Mute Swan Management
A literature review and discussion document

By Kelly Duffin | Revised and updated May 2025

Abstract

"Mute Swan management" programs, which entail the destruction of Mute Swan eggs and nests, have been in place in Ontario for over two decades. The species is federally protected under the Migratory Birds Convention Act, but Canadian Wildlife Service (CWS) within Environment and Climate Change Canada (ECCC), issues Danger and Damage Permits for "management" activities. Danger and Damage Permits are also issued by CWS/ECCC for the killing of young and adult Mute Swans on private or federal property.

To understand whether management is necessary and how real the risks might be, an extensive review of the literature published on this topic was undertaken. The research reviewed included the reports that precipitated Mute Swan management programs in Canada and the US and dozens of subsequent studies up to the present day. Scientists in relevant disciplines – including ornithology, biology, and ecology – have provided research, expertise, and guidance and have reviewed drafts.

The findings of the literature review include:

- The need for Mute Swan management is not substantiated by the scientific evidence. An extensive search has found no fulsome environmental impact assessment or reference to one having been done.
- Many of the studies are anecdotal and at best inconclusive.
- Relative to the stated reasons for management, the literature review finds that:
    - Mute Swans do not routinely outcompete other waterbirds for territory;
    - Mute Swans' foraging does not deplete vegetation; and
    - Their population growth is not problematic.
- That they are not detrimental is further evidenced by the fact that Trumpeter Swans exhibit the same behaviours and attributes as Mutes and no concerns are expressed by wildlife authorities about Trumpeters' impacts on ecosystems. Nor does CWS issue Danger and Damage Permits to manage Trumpeter Swans.
- If controlling the Mute Swan population was initiated in part to support the "re"-introduction of Trumpeter Swans, who are considered and therefore favoured as a "native" species, that support is no longer warranted. Trumpeters now outnumber Mutes 8:1 in Canada and their numbers and range are increasing more rapidly than Mutes'. This is what the late Harry Lumsden, often called the father of their "re"-introduction, predicted as Trumpeters are the larger and more aggressive species.
- It is also questionable whether Trumpeters were in fact a native breeding species in southern Ontario, where they have been encouraged to nest over the last three and a half decades or whether, like Mutes were, they have been introduced as a new breeding species.
- Classifying flora and fauna as "native" and "non-native" and preferring "natives" sounds logical and has become a reflexive way of categorizing species, but the utility of judging species on their origins is a matter of debate among ecologists. First, establishing the era and boundaries in which species had to exist to be "native" is subjective. Second, as animals and plants are mobile, their ranges are in constant flux even without human intervention. Many ecologists argue that this paradigm has introduced a value-laden hierarchy and too often led to blunt instrument-type and often lethal actions against non-natives – despite the fact that the vast majority of them are benign or beneficial. Those ecologists argue that a more nuanced approach is needed, based on impacts not on origins.

In addition to being a literature review this paper is also a discussion document. It is hoped that the findings herein will demonstrate that current management practices are disproportionate to any "problem." It is time to eliminate Mute Swan management activities entirely or at least implement more humane alternatives to lethal approaches. One such alternative is removing or replacing some swan eggs with fake eggs while leaving two or three to hatch.

This is a viable compromise. Why wouldn't we act on it?

About Mute Swans

Mute Swans (*Cygnus olor*) are the intelligent, majestic, orange-beaked waterbirds that have been the subject of myth and art and a symbol of beauty and love for centuries. They are enjoyed and beloved by many in Canada and around the world, for their grace, beauty, lasting pair bonds, and the care both parents give to raising their young.

Mute Swans pick a mate at approximately three years of age and begin breeding thereafter. The cob (male) selects a nest site agreed to by his mate (the pen) and they spend approximately three weeks in March and April building the nest. The pen will then lay an egg every day or two until the clutch (complete set of eggs) numbers somewhere between five and nine eggs[1]. The pen will begin incubating the eggs in mid- to late-April when the clutch is complete. During incubation she plucks out down and feathers to make a nearly featherless area on her abdomen, called a brood patch, that will come in contact with the eggs and keep them warmed. She will also regularly rotate the eggs with her beak, so they heat and develop evenly. Once incubating, she does not leave the nest often, even to eat, so she grows weaker and increasingly vulnerable.

The cob sleeps near her at night to protect her and the eggs. The balance of the time he can often be found patrolling their territory, which averages 15 acres[2], to prevent the incursion of other swans.

Approximately 35 days after incubation starts, eggs will hatch within 48 hours of each other. Within the first two days of the cygnets (babies) hatching, the parents lead them into the water to swim, eat, drink, and preen.

Typically, not all eggs hatch and of those that do, only half the cygnets will survive to fledge (grow feathers and fly away)[3]. They will leave their parents after six to nine months and may join a flock that includes non-paired juveniles for a year or two before selecting a mate and beginning their own adult lives.

While this is the natural life cycle of Mute Swans, municipal and wildlife authorities are dramatically altering their life cycle through "Mute Swan management Programs."

