ATLANTIC FLYWAY MANAGEMENT PLAN FOR INTERIOR POPULATION TRUMPETER SWANS

Atlantic Flyway Council Snow Goose, Brant, and Swan Committee and The Trumpeter Swan Society

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Prepared by the Snow Goose, Brant, and Swan Committee and The Trumpeter Swan Society

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EXECUTIVE SUMMARY

In recent years, the range of the Interior Population (IP) of trumpeter swans (*Cygnus buccinator*) has expanded into the U. S. portion of the Atlantic Flyway (AF). This includes occasional observations of wintering birds in Connecticut and southern New England, but increasingly along the Chesapeake Bay and coastal North Carolina and recent documentation of breeding pairs in New York and Pennsylvania. A chief concern among waterfowl managers in the U.S. portion of the AF is that breeding trumpeter swans might not be migratory. Ongoing problems with resident Canada geese and non-native mute swans are such that presence of another large, non-migratory species is undesirable.

The management goal of this plan is to manage the range expansion of trumpeter swans into areas of the U.S. portion of the AF where suitable habitat exists and when compatible with other waterfowl management programs and human activities. Populations in the AF will continue to be monitored and habitat use will be documented. Chief amongst management actions that needs to occur as range expansion continues is the development of an Environmental Assessment to ensure compatibility of IP trumpeter swan range expansion in the U.S. portion of the AF with existing and potential tundra swan hunting. Another major task that needs to be undertaken is to educate the public on the deleterious effects of winter feeding of trumpeter swans and other waterfowl. Winter feeding may result in an increase in the propensity of non-migratory behavior in trumpeter swans and exacerbate other problems associated with supplemental feeding of wild waterfowl.

PREFACE

The four Flyway Councils are administrative bodies established in 1952 to represent the state/provincial wildlife agencies and work cooperatively with the U.S. Fish and Wildlife Service (USFWS), Canadian Wildlife Service, and Mexico for the purpose of protecting and conserving migratory game birds in North America. The Councils have prepared numerous management plans for most populations of swans, geese, ducks, doves, pigeons, woodcock, and sandhill cranes in North America. These plans typically focus on populations, which are the primary unit of management, but may be specific to a species or subspecies. Management plans serve to:

- Identify common goals and objectives.
- Establish priority of management actions and agency responsibility for implementing these actions.
- Coordinate collection and analysis of biological data.
- Emphasize research needed to improve management.

Flyway management plans are products of the Councils, developed and adopted to help state and federal agencies cooperatively manage migratory game birds under common goals. Management strategies are recommendations and do not commit agencies to specific actions or schedules. Fiscal, legislative, and priority constraints influence the level and timing of implementation.

Wintering trumpeter swans (*Cygnus buccinator*) have been increasing in the U.S. portion of the AF over the past 15 years. Successful breeding pairs have been documented in both Pennsylvania and New York. Ontario Ministry of Natural Resources initiated restoration efforts in 1982 and has been successful in attaining their stated management objectives of a population of over 1,000 individuals. In the late 1990s, the ongoing restoration efforts in Ontario and other states in the Mississippi Flyway prompted the Atlantic Flyway Technical Section along with representatives from several NGO's including the Trumpeter Swan Society to develop a draft Atlantic Flyway Plan for an Atlantic Coast Population of Trumpeter Swans. The principal goal and associated strategies of that draft plan centered on the restoration of a self-sustaining migratory sub-population of trumpeter swans in the AF. Due to a number of hurdles and issues that were never resolved, the plan was never completed.

Currently, managers are concerned that the increase in Interior Population (IP) trumpeter swans, especially the increasing numbers of wintering trumpeter swans, may conflict with existing waterfowl programs such as the Eastern Population (EP) tundra swan hunt program in the mid-Atlantic region. Concern also exists that wintering trumpeters may become essentially non-migratory as has occurred with other species such as resident Canada geese (*Branta canadensis*) and mute swan (*Cygnus olor*).

These concerns prompted renewed efforts to develop and implement a management plan for trumpeter swans in the U.S. portion of the AF. Restoration activities in Ontario or other Canadian provinces were beyond the necessary scope of this current plan, but will need to be considered in the future management of trumpeter swans in the Atlantic Flyway.

The purpose of this plan is to document and manage the expansion of wintering trumpeter swans in the Atlantic Flyway consistent with their historic wintering range, and to provide for expansion of breeding migratory trumpeter swans where compatible with existing wildlife management programs.

INTRODUCTION

Management History of the Interior Population of Trumpeter Swans

What is now considered the Interior Population (IP) of trumpeter swans (*Cygnus buccinator*) once ranged across central and eastern North America (Lumsden 1984). Trumpeter swans that are now considered part of the IP were largely extirpated from the current range by the early 1900's (Banko 1960). Public interest for restoration of trumpeter swans precipitated the initiation of active restoration efforts beginning in 1960 in South Dakota. Subsequent restoration efforts were begun in Minnesota in 1966 and again in 1982. Missouri and Ontario began restoration efforts in 1982. Michigan began in 1986, Wisconsin in 1987, Iowa in 1994, and Ohio in 1995. Many of these programs relied upon eggs from Alaska and subsequent incubation and release. While the presence of wintering trumpeters swans in portions of the AF seems well documented, it remains uncertain whether trumpeter swans were ever a regular breeding species in the U.S. portion of the flyway.

