

A Proposal for the Introduction of Wild Turkeys in Nova Scotia



**Submitted to the Nova Scotia Department of Natural Resources
17 August 2001**

Table of Contents

Section	Page
Executive Summary	4
Introduction.....	4
Habitat Suitability.....	5
Location of Introduction	9
Source of Wild Turkeys.....	11
Research Opportunities.....	12
Potential for Impacts to Other Wildlife and Threatened and Endangered Species.....	12
Potential for Disease Transmission.....	13
Potential for Agricultural / Nuisance Damage.....	14
Consumptive and Non-Consumptive Use.....	15
Economic Impact.....	16
Timeline, Estimated Budget and Source of Funding.....	16
Conclusion.....	18
Contacts.....	18
Literature Cited.....	20

Figures

Figure 1. Nova Scotia land cover / land use.....	6
Figure 2. Central Nova Scotia land cover / land use.....	7

Tables

Table 1. Comparison of wild turkey winter foods in New Hampshire and Nova Scotia.....	5
Table 2. Preferred foods of the Eastern wild turkey, by season.....	8
Table 3. Important land use and habitat characteristics in Nova Scotia. Comparison with New Hampshire and discussion of importance.....	10
Table 4. Year when wild turkey restoration programs started, New England states and selected western states where turkeys are considered non-native.....	12
Table 5. Disease testing summary, various states, 1999-2001.....	13

Table 6. Suggested timeline for introduction of wild turkeys in Nova Scotia..... 17

Table 7. Estimated budget for the introduction of wild turkeys and associated research 18

Appendices

- Appendix A. Evaluation of potential wild turkey Habitat (Annapolis Valley of Nova Scotia)
- Appendix B. Resolution on Artificial Feeding on Wild Turkeys
- Appendix C. Letters regarding wild turkey impact to other bird species
- Appendix D. The economic impact of hunting in Ontario, 1999

Executive Summary

The Nova Scotia Chapter of the National Wild Turkey Federation (NWTF) is interested in introducing wild turkeys in Nova Scotia, provided suitable habitat exists and the project has the support of the Nova Scotia Department of Natural Resources (DNR). The NWTF has reviewed the literature and determined that the habitat is suitable for wild turkeys and the birds would flourish in Nova Scotia. Wild-trapped, eastern wild turkeys are recommended for introduction. Potential impacts from wild turkey were investigated and it is believed that impact to other wildlife would be minimal, particularly as it relates to other upland game birds. No evidence exists to suggest that disease transmission by wild turkeys would be an issue. Agricultural damage by wild turkeys is more misconception than fact; research has proven that damage to crops by wild turkeys is insignificant and usually caused by other species of wildlife. Wild turkey damage and nuisance complaints, when they occur, are usually related to severe weather conditions. Nuisance complaints related to wild-trapped wild turkeys are rare; most nuisance problems can be attributed to pen-raised turkeys. The National Wild Turkey Federation would help ensure that appropriate financial resources are available and will work with state and provincial agencies to obtain suitable wild-trapped wild turkeys if and when the Nova Scotia Department of Natural Resources decides to initiate a wild turkey program.

Introduction

The Nova Scotia Chapter of the National Wild Turkey Federation and the Nova Scotia Department of Natural Resources have asked the NWTF to prepare this proposal to examine the feasibility of the introduction of wild turkeys into Nova Scotia.

The NWTF is an international, non-profit conservation organization with over 1800 chapters in the United States and Canada. Dedicated to the conservation of the wild turkey and the preservation of the hunting heritage, the NWTF's more than 390,000 members and cooperating partners have spent more than \$144 million US since 1973 toward this mission. NWTF chapters and a representative from the state or provincial wildlife agency approve all projects to ensure that the projects will help the agency achieve their management goals.

Since the early 1950's, state and provincial wildlife agencies have moved more than 162,000 wild turkeys into unoccupied habitats. Since 1985, the NWTF has helped fund and coordinate many of these releases across the continent. The state and provincial agencies have the responsibility to determine release sites and the NWTF provides technical assistance when requested. Between 1999 and 2001, the NWTF coordinated the donation and subsequent release of nearly 600 wild turkeys from New York, Michigan and Tennessee to Ontario, allowing the Ontario Ministry of Natural Resources (MNR) to supplement the restoration of wild turkeys in the province. This partnership has allowed the Ontario MNR to advance their restoration program by at least 2 years.

In addition to funding projects benefiting the conservation and management of the wild turkey and other wildlife, the NWTF also supports hunter safety programs, youth and women's outdoor education programs and projects that support hunting heritage. The NWTF and its partners have provided more than \$12 million US in research grants since 1977.

Habitat Suitability

In 1988 Ted Walski, wild turkey biologist with the New Hampshire Department of Natural Resources, was asked by the Digby East Fish and Game Association to assess the potential for wild turkeys in the province of Nova Scotia (Appendix A). Walski's assessment focused on the Annapolis Valley region of the province. Because Walski's evaluation provides the best known comparison of habitats, we will focus on this area but realize that other regions of the province may provide additional habitat for wild turkeys.

After Walski visited the Annapolis Valley, "...noting the winter foods available, the abundance of farmland, and the milder winter conditions", he concluded, "that the potential for turkeys is at least equal to, and probably greater than, that in New Hampshire or Maine." (Walski 1988, unpublished report). The NWTf obtained digital data from the Digital Chart of the World (DCW), an Environmental Systems Research Institute, Inc. (ESRI) product originally developed from U.S. Defense Mapping Agency (DMA) data. We used GIS technology to identify agricultural areas and forested areas dominated by deciduous and mixed forest types. These areas are thought to harbor the best wild turkey habitat in Nova Scotia (Figures 1 and 2).

Winter food sources and their availability during deep snow conditions are the primary limiting factor of turkeys along their northern range, a fact that undoubtedly will hold true in Nova Scotia. Walski reported that the Annapolis Valley has essentially the same winter food sources as found in the New England states (Table 1). While oaks are present in Nova Scotia, Walski "purposely downplayed the presence or importance" of this food source because, in his opinion, acorns are not a critical food during the winter due to inaccessibility and the inconsistency of production. While this may be true, it is important to note that mast is a primary component of the wild turkey's diet when it is available. Mast producing trees in an area will be heavily utilized and should be included as a factor in habitat suitability.

Table 1. Comparison of wild turkey winter foods in New Hampshire and Nova Scotia. (From Walski 1988)

Food Source	Comparison with availability in New Hampshire
corn	equal to or greater than in New Hampshire
Multiflora rose	greater than in New Hampshire
Pasture rose	greater than in New Hampshire
barberry	less than in New Hampshire
apples	greater than in New Hampshire
sensitive fern	equal to New Hampshire
sumac	equal to New Hampshire
juniper	less than in New Hampshire
burdock	equal to or greater than in New Hampshire
winterberry	equal to New Hampshire
green grasses	greater than in New Hampshire
small grains	much greater than in New Hampshire
white ash seeds	much greater than in New Hampshire
beechnuts	much greater than in New Hampshire
mountain ash	not found in New Hampshire

Figure 1. Nova Scotia Land Cover/Land Use

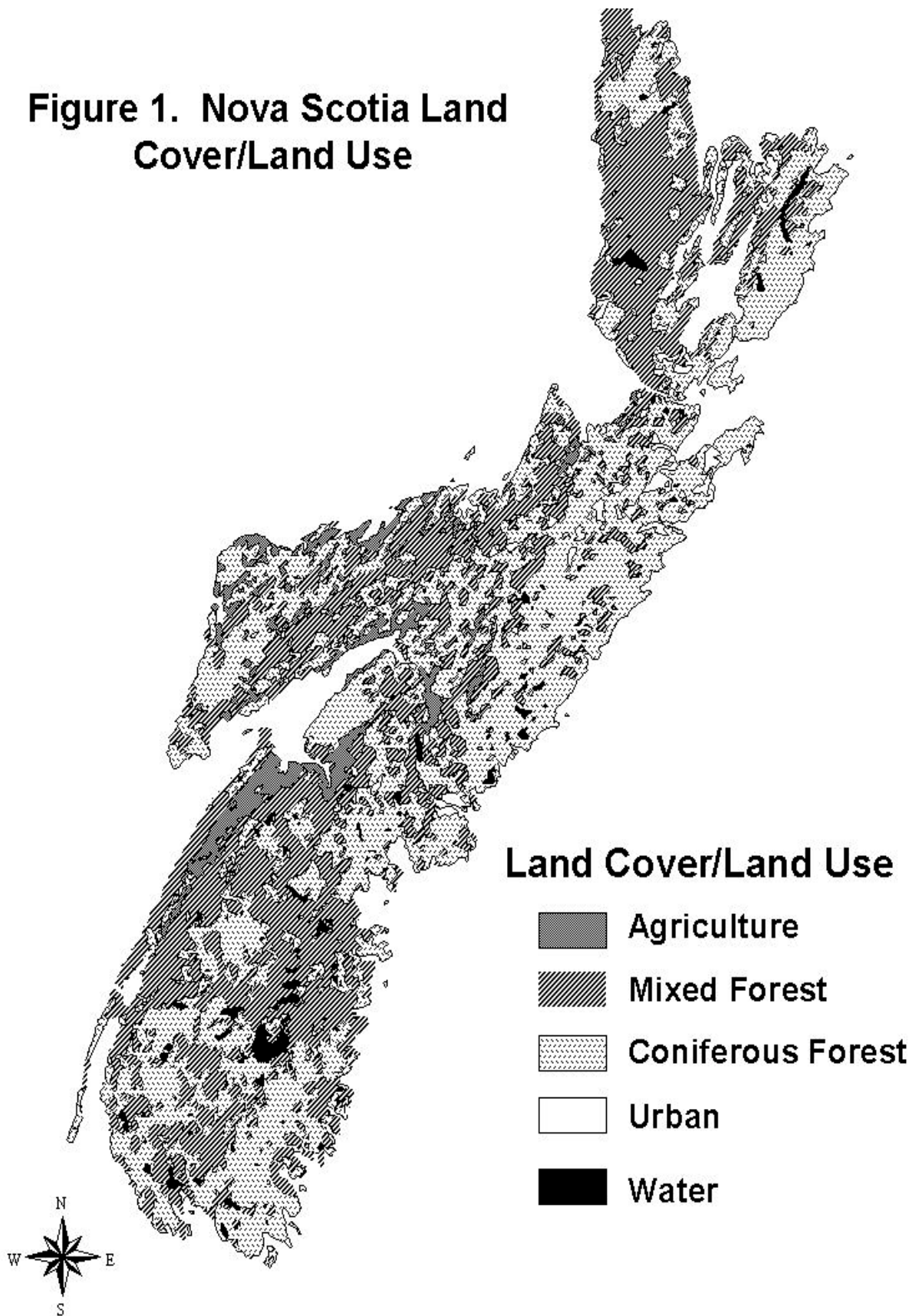
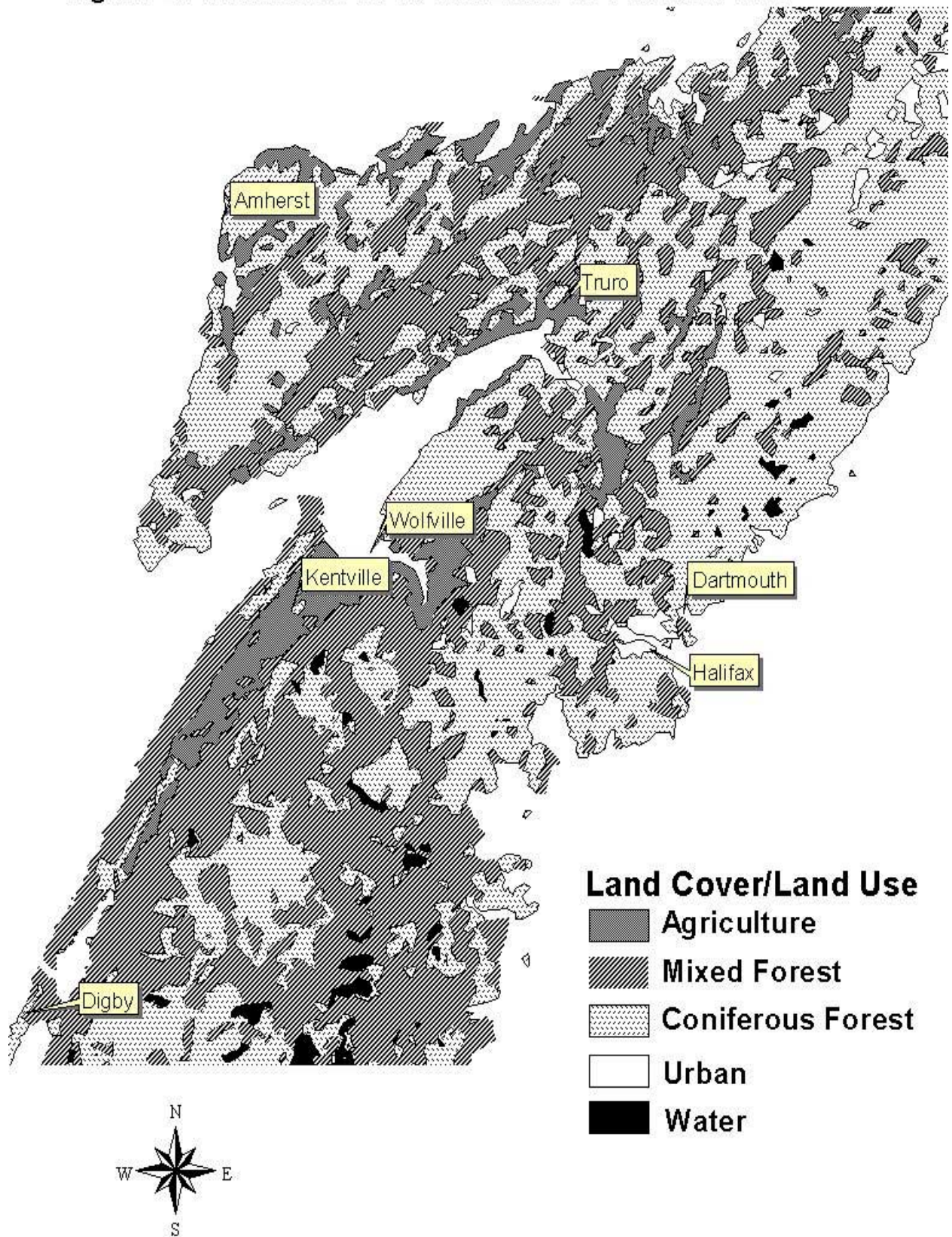


