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STATE FUNDED WILDLIFE DAMAGE PROGRAMS: THE WISCONSIN EXPERIENCE

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by Scott E. Hygnstrom[#] and Scott R. Craven

INTRODUCTION

Wisconsin has a long tradition of involvement with wildlife damage and wildlife damage programs. It is one of less than a dozen states that presently has a program for wildlife damage. From 1931 to 1980, Wisconsin paid landowners for damage to crops caused by wildlife. Now the focus of Wisconsin's wildlife damage program is on damage control and prevention through appropriate abatement techniques and wildlife population control. This paper will detail Wisconsin's experience with these approaches and will offer insight into improving state funded wildlife damage programs.

Wisconsin is an agricultural state, with nearly half of its 14.5 million ha under agricultural production (Fig. 1). It is also rich in wildlife resources. Growing populations of white-tailed deer (Odocoileus virginianus), Canada geese (Branta canadensis) and sandhill cranes (Grus canadensis) provide abundant recreational and esthetic opportunities but Wisconsin also must contend with the increasing incidence and severity of crop damage caused by these species and others (Table 1). White-tailed deer are the most serious threat to Wisconsin agriculture. Therefore, most examples in this paper will pertain to deer. In 1981, a survey of Wisconsin farmers suggested that annual deer damage was in excess of $15 million (Craven 1981). In 1984, after a dramatic increase in the deer herd a similar survey estimated annual deer damage losses at $36.7 million (Wisconsin Department of Agriculture Trade and Consumer Protection 1984). Farmers became less tolerant of deer damage and pressured the Wisconsin Department of Natural Resources (WDNR) for a review of herd management policies.

This conflict between state-owned resources and privately-owned property is complex. It polarizes special interest groups: farmers vs. sportsmen, farmer organizations vs. resource management agencies. Further, wildlife damage may be a major obstacle to wildlife management on private lands. Wildlife damage should be viewed as a disincentive to landowners and steps should be taken to minimize its impact. Ultimately, state and federal legislators must address this issue to bring about conditions that are equitable to all those involved.

THE PAST: WISCONSIN'S WILDLIFE DAMAGE CLAIMS PROGRAM (1931-1980)

From 1931 to 1980, the WDNR administered a compensation program to pay landowners for damage to commercial crops and trees caused by deer or bear. Sandhill cranes and waterfowl were included in the program coverage in the 1960s. Damage to private gardens, ornamental vegetation or vehicles involved in collisions were not eligible for payment. Other stipulations required that landowners: 1) file damage claims with the WDNR within specified time limits, 2) could not post their land, and 3) allow public hunting on all their land.

Damage assessment was conducted by WDNR game wardens, wildlife managers and other agency personnel. Compensation initially consisted of 80% of the total damage assessment but in the last 10 years of the program, compensation reverted to a prorated payment of damages based upon available funds. Some $2 million were paid out during the 50 year duration of the program. Payments were made with money generated by hunting and fishing license sales. Most of the claims were for deer damage to corn but most of the money was spent on claims for

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damage to vegetable crops (Table 2).

There were many problems associated with this compensation program. Administrative costs nearly equalled claim payments, because of time-consuming and costly damage assessments and excessive paperwork. There was considerable disagreement between the WDNR and claimants concerning the extent of damage, damage assessment techniques, eligibility requirements, and deer herd management. These and other factors led to public relations problems for the WDNR. In addition, payments were made year after year to a relatively small number of farmers. The general dissatisfaction with the compensation program led to the State Legislature's creation of a Wildlife Damage Study Committee (WDSC) in 1979. The WDSC made recommendations to the legislature on alternatives to the compensation program. The compensation program was terminated on 30 June 1980.

The WDSC ultimately recommended that Wisconsin begin a new wildlife damage program, based on damage control and prevention rather than compensation. In 1982, the Natural Resources Board (governing body of the WDNR) appointed a 10-member Hunter-Landowner Council (HLC) to address the problem of strained hunter-landowner relationships in Wisconsin. The HLC was composed of farmers, landowners, sportsmen and wildlife organization representatives, WDNR and Soil Conservation Service (SCS) personnel and state legislators. They developed a list of 32 recommendations that dealt with private lands management, landowner incentives, fee hunting, trespass and liability, hunter education and incentives, deer herd management, wildlife damage and interagency cooperation. These recommendations were directed to the WDNR, NRB, and State Legislature. A key HLC recommendation identified the role of wildlife damage in hunter-landowner relations and urged adoption of a comprehensive and fair state program which would address wildlife damage.