The first IP Plan was written and approved by both the Mississippi (MF) and Central Flyways (CF) in 1998. This Plan was subsequently revised by the MF in 2002 and by the CF in 2006. Population objectives as outlined in the original 1998 IP Plan have been met. Both Flyways are currently in the process of another revision.

Need for an Atlantic Flyway Management Plan

In recent years, some IP trumpeter swans have moved into the U. S. portion of the AF. This includes occasional observations of wintering birds in Connecticut and southern New England and increasingly along the Chesapeake Bay and coastal North Carolina. There is also recent documentation of several breeding pairs in New York and Pennsylvania. Because the occurrence of this population is expected to increase over time to larger portions of the AF, a coordinated plan to address management philosophy and concerns is needed. Past attempts at providing a coordinated management framework have been unsuccessful. In the late 1990s, the Atlantic Flyway Technical Section along with representatives from several NGO's including The Trumpeter Swan Society (TTSS) developed a draft Atlantic Flyway Plan for an Atlantic Coast Population of Trumpeter Swans. The principal goal and associated strategies centered on the restoration of a self-sustaining migratory population of trumpeter swans in the AF. The plan never came to fruition for several reasons. Most notably, assurances that tundra swan hunting programs would not be impacted by the restoration program were never resolved, along with the ongoing concerns regarding the establishment of non-migratory flocks of trumpeter swans.

Because increasing numbers of IP trumpeter swans are moving into to the U. S. portion of the AF, active restoration programs are no longer needed or desired in the AF. However, many of the issues and concerns expressed during the development of the original plan were never resolved and still exist. The Atlantic Flyway Council (AFC) recognizes that breeding trumpeter swans may become part of the modern-day fauna in the flyway, regardless of their history, and if so, would like to manage these birds in responsible manner. A chief concern among waterfowl managers in the U.S. portion of the AF is that breeding trumpeter swans might not be migratory.

Ongoing problems with resident Canada geese (*Branta canadensis*) and exotic mute swans (*Cygnus olor*) are such that presence of another large, non-migratory species is undesirable. There are also some concerns about what niche and available habitats trumpeter swans will occupy, and how they will interact or potentially compete with present day waterfowl populations. The purpose of this plan is to manage the expansion of wintering trumpeter swans in the flyway consistent with their historic wintering range, and to provide for expansion of breeding migratory trumpeter swans where compatible with existing wildlife management programs.

History in the Atlantic Flyway

Migratory trumpeter swans were believed to once range throughout North America in the hundreds of thousands (Lumsden 1984). However by 1933, trumpeters had been reduced, primarily by subsistence and commercial harvest of their feathers and skins, to only 66 known wild individuals that summered in an isolated region near Yellowstone National Park. Additional remnant flocks were later discovered in Alaska and Alberta. Conservation measures undertaken in the past 60 years have protected the species from extinction although it remains missing from much of its former range. The primary means of conservation have been the protection of the remnant flocks and reintroduction and restoration programs within portions of their historic ranges.

There are three recognized North American trumpeter swan populations (Gillette and Shea 1995). The most naturally functioning one is the Pacific Coast Population (PCP) of approximately 26,800 birds, which breeds in Alaska and winters along the Pacific coast. The other two populations, which contain both migratory and non-migratory individuals, are the Rocky Mountain Population (RMP) of approximately 9,600 birds and the IP of approximately 9,800 birds (USFWS 2011).

The exact historic range and distribution of trumpeter swans within the AF remain uncertain because they disappeared so early in the period of European colonization. It is clear from reports from several authors that by 1838 and likely earlier, trumpeter swans had been extirpated from the Atlantic coast (Banko 1960). Efforts to piece together the breeding and wintering ranges, overall distribution and estimated number of birds have had to rely upon limited evidence from the fossil and archeological records, scarce museum collection specimens, colonial literary accounts, and the records of colonial trading companies. Consequently, the historic breeding range of trumpeter swans in the AF remains uncertain and a subject of ongoing debate (http://www.acsu.buffalo.edu/~insrisg/nature/swans.html).

Rogers and Hammer (1998) provide a comprehensive review of archeological records and historical literary accounts and postulate that historical breeding and wintering range encompassed much of the eastern U.S.. Further, Lumsden (1984) reports a pre-settlement breeding distribution extending into eastern Canada. Matteson et al. (1995) summarizing several authors, reported that in the AF, the breeding distribution extended from Ontario east to Nova Scotia, New Brunswick and Newfoundland and south to the Carolinas. Wintering range extended from central Florida north along Atlantic coast as far as ice-free waters existed (Figure

1). This range is much larger than depicted in Bellrose (1976) and Banko (1960) which did not include archeological and colonial literary accounts (Figure 2). In a point-counterpoint article debating the merits of trumpeter introductions in the eastern U.S., Whan et al. (2002) provided an alternative viewpoint to the expansive, historical eastern breeding and wintering range. Their critical review questioned the interpretation of historical documents by previous authors and they suggested that the proper historical breeding and wintering range in the AF likely resembled that presented in Bellrose (1976). For the purposes of this Plan, we leave the debate about historic breeding distribution of trumpeter swans unresolved, and focus instead on the future management of these birds in the AF.

