



# Mute Swans in New York: A Final Management Plan to Prevent Population Growth and Minimize Impacts of an Invasive Species

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION



**New York State Department of Environmental Conservation  
Division of Fish and Wildlife  
Bureau of Wildlife**

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## ***Executive Summary***

The New York State Department of Environmental Conservation's (DEC) plan for mute swan management in New York outlines DEC's strategies to contain and minimize the impacts of free-ranging mute swans. It contains a three-part, regionalized approach that emphasizes non-lethal management both upstate and downstate. The plan includes public education and outreach to inform the public about the status and ecological impacts of mute swans, efforts to foster responsible possession and care of mute swans, and management of feral mute swan populations.

Part one of the plan focuses on public education and outreach to increase awareness of the potential negative impacts of mute swans and potential hazards of feeding wild waterfowl. Efforts will also be made to inform the public and property owners of their options to address site-specific concerns for aggressive swans and/or swans causing damage.

The second part of the plan focuses on the responsible possession and care of mute swans. DEC will make an effort to inform the public of the invasive species regulations adopted in September 2014 that designate mute swans as a "Prohibited Invasive Species" pursuant to Environmental Conservation Law. The section also clarifies the permit requirements to possess, transport, transfer, or release mute swans.

Lastly, DEC will take a regionalized approach to the hands-on management of feral mute swans that recognizes the social and ecological differences between upstate and downstate. Downstate, where mute swans have existed in a wild state for many decades, DEC will work with cooperators conducting non-lethal mute swan control activities to minimize population growth in the region and to achieve a stable population of approximately 2,100 swans, primarily through egg-addling. Upstate, where the range expansion and introduction is more recent, DEC will be pro-active to mitigate the environmental impact of feral mute swans by preventing range expansion and reducing or stabilizing the overall population over the next six years at approximately 175 mute swans with an emphasis on non-lethal removal and nest treatments.

**MUTE SWANS IN NEW YORK:  
A FINAL MANAGEMENT PLAN TO PREVENT POPULATION GROWTH AND MINIMIZE  
IMPACTS OF A NON-NATIVE INVASIVE SPECIES**

**New York State Department of Environmental Conservation  
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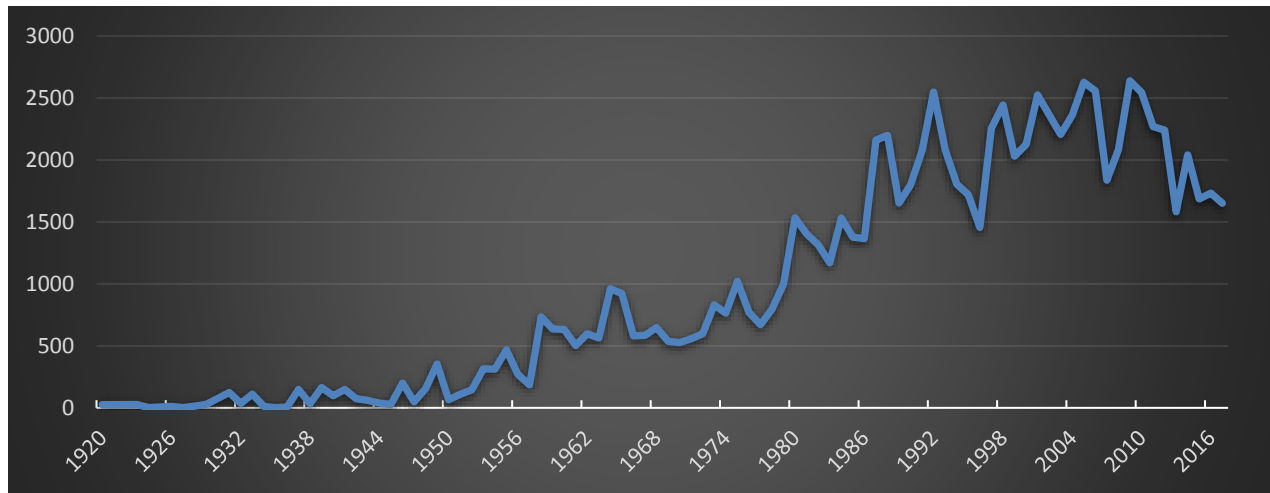
**January 2019**

This plan provides guidance to New York State Department of Environmental Conservation (DEC) staff and the public concerning management of mute swans (*Cygnus olor*). Mute swans are a non-native, invasive species that many people enjoy seeing despite adverse impacts the birds can cause. The plan strives to balance these competing values by accepting the continued existence of some mute swans in the wild, while preventing any further population growth or range expansion. It also supports efforts by DEC and others to prevent or alleviate site-specific conflicts with mute swans that may be experienced by public or private property owners and outdoor enthusiasts. Based on extensive public input over the past four years, the plan gives priority to non-lethal management techniques, documents the scientific basis for population projections and environmental impacts, and includes public education as a management strategy. DEC's responses to substantive public comments on previous drafts of this plan are available at: [www.dec.ny.gov](http://www.dec.ny.gov).

It should be noted that this plan deals primarily with the management of free-flying or "feral" mute swan populations that have or may become established in the wild in New York State. For swans possessed or held in captivity, DEC adopted final regulations (6 NYCRR Part 575) in September 2014 designating numerous plant and animal species, including mute swan, as "Prohibited Invasive Species" pursuant to the "Invasive Species law" (Environmental Conservation Law Section 09-1709). As of March 10, 2015, it became illegal to sell, import, purchase, transport, introduce, or propagate (or possess with the intent to sell, import, purchase, transport, or introduce) any prohibited invasive species, including mute swans in New York State. No person may possess, with the intent to sell, import, purchase, transport, or introduce a prohibited invasive species unless the person has been issued a permit by DEC for research, education, or other approved activity. These permits may be issued by regional DEC Natural Resource offices, and special permit conditions are included to ensure that mute swans in possession do not escape or are not released to the wild. This regulation should eliminate commercial trade of mute swans in New York, which has been a source of birds escaping to the wild. Designation of mute swans as a prohibited invasive species has no direct bearing on swans currently living in the wild.

## **BACKGROUND**

Mute swans are a bird that many people have enjoyed seeing in public parks and on lakes and coastal waters of New York for many years. However, these birds are not native to North America; they were imported as captive birds from Europe during the late 1800s to beautify private estates in the Hudson Valley and on Long Island. Mute swans began nesting in the wild in the early 1900s, establishing a population that grew to more than 2,000 birds statewide by 1990 (Figure 1). All free-flying mute swans living in the state today are descendants of birds that were released or escaped from captivity since the early 1900s.

