# The Controversial Aspect of Wildlife Management: Case Studies from Delaware

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*Abstract:* Wildlife agencies are challenged to conserve wildlife populations while supporting a persistent recreational and commercial demand for the resource. Conservation of some populations may require harvest restrictions to prevent over-exploitation. Hunting restrictions are often unpopular and create confrontations between user groups and wildlife agencies. The success of conservation measures, however, rests on shaping public opinion to accept reductions in consumptive use of the resources. I discuss 2 case studies in Delaware regarding confrontational responses to harvest restrictions placed upon 2 popular species, the Northern bobwhite (*Colinus virginianus*) and the Canada goose (*Branta canadensis*). Most sportsmen and conservation groups supported agency actions, while a determined influential minority contested imposed restrictions and worked persistently to eliminate them. Opposition arguments were predicted on 3 common attitudes: provincialism or denial of a resource problem, misunderstanding of information and issues, and a general distrust for biologists and scientific data. Educational mitigation efforts (e.g., seminars, public hearings, increased public involvement in resource planning) and research diffused opposition arguments and generated support for agency action. Delaware examples may provide useful insight for other wildlife agencies facing similar resource management problems.

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Fish and wildlife agencies face many challenges as the 21st century approaches. Foremost will be our ability to maintain viable populations of fish and wildlife. Simplistic in statement and purpose, meeting this challenge will require strategies as complex as the very systems we manage. The complexity lies in developing and implementing creative programs to: 1) arrest the loss and further degradation of habitat resulting from a landscape physically taxed by an expanding human population, 2) manage nuisance wildlife, and 3) prevent over-exploitation of fish and wildlife populations. The key to implementing these strategies rests on shaping public opinion to accept nontraditional management programs and more creative measures to regulate consumptive use of wildlife resources.

We often possess the knowledge and necessary skills to develop sound resource management programs to meet impending challenges. However, we are woefully inadequate in our ability to shape attitudes and perceptions of the people who use the resources. Though often seemingly misguided and misinformed, it is these attitudes that affect the direction, magnitude, and success of management programs. Manipulating or changing people's perceptions and attitudes about resource use, therefore, is a formidable challenge facing resource managers, and one that will test our acceptance as professionals.

At the heart of many resource management conflicts is the dilemma of preventing over-exploitation of fish and wildlife resources. During the past few decades, some fish and wildlife populations, including white-tailed deer, wild turkey, striped bass, and blackbirds, have increased significantly while other populations of fish and wildlife species have declined. In contrast, human demand for the recreational and commercial use of these resources remains high or has increased. Frequently, this demand places resource agencies and consumers in conflict. Confronted with the combination of shrinking and degraded habitat and declining fish and wildlife populations, responsible resource managers must implement programs to reduce the potential for over-exploitation. Conversely, high user demand for limited resources often leads to conflicts between user groups and resource agencies and among user groups themselves (recreational versus commercial and non-consumptive versus consumptive) competing for priority use of a specific resource. Fish and wildlife agencies are left perplexed as to how to satisfy the public's recreational and commercial needs, while simultaneously conserving viable resources. This dilemma is further exasperated by the fact that program success is often dependent upon the financial support and cooperation of the user constituents.

In this paper I will review case studies regarding management of 2 important wildlife species in Delaware. I will provide background relative to the status of the topic species, reasons for initiating management action, and management strategies devised to allocate the resource while protecting its future viability. I also will discuss public participation and identify analogous attitudes, forming the basis of public reaction to both issues. My objective is to provide examples, for use by other conservation agencies, of our attempts to shape public attitude and acceptance for controversial management programs. The case studies I will review involve changes in harvest management strategies for the Northern bobwhite and the Canada goose.

## Case Study 1: Northern Bobwhite

The Northern bobwhite is the most popular upland game bird species hunted in Delaware. At one time, 25% of all licensed Delaware hunters reportedly hunted quail (Whittendale 1993*a*). Located on the northern fringe of the bobwhite's range, Delaware's favorable habitat conditions supported healthy populations of quail through the early 1970s. During that period, hunting sea-

sons were liberalized to accommodate an increased recreational demand for the resource.