Under Danger and Damage Permits issued by Environment and Climate Change Canada (ECCC), over 1,166 young and adult Mute Swans have been killed in Ontario on federal and private property in the decade between 2014 and 2023[4]. The same Permits enable authorities and private landowners to attend known and newly discovered nests every year and coat all the eggs in oil, or use some other method of destruction, to prevent them from hatching. Over 1,859 eggs have been destroyed in the province in the same decade.[5]

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[1] Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010; Ciaranca, M. A., C. C. Allin, and G. S. Jones (2020). Mute Swan (*Cygnus olor*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology; Final Michigan Environmental Assessment 2012; Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

[2] *Rapid increase in the lower Great Lakes population of feral mute swans: a review and a recommendation*, Scott A. Petrie and Charles M. Francis, 2003, Wildlife Society Bulletin.

[3] An Evaluation of 22 Years of Mute Swan Management in Rhode Island, Charles H. Allin et al, in Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium

[4] Environment and Climate Change Canada Access to Information responses

[5] Environment and Climate Change Canada Access to Information responses. Note that had they been left to hatch, the population increase would not have been 1,859. Some of these represent second clutches which would never have

Oiling the eggs starves the developing cygnets of oxygen, which would otherwise pass through the shell, so the cygnets die. It also causes the pen to stay on the nest longer, often weeks longer, as she is not willing to give up on the cygnets she thinks will emerge. Recently, some authorities began destroying nests earlier in the season, several weeks after the final oiling is applied, as the pen is otherwise often nearly starving when she finally abandons the nest.

If this happens early enough in the breeding season the pen may lay a second clutch after a period of rest and recovery. When that clutch is found it is also destroyed. At some point the eggs are taken and the nest is destroyed. By this time the pen may have laid 12 or more eggs and spent over 10 weeks laying and incubating.

For both would-be parents this practice eliminates a fundamental – not incidental – feature of their wild lives. Mute Swans spend approximately 80% of their adult lives (10 months each year) engaged in reproducing and rearing their young. Preventing this year after year is not inconsequential.

Stated reasons for management

Municipalities and wildlife authorities in Canada and the United States who engage in Mute Swan management provide as the reason for management a number of claims which fall into three broad categories:

1. Mute Swans may reduce wetlands available for use by smaller native, threatened, and endangered waterfowl by outcompeting them for territory and for food by overgrazing.
2. Mute Swans are aggressive.
3. Unchecked, the Mute Swan population would grow exponentially and exacerbate problems 1 and 2.

An extensive literature review was conducted to determine whether these negative impacts attributed to Mute Swans are scientifically substantiated. The findings are presented below.

1. **Accusation: Mute Swans may reduce wetlands available for use by smaller native, threatened, and endangered waterfowl by outcompeting them for territory and for food by overgrazing.**

   Finding: This is not substantiated by the evidence.

   <u>Competition with other waterfowl</u>

   Like most species, Mute Swans will defend their nests, young, and territories. They occasionally kill other birds, mostly other swans' cygnets. Their own babies are also occasionally killed by other birds. But "…studies of breeding waterbirds found no evidence that swans exclude other waterbirds from habitat or reduce breeding densities…. A recent meta-analysis cast further doubt, by showing that swans spent no more time engaged in aggressive behavioral interactions than other waterbird taxa."[6]

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been laid if the first clutch had hatched. In addition, not all eggs hatch and of those that do, mortality is approximately 50% to age one.

[6] *Aggressive behavioural interactions between swans (Cygnus spp.) and other waterbirds during winter: a webcam-based study*, Kevin Wood et al (Swan Specialist Group) in Avian Research.

Multiple studies, including the one by Kevin A. Wood and others with the Wetlands International Swan Specialist Group cited above, establish that the vast majority of Mute Swan aggression is towards other swans[7], with Canada Geese in second place. The remaining 7% of aggressive encounters were spread over 12 other waterbird species (i.e., less than 1% per species on average).[8] One study found that many native waterbirds were found "significantly closer to mute swans than control stakes…perhaps suggesting an advantage to being proximate to mute swans."[9] These findings led authors of another study to state: "Given that even the low incidences of aggression…could carry the risk of serious injury or death, it may seem counter intuitive that smaller waterbirds are so often observed to share habitat with swans."[10]

A 2022 webcam study also by Kevin A. Wood again found that most Mute Swan "aggression is directed towards conspecifics"[11] (members of the same species, in this case Mute Swans). The same report also stated that "Studies of ecologically-similar large-bodied herbivorous avian species have recorded higher levels of aggression" than Mute Swans.

Similarly, in a study conducted over seven years in Chesapeake Bay[12] "observation[s] of breeding Mute swans …, Reese (1975) did not observe any serious attacks on other waterfowl, and stated that several other authors believed that attacks were rare…. [The other waterfowl] were bitten by swans in fewer than 20% of the attacks. The authors did not observe any instances of the swans foiling breeding attempts by other species, which did nest along with swans at most of the sites."