Figure 2. Central Nova Scotia Land Cover/Land Use



Pertaining to diet, the wild turkey is a generalist, or opportunistic omnivore, eating whatever acceptable items – plant or animal – are available (Hurst in Dickson 1992). Consequently it utilizes a wide variety of food sources; therefore wild turkey do not pose a threat to over-utilization of any single food source. Schorger (1966) concluded, “The turkey consumes a great variety of animal and plant foods. By far the greater part is from plants. The food eaten depends largely on what is available.” The contents of 524 wild turkey crops and stomachs from Virginia contained more than 354 plant species (representing 80 different families) and 313 invertebrate species (Mosby and Handley 1943). Vance (2001) summarized the preferred foods of the Eastern wild turkey reported in numerous studies of the wild turkeys diet (Table 2).

Table 2. Preferred foods of the Eastern wild turkey, by season. (From Vance 2001).

Summer		
grass leaves	bluegrass seeds	crabgrass seeds
various herbaceous plants	acorns	huckleberries
blackberries	panic grass seeds	paspalum seeds
invertebrates	cherries	smartweed seeds
Fall		
crabgrass seeds	tick trefoils	cherries
invertebrates	various herbaceous plants	sheep sorrel
acorns	beechnuts	panic grass seeds
grass or sedge leaves	grapes	various other grasses
Winter		
acorns	dogwood berries	invertebrates
grass and sedge leaves	various herbaceous plants	beechnuts
corn	sumac fruit	sedges
grapes	ferns or mosses	cherries
Spring		
acorns	bluegrass seeds	burdock
grass or sedge leaves	corn	wheat
oats	beechnuts	invertebrates
various herbaceous plants	sedges	chufa

Surprisingly, cold temperatures do not affect wild turkeys as much as one might expect. The insulating qualities of their feathers allow them to thermoregulate very well. No physiological changes were noted in turkeys subjected to -22°C temperatures (Haroldson et al. 2001). Snow cover, too, is a challenge that is often overcome. During short periods of deep snow, wild turkeys simply do not leave the roost. They have been documented to survive for 14 days without eating in winter conditions (Hayden and Nelson 1963). Crusted snow provides a stable footing and allows wild turkeys to walk to food sources over the snow. Wild turkeys will utilize areas cleared of snow by deer or other wildlife and livestock. Spring seeps, streambanks, and south facing slopes often remain clear of snow for parts of the winter and allow wild turkeys to scratch for food. Deep, powdery snow, in excess of 12 inches has the greatest adverse impact upon the survival of wild turkeys (Wunz 1981). If these conditions are widespread and persist for more than 10 consecutive days, wild turkeys have difficulty surviving because of their

inability to walk to food sources and their inability to scratch the snow out of the way to get to the food source. These conditions usually don't persist in the New England states and Walski noted that the maritime climate of Nova Scotia made for significantly easier winter conditions than those found in New Hampshire and Maine. Specifically, Walski noted the frequent thaws and winter rains that pack and melt the snow.

The harsh conditions of the winter of 2001 brought the survivability of the wild turkey to the forefront of many people's minds. The NWTF closely monitored the situation. While there were some reports of winter mortality, they were scattered and insignificant on a population scale. New Hampshire's winter was as bad as occurred in the Northern latitudes. Researchers conducting telemetry studies in the state reported reduced movements and activities during the winter, but documented no mortality (Pete Pekins, Pers. Commun.). Wunz and Hayden (1975) studied winter mortality and supplemental feeding of wild turkeys in Pennsylvania. During their study, they had winter mortality of up to 63% of the population. These same populations recovered to their original numbers within 2 breeding seasons. In 1994, significant winter mortality occurred in the Barrie area of Ontario. Turkey harvest the following spring declined 32% but rebounded the following spring (Karen Bellamy, Pers. Commun.).

Supplemental feeding is often thought to be the solution to minimizing winter mortality. Wunz and Hayden (1975) concluded that while supplemental feeding of wild turkeys may have prevented some individuals from dying, the presence of supplemental feed had no impact upon survival of the population. If turkeys were not near a feeding station at the onset of a storm, they would not move there during the severe conditions. Based upon the recovery of the populations after high winter mortality, they concluded that the tremendous monetary expense of supplemental feeding during winter was not worth any benefits that might be seen. Additionally, emergency feeding during only the worst conditions would be futile because the turkeys would not know where to look for the additional food (Wunz and Hayden 1975). This is not to say that turkeys will not use supplemental food sources if they are available. Like any wildlife, they will learn to utilize the food sources that are most readily available. However, it does not appear that supplemental feeding is critical to their survival in the northern reaches of their range. The NWTF Technical Committee has been on record since 1982 as being opposed to the use of artificial feeding as a practical management tool for wild turkeys. Rather the NWTF supports using sound wildlife management practices and habitat enhancement to manage wild turkey populations (Appendix B). In 1996 the NWTF adopted the position "...Super Fund dollars can not be used to artificially feed wild turkey... However, the NWTF recognizes exceptional local conditions when the NWTF may provide non-Super Fund support."

In addition to winter foods and weather conditions, Walski also highlighted important land uses and habitat characteristics in Nova Scotia. Generally these characteristics are similar to those found in New Hampshire and add to the desirability of Nova Scotia's habitat (Table 3).

Location of Introduction

Walski's assessment was focused on the Annapolis Valley region of the province. Specifically, Walski (1988) suggested the area around Bridgetown and Lawrencetown as a good area to introduce turkeys (Appendix A). The NWTF would support the introduction of turkeys in this area based upon Walski's report and our knowledge of the habitat available. In addition, the Truro Valley and the Stewiacke Valley have been suggested as areas with similar habitat (Steve Gloade, personal communication). Nonetheless, the ultimate decision for the location of an introduction rests solely with the Nova Scotia DNR. The decision to introduce any wildlife,

Table 3. Important land use and habitat characteristics in Nova Scotia. Comparison with New Hampshire and discussion of importance. (From Walski 1988)

Characteristic	Comparison
<ul style="list-style-type: none"> • dairy farms • beef cattle farms • winter manure spreading • manure piles in fields 	<p>Greater in Nova Scotia</p> <p>Greater in Nova Scotia</p> <p>Greater in Nova Scotia</p> <p>Similar to New Hampshire</p>
<p>The above provide sources of food for turkeys during severe winter conditions through waste feed and corn in manure. Turkeys normally shy away from these sites due to human activity except under extreme conditions.</p>	
<ul style="list-style-type: none"> • trench/bunker silos for corn silage 	<p>Less than in New Hampshire</p>
<p>In New Hampshire, unprotected trench/bunker silos are used during severe winter conditions as a source of food.</p>	
<ul style="list-style-type: none"> • apple orchards 	<p>Greater in Nova Scotia</p>
<p>Orchards provide good brood habitat and waste fruit may be utilized as a fall and winter food source.</p>	
<ul style="list-style-type: none"> • pasture seeps • woodland seeps 	<p>Similar to New Hampshire</p> <p>Similar to New Hampshire</p>
<p>Seeps provide excellent brood habitat and serve as good winter food sources because the flowing water keeps snow cover minimal.</p>	
<ul style="list-style-type: none"> • openings in snow cover on south and west slopes 	<p>More common in Nova Scotia</p>
<p>Provides snow-free foraging area for wild turkeys during the winter months</p>	
<ul style="list-style-type: none"> • hayfields • cattle pastures • winter rye 	<p>Greater in Nova Scotia</p> <p>Greater in Nova Scotia</p> <p>Similar to New Hampshire</p>
<p>The above provide excellent nesting cover and brood habitat for raising poults.</p>	
<ul style="list-style-type: none"> • crop fields 	<p>Greater in Nova Scotia</p>
<p>Waste grains remaining after harvest are heavily utilized by turkeys throughout the fall and winter as accessible.</p>	

including wild turkeys, should include a social element and meetings with the local people (farmers, hunt clubs, birdwatching groups, etc.) are recommended. If requested, the NWTF would assist with identifying introduction sites and conducting meetings with local groups to provide information and answer questions on the benefits of a wild turkey program.