Origin of Contemporary Population and Status

In 1982, the Ontario Ministry of Natural Resources began a restoration program using eggs obtained from Alberta and breeding pairs obtained from aviculturists (primarily the RMP). In 1993, to improve genetic composition, additional eggs were obtained from Alaska (PCP). Trumpeter swans are now found in three distinct sub-populations in Ontario (extreme western, southern and eastern), with a fourth potentially developing (Lumsden 2007). The southern sub-population is considered self-sustaining; however, there is no evidence of interchange among the three sub-populations. Wild breeding by released swans was first recorded in 1993 and had increased to 62 wild and captive-released pairs by 2006. The Ontario Ministry of Natural Resources population objective of 1,000 birds by 2010 in the southern Ontario flock with all available habitat occupied has been achieved (Ontario Draft Trumpeter Swan Management Plan 2007). None of these established populations are truly 'migratory'. Recently, however, increasing numbers of trumpeters throughout the MF are wintering south of 40º (n = 1,300 in 2010). Occasionally, birds will winter in the southern AF, but when frozen out of summering areas most trumpeters move only as far as open water. This is certainly the case in southern Ontario, where birds will usually only move as far south as northern New York. The active restoration program in Ontario (captive breeding and cygnet release) was suspended in 2006, because the population goal had been met. The Ontario population is conservatively estimated at 1,180 (Lumsden 2010). A recent analysis of trumpeter re-sighting data indicated that most observations of wintering trumpeter swans in the U.S. portion of the AF occur from Pennsylvania north (Lumsden 2009).

In the late 1990s, researchers with Environmental Studies at Airlie were granted authorization for a research study to attempt to teach trumpeter swans migration paths from upstate New York to the Chesapeake Bay via ultra light aircraft. The hypothesis was that a successful migration project would set the stage for possible future restoration efforts in the AF pending an AFC-approved restoration plan. At the end of a three-year experimental period in 2001, future efforts were discontinued due to poor success and prohibitive costs (Sladen et al. 2002). Without some assurance that any breeding trumpeters could be encouraged to migrate, work on developing a restoration plan ceased. The primary concern was the fear that breeding trumpeter swans would become non-migratory and reside year-round in AF states. This is the case with many of the re-established populations in the IP (J. Johnson, Kellogg Bird Sanctuary, pers. comm.). Winter-feeding programs in Ontario, for instance, are largely conducted to keep trumpeter swans from undergoing migrations to historic wintering areas in the Chesapeake and Carolinas. These

winter-feeding programs have also enabled researchers in Ontario to more easily mark birds. There is a very reasonable expectation that public feeding of trumpeter swans, similar to what already occurs with resident Canada geese, would occur with regularity in the U.S. as breeding swans expand. Another concern about trumpeter swans in the AF is the unresolved issue of accidental take during existing and future tundra swan hunting seasons.

Currently, the only known breeding locations of trumpeter swans in the AF occur in southern and eastern Ontario, Pennsylvania, and upstate New York. In 2007, over 700 trumpeter swans were recorded on surveys in the AF portion of Ontario and are a result of the Ontario restoration program described above. Seven successful pairs were counted in New York during the 2010 quinquennial survey (B. Swift, New York Dept. of Environ. Conserv. pers. comm.). The source of breeding trumpeter swans in upstate New York is unclear, but did not result from any active restoration programs by the state wildlife agency.

Wintering distribution of trumpeter swans in the AF is less clear and information is obtained primarily from observations reported by birders and the general public. However, wintering trumpeter swans are consistently observed throughout the AF (Figures 3 and 4). In the northern portion of the AF trumpeter swans are seen annually in New York and Pennsylvania, with sporadic observations in Connecticut and other portions of southern New England. In more southerly regions of the AF, trumpeters are observed in Maryland, Virginia, and North Carolina with increasing frequency. Audubon Christmas Bird Counts indicate <75 trumpeters annually in the U.S. portion of the AF.

Continental trumpeter swan populations are monitored through the quinquennial North American Trumpeter Swan Survey. The latest complete iteration of this survey occurred in 2010. Swans are counted during the targeted survey period (late summer/early fall) and classified into two age groups (cygnet or adult/subadult) and five distinct social organizations (paired with cygnets, paired without cygnets, single without cygnets, single with cygnets, or members of flocks). The IP was last estimated at 9,808 birds, with an estimated 9,236 of these in the MF and AF.

Management Issues to be Addressed:

As the number of trumpeter swans breeding and wintering in the U.S. portion of the AF increases, a number of issues from a waterfowl management perspective are in need of resolution.

Breeding Distribution and Migratory Patterns: A chief concern of northern AF states is that breeding trumpeters will exhibit seasonal site fidelity and become another non-migratory species similar to mute swans and resident Canada geese. These largely non-migratory species pose significant ecological and nuisance problems throughout their range. The addition of another large non-migratory waterfowl species is not desired. Given the current problems that state agencies experience with the public feeding of waterfowl, it is not unreasonable to expect that breeding trumpeter swans in the U.S. portion of the AF, similar to what occurs in Ontario, would be fed throughout the year, resulting in non-migratory behavior. As noted above, there are some concerns about what niche trumpeter swans will occupy in the Atlantic Flyway and how they

might interact or compete for existing habitats with current waterfowl populations. If mute swan populations were reduced to levels suggested in the Atlantic Flyway Mute Swan Management Plan (AFC 2003), an increase in native trumpeter swans would likely be a much more amenable scenario for wildlife managers.