Relative to the concern for smaller native, threatened, and endangered waterfowl, The State of Canada's Birds, released in 2024 by Birds Canada and Environment and Climate Change Canada, reports that waterfowl and wetland birds increased by 46% and 21% respectively between 1970 and 2021.[13]

Birds including the Least Bittern and Pied-billed Grebe remain within goal range and have seen little change overall. Other birds, including the Black Tern, Common Gallinule, and American Bittern have experienced large decreases in the same timeframe but those decreases began in the late 1970s (or earlier) and the species have been below their goal population range since 1978. Since there were no Mute Swan populations of any meaningful size at that time Mute Swans could not have contributed to these declines. Furthermore, those decreases occurred in areas where there are no Mute Swans.[14]

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[7] *Aggressive behavioural interactions between swans (Cygnus spp.) and other waterbirds during winter: a webcam-based study*, Kevin Wood et al (Swan Specialist Group) in Avian Research.

[8] Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

[9] Mute Swan Impacts on Native Waterbirds and Submerged Aquatic Vegetation in Illinois; Adam Christoper Phillips; 2010

[10] Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010; Ciaranca, M. A., C. C. Allin, and G. S. Jones (2020). Mute Swan (*Cygnus olor*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology

[11] *Assessing trade-offs in avian behaviour using remotely collected data from a webcam*, Kevin A. Wood, Rebecca Lacey, and Paul E. Rose, 2022

[12] Chesapeake Bay is arguably the epicentre of Mute Swan management and considerable research has been conducted in that region. Authorities throughout the Atlantic Flyway (which includes Chesapeake Bay and Ontario) have relied on those studies to justify management in their own jurisdictions. Much of what will be cited in this paper is therefore US-based and Chesapeake Bay-based.

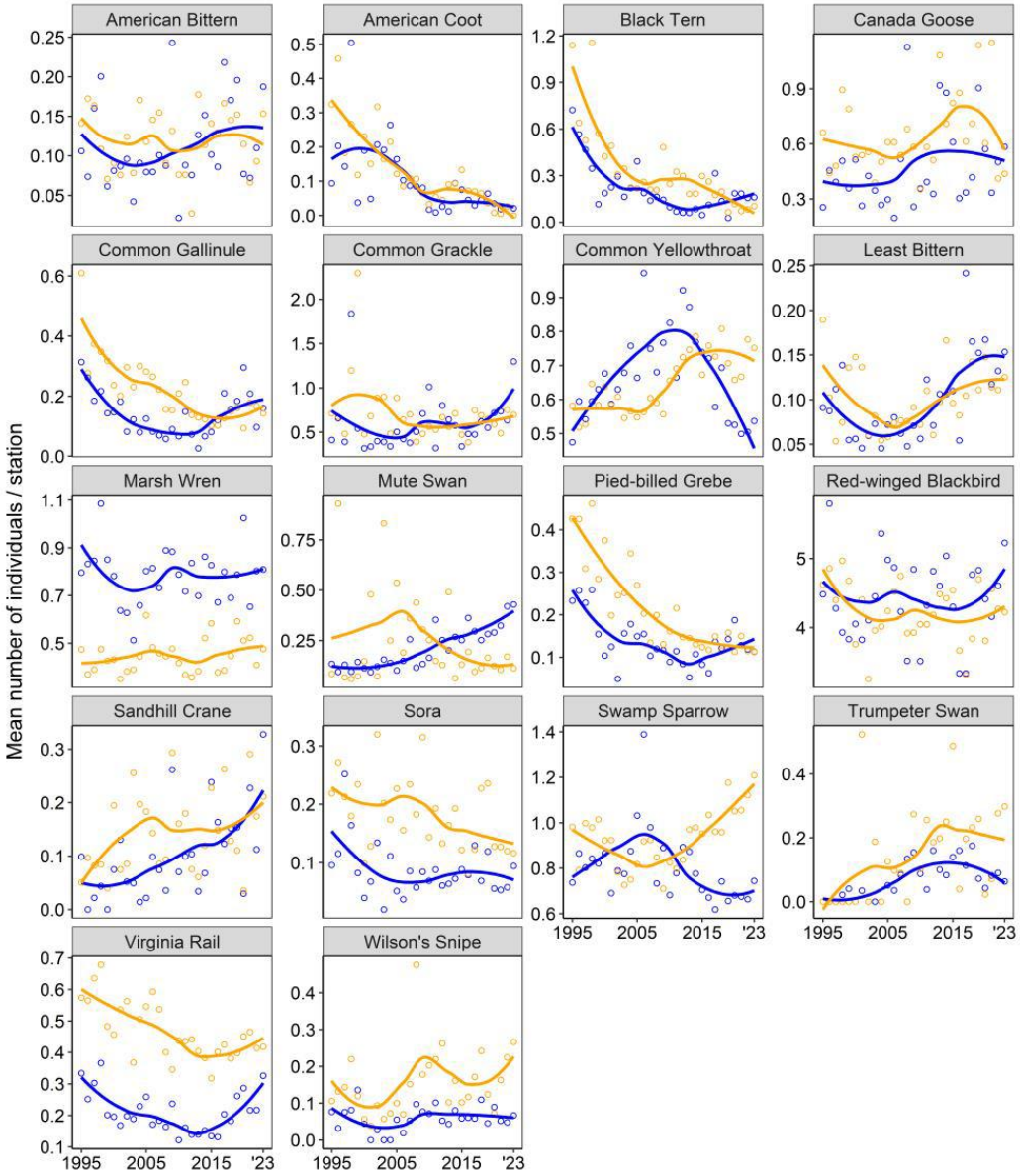
[13] Birds Canada and Environment and Climate Change Canada. 2024. The State of Canada's Birds