In some portions of the Annapolis Valley small populations of pen-raised turkeys are present. While wild turkeys can be introduced into areas where pen-raised turkeys already exist, the NWTF would not encourage this approach. Pen-raised birds are more prone to nuisance type activities and may carry diseases that would impact wild turkeys. Wild turkeys released into areas already inhabited by pen-raised turkeys may be blamed for nuisance complaints when, in reality, it is the pen-raised birds that are causing the problems. The NWTF recommends that wild turkeys be introduced into an area free of pen-raised turkeys so that the true impact of turkeys being introduced in an area can be measured without the influence of pen-raised birds.

The best option for dealing with pen-raised turkeys is to eradicate them and replace them with wild trapped turkeys. The NWTF recognizes that, politically, this may not be a viable option. Persons with pen-raised turkeys in their area may want to keep them, because they are accustomed to having them around. If this is the case, the NWTF recommends that wild turkeys be released as far as possible from the pen-raised population. This will allow the wild population to expand and show its true potential before it potentially mixes with the pen-raised population. Once landowners see the success of truly wild turkeys, resistance to the eradication of the pen-raised stock and replacement with wild stock may be minimal. If eradication of pen-raised turkeys can not be achieved, wild turkeys will establish and override pen-raised birds. This is not the ideal situation, however, as the wild birds may be blamed for nuisance complaints that are really caused by the pen-raised birds which are more likely to interact with and tolerate humans.

Source of Wild Turkeys

Over the years, the state wildlife agencies have found that the only reliable source of wild turkeys to establish new populations is wild-trapped wild turkeys. Pen-raised turkeys rarely survive more than a few weeks in the wild and, if they do survive, often lead to future nuisance problems because of their lack of fear of humans (Kennamer et al. no date). With this in mind, the NWTF has investigated the opportunity to obtain wild-trapped wild turkeys for introduction in Nova Scotia.

Should the Nova Scotia DNR decide to initiate a wild turkey program, the NWTF would coordinate the capture of wild turkeys for transplant to Nova Scotia with other state and provincial wildlife agencies. The turkeys would be captured by either the donor agencies or by trappers contracted by the NWTF to capture turkeys for Nova Scotia. Several agencies have expressed an interest in assisting with wild turkey programs in other states and provinces. The NWTF would like any potential introduction to have the best possible chance for success. Therefore, the NWTF would recommend an initial release of 25-35 Eastern wild turkeys at each identified location. Evidence suggests that new wild turkey populations respond best when additional releases occur in subsequent years. Consequently, the NWTF would suggest that new wild turkey populations be monitored and additional releases occur as necessary.

Research Opportunities

Since 1977, the NWTTF has awarded research grants to investigate wild turkey biology and management. Currently, we are interested in studying wild turkeys along their northern range and view a potential introduction of wild turkeys in Nova Scotia as an excellent opportunity for additional research. If research is desired, the NWTTF would recommend radio-tagging approximately 25 wild turkeys to be followed for 2 years by a graduate student to determine habitat use, food habits, etc. Throughout any research it may be necessary to supplement the population in subsequent years to ensure adequate sample sizes. Through the NWTTF's research grant program, money would be available for properly designed research to address specific objectives that will add to the understanding of the wild turkey in northern locations. The NWTTF would work with the Nova Scotia DNR to design an appropriate study, locate an appropriate University to conduct the research, and find additional sources of funding.

Potential for Impact to Other Wildlife and Threatened and Endangered Species

Wild turkey restoration, in its modern form, has been taking place across North America since the 1950s. In addition, wild turkeys have been successfully introduced into new habitats (primarily the western U.S.) since the late 1950's (Tapley 2001) (Table 4).

Table 4. Year when wild turkey restoration programs started, New England states and selected western states where turkeys are considered non-native (From Tapley 2001).

State / Province	Year
Canada	
Ontario	1984
New England States	
Maine	1977
Maryland	1966
Massachusetts	1972
New Hampshire	1975
Rhode Island	1980
Vermont	1969
Western States	
California	1959
Idaho	1961
Oregon	1961
Washington	1960

Wild turkey restoration or introduction has occurred in 49 states (only Alaska has no wild turkeys) and the provinces of Ontario, British Columbia, Alberta, Saskatchewan, and Quebec. Currently there is an estimated population of 5.4 million wild turkeys in North America, up from about 30,000 in the early 1900's. Through all the restoration efforts and the tremendous population growth there have been no documented reports of wild turkeys having any negative

impact on other wildlife or threatened or endangered species. Vance (2001), in his exhaustive analysis of wild turkey food habit studies, concluded that while the diet of the turkey may include an occasional threatened species of animal or plant, it is uncommon and coincidental, and thus has no adverse impact on the population of that species as a whole.

Because of their general and opportunistic feeding habits and adaptability, the wild turkey seems to be able to find a non-competitive niche in which to survive regardless of the other species found in the area. Wunz (in Dickson 1992) noted that turkeys “usually have filled a vacant environmental niche wherever they have been introduced and no significant environmental problem has been attributed to them.” Walski (1988) concluded that there is a niche in the Annapolis Valley not being fully utilized by ruffed grouse, pheasants, and other game species that could be utilized by wild turkeys.

While stories have circulated that attribute the decline of the bobwhite quail and ruffed grouse to the increase in wild turkeys, all wildlife biologists familiar with this issue believe this decline is attributable to a reduction in suitable habitat for both quail and grouse. Dan Dessecker, Senior Wildlife Biologist for the Ruffed Grouse Society, suggested that competition for succulent herbaceous vegetation might occur in winter months. However, he noted that this would largely be limited to those regions where ruffed grouse populations are low and isolated due to habitat fragmentation and catkin-producing trees and shrubs are rare (Appendix C). Dessecker (1996) summarized that “although ruffed grouse populations are declining while wild turkey populations are increasing, this is most likely due to turkeys replacing ruffed grouse as forests mature and not likely due to turkeys displacing ruffed grouse.” (Appendix C). Similarly, Mike Pruss, Regional Biologist with Pheasants Forever writes, “...I am aware of no scientific evidence that turkeys have negatively influenced pheasant populations.” He also comments that in overlapping range where pheasant numbers have declined and turkey numbers have increased, the population fluctuations are largely due to habitat changes and changing land use practices. Pruss also notes that habitat management practices can be mutually beneficial (Appendix C).

Potential for Disease Transmission

The potential for disease transmission by wild-trapped wild turkeys is very low. From 1999 through 2001, 1,232 wild turkeys were tested for disease before being relocated and all birds tested negative (Table 5).

Table 5. Disease testing summary, various states, 1999-2001. (Gunn 2001).

State	Year	Subspecies tested	# tested	Results
Oregon	1999-2000	Rio Grande	159	0 positive / 0 false positive
	2000-2001	Rio Grande	29	0 positive / 0 false positive
Michigan	1999-2000	Eastern	57	0 positive / 1 false positive
Kansas	1999-2000	Rio Grande	444	0 positive / 0 false positive
New York	1999-2000	Eastern	238	0 positive / 1 false positive
Wyoming	1999-2000	Merriam’s	111	0 positive / 57 false positive*
Tennessee	2001	Eastern	191	0 positive / 0 false positive

* 57 tests were false positive, many of these tests were on the same individuals.

Wild turkeys are commonly tested for 3 *Mycoplasma* spp. (*M. gallesepticum*, *M. gallopavonis*, *M. synoviae*) and for *Salmonella pullorum*. These are the diseases that are of concern to domestic poultry growers. While these are the most common diseases tested for, the Nova Scotia DNR would make the final determination as to disease protocol. At the Nova Scotia DNR's request, the NWTf will work with the Nova Scotia DNR and other agricultural agencies to determine the appropriate disease testing procedures.

Potential for Agricultural / Nuisance Damage

Wild turkeys are often blamed for agricultural damage to crops. Usually this is a misperception due to the high visibility of wild turkeys. Because of this misperception, researchers from several states, most notably from Wisconsin and Ohio, have investigated agricultural damage by wild turkeys. This misperception was confirmed in Wisconsin by Payer and Craven (1995) who reported that half the farmers they surveyed who had observed turkeys on their farm stated that turkeys were a problem - of these 9% considered turkeys a major problem. Between 1989 and 1990, the Wisconsin Department of Natural Resources investigated 28 complaints of wild turkey damage. Of these, only 5 were confirmed as caused by wild turkeys and only 1 was considered significant. Payer and Craven (1995) concluded that, except in isolated cases, damage and adverse economic impact caused by turkeys was minimal and overshadowed by the damage caused by other wildlife species. They went on to note that turkeys are "often implicated because they are so visible."

A similar study was recently completed in Ohio and found comparable results (Swanson et al. 2001). Statewide, over 75% of farmers that had seen turkeys on their land had experienced no wild turkey crop damage during the previous 12 months. Of those farmers that believed turkeys damaged crops, 57% enjoyed having turkeys around while only 13% considered them a nuisance. In the same group, 30% were worried about potential crop damage but still enjoyed having the birds around. The Ohio Division of Wildlife investigated 26 turkey crop damage complaints from 1995-1998. In 8 cases, no damage was found. In 13 cases, crop damage resulting from other wildlife had been blamed on turkeys. Only 3 complaints involved wild turkey crop damage; none of which were considered severe.

These 3 complaints consisted of the following: (1) Turkeys scratched through peanut hulls used as mulch on tobacco plants. By switching to mulch less attractive to wild turkeys, no subsequent damage was reported. (2) About 30 turkeys damaged a 2-acre strawberry garden. Stringing Mylar tape around the garden's border prevented subsequent damage to the strawberries by turkeys. (3) Raccoons, blackbirds, and turkeys damaged a 20-acre field of sweet corn. Inspection revealed that turkeys were responsible for little initial damage. Turkeys fed primarily on ears of corn knocked to the ground by raccoons. Swanson et al. (2001), concluded that Ohio farmers equated the presence of turkeys or their sign in fields with crop damage but, in most instances, neither turkeys nor their sign were related to crop damage.

In the Northeast and New England States wild turkeys have caused some damage to corn silage stored in trench bunker silos and Ag bags. Complaints focus more on the presence of wild turkeys, holes in the Ag bags, the amount of defecation into the silage, and the possibility of disease in their livestock as a result, than the amount of silage eaten. While this is a concern, there has been no proven connection to date between the transmission of disease and the presence of wild turkeys (Randy Davidson, person. comm.) These complaints are generally

associated with severe winter weather conditions and last only as long as the conditions persist (Bob Sanford, personal communication). In western states damage to haystacks and bales has also been reported. Like in the eastern states, these complaints usually accompany severe winter weather conditions (Harry Harju, personal communication). Fencing, covering with tarps, and the use of Mylar tape are some techniques used that often are successful in minimizing damage. In the Northeast and in California, some reports of wild turkey damage to grape vineyards in the fall have been reported (Bob Sanford, personal communication; Scott Gardner, personal communication).

The NWTF chapters in areas where complaints have occurred are sensitive to the concerns of the landowner and the state wildlife agency and have worked with both to find solutions to the problem through the use of Wild Turkey Super Fund money and/or volunteer labor to mitigate the situation. NWTF chapters throughout the northern range of the wild turkey pay some farmers to leave corn standing as a winter food source. In the west, where the Merriam's subspecies tends to congregate around ranches, NWTF chapters have contracted with ranchers to grow grain, bale it and store it away from ranch houses. The turkeys then congregate around these bales rather than near the house. The Eastern subspecies, like those that would be introduced in Nova Scotia, have not shown this propensity to congregate in large flocks.

Because of the wary nature of the wild turkey, nuisance complaints involving truly wild birds are uncommon. Wild turkeys simply do not like to be close to human activity if they can avoid it. Like other wildlife, however, if they are fed on a regular basis they will become habituated and cause more problems than normally expected. Most nuisance complaints associated with wild turkeys are a result of habituation to the actions of humans.