Wintering Distribution and Conflicts with Tundra Swan Harvest Management: Concerns abound about how accidental take of trumpeter swans during existing tundra swan and other waterfowl hunting seasons should be addressed. As increasing numbers of trumpeters begin to winter south of 40 degrees latitude there will be an increased risk of accidental harvest. The incidental take of trumpeter swans during tundra swan seasons in the Pacific Flyway was addressed in an Environmental Assessment (EA) in 2003 (USFWS 2003). A similar administrative strategy will likely need to occur in the AF.

GOALS AND OBJECTIVES

THE MANAGEMENT GOAL IS: *Manage the range expansion of trumpeter swans in areas of the U.S. portion of the Atlantic Flyway where suitable habitat exists and when compatible with other waterfowl management programs.*

POPULATION GUIDELINES

OBJECTIVE A: Monitor the range expansion and movements of trumpeter swans in AF states.

Strategy A-1. Identify breeding, non-breeding, wintering, and migration habitats in the AF currently being used by trumpeter swans.

Rationale: Banko (1960) summarized the specific physical features of the trumpeter's breeding habitat as follows: stable waters possessing a relatively static level, not exhibiting marked seasonal fluctuations; quiet waters of lake, marsh, or slough, not waters subject to obvious current or constant wave action; and shallow waters of lake or open marsh, not so deep as to preclude considerable digging and foraging for lower aquatic plant parts, roots, tubers, etc. Water rich in nutrients from dense aquatic growth and invertebrates is essential during the breeding season.

Historically, winter habitat requirements were waters with extensive beds of submerged aquatic vegetation that remain largely free of ice. Trumpeters utilize lakes, streams, and ponds. They are also very adaptable and have learned to make use of man-made resources such as reservoirs and impoundments. In the western U.S. and Canada, trumpeters use both estuarine and freshwater habitats and have become accustomed to feeding in agricultural fields. Optimal winter habitats must also provide ample open terrain that allows the birds to loaf and fly without restricted movement or visibility. Trumpeter swans will leave winter habitats that do not satisfy their needs unless artificial feeding provides an adequate supplement.

Recommendation 1. Where detailed site location records exist, describe key habitat features of observation locations. Because current observation databases will be limited with this type of information, a first cut will be to ascertain density and relative size of the wetlands in the area, whether it's freshwater or estuarine in nature and if located in a rural, urban or suburban setting.

Responsibilities: AFC, TTSS

Strategy A-2. Identify derivations and seasonal movements of trumpeter swans in the AF.

Rationale: Due to ongoing marking of IP trumpeter swans in many parts of its range, observations of marked swans allows for a relatively easy synopsis of banding origin and seasonal movements of trumpeters in the AF. When sufficient data exists, a review of observation data may provide insight into whether breeding trumpeter swans in the AF are migrating/moving in response to weather or other factors. In addition, determining origin of

birds moving into the AF will assist managers of IP trumpeter swans with evaluation of management goals.

Recommendation 1. At a minimum of every five years and when a sufficient observation database becomes available, derivation of trumpeter swans moving into the AF should be determined along with seasonal movement of birds already established in the AF.

Responsibilities: AFC, States/Provinces with portions of the IP, TTSS

Strategy A-3. Discourage non-migratory flocks of trumpeter swans in the U.S. portion of the AF.

Rationale: Management of large resident non-migratory waterfowl (e.g. Canada geese, mute swans) in the AF is a time consuming and costly endeavor for many AF states. There is no desire for the establishment of another non-migratory waterfowl species, particularly one that has the potential to negatively impact emergent wetlands.

Trumpeters establish strong ties to nesting, staging and wintering sites. Once established they will faithfully utilize and maintain a bond to these sites. The family unit consisting of adults and their immediate offspring is the primary social unit. The cygnets learn the migration route from their parents. Further, trumpeter swans will stay as far to the north as possible during winter. Their migrations may therefore be only long enough to take them to open water and food. Supplemental feeding of wintering swans in Ontario is a primary management tool for that portion of the IP (Lumsden 2007). Winter feeding in Ontario has likely resulted in fewer swans migrating south to find the resources needed to carry them through the winter. If growing numbers of trumpeters winter in northern portions of the AF, public demand for supplemental feeding programs by wildlife agencies or others (to prevent starvation of birds) can be expected.

Recommendation 1. Ensure that supplemental feeding of trumpeter swans outside of Ontario during the winter does not occur in the AF.

Recommendation 2. Prohibit any releases of free-flying trumpeter swans or their progeny into any AF states, unless those activities are explicitly authorized by the respective state wildlife agency and endorsed by the AFC.

Responsibilities: AFC, USFWS

Strategy A-4. Encourage removal of mute swans where they occur in the AF.