[14] Birds Canada and Environment and Climate Change Canada. 2024. The State of Canada's Birds

The same species are now showing signs of recovery. The 2024 Marsh Monitoring Program report illustrates declines inland but increases in the coastal populations of American Bittern, Black Tern, Common Gallinule (which can also be hunted despite its status as a priority for conservation), Least Bittern, and Pied-billed Grebe, among others. The same report shows that Mute Swans were also increasing in coastal wetlands but decreasing inland.

Despite Mute Swans, the waterbirds who share territory are recovering.

Great Lakes Marsh Monitoring Program annual abundance for birds in coastal and inland wetlands 1995 – 2023



[15]

[15] The Marsh Monitor, Fall 2024 Number 30, Birds Canada

Ecosystem degradation

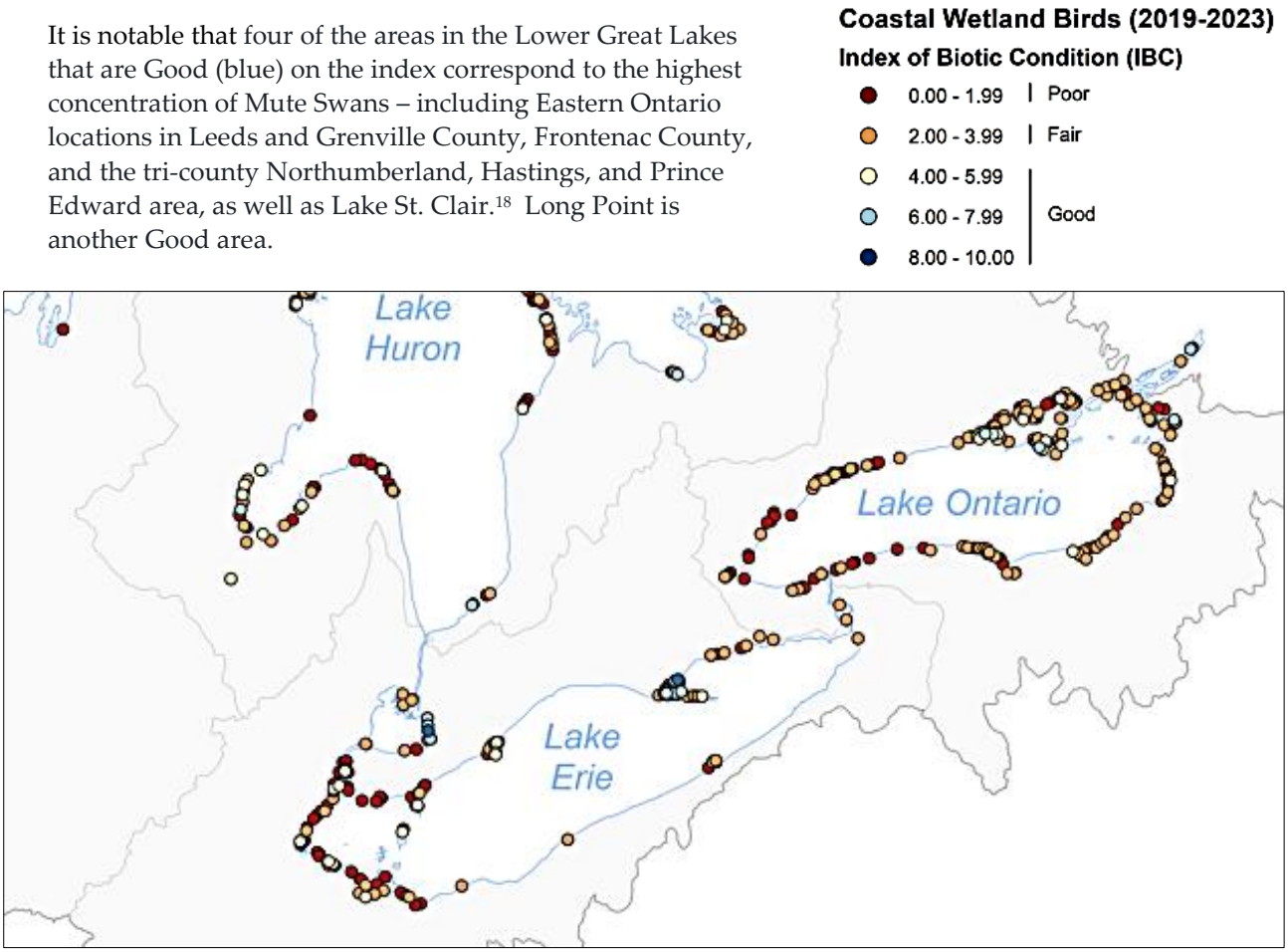
Human activity has left intact only 20-25% of original wetland areas of western Lake Ontario and less than 5% of western Lake Erie.[16]

It is not uncommon for species considered native to fare poorly once their traditional habitat is reduced or compromised, whereas "introduced" species (those brought by humans), if they survive the introduction, tend to be more adaptable. Indeed, "Mute Swans do well in degraded environments."[17]

Declines in other species are more likely the result of our actions and other species' inability to adapt to the ecosystem we have left them.