Pen-raised turkeys are turkeys that are raised in captivity and then released into the wild. In most states, this practice is illegal. When well-meaning people raise these turkeys by hand, the birds lose their natural fear of man and often become a nuisance. The large majority of reported nuisance complaints involve pen-raised turkeys, which tend to remain in large flocks year-round and stay near human development and activity. Reports of wild turkeys attacking the postman or kids at the bus stop, and roosting on decks can usually be attributed to pen-raised turkeys. Wild turkeys, such as those that would be introduced in Nova Scotia, do not exhibit this type of behavior.

Consumptive and Non-Consumptive Use

It is dawn in the spring woods and a large gobbler is strutting and gobbling 60 yards in front of the hunter. As the tom approaches, attracted by the yelps and clucks of the hunter, the breathing becomes labored and the heartbeat races until it seems as though the man's chest will burst. This intense experience is why each year 2.7 million hunters rise long before dawn from a perfectly warm comfortable bed to pursue the wild turkey. It is not a traditional time of the year for many hunters to be in the woods but for those who try it, it quickly becomes a way for many people to extend their time in the woods and enhance their outdoor experiences.

The spring is a glorious time of the year to be out. Birds are returning on their spring migration and the woods are alive with the sound of males establishing territories. The gobble of the wild turkey and the accompanying mating display can be appreciated by the hunter and the non-hunter alike. The birds are large, vocal, frequent open fields, and they can be called in to the observer

for a closer look. These characteristics make them especially attractive to the bird watcher. When a group of turkeys begin to congregate in a particular field or pasture, they will often visit the field daily until they are disturbed. They are a great excuse to take a group of scouts or school children on a field trip that might actually make it to a field instead of a museum or a factory. Generally, most everyone likes to see wild turkeys, even the 57 percent of Ohio farmers surveyed that thought the turkeys were causing some damage to their crops, joined the birders, hunters and tourists when they said that they still enjoyed having the turkeys around their farms.

Economic Impact

Hunting is big business. Hunters in the United States spend approximately \$22.1 billion US annually with an estimated total economic impact of more than \$61 billion US (IAFWA 1996). Turkey hunting contributes a considerable portion of this. In 1989, turkey hunters spent an estimated \$567 million US on turkey hunting, excluding license fees (Baumann et al. 1990). Ontario's 8,100 wild turkey hunters, in 1999, spent more than \$1.8 million CAN on licenses, travel supplies and services directly connected with turkey hunting. The total estimated economic impact of turkey hunting in Ontario in 1999 was \$4.7 million CAN. Of these totals, more than \$153,000 CAN in license revenue was received by the Ontario MNR and tax revenues for various government agencies totaled nearly \$796,000 CAN. In addition, 1999 expenditures on turkey hunting sustained 46.2 person-years of employment (Ontario MNR 2000, Appendix D). Once turkeys are established and hunting seasons are open, Nova Scotia could expect similar positive impacts.

Timeline, Estimated Budget and Source of Funding

The NWTF has prepared a suggested timeline (Table 6) and estimated budget (Table 7) for the project should an introduction of wild turkeys be approved by the Nova Scotia DNR. The timeline is written with the success of a new population in mind and should allow for the appropriate evaluation of success.

The NWTF, through the Nova Scotia Chapter's Wild Turkey Super Fund and other NWTF funding sources, would raise the majority of the financial resources necessary to fund the introduction of wild turkeys and subsequent research. The NWTF would also look favorably on the formation of partnerships to raise additional funds. The NWTF has recently established 2 local chapters in Nova Scotia. Both chapters held fund-raising banquets in June 2001. Money raised at these banquets and future banquets can be used to fund the introduction and management of wild turkeys within the province. The only initial expense incurred by the Nova Scotia DNR would be the manpower costs associated with the selection of the release sites and public meetings. Money raised from future Nova Scotia banquets could be used to help offset management expenses incurred by the Nova Scotia DNR.

Table 6. Suggested timeline for introduction of wild turkeys in Nova Scotia.

1. Work with the Nova Scotia DNR to develop a Memorandum of Understanding (MOU) as a framework to define everyone's role in the process (Summer/Fall 2001).
 2. Develop a second MOA and work with other state and provincial wildlife agencies to supply wild trapped wild turkeys in January, February or March 2002 for introduction in Nova Scotia (Fall 2001).
 3. Work with the Nova Scotia DNR to identify the best potential wild turkey habitat in Nova Scotia and work with the local population to publicize and protect the introduction (Fall 2001).
 4. Work with the appropriate agriculture departments in Nova Scotia to define disease-testing protocol required prior to the introduction of the birds (Fall/Winter 2001).
 5. Develop a request for proposals to be distributed to all universities in eastern Canada and the northeastern United States to develop an appropriate research project (Fall 2001).
 6. Select area and locations for introduction (Fall 2001).
 7. Conduct public information forums in the area selected for the release to explain the reasons and expected results of the introduction (Fall/Winter 2001).
 8. Work with the volunteers in donor states/provinces and Nova Scotia to transport the birds (Fall/Winter 2001).
 9. Finalize a research project (Winter 2001).
 10. Capture and release 25-35 wild-trapped eastern wild turkeys at each release site (January-March 2002).
 11. Follow the turkeys from January 2002 through May 2004.
 12. Evaluate the success of the introduction (Summer 2002, 2003 and 2004).
 13. Subsequent releases of wild-trapped wild turkeys (Winter 2003, 2004 and 2005).
-

Table 7. Estimated budget for the initial introduction of wild turkeys and associated research.

Budget Item	Amount (US Funds)
Capture of 25 to 35 wild-trapped wild turkeys (Additional turkeys approximately \$500 each)	\$17,500
Transportation costs	\$1,000
25 radio transmitters	\$7,500
Research project for 2 years	<u>\$40,000</u>
Total	\$66,000

Conclusion

Conditions in Nova Scotia appear suited for the introduction of wild turkeys. Habitat suitability seems equal to or greater than that found in the New England states. Impact to other wildlife and disease transmission has not been documented and agricultural and nuisance damage would appear to be minimal. Throughout the history of wild turkey translocation, there have been no documented reports of wild turkeys having any negative impact on other wildlife, including other upland game birds. The potential for disease transmission by wild turkeys is minimal, no wild turkeys have tested positive for diseases in the last 3 years, and can be avoided with the proper disease testing procedures. Studies have shown that agricultural damage by wild turkeys is infrequent and normally considered minimal. Most complaints are received during severe weather conditions, which, even in Nova Scotia are expected to occur infrequently. Nuisance complaints related to wild turkeys can normally be attributed to illegally released pen-raised turkeys. The NWTF is committed to the success of an introduction should the proposal be approved. In addition, the NWTF would welcome the opportunity to help the Nova Scotia DNR plan and fund a research project studying an introduction of wild turkeys in Nova Scotia. Money raised at NWTF Super Fund banquets in Nova Scotia could be used to support the introduction of wild turkeys in Nova Scotia and to offset management costs in the future.

Contacts

Joel Pedersen
 NWTF Wildlife Biologist
 P.O. Box 530
 Edgefield, SC 29824 USA
 803-637-3106
jpedersen@nwtf.net

Robert Abernethy
 NWTF Director of Agency Programs
 P.O. Box 530
 Edgefield, SC 29824 USA
 803-637-3106
rabernethy@nwtf.net

Tom Nannery
NWTF Regional Director
1435 Royalsborough Rd.
Durham, ME 04222
207-353-8654
tomrdnwtf@aol.com

Steve Gloade
NWTF Volunteer
Nova Scotia Provincial Chapter President
P.O. Box 400
Baddeck, Nova Scotia, B0E 1B0

James Earl Kennamer, Ph.D.
NWTF Senior V.P. for Conservation Programs
P.O. Box 530
Edgefield, SC 29824 USA
803-637-3106

Literature Cited

- Baumann, D.P., Jr., L.D. Vangilder, C.I. Taylor, R. Engle-Wilson, R.O. Kimmel, and G.A. Wunz. 1990. Expenditures for wild turkey hunting. Proc. National Wild Turkey Symp. 6:157-166.
- Dessecker, D. 1996. The Turkey Question. RGS - The Ruffed Grouse Society Magazine. Volume 8 Issue 2:10-11.
- Gunn, B.B. 2001. Disease testing summary. NWTF unpublished report. 1 pp. Mimeo.
- Haroldson, K.J., M.R. Riggs, R.O. Kimmel. 2001. Effects of cold on body temperature regulation of wild turkeys. Proc. National Wild Turkey Symp. In press.
- Hayden, A.H., and E. Nelson. 1963. The effects of starvation and limited rations on reproduction of game-farm wild turkeys. Trans. Northeast. Section, The Wildlife Society 20:1-11.
- Hurst, G.A. 1992. "Foods and Feeding." Pages 66-83 in J. G. Dickson, ed., The Wild Turkey: Biology and Management. Stackpole Books, Mechanicsburg, Pa.
- International Association of Fish and Wildlife Agencies. 1996. The Economic Importance of Hunting. Southwick Associates. 10 pp.
- Kennamer, J.E., M.C. Kennamer, R. Brenneman. No Date. History of the Wild Turkey in North America. NWTF Wildlife Bulletin No. 15. 8 pp.
- Mosby, H.S., and C.O. Handley. 1943. The wild turkey in Virginia: its status, life history and management. Richmond: Virginia Division of Game, Commission of Game and Inland Fisheries. P-R Projects. 281 pp.
- Ontario Ministry of Natural Resources. 2000. The economic impact of turkey hunting in Ontario, 1999. Lands and Water Branch, Peterborough, Ontario, Canada. 4 pp. Mimeo.
- Payer, D.C., and S.R. Craven. 1995. Wild turkeys: A problem for Wisconsin farmers? Cooperative Extension Publications. Madison, Wi. 19 pp.
- Schorger, A.W. 1966. The wild turkey: its history and domestication. Norman: University of Oklahoma Press. 625 pp.
- Swanson, D.A., G.E. Meyer, and R.J. Stoll, Jr. 2001. Crop damage by wild turkey in Ohio. Proc. National Wild Turkey Symp. In press.
- Tapley, J.L., R.K. Abernethy, and J.E. Kennamer. 2001. Status and distribution of the Wild Turkey in 1999. Proc. National Wild Turkey Symp. In press.
- Vance, A.S. 2001. Wild turkey food habits: A review of existing literature. NWTF unpublished report. 34 pp. Mimeo.

- Walski, T. 1988. Evaluation of potential wild turkey habitat (Annapolis Valley of Nova Scotia). Unpublished report. 11pp. Mimeo.
- Wunz, G.A. 1981. Evaluation of supplemental winter feeding of wild turkeys. Harrisburg: Pennsylvania Game Commission. P-R Proj. 04030. Final Rep. 3pp. Mimeo.
- Wunz, G.A. 1992. "Wild Turkeys Outside Their Historic Range" Pages 361-384 *in* J.G. Dickson, ed., *The Wild Turkey: Biology and Management*. Stackpole Books, Mechanicsburg, Pa.
- Wunz, G.A., and A.H. Hayden. 1975. Winter mortality and supplemental feeding of turkeys in Pennsylvania. *Proc. National Wild Turkey Symp.* 3:61-69.