THE PRESENT: WISCONSIN'S WILDLIFE DAMAGE ABATEMENT AND CLAIMS PROGRAM (WDACP)

In 1983, in response to pressure from the agricultural community and the HLC recommendations, the legislature passed new legislation creating Wisconsin's WDACP. The focus of this program is on damage abatement--the reduction of damage to a tolerable level through cost effective techniques such as cultural modification, fencing, repellents, scare devices and wildlife population control. Where abatement is impractical or ineffective, compensation is authorized if funds are available. Under the new program, only damage caused by deer, bear or geese to crops on agricultural land, orchard and Christmas trees, nursery stock, apiaries and livestock are eligible. These species and crops were selected because of the extent of damage, public pressure, and tradition.

The new program is organized around county administration and participation is optional. The WDNR is responsible for regulating the program, which involves recordkeeping and accounting, county plan review and technical assistance. Counties that choose to participate must pass a county resolution to that effect and submit a plan of administration to the WDNR. Usually counties administer the program through committees such as the county Land Conservation Committee (LCC). These committees either appoint on-staff personnel or hire technicians to handle damage complaints. These technicians respond to all calls, conduct damage assessment, prescribe appropriate abatement measures, and maintain records.

Counties in Wisconsin have a reputation for operating programs efficiently. The Legislature concluded that administrative costs would be minimized and control of the program would be on a local level if counties were authorized to administer the program.

The costs of county-approved abatement practices are split 50:50 between the WDNR and the landowner. In reality, the proportion of the costs assumed by the landowner varies from 50:50

with the recommended technique. The WDNR reimburses participating counties for the cost of materials for abatement measures. Landowners receive the abatement materials from their county and must pay labor costs for the construction and maintenance of the abatement measures. Most counties require a 20-year maintenance agreement for high tensile electric fencing. The early financial history of the WDACP is summarized in Table 3.

If abatement measures are inappropriate or ineffective, landowners may be eligible for damage compensation. The WDNR may pay a maximum of $5,000 for each claim. There is a $500 deductible on all damage claims. The deductible was based on a general and apparent tolerance for damage less than $500 revealed by the 1981 and 1984 wildlife damage surveys. Additional conditions include: 1) land for which abatement assistance and damage claims are sought must be within a county that is participating in the WDACP, 2) landowners must file a complaint with the county within 14 days of the initiation of damage and must notify the county not less than 10 days prior to harvest for damage assessment, 3) landowners must follow county recommendations regarding abatement measures, 4) landowners must allow some hunting (up to 2 hunters/16 hectares (40 acres) of huntable land/day) on the land where damage occurred or contiguous land under the same ownership during appropriate hunting seasons (counties define huntable land), 5) crops must be managed and harvested in accordance with normal agricultural practices (counties define normal agricultural practices), and 6) all lands shall have been in cultivation or an approved Agricultural Stabilization and Conservation Service (ASCS) set-aside program for at least 5 years prior to the application. If a claim for damage compensation is made, noncompliance with abatement recommendations or other provisions increases the deductible limit to $2,000.

The original program budget of $486,500 for the 1983-85 biennium came from hunting and fishing license revenues. The funding level was based, somewhat arbitrarily, on the 1979-1980 claims program expenditures. In 1983, a $1 surcharge on all hunting licenses was proposed to generate sufficient revenues to fund the program. This surcharge was expected to generate approximately $1 million. The proposal was not adopted and the initial program was inadequately funded. In 1983-1984, funds covered administrative and abatement costs but were insufficient to pay damage claims. The legislature, NRB and WDNR received considerable comment from landowners and landowner organizations, such as the recently formed Farmers for Appropriate Resource Management (FARM), regarding deer damage and the funding level of the 1983-1984 WDACP. In 1985, in partial response to public pressure, the legislature included the WDACP and the $1 surcharge in the 1985-1987 biennial budget. Surcharge revenues were to be divided between the WDACP and private lands wildlife management.