Again, there is some reason for optimism. Relative to the health of the Great Lakes environment, a new report being finalized by Birds Canada for release later this year provides evidence of the improvement of biotic conditions over the last four years in several areas.

It is notable that four of the areas in the Lower Great Lakes that are Good (blue) on the index correspond to the highest concentration of Mute Swans – including Eastern Ontario locations in Leeds and Grenville County, Frontenac County, and the tri-county Northumberland, Hastings, and Prince Edward area, as well as Lake St. Clair.[18] Long Point is another Good area.



[16] Review of the Status of Mute Swans on the Canadian Side of the Lower Great Lake by Scott A. Petrie, in Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium

[17] Cornell Lab of Ornithology

[18] Population data are based on the Midwinter Waterfowl Count, the Midsummer Mute Swan Survey, and the Breeding Bird Atlas

Some of this improvement may be attributable to increased water levels, greater fluctuation in water levels, and interspersion ("the ratio of open water to wetland vegetation").[19] High water and fluctuating water levels are positively associated with waterbird density and success.

Before 2016, Great Lakes water levels were low and declining and that was strongly correlated with a decline in the waterfowl species mentioned above. Indeed, the American Bittern, Black Tern, Common Gallinule, Least Bittern, and Pied-billed Grebe are among the species who have been "shown to *decline* with receding lake levels and *increase* with rising lake levels."[20]

In addition to the real decline in some species, lower water levels may also have caused the birds to relocate. "Nearly all the marsh…bird species in the Great Lakes are migratory, and thus they are capable of colonizing newly created wetlands and abandoning sites that become unsuitable. This means that local populations might shift geographically as Great Lakes water levels increase and decrease"[21] but local changes may not be reflective of changes in the overall population.

Since 2016, higher water levels and greater fluctuations have been in place and "species like the American bittern, common gallinule…and pied-billed grebe were significantly more abundant during high water years."[22]

These waterbirds are now recovering at a rate estimated to range from 18% to 37% per year. The base is small, and they remain a fraction of the number of Mute Swans, but their growth rates dramatically outpace Mutes' 1.7% annual increase in the same study.[23]

<u>Overgrazing</u>

Mute Swans are a tiny percentage of waterfowl. Even when Mute Swan management began in earnest in and around Chesapeake Bay, they represented only .5% of the waterfowl in the Bay[24]. In a paper seeking to justify their management back in 2001, the presenter acknowledged that "the biomass of SAV [subaquatic vegetation] currently being consumed by the Chesapeake Bay mute swan population is almost certainly negligible."[25]

In fact, numerous studies have established that SAV severely declined in Chesapeake Bay in distribution and abundance in recent decades due to anthropogenic (human) activity, including

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[19] Influence of lake levels on water extent, interspersion, and marsh birds in Great Lakes coastal wetlands, Tara R. Hohman et al. 2020

[20] Timmermans et al. 2008, Gnass Giese et al. 2018, Kirchin et al. 2020, Hohman et al. 2021, Denomme-Brown et al. 2023 as reported in Increasing marsh bird abundance in coastal wetlands of the Great Lakes, 2011-2021, likely caused by increasing water levels, Doug Tozer et al. 2023

[21] Influence of lake levels on water extent, interspersion, and marsh birds in Great Lakes coastal wetlands, Tara R. Hohman et al. 2020

[22] Influence of lake levels on water extent, interspersion, and marsh birds in Great Lakes coastal wetlands, Tara R. Hohman et all. 2020

[23] Increasing marsh bird abundance in coastal wetlands of the Great Lakes, 2011-2021, likely caused by increasing water levels, Doug Tozer et al. 2023

[24] Mute Swans accounted for less than .5% of the 879,000 waterfowl counted in 2004 in Chesapeake Bay, from Nonlethal Techniques to Reduce Animal Problems by Priscilla Feral, in Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium

[25] Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

runoff from industry, agricultural pollution, waste water treatment, deforestation, urban and suburban shoreline development, and wetland destruction.[26] One such report noted that "decreased sunlight penetration…by excessive algae growth on SAV plant surfaces, [was] caused by nutrients and sediments that run into [the Bay] from the surrounding watershed."[27] The water quality in Chesapeake Bay received a D+/32 score in the most recent report in 2022. This is exactly the same score as a decade earlier, despite the near-elimination of Mute Swans in Maryland by 2013.[28] Clearly Mute Swan grazing was not a leading cause of SAV declines or poor water quality in Chesapeake Bay.