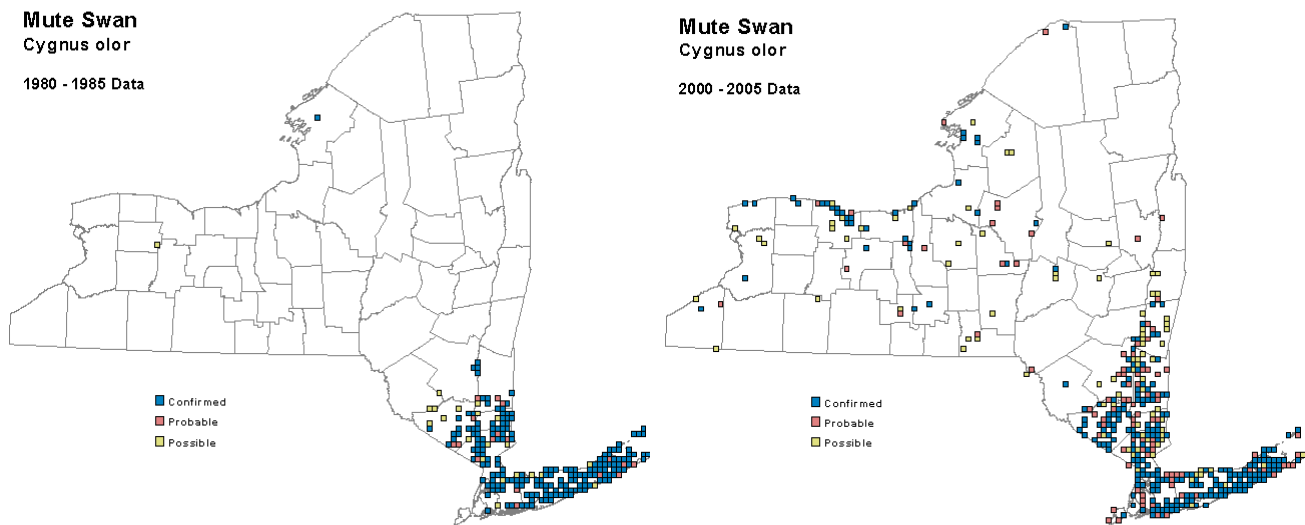


**Figure 1.** Total number of mute swans counted during Christmas Bird Counts in New York State, 1920-2017 (source: National Audubon Society, Christmas Bird Count Historical Results [Online], <http://netapp.audubon.org/cbcobservation>, accessed May, 2018).

### Swan Populations in New York

Two distinct populations of mute swans currently exist in the wild in New York State.

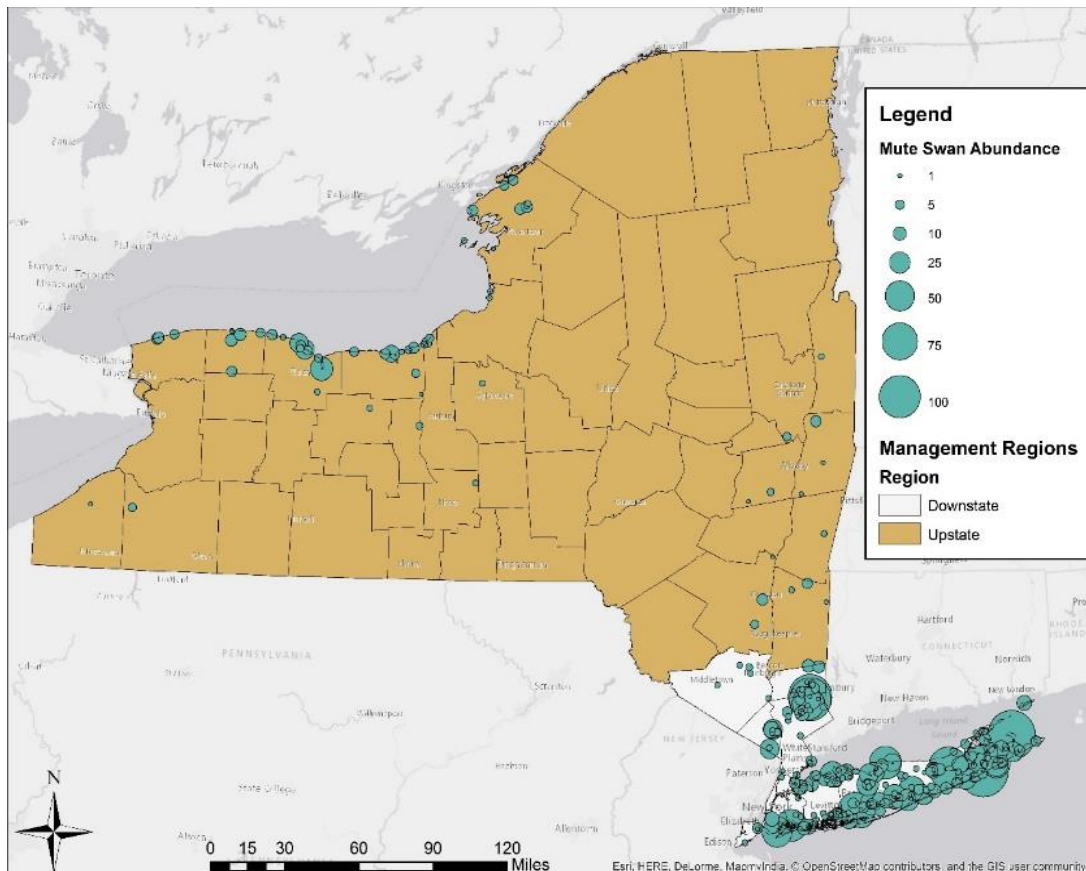
First is the “downstate” population of swans that occurs on many inland and coastal water bodies around Long Island, New York City, and in the lower four counties of the Hudson Valley (Orange, Rockland, Putnam, and Westchester). This population was estimated at approximately 500 birds in the early 1970s, but expanded northward and grew to more than 2,000 birds by the early 2000s (Figure 2). Further range expansion has been limited by egg- adding and removal of adult birds by DEC and others. Although exact counts are not possible, overall numbers in the downstate region have been relatively stable since the early 2000s likely because of these management activities, some overwinter losses due to starvation, and perhaps because most potential nesting areas on Long Island are now occupied (Swift et al. 2013).



**Figure 2.** Breeding distribution of mute swans based on New York State Breeding Bird Atlas data, 1980-1985 (Andrle and Carroll 1988) and 2000-2005 (McGowan and Corwin 2008).

A second population of mute swans in New York became established around Lake Ontario in the late 1980s, presumably from birds that came across the lake from Ontario (Figure 2). This “upstate” population grew from just a few pairs in 1990 to more than 300 birds in winter 2007 (NYSOA 2015; <http://nybirds.org/ProjWaterfowl.htm>), and this population has the potential to expand to numerous water bodies and wetlands throughout the state.