Delaware's Northern bobwhite harvest peaked in 1973 with an estimated harvest of 98,202 birds (Whittendale 1993*a*). In the 20-year period since, quail harvest has declined dramatically (Fig. 1). Whittendale (1993*a*) indicates an 80% decline in quail harvest since 1973. The lowest quail harvest (16,822 birds) occurred in 1993 (Whittendale 1993*a*). Applying a trend line to the hunter harvest data suggests that huntable populations of Northern bobwhites may cease in Delaware by the turn of the century (Fig. 1).

The downward trend in the quail population indicated by harvest data also was supported by Audubon Society Christmas bird counts (CBC) and the National Breeding Bird Survey (NBBS). CBC data show a 51% decline in Delaware's quail population over the last 10 years with the highest average annual rate of decline (10.5%) among northern states (Droege pers. commun.). The NBBS indicates a 63% decline in calling males recorded during the last 25 years in the northeastern United States (Droege 1994). Delaware's quail population decline parallels the overall downward trend in quail numbers throughout this species' geographic range (Brennan 1993).

To address this concern, in 1992 the Delaware Advisory Council on Game and Fish developed a special ad hoc committee composed of citizen volunteers and a staff member of the Division of Fish and Wildlife. This committee was charged with 3 functions: 1) coordinate a quail symposium featuring prominent quail researchers, 2) develop a strategic quail management plan, and 3) make management recommendations to the Division. The main focus of the committee was to develop a quail management plan for Delaware. The plan was com-

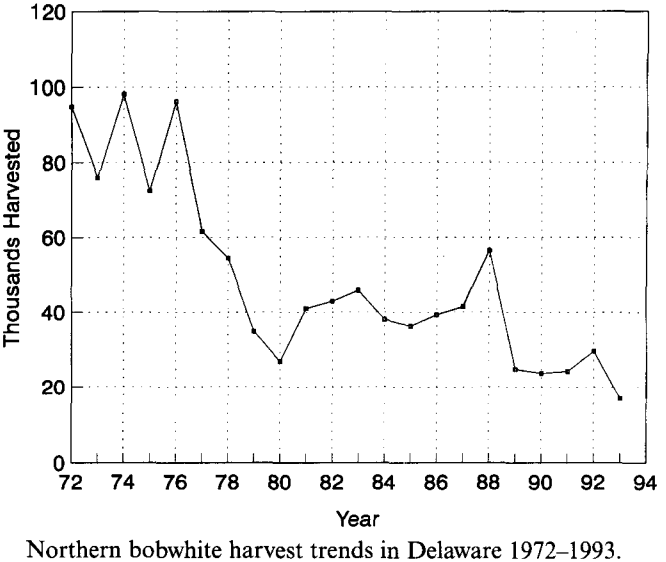


**Figure 1.** Northern bobwhite harvest trends in Delaware 1972–1993.

pleted in 1993 and was patterned after the National Strategic Quail Management Plan (Brennan 1993) and identified the major problem areas affecting quail populations in Delaware with recommended appropriate remedial management strategies. The plan addressed a multitude of issues, most controversial including the additive effect of late season hunting. Since the late 1970s, Delaware's quail season has begun on the Monday of Thanksgiving week and ended on the last day of February. The quail plan eliminated the February portion of the season to curtail late season hunting.

To solicit public comment, the plan was presented at a public hearing and workshops held in each county of the state. Written and oral correspondence also were recorded and incorporated into the final version of the plan. Response to the plan in general was positive, with the exception of the proposal to shorten the season which received a clearly divided reaction. Polarized opinions posed hunter groups against non-consumptive users and against the Division of Fish and Wildlife. The Division's final position was to accept the plan including the recommendation to shorten the season. Despite the opposition, this position was supported by several conservation groups and a substantial number of hunters, landowners, and sportsmen.