Rationale: Mute swans are a non-native species that is not regulated under the Migratory Bird Treaty Act. A reduction of this non-native species in the AF is recommended in the Atlantic Flyway Mute Swan Management Plan (AFC 2003). As it pertains to management of trumpeter swans, the removal of mute swans may have benefits from two perspectives. Mute swans have been documented to have detrimental impacts to both wetland habitats and native waterfowl species. A reduction in mute swan populations in the flyway will lessen the potential conflicts,

i.e., competition that may occur with an expanding trumpeter swan population in the flyway. Secondly, several AF states have expressed concern that trumpeter swans (especially non-migratory birds) will exhibit the same management challenges as the non-native mute swan and resident Canada geese. While this possibility exists, the expansion of trumpeter swans in the AF may be aided by the removal of mute swans.

Recommendation 1. Continue to encourage AF states to enact state-level regulation or develop programs to reduce or eliminate feral mute swans within their state.

Responsibilities: AFC

PUBLIC USE GUIDELINES

OBJECTIVE B: *Provide public use of trumpeter swans commensurate with existing waterfowl management programs in the AF.*

Strategy B-1. Minimize conflicts with other wildlife, human, and resource management programs.

Rationale: State wildlife agencies within the AF have expressed concern regarding the potential for conflicts with increasing trumpeter swan populations and waterfowl harvest management, wetland habitat management, and human recreational and transportation activities. One concern voiced from northern AF states is that the presence of semi-tame trumpeters is increasing and creating potential nuisance situations (John Dunn, Pennsylvania Game Comm., pers. comm.). Although current documented wintering trumpeter locations are not in conflict with wintering tundra swans, as the wintering population increases, the potential for competition will likely increase. Additionally, increasing trumpeter swan use of inland emergent wetlands may constitute another potential stressor on a limited resource and similar to mute swan residence in similar habitats, may result in decreased use by other native wetland species, particularly floating nest species such as black tern (*Chlidonias niger*) and pied-billed grebe (*Podilymbus podiceps*). As mute swan populations are reduced throughout the AF, this concern may lessen.

Recommendation 1. Monitor trumpeter swan distribution in the AF.

Responsibilities: USFWS, AFC, TTSS

Recommendation 2. Allow states to work with the USFWS to address potential conflicts through established federal permitting processes.

Responsibilities: USFWS, AFC

Recommendation 3. Using current or additional waterfowl population monitoring programs, evaluate whether increasing trumpeter swan populations may be impacting existing waterfowl/waterbird populations or habitats in the flyway.

Responsibilities: USFWS, AFC, TTSS

Recommendation 4. Provide information to the public to discourage winter feeding of trumpeter swans and other waterfowl in general.

Responsibilities: AFC, USFWS, TTSS

Strategy B-2. Ensure compatibility of IP trumpeter swan range expansion in the U.S. portion of the AF with existing and potential tundra swan hunting seasons.

Rationale: The most contentious conflict with increasing trumpeter swans on AF wintering grounds is where current and potential tundra swan hunting seasons occur. Hunters cannot easily distinguish between the two swan species. Trumpeter swan behavior makes it susceptible to harvest. Currently only two AF states (North Carolina and Virginia) allow tundra swan hunting. However, other AF states have expressed an interest in participating and may implement tundra swan hunting programs in the future. Thus, there is the need to reconcile any potential conflicts involving the incidental take of a few trumpeter swans during tundra swan hunting seasons. Since trumpeter swans are regulated as a game species under the Migratory Bird Treaty Act of 1918 and given that the AF portion of IP trumpeters are all descendants of introduced birds, some small accidental take should be acceptable and consistent with the overall IP Management Plan.

The EA establishing operational general swan hunting seasons in the PF should serve as a general guide for the establishment of incidental take of trumpeter swans in the AF during any current or future tundra swan hunting season. An AF EA will not have to specifically address incidental take of a threatened species and should be a much less controversial document than the PF EA. The IP has exhibited 17% annual growth rates from 2005-2010 (USFWS 2011) and is well above the stated goals for both population distribution and breeding pairs as outlined in the 1998 Interior Population Management Plan. Given the history of the IP, the current demographic data, and the increasing frequency of wintering trumpeter swans south of Maryland in the AF, some take of IP swans is likely to continue to occur and is acceptable at certain levels.

Recommendation 1. Develop an Environmental Assessment to establish the allowable incidental take of trumpeter swans during existing or future tundra swan hunting seasons in the AF.

Responsibilities: USFWS, AFC

Strategy B-3. Provide aesthetic and recreational benefits to the public from trumpeter swans, including watching.

Rationale: In those areas where wintering birds do occur there will be great interest in viewing trumpeter swans. Efforts should be made to provide educational materials to the public at swan observation sites, and through the internet in order to maximize the public enjoyment, appreciation, and understanding of the natural history of this species. These materials should stress the need and desire that breeding birds not become established outside of designated AF breeding zones and that wintering birds maintain their degree of migratory behavior. They should also strive to educate the public on mute swans and the problems associated with these non-migratory birds.

Recommendation 1. Develop and make available information on trumpeter swans and the benefits and detriments of their presence as wintering or breeding fauna.

Responsibilities: AFC, USFWS, TTSS

RESEARCH AND SURVEY GUIDELINES

OBJECTIVE C: *Monitor breeding and wintering trumpeter swan distribution in the AF*.

Strategy C-1. Develop a coordinated population survey and centralized observation network for trumpeter swans in the AF.