Appendix A

Evaluation of potential wild turkey habitat
(Annapolis Valley of Nova Scotia)

Evaluation of Potential Wild Turkey Habitat (Annapolis Valley of Nova Scotia)

Even before going to Nova Scotia for the first time, there was no doubt in my mind that Nova Scotia had potential habitat for some turkeys because of the Maritime climate and farmland. After seeing the Annapolis Valley Region, noting the winter foods available, the abundance of farmland, and the milder winter conditions, I would conclude that the potential for turkeys is at least equal to, and probably greater than, that in New Hampshire or Maine.

The Nova Scotia forest and field habitat is not that different from other northern areas of the Northeast, including Ontario. There is a niche or type of habitat not being fully used by partridge, pheasants, and other game species in the Annapolis Valley which could be utilized by wild turkeys.

This wild turkey restoration in the Northeast has been going on for two decades with no apparent harm nor competition with other game species. Also, it is not as if wild turkeys are an exotic type of game species. Wild turkeys are native to most of North America and are showing great adaptability in surviving in different habitats. The big factor in northern states is the presence of farms to help turkeys through the critical deep snow period.

I have hunted pheasants extensively for 35 years, been in charge of the New Hampshire pheasant project, and can't see much of any potential conflict between pheasants and wild turkeys. I think there are ample sources of food for both pheasants and turkeys. Pheasants are not native to North America and are declining in most areas.

The Annapolis Valley has all the natural winter foods used by wild turkeys in the northern New England states of Vermont, New Hampshire and Maine—except for an apparent scarcity of European and Japanese barberry bushes. However, the absence of barberry is more than made up for by the abundance of pasture and multiflora rose bushes. The farmland is even more extensive than the western counties of Vermont and manure spreading is common.

I have purposely downplayed the presence or importance of mast (acorn, beechnuts) because this is not a critical factor during the winter. In the northern states, wild turkeys seldom have access to acorns and beechnuts during the critical deep snow period of January/February. In the New Hampshire turkey range, there is only a viable beechnut crop about once every four years, and it is common to have years with little or no acorn crop. I am told that the beechnut and acorn crop is good only about once in every four years in Nova Scotia. During the relatively short, deep snow period in the Annapolis Valley, turkeys could survive on rose hips and sensitive fern alone—not to mention the spring seeps and grain wastage in the manure spreading.

Recommendations

- 1) Game farm turkeys are bad news. A law should be passed preventing the importation, propagation and/or release of game farm turkeys in Nova Scotia. Strong consideration should be given to removing any existing game farm turkeys.
- 2) The Department of Lands and Forests should contact Dr. Kennamer of the National Wild Turkey Federation if it decides to try an introduction of wild turkeys. He could communicate with the members of the Northeast Turkey Committee and try to solicit and facilitate a donation of wild turkeys from a northern state.
- 3) Of the New England states, Vermont and Connecticut are essentially finished with trapping and transplanting of turkeys within their states. Over the past years Vermont has been very generous in trapping and donating wild turkeys to numerous states—most recently the Province of Ontario. For the second year in a row, Connecticut is trapping turkeys to give to Maine—either for a nominal fee per turkey or in return for some fisher. It might even be

possible to obtain 15-20 turkeys before the end of this winter if the respective department heads and/or biologists officially communicated.

- 4) The host state for the annual workshop of the member states of the Northeast Turkey Committee for September 1988 is the Province of Ontario. The Department of Lands and Forests should consider sending a biologist to this meeting.

Enclosed are the following items which may help you in considering the possibility of a wild turkey transplant in Nova Scotia:

- 1) impressions of habitat in Annapolis Valley from my field trip of January 29-February 1, 1988;
- 2) comments on winter conditions;
- 3) some unpredictable factors;
- 4) comparison of turkey winter foods between New Hampshire and Nova Scotia;
- 5) summary of the turkey restoration project in the Province of Ontario (6pp);
- 6) summary of the turkey restoration project in New Hampshire.

Note: If I can be of any assistance to you in the future, please let me know. I would even be willing to go to another state free of charge and trap a flock of turkeys for Nova Scotia if official permission could be arranged.

I think wild turkeys are a quality resource which should be utilized and appreciated by as many sportsmen and public as possible. I sincerely encourage the wildlife managers and sportsmen in Nova Scotia to consider a transplant of wild turkeys.

Positive Impressions of Potential Turkey Habitat in the Annapolis Valley of Nova Scotia

Note: The following observations were made on my tour of the Annapolis Valley on January 29 and January 31 on my way from Digby to Halifax and back with two members of the Digby East Fish and Game Association. I saw both the north and south sides of the Valley, North Mountain, and the Bay of Fundy side of North Mountain. I also explored the woodland and fields around Digby on February 1.

The area of Bridgetown and Lawrencetown would make a good turkey release site.

The area around Wolfville was also impressive with numerous farm fields and with many field sites free of snow cover.

Some of the name places I remember with habitat which turkeys would like are: Annapolis Royal, Kingston, New Minas, Port William, Kentville, Canning, Gasbrow Valley, Windsor, Avon River, Annapolis River.

Comments/Observations:

- 1) When I landed at Digby on the ferry from St John, the nearby property of my host had 7 of 8 important turkey winter foods common to New Hampshire: multiflora rose, pasture rose, apple, barberry, burdock, sensitive fern, sumac. Also present on the ridge in back of the house were numerous beech and white ash trees.
- 2) The southerly and westerly slopes with numerous small bare spots free of snow cover, such as at the base of trees.
- 3) The bare ground in a strip along the water's edge.
- 4) The sites free of snow cover along the banks of the tidal rivers and streams.
- 5) The hillside pastures and hayfields along the lower slopes of North Mountain. It reminded me of farms in western Vermont.
- 6) The numerous farms and fields (open land) will provide winter food in the form of fruiting shrubs even if corn wastage and manure spreading are not available.
- 7) The fields, particularly those bordering North Mountain, will make good summer brood habitat. Numerous grasshoppers should be available.
- 8) The numerous orchards will provide some winter food in the form of dried apples left in trees or on ground and will also serve as good brood habitat. The first in-state transplant of turkeys I made within New Hampshire was to our little orchard region for these two reasons.
- 9) Crows were common at the farms and getting ample grain wastage from manure spreading.
- 10) There is ample cover and blocks or strips of woodland in the Annapolis Valley for turkeys to use as roosting sites, cover and travel lanes.
- 11) The extensive, long sloping ridge of North Mountain will be appreciated by the turkeys. They can roost there, use the mast, and have easy access to the farm fields.
- 12) The road network will not deter turkey movements.
- 13) Fields with small grain (oats, wheat, etc) will be an added plus for turkeys. There should be some wastage after cutting in the fall.
- 14) Large fields with manure spread on them are common.
- 15) Winter rye appears common and will be used as winter/spring food.
- 16) The abundance of pasture rose throughout the Valley will be a big plus for turkeys and would serve to prevent starvation during any deep snow period.
- 17) Multiflora rose bushes are common and will be well-used by the turkeys.

- 18) Apples are commonly seen on the ground under trees.
- 19) I saw winterberry bushes on a power line and in several wet sites in the Digby area. These are well-used by turkeys during hard winter conditions.
- 20) I saw some juniper bushes in the Digby area.
- 21) Sumac is fairly common in The Valley.
- 22) Turkeys will like the woods and fields along the Annapolis River with the presence of pasture seeps, cornfields, rose bushes and green grass.
- 23) Turkeys should readily cross between the north and south sides of the Annapolis Valley. Food sources are good on either side.
- 24) Just as in New Hampshire, sensitive fern is common in all the low, wet sites.
- 25) The white ash trees will be a big plus during deep snow periods. Turkeys will use the seeds I saw on top of the snow.
- 26) I also saw good beechnuts on top of the snow.
- 27) Blue beech and hornbeam are present. Turkeys like the seeds of both.

Comments on Winter Conditions (Annapolis Valley)

- 1) Nova Scotia has a maritime climate and has significantly easier winter conditions than the southern New Hampshire or Maine turkey range.
- 2) Deep, powdery snow cover does not last long. You get frequent thaws and rains.
- 3) The slopes and ridges in The Valley and those bordering the ocean have varying snow depths. There is a strip bordering the water with little snow cover. The slopes I climbed had about a foot of snow cover and numerous small, bare sites. The top of the ridges had 18-24 inches. However, there is no reason turkeys need to be at the highest elevations during the middle of the winter.
- 4) Your milder winter temperatures will make it easier for turkeys to conserve energy. I was told it rarely gets down to 0° F and that the temperature is usually in the range of 10-20° F.
- 5) Deep snow conditions do not (November/December) come early in Nova Scotia and do not last a long time (into March/April) as they would in northern New Hampshire. I was told that the hard part of your winter is over by February 15th, that there are usually no big storms after January 31st. A snowfall of 4-5" would be typical after that date.

Some Unpredictable Factors

Poaching

It appears that Nova Scotia may have more hunters than New Hampshire, who are apt to break regulations, take an extra deer, etc. A good public relations effort should be made in the region of the turkey transplant to inform hunters and landowners of the valuable nature of these turkeys trapped in and transplanted from another state or province.

The widespread use of snares could have the “potential” to hunt the turkey population. It is not uncommon for turkeys to get caught in leg-hold traps set for fox during October/November.

Predation

In most areas of The Northeast, turkey populations readily withstand the effects of predation if habitat is extensive because of their high reproductive potential (12 eggs) and their ability to re-nest. However, northern areas with limited habitat and numerous predators such as New Hampshire and Maine, can have problems. Fisher and coyotes readily prey on adult turkeys. There were little of either species in New Hampshire 30 years ago. Foxes do not generally pose a significant threat to adult turkeys. Bobcats commonly take turkeys in some states. However, the bobcat population does not appear too high in most of Nova Scotia. Your fisher population does not appear to be widespread or expanding.

Spring Hatching Weather

Warm, sunny days during late May/early June are conducive to good hatches and high survival rate of the chicks. The greatest mortality of the young occurs during the first week or two after hatching. They are very vulnerable to wet, chilling weather at this time as well as predation. They cannot fly until about two weeks of age and the hen has to brood them on the ground. Days of continuous rain and cool temperatures right after hatching can decimate broods.

Brood production in New Hampshire and Vermont has generally been good over a period of 13-19 years since the original re-introduction of turkeys. There have been several notable summers of poor production. However, turkeys have the ability to quickly rebound the following year because of high reproductive potential. Days with rain are quite common in New England during May/June. However, the eastern wild turkey has adapted to the conditions.

I cannot say how the average rainfall during April/May/June in the Annapolis Valley compares to the average rainfall in the New Hampshire turkey range because I do not have weather records from Nova Scotia.

Nest Disturbance

To what degree hen turkeys would be vulnerable to nest disturbance/predation by man and predators is hard to say. Turkeys in northern New England are prone to nest close to fields as this is where they take the chicks for the brood habitat and insect diet. In New Hampshire, a few nests are destroyed each year in fields because of hay mowing. Usually, these have been second nesting attempts. It is doubtful that the incidence of nesting in fields would be any greater than it would be in New York or western Vermont which also have large contiguous blocks of farmland.

In the Annapolis Valley there would appear to be numerous brushy edges, swamp sites, uncultivated sites, patches of woodland between fields, and all the lower slope of North Mountain where hen turkeys would nest.

The degree of egg predation will depend to a large extent on where turkeys choose to nest – either in among the fields or the lower slopes of North Mountain – and the density of predators. Raccoons and foxes will probably be the common nest predators.

