PUBLIC COMMENT RESPONSE OF THE

NORTH AMERICAN GAMEBIRD ASSOCIATION
NORTH CAROLINA WATERFOWL ASSOCIATION
SOUTH CAROLINA WATERFOWL ASSOCIATION
GRAND NATIONAL WATERFOWL ASSOCIATION

TO THE FINAL DRAFT OF THE

"REVIEW OF CAPTIVE-REARED MALLARD

REGULATIONS ON SHOOTING PRESERVES"

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I. INTRODUCTION

A. *North American Gamebird Association*

The members of the 72 year old *North American Gamebird Association* (NAGA) are shooting preserve operators and game bird breeders (i.e., quail, pheasants, chuker and ducks) located in Canada, Mexico and the United States. Among its stated goals and objectives, NAGA seeks to "perform, stimulate and promote educational work...[for] the game bird industry and shooting preserve industries" as well as "to afford means of cooperation with federal, state, and local governments in all matters of general concern to the industries." NAGA Bylaws, Art. I, Sec. 3.

In keeping with those goals, this Public Comment is respectfully submitted as for review and consideration on issues regarding the release and harvest of captive-reared mallards within the United States.

The 1,500 plus members of the *North Carolina Waterfowl Association* (NCWA) are waterfowl hunters and conservationists. NCWA was founded in the summer of 2002. NCWA members are dedicated to achieving the mission of the Association to conserve, enhance and perpetuate North Carolina's waterfowl heritage. NCWA staff includes two waterfowl biologists with over 40 years of combined experience.

In keeping with the mission of NCWA, this public comment is respectfully submitted as for review and consideration on issues regarding the release and harvest of captive-reared mallards within the United States.

The 4,500 plus members of the *South Carolina Waterfowl Association* (SCWA) are waterfowl hunters and conservationists. SCWA is 17 years old and is the second largest state waterfowl association in North America. SCWA's Camp Woodie program is the leading youth waterfowl education summer camp program in North America. SCWA members are dedicated to achieving the mission of the Association to conserve, enhance, and perpetuate South Carolina's waterfowl heritage. SCWA staff includes 3 waterfowl biologists, 1 waterfowl education professional and 2 waterfowl management technicians. SCWA's waterfowl management and education staff have over 50 years of combined experience.

In keeping with the mission of SCWA, this public comment is respectfully submitted as for review and consideration on issues regarding the release and harvest of captive-reared mallards within the United States.

The Grand National Waterfowl Association (GNWA) is located in Dorchester County, Maryland. It's 1200 members and participating landowners have released over 2.6 million mallard ducks since 1982.

B. Federal Regulations

The question of what impact, if any, the release of captive-reared mallard ducks has on migratory waterfowl has been an issue since the early 1990's. In 1993, the Fish & Wildlife Service (FWS) of the U.S. Department of Interior (DOI) published a Notice of Intent (NOI) in the *Federal Register* (Fed.Reg.) indicating that a review would be undertaken of the regulations regarding the release of captive-reared mallard ducks (*Anas playrhynchos*) and the subsequent harvest by hunting on licensed shooting preserves. 58 Feg.Reg. 31247, *et seq*. (June 1, 1993); 50 CFR § 21.13. The review was to be undertaken after the completion of certain studies. In August 2001, the FWS announced in the *Federal Register* that it would continue the review. 66 Feg.Reg. 45274, *et seq*. (Aug. 28, 2001). Pursuant to a *Federal Register* Notice in August 2003, the FWS advised "that a Final Draft of a review of the regulations pertaining to the release and take of captive-reared mallards on licensed shooting preserves" was available for public review. 68 Feg.Reg. 51231, *et seq*. (Aug. 26, 2003).

II. BACKGROND

A. Historical Waterfowl Populations

The earliest history of ducks in North America comes from along the Atlantic Coast, though from the time of European settlement. From that time to today there has been continuing decline in waterfowl populations.

The earliest accounts found in ship's logs, diaries and letters, described an Eastern Seaboard awash in ducks that erupted in enormous flight from marsh and bog, river and lake, cove and bay.

British Captain Christopher Levett sailed into Maine's rock-strewn, island-studded Saco Bay in 1632 to discover a "world of fowl." He described the birds as so innocent of the ways of man that the crew quickly killed a great number and then went ashore to feast on "crane, duck and mallard with other fowl, both boiled and roasted."

Thomas Morton, a Pilgrim at Plymouth Colony on the Massachusetts Coast, found "pied ducks, gray ducks and black ducks in great abundance." In the Dutch settlements along the lower Hudson River where New York City now stands, Nicolas Van Wassenaer reported local waters supported "all sorts of fowls, such as cranes, bitterns, swans, geese and ducks."

Captain Philip Amidas in 1584 entered North Carolina's Pamlico Sound, an expansive, shallow estuary bounded on the east by the shifting sands of the capes and on the west by low-lying cypress swamps, to gaze upon "fowl, even in the middest of summer, in incredible abundance."

South Carolina rice planter, Duncan Clinch Heyward, in his book "Seed from Madagas-

car" reported that "the reason why the planters before the Civil War did not care for duck shooting was that these birds were then so plentiful in their fields, and hence so easily killed."

French Captain Rene Laudonniere described Florida's sounds and inlets as teeming with "an infinite sort of all wildfowl."

These accounts reveal an abundance of ducks the length of the Atlantic Coast, but one region ultimately came to be viewed as preeminent — the mighty Chesapeake Bay, a major waterfowl wintering ground that would become the cradle of American wildfowling. Its modern history began with Captain John Smith, who in 1607 founded along the bay shore the nation's first permanent settlement at Jamestown, Virginia.

Smith wrote that in winter on Chesapeake Bay "there are swans, cranes, geese and ducks aplenty," an observation that reflected both abundance and the migratory nature of our continental wildfowl. Another settler, William Strachey, described the bay as "covered with flocks of wildfowl ... in such abundance as are not in all the world to be equaled."

But these reports fail to provide the full flavor of the Chesapeake's pristine bounty.

Marylander George Alsop wrote in 1666 that in early September on Chesapeake Bay ducks "arrive in the millionous multitudes" and "beleaguer the borders of the shore with their winged dragoons." His flowery prose might suggest poetic exaggeration. But Robert Evelyn, a fellow Marylander of the same era, witnessed a single flight of ducks at the head of the bay that he estimated to be a mile wide and seven miles long. And Henry Danckaert in 1680 came upon a Chesapeake Bay cove so tightly packed with ducks the resting flock resembled "a mass of filth or turf."