Findings were the same "[o]n 15 freshwater ponds in Connecticut occupied by mute swans, [where] Conover and Kania (1994) found no significant differences in above-ground biomass of SAV between grazed and exclosed sites."[29]

A 2010 study in Illinois had similar findings. That study "did not detect a reduction in above-ground SAV biomass." While the researchers did detect some depletion of below-ground structures, the report notes that a study by Bailey et a. (2008) "found that mute swan diets were comprised of 72% above-ground SAV parts and 22% below-ground SAV parts. Since below-ground parts comprised a significantly smaller proportion of mute swan diets, direct reduction of below-ground biomass may be unlikely."[30]

Yet another study found SAV percentage cover was actually higher in areas that had a higher density of Mute Swans compared to percentage cover with a lower density of Mute Swans, which "shows that mute swans may not be impacting the SAV % cover."[31]

By 2021, according to the State of Canada's Birds, Trumpeter Swans *(Cygnus buccinator)* outnumbered Mute Swans in Canada 8:1; Tundra Swans *(Cygnus columbianus)* outnumbered Mute Swans by 47:1; Canada Geese (*Branta canadensis*) by 945:1; and Mallards (*Anas platyrhynchos*) by 982:1.[32] It is hard to imagine that Mute Swans are responsible for depleting vegetation given these relative numbers.

Mute Swans' impact is grossly overstated but even if Mute Swans were a small factor, natural mechanisms have regulatory effects. "At least some species of SAV are able to adapt to heavy grazing. Studies have shown that increased predation pressure on [one type of plant] by Europe's Bewick swans resulted in deeper burial of tubers, an adaptive response that occurred over approximately 20 years."[33] Two other studies cited in the same report also suggest SAV adapts to grazing and returns to acceptable levels. Other studies have found that waterfowl will not graze when SAV falls below a certain threshold ("giving-up density"), such that that there would not be a total loss of SAV.[34]

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[26] Water Quality Standards Attainment and Monitoring, Chesapeake Progress, Chesapeake Bay Program reports, Chesapeake Bay Foundation reports, and others

[27] Water Quality Standards Attainment and Monitoring, Chesapeake Progress, Chesapeake Bay Program reports, Chesapeake Bay Foundation reports, and others.

[28] Chesapeake Bay Foundation, 2022 State of the Bay Report

[29] Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

[30] Mute Swan Impacts on Native Waterbirds and Submerged Aquatic Vegetation in Illinois; Adam Christoper Phillips; 2010

[31] A Deeper Look into the Invasive Mute Swan's Impact on the Coastal Wetlands of Michigan, Nicole J. Wood et al.

[32] Birds Canada and Environment and Climate Change Canada. 2024. The State of Canada's Birds.

[33] Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

[34] Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010 and Final Environmental Assessment: Mute Swan Damage Management in Michigan 2012

The Illinois study cited above also reports "Response of aquatic vegetation to waterbird herbivory has been thoroughly studied throughout the world… Compensatory growth is a common phenomenon…[and] In some cases, SAV biomass can be greater following herbivory pressure…"[35]

Finally, food is a limiting factor and "if [Mute Swans] are depleting all the vegetation" one observer wondered how the birds "stay in the same locations year after year."[36]

2. **Accusation: Mute Swans are aggressive.**

   Finding: As noted above, like most animals – and less than Trumpeter Swans – Mute Swans will defend their nest and young, but this can usually be overcome by minor human behaviour modification.

   Busking (puffing and hissing) is mostly bluff and occurs primarily during breeding season to protect eggs and cygnets. It is often precipitated by human harassment. While people occasionally hurt themselves evading a busking swan, calls to all Toronto area hospitals yielded 0 reports of swan attacks requiring treatment.[37] Statistics on swan attacks are also not available through Toronto and Region Conservation Authority, Ontario's Ministry of Natural Resources and Forestry, or Canadian Wildlife Service.[38] The Public Health Agency of Canada (PHAC's) Injury Surveillance within the Centre for Surveillance and Applied Research also has no records of swan attacks.

   It is far more common for Mute Swans to be injured or killed by humans or offleash dogs than for Mute Swans to seriously attack (see Mortality below).

   This "problem" is often easily resolved by giving swans space until they leave the nest with their cygnets. It can also be addressed by installing "Do Not Harass" signs, establishing and enforcing non-harassment regulations, and engaging and educating the community on these and other coexistence strategies.

   Furthermore, Mute Swan management does not reduce but extends aggression. "If eggs are left in the nest but rendered unviable through oiling, addling or puncturing, birds will persist in defending the area until they give up on the nest."[39]

3. **Accusation: Unchecked, the Mute Swan population would grow exponentially and exacerbate problems 1 and 2.**

   Finding: The Mute Swan population is far from carrying capacity and in some regions, in decline.

   <u>Population, range, and distribution</u>

   As of the 2024 Midsummer Mute Swan Survey, 8,626 Mute Swans were counted both in aerial and ground parts of the survey which covered the Lower Great Lakes, Upper Great Lakes, and inland areas in Ontario. Of that total, 7,951 or 92% were in the Lower Great Lakes. Of the 7,169 reported along the shoreline of the Lower Great Lakes, 782 or 11% were cygnets.

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[35] Mute Swan Impacts on Native Waterbirds and Submerged Aquatic Vegetation in Illinois; Adam Christoper Phillips; 2010

[36] *Alien swans create controversy in Michigan* in the Examiner, July 2021.