A recent on-going radio telemetry study of nesting hen turkeys in New Hampshire has confirmed that a high percent of the tagged hens sought out sites with extensive softwood (pine/hemlock) logging slash in which to nest. In Nova Scotia spruce takes the place of the widespread white pine in New Hampshire. If logging slash from beech and/or beech is nearby to the fields in the Annapolis Valley, the turkeys will no doubt seek it out for nesting.

Game Farm Turkeys

Nova Scotia already has an existing “problem” with this highly undesirable type of turkeys. Hopefully, there are none in the area of the potential transplant site in the Annapolis Valley. There were only a few people on the ferry from St John to Digby but one person told me of a resident in Sandy Cove who had acquired eggs two years ago, hatched them, and released the turkeys. Other bird enthusiasts and sportsmen have acquired and released game farm turkeys.

There is no such thing as raising or buying true wild turkeys which can only be obtained from another state Fish and Game Department by live-trapping with rocket net or drugs. While most states in the Northeast have regulations preventing the keeping/propagation or importation of game farm turkeys, there are some other states which do not have strict regulations for game farms or game breeders. Many species of fowl or game, including eggs from game farm turkeys, can be acquired through the mail.

Game farm turkeys are not genetically true wild birds. This breed originated years ago from crossing domestic and wild turkeys. In the process, many of the genetic traits for survival in the wild were lost or bred out. They are undesirable for three basic reasons: 1) Genetic pollution from inter-breeding of your wild population occurs immediately if game farm turkeys and the wild turkeys come together. 2) Disease transmission from the game farm stock to the wild turkey has often occurred and entire populations of wild turkeys can be decimated or wiped out entirely. Wild turkeys have little or no immunity to such diseases as blackhead, fowl pox, and cholera. Game farm turkeys, on the other hand, have been raised in captivity where they generally receive vaccination and medicated feed. They are also prone to pick up various diseases and parasites from the numerous exotic species of fowl at game farms. The third negative effect of game farm turkeys results from their semi-tame nature. They commonly walk up to houses, stand by the side of highways to be photographed, and generally create “incidents”. The insidious effect is the poor image and first image the public gets of “wild” turkeys, which are supposed to be very wild and elusive. A protectionist and anti-turkey hunting attitude develops.

There is no excuse for any public or sportsman playing with game farm turkeys. All the success with the turkey restoration in recent years has come with the trapping and transplanting of small numbers of wild turkeys. In northern areas with hard winter conditions, such as Minnesota, New Hampshire and Nova Scotia, the hardiest strain of wild turkey is necessary. Game farm turkeys are a complete waste of time and are a very real threat to the establishment of a wild turkey population.

Another potential problem Nova Scotia has to resolve is its absence of any regulations prohibiting the importation, propagation and release of game farm turkeys. It has been written policy of the Northeast Turkey Committee that no northeastern state or province (Ontario) will give wild turkeys to a new state or province without wild turkeys until and unless that state or province makes a strong attempt to rid the area of existing game farm turkeys and prohibits their importation.

The Nova Scotia Department of Lands and Forests and the Nova Scotia Wildlife Federation should jointly introduce resolutions and pass regulations prohibiting the importation, propagation and release of game farm turkeys.

**Comparison of Turkey Winter Foods Between
New Hampshire and Nova Scotia**

	<u>New Hampshire</u>	<u>Nova Scotia</u>	<u>Comparison with NH</u>
#1	corn	corn	equal or greater
#2	multiflora rose	multiflora rose	greater than in NH
#3	pasture rose	pasture rose	greater than in NH
#4	barberry	barberry	less than in NH
#5	apples	apples	greater than in NH
#6	sensitive fern	sensitive fern	equal to NH
#7	sumac	sumac	equal to NH
#8	juniper	juniper	? less than NH
#9	burdock	burdock	equal to or greater
#10	winterberry	winterberry	? equal to NH
#11	green grasses	green grasses	greater than NH
#12	small grains (very minimal)	small grains	much greater than in NH
#13	white ash seeds (very minimal)	white ash seeds	much greater than in NH
#14	beechnuts (very minimal)	beechnuts	much greater than in NH
#15	none	mountain ash	-----

Comparison of Important Land Use/Habitat Characteristics Between New Hampshire and Nova Scotia

<u>Characteristic</u>	<u>Comparison</u>
#1 dairy farms	Nova Scotia definitely has more. Also has more adjacent or contiguous blocks of farms. Only 300 dairy farms left in all 10 counties of New Hampshire.
#2 beef cattle farms	It appears Nova Scotia has more. Their number is minimal in New Hampshire.
#3 apple orchards	Number much greater in Nova Scotia (good source of brood habitat and winter food).
#4 trench/bunker silos (corn ensilage covered w/black plastic)	Do not appear to be present in Nova Scotia. In Nova Scotia, corn ensilage and grain appears to be stored in metal silos.
#5 winter manure spreading	Appears more in Nova Scotia because of more total farms.
#6 pasture seeps	Appear to be as common as in New Hampshire.
#7 woodland seeps	? Did not see enough of wooded areas to be sure. However, with your hilly topography and winter thaws, it would appear they are abundant.
#8 small bare sites on southerly and westerly facing slopes	Very common in winter in Nova Scotia. Much greater than in New Hampshire.
#9 hayfields	Much more throughout Nova Scotia because of more total farms.
#10 cattle pastures	(same as above)
#11 crop fields	(same as above)
#12 hedgerows/stone walls with fruiting shrubs	Uncommon in Nova Scotia because less rocks and more clean farming.
#13 manure piles in fields	Common as in New Hampshire.
#14 winter rye, green manure crop	Common as in New Hampshire.

Prepared by Theodore W. Walski
Wildlife Biologist/Turkey Project Leader
New Hampshire Fish and Game Department

Appendix B

Resolution on Artificial Feeding of Wild Turkeys

RESOLUTION ON ARTIFICIAL FEEDING OF WILD TURKEYS

WHEREAS, it has been proven that wild turkeys will establish self-maintaining populations in areas where sufficient quality and quantity of habitat is available; and

WHEREAS, management of these populations involves improving habitat through such techniques as proper timber management including harvest and creation of suitable openings and where recommended by trained biologists, planting of supplemental foods for use by wild turkeys throughout the year; and

WHEREAS, the use of providing artificial foods in feeders or otherwise provided has proven to be of potential harm to wild turkeys by concentrating the birds so diseases could be detrimental to the population; and

WHEREAS, use of these artificial foods tends to create a dependency with tame and unnatural condition in wild turkeys and is neither practical nor possible on a sustained basis; and

WHEREAS, the expense of providing these artificial foods can not be justified in terms of costs benefits to a significant number of in a population, NOW

THEREFORE BE IT RESOLVED that the National Wild Turkey Federation technical committee recommends that wild turkeys be managed according to sound wildlife management principles and this committee does not consider the use of artificial feeding as practical to manage wild turkey populations for either present of future generations.

(Adopted by the National Wild Turkey Federation technical committee at the sixth annual convention in Orlando, Florida, on February 27, 1982.)

Appendix C

Letters regarding wild turkey impact to other bird species



The Ruffed Grouse Society

DEDICATED TO IMPROVING THE ENVIRONMENT
FOR RUFFED GROUSE, WOODCOCK,
AND OTHER FOREST WILDLIFE

P.O. Box 2 • Rice Lake, WI 54868
(715) 234-8302 • Fax (715) 234-5051

5 July 2001

James Earl Kenamer
National Wild Turkey Federation
P.O. Box 530
Edgefield, SC 29824

Dear James Earl,

Thank you for sending me information regarding the proposal to establish a wild turkey population in Nova Scotia. I understand that one of the issues that have been raised is the potential for competition between turkeys and ruffed grouse. I have enclosed for your review an article I wrote in 1996 addressing this topic.

As I suggest in this article, the recent decreases in ruffed grouse populations are likely driven by habitat loss, particularly in our central hardwood forests. Data also suggest that mammalian predators are more abundant than in the past and may be taking a greater toll on ruffed grouse than previously thought, and perhaps other ground-nesting birds as well.

You will note that I do question whether competition for winter food might be a factor in some locales. This could occur where succulent herbaceous vegetation is a critical component of the ruffed grouse winter diet and this ground vegetation is in short supply. I suspect that such competition would largely be limited to those regions where grouse populations are low and somewhat isolated due to habitat fragmentation and catkin-producing trees and shrubs are rare.

I hope this information is useful. If you have any questions, please don't hesitate to contact me.

Take care,

Dan Dessecker
Senior Wildlife Biologist

THE TURKEY QUESTION



By Dan Dessecker, RGS forest biologist

Over the past decade, as the forest biologist for the Ruffed Grouse Society, I've worked with resource management professionals and Society members in virtually all of the states and provinces that support ruffed grouse populations. During my travels, the question I've most often been asked is: how many grouse will be in the woods this fall?

In the Great Lakes states and elsewhere where ruffed grouse populations follow a 10-year cycle, this question is an easy one to answer; recent history and current trends predict the fall outlook with reasonable accuracy, even without specific data. Throughout much of the remainder of the ruffed grouse range, where bird numbers may be dependent upon late spring and early summer weather or other factors, it's best to hedge one's bets.

Increasingly, another issue is getting a lot of attention when ruffed grouse enthusiasts gather to spend time afield or reminisce about previous hunts. They're pondering the likelihood of a cause and effect relationship between increasing wild turkey populations and decreasing ruffed grouse numbers.

When I first began to hear the discussions, I was inclined to dismiss the thought of any connection. After all, there is substantial habitat separation between ruffed grouse and wild turkeys. The former require dense young forest stands while the latter prefer relatively open mature forests.

Even a cursory examination of forest inventory data from the Midwest and throughout the Appalachians clearly shows that the young forest habitats required by ruffed grouse are declining dramatically. There is no question that this loss of quality habitat is primarily responsible for declining populations of ruffed grouse, American woodcock, chestnut-sided warblers, yellow-breasted chats and many other species

of forest wildlife. Wild turkeys are becoming increasingly common as they take advantage of the increased availability of mature forest habitats. Still, when competent observers from across a wide geographic area continue to raise a specific issue, it deserves thoughtful consideration.

In order for increasing wild turkey populations to be able to exert a direct negative influence on local ruffed grouse, there would have to be some form of competition. Such competition would need to be related to some relatively limited resource. If this resource is heavily utilized by wild turkeys, then it is possible that there could be a direct relationship.

Competition between wildlife species typically develops from limited space or limited food. Eastern bluebirds, house sparrows and European starlings, for example, all utilize natural or man-made cavities for nest sites. Because only one nest can be maintained within each individual cavity, the most aggressive species is most likely the one that will successfully establish a nest and fledge a brood. The introduction of the aggressive house sparrow and European starling to North America played a significant role in the dramatic decline of the bluebird in the mid-1900s. (Its decline has since been partially reversed due, in part, to the extensive placement of nest boxes well-suited for bluebirds.)

Might today's wild turkeys be out-

competing ruffed grouse for the use of limited breeding areas or nest sites? That's doubtful because breeding male ruffed grouse drum on logs surrounded by dense shrubs or young trees. Wild turkey gobblers require elbow room for

the activities associated with their breeding display, and the dense cover used by drumming male ruffed grouse is simply too confining. Although both ruffed grouse and wild turkey hens commonly nest within middle-aged or mature forest stands, both birds exhibit relatively imprecise habitat requirements and will nest across a wide range of habitat conditions, making it unlikely that competition for nest sites would occur.

Ruffed grouse are generalists when it comes to their food habitats. This means that they utilize a variety of food sources depending upon what is available at different times.