This abundance of ducks was not to continue unabated. Increasing human settlements produced a small army of subsistence, market and sport gunners who sought "food on the wing." By the mid-1800s Elisha Lewis, a Philadelphia physician and sportsman, observed that "the Chesapeake Bay shore, long before the dawn of day, for miles and miles, is alive with shooters; and every passing point is occupied with eager marksmen...." The growing number of hunters produced an increased kill — and a decline in wintering ducks, especially the once teeming flocks of canvasback, the bay's most celebrated species.

The disappearance of ducks was not limited to Chesapeake Bay. Concerned sportsmen in others states along the Atlantic Flyway complained of diminishing flights. They urged passage of laws to protect ducks from over-shooting. In 1916 the United States and Canada signed the Migratory Bird Treaty that gave the federal government authority to regulate waterfowl hunting that was implemented in the United States by the Migratory Bird Treaty Act. Aug., 16, 1912, 39 Stat. 1702, T.S. No. 628; 16 USC §§ 703-712. Although market hunting was banned, spring shooting was outlawed and annual seasons and daily bag limits were established for sport hunters, even these needed actions failed to halt the decline.

In the 1930's biologists began documenting and investigating the causes of the diminishing fall flights not only on the Atlantic Flyway, as well as the other flyways. The combination of scientific investigation and annually adjusted restrictive hunting regulations came to be known as "waterfowl management." Although a positive and needed step, the the efforts, at best, only slowed a continuing decline in waterfowl populations.

Winter surveys documented the steady decline in numbers of ducks within all flyways. [See census reports on Atlantic Flyway below].

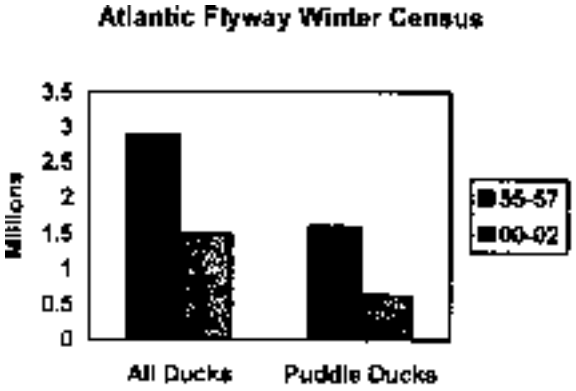

Figure 1. Winter surveys reveal the number of ducks in the Atlantic Flyway from 1955-57 to 2000-02 fell from an average of 2.9 million to 1.5 million, while puddle ducks dropped from 1.6 million to 623,000. Source: USFWS.

As the data reveals, the "all duck" total fell from an average of 2.9 million in 1955-1957 to 1.5 million in 2000-02, a drop of forty six percent (46%). The number of puddle ducks during the same time period fell from 1.6 million to 623,000, a decline of sixty percent (60%).

Chesapeake Bay flocks fared even worse, as is reflected in the following graph.

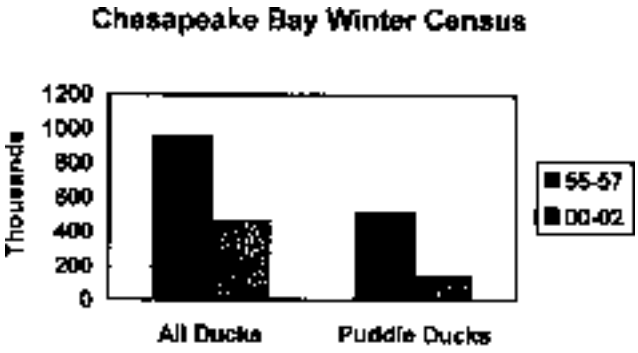

Figure 1. Winter surveys of Maryland and Virginia disclose that from 1955-2002 the average "total duck" population fell from 955,000 to 465,000, while puddle ducks dropped from 512,000 to 138,000.
Source: USFWS.

For example, the winter censes data shows the Chesapeake Bay's wintering population of all species fell from an average of 955,000 in 1955-1957 to 465,000 in 2000-2002, a decline of fifty-one percent (51%), while puddle duck numbers dropped from 512,000 to 138,000, an alarming seventy three percent (73%) decline.

These declines were not shared equally by all species. Waterfowl management in the 1970's became especially concerned about declining numbers of black ducks, a popular species among East Coast water fowlers.

Yet, by any measure, the overall losses for both the Atlantic Flyway and other flyways stand as stark testimony to waterfowl management's historic failure.

B. Management and Hunter Response

In response to declining numbers of ducks, waterfowl hunters in Maryland in 1982 began raising and releasing captive-reared, free-flying mallards. The releases did not represent a new phenomenon. Various states, duck clubs and individuals along the Atlantic Flyway had been releasing ducks into the wild since the early 1900's in an effort to augment diminishing wild populations. The distinguishing characteristic of Maryland releases was one of scale. A total of 2.6 million mallards have been released since 1983.

These free-flying mallards not only filled the skies over hunters' blinds, but allowed hunters to satisfy their bag limits on successful hunts.

The success of Maryland's program prompted other individuals and organizations along the Atlantic Flyway to begin releasing free-flying mallards.

In response to a more than 75% decline in historic wintering mallard numbers, the *South Carolina Waterfowl Association* began an experimental mallard release program in 1994. In that year 6,300 mallards were released on 16 experimental sites. Since then the program has expanded to 106 sites that released 51,200 mallards during the summer of 2003. Since the program's inception over 270,000 mallards have been released.

In response to declining numbers of wintering mallards and the success of the Maryland and South Carolina release programs, the North Carolina Waterfowl Association began releasing mallards in 2002. In 2002, 12,300 mallards were released on 23 sites. In 2003, 29,120 mallards were released on 42 sites.

III. THE DEBATE

The release of free-flying Mallards has caused some biologists to express concern about potential biological problems, including the displacement of beleaguered Black ducks, mallard-black duck, mallard-mottled duck hybridization and disease outbreaks. The issues were detailed in August 2003 in a FWS document entitled "Review of Captive-Reared Mallard Regulations on Shooting Preserves." This set the stage for the current biological debate, that is addressed in the following comments.