Wildlife species other than deer, bear and geese cause damage to crops in Wisconsin but they are not covered under the present program. There have been attempts to include species such as raccoon (Procyon lotor) and beaver (Castor canadensis), but they have not gained legislative support. Compensation for damage caused by endangered wildlife species can be obtained from the WDNR through a 3% appropriation of Wisconsin's wildlife tax check-off, the "Endangered Resources Fund." Other claims (i.e., other species) can be filed before the Wisconsin State Claims Board. However, the Claims Board has not been sympathetic because of the availability of the WDACP.

It is difficult to measure the success of a wildlife damage program but there are a few indicators that tell how well a program is operating. In 1983, 18 of Wisconsin's 72 counties participated in the WDACP (Fig. 2). Many counties chose to not enroll the first year, but rather took a "wait-and-see" position. In 1984, 17 of the 18 original counties and

an additional 14 counties enrolled in the program (Fig. 3). It is anticipated that enrollment will level off at 40 to 50 counties by the late 1980s, based upon current satisfaction and demand for crop damage assistance.

We surveyed the 18 counties that participated in the 1983-1984 program to determine the effectiveness of abatement techniques, the efficiency of the program and to solicit their suggestions on how the program might be improved. All 18 counties returned the survey. Most were completed by the county abatement technicians and reviewed by the administrative committees.

Twenty-one high tensile electric fences were constructed at an average cost of $0.82 per foot (range: $0.43-1.57). Satisfaction was rated as good to very good for all fencing designs (vertical, slanted and offset). Seventeen low-profile fences (peanut butter fence, Glowgard and Visible Grazing Systems) were installed at an average price of $0.18 per foot (range: $0.10-0.30). Satisfaction ranged from fair to very good. Six repellents were used in 98 applications to protect many different crops. In general, satisfaction was lower with repellents than fences. For example, Hinder rated poor to fair in 49 applications while tankage rated poor to good in 38 applications. Thirty-eight propane exploders were issued to farmers to control deer damage in field crops. Their effectiveness was rated poor, primarily because deer only responded to the exploders for 1-2 weeks.

The most frequent problems experienced by counties included: 1) a lack of training in assessing damage and prescribing abatement measures, 2) a lack of abatement techniques suited for field crops, and 3) excessive paperwork. Most recommendations made by counties dealt with financial problems they had experienced. They called on the WDNR to fund abatement and claims and to increase the money advanced to counties from 25% of the estimated annual cost to 33%. Many counties called for increased cooperation from the WDNR to identify areas with severe damage problems. To further implement this, the Wisconsin Land Conservation Association (WLCA) (a state organization for county LCCs and state and federal soil conservation employees) adopted a resolution that directed county staff to meet with WDNR managers to identify "hot spot" areas. This action was accepted by the WDNR and conferences were held to evaluate local overwinter deer population goals and harvest recommendations.

THE PRESENT: UNIVERSITY OF WISCONSIN-EXTENSION'S (UWEX) ROLE

In 1983, the HLC recommended that UWEX assist the WDNR in providing information to the public and conducting research on the wildlife damage program. In addition to the county satisfaction survey, UWEX has 1) conducted training sessions on the WDACP, abatement measures and damage assessment techniques for county and WDNR employees and landowners, 2) presented information at county board and LCC meetings on the mechanics of the WDACP, 3) presented information on the WDACP at numerous farm organizations, UWEX, WDNR and other public meetings, 4) developed deer fencing demonstration areas at Agricultural Experiment Farms throughout Wisconsin, and 5) conducted research abatement techniques and landowner attitudes towards deer and deer damage.

UWEX conducted two surveys of Wisconsin farmers (Craven 1981, Wisconsin Department of Agriculture Trade and Consumer Protection 1984) to 1) determine the extent and distribution of deer damage in Wisconsin, 2) evaluate farmers' attitudes towards deer damage (tolerance) and deer populations in general, and 3) evaluate the success of various abatement techniques used in Wisconsin. The surveys were conducted with mail questionnaires similar to those used by Brown et al. (1978). The response rate between years was similar; 1736 (60%) and 1676 (56%) of the farmers responded in 1981 and 1984 respectively.

Corn was the most frequently damaged crop (42% in 1981, 55% in 1984), fol-

lowed by hay, oats, apples and soybeans. The 1984 survey indicated a total of $36.7 million in damage occurred to Wisconsin crops from October 1983 to September 1984. This is a substantial figure, however, it represents only about 1.4% of the total value of crops ($2.5 billion) raised in Wisconsin during 1983.

