river otter is formatted very similarly to the actual output of the CFWIS.

<sup>5</sup> The numbers in asterisks are reference numbers for the preceding line of information.

LAND.USE = Nonforested  
wetland;

Comments on food habits =  
"9999S=not a significant predator of muskrat \*154\*; birds occasionally, usually carrion; boon to fishermen: prey primarily on non-game fish -- especially slow moving fish, bottom dwelling/'rough' fish, secondarily on fish in abundance/large schools \*154,57,133\*; insects: mostly large aquatic \*154,57\*; high metabolic rate, efficient digestive system \*57\*; crayfish important in diet \*154,57,133\*";

Comments on environmental associations = "00020S=may travel on ice in winter or swim long distances under it \*154,57\*; 00040S=absent in waters altered by acidic mine drainage \*57\*; water quality in general: 'little work done on identifying range of water quality tolerated' \*57\*; 00060S=otter habitat destruction from increased siltation \*57\*; 00170S=need stretches of water with flow swift enough to remain open in winter \*154\*; 00300S=from marine environment to high mountain lakes; more abundant in food-rich coastal areas/lower parts of streams, rivers \*57\*; 00410S=drift piles, logjams \*57\*; 00540S=among tree roots \*154\*; 00900S=occasionally use duck blinds, abandoned boat houses \*57\*";

MANAGEMENT = Beneficial;

Regulating harvest of species being described;

Maintaining wilderness environment;

Developing/maintaining stream bank vegetation;

Maintaining/protecting riparian habitats;

Stocking captive-reared wild-strain animals;

Restricting/regulating human use of habitats;

Maintaining undisturbed/undeveloped areas;

Maintaining unique or special habitat features [wetlands, caves, etc.];

Developing/maintaining water holes, ponds, potholes, etc.;

Maintaining dead/downed woody materials;

Developing/maintaining submerged brush, timber, debris, etc.;

Maintaining large trees for denning, nesting, or roosting;

Developing/maintaining suitable pH;

Developing/maintaining brackish marsh;

Developing/maintaining saline marsh;

Developing/maintaining freshwater marsh;

Developing/maintaining/protecting wetlands;

Controlling sedimentation;

Controlling pollution  
[thermal, chemical, physical];

Segregating and treating  
toxic materials;

Excluding livestock from  
banks and water;

MANAGEMENT = Adverse;

Applying herbicides;

Applying pesticides;

Applying insecticides;

Applying fertilizers;

Other management practices  
[specified in comments];

Draining wetlands, marshes,  
ponds, lakes;

Construction of navigational  
improvements [dams,  
locks, etc.];

Constructing/maintaining  
bulkheads, seawalls, and  
dikes;

Dredging;

Underwater explosions;

Underwater mining;

Surface mining;

Clean farming;

MANAGEMENT = Existing;

Regulating harvest of species  
being described;

Comments on Management Practices - "999(B)=much research needed \*154,57\*; first priority-review status east of Blue Ridge; trapping season

should be earlier-when extends to Feb. 28, overlaps birth, mating seasons-wipe out 3 generations when capture mated female with litter in den; educate fishermen, pond owners about food habits, value of otter; remove and relocate from fish hatcheries, areas where unwanted, polluted waters \*154\*; 999(A)=industrial pollution, intensive recreational development, urban or agrarian development, creation of suburban residential areas \*132,45,90,57\*";

The next step in the analysis was to address the effects on the food chain in the animal community if grackles are removed. This information can be used to identify potential biological control methods and also to identify which species use grackles for a food base.

8. What species prey on grackles, and what management practices may be used to enhance the predators' habitat?

-Result: 4 SPECIES

Hawk, red-shouldered;

MANAGEMENT= Beneficial;

Maintaining/protecting  
riparian habitats;

Developing/maintaining/  
protecting wetlands;

Other management practices  
[specified in comments];

MANAGEMENT= Adverse;

Draining wetlands,  
marshes, ponds, lakes;

Comments on Management Practices - 999 (B) = intense research needs to be conducted to determine reasons for population declines, this sharp drop cannot be attributed to pesticide use since the major part of their diet (rodents) are relatively free of pesticide contamination \*693\*;

Owl, common barn;

MANAGEMENT= Beneficial;

Restricting/regulating human use of habitats;

Restricting/regulating human disturbance of populations;

Maintaining unique or special habitat features [wetlands,

caves, etc.];

Creating/maintaining snags;

Providing artificial nesting/spawning sites;

Maintaining overmature forests;

MANAGEMENT= Adverse;

Applying pesticides;

Timber harvesting - clearcutting;

Timber harvesting - selection cuts;

Timber harvesting - shelterwood cuts;

Timber harvesting - seed tree cuts;

Clean farming;

Comments on Management Practices - "999(B)=need to identify habitat requirements for nesting, roosting and feeding and then inventory such habitats in area being managed \*459\*; pesticides and rodenticides should be used cautiously \*459\*; maintain special habitats = cavities and snags for nesting/roosting \*459\*; provide artificial nest sites where natural sites are not available \*459\*; 999(A)=industrial pollution, intensive agricultural practices \*511, 528\*";

Owl, short-eared;

MANAGEMENT= Beneficial;

Using flushing devices on mowers;

Maintaining early stages of ecological succession;

MANAGEMENT= Adverse;

Maintaining natural ecological succession;

Other management practices [specified in comments];

MANAGEMENT= Existing;

Other management practices [specified in comments];

Comments on Management Practices - 999(A+E)=where owls are a nuisance mowing and agricultural practices should be minimized to reduce number of prey species \*3831\*;

One of the goals of a computerized fish and wildlife system is low user cost and speed. The following is a breakdown of search costs and the time re-



quired to complete this analysis.