A. Displacement, Hybridization and Disease

1. Hybridization

No species plays a greater role in the mallard-release debate than the black duck (Anas Rubripes), a species that once reigned supreme among waterfowl hunters along the Atlantic Flyway. The large, dusky-plumaged duck — a cousin of the mallard - inhabited tidal estuaries, inland marshes and beaver bogs. Its wariness made it a challenging quarry for hunters who wanted to rigorously test their hunting skills.

From Ontario eastward to the Atlantic Coast, from the Canadian forests southward to Georgia, the black duck was the most sought after species, often ranking number 1 in the bag of mid-century Atlantic Flyway wildfowlers.

But winter surveys revealed the black duck was a troubled species. The annual surveys disclosed a gradual, steady population decline.

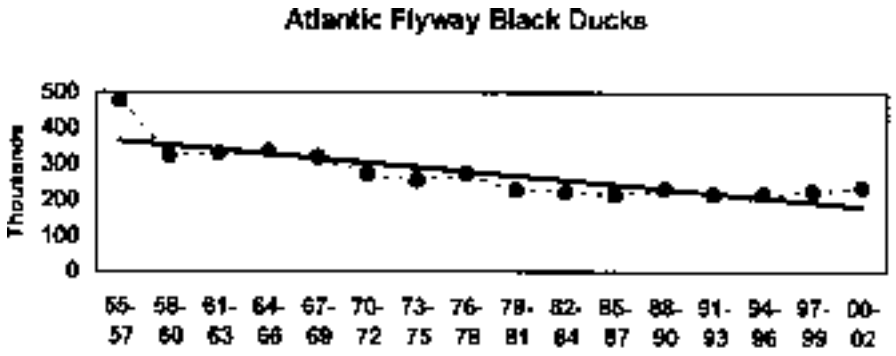

Figure 3. Winter surveys reveal Atlantic Flyway black duck populations have declined from an average of 476,000 in 1955-57 to 236,000 in 2000-02. This represents a 50 percent decline.

Source: USFWS

Initially, the cause of the decline was thought to be over-harvest. A successive series of investigations beginning in the late 1960's found that, as stated by a 1980 FWS study group, "declining numbers of black ducks are primarily the result of annual mortality that exceeds production. Most of that mortality is related to hunting."

Authorities attempted to reverse the decline beginning in the 1960s by reducing the daily bag limit from four to two. When this failed to halt the downward trend, authorities reduced the daily bag limit to one and restricted the number of hunting days. These, too, failed to reverse black duck 's decline.

The popular press eagerly trumpeted this biological indictment, especially the eastward invasion of mallards that purportedly displaced black ducks from their traditional breeding haunts. The mallard thus became the bogeyman in the debate over how to restore the black duck to abundance.

The pertinent inquiry is whether this is a valid biological indictment?

1. The Displacement Hypothesis

The displacement hypothesis largely stems from biological investigations in southern Ontario. A summary is found in Meredino, et al., 1993:

"Historically, American black ducks were common breeders in most of southern Ontario, but the region is now dominated by breeding mallards. In southern Ontario, mallards increased 600 percent between 1951 and 1971, while black ducks decreased 51 percent (Collins 1974). From 1971 to 1985, mallards increased another 51 percent, while black ducks decreased 38 percent (Ankney, et al., 1987)."

No one disputes this change in the make-up of southern Ontario's locally nesting ducks. But to suggest, as frequently occurs, that this localized build-up of mallards is representative of the entire flyway, and causing the displacement of black ducks from traditional haunts throughout its eastern range, is grossly misleading, as evidenced by winter surveys.

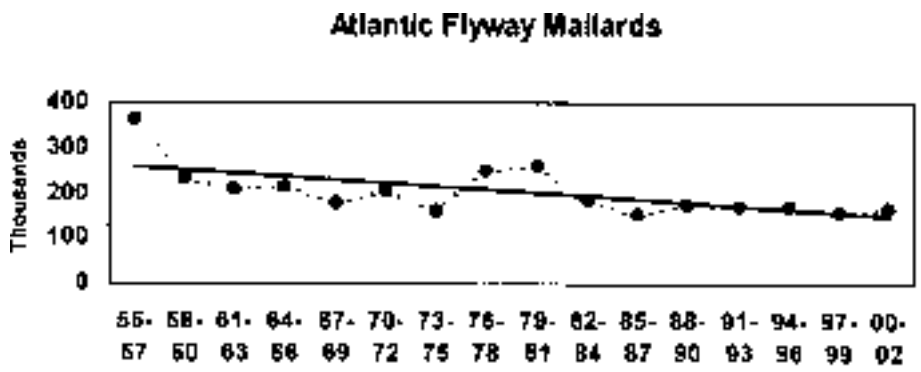

Figure 2. Winter surveys disclose a steady decline from 1955-2002 in the number of wintering mallards along the Atlantic Flyway. Biologists counted an average of 367,000 mallards from 1955-57. This total fell to 165,000 during the years 2000-02, a decline of 55 percent.

Source: USFWS.

As can be seen by the trend line, the winter mallard population in the Atlantic Flyway has steadily declined since the mid-1950's. This is contrary to many popular accounts that suggest an explosive growth of Atlantic Flyway mallards during the past half century.

Moreover, the data reveals mallards are declining at a faster rate than black ducks. As you can see in the two graphs (Figs. 1 and 2), winter mallard numbers have declined fifty five percent (55%), compared to fifty percent (50%) for black ducks.

Left unanswered in the mallard displacement hypothesis debate is how a declining mallard population can increasingly displace native black ducks throughout the latter's breeding range.

Waterfowl biologist Norman Seymour of St. Francis Xavier University adds a further note regarding the displacement hypothesis:

Displacement involves one species preventing the other from occupying a particular location, even preventing it from reproducing. The main evidence for this in the current debate involved research in southwestern Ontario where mallards occupied breeding habitat formerly used exclusively by black ducks. The researchers assumed mallards had displaced the black duck. Implicit in this was the assumption that mallards were preventing black ducks from breeding with an

obvious impact on the population.

"We know that mallards can exclude black ducks from breeding sites, but the reverse is also true. Furthermore, for this behavior to have a negative impact on the excluded pair (of either species) it must be shown that the excluded pair is unable to breed elsewhere. It must be demonstrated that breeding sites are limited and that black ducks and mallards are competing for these sites. No study has ever demonstrated that this is happening.

Moreover, no study has suggested pond-reared released mallards that survive the gunning season are displacing breeding black ducks in Maryland, the home site of today's largest mallard-release programs.