Numerous studies have documented rapid population growth by mute swans. Petrie and Francis (2003) estimated that mute swan populations on the Great Lakes, particularly Lake Ontario and Lake Erie, were increasing at a rate of 10-18% per year. The escape of one or two captive pairs in Maryland in 1962 increased to a flock of 151 birds by 1974 (Reese 1980) and to more than 4,000 birds by 2002 (Hindman and Harvey 2004). In Michigan, the first pair of mute swans was documented in 1919, and by 2010, the estimated population was more than 15,000 swans, up from an estimated 5,700 in 2000 (Michigan DNR 2012). Due largely to egg-addling and removal of adult swans by DEC and others in 2012 and 2013, the population along the Lake Ontario shoreline had been reduced to 39 birds during the summer of 2014 (NYSDEC 2018). However, in the absence of management the past three years, the population has rebounded to approximately 262 birds (~570% increase). The exponential population growth is likely the product of both immigration from the northern shore of Lake Ontario and high productive coupled with several mild winters. Free-ranging mute swans still appear at new locations upstate every year, often from unknown sources. During the most recent mid-summer mute swan survey in 2017, DEC staff and cooperators counted 2,150 mute swans downstate and 327 upstate (Figure 3 and Table 1).



**Figure 3 - Distribution and Abundance of Mute Swans Observed during the 2017 Mid-Summer Swan Survey**

**Table 1.** Mute Swans and Trumpeter Swans Observed by Management Region during the 2017 Mid-Summer Swan Survey

Management Region	Mute Swans				Trumpeter Swans			
	No. of Adult	No. of Broods	No. of Cygnets	Total	No. of Adult	No. of Broods	No. of Cygnets	Total
Upstate	215	35	112	327	25	2	8	33
Downstate	1,925	69	216	2,141	1	0	0	1
Total	2,140	104	328	2,468	26	2	8	34

In a few locations around Lake Ontario, trumpeter swans (*Cygnus buccinator*), which are native to North America, have also begun nesting, but their numbers in New York peaked at about 50 birds in 2010 (Swift et al. 2013) and have held relatively stable at about 25-50 swans (NYSDEC, 2018). It is unclear whether trumpeter swans will create some of the same problems or concerns as mute swans, therefore DEC has not undertaken any management efforts to promote or control this species. Tundra swan (*Cygnus columbianus*), a native species that breeds in the Arctic, also occurs in this region during fall and spring migration, and several hundred have wintered on the Niagara River, northern end of Cayuga lake, and around the Montezuma Wetlands Complex in recent years. Both of these native swan species provide potential swan viewing opportunities in certain areas of western New York. Neither species is a legal game bird in the state.

### Legal Status

Mute swans have had legal protection in New York since 1946, when swans were specifically added to the definition of protected birds in the Environmental Conservation Law (ECL). Take of protected wildlife species is not prohibited by state law, but requires some authorization by DEC. Thus, while all wild waterfowl in New York are “protected”, there are lawful hunting seasons for most, and permits can be issued for take of protected species to alleviate conflicts with human interests.

Mute swans are not protected by federal laws or regulations. The status of mute swans under federal law was clarified when Congress passed the “Migratory Bird Treaty Reform Act” in December 2004. This act clarified that the Migratory Bird Treaty Act (MBTA) applied only to bird species that are native to the United States or its territories. In March 2005, the U.S. Fish and Wildlife Service (USFWS) published an official list of non-native species to which the MBTA did not apply, including mute swan (USFWS 2005). For more information about the legal status of mute swans, see Swift et al. (2013).

In November 2016, legislation was signed into law that established criteria DEC must comply with prior to adopting a final mute swan management plan. Upon the adoption of this final plan, DEC has complied with all provisions of the aforementioned legislation.

### Impacts on Submerged Aquatic Vegetation (SAV)

Wildlife managers, ecologists, ornithologists and others have been concerned about the impacts of mute swans in North America for decades (Willey and Halla 1972, Allin et al. 1987, Maryland DNR 2001). Of particular concern is the consumption and uprooting of submerged aquatic vegetation (SAV) that provides important food and shelter for native fish and wildlife in marine and freshwater ecosystems (New York State Seagrass Task Force 2009).

Mute swans feed primarily on SAV, consuming 4-8 pounds per day and often uprooting more than they consume (Willey and Halla 1972, Scott and the Wildfowl Trust 1972, Fenwick 1983, Ciaranca et al. 1997, Bailey et al. 2008). This can reduce SAV biomass locally by as much as 70-95% within a single growing season (Allin and Husband 2003, Naylor 2004, Tatu et al. 2007, Swift et al. 2013). In some cases, below-ground biomass may be affected, even where above-ground impacts are less apparent (Stafford et al. 2012). Mute swans consume the same SAV species used by native waterfowl, so they can reduce the amount of food available at migratory stopover or wintering sites (Bailey et al. 2008). However, where there is an abundance of submerged aquatic vegetation, a variety of water bird species may co-exist without any apparent interspecific competition occurring (Gayet et al. 2013). The impacts of SAV removal by mute swans, which are year-round residents of most areas, are likely greater than that of migratory waterfowl that are not present during the growing season (Badzinski et al. 2006).

The impact of mute swans on SAV at any particular location depends on the number of swans present, size of the affected area, and other factors (Chasko 1986, Stafford et al. 2012, Gayet et al. 2013, Wood et al. 2014). A large pond or lake with a single breeding pair would show little effect, whereas a small coastal pond or bay with a large number of mute swans year-round would have significantly less SAV and support fewer migratory waterfowl during the winter. Coastal SAV beds are important for sustaining several species of conservation concern, including American black duck (*Anas rubripes*), canvasback (*Aythya valisneria*), and Atlantic brant (*Branta bernicla*). As natural foods become scarce, mute swans will readily accept human handouts, whereas these other waterfowl species are not so adaptable. Mute swans are not the only threat to SAV in wetland or aquatic areas, but they can exacerbate the effects of other stressors, such as polluted runoff from upland areas, shoreline development, and rising sea levels. The presence of mute swans in tidal waters may conflict with local efforts to protect and restore estuarine ecosystems in New York and the benefits they provide, including nursery areas for economically important species such as bay scallops (*Argopecten irradians*), winter flounder (*Pseudopleuronectes americanus*), and blue crabs (*Callinectes sapidus*).

### **Displacement of Native Bird Species**

Mute swans often behave aggressively towards other birds, especially other waterfowl during the nesting and brood-rearing periods (Kania and Smith 1986, Allin et al. 1987, Ciaranca et al. 1997, Swift et al. 2013). In extreme cases, mute swans may attack and kill ducklings, goslings, or other small water birds (Stone and Marsters 1970, Virginia DGIF 2012, and many video clips on the internet). More often this aggression simply displaces other birds from the swan's territory, limiting the use of valuable or preferred wetland habitats by native species (Willey and Halla 1972, Chasko 1986, Allin et al. 1987, Ciaranca 1990, Ciaranca et al. 1997). Mute swans will typically defend several acres around their nest site, especially against other swans, Canada geese, or humans who enter their territory. However, this behavior varies widely among individual swans (Willey 1968, O'Brien and Askins 1985, Conover and Kania 1994, Gayet et al. 2011, Swift et al. 2013); in some cases other waterfowl have nested in close proximity to active mute swan nests (Willey and Halla 1972, Conover and Kania 1994, Maryland DNR 2001). Displacement of other species by mute swans can be difficult to observe, as birds attacked or threatened by swans are not likely to keep returning to the area.