[37] Barry Kent McKay, letter to Birds Studies Canada

[38] Access to Information and Freedom of Information responses, 2023

[39] Decision and Finding of No Significant Impact for the Environmental Assessment: Mute Swan Damage Management in Michigan

In the winter, their population has been largely stable in the Niagara, Hamilton, and Toronto regions between 2002 and 2023, according to The Midwinter Waterfowl Counts. [40]

As noted above, their numbers pale in comparison to other species. According to the State of Canada's Birds, the 2021 estimated annual population numbers for five waterfowl species were:

Species	Annual population estimate at 2021	Average annual rate of growth 1970-2021	Ratio of x species : Mute Swan
Mute Swan	5,500	5.38%	1:1
Trumpeter Swan	45,000	6.49%	8:1
Tundra Swan	260,000	.74%	47:1
Canada Goose	5,200,000	8.99%	945:1
Mallard	5,400,000	-.52%	982:1

The Great Lakes Marsh Monitoring Program determined the average annual growth rate of the Mute Swan population to be 2.7% between 1995 and 2022, lower than other species including Trumpeter Swans. (See A tale of two swans, Population, distribution and relative abundance below).

As previously noted, the Marsh Monitoring Program also found that Mute Swans were decreasing inland.

The swans have also declined precipitously – by 81% since 2011 – from Toronto to Hamilton, according to the Midsummer Mute Swan Surveys:

Humber Bay to Hamilton Harbour [41]	Adults	Cygnets	Total Birds
2011			
	404	9	413
2024			
	67	13	80
Change #			-333
Change %			-81%
Annual growth			-6%

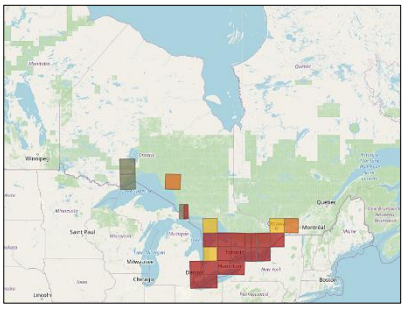
By the 2024 Survey, the density of Mute Swans from the CN Tower to Hamilton Harbour was only .56 swans per kilometre (.47 adults and .09 cygnets per kilometre).[42]

[40] Midwinter Waterfowl Count, conducted by Ministry of Natural Resources and Forestry, Environment and Climate Change Canada, Bird Studies Canada, Toronto Ornithological Club, and numerous volunteer observers. "Please note that there is some overlap of survey areas between the ground and aerial surveys and that some areas may have changed slightly over time. Because of the overlap of some areas, this data should only be used for trend estimation and not total abundance." Email from Ministry of Natural Resources and Forestry.

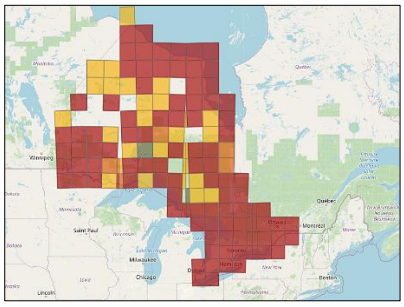
[41] The Status of Mute Swans in Ontario, 2024 (Midsummer Mute Swan Survey), Environment and Climate Change Canada

[42] The Status of Mute Swans in Ontario, 2024 (Midsummer Mute Swan Survey), Environment and Climate Change Canada

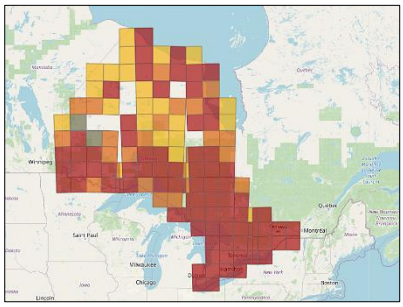
Their range is also not expanding. The Third Ontario Breeding Bird Atlas (2021-2025, 2021-2024 to date) illustrates that they are concentrated in the Lower Great Lakes and largely urban coastlines. This is consistent with the Midsummer Mute Swan Survey finding that 92% are in the Lower Great Lakes and very similar to their range and distribution in the Second Atlas (2001-2005). Other species, including Canada Geese, and Mallards, have comparatively larger ranges and are more distributed across the province.



Mute Swans



Canada Geese



Mallards[43]

Mortality

In rationales for egg destruction, it is often said that Mute Swans have few natural predators. While adult Mute Swans are not often (but sometimes) predated, their eggs and cygnets are often predated so this statement should not suggest low mortality rates.