All of this suggests the correctness of Walter Crissey, the former Chief U.S. Fish and Wildlife Service biologist, who in 1976, presciently stated:

Much has been said lately about the increase in mallards in the east and the possibility that mallards are pushing blacks out of portions of their breeding range. However, it seems evident that within the black duck population as a whole the reproductive rate is very high. This suggests to me that although mallards are nesting now in portions of the black duck breeding range where they were not present before, that there is no evidence as yet that the presence of mallards is inhibiting the ability of blacks to reproduce.

Since Crissey wrote these words, the Atlantic Flyways winter mallard population has further declined, falling from 278,467 in the winter of 1976-77 to 133,237 in 2002-03. This represents a drop of fifty two percent (52%) percent.

In a study performed by Rohwer and Smith, LSU, 1991, Maryland, Rohwer and Smith reported:

Do Mallards use up vital resource from Black Ducks?

Mallards and Black Ducks are genetically and ecologically very similar, so there is plenty of potential for competition. However, the evidence for competition is not particularly strong. First we will focus on events during the breeding season. The eastern expansion of breeding populations of Mallards has been mirrored by an eastern retreat for breeding Black Ducks in Ontario and Quebec. The concomitant population changes may reflect the outcome of competition for breeding habitat, with Mallards as the clear winners (Ankney et al. 1987, Merindino et al. 1993). We agree with that assessment, but we note that it is difficult to rule out the alternative idea that habitat changes in southern Ontario were favorable to Mallards and made the habitat unsuitable for Black Ducks. In this scenario competition plays no role in the Black Duck population changes.

Assessing whether mallards and black ducks compete for limited resources where they share wintering sites is even more difficult than on breeding areas. There is essentially no data to

directly assess competition in the winter."

Thus, in the absence of scientific evidence, the displacement hypothesis can be dismissed as a significant factor in the long-term decline of Atlantic Flyway black ducks.

2. The Hybridization Hypothesis

A second biological concern involves hybridization. Critics of the mallard-release program suggest growing numbers of captive-reared mallards increasingly interbreed with black ducks and mottled ducks, threatening their genetic integrity.

As Seymour explains, "hybridization can occur as a result of (1) forced copulation (rape) and (2) mixed pairing in which a male and female of two different species reproduce. Both phenomena occur in wild populations and local/regional increases in hybrids and mixed pairs are documented.

Mixed pairing between mallards and black ducks occurs more often than in any other two species of North American ducks. However, there is no compelling, certainly no conclusive evidence, showing that mixed pairings are having a negative impact on any black duck population.

Furthermore there is no evidence that released mallards negatively impact wild mallard populations through interbreeding or from competition for habitat requirements."

The hybridization hypothesis can be further examined by comparing historical hybrid harvest rates (the percentage of hybrids in the combined kill of mallards, black ducks and mallard-black duck hybrids) along the Atlantic Flyway.

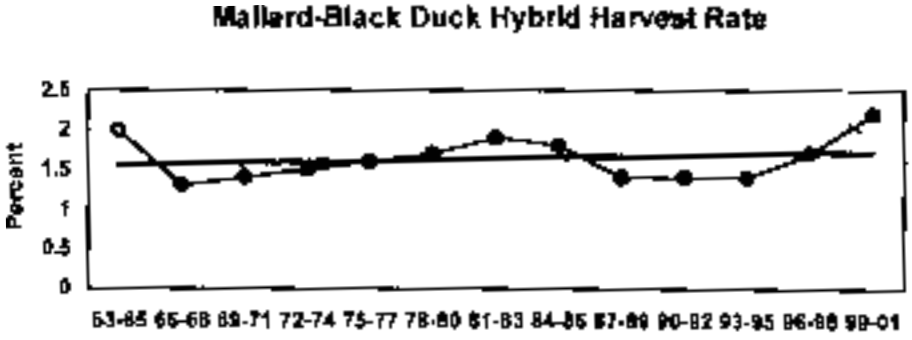

Figure 4. The harvest rate of mallard-black duck hybrids has remained virtually constant over the years despite the release of increased numbers of free-flying captive-reared mallards since 1983. Hybrids in the mallard-black duck-hybrid bag averaged 1.63 percent from 1963-83 and 1.65 percent from 1984-2001. Source: USFWS.

As can be seen, the release of pond-reared, mallards has not triggered a significant increase in the harvest rate of mallard-black duck hybrids among eastern seaboard hunters.

In Maryland, which hosts a significant number of breeding black ducks, the hybrid rate also has remained constant. The percentage of mallard-black hybrids in the combined mallard-black-hybrid bag averaged 1.48 percent from 1961-1985 and 1.57 percent from 1986-2000, a statistically insignificant increase during a period in which over 2.5 million mallards had been released.

A secondary issue involves released mallards interbreeding with wild-strain mallards, altering the genetic make-up of the latter and reducing "fitness under natural conditions to populations of wild mallards" (USFWS, 2003). However, the FWS accurately admits this concern is "largely speculative." The FWS stated that "The flow of genes from captive-reared to wild mallards, and thus the likelihood of introducing 'nonadaptive' traits to wild populations, depends in part on the extent of interbreeding between the strains."

An examination of the data clearly does not suggest increased, widespread interbreeding between wild and released mallards since the large-scale Maryland releases began in the mid-1980s. Wing surveys do not show a significant increase in the percentage of ducks in the bag that display the plumage characteristics of hand-reared mallards.

The data of the FWS reveals the percentage of hand-reared mallards in the Atlantic Flyway bag averaged 1.7 percent from 1961-1985 and 1.8 percent from 1986-2000. This information would indicate that both flyway-wide and site-specific harvest data do not suggest that black ducks or wild-strain mallards have been threatened by hybridization resulting from Maryland's long-term, large scale releases.

In the Rohwer and Smith 1991, it was reported:

There is absolutely no doubt that hybridization poses a serious threat to Black Ducks (Johnsgaurd 1967, Heusmann 1974). The fraction of Black Ducks that are hybrids with at least partial Mallard ancestry ranges from 10% to almost 50% (Morgan et al. 1984, Smith 1999). The concern is that far more abundant mallards will eventually hybridize Black Ducks out of existence (Rhymer and Simberloff 1997). The pressing management issue is whether releases of mallards exacerbate the hybridization problem. It seems logical that releasing captive-reared Mallards in areas with Black Ducks would increase hybridization rates. However, data from Maryland's or South Carolina's long-term, large scale releases, or North Carolina's short term, large scale releases do not readily support this idea.