Rationale: Birding organizations through their annual Christmas Bird Counts and Breeding Bird Surveys could be important sources of information on the presence of trumpeters in the AF. It is important that age ratios and brood sizes are recorded. In addition to developing observer networks, each state (not necessarily the state wildlife agency) should have a central contact person to whom observations can be reported and who can answer questions about the program. These coordinators would compile reported sightings in a standardized database and report them to a designated contact at The Trumpeter Swan Society, which would act as a central clearinghouse for the information.

The development of partnerships among public and private organizations and individuals would be one way to support these activities. Building a network between potential conflicting user groups (e.g., hunter and non-hunter) by having them partner for a particular purpose, helping keep communication lines open and build human relationships would enable mutual resolution of issues and a greater impact on the desired outcome.

Recommendation 1. Work with state and local birding groups and particularly the Trumpeter Swan Society to promote the coordinated submission of trumpeter swan observation records.

Responsibility: AFC, USFWS, TTSS

Strategy C-2. Fully participate in quinquennial North American Trumpeter Swan Survey.

Rationale: The quinquennial North American Trumpeter Swan Survey is meant to be a comprehensive assessment of the breeding distribution and productivity of the three recognized trumpeter swan populations on the Continent. This is a systematic and coordinated survey and as trumpeters expand their breeding areas, participation in the survey will help to better document the expansion into the U.S. portion of the AF. The results of the survey also serve to provide the needed information to assess accomplishment of stated management plan goals and objectives.

Recommendation 1: Fully engage northern AF states and Ontario to participate in the survey.

Responsibilities: AFC

Strategy C-3. Develop a wintering ground monitoring program for trumpeter swans in the AF.

Rationale: It is important to monitor the movement and distribution of wintering swans throughout the AF.

Recommendation 1. Encourage AF states to develop standardized wintering ground surveys. Strive to utilize volunteer networks for this effort.

Responsibilities: AFC, USFWS, TTSS

Strategy C-4. Utilize a combination of satellite telemetry, neck collaring and patagial tagging of swans on their breeding grounds to document their annual distribution, habitat use and migration characteristics within and between the AF &MF.

Rationale: It is important to monitor the movement and distribution of wintering trumpeter swans as they expand in numbers and distribution throughout the AF and between the AF & MF. In addition, knowledge will be gained on habitat use and range expansions of trumpeter swans in the AF, to help identify and evaluate any adverse impacts that may be occurring.

Recommendation 1. Engage state and provincial agencies in the AF & MF to develop a program for auxiliary marking and wintering ground observation surveys, using agency staff, and volunteer networks for this effort.

Responsibilities: AFC, MFC, Ontario, USFWS, TTSS

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APPENDIX A

Figures

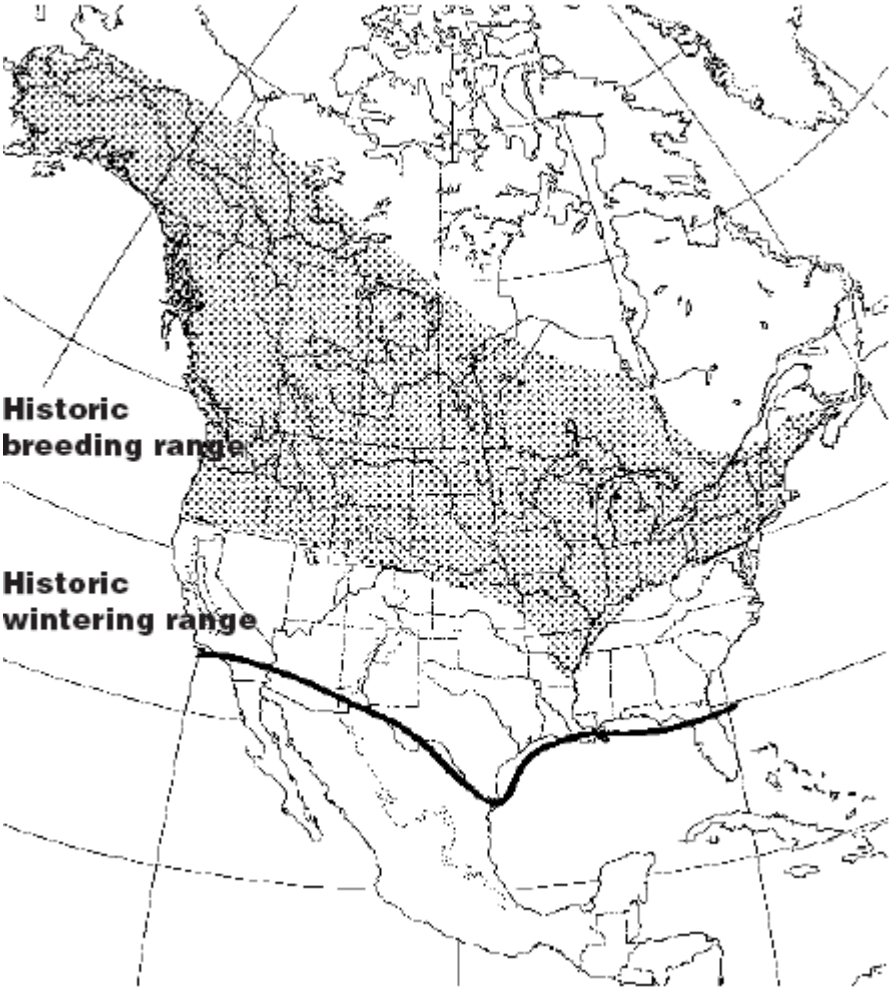

Figure 1. Historic breeding and wintering range of trumpeter swans in North America according to Matteson et al. (1995).