The perception of the level of damage and attitudes toward damage as related to dollar value varied greatly (Tables 4, 5). Some respondents termed damage of $100-500 as "none" while others termed damage of $0-100 as "severe." However, in general the perceptions grouped rather well. The majority of farmers reporting $100 or less in damage perceived that damage as light and only 2% felt it was unreasonable. At the $100-500 level, 52% felt the damage was still light and in terms of attitude, 84% reported it as negligible or tolerable. At the $500-1000 level, 70% rated the damage as moderate to substantial but only 41% felt it was unreasonable. At the $1000-5000 level, most farmers rated the damage as moderate to severe and 60% felt it was unreasonable.

Despite the risk of damage, most farmers welcome deer on their land (Table 6). In 1981, a full 75% stated that they enjoyed having deer on their land, but in 1984 that figure dropped to 56%. There was an associated rise in the percentage of farmers who enjoyed a few deer but worried about crop damage (14 to 31%) and felt deer were a nuisance (4 to 7%). During the same period there was a substantial increase in the deer herd throughout most of the state. Farmer tolerance toward deer seemed to decrease as local deer populations increased. This was especially apparent in central and southwestern Wisconsin where deer herds have exceeded 24 deer per square km (60 deer per square mi). Of the responding farmers in these areas, 54% preferred a decrease in their local deer populations.

Response to damage control questions suggested that little was being done to control deer damage. Only about 3% of the farmers employed any control measures, other than shooting deer. Electric fencing was cited most often, followed by repellents and woven-wire fencing.

THE PRESENT: DEER HERD MANAGEMENT IN WISCONSIN

The majority of crop damage in Wisconsin is caused by white-tailed deer. Farmers strongly believe that fewer deer would mean less deer damage. However, we recognize that local trouble spots may be unaffected by overall herd reduction.

The WDNR uses a management unit (MU) system to maintain local control of harvests and make habitat management decisions (Creed et al. 1984) (Fig. 4). The 96 MUs are areas of similar habitat bounded by major roads. They average about 1500 km^2 (580 mi^2) in size. Overwinter deer population goals are established for each MU and usually range from 2-12 deer per square km of deer range (5-30 deer per square mi). In the northern forested region, overwinter goals are based on each MUs long-term carrying capacity and how well the local deer herd responded to past winters. In the southern agricultural region, overwinter goals are based on hunter demand and modified by an assessment of human tolerance of deer, particularly to crop damage and deer-vehicle collisions. Harvest recommendations are based on 3 factors: 1) the relationship of fall deer populations to overwinter goals for each MU, 2) the impact of the previous winter on deer survival and fawn production, and 3) the effect of any proposed quota harvest.

A statewide winter deer population of 575,000 is capable of producing a fall population in excess of 800,000. This should permit an annual gun harvest of 150,000 or more deer (Creed et al. 1984). Over the past 5 years, the fall population has increased from 800,000 to over 1 million, with the majority of this population increase occurring in the agricultural region (Fig. 5). Annual gun harvests have increased substantially in the past 10 years (Table 7) yet deer populations

remain high.

The WDNR has implemented a number of harvest strategies to reduce the deer herd in MUs where the population is too high. The first approach is to reevaluate and lower the overwinter goals. This has been done in a number of MUs where crop damage is a problem.

The November gun-deer season is traditionally a maximum 9 day hunting period with a buck plus quota deer harvest. Season length and the buck/antlerless harvest strategy vary some what between regions. Quota permits allow hunters the choice of harvesting an antlered buck or antlerless deer. The number of quota permits issued for a MU is dependent upon the number of deer to be removed to bring the fall population back in line with the overwinter goals. Hunter success plays a major role in determining the number of quota pemits issued.

A 3 year experimental "antlerless only" permit program was initiated in 1982 to increase the harvest of does in MUs where deer damage was a problem. Hunters applied for "antlerless only" permits instead of quota permits in participating MUs. Recipients could not legally shoot an antlered deer. The future of the "antlerless only" permit is presently under review.