Maryland has a long tradition of large scale releases of Mallards (Hindman et al. 1992), with numbers approaching 100,000 in peak years (Smith & Rohwer 1997). When we initiated research in 1991 we expected, based on published work (Brodsky & Weatherhead 1984), to encounter frequent pairings between captive-reared drake Mallards and wild Black Duck females. However, in three years we examined 492 Mallard and 159 Black Duck pairings and saw few mixed species pairs (Smith 1999). Three Black Duck females had paired with male Mallards.

The single drake Mallard that we could positively identify was of wild origin. Three female Mallards paired with males that were Mallard-Black Duck hybrids. The only female of those three with known origin was a wild bird. Our pairing data suggest that mixed species pairings are only 1.6% for Black Ducks, but harvest data reveal that at least 8.4% of Black Ducks are actually Black Duck-Mallard hybrids (Smith 1999). This suggests that mixed species matings are more common than winter pairing behavior suggests. Perhaps repairing or forced copulation at northern breeding sites (Seymour 1990, E'Eon et al. 1994) explain the discrepancy between the low occurrence of mixed species pairs in the winter in Maryland and the actual frequency of hybrids. Our pairing data clearly contradict the findings of Brodsky and Weatherhead (1984), which suggest that as soon as the last female Mallards had paired the remaining unmated drake Mallards would then intensively court and form mixed species pair bonds with hen Black Ducks (Brodsky et al. 1988).

Telemetry studies showed that released Mallards rarely moved more than a few miles during the 6 months after release, during which time there was about eighty percent (80%) mortality (Smith 1999). Pairing data revealed that captive-reared mallards preferentially mated with other captive-reared birds; likewise wild birds preferentially mated with wild Mallards (Smith 1999). This means that most captive-reared Mallards in Maryland were shot or died long before the breeding season (see also, Soutiere 1989, Hindman et al. 1992), they rarely moved far from their release site and the great majority of the time were on intensively managed Regulated Shooting Areas (Stanton et al. 1992, Smith 1999), and they preferentially form pairs with other released Mallards. Accordingly, there is little probability that Mallards released in Maryland increase the rates of hybridization with Black Ducks. Mallard releases in other eastern states have resulted in greater dispersal. For instance, thirty one (31%) of band recoveries from Mallards released in Pennsylvania were from out-of-state (Dunn et al. 1995).

In summary, intensive research on Maryland's eastern shore revealed almost no information to suggest that the large-scale state and private releases of captive-reared mallards cause serious problems for black ducks by increasing hybridization rates or facilitating competition. Of course, the situation with released Mallards is quite different in North and South Carolina, but it is also clear that wintering Black Ducks are far less abundant than in the Chesapeake Bay wetlands. Concerns over the possible adverse impact of Released Mallards on Black Ducks could easily be addressed in North and South Carolina, by studying pair formation during the winter and spring months.

Similarly as reported by Dr. Norman Seymour (St. Francis Xavier College, Nova Scotia): Black ducks are late migrators from Canada and its maritime provinces. During this late migration period most have reached the "paired" status by the time they arrive at the wintering ground. Because they have already bonded, it is highly unlikely that released mallards would have any

effect on hybridization with migratory black ducks. Further, all ducks have an affinity to pair with the same species with which they were raised (Cheng et al. 1978).

Raised for release mallards also tend to have a late pair-bonding character. Thus, time of pair bonding being delayed would greatly decrease the possibility of release mallards pairing with migratory mallards.

Correspondingly, hybridization of mottled ducks with released mallards is highly unlikely. Mottled ducks have extremely long pair bonds (pairing for life or very close to it). They have the longest pair bonds of any North American duck and, thus, the "window of time" when they would be susceptible to mating overtures of a mallard would be brief making cross breeding highly unlikely. (Seymour 1993).

Presently, there is an on-going study "Atlantic Flyway American Black Ducks and Mallards — Population Genetics" being conducted by the Delta Waterfowl Foundation, by Dr. Serge Laviviere, Scientific Director, and Ryan Harrigan, Ph.D. candidate, Boston University.

A study of black duck and mallard hybridization was initiated in May of 2001. To resolve historical relationships among black duck populations and those of other North American "mallard" species (including mottled ducks (Anas fulvigula fulvigula), Mexican ducks (Anas diazi), and mallards), Ryan Harrigan, under the supervision of Dr. Mike Sorenson (Boston University), is developing a variety of nuclear and mitochondrial genetic markers. Ultimately, the goal of this study is to sequence mtDNA and type a number of nuclear microsatellite markers from at least 200 individuals of each species (mallards, black ducks, and mottled ducks), thereby providing insight into their population dynamics and interactions.

To date, Ryan has:

1. Collected over 1,100 samples from the U.S. and Canadian "WingBees." Currently in the process of obtaining additional black duck and mallard samples from the Canadian Wildlife Service in Ontario and the Atlantic Region. Working on establishing contacts to sample museum samples to examine genetic changes in mallards and black ducks over the last century.

2. Sequenced the mtDNA control region for representatives of all "mallard" species worldwide to produce a phylogeny or evolutionary tree for this group. Thereby providing a historical framework for more detailed analyses of North American populations.

3. Collected DNA sequence data for 189 individual birds, representing mallards, black ducks and hybridized individuals. Dr. McCracken (University of Alaska, Fairbanks) will provide information on Alaskan and Asian mallards.

4. Optimized a number of previously published nuclear microsatellite markers for use with mallards, black ducks, and related species. Sequenced an intron of 12 nuclear genes for several representative mallards and black ducks. One of these, intron 6 of theornitine decarboxy-

lase (OD) gene, was sequenced for 8 individual birds to provide a nuclear genetic marker comparable to the mtDNA data.

5. Investigating the use of SNP's (sincle nucleotide polymorphisms) to distinguish mallards and black ducks, and provide an additional measure of the rate of hybridization.

6. Presented the results of preliminary analysis at the Delta Student Symposium (July 2002) and the North American Ornithological Conference (September 2002).