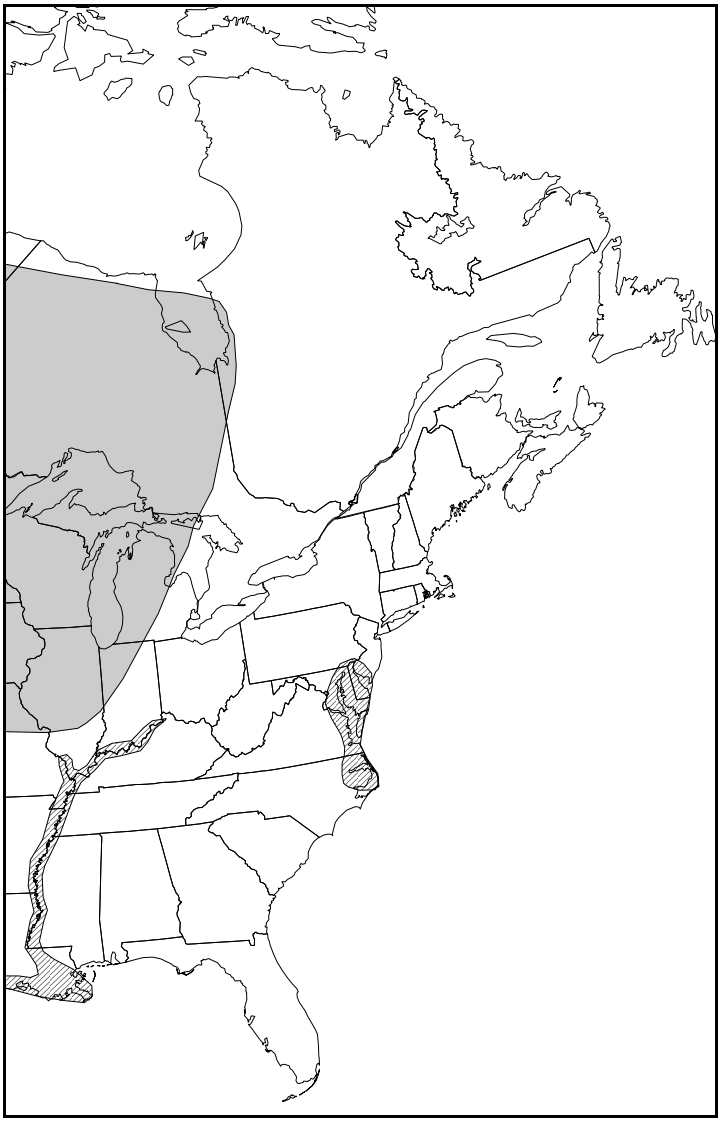

Figure 2. Historic breeding and wintering range of trumpeter swans in eastern North America according to Bellrose (1976).