Non-breeding swans generally do not behave aggressively toward one another or other species, but they can displace other sensitive bird species by their sheer abundance on loafing sites. In Maryland, a large molting flock of mute swans caused the abandonment of a colony of

endangered least terns (*Sterna antillarum*) and black skimmers (*Rynchops niger*) (Therres and Brinker 2004), two species of conservation concern in New York. The same could happen to black terns (*Chlidonias niger*), a State-listed endangered species that nests in large freshwater marshes in upstate New York that are favored by mute swans. One of New York's largest known black tern nesting colonies at Braddock Bay (near Rochester) disappeared in the mid-1990s, within a few years after mute swans were first documented nesting in the area (Swift et al. 2013); a similar correlation was reported from Michigan (Shuford 1999).

## **Other Concerns**

Mute swans have little or no fear of humans so they provide opportunities for people to observe and come in close contact with them. However, mute swans can cause problems for people too. Some territorial swans will directly attack humans, especially small children or people in small watercraft who are swimming or boating in proximity to locations where swans reside. In extreme cases this has resulted in accidental deaths (from drowning) or injuries (Willey and Halla 1972, Rhode Island DEM 2006, Animal People Online 2012). DEC has received complaints about aggressive swans making areas inaccessible for outdoor recreation in Nassau, Suffolk, Orange, Ulster, Onondaga, and Monroe counties.

Where mute swans occur near airports, they pose a serious threat to aviation. Their large size makes them one of the most hazardous species to aircraft in New York. Since 2000, there have been three documented mute swan strikes in the U.S., all at JFK International Airport (one in 2010 and two in 2011). Although the number of strikes at airports has been small, this might have been higher without active management efforts to minimize the potential for bird strikes. At JFK, for example, Port Authority and USDA Wildlife Services personnel removed a total of 35 mute swans from airport property during 2011-2015 to protect aviation safety. Many other mute swans were hazed off of airport property during that same period as part of a comprehensive bird hazard management program to protect aviation safety (USDA Wildlife Services, unpublished data).

Additionally, swan feces contain high levels of fecal coliform bacteria (Hussong et al. 1979), so the presence of large flocks at certain times could impair use of waters for swimming or drinking. Mute swans have been associated with high fecal coliform counts in some marine waters on Long Island, which could affect the use of local areas for shellfishing (Swift et al. 2013).

## **The Need for Management**

Based upon past experience and available scientific information, it is reasonable to expect that, in the absence of management, mute swan populations will increase in number and expand their range throughout New York State. DEC is especially concerned about the more recent arrival of mute swans around Lake Ontario, which could rapidly expand to countless lakes, ponds, rivers, and wetlands throughout the state. DEC is also concerned about the impacts that mute swans may already be having on fish and wildlife habitats in and around Long Island, New York City, and the Lower Hudson Valley. Mute swans are one of many stressors on fish and wildlife habitats in the downstate area, and their impacts can be locally significant.

The consequences of not preventing mute swan population growth include reduced habitat for native fish and wildlife such as, black terns and several other species of conservation concern. Landowners who wish to conserve and manage their property for wildlife also should not be constrained by the presence of a non-native invasive species. Site-specific conflicts between mute swans and human activities would also increase in the absence of management, as



swans establish new nesting territories in areas currently used for water-based recreation or municipal purposes. This would increase demands on DEC for relief from such problems, ranging from aggressive swans to water quality concerns and hazards at airports. Gayet et al. (2013) reviewed existing studies on the ecological effects that mute swans have on wetlands and found that the threat mute swans pose to waterbirds and aquatic plant beds varied, but they concluded that "...there is a genuine risk of biological invasion in North America ... [and]...it can be considered a safety measure to eradicate the species from North America."

In response to public comments on previous drafts, this plan does not call for the complete elimination of mute swans from New York, but rather management will focus on preventing population growth and range expansion. Downstate, the plan will focus on addressing site specific mute swan concerns involving human health and safety. Upstate, the plan will focus on stabilizing or reducing swan populations. Opportunities for people to see swans will still exist in areas where swans have historically occurred (i.e., downstate) and in some locations upstate where small local populations will continue to exist. Additionally, actions will be undertaken or permitted where necessary to empower property owners, municipalities, and governmental agencies, regardless of their location, to be able to resolve any conflicts that mute swans may have with the desired use or management of lands or waters under their control or jurisdiction.

## MANAGEMENT GOAL

The goal of DEC's mute swan management program is ***to minimize the current and potential impacts of mute swans on native wildlife, their habitats, and people, while recognizing public desire for a continued presence on the landscape.***

The goal and objectives of this plan focus primarily on the population growth and impacts of mute swans, rather than specific management methods that may be used. Because many people object to the use of lethal control methods (i.e., killing birds), non-lethal methods (e.g., egg-addling, capture, and placement at licensed facilities) will be used to the extent possible; however, lethal controls will be used in limited circumstances where non-lethal options are not practical or timely to achieve management objectives.

The goal and objectives of this plan are consistent with those of the recently updated Atlantic Flyway Mute Swan Management Plan (AFC 2015) and also with state-level management plans adopted by Rhode Island (Rhode Island DEM 2006), Virginia (Virginia DGIF 2012), and Michigan (Michigan DNR 2012). Although mute swans are generally non-migratory, juvenile swans will disperse up to 600 km from where they hatched (Wlodarczyk et al 2013). Therefore, coordinated management among neighboring states and provinces is desirable.

## REGIONAL APPROACH TO MANAGEMENT

DEC recognizes the distinct differences in history, status, impacts, objectives, and management opportunities for mute swans between downstate and upstate regions of New York (see Background section of this plan).

Downstate swan populations grew steadily for nearly a century, but the number of swans has stabilized in recent years, at least on Long Island and in New York City. Most suitable nesting areas may now be occupied, and many of the birds are in parks or other settings where the negative impacts of other environmental stressors (e.g., pollution, etc.) are far greater. However, even in these settings, nesting birds can be a source of more swans that may

disperse to sensitive wildlife habitats or interfere with use of public waters or private property. Fortunately, the high densities of people, development, and public open spaces in this region make most mute swans in the region relatively visible and accessible. This creates opportunities for cooperative management of mute swans with local communities, non-government organizations (NGOs), and landowners. DEC will seek cooperation or assistance from such partners to implement strategies described in this plan.

In upstate New York, few mute swans existed in the wild before 1990. From just a few nesting pairs along Lake Ontario the population observed during the fall quickly grew to more than 200 birds. However, the number of mute swans in that area was down to less than 60 birds by 2015, largely because of management efforts by DEC and USDA Wildlife Services before lethal control work was suspended in 2014. The potential for population growth and range expansion to waters and wetlands throughout the state remains very real, as mute swan populations around the Great Lakes have estimated average growth rates between 10% and 18% per year (Petrie and Francis 2003). If that happened in New York, it would be extremely difficult and costly to manage mute swans throughout the state to minimize their adverse impacts.