An "incentive" or "bonus" deer permit was offered in 1984 to give specific hunters the opportunity to harvest 2 deer in a single season. Hunters could obtain a "bonus" deer permit if they legally killed and registered an antlerless deer in particular MUs. The intent was to provide additional permits to hunters who demonstrated the ability to harvest an antlerless deer and had access to land for hunting purposes. The limited number of permits were issued on a "1st come 1st served" basis, which generated concern for the development of a competitive atmosphere. Demand for "bonus" deer permits was high at deer registration stations on the first 2 days of the 1984 gun deer season.

"Permits to destroy" or shooting permits, have been issued to landowners to kill deer at any time of year where crop damage is acute and no viable abatement techniques are available. Relatively few deer are killed under such permits annually. Although they seem to appease the farmer, use of such permits is not well accepted by the public. Current controversy over changes in the requirements to receive a shooting permit, inconsistencies between the permits and a new "anti-shining" law in Wisconsin, and legislative intervention on behalf of irate farmers all cloud the future use of shooting permits.

Finally, in 1984, the Legislature authorized the WDNR to implement post-season hunts. These may be used in MUs where regular gun deer harvests are lower than needed. Poor weather and other factors can limit the harvest to the extent that additional reduction of the population is necessary. Post season hunts will be used on an emergency basis only.

THE FUTURE: SOME INSIGHTS

We have presented a history of Wisconsin's experiences with wildlife damage and wildlife damage programs. Still, there are many management and research issues that have not been discussed. We suggest that the following issues and policies will become part of Wisconsin's wildlife damage picture in the future.

1) "Hot spot" management: small areas where deer densities exceed the overall MU goals. These areas require direct management of harvest and hunter pressure to reduce deer populations and damage to a tolerable level.
2) Landowner education: wildlife managers should work with landowners to determine how many deer should be harvested from their land to bring local populations in line with MU goals.
3) "Hunter clearinghouses": innovative techniques to inform hunters of local areas where wildlife populations are high and hunter access is easily obtained. It is a way of distributing hunting pressure where it is needed.

4) Fee hunting: may be useful in mitigating landowner losses to wildlife damage.
5) County cooperatives: encourage neighboring counties to share wildlife damage technicians, equipment and ideas.
6) Fencing specifications: develop statewide specifications to facilitate company bidding procedures and the decisionmaking process.
7) Research: promote wildlife damage research in areas such as varietal preference, field crop abatement techniques, damage assessment techniques, wildlife behavior and damage modelling.
8) Funding: secure adequate funding for wildlife damage programs through segregated and general purpose state revenues, license surcharges, sales taxes and donations.

We feel that Wisconsin has one of the most imaginative and innovative wildlife damage programs in the nation. It was founded on considerable experience, input and deliberation between landowners, the WDNR and the Wisconsin Legislature. Communication from participating counties and landowners indicate that it has been well received and should be continued.

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Table 1. Wildlife and crops most frequently involved in agricultural damage in Wisconsin.

Species	Crops
White-tailed deer	corn, hay, soybeans, fruit[1/], vegetables[2/], nursery stock
Canada geese	corn, winter wheat
Black bear	apiaries, fruit
Sandhill crane	corn
Beaver	timber
Raccoon	corn, vegetables
Blackbirds/starlings	corn, fruit
Meadow voles	fruit, Christmas trees

[1/] includes apples, cherries, strawberries, cranberries, raspberries

[2/] includes carrot, cabbage, melons, celery

TABLE 2. DAMAGE CLAIM PAYMENTS (1978-79)

CROP	% OF CLAIMS	% OF PAYMENTS
CORN	27	22
ORCHARDS	17	22
VEGETABLES	16	34
HAY	11	<10
SMALL GRAINS	9	<10
OTHER	20	<10

TABLE 3. WISCONSIN WILDLIFE DAMAGE PROGRAM

1984 EXPENDITURES

$486,500 APPROPRIATED

COUNTIES SPENT $194,500

158,000 FOR ABATEMENT

- 134,000 FENCING
- 16,500 REPELLENTS
- 7,500 SCARE DEVICES

36,500 FOR ADMINISTRATION

220,000 WAS ADVANCED TO COUNTIES FOR 1985 EXPENSES

$72,000 WENT TO DNR STAFF EXPENSES AND UNIVERSITY EDUCATION AND RESEARCH PROGRAMS.