A good example of how important genetic work is can be seen in recent molecular population genetic studies on the mottled duck that have proven valuable from both a phylogenetic and conservation standpoint. A preliminary analysis of the data collected in this study of black duck genetics suggests that Ryan's study will provide equally informative results for understanding the dynamics of mallard and black duck populations in the Atlantic Flyway. Unlike previous genetic studies that have found few useful genetic markers, Ryan has identified substantial variation that is differentially distributed between mallards and black ducks in both the mitochondrial and nuclear genomes. His previous finding supported the existence of two distinct halotypes within North American mallards, with only one of these halotypes being present in the black duck, mottled duck and Mexican duck. Additional data indicates that at least some black duck/mallard hybridization involves male black ducks and female mallards, contrary to conventional belief that it is male mallards that breed with female black ducks. Similar results have been obtained using sequences of the nuclear OD gene, which shows substantial variation and differences in gene frequencies between mallards, black ducks, and mottled ducks. With the development of additional nuclear markers and sampling of museum specimens, it is anticipated that the analysis of "composite genotypes" will be a powerful tool for evaluating the effects of hybridization of black duck populations over the last several decades.

The population dynamics of the American black duck and other Atlantic Flyway species are a crucial component to the management and conservation of these valuable ecological resources. An understanding of both current and historical genetic structure generated by this project, combined with previous studies of behavior, ecology, and productivity, will ensure that management decisions aimed at guaranteeing the long-term survival of the black duck will be based on the best possible information.

Given the success of the work to date and the expanded scope of the project (both in terms of the number of samples and the amount of genetic work to be done), Ryan Harrigan has extended the completion date of his study to the Spring of 2004.

This study could also be used to determine if mallard ducks have genetic variation and may find out if eastern mallards are genetically the same as western and mid continent mallards. It may also discover that variations of genetic modeling varies among the same geographic

mallards. Certainly, it will add a new database to waterfowl management to determine if there is a possibility of "genetic sampling" between various genetically different mallard ducks.

In conclusion, after more than a quarter-century after the first speculations regarding displacement and hybridization, no scientific studies have proven these factors have played a significant role in the decline of black ducks or accelerated hybridization rates between mallards and black ducks and mottled ducks or release and wild strain mallards.

3. Disease

Perhaps the most controversial elements of waterfowl management is one of disease. Major concern has been presented about the potential of released ducks introducing disease into the wild population. The major disease of concern is "duck virus enteritis" or duck plague. There are two elements of threat when considering the potential for disease. First is the risk of introducing diseases into migratory waterfowl, and secondly, is the possible impact on migratory waterfowl populations.

There are four diseases which are generally regarded to be the most important in wild waterfowl: lead poisoning, botulism, avian cholera and the previously mentioned duck plague (Wobeser, 1997). Lead poisoning, avian cholera and botulism, already have been identified in wild waterfowl and will not be addressed in this Public Comment.

Duck plague is a contagious viral disease that affects only waterfowl. It was first diagnosed on North America in commercial peking ducks on Long Island, New York, in 1967, but soon was reported in captive avicultural and free-flying wild waterfowl in the area (Leibovitz, 1968). In 1973, an outbreak at Lake Andes, South Dakota, killed an estimated 42,500 waterfowl, primarily mallards, out of a total population of 163,500 (Pearson and Cassidy, 1997). Studies conducted during that outbreak showed that up to 31% of the survivors had been exposed to duck plague virus, and band returns showed that mallards from Lake Andes disperse to 26 states and four Canadian provinces in all four flyways (Pearson and Cassidy, 1997). Despite this massive infusion of duck plague carriers into wild waterfowl populations across the continent, the only outbreak reported in wild waterfowl since then occurred in 1994 on the Finger Lakes in New York, where an estimated 1,200 waterfowl died (Wobeser, 1997). Several isolated duck plague mortalities also have been reported in wild waterfowl, and an average of about four outbreaks with mortalities averaging 39 birds per year were reported in non-migratory waterfowl from 1967 to 1995 (Converse and Kidd, 2001). The total reported losses of migratory waterfowl from duck plague since 1967 are approximately 45,000 (Pearson and Cassidy, 1997). To put this into perspective, these total reported losses of migratory waterfowl from duck plague over the past 34 years are equivalent to about 0.1% of the total annual mortality in a continental population of 80,000,000 ducks.

A study by the National Wildlife Research Health Center of non-migratory waterfowl in the Chesapeake Bay area of Maryland in 1998 using a newly developed polymerase chain reaction procedure showed high rates of duck plague infection in private flocks, in free flying non-migratory waterfowl and in waterfowl raised and released for hunting (Anonymous, undated). The study did not include migratory waterfowl from the area, but with the high prevalence of infection in these other groups with which they frequently associate, there can be little doubt that duck plague is present in migratory waterfowl populations, as well (Wobeser, 1997).

The NWRHC study demonstrates two things. Firstly, with the high prevalence of duck plague in free-flying non-migratory waterfowl in the area, the only way that infection could be prevented in captive-reared waterfowl would be to vaccinate them before they have an opportunity to become exposed.

Secondly, the relative paucity of duck plague outbreaks reported in Maryland [29 from 1967 to 1995, most involving muscovy (Caairina moschata) ducks]. (Converse and Kidd, 2001) in the face of this high prevalence of infection in non-migratory waterfowl in the area indicates that the duck plague virus strains circulating in those populations are of low virulence and pose little threat to migratory waterfowl. In fact, it is likely that these low virulence virus strains are producing natural immunity to more virulent duck plague virus strains in both non-migratory and migratory waterfowl.

Five conclusions can be drawn regarding the threat posed by captive waterfowl for introducing diseases such as avian cholera and duck plague into wild waterfowl populations.

Firstly, the risk is minor in comparison with the risks posed by chronically infected carriers already present in those populations and in other non-migratory waterfowl with which they commonly associate;

Secondly, in the unlikely event that captive-reared waterfowl should introduce diseases into wild waterfowl populations, the probability of major outbreaks occurring is extremely low;

Thirdly, even if disease outbreaks were to occur from such introductions, they would pale in comparison with the losses from non-contagious diseases such as lead poisoning and botulism;

Fourthly, the impacts of such disease introductions on migratory waterfowl populations, if they should occur, would not be significant; and

Fifthly, any concerns about the introduction of duck plague into wild waterfowl populations could be minimized by vaccinating captive-reared waterfowl before they are released.