## **MANAGEMENT STRATEGIES**

### **Part 1. Public Education and Outreach**

#### **Objectives:**

- **Inform the public of the history, ecology, and impacts of mute swans.**
- **Inform the public of ways to minimize negative interactions with swans**

#### **1.1 Inform the public about the status and ecological impacts of mute swans.**

Many people are unaware and some disagree that mute swans are an invasive species that can adversely affect native wildlife and their habitats. However, numerous scientific studies since the 1960s have documented the ability of mute swan populations to grow by 10% or more annually, reduce the amount of SAV, and displace native wildlife (see Background section and other references in Swift et al. 2013). These impacts are largely unseen by the public, which results in many people questioning the need for management. This lack of understanding is a major impediment to gaining public acceptance of the management actions prescribed in this plan.

DEC will work with any interested partners, including conservation groups, bird clubs, animal protection organizations, and local governments to better inform the public about the history, status, and impacts of mute swans. Such public education will acknowledge the enjoyment that many people derive from seeing swans, while explaining the need for management. We will identify key messages about the environmental impacts of mute swans and encourage cooperative management of this species. Information will be disseminated through individual and combined efforts by partner organizations and cooperators. Outreach materials may include printed brochures, posting signs where mute swans occur, web-based information, and public presentations by DEC staff or partner organizations. Regional Partnerships for Invasive Species Management ([www.dec.ny.gov/animals/47433.html](http://www.dec.ny.gov/animals/47433.html)) will be asked to assist in these efforts.

This strategy will increase public awareness of the impacts of mute swans and acceptance of other mute swan management strategies in this plan, including population control and allowing property owners to address conflicts with mute swans on lands or waters where they have management jurisdiction. Some specific messages for outreach and education efforts include:

1. Mute swans in New York are descendants of imported or captive birds that escaped or were released by their owners to the wild;
2. Mute swans nesting or raising young can be very territorial and aggressive, deterring native bird species and people from using natural areas;
3. Wherever mute swans congregate, they may impair habitats for native fish and wildlife species, and can interfere with efforts to restore degraded wetland areas;
4. If left unchecked, free-living mute swans would multiply quickly and spread throughout New York State;
5. Learn to appreciate the diversity of native waterfowl species in the local area, including native swans that occur in upstate New York; and
6. The goal and objectives of DEC's mute swan management program.

DEC will work with partner organizations to develop and distribute information on how to prevent or alleviate conflicts with swans, how people can assist with monitoring or management of swans, and contact information for local or state agencies involved with swan management.

### **1.2. Develop outreach materials regarding ways to minimize conflicts with swans**

Mute swans cause damage in a variety of ways and can be aggressive towards people and their pets (see Background above), especially when they are defending breeding territories and cygnets. DEC will increase outreach efforts to inform the public of the alternatives to minimize the impacts of swans and ways to avoid conflict. In some situations, the easiest way to avoid conflicts with swans is to simply avoid the area during the times of year when swans are likely to be territorial. However, mute swans can aggressively defend territories as large as 75 acres (Conover and Kania 1994), often making it difficult to completely avoid these areas without severely limiting access to waterbodies and recreational opportunity. Managing the problems associated with territorial swans is especially difficult in the downstate region where swans often establish territories on small tidal creeks and canals frequented utilized by people on smaller watercraft (i.e. canoes, kayaks, jet skis).

Additionally, DEC will develop informational brochures and signage to educate the public of ways to avoid conflicts with swans (e.g., R.E.P.E.L - <http://www.dec.ny.gov/animals/89522.html>) and to inform landowners of their options to address site-specific problems.

### **1.3. Discourage feeding of mute swans and other wild waterfowl.**

Mute swans will readily accept human handouts of food, and many people enjoy this way of interacting closely with these birds. However, this should not occur where it will attract mute swans to natural habitats used by wild waterfowl, or where it conflicts with local efforts to discourage feeding of ducks and Canada geese.

Often, many people who intentionally feed mute swans and other wild waterfowl are unaware of the negative impacts feeding can have on the birds themselves and the environment. DEC will produce and distribute informational flyers and signage addressing the potential damage and concerns related to artificial feeding.

Additionally, DEC will consider statewide regulations to prohibit the intentional feeding of wild mute swans and other waterfowl, similar to what was enacted to prohibit the feeding of bears in New York (6 NYCRR Section 187.1). In the interim, DEC will also encourage the adoption and enforcement of local ordinances or regulations to prohibit public feeding of wild waterfowl. Exceptions would be made for captive swans possessed pursuant to a DEC license.

## **Part 2. Responsible Possession and Care of Mute Swans**

### **Objectives:**

- **Foster the responsible possession and care of mute swans in accordance with their legal designation as a “prohibited invasive species”.**
- **Prevent reproduction of captive mute swans and release of mute swans into the wild.**

### **2.1. Develop guidance on housing and care considerations for captive swans held under an Invasive Species Permit.**

DEC adopted final regulations (6 NYCRR Part 575) on September 10, 2014, designating various plant and animal species, including mute swan, as “Prohibited Invasive Species” pursuant to the Invasive Species law (Environmental Conservation Law Section 09-1709). **This designation has no direct bearing on swans currently living in the wild.** Rather, this rule made it illegal to sell, import, purchase, transport, introduce, or propagate (or possess with the intent to sell, import, purchase, transport, or introduce) any prohibited invasive species in New York State. No person may possess, with the intent to sell, import, purchase, transport, or introduce a prohibited invasive species unless they have been issued a permit by DEC for research, education, or other approved activity. These permits will be issued by regional DEC offices, and special permit conditions will be included to ensure that mute swans in possession do not escape or are not released to the wild (see below).

Designation as a prohibited invasive species should end the importation and commercial trade of mute swans in New York, which has been a source of birds escaping to the wild. The occurrence of mute swans at many widely scattered locations across the state during the 2000-2005 Breeding Bird Atlas (Figure 2) is believed to be related to swans that were in private ownership (but loosely controlled), even though very few permits for possession had been issued at that time. Most people were probably unaware that a license was required to purchase or possess mute swans, and breeders across the country would ship birds to anyone without requiring proof of authorization by the state wildlife agency (except to California or Maryland, which had prohibitions). Known suppliers of mute swans and anyone else known to possess mute swans in New York (e.g., game bird breeders, wildlife rehabilitators) have been notified of the new regulations, and additional outreach will be made as needed.

DEC Bureau of Wildlife staff, with the assistance from wildlife health professionals, will develop outreach materials to summarize the housing requirements and other guidelines (age and sex considerations, methods for ensuring the birds remain flightless, and nutritional requirements) for individuals seeking permission to possess swans. Clearly articulated guidelines for ownership of swans will ensure that people interested in taking possession of birds have a full understanding of the facilities and materials needed for responsible care for swans before taking possession of birds, and to minimize the chance that swans taken into captivity escape to the wild.

DEC will also request assistance from cooperators (e.g., wildlife rehabilitators, domestic game bird breeders, or wildlife education facilities) to identify property owners with the interest and appropriate facilities to humanely care for mute swans that are removed from the wild.

