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Assessment of crop depredation by wild turkeys in the United States and Ontario, Canada

Brian C. Tefft, Michael A. Gregonis, and Robert E. Eriksen

Abstract The wild turkey (*Meleagris gallopavo*) repatriation in the United States and Canada has been a major achievement in wildlife management. This success has led to increasing wild turkey populations and calls to wildlife professionals complaining about wild turkeys causing agricultural damage. A mail survey was distributed to state, federal, and provincial agencies that respond to wildlife crop-damage complaints. Survey recipients were asked to report the number of crop-damage complaints and their severity received from farmers, how many of these complaints were investigated and by what means, how often damage was confirmed when investigated, the severity of actual damage observed, and how frequently the damage was caused by other species. We wanted to compare farmers' perceptions of crop-depredation levels to actual damage as observed by experts. We further assessed the number of complaints received, the severity of the damage, and the economic impact relative to specific agricultural crops. Twenty-three different crops were reported as having confirmed damage caused by wild turkeys. In the majority of these cases (93%) damage was reported as light. In 46% of inspected cases, investigators reported most of the damage (76–100%) was caused by another species. Our results provide wildlife managers with an understanding of the nature of crop depredation relative to the wild turkey.

Key words complaints, confirmed damage, corn silage, crop depredation, *Meleagris gallopavo*, omnivore, removal permit, turkey restoration

The wild turkey (*Meleagris gallopavo*) is a highly adaptable wildlife species that has been successfully established in 49 states. Once near extinction, the wild turkey population in the United States now exceeds 5.4 million birds (Tapley et al. 2001). The success achieved by state wildlife agencies, with assistance from private nongovernmental conservation organizations such as the National Wild Turkey Federation, to restore and enhance wild turkey populations is recognized as one of the major achievements of modern wildlife management. Expansion of wild turkey populations in areas where agriculture is economically important has generated concern by farmers, real or perceived, that crop damage by wild turkeys is an

increasing and potentially serious problem (Miller et al. 2000).

Crop depredation by wild turkeys has been investigated in Wisconsin (Payer and Craven 1995), Ohio (Forster et al. 1996, Swanson et al. 2001), Iowa (Gabrey et al. 1993), and Pennsylvania (Tzilkowski et al. 1997). These studies concluded that wild turkeys often are blamed for crop damage because of their high visibility and numbers observed on farms; however, damage attributed to turkeys often was caused by other wildlife, principally deer (*Odocoileus virginianus*) and raccoons (*Procyon lotor*) (Swanson et al. 2001). In Ohio Swanson et al. (2001) investigated 15 turkey crop-damage complaints received over a 2-year period and found that

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only 1 (7%) was caused by wild turkeys. Deer, squirrels (*Sciurus* spp.), and raccoons were the cause of damage in most complaints. A telephone survey of 1,206 farmers in Ohio found that perceived wild turkey damage was low, with 69% reporting no damage at all, 13% reporting light damage, and 16% moderate to severe damage (Duda et al. 1995).

In Wisconsin 28 wildlife damage complaints investigated from 1989–1990 found that 5 (18%) were attributable to wild turkeys and 1 (4%) was considered significant damage (Payer and Craven 1995). Further investigation found that deer had caused 55% and raccoons 25% of the damage. A survey of 475 farmers in Iowa reported 82% had wild turkeys on their land and 64% reported crop damage by turkeys (Gabrey et al. 1993). The observation of turkeys in crop fields often prompted farmers to report damage without actual confirmation. Swanson et al. (2001) found that mature corn knocked down by raccoons at night and fed upon later by turkeys during the day will result in turkeys being blamed even though they were not the primary cause of the damage.

The need to quantify and understand human–wildlife conflicts is vital to successful wildlife management. Growing populations of wild turkeys throughout the United States and Canada make it essential that wildlife managers understand the nature of and factors that drive wildlife crop-depredation complaints. By having a better understanding of crop depredation, managers can better respond to complaints and resolve conflicts with sound biological information. Our objective is to assess the extent of crop-depredation complaints attributed to wild turkeys in the United States and Canada and to outline how state, federal, and provincial agencies respond to the problem.

Methods

A mail survey was developed to assess the nature and extent of crop-damage complaints and problems caused by wild turkeys. The survey was sent to state wildlife agency wild turkey biologists, State Extension Service wildlife specialists, and United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS) Wildlife Services biologists throughout the United States. The survey also was sent to agency personnel in the province of Ontario. The survey sought to determine whether a particular agency had received, investigated, and confirmed turkey crop-depredation com-

plaints and by what methods. The level of damage caused to specific crops and information on monetary loss caused by turkey damage was requested of each respondent. Finally, we asked whether removal permits or other methods were used to resolve complaints.