Table 4. Crop loss (in dollars) related to farmers perception of the level of damage (1981 data).

Value	Percent reporting damage	Perception of deer damage				
		None	Light	Moderate	Substantial	Severe
0-1[1]	66.5	62.5	30.6	5.1	1.3	0.5
1-101	14.9	3.8	79.6	15.3	0.8	0.4
101-501	13.1	1.0	52.7	35.3	9.7	1.4
501-1001	2.5	0	25.0	42.5	27.5	5.0
1001-5001	2.8	0	15.9	40.9	27.5	15.9
> 5001	0.2	0	0	25.0	50.0	25.0

[1] Includes a few farmers who did not assign a value to their damage.

Table 5. Crop loss (in dollars) related to farmer tolerance of deer damage (1981 data).

Value	Percent reporting damage	Feelings about damage			
		Unaware	Negligible	Tolerable	Unreasonable
0-1[1]	65.7	60.8	19.3	18.3	1.2
1-101	15.3	3.9	32.2	61.3	2.6
101-501	13.5	3.0	22.7	61.6	12.8
501-1001	2.6	2.6	15.4	43.6	41.0
1001-5001	2.6	0	17.5	30.0	52.5
> 5001	0.3	0	20.0	20.0	60.0

[1] Includes a few farmers who did not assign a value to their damage.

Table 6. Wisconsin farmers' attitudes towards deer in the neighborhood in 1981 and 1984.

Attitude	Percent	
	1981	1984
no feelings towards deer	7	6
have value, enjoy deer in neighborhood	75	56
enjoy a few deer, worry about crop damage	14	31
deer are a nuisance	4	7

TABLE 7. WISCONSIN DEER HARVESTS, 1975-1985

YEAR	ANTLERED BUCKS	ANTLERLESS
1975	73,373	44,005
1976	69,510	52,999
1977	82,762	49,148
1978	87,397	63,448
1979	76,550	49,020
1980	81,041	58,583
1981	99,034	67,639
1982	97,534	85,181
1983	96,928	99,670
1984	117,197	137,627
1985	300,000 PROPOSED	

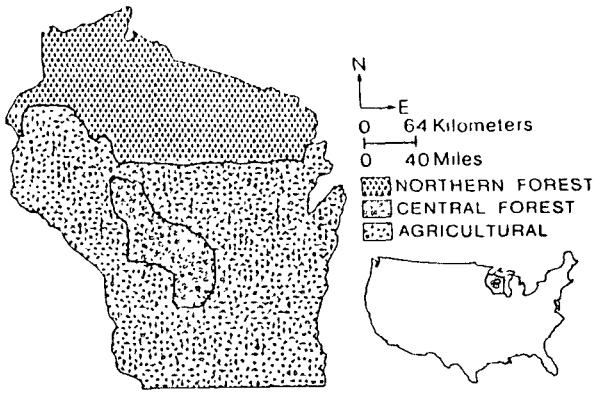


Figure 1. Distribution of Agricultural land in Wisconsin.

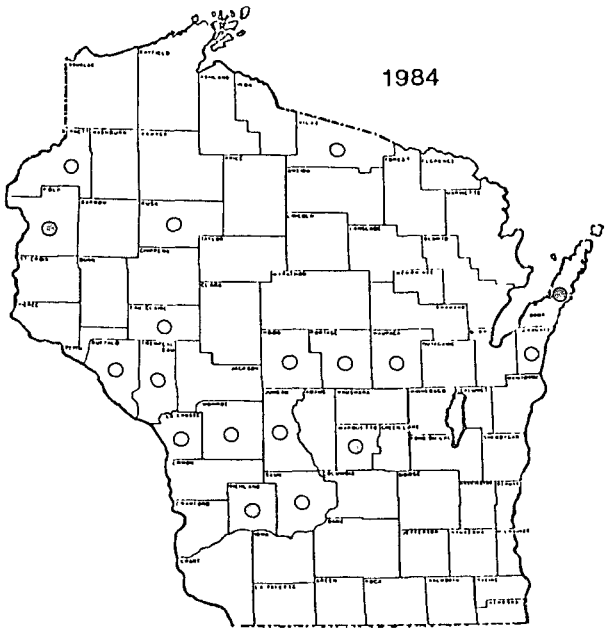


Figure 2. Counties participating in NDACP, 1984.