## **2.2. Develop and refine conditions under which swans must be held in order to prevent reproduction and escape to the wild.**

In accordance with Invasive Species regulations cited above (6 NYCRR Part 575), DEC will allow the possession of mute swans by properly licensed entities for scientific research, education, public exhibition, or control (management) purposes. DEC will not allow mute swans to be imported into the state, but may allow birds taken from the wild to be possessed for non-commercial uses. Mute swans lawfully possessed before March 10, 2015, (the effective date of adoption of the Invasive Species regulations) would also be allowed to remain in possession of the licensee for the remainder of the birds' lives. However, to ensure that intentional or accidental releases of mute swans or their progeny do not occur, and to help identify any birds that escape, DEC will require that any person who possesses mute swans must:

1. Obtain an Invasive Species permit authorizing such possession at a suitable facility where mute swans will be maintained, with specific plans for food and shelter during the winter;
2. Prevent escapes from the licensed premises by: a) rendering the birds unable to fly by regular clipping of the wing feathers or permanent pinioning in accordance with accepted veterinary practices (e.g., at an early age or with anesthesia); or b) maintaining a completely enclosed (fenced and covered) area that the birds can move freely within, but which does not allow them to leave the property by flying, walking, or swimming;
3. Prevent any swans on the property from reproducing by: a) keeping only one gender (male or female) of swans on the property, as long as no swans of the opposite gender can enter the property; b) destroying or oiling any nests constructed or eggs laid within 14 days of being deposited; or c) having a licensed veterinarian surgically sterilize the birds; and
4. Mark all swans on the property with a permanent leg band, collar or wing-tag approved by DEC that allows identification of the owner or keeper of the birds.

Mute swans possessed pursuant to a DEC permit may be disposed of by: transfer to another entity licensed to possess mute swans; donation for zoological purposes; or euthanasia at the discretion of the permittee. Mute swans held in possession may not be used for shooting sport purposes. Licensed wildlife rehabilitators in the downstate region will be allowed to release rehabilitated swans back into the wild, but only at a DEC-approved location and pursuant to an Invasive Species permit. In upstate New York, DEC will help find suitable facilities for placement of rehabilitated mute swans in lieu of release back to the wild. Based on previous rehabilitator summary logs (2012-2014), DEC expects to place one to five swans annually at approved, licensed facilities.

## **Part 3. Management and Monitoring of Wild Mute Swan Populations**

### **Objectives:**

- **Statewide**
  - **Fully exhaust non-lethal control measures prior to any lethal removal.**
  - **Provide property owners, municipalities, and governmental agencies the necessary authorizations to prevent or alleviate site-specific mute swan impacts.**
  - **Ensure populations are managed consistent with social and environmental objectives.**

- **Downstate**
  - **Limit mute swan population growth in New York City, on Long Island, and in Orange, Rockland, Putnam, and Westchester counties.**
  - **Maintain a stable population of approximately 2,100 swans.**
- **Upstate**
  - **Prevent the establishment or expansion of nesting mute swan populations.**
  - **Achieve a stable to decreasing population of mute swans over the next six years with a population goal of 175 swans existing only in areas with currently established populations.**

### **3.1. Conduct mute swan population control activities to meet regional objectives.**

DEC conducted mute swan population control activities for many years in accordance with a management policy adopted in 1993 (DFWMR 1993). That policy authorized staff to remove mute swans from lands administered by the Division of Fish, Wildlife and Marine Resources (now the Division of Fish and Wildlife), but it did not specify the extent to which those activities should occur. Consequently, the amount of effort and type of controls conducted (e.g., nest/egg treatment, shooting, or removal of adult birds) varied among regions of the state. From 2005-2013, more than 500 adult mute swans and close to 2,500 eggs were taken from the wild across the state. Most of the take of adult birds occurred around Lake Ontario and at other locations in upstate New York, which reduced their numbers significantly and helped prevent range expansion. Downstate, most of the activity involved egg and nest treatment, which likely helped to stabilize the population in those regions.

DEC will consider population objectives for each region and conduct all mute swan population control activities with a priority given to non-lethal techniques in both the downstate and upstate regions of New York. DEC will develop a clear and transparent process to document non-lethal alternatives pursued prior to considering lethal removal.

The population objectives for downstate and upstate areas were based on the three-year average number of swans observed during the mid-summer breeding survey (2011, 2014, and 2017). The downstate population is likely at, or near the maximum the habitat can support and the population objective of 2,100 birds represents a stable population that will result from site-specific non-lethal control methods. The upstate population has the potential for rapid growth, and an objective of 175 birds will allow for more rigorous management while permitting small, local populations to persist. This will minimize the negative ecological impacts of swans upstate and decrease the opportunities for negative interactions between aggressive swans and people.

In the downstate region, DEC staff and cooperators will conduct non-lethal mute swan control activities wherever possible to minimize population growth in the region and to prevent dispersal of swans to other areas (i.e., upstate or adjoining states). Downstate, lethal removal by DEC will be limited to situations involving human health or safety. In situations involving human health (e.g. water quality), DEC will coordinate with local public health entities to assess the risk, prior to lethally removing any birds.

In upstate New York, DEC will conduct mute swan control activities to prevent the establishment or expansion of any nesting populations in the region. Control activities in this region will primarily involve direct removal of mute swans from any accessible public or private lands or waters, again with the landowner's consent. In all areas, priority will be given to non-lethal removal (live capture and placement at a DEC-licensed facility), wherever practical. DEC will attempt to identify such facilities soon after adoption of this plan. However, if live- capture is not feasible (due to logistic constraints or inability to readily capture swans that appear at new

locations) or no facility is able to take the birds in a timely manner, then lethal control may be used. Lethal control may also be necessary to ensure that the swans do not disperse to inaccessible locations in response to live-capture efforts. Lethal control activities will be conducted in accordance with established guidelines for humane killing of wildlife (e.g., Julien et al. 2010, AVMA 2013). Based on the most recent population estimates for this region, the total removal of mute swans statewide is expected to be less than 100 birds annually, with many of those being placed at DEC-licensed facilities.

Non-lethal management techniques will primarily involve egg-addling (e.g., coating with corn oil) or nest destruction on any accessible public or private lands or waters, with the landowner's consent. Non-lethal removal will involve live capture of free ranging swans and placement at licensed facilities. DEC will develop educational materials on care standards for mute swans (see 2.1, above), and undertake outreach efforts to identify facilities that are capable of obtaining the necessary permits to care for mute swans.

Based on the most recent population estimates for upstate New York, we expect that fewer than 100 nests would be treated and fewer than 100 swans would be removed (non-lethal and lethal combined) annually statewide. Based on the population growth rates we have observed, this removal rate should allow for a stable population in the downstate region and a stable to declining population in the upstate region. In the event population goals are achieved in either region, management actions will be restricted to non-lethal alternatives to maintain populations at appropriate levels and to situations involving human health and safety.

### **3.2. Conduct biennial mid-summer swan surveys to monitor population trends relative to regional population objectives**

DEC has committed to conducting biennial (e.g. 2017, 2019, 2021, etc.) mid-summer swan surveys to monitor population trends of both mute swans and trumpeter swans. Due to the uneven distribution of swans across the landscape, DEC will use all available information regarding the current and potential distribution of mute swans in New York to maximize survey coverage of areas that are known to be, or are potentially, inhabited by mute swans. Surveys will be conducted using the most effective methods for counting large conspicuous water birds and will include ground, boat, and aerial survey methodologies (see NYSDEC 2018).