#### 9. Cost summary.

Operator -  
21 minutes \* \$7.30/hr = \$2.19  
Computer costs = \$6.06  
TOTAL = \$8.25

#### DISCUSSION

The Virginia CFWIS is still very much in the development stage and there are some obvious holes in the data. For example, cowbirds and red-winged blackbirds never show up in the analysis, but they do appear in the life history of the common grackle. The animal damage control professional may be required to recognize and assimilate some types of information that are not included in the CFWIS. An example would be the application of pesticides; the system does not include detailed information on licensing and available control measures for the various pest species. Also, an on-site investigation should always be conducted by the wildlife professional to determine whether the species of concern are actually in the area.

The manager must rely on common sense and his own experience to interpret the results of a CFWIS analysis. The system is not designed to make decisions. It is designed to provide pertinent information in a timely manner. A good analogy would be a complete university and agency library combined in a small box on the managers desk that can instantly access any reference in the library given some environmental or taxonomic criteria. A weak point of the system is that it requires experienced managers to interpret results. The strong point of the system is its ability to provide the manager with an expanded and technically docu-

mented information base to make better informed decisions.

#### CONCLUSION

A computerized fish and wildlife information system is a powerful tool that can enable the wildlife professional to quickly and cheaply obtain large amounts of pertinent fish and wildlife data for a number of different applications. Although specific information on animal damage control problems is not currently included in the Virginia CFWIS, a state may decide to include things like information on certain pesticides or unusual damage control techniques. The systems have the capability to absorb and manipulate information on those subjects as easily as life history or environmental associations .

The rice example is the sort of problem that animal damage control professionals face each day. In addition to calling up information on current conditions in the management area, the user can ask "what if" type questions concerning potential habitat changes, management practices, and effects on non-target species. Information found by a search of the CFWIS is in a condensed format, but still requires a professional to assimilate and organize it into a workable management plan; consequently specific management recommendations are not included in this work.

Perhaps the most powerful aspect of a CFWIS is its ability to grow and become more useful over time. The Virginia CFWIS that was used for the previous examples, is still under development. New information is constantly being entered and old information updated as research results become available. In 5-10 years, with continuing additions and improvement, this CFWIS will be

a major source of fish and wildlife information, and we predict it will be indispensable to the wildlife professional in the 21st century.

#### LITERATURE CITED

- Cushwa, C.T. and V.E. Kopf. 1984. Computerized Fish and Wildlife Information Systems. MSFWIS-P VPI&SU, Blacksburg, Virginia. Special Report #6, 33 pp.
- Dolbeer, Richard A. 1983. Blackbirds. IN Prevention and Control of Wildlife Damage, Robert M. Timm ed. Great Plains Agricultural Council Wildlife Resources Committee and Cooperative Extension Service University of Nebraska - Lincoln, E7-E21.
- Mason, W.T., Jr., C.T. Cushwa, L.J. Salaski, and D.N. Gladwin. 1979. A procedure for describing instructions for PA USDI FWS/OBS 79/19 Wash. D.C. 21 pp. + 19 appendices.
- APPENDIX A - List of species found in Chesapeake County Virginia that are potentially associated with rice fields.
- Anhinga;  
Bittern, least;  
Bullfrog;  
Canvasback;  
Crow, American;  
Dove, mourning;  
Dowitcher, long-billed;  
Duck, American black;
- Duck, ring-necked;  
Egret, great;  
Frog, little grass;  
Gadwall;  
Goose, Canada;  
Goose, greater snow;  
Goose, lesser snow;  
Grackle, common;  
Heron, tricolored;  
Ibis, glossy;  
Ibis, white;  
Knot, red;  
Mallard;  
Merganser, common;  
Merganser, hooded;  
Mouse, cotton;  
Muskrat, large-toothed;  
Otter, river;  
Owl, short-eared;  
Pheasant, ring-necked;  
Pintail, northern;  
Rail, king;  
Rail, Virginia;  
Rat, marsh rice;  
Redhead;  
Sanderling;  
Sandpiper, least;  
Sandpiper, spotted;  
Sandpiper, western;  
Scaup, lesser;  
Shoveler, northern;  
Skimmer, black;  
Snipe, common;  
Teal, blue-winged;  
Teal, green-winged;  
Tern, common;  
Weasel, long-tailed;  
Wigeon, American;  
Willet, eastern;

APPENDIX B - List of species out of the 47 identified in the animal community that are known to eat rice.

Bullfrog;<sup>6</sup>  
Crow, American;

---

<sup>6</sup> References for the bullfrog's food habits are available upon request.

Dove, mourning;  
Duck, ring-necked;  
Goose, greater snow;  
Goose, lesser snow;  
Grackle, common;  
Mallard;  
Muskrat, large-toothed;  
Pheasant, ring-necked;  
Pintail, northern;  
Rail, king;  
Redhead;  
Scaup, lesser;  
Teal, green-winged;  
Willet, eastern;

APPENDIX C - List of species out of  
the 47 identified in the animal  
community that would be adversely  
affected by avicide application.

Anhinga;  
Bullfrog;  
Canvasback;

Crow, American;  
Duck, American black;  
Duck, ring-necked;  
Gadwall;  
Goose, Canada;  
Ibis, glossy;  
Ibis, white;  
Merganser, common;  
Merganser, hooded;  
Otter, river;  
Pheasant, ring-necked;  
Pintail, northern;  
Rail, king;  
Rail, Virginia;  
Rat, marsh rice;  
Redhead;  
Sandpiper, least;  
Sandpiper, spotted;  
Scaup, lesser;  
Shoveler, northern;  
Snipe, common;  
Teal, blue-winged;  
Teal, green-winged;  
Wigeon, American;