Results

We sent surveys ($n = 170$) to 75 state provincial agencies (SPA), 58 State Extension wildlife specialists (CE), and 38 United States Department of Agriculture APHIS wildlife specialists. Sixty-nine surveys were returned (41%), including 45 state agencies and the Province of Ontario, 16 APHIS units, and 8 Cooperative Extension wildlife specialists.

Thirty-eight (72%) SPA and CE received complaints of crop depredation by wild turkeys; 29 (55%) of these complaints were investigated and all 29 confirmed damage by wild turkeys. Wild turkey crop-depredation complaints were received by 4 (31%) APHIS inspectors; all 4 (31%) were investigated and had confirmed crop damaged. Forty-three (62%) of the respondents who received complaints of damage by wild turkeys used an on-site evaluation to confirm turkey crop damage. In addition to the on-site evaluation, some agencies also documented crop damage by filing an investigative report, taking still photos or video, or other specialized methods. Three states (Rhode Island, West Virginia, and Alabama) used the combination of field visit, investigative reports, and photos to document turkey damage. Indiana and Ohio used both still photos and video to document damage. The Indiana Department of Natural Resources used a telephone survey of landowners to determine the extent of crop damage. In Wisconsin, where the state pays landowners for damage done by wild turkeys, a written appraisal of the damage was obtained by the state to further document damage. Six states, (Alabama, Indiana, New Hampshire, Ohio, Utah, and Wyoming) all had methods to document the annual monetary amount of statewide damage caused by wild turkeys.

A variety of crops were confirmed damaged by wild turkeys (Figure 1). Corn in 3 different forms—silage (stored), spring (planted) corn, and fall (standing) corn—accounted for 41% of reported damage by wild turkeys. Silage corn, an important stored commodity for dairy farms, was the most widely reported crop damaged by wild turkeys. Blueberries (*Vaccinium corymbosum*), coffee

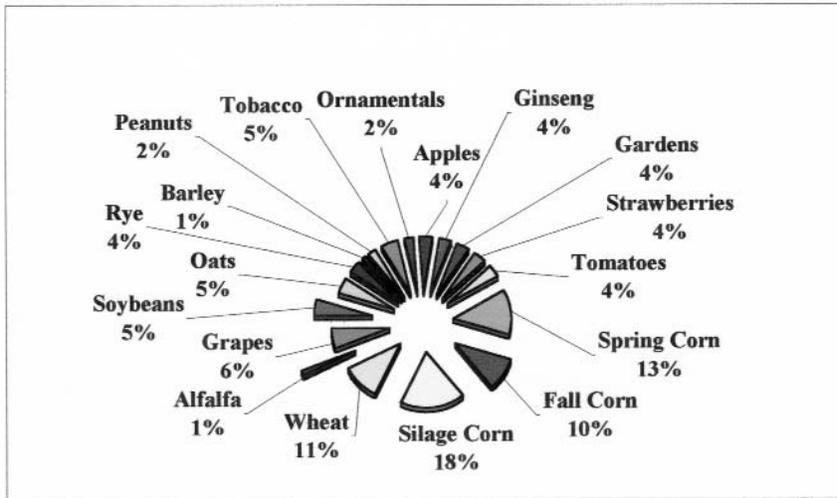


Figure 1. Crops damaged by wild turkeys in the United States, 1996–1999.

(*Coffea arabica*), hay, koa (*Acacia koa*), and milo (*Sorghum* sp.) were other crops reported with minor damage (1% each).

We asked respondents to indicate whether farmers reported crop damage complaints as light, moderate, or heavy (Table 1). For all crop types, 117 survey respondents reported receiving farmer complaints of some level of damage, with 96 (82%)

reporting complaints of light damage, 21 (18%) reporting complaints of moderate damage, and none reporting complaints of heavy damage. Minnesota Department of Natural Resources reported receiving complaints of moderate damage to corn (*Zea mays*), wheat (*Triticum* spp.), alfalfa (*Medicago sativa*), soybeans (*Glycine max*), and oats (*Avena* spp.), although the confirmed level of damage to these crops was light. New Jersey reported receiving complaints of mod-

erate damage to corn, wheat, and grapes (*Vitis* spp.); however, only wheat was confirmed to have this level of damage. Ohio reported receiving complaints of moderate damage to corn, wheat, alfalfa and oats; however, none of these crops were confirmed to have sustained that level of damage. The preceding examples suggest that complaints from farmers may overstate the actual damage found

Table 1. Severity of reported damage complaints for wild turkeys 1996–1999 and numbers of reported complaints as light, moderate, or heavy damage in United States and Canada.