The opposing philosophy was espoused by one local chapter of Quail Unlimited and a few influential hunters. They opposed any modification of the quail season and threatened to sabotage the implementation of the entire quail plan if the season were shortened. Their position was based on several allegations. First, they contended that there was not a problem with number of quail because they were still finding sufficient number of birds in the remaining good habitat. Secondly, these individuals questioned the validity of the hunter mail survey, CBC and NBBS data and argued that not only was the hunter mail survey based on too small of a sample (10%), it also did not sample the opinions of "true" quail hunters. They further argued that the CBC data were gathered by bird watchers who did not have the skill or knowledge to identify quail and that the NBBS was invalid because it inventoried quail populations over all prevailing habitat types and not just the best quail habitat. Finally, they contended that the Division should not base remedial strategies using quail research conducted in other states because the results would not apply to Delaware. Additional points they made included that staff biologists could not be trusted to make decisions on quail management because most were not true quail hunters, the Division's position was predetermined prior to the committee's recommendation and represented an impetuous reaction to a perceived problem, predation and habitat loss were the only factors negatively affecting quail populations, and to increase quail numbers the Division only needed to plant more food strips and eliminate predators.

Often, minority opinions can overrule the majority through political intervention. Because of the political power of the opposition, proposed shortening of the quail season had the potential to develop into an explosive issue even though most hunters and environmental groups supported the plan with its

proposal to shorten the season. The Division, however, was able to diffuse the issue by educating many potential opponents by coordinating a major symposium to present current information regarding quail management, precluding political intervention by presenting legislators with a position paper early in the discussion of the issue, conducting several public meetings and a regulatory hearing to solicit public involvement and comment prior to establishing a change in the season, and by committing Division resources to address major recommendations of the quail plan including involving the public in future quail management activities.

## Case Study 2: Canada Goose

Only an occasional visitor until the late 1950s, Delaware's Canada goose population grew from an estimated 10,000 birds in 1959 to a peak mid-winter count of 134,000 in 1977 (Whittendale 1993*b*). This explosion resulted largely from a redistribution of the Canada goose sub-flock that formerly wintered in North Carolina to the Delmarva Peninsula and a high recruitment rate. Concomitant with this population expansion was an increase in the recreational demand for hunting. Economic importance of this species also grew substantially with commercialization of the resource. Millions of dollars were generated annually in the Delmarva Region from land leases for paid guided goose hunts (Eduljee and Mackenzie 1990). Concerns by farmers of crop depredations from an expanding wintering goose flock fueled the commercialization of the resource and formed the basis for requesting more liberal harvest management strategies.

In response to the need to control the expanding goose population, the hunting season and daily bag limits were liberalized. To reduce number of Canada geese wintering in Delaware, the hunting season and daily bag limit were expanded in 1977 to its most liberal level of 90 days with a 4-bird daily bag limit. High mid-winter populations and liberal hunting seasons established the Canada goose as one of the most frequently hunted wildlife species in Delaware in the 1970s and early 1980s. Following more than a decade of intense harvest, the boom in the Canada goose numbers soon turned to a bust.

The Canada goose harvest reached its peak in 1974 with 85,191 birds harvested, but thereafter declined abruptly (Fig. 2). In 1994, the Canada goose harvest had declined by approximately 90% from the 1974 level (Alexander 1994). Mid-winter aerial surveys corroborated the decline (Fig. 2) (Whittendale 1993*b*). Decreases in immature-to-adult age ratios provided further evidence of over-harvesting and poor reproduction. In 1973, there were 3.5 immatures per adult; in 1991 this ratio had shrunk to 0.5 immatures per adult (Hestbeck and Malecki 1989).

In 1982, public concern was raised at the Delaware Game and Fish Advisory Council Meeting regarding what management efforts could be employed to arrest the decline of this economically and recreationally important species.

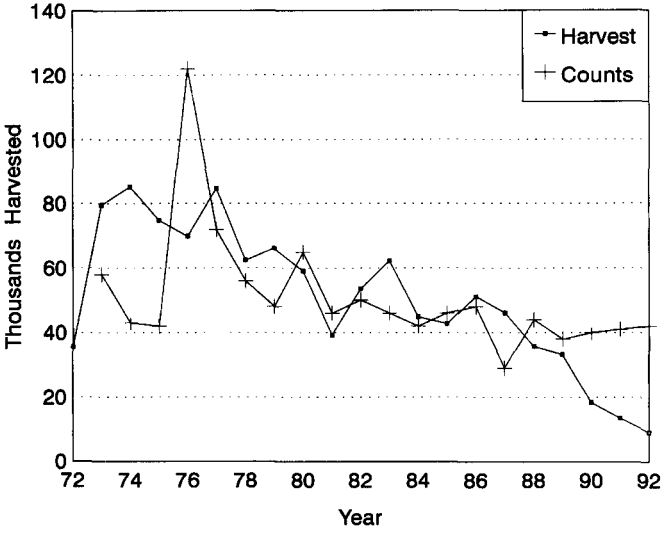


**Figure 2.** Trends in Canada goose harvest and mid winter counts (average for November, December, and January) in Delaware 1972–1992.