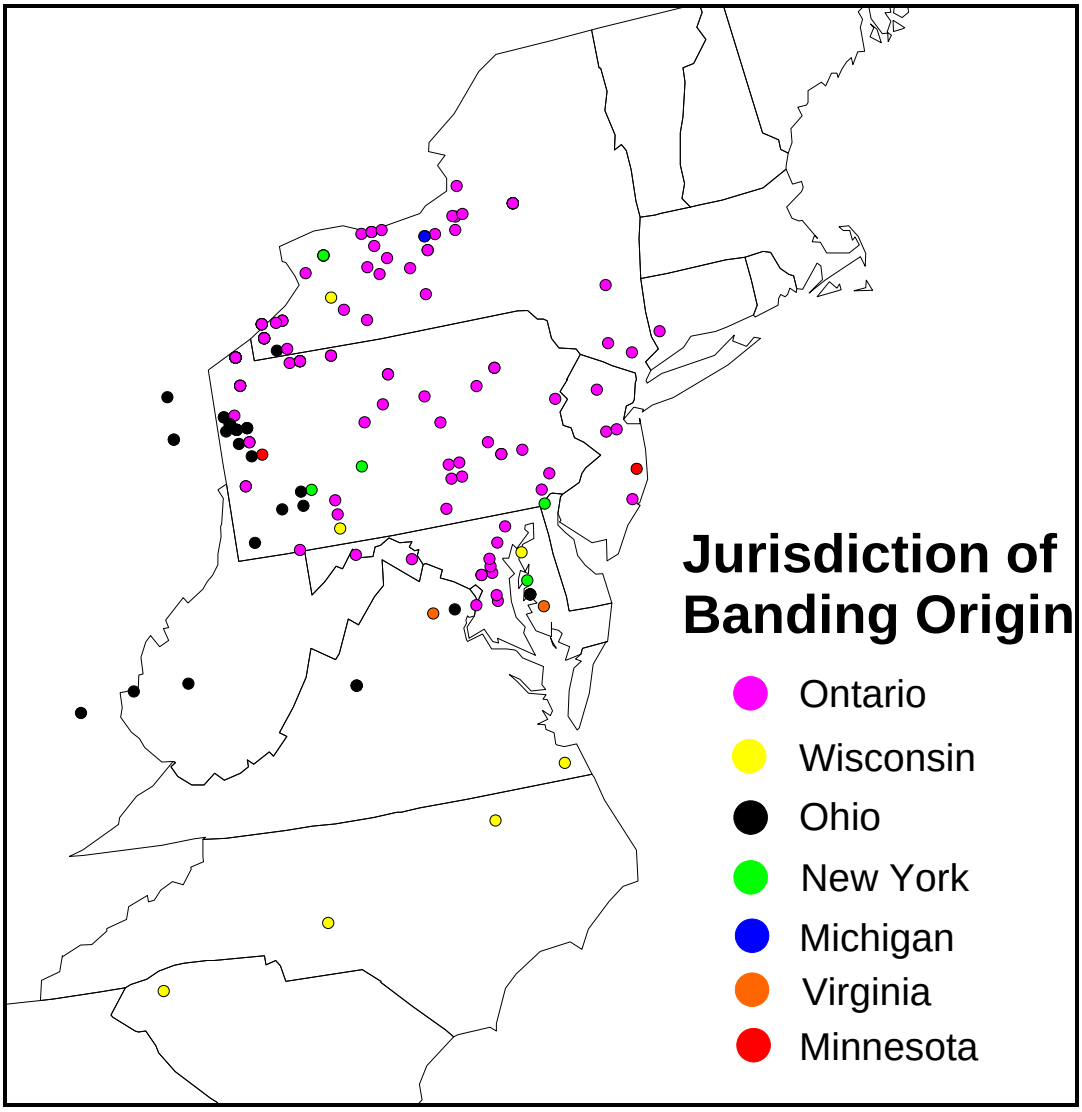

Figure 3. Fall and winter observations of marked trumpeter swans observed in the U.S. portion of the Atlantic Flyway. Includes only sight records in the U.S. Geological Survey Bird Banding Lab database (through March 2010).

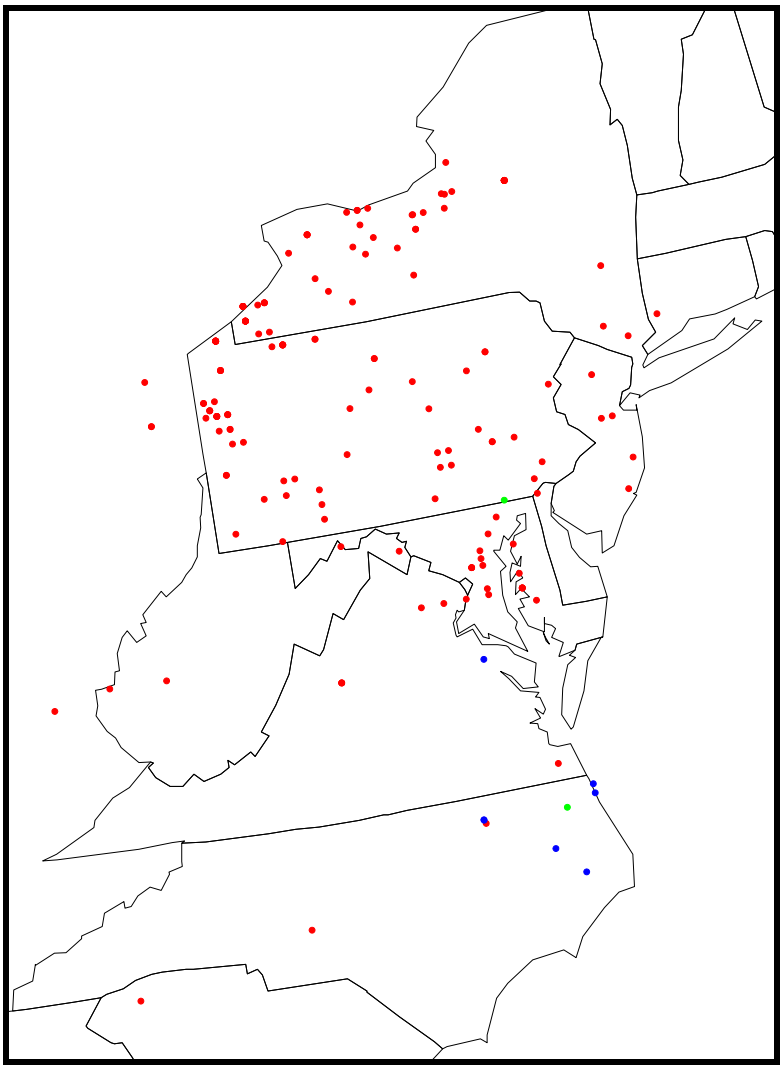

Figure 4. Trumpeter swan observation and recoveries in the Atlantic Flyway. Red dots – visual sight records in the U.S. Geological Survey Bird Banding Lab (BBL) database (through 3/2010); blue dots – supplemental observations occurring during Atlantic Flyway tundra swan research (Wilkins et al. 2010); green dots – harvested trumpeter swans reported to the BBL.