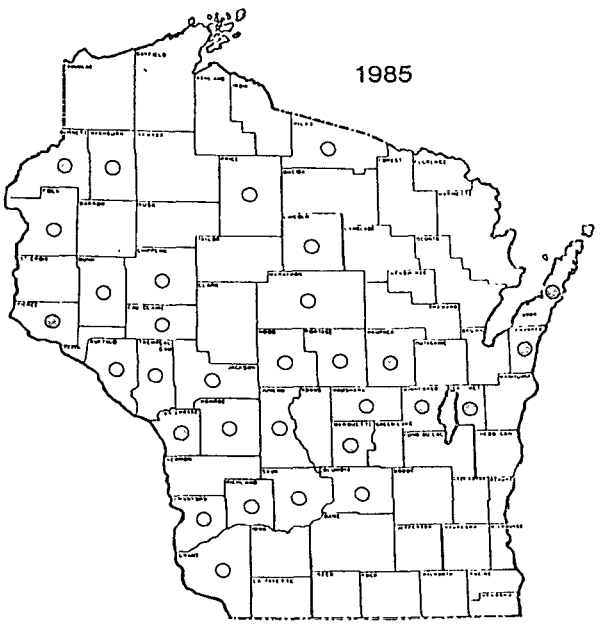


Figure 3 Counties participating in NDACP, 1985

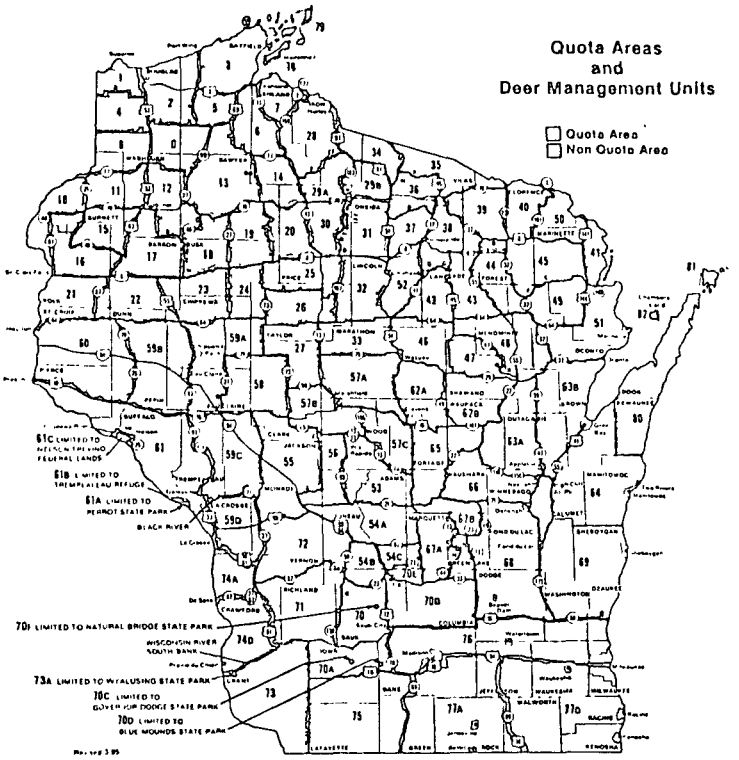
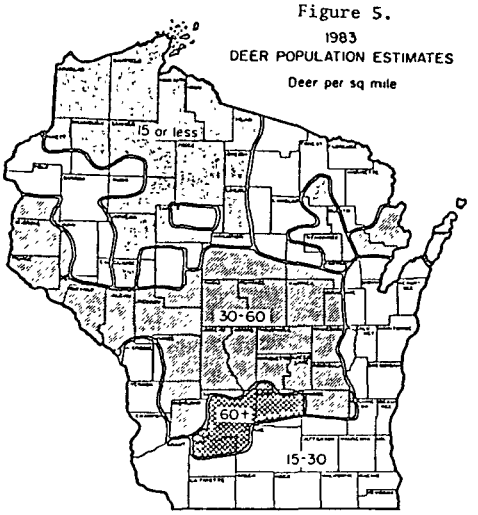


Figure 4. Wisconsin deer management units.

Figure 5.



Source Forest Wildlife Research Group, Dept of Natural Resources