It remains that even the new method of determining duck plague found infection in released mallards, there has never been an outbreak of duck plague involving the large release programs in Maryland, South Carolina, North Carolina or Alabama. In fact, there has not ever been a suspected case in those states among the participating release farms. It should also be

stated that in 1993 a "blue ribbon panel" of avian diseases submitted a report to the FWS that duck plague is already found in wild waterfowl and not solely isolated to captive reared flocks.

Unfortunately, the rhetoric concerning the alleged disease threat to migratory waterfowl posed by the release of captive-reared waterfowl has been dominated by agency bias, personal prejudice, invalid assumptions and inaccurate and misleading information. However, an objective analysis of the scientific evidence demonstrates that those claims are unfounded.

One could also conclude that there is potential for wild waterfowl to introduce disease to the release ducks. Presently in most states where free-flying release duck programs are present, there exists mandatory criteria pertaining to the management of the released ducks. Items such as good clean potable water, require a volume of water related to the quantity of ducks being released, methods of feeding the ducks and ample nutritional habitat to sustain the released ducks when they cannot be fed artificially (See Maryland's RSA permit and proposed free-flying mallard release permit). Mallard release projects of the NCWA and SCWA are inspected annually and are provided with waterfowl management plans that ensure healthy release sites and proper nutrition for all released mallards. As a result of these criteria, the release ducks are guaranteed a good healthy, stress free, and monitored atmosphere; one that may be threatened by a diseased wild migratory duck.

As stated, until such time when migratory waterfowl populations are given the same scrutiny as released waterfowl, scientific evidence is insufficient to suggest or claim that any disease outbreaks in North America are caused by released waterfowl.

4. Health Certification

At present, the game bird breeding industry is preparing a voluntary, health certification program, perhaps administered by the North American Gamebird Association (NAGA). One that producers would want to participate, where producers would work with their private veterinary practitioners in a program that would involve (1) periodic inspections of facilities and consultation on problems, (2) regular diagnostic support utilizing their veterinarian and a veterinary diagnostic laboratory to monitor mortalities (e.g., periodically [i.e., once a month]) submitting birds that die, and submitting any unusual mortalities [i.e., above a certain number of birds or percentage of the flock]), and (3) vaccination for selected diseases, such as duck plague.

A provisional health certification being offered for producers when they first agree to participate in the program, and then full certification being given after compliance has been demonstrated for one production season. The producer or his/her veterinarian would be required to provide periodic reports, including diagnostic laboratory reports on routine and unusual mortalities, to the NAGA to document the producer's flock. Most states require a certificate of veterinary inspection (health certificate) for birds imported into the state, so there also would be

a requirement for health certification of birds shipped by the producer. For example, with the widespread distribution of low-virulence duck plague viruses in captive, feral and undoubtedly wild waterfowl, simply demonstrating the presence of duck plague virus or antibody in a flock that is not experiencing mortalities is of little consequence. On the other hand, it would not be appropriate to grant health certification or issue a health certificate for a producer whose flock was experiencing mortalities from virulent strains of duck plague virus. However, requiring regular submission of mortalities to a diagnostic laboratory would soon establish a profile of the disease status of the flock and provide continued monitoring of the flock.

The only realistic way to approach the development of a health certification program that will be accepted by the industry is to make it (A) voluntary and (B) independent of government agencies.

IV. RELEASED CAPTIVE REARED DUCKS AND THE PROHIBITION OF HUNTING WITH THE AID OF LIVE DECOYS

During the fall of 1933, Dr. Francis Uhler began a study involving the shooting of ducks over live decoys and bait. He found that there was a surprisingly large amount of field-pen shooting with live decoys and bait. As a result of his report, live decoys and baiting were prohibited after 1934. Dr. Uhler conducted his study primarily on the Illinois River. In the Illinois River bottoms, over 600,000 bushels of corn were placed for waterfowl during a seventy-day season and thousands of ducks were kept as callers and live decoys. A general example of live decoys and bait were the placement of scattered corn around a natural pond or created pond where ducks were penned in a wire enclosure. Many blinds were constructed directly adjacent to these areas, placing any wild waterfowl within shooting range.

Live decoys, as demonstrated by Dr. Uhler's study, the intent of live decoys was to place waterfowl within the range of shooting and harvesting. This was accomplished either by placing the waterfowl in a pen or by tethering, directly in the area being hunted.

It is and has been the practice of both state and federal waterfowl law enforcement in areas where large raised-for-release duck programs have been functioning for over thirty (30) years, to consider waterfowl that are raised for release waterfowl; that are well outside the range of harvest by shooting; not to be considered as "live decoys."

In the case of "Free Flying Released Mallard Duck," Section 21:13 of the 50 Code of Federal Regulations defines that these ducks can only be taken during the waterfowl season specified for the taking of wild waterfowl. To offer any other time period could possibly be a violation of this section if a wild bird was to be taken. Section 21:13 it also states that the release ducks can be taken regardless to sex or daily bag limits if they are properly marked and har-

vested on a state permitted area. Further, raised-for-release waterfowl that are taken outside the permitted area will be provided the same protection of wild waterfowl.

It should be recognized that these regulations pertaining to "live decoys and bait" are over seventy (70) years old and clearly must be revised to clarify intent and definition given the situation today since many changes have been made that make the regulations obsolete. When originally written, the intent of the regulation was to ban previously permitted use of actual live decoys. See, United States v. Comb, 203 F.Supp. 202 (W.D.Ark. 1962). Urbanization has taken place on much of the habitat frequented in the past by waterfowl. Human activity is common around waterfowl making them less wary as they may have been in the past. As a result of these activities, waterfowl behavior has changed as well making their habits non-conforming with the old regulations. One only has to observe waterfowl on refuges and urban areas to determine they act differently than the same species that reside in the wilderness.

The applicable regulation states, in part, that it is illegal to hunt "by the use or aid of live birds" and at a location where "tame or captive live ducks or geese are present."