Crop	Light	Moderate	Heavy	% of total surveys
Spring corn	15	2		25
Fall corn	11	2		19
Silage corn	13	2		22
Wheat	10	4		20
Alfalfa	3	2		7
Grapes	3	4		10
Soybeans	6	1		10
Oats	6	2		12
Rye	3			4
Barley	3			4
Peanuts	1	1		3
Tobacco	4			6
Ornamentals	4			6
Apples	2			3
Ginseng	2			3
Gardens	3			4
Strawberries	2			3
Blueberries	1			1
Coffee	1			1
Hay	1	1		3
Koa	1			1
Milo	1			1

Table 2. Severity of confirmed crop damage from wild turkeys 1996–1999 and number of confirmed damage surveys reported as light, moderate, or heavy in the United States and Canada.

Crop	Light	Moderate	Heavy	% of total surveys
Spring corn	13			19
Fall corn	8			12
Silage corn	11	3		20
Wheat	10	1		16
Alfalfa	4			6
Grapes	5	1		9
Soybeans	6			9
Oats	5			7
Rye	3			4
Barley	3			4
Peanuts	2			3
Tobacco	3			4
Ornamentals	3			4
Apples	1	1		3
Ginseng	1		1	3
Gardens	2			3
Strawberries	3			4
Blueberries	0			0
Coffee	1			1
Hay	2			3
Koa	1			1
Milo	1			1

when an onsite inspection is conducted.

We also asked respondents to rate the severity of investigated and confirmed crop damage as light, moderate, or heavy (Table 2). For all crop types, survey respondents reported 95 cases of investigated and confirmed damage, with 88 (93%) confirmed light damage to the particular crop, 6 (6%) confirmed moderate damage, and only 1 (1%) confirmed heavy damage to the crop. Massachusetts, Maine, Ontario, and Wisconsin all reported moderate damage to stored silage corn. New York, with its large dairy industry and severe winters with deep snow, reported only light damage to silage corn. Grapes, an important crop associated with the wine industry in New York, received moderate damage. Wisconsin reported moderate to heavy damage to 4 principal crops; ginseng (*Panax quinquefolius*), apples (*Malus pumila*), silage (stored corn), and (standing) corn, and was the only major agricultural state to confirm heavy crop damage as a result of wild turkeys. Ginseng, a relatively new and valuable crop grown in the forest understory, may be particularly vulnerable to turkeys scratching to reach tubers.

In many cases where crop damage occurs, species other than the wild turkey may be responsible (Swanson et al. 2001). We asked respondents to estimate how often confirmed crop damage was caused by a species other than wild turkeys. Forty-six percent of the agencies responded that 76–100% of the damage was caused by other species, 18% responded that 51–75% of the damage was caused by other species, and 36% responded that 0–25% of the damage was caused by other species.

We asked states to provide the annual cost of confirmed damage caused by wild turkeys (Table 3). Of the 23 states that responded, 21 (91%) reported <\$10,000 (U.S.) in annual damage. New York estimated annual damage at \$20,000–30,000, and Wisconsin estimated annual damage at >\$50,000 annually. Most states reported fewer than 25 complaints annually; however, New York and South Dakota reported 25–50 complaints annually. Wisconsin reported receiving over 100 complaints annually. Trends in wild turkey depredation complaints among states indicated that 50% (14) were stable, with 25% of states reporting increasing complaints and 25% reporting decreasing complaints.

Discussion

Wild turkey populations across the United States are increasing and may be at an all-time high as

wildlife management efforts for this important species have made it one of the best examples of modern wildlife restoration (Lewis 2001). These efforts have made the wild turkey a highly sought game species by sportsmen in 49 of 50 states. Miller et al. (2000) estimated the economic impact of turkey hunters in the United States in 1989 was over \$567 million. Additionally, the economic value of the wild turkey to nonconsumptive observers should be considered. Although it may be difficult to obtain accurate figures, the substantial economic value of the wild turkey resource should be determined by each state and weighed against the actual damage before depredation permits are issued. In some instances it may be necessary to issue removal permits when the level of damage confirmed by a wildlife biologist to be attributed to the wild turkey exceeds some threshold of damage; however, this threshold must first be determined on a state-by-state basis.