By surveying every two years and monitoring removal efforts annually, DEC will be able to respond to changes in the mute swan population. As stated above, in the event the mute swan population upstate declines below management goals, as a result of population management or environmental factors, DEC will limit management actions to non-lethal alternatives to maintain populations at appropriate levels and to situations involving human health and safety.

### **3.3. Allow government agencies, municipalities, property owners, and others to conduct control activities to prevent or alleviate site-specific impacts of mute swans.**

In addition to population management activities, DEC will permit property owners and others to take adult swans, cygnets, eggs, or nests where immediate removal is necessary to alleviate a site-specific conflict (e.g., aggressive swans preventing use of a private pond or public waterway). In principle, property owners and managers should be allowed to resolve any problems caused by a non-native, invasive species, especially where habitats for native wildlife, recreation or human health and safety may be affected (e.g., wildlife management areas, near airports, etc.).

Nonetheless, any mute swan control work by cooperators should be done in a safe, effective and humane manner; this will be accomplished through issuance of individual permits with specific conditions and reporting requirements. Wherever practical, DEC will encourage live-capture and placement of birds at a DEC-licensed facility, and DEC will attempt to identify such facilities soon after adoption of this plan. However, if live-capture is not feasible or no facility is able to take the birds into possession immediately, then shooting (where it can be done safely) or live-capture and euthanasia in accordance with the above-referenced guidelines will be allowed. Hazing of mute swans will not be encouraged, especially upstate, as this would simply disperse the birds to other locations and could promote range expansion. As stated above, based on recent data on abundance and projected population growth, the total number of mute swans removed statewide to alleviate conflicts is expected to be less than 100 birds annually, with as many of those being placed at DEC- licensed facilities as possible.

#### **3.4. Encourage control of mute swans in neighboring states and provinces.**

Wild populations of mute swans exist in most adjoining states and provinces (Ontario, Connecticut, Rhode Island, New Jersey, and Pennsylvania) and all are potential sources of mute swans immigrating into New York. The population in Ontario is of particular concern because it is believed to be the original source of mute swans nesting and wintering along the New York shoreline of Lake Ontario. Most other states and provinces in the Atlantic Flyway support control of wild mute swan populations, as indicated by their adoption of a flyway management plan which called for a substantial reduction or elimination of mute swans in most jurisdictions (AFC 2015). Maryland has conducted a very aggressive control program, reducing the free-ranging swan population from nearly 4,000 birds in 1999 to less than 100 by 2014 (AFC 2015). Vermont has been successful at preventing a free-ranging swan population from becoming established, and some control efforts (nest and egg treatment or removals) have occurred in Rhode Island and New Jersey. Ontario conducted some mute swan control (primarily egg-oiling) in conjunction with efforts to promote restoration of a breeding population of trumpeter swans in that province, but that program has been discontinued.

Under this strategy, DEC will advocate for mute swan management programs that will complement our own efforts. As noted above, Ontario is of particular concern, so we will urge provincial and federal wildlife agencies in Canada to take appropriate action.

#### **IMPLEMENTATION AND EVALUATION OF MANAGEMENT SUCCESS**

Implementation of the above strategies will require some additional staff time and resources on a statewide basis, but not at the expense of other important conservation work. Fortunately, at this time mute swans are still quite limited in distribution and abundance upstate; therefore, much of the population control work there can be accomplished in the first few years by existing staff and cooperators if action is taken immediately. It should be noted, however, that non-lethal removal and placement of adult birds will be more difficult and time-consuming than would lethal removals.

Given the modest goal adopted in this management plan (i.e. to prevent population growth or range expansion), success can be measured fairly easily through systematic surveys. DEC will monitor the results of available population monitoring programs for waterfowl and other birds, including agency-sponsored and independent surveys such as winter waterfowl counts and Christmas Bird Counts, as an index of winter abundance. Additionally, DEC has developed a



comprehensive survey of mute swans during the breeding season to be conducted every two years to monitor and evaluate the success of management efforts.

## REFERENCES

- Allin, C. C., G. C. Chasko, and T. P. Husband. 1987. Mute swans in the Atlantic Flyway: a review of the history, population growth, and management needs. *Transactions of the Northeast Section of the Wildlife Society* 44:32-47.
- Allin, C. C., and T. P. Husband. 2003. Mute Swan (*Cygnus olor*) impact on submerged aquatic vegetation and macroinvertebrates in a Rhode Island coastal pond. *Northeastern Naturalist* 10:305-318.
- American Veterinary Medical Association (AVMA). 2013. AVMA Guidelines for the Euthanasia of Animals: 2013 Edition. AVMA, Schaumburg, Illinois. Available on-line at: <https://www.avma.org/kb/policies/documents/euthanasia.pdf>.
- Andrle, R. F. and J. R. Carroll, editors. 1988. *The Atlas of Breeding Birds in New York State*. Cornell University Press, Ithaca, New York.
- Animal People Online. 2012. Chicago-area caretaker is first known mute swan attack death. Article viewed on-line at: <http://www.animalpeoplenews.org/anp/2012/07/14/chicago-area-caretaker-is-first-known-mute-swan-attack-death/> on August 13, 2013.
- Atlantic Flyway Council (AFC). 2015. Atlantic Flyway Mute Swan Management Plan. Snow Goose, Brant, and Swan Committee, Atlantic Flyway Council and U.S. Fish and Wildlife Service, Laurel, Maryland.
- Badzinski, S.S., C. D. Ankney, and S. A. Petrie. 2006. Influence of migrant tundra swans (*Cygnus columbianus*) and Canada geese (*Branta canadensis*) on aquatic vegetation at Long Point, Lake Erie, Ontario. *Hydrobiologia* 567:195-211.
- Bailey, M., S. A. Petrie, and S. S. Badzinski. 2008. Diet of mute swans in the lower Great Lakes coastal marshes. *Journal of Wildlife Management* 72:726-732.
- Berglund, B.E., K. Curry-Lindahl, H. Luther, V. Olsson, W. Rodiie, and G. Sellerberg. 1963. Ecological studies on the mute swan (*Cygnus olor*) in southeastern Sweden. *Acta Vertebratica* 2:167-288.
- Chasko, G. 1986. The impact of mute swans on waterfowl and waterfowl habitat. *Wildlife Investigation: Waterfowl Research and Surveys W-49-R-10*, Final Report, Connecticut Department of Environmental Protection, Hartford.
- Ciaranca, M. A. 1990. Interactions between Mute Swans (*Cygnus olor*) and Native Waterfowl in Southeastern Massachusetts on Freshwater Ponds. M.S. Thesis, Northeastern University, Boston, Massachusetts.
- Ciaranca, M. A., C. C. Allin, and G. S. Jones. 1997. Mute Swan (*Cygnus olor*), in Poole, A., editor, *The Birds of North America Online*. Cornell Lab of Ornithology, Ithaca. Retrieved from the *Birds of North America Online*: <http://bna.birds.cornell.edu/bna/species/273>.
- Conover, M. R., and G. S. Kania. 1994. Impact of interspecific aggression and herbivory by mute swans on native waterfowl and aquatic vegetation in New England. *Auk* 111:744-748.