Wild turkeys, too, feed upon a wide array of different foods, although hard mast – such as acorns and waste grain scattered throughout harvested agricultural fields – are important winter foods. During the winter months in New England, Pennsylvania, New York and the Great Lakes states, ruffed grouse commonly feed on the dormant flower buds of various trees and shrubs. These foods remain largely unavailable to wild turkeys because the heavy-bodied birds have to have relatively stout limbs to hold them,

In order for increasing wild turkey populations to be able to exert a direct negative influence on local ruffed grouse, there would have to be some form of competition.

so they typically forage only on the ground.

In the central and southern Appalachians, however, there exists another situation. Research has shown that in some areas of the southern portion of the ruffed grouse range, nutritious winter forage is limited and may indeed be one reason why southern ruffed grouse populations seldom attain comparable densities to those in the more northern latitudes, even where quality habitats do exist. Bud-producing trees and shrubs preferred by ruffed grouse are uncommon in this region, forcing the local birds to forage on the ground for the few remaining green plants, or what's left of that fall's fruit crop. These relatively limited food supplies are also readily consumed by resident wild turkeys.


It is possible that in some regions where winter foods for ruffed grouse are scarce, increasing turkey populations may exacerbate this problem of limited food availability. However, even if such competition for winter food does exist, its impact on local ruffed grouse populations is probably insignificant when compared to continued declines in the availability of young forest habitats — those habitats required by ruffed grouse. As such adequate areas of habitat for grouse become fewer and fewer, and farther and farther apart, ruffed grouse will become increasingly scarce.

In summary, although ruffed grouse populations are declining while wild turkey populations are increasing, this is most likely due to turkeys replacing ruffed grouse as forests mature, and not likely due to turkeys displacing ruffed grouse.



Dan Dessecker is the forest wildlife biologist for the Ruffed Grouse Society, and his travels make him well acquainted with most of the regions in ruffed grouse and American woodcock range.

MAINE GROUSE-WOODCOCK HUNTS



Enjoy the unique combination of traditional and driven wild grouse and woodcock hunts through forgotten orchards and stone fenced woodlands of coastal Maine. Twenty-five to thirty flushes per day present each hunter the opportunity to fill his daily limits.

Call or write:
MAINE GAME BIRD GUIDES
 Jo-Ann Moody, Prop.
 R.F.D. #2, Box 468 • Belfast, Maine 04915
 Tel. 207-722-3664

FLUSHING OUT NEW TITLES



Fish Tales by Ken Scott, \$15.95, Carlton Press Corp., 11 West 32nd Street, New York, New York, 10001, available through 1-(800)-BOOKS-08 or 1-(800)-266-5708.

In *Fish Tales*, Scott reminisces about the special moments in life, recording his favorite fishing trips experienced over three decades. The author recaptures the detail, the locations and panoramic settings of the trips, along with the camaraderie shared with a group of fishing buddies who developed the fun of the sport into a fine art.

Scott, a retired vice president of General Motors' Body and Assembly operation, lives in Winter Park, Florida. He holds a membership in the Ruffed Grouse Society and several other organizations, including Ducks Unlimited and the U.S. Trotting Association.

A Boy, A Bike & Buster by Gordon Charles, Traverse City, Michigan, *Record-Eagle* outdoor editor. The book celebrates the way kids did things in the 1930s as they and their dogs went hunting and fishing with few cares.

These are memories of hunting and fishing in the good old days, that are sure to stir the recollections of similar experiences for older readers. There are also a host of great insights for younger readers.

Price: \$16.45, Traverse Outdoor Press, 1495 W. Silver Lake Road, Traverse City, Michigan, 49684.



Larson's Guide Service in Minnesota's Greatest Grouse Habitat

**You Can't Miss with Our
Experienced Guides**

Our Hunts Include:
 Experienced guides, three meals a
 day and lodging.
 Your dogs are welcome.

Plan Now!
 The season begins September 14 and runs
 through December 31.

Our Hunting Package

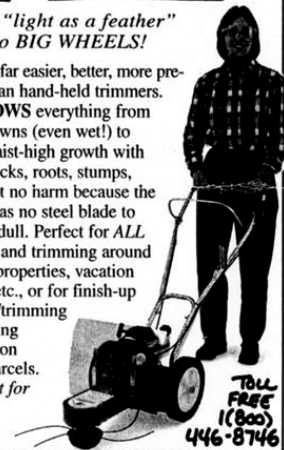
- Daily Hunts Available
- 3-Day Hunts: \$625
- 5-Day Hunts: \$1,025

Call or Write:
Larson's Guide Service
 P.O. Box 131
 Minnetonka Beach, MN 55361
 (612) 922-1002

New TRIMMER ON WHEELS!

Rolls "light as a feather"
on two BIG WHEELS!

TRIMS far easier, better, more precisely than hand-held trimmers. Plus MOWS everything from whole lawns (even wet!) to tough waist-high growth with ease! Rocks, roots, stumps, etc., do it no harm because the "DR*" has no steel blade to bend or dull. Perfect for ALL mowing and trimming around smaller properties, vacation homes, etc., or for finish-up mowing/trimming after riding mowers on larger parcels. A delight for anyone to use!



Please mail this coupon today for FREE DETAILS about the Revolutionary DR* TRIMMER/MOWER including prices and specifications of Manual- and Electric-Starting Models, and "Off-Season" Savings now in effect.

Name _____ RGS, Inc.
 Address _____
 City _____ State _____ ZIP _____
 To: COUNTRY HOME PRODUCTS*, Dept. 1501
 Ferry Road, P.O. Box 89, Charlotte, VT 05445



PHEASANTS

forever®

Joel Pedersen
National Wild Turkey Federation
P.O. Box 530
Edgefield, SC 29824

June 21, 2001

Mike Pruss
HC 67 Box 104A
Mifflin PA 17058
Phone & Fax: (717) 436-0005
e-mail: pruss@lcworkshop.com

Dear Joel,

Thank you for expressing your concern and interest in pheasant populations and related habitat and wildlife issues in Nova Scotia. As the Regional Biologist for Pheasants Forever, Inc. in the northeastern U.S., I have had numerous opportunities to work with your local staff and chapters on cooperative projects.

This portion of the North American continent has some unique challenges for establishment and management of both species. Both pheasants and wild turkey have been established and expanded their ranges in parts of the northeast during the course of the last century. In areas where transplants have overlapped, I have observed no direct impacts, and I am aware of no scientific evidence that turkeys have negatively influenced pheasant populations.

In some overlapping ranges, pheasants have declined, while turkey populations have increased. In most instances, these population fluctuations can be attributed to landscape level habitat changes and land use practices. Throughout both species' ranges, habitat remains the most important factor to the success of populations.

In fact, habitat management practices that are implemented to help one or the other species can be mutually beneficial. Programs such as leaving standing grain and the development of delayed mowing or grazing plans that provide secure nesting and brood rearing habitat can improve winter survival and reproductive success of both pheasants and turkeys in an area.

Pheasants Forever is not opposed to the development of a wild turkey transplant plan for Nova Scotia. Such a plan should include a thorough consideration of the habitat, to ensure that a transplant has the maximum chance for success. If habitat exists for a species, and it is acceptable to transplant the animal, a transplant can be the logical conclusion to successful habitat management.

I wish you luck with your continued habitat management and transplant efforts. Don't hesitate to contact me if I can be of further assistance.

Sincerely,

Mike Pruss
Regional Biologist

Cc: Howard Vincent, CEO Pheasants Forever, Inc.

Appendix D

The economic impact of hunting in Ontario, 1999

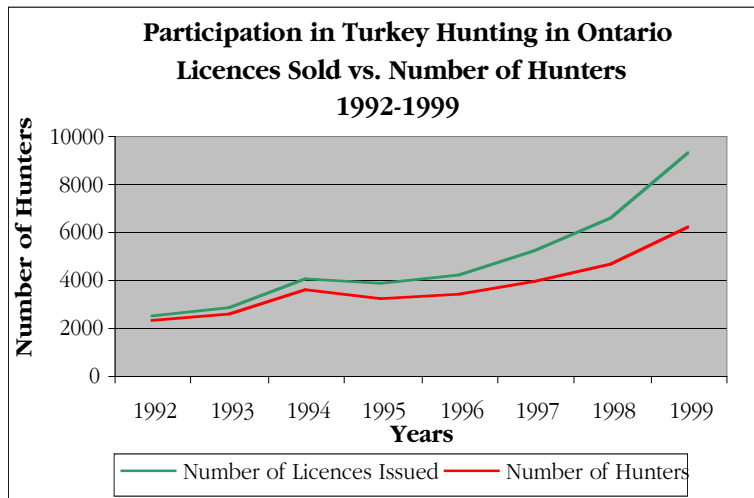
August 2000

WILD TURKEY HUNTING

Given that wild turkeys are wary and elusive birds, they provide a tremendous challenge to hunters of all ages. Originally native to Ontario, wild turkey populations struggled for much of the past century; however, through the efforts of many, the reintroduction of turkey to Ontario has been a successful venture.

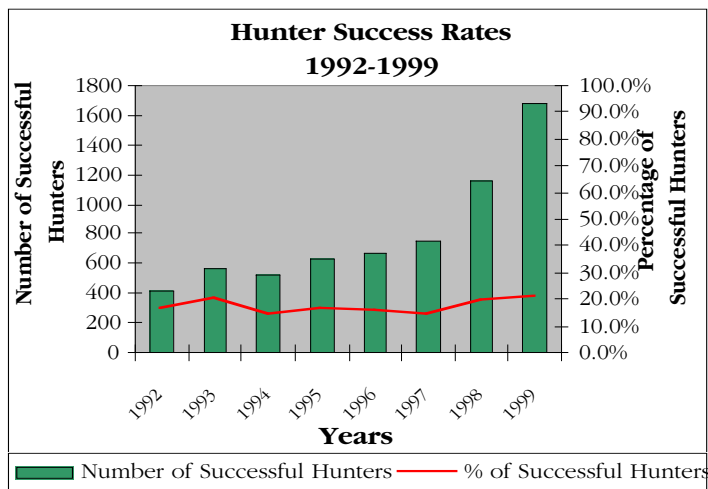
PARTICIPATION

- Participation in turkey hunting has continued to increase since 1992 when an estimated 2,497 licences were sold, and 2,264 hunters or 86 per cent actually participated. In 1999, there were 9,305 licences issued, of which 6,160 or 76 per cent of the individuals actually hunted. This represents an increase of over 150 per cent in participation in just seven years.
- Starting in 1998, turkey hunters were allowed to purchase a second licence. In 1998 there were 4,601 hunters of which 619 purchased a second licence. Correspondingly, in 1999, of the 6,160 individuals who turkey hunted 1,206 purchased a second licence.



Source: 1999 Wild Turkey Survey Summary Report. **Data for 1997 is based on estimates**.

EFFORT



- Despite the increase in participation, success rates have remained relatively constant from 1992 to 1999. In 1992, it is estimated that 461 birds were harvested for a success rate of 16.7 per cent. In 1999, approximately 1,683 birds were harvested representing a 20.8 per cent success rate.

- On average the number of birds 'seen' each year, from 1992 to 1999 while turkey hunting was reported at 6.1 birds per hunter.