Much of the wild turkey resource occupies habitat on private lands across the United States and Canada, including extensive acreage within important farming regions. Some farmers perceive that the presence of large numbers of highly visible turkeys makes them a primary culprit, and blame them for damage and crop-depredation losses. Our survey found that in many states, on-site inspections of crop damage often determined that other species were responsible for the actual crop damage, similar to findings of other studies (Swanson et al. 2001).

The severity of damage is another important issue. Turkeys often utilize corn as a food item, and it was the most affected crop in the survey. We found that 93% of the confirmed crop damage done by turkeys was considered light damage. The turkey is best described as an opportunistic omnivore and feeds on a variety of food items as they are encountered (Hurst 1992). The observation of large numbers of turkeys on a farm may lead to the overestimation of the damage they cause since the birds may be feeding on waste grain or natural food items such as insects or mast encountered on farms. This is supported by reported complaints that turned out to be less severe when the damage was actually inspected.

The estimated annual dollar value of the crop damage caused by the wild turkey was relatively small on a state-by-state basis. Ninety-one percent of the states responding to the survey reported <\$10,000 in annual damage caused by wild turkeys,

Table 3. Profile of confirmed wild turkey crop damage complaints: annual cost of damage, number of complaints, number of removal permits issued, and trends in the United States and Canada, 1996–1999.

State	Agency	Annual \$ damage	Annual # complaints	Annual # removal permits	Trend of WT complaints
AR	Game and Fish	<10,000	0–25	0	Increasing
GA	Department of Natural Resources	<10,000	0–25	0	No complaints
HI	Department of Land and Natural Resources	<10,000	0–25	0	Stable
ID	Fish and Game Department	<10,000	0–25	0	Increasing
IN	Department of Natural Resources	<10,000	0–25	0	Decreasing
KS	University Extension	<10,000	0–25	0	Stable
KY	Department of Fish and Wildlife Resources	<10,000	0–25	0	Stable
MA	Division of Fish and Wildlife		0–25	0	Stable
MD	Department of Natural Resources	<10,000	0–25	0	Stable
ME	Department of Inland Fish and Wildlife		0–25	1	Stable
MN	Department of Natural Resources	<10,000	0–25	0	Increasing
MO	Department of Conservation	<10,000	0–25	0	Decreasing
NC	Wildlife Resources Commission	<10,000	0–25	0	No complaints
NE	Games and Parks Commission ^a	<10,000	0–25	0	Stable
NE	Games and Parks Commission ^b	<10,000	0–25	0	Increasing
NJ	Division of Fish and Wildlife	<10,000	0–25	0	Stable
NH	Fish and Game Department	<10,000	0–25	0	Stable
NY	Cornell University		0–25	0	Increasing
NY	Bureau of Wildlife	20,000–30,000	25–50	10	Stable
OH	Division of Wildlife	<10,000	0–25	0	Decreasing
OK	Department of Wildlife Conservation		0–25	0	Stable
Ontario	Ministry of Natural Resources	<10,000	0–25	0	Stable
OR	Department of Fish and Wildlife	<10,000	0–25	2	Increasing
RI	Department of Fish and Wildlife	<10,000	0–25	0	Stable
SC	Department of Natural Resources	<10,000	0–25	0	Stable
SD	Department of Game, Fish and Parks	<10,000	25–50	0	Decreasing
VA	Virginia Tech		0–25	0	Decreasing
VT	Department of Fish and Wildlife	<10,000	0–25	0	Stable
WI	Department of Natural Resources	>50,000	>100	1	Decreasing
WV	Division of Natural Resources		0–25	0	Decreasing
WY	Game and Fish Department	<10,000	0–25	0	Increasing

^a Nebraska Game and Parks Commission Big Game Project Manager.

^b Nebraska Game and Parks Commission Assistant Administrator, Cooperative Extension Service.

and only one state reported >\$50,000 damage. Winter populations in northern areas with deep snows and periodic winter food shortages can cause turkeys to concentrate at corn silage pits. Efforts to improve winter habitat and natural food supplies in turkey range can help ease but will not eliminate this problem.

Any damage to the farm crop cuts into farmers' profits, and this will continue to be a sensitive area of discussion. There are a variety of techniques that can be employed to disperse turkeys and reduce the damage that they can cause to farm crops. Various forms of harassment including shell crackers, propane cannons, water cannons, chase dogs, fencing, scare balloons, and mylar ribbons will dis-

perse, scare, or exclude birds in many situations. The requirements for success when using these methods include a commitment of time and energy in a consistent and coordinated way to keep the birds continuously disturbed in the problem area. The need for removal permits should be the last resort to resolve the problem.

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