- Division of Fish and Wildlife and Division of Marine Resources (DFWMR). 1993. Policy on Management of Mute Swans in New York. New York State Department of Environmental Conservation, Bureau of Wildlife, Albany.
- Fenwick, G. H. 1983. Feeding behavior of waterfowl in relation to changing food resources in the Chesapeake Bay. PhD Dissertation, Johns Hopkins University, Baltimore, Maryland.
- Gayet, G., M. Guillemain, F. Mesléard, H. Fritz, V. Vaux, and J. Broyer. 2011. Are Mute Swans (*Cygnus olor*) really limiting fishpond use by waterbirds in the Dombes, eastern France. *Journal of Ornithology* 152: 45-53.
- Gayet, G., M. Guillemain, P. Defos du Rau, and P. Grillas. 2013. Effects of mute swans on wetlands: a synthesis. *Hydrobiologia* 723:195-204.
- Hindman, L. J. and W. F. Harvey, IV. 2004. Status and management of Mute Swans in Maryland. Pages 11-17 in Perry, M. C., editor, *Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium*. U.S. Geological Survey, Biological Resources Discipline Information and Technology Report USGS/BRD/ITR 2004-0005, Reston, Virginia.
- Hussong D., J. M. Damaré, R. J. Limpert, W. J. L. Sladen, R. M. Weiner and R. R. Colwell. 1979. Microbial impact of Canada geese (*Branta canadensis*) and whistling swans (*Cygnus columbianus columbianus*) on aquatic ecosystems. *Applied Environmental Microbiology* 37:14-20.
- Julien, T. J., S. M. Vantassel, S. R. Groepper, and S. E. Hygnstrom. 2010. Euthanasia methods in field settings for wildlife damage management. *Human-Wildlife Interactions* 4:158-164.
- Kania, G. S. and H. R. Smith. 1986. Observations of agonistic interactions between a pair of feral mute swans and nesting waterfowl. *Connecticut Warbler* 6:35-37.
- Maryland Department of Natural Resources (Maryland DNR). 2001. Mute Swans - Population Status, Impacts on Native Wildlife and People, and Management Needs In Maryland - A Summary of Information Prepared by the Maryland DNR Mute Swan Task Force, January 2001. Maryland DNR, Wildlife and Heritage Service, Annapolis.
- Maryland Department of Natural Resources (Maryland DNR). 2011. Mute Swan Management Plan for Maryland. Maryland DNR, Wildlife and Heritage Service, Annapolis.
- McGowan, K. J. and K. Corwin, editors. 2008. *The Second Atlas of Breeding Birds in New York State*. Cornell University Press, Ithaca, New York.
- Michigan Department of Natural Resources (Michigan DNR). 2012. Mute Swan Management and Control Program Policy and Procedures. Wildlife Division, Michigan DNR, Lansing.
- Naylor, M. 2004. Potential impacts of mute swans to SAV in Chesapeake Bay. Pages 36-37 in Perry, M. C., editor, *Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium*. U.S. Geological Survey, Biological Resources Discipline Information and Technology Report USGS/BRD/ITR 2004-0005, Reston, Virginia.

- NYSDEC. 2018. Mid-summer swan survey, 2017. New York State Department of Environmental Conservation, Division of Fish & Wildlife, Bureau of Wildlife. Albany, NY 7 pp.
- New York State Seagrass Task Force. 2009. Final Report of the New York State Seagrass Task Force: Recommendations to the New York State Governor and Legislature. Available on-line at:  
[http://www.dec.ny.gov/docs/fish\\_marine\\_pdf/finalseagrassreport.pdf](http://www.dec.ny.gov/docs/fish_marine_pdf/finalseagrassreport.pdf).
- O'Brien, M. and R. A. Askins. 1985. The effects of mute swans on native waterfowl. *The Connecticut Warbler* 3:27-39.
- Petrie, S. A. and C. M. Francis. 2003. Rapid increase in the lower Great Lakes population of feral mute swans: a review and recommendation. *Wildlife Society Bulletin* 31:407-416.
- Reese, J.G. 1980. Demography of European Mute Swans in Chesapeake Bay. *Auk* 97:449-464.
- Rhode Island Department of Environmental Management (Rhode Island DEM), Division of Fish and Wildlife. 2006. Mute Swan Management Plan. Rhode Island Department of Environmental Management, Providence.
- Scott, P. and the Wildfowl Trust. 1972. *The Swans*. Houghton Mifflin Company, Boston, Massachusetts.
- Shuford, W. D. 1999. Status Assessment and Conservation Plan for the Black Tern in North America. U. S. Fish and Wildlife Service, Denver, Colorado.
- Stafford, J. D., M. W. Eichholz, and A. C. Phillips. 2012. Impacts of mute swans (*Cygnus olor*) on submerged aquatic vegetation in Illinois River Valley backwaters. *Wetlands* 32:851-857.
- Stone, W. B., and A. D. Marsters. 1970. Aggression among captive mute swans. *New York Fish and Game Journal* 17:50-52.
- Swift, B. L., K. J. Clarke, R. A. Holevinski, and E. M. Cooper. 2013. Status and Ecology of Mute Swans in New York State, Draft Final Report. New York State Department of Environmental Conservation, Bureau of Wildlife, Albany.
- Tatu, K. S., J. T. Anderson, L. J. Hindman, and G. Seidel. 2007. Mute swans' impact on submerged aquatic vegetation in Chesapeake Bay. *Journal of Wildlife Management* 71:1431-1439.
- Therres, G. D., and D. F. Brinker. 2004. Mute swan interactions with other birds in Chesapeake Bay. Pages 43-46 in Perry, M. C., editor, *Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium*. U.S. Geological Survey, Biological Resources Discipline Information and Technology Report USGS/BRD/ITR 2004-0005, Reston, Virginia.

- Virginia Department of Game and Inland Fisheries (Virginia DGIF). 2012. Mute Swan Management Plan. Virginia Department of Game and Inland Fisheries, Richmond.
- Willey, C. H. 1968. The ecology, distribution, and abundance of the mute swan (*Cygnus olor*) in Rhode Island. M.S. Thesis, University of Rhode Island, Kingston.
- Willey, C. H. and B. F. Halla. 1972. Mute swans of Rhode Island. Wildlife Pamphlet Number 8, Rhode Island Department of Natural Resources, Division of Fish and Wildlife, Providence.
- Wlodarczyk, R., M. Wieloch, C. Stanislaw, P.t. Dolata, and P. Minias. 2013. Natal and breeding dispersal in Mute Swans: influence of sex, mate switching and reproductive success. ACTA Ornithologica 48:237-244.
- Wood, K. A., R. A. Stillman, F. Daunt, and M. T. O'Hare. 2014. Chalk streams and grazing mute swans. British Wildlife 25:171-176.