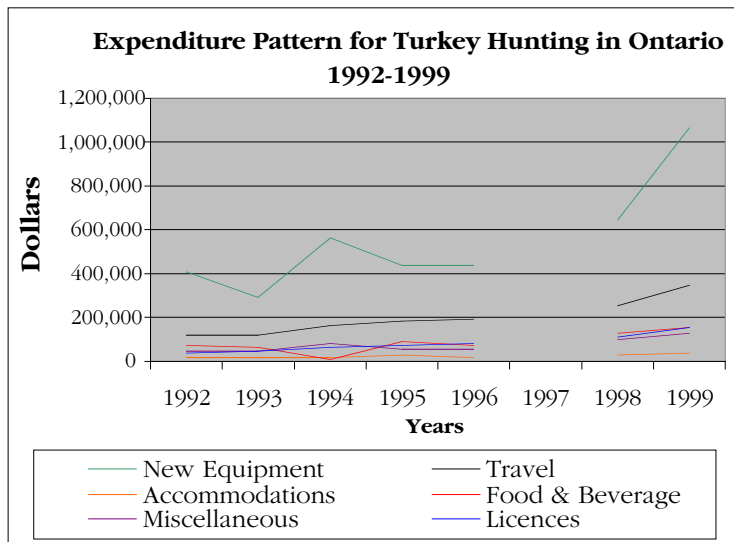
- On average, since 1995, 8 per cent of turkey hunters hunted in more than one WMU.

- In any given year, the average number of 'other-hunters' encountered while turkey hunting is 1.8.

Source: 1999 Wild Turkey Survey Summary Report. **Data for 1997 is based on estimates**.

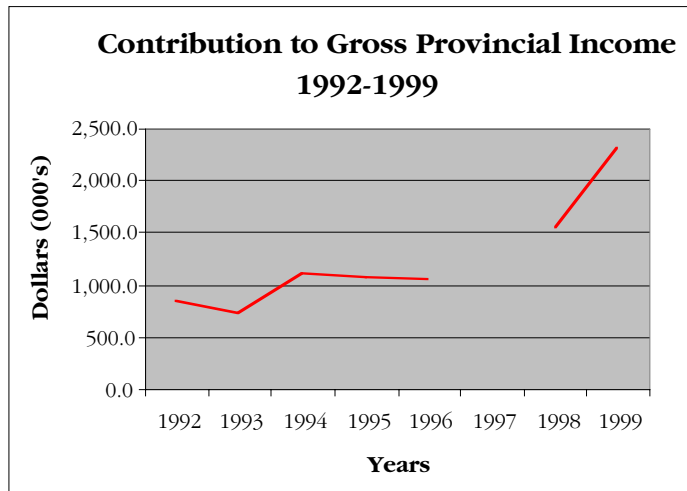
Expenditures

- In 1992, turkey hunters spent roughly \$695,386 on goods and services directly related to turkey hunting. Approximately 58 per cent was spent on new equipment, 17 per cent on travel, 10 per cent on food and beverages, 3 per cent on accommodations, 5 per cent on licences and 7 per cent on miscellaneous items. In 1999, turkey hunters spent roughly \$1,874,792 to hunt. The distribution was similar to 1992 in that, 57 per cent was spent on new equipment, 19 per cent on travel, 8 per cent on food and beverages, 2 per cent on accommodations, 8 per cent on licences and 7 per cent on miscellaneous items.



Source: 1999 Wild Turkey Survey Summary Report.

ECONOMIC IMPACT



- Expenditures made by turkey hunters in Ontario, in 1999, contributed an estimated \$2.3 million to the Gross Provincial Income. Correspondingly, in 1992, the expenditures made by turkey hunters contributed 0.838 to Gross Provincial Income.

- Expenditures on turkey hunting sustained 19.9 person-years of employment in 1992. In 1999, this figure had increased to 46.2 person-years.

Source: 1999 Wild Turkey Survey Summary Report & SEIM Version (4.3).

REVENUE

- In 1999, the sale of turkey licences contributed \$153,533 to the Fish and Wildlife Special Purpose Account.

Source: OMNR, Fish and Wildlife Branch.

CONTACT: For further information concerning the subject matter contained in this fact sheet, contact

Lands and Waters Branch
Conservation and Planning Section
Ministry of Natural Resources
300 Water Street, P.O. Box 7000
Peterborough, Ontario
K9J 8M5

AUGUST 2000 WILD TURKEY FACT SHEET: The information contained in this publication should be used with caution. For further explanations please refer to the Fact Sheet on Caveats.

THE ECONOMIC IMPACT OF TURKEY HUNTING IN ONTARIO, 1999

Lands and Waters Branch Conservation and Planning Section Ontario Ministry of Natural Resources (August 2000)

Abstract: This paper examines the estimated economic impacts derived from the expenditures made in Ontario, in 1999, by turkey hunters. Although these expenditures represent only a portion of the total expenditures spent on recreational hunting in Ontario (in 1996, Ontario resident hunters spent an estimated total of \$200.6 million¹), they provide the basis by which turkey hunting contributions to the economy can be assessed. Turkey hunting is estimated to contribute \$2.3 million to Gross Provincial Income and sustains 46.2 person-years of employment.

ECONOMIC IMPACT ANALYSIS

The goal of economic impact analysis is to measure the economic activity attributable to some activity or event. It is typically measured in terms of gross output or production, value added or income, employment, and tax revenues generated by expenditures made as a result of the activity or event.

Economic impact analysis views the economy as a system of interrelated sectors. The system is driven by the demands for final goods and services. Initial expenditures (eg., by hunters) are generally called the direct costs of an activity and their effects on the economy are **direct effects**. Purchases by suppliers (eg., tourist outfitters, hotel and restaurant owners, charter operators) of the final goods and services of materials and supplies to sustain the original purchases are called **indirect effects**. **Induced effects** occur when workers in the sectors stimulated by direct and indirect expenditures spend their additional income on consumer goods and services. The **direct** plus **indirect** plus **induced** effects equal the **total effect**.

At each step of the spending chain some demand will be directed to goods and services produced outside the immediate economy. Imports of goods and services produced in other provinces and countries are leakages from Ontario's economy. Likewise, at each step of the spending chain some expenditures are absorbed by indirect taxes. Both imports and indirect taxes will reduce the size of indirect effects. Similarly, leakages in the form of direct taxes and household savings limit the size of the induced effects.

¹ DuWors, Elaine, et. al. (1999) The Importance of Nature to Canadians: Survey Highlights. Economics Report (forthcoming), Environment Canada, Ottawa.

In this analysis, the economic impacts of turkey hunting were calculated using the Socio-Economic Impact Model (SEIM Version 4.3) developed for the Ontario Ministry of Natural Resources by Econometric Research Limited and are evaluated in terms of gross output, value added, employment, labour income, and taxes.

Gross output includes the total value of all goods and services sold to sustain turkey hunting. This measure of economic impact is limited as it includes the sales of both inputs and outputs and, therefore, it double-counts a certain amount of economic activity. Value added impacts, which are measured as Gross Provincial Income (GPI), avoids the double-counting problem by including only final goods and services and is, therefore, a more accurate measure of economic benefit. GPI includes wages and salaries, depreciation allowances, interest payments and pretax profits. It does not include indirect taxes that may be built into the prices of goods and services.

Employment impacts are measured in terms of person-years of employment and labour income. The number of employees has been standardized to person-years of employment to account for the variability between industries in the amount of full and part-time and seasonal employees.

EXPENDITURE DATA

Data for this analysis were obtained from the Ministry of Natural Resources 1999 Wild Turkey Hunter Report. Based on a survey of licence holders, the 1999 Mail Survey provides estimates on the number of hunters who turkey hunted in Ontario in 1999, as well as those who purchased a turkey licence but failed to hunt. The report also contains information about the type and amount of expenditures made by hunters that were directly related to turkey hunting.

Table 1
Expenditures Directly Related to
Turkey Hunting in 1999

Expenditure Category	Hunted	Did Not Hunt	Total
New Equipment	\$742,822	\$318,086	\$1,060,908
Travel	\$305,411	\$43,970	\$349,381
Accommodation	\$33,462	\$0	\$33,462
Food & Beverage	\$154,677	\$0	\$154,677
Licences	\$121,523	\$32,010	\$153,533
Other	\$121,277	\$2,192	\$123,469
Total	\$1,357,649	\$364,248	\$1,875,430

Source: OMNR 1999 Wild Turkey Hunter Report.

In 1999, an estimated 8,099 people purchased a turkey hunting licence; however, only an estimated 6,155 or 76 per cent of these people actually hunted turkey, the remaining 1,944 did not. Starting in 1998, turkey hunters were able to purchase a second licence, correspondingly, in 1999 1,206 individuals purchased a second licence.

It is estimated that turkey hunters, both those who hunted and did not hunt, spent \$1.8 million (Table 1) on licences, travel, supplies and services directly connected with turkey hunting in Ontario. Of the total expenditures, those who hunted spent 79 per cent of the dollars. Food and accommodations accounted for 10 per cent of the total expenditures, new equipment 57 per cent, transportation 19 per cent and licences 8 per cent. All other expenditures accounted for approximately 7 per cent of the total expenditures for 1999. On average, those who hunted spent an estimated \$240 while those who did not hunt spent \$204 to hunt turkey in Ontario, in 1999.

ESTIMATED ECONOMIC IMPACT OF TURKEY HUNTING IN ONTARIO

The results of the analysis (Table 2) show that the initial expenditures of \$1.8 million are multiplied into a total sales impact (gross output) of \$4.7 million. In terms of value added (GPI)², the estimated direct-plus-indirect-plus-induced impact of expenditures related to turkey hunting in Ontario amounted to \$2.3 million or 48.9 per cent of gross output. On a per dollar basis, the gross output multiplier is 2.54 and the corresponding value added multiplier is 1.23³.

The estimated direct-plus-indirect-plus-induced impact in terms of employment was 46.2 person-years. Turkey hunters sustain a total of 24.6 person-years of employment per one million dollars of expenditures. A total of \$1.4 million of labour income is paid to persons directly and indirectly associated with turkey hunting. On a per person basis, the average effective (direct) wage is \$29,860 whereas the average wage in the associated sectors is \$28,426.

Tax revenues as a result of the activity totalled \$795,907. About \$444,888 was collected by the federal government, \$284,290 by the provincial government, and \$66,729 by local governments. On a per dollar of expenditure basis, federal, provincial, and local government collected \$0.42.

² Value added (GPI) is the measure of economic impact used to gauge economic benefit.

³ Gross output and value added multipliers are Keynesian type-II multipliers calculated as direct + indirect + induced impacts / initial expenditures.

In addition to tax revenues, the Province of Ontario also receives revenue from the sale of turkey hunting licences. Based on the number of licences sold in 1999, revenue from turkey licence sales totalled \$153,533.

Table 2
Estimated Economic Impact of
Turkey Hunting in Ontario, 1999
(000's & person-years)

Impact Measure	Economic Impact
Initial Expenditure	\$1,875.4
Gross Output	
Direct	\$1,875.4
Indirect & Induced	\$2,896.3
Total	\$4,771.7
Multiplier	2.54
Value Added	
Direct	\$669.3
Indirect & Induced	\$1,634.7
Total	\$2,304.0
Multiplier	1.23
Employment (person years)	
Direct	14.6
Indirect & Induced	31.6
Total	46.2
Multiplier	3.16
Labour Income	
Direct	\$415.0
Indirect & Induced	\$964.5
Total	\$1,379.5
Taxes	
Federal	\$444.9
Provincial	\$284.3
Local	\$66.7
Total	\$795.9

Source: Econometric Research Limited SEIM version 4.3