From 1986–1988 the Canada goose issue was the main topic of discussion at 12 of 18 regularly scheduled Advisory Council meetings. In 1986, the Division held a Canada goose workshop inviting several noted researchers on the subject. Management of the species traversed state lines as Delaware and Maryland Advisory Councils held joint meetings to devise concurrent strategies. Importance of this issue within the region and concern over the continued decline in the Canada goose stimulated a major neck collaring study initiated in 1983 involving 8 states. Research from this work generated more than 16 scientific papers and 11 reports. The general findings support the following conclusions: 1) the Delmarva Canada goose population was declining, 2) the decline was attributable to over-harvesting and poor reproduction, 3) there was no evidence of any short-stopping or shifting of the Canada goose population away from Delmarva, and 4) Canada geese demonstrated a strong fidelity for the region.

The first hunting restrictions occurred in 1982 when the Delaware Division of Fish and Wildlife, at the request of the Game and Fish Advisory Council, initiated restrictions on off-shore hunting as means of reducing disturbance on resting Canada geese. This restriction was to establish portions of the Delaware Bay as a refuge. Over the next several years, this action was followed by a series of restrictions that would ultimately culminate in the transformation of the once liberal Canada goose season from a 90-day, 4-bird daily bag limit, to a very conservative 26-day, 1-bird daily bag in 1993. The objective of harvest restrictions was to provide maximum recreational opportunity while stopping its decline. To accomplish this goal, harvest had to be maintained below production, until a time when the population rebounded sufficiently to liberalize hunting

restrictions. To meet this objective, the Division also established season guidelines (Alexander 1994) which established a minimum base season and a maximum season depending on the average of the mid-winter counts from the previous 3 years. Future seasons would vary depending on production and adult survival. Intuitively, when numbers are low a conservative base season and bag are employed; when the population increases, the season and bag limit are relaxed.

Harvest restrictions were poorly received by many area hunters. By this time, the Canada goose represented substantial recreational hunting opportunities and a major commercial enterprise. Millions of dollars were generated annually in the Delmarva Region from commercial goose hunting operations. Several issues were raised to discredit the Division's position and preclude hunting restrictions. Actions varied from personal intimidation and heated public arguments, to threats of political intervention. Despite an abundance of information outlining the major issues affecting Canada goose decline, some hunters criticized the methodology of the data collection and denied the Canada goose population was declining. Hunters argued aerial counts missed significant numbers of birds, specifically those birds that flew from their marsh roosting areas to their feeding grounds in Maryland, and thus were absent in the counts. They contended that sufficient refuge areas to protect geese from "excessive hunting pressure" were lacking. They perceived that lack of food for wintering geese resulted in birds not remaining in Delaware and migrating elsewhere to feed. The hunters also contended that competition with an expanding snow goose population was driving Canada geese away from traditional feeding and resting areas and that Delaware geese were being "short-stopped" farther North in a similar manner that Delaware had "short-stopped" North Carolina's flock.

The Division mitigated hunter concerns in several ways. First, the Division participated in a multi-state research project that assessed survival and movement patterns of the Delmarva Canada Goose sub-flock. This action established an objective data base which supported management decisions. Secondly, an aggressive information campaign was employed to educate the public regarding the Canada Goose population status and research findings. This was accomplished by hosting 2 seminars reporting information collected from the multi-state research project and by presenting population data (e.g., mid-winter counts and breeding grounds surveys) at Game and Fish Advisory Council meetings. To further involve the public, several citizens were invited to attend the Atlantic Flyway Council Technical Session meetings. Lastly, the Division developed population guidelines to measure the effect of hunting restrictions. These guidelines provided objective criteria to extend or further restrict the season.