Firstly, with regard to whether "use or aid" applies, game wardens should evaluate (a) the purpose for which the ducks were released, and (b) the reason(s) why released ducks tend to habituate in the particular area being checked. If the purpose for which the birds were released was to attract ducks, then arguably "use or aid" might apply. However, if the birds were released for the purpose of hunting them, then "use or aid" should not apply. Moreover, the FWS agents should determine what factors account for released birds presence at a particular location, with a presumption that released birds tend to habituate in a limited area. Without direct evidence that the birds are held there by an illegal human activity. For example, baiting, the tendency of released ducks to habituate in a particular area should not itself be considered as indicative of the "use or aid" of live decoys

The second prong of the test would relate to the "tame or captive" language. It is suggested that ducks released for the purpose of hunting are not, and cannot be, considered "tame or captive" (without the interceding influence of illegal human activity), and this rationale must also be employed by game wardens. The argument in this context is that all property interests in the ducks are extinguished once they are released, a proposition which is supported by case law, discussed below. In essence, the ducks are free to go wherever they please, and hence they cannot be considered "tame or captive." . See, Koop v.United Staes, 296 F.2d 53 (8th Cir. 1061) where the Court held that once possession and control over the released duck took place, the ducks would be considered "wild" as opposed to "tame" and "it must be held that the mallard diucks here were no more within the possession and control of [the defendant] than were the pintails, wood ducks and teal that admittedly flew in and out of the ponds....Id. at 60. This argument, as well as the "use or aid" argument, should be supported by evidence which indicates that

while released ducks do in fact trade back and forth within a localized area, their habits are such that they tend to remain within that localized area, and such tendency is not indicative of the ducks being “tame or captive,” but rather typical behavior of released ducks.

One may also review the actions of release ducks as they interact with wild ducks. Though purely observational, most release sites have recorded that release ducks do not actively co-mingle with wild ducks. Their interpretation is that released ducks and wild ducks when using the same habitat remain apart from each other. The usual case is that wild ducks come to feed in the designated habitat and leave soon after. The raised-for-release ducks remain in the area and if they do move, it is usually to another designated habitat nearby. In Maryland, it is rare to find the release ducks moving further than 1 1/2 kilometers.

This statistic also explains why so few wild ducks are harvested on the release sites. When they are, it is usually a result of weather conditions rather than the desire to be at the release site. The harvest of wild ducks at the release site is usually by two descriptions: Firstly, it will be an early hunting season whereby teal and wood ducks are taken, and secondly, when weather conditions have frozen most of the surrounding water and the ducks are forced to utilize the open water provided at the release site. (Rohwer Smith 1991)

To examine this hypothesis, it has been observed that resident Canada Geese and migratory geese tend not to co-mingle.

The South Carolina Waterfowl Association released mallard program banding data from the 2002/2003 hunting season further supports the observation that a majority of raised-for-release mallards do not move far from release sites. 92.7% of total band returns were reported from within South Carolina. 71.3% of total band returns were reported from release sites. North Carolina Waterfowl Association released mallard program banding data from the 2002/2003 hunting season provides further support. 89.6% of total band returns were reported within North Carolina. Banding data for both states is currently being analyzed to determine the average distance of off release site band recoveries. Existing data analysis suggests that most raised-for-release mallards in North and South Carolina are harvested on or near release sites. 2002/2003 banding data demonstrates that only a small percentage of raised-for-release mallards in South Carolina (7.3%) and North Carolina (10.4%) are harvested out of state.

V. ECONOMIC BENEFITS OF THE CAPTIVE REARED AND RELEASE DUCK PROGRAMS

As has been proven through the release duck program, farms that are not economically productive for crop lands make the best waterfowl habitat. Poorly drained hydric soils are best suited for waterfowl habitat development. This is demonstrated vividly by Dorchester County,

Maryland where 37,000 acres have been developed into waterfowl habitat to support its duck release programs. Over one hundred persons are employed as a result of the duck release program. Five hundred thousand dollars are spent for crops to sustain the released ducks. Over three hundred thousand dollars are spent to purchase formulated feeds to keep the ducks in optimum physical condition. Poor farms have seen their value triple after being developed as a waterfowl release site while ancillary structures such as lodges, barns, storage facilities and homes have added over 50 million dollars to the assessable tax base. On a recent survey, the release duck program in Dorchester County, Maryland was its fifth largest employer; truly a huge success story for a moderate, rural Maryland county.

On a national basis, as a result of the funds spent annually on supplies, employee paychecks and other expenses, game bird breeding and shooting preserve operations increase the U.S. economy - especially the hard-hit rural economy - by $1.1 billion annually. With nearly ten percent (10%) of the industry's members involved with mallard ducks, these birds comprise a significant part of this economic impact. (Southwick 2003)

IV. CONCLUSION

This Public Comment has attempted to demonstrate that much data has been ignored or lightly dismissed by the Final Draft of the "Review of Captive-reared Mallard Regualtions on Shooting Preserves;" especially pertaining to disease and hybridization. It is a historical fact that today's mallard release programs owe its origin to the long-term failure of maintaining abundant populations of wild ducks. For nearly a century sports persons have released ducks into the wild in an effort to provide a semblance of sport they once knew. However, more specifically to the recommendations of the Final Draft, there is not conclusive or definitive existing science and data to justify the adverse economic impact to the ducks breeding operations and shooting preserve industry and the removal of recreational hunting opportunities to thousands of waterfowl hunters by prohibiting the release of free flying mallard ducks through federal regualtions.

Based on this uncertainty, NAGA, NCWA and SCWA would recommend the following:

- Base all decisions to science, no matter how long it takes to get adequate information. If one does not want to invest in the science required, how concerned are the managers and custodians of the resource?
- Do not just unilaterally adopt the precautionary principal. Erring on the side of the species without any foundation in science is not an acceptable wildlife management strategy. Efforts should be made on improving the release program while looking for methods to further safeguard wild population.
- Develop a complete comprehensive review of all available scientific literature and data by a

"blue ribbon panel" for recommendations of improvement and protection of the release program and create more scientific study to continue its successes for the sporting community while protecting the integrity of the wild waterfowl population.

If the mantra of the Fish and Wildlife Service is to (and should) base its decisions on the best available science, clearly additional studies need to be done before any definitive decisions can be made regarding the future of the released mallard program. With the release of over 2.5 million ducks over a twenty (20) year period on the Eastern Shore of Maryland alone with no demonstrable adverse effects points towards retaining the release mallard program and a rejection of the restrictive recommendations made. There is absolutely insufficient data to suggest that the program should be terminated. Such action would amount to a tragic miscarriage of the trust placed in the FWS by sportsmen and would rise to the legal level of being arbitrary and capicious regulation. NAGA, NCWA and SCWA as well as other members of the sportsmen's community, would welcome the opportunity to work with the FWS to review the released mallard program and objectively work together to improve upon it as might be necessary. There are many positive attributes to the released mallard program and the challenge should be to build upon these while protecting the integrity of wild waterfowl populations.

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