Restrictions are currently showing positive results as preliminary data for the 1994–95 season indicate a modest increase in the Delmarva Canada goose flock, and an improved immature-to-adult ratio in the 1992–93 harvest. The immediate problem is to continue with conservative regulations amidst a bar-

rage of requests to liberalize the season as a result of the rebounding goose population.

## Summary

Public attitudes and scientific data form the basis for decision making in natural resource management. Public attitudes can shape management objectives and influence the course of action. Therefore it is imperative that we understand and address user concerns to gain program support, allay suspicions and engender trust and respect.

Both of the issues discussed in this paper involved declining wildlife populations, a persistent demand for the resource, and establishment of harvest restrictions to protect a species. Harvest restrictions placed upon favored species were unpopular and viewed with suspicion. A vocal minority skeptically regarded our ability to determine the need for action and to devise remedial solutions. My agency was not trusted, and was even suspected of having some hidden agenda or reason for initiating restrictions on a resource.

The overriding opposing thought during our experience was that the resource user or the hunters are the real authorities and the trained scientist the novice. The common philosophy presented was I hunt, therefore I know. This philosophy is enhanced by the human tendency to observe a problem but frequently develop the wrong explanation to account for the observation.

Three common attitudes formed the basis of opposition arguments regarding the confrontational resource issues discussed. Foremost is the attitude of provincialism (e.g., populations are thriving in my area, or where I hunt) or denial. Some consumptive users deny or fail to realize that the populations they pursue are in trouble. In most cases, these individuals can be characterized as the most skillful hunters or those with access to the best habitat in the population. Because of their access and/or skill, these individuals have no trouble finding remaining areas of good habitat, locating their prey and successfully filling their daily bag. Therefore, they are the last ones to recognize the problem. The element of economic self-preservation is another related issue. In species of economic importance, such as the Canada goose, guides or hunters are reluctant to accept restrictions simply because they can significantly affect their income.

The second common attitude involves issues dealing with additive mortality as a result of hunting. Most hunters do not understand the concepts of additive versus compensatory mortality. This is due in part to the fact that some biologists for so many years did an excellent job convincing the public that hunting had no effect on wild populations. Some biologists preached that you could hunt a wildlife population without affecting its standing density or viability. Current literature now indicates that in some cases hunting is additive to total annual mortality and does affect standing density (Curtis et al. 1988, Hestbeck and Malecki 1989, Roseberry 1991). The irony is that common sense would lead a reasonable person to believe that hunting could affect the annual popula-

tion of some heavily used specie, or species that have limited or declining habitat.

The most common attitude expressed in the Delaware issues was a general distrust of the data presented. This stems from a misunderstanding of sampling procedures and statistical inference. Sportsmen commonly think that to evaluate a population, you must count every individual, or in the case of a hunter survey, interview all of the "dedicated" quail or goose hunters. Using data to support management actions is further complicated by the non-acceptance by most hunters of data or research from areas other than their state or locality.

How then do we as resource managers solicit support of the public to implement controversial programs? The answer involves education, structured public involvement, and pure dogged determination. We must exhaust every attempt to inundate the public with the best available scientific information, and present it in a way that is understandable. We must draw upon our knowledge and skills to educate the public concerning program objectives and supporting information. When possible, agencies should fill information gaps with applied and empirical research to achieve policy objectives. Scientific studies alone, however, will rarely overcome opposition opinions which are frequently based upon anecdotal information.

Attempts to convince or change opposing attitudes such as provincialism, ignorance, and distrust will often fail. A more practical strategy is to recognize rival concerns to place objectionable issues in perspective. This approach will enable resource managers to separate controversial elements without jeopardizing rejection of the entire proposed program. Biologist/managers must then address these identified concerns by preparing documentation to support the recommended action, using the best available scientific information.

Upon addressing objectional concerns, resource agencies should implement the appropriate remedial action as the best reasonable alternative based upon available scientific information. Failure to implement proposed programs by adopting the least objectional action, not only will negatively affect the resource but will also weaken credibility. In the end, we must weather the storm of public criticism and be true to our profession. Our final action should involve implementing the best management strategy for the good of the resource, based upon the most reliable available scientific information.

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