Mute Swans have a 40-56% survival rate to age one.[44] Most mortality occurs in the first two weeks of life.[45] Young cygnets' most common causes of death include cold and storms and predation.[46] For post-fledging juveniles and adults causes of death include watercraft, cars, fishing line and hooks, fireworks, hydro lines, poles and hard-to-see obstacles, netting, and other human debris and activity. Coyotes, wolves, foxes, offleash dogs, minks, snapping turtles, owls, and other raptors are all predators of swans.[47] Disease and weather events can also kill adults. There was higher than usual mortality among Mute Swans in Ontario due to starvation in the extremely cold winters of 2014 and 2015 and due to flooding in 2017.[48]

Mute Swans who survive to age one have an average life expectancy in the wild of approximately 11 years.[49]

Carrying capacity

It was 2003 when Canadians Scott Petrie and Charles Francis projected the carrying capacity (which

[43] Third Ontario Breeding Bird Atlas, 2021-2025 (2021-2024 to date)
[44] An Evaluation of 22 Years of Mute Swan Management in Rhode Island, Charles H. Allin et al, in Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium
[45] Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001
[46] Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010
[47] Various mortality studies including British Trust of Ornithology, Cornell Lab of Ornithology, Swan Research Project – Environmental Studies at Airlie, Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010
[48] Midsummer Mute Swan Survey 2017
[49] Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

is the maximum population that can be sustained in a given environment) of the Canadian side of the Lower Great Lakes at 30,000 individuals at 15 ac/6/ha per territory and more if the territories were smaller.[50] This size of territory led Friends of Animals to argue that "The eventual maximum population will likely be quite modest because mute swans require rather large nesting territories from which they will exclude conspecifics. Mute swans are naturally thinly distributed."[51]

Twenty-two years later, based on the 2024 Midsummer Mute Swan Survey count of 7,951 in the Lower Great Lakes, the birds have reached less than 27% of their carrying capacity.

Typically a species' population will increase rapidly before leveling off as it approaches carrying capacity. This also thwarts many management efforts because, until carrying capacity is reached, the available territory not taken by cygnets because eggs are destroyed or birds are killed, is likely to be taken by "immigrants," resulting in little to no net reduction.[52]

A tale of two swans

While research that counters the prevailing bias against Mute Swans is provided above, the other reason for targeting Mute Swans has been to make way for the "re"-introduction of Trumpeter Swans[53] (*Cygnus buccinator*).

History

Mute Swans were introduced to North America anthropogenically (humans brought them) over a century ago. They are now "naturalized," having lived and bred on the continent for over 67 years and more than 19 generations.

Trumpeters are considered "native" and increasing their numbers has been an objective of both conservation authorities and volunteers, in Ontario led by the late Harry Lumsden, after their near extirpation (local extinction) due to over-hunting towards the end of the 1800s.

There are ironies in this tale of two swans. For one thing, there is no solid evidence that Trumpeters nested in regions where they are now being encouraged to. Given that any description of native implies a boundary, it is uncertain whether in urban areas of the Lower Great Lakes Trumpeters are truly being re-introduced – or, as Mutes were, introduced as a new breeding species in the region. Indeed, National Geographic calls it a "(re-)introduction" noting "the former range in eastern N.A. is very unclear."[54]

In any case, the way that both species arrived or re-arrived is strikingly similar. Trumpeters

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[50] The Status of Mute Swans in Ontario, 2017 (Midsummer Mute Swan Survey), Environment and Climate Change Canada and *Rapid increase in the lower Great Lakes population of feral mute swans: a review and a recommendation*, Scott A. Petrie and Charles M. Francis, 2003, Wildlife Society Bulletin.

[51] Nonlethal Techniques to Reduce Animal Problems by Priscilla Feral, in Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium

[52] The City of Burlington's Coyote Strategy notes: "we don't recommend relocating or killing coyotes, as it is…only a temporary solution. Removing a coyote will simply allow another one to move in in its place." Though coyotes are of course a different species, the concept is the same.

[53] Mute Swan management was undertaken for the express purpose of reintroducing Trumpeters in Wisconsin, Washington and elsewhere according to the Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

[54] **Complete Birds of North America**, National Geographic, edited by Jonathan Alderfer and Jon L. Dunn

were brought by humans from the US, were fed, pinioned (making them flightless), and had their eggs and cygnets often in captivity and cared for while Mutes are being killed and their eggs destroyed.

	Mute Swans	Trumpeter Swans
c. 1900	**Eggs and birds purchased and brought from Europe to North America for captive and ornamental purposes**	Nearly extirpated (hunted for their feathers)
	Some escaped/were released	
1950s	Began nesting in southern Ontario	
1980s onwards		Re-introduction campaign begins and includes: ▪ **Eggs and birds purchased and brought from Alaska and the American Midwest and reared in captivity** ▪ Some eggs matured in incubators ▪ Some Mute eggs replaced with Trumpeter eggs for Mutes to hatch and raise[55] ▪ Trumpeter cygnets hatched by Mutes dyed so cobs wouldn't reject them for being the wrong colour[56] ▪ **Some were released** (breeding stock was kept in captivity) ▪ Flocks fostered and fed by a network of "cooperators" ▪ Some Trumpeters pinioned ▪ Tagging and tracing programs were established
2000s	Management programs, including egg destruction and killing of young and adults begins in Canada and the US	
2021	Estimated Canadian population of 5,500[57]	Estimated Canadian population of 45,000[58]
2024	8,626 Mute Swans observed in the Ontario Midsummer Mute Swan Survey[59]	
2025	1,112 Mute Swans observed during an Ontario Trumpeter Swan survey[60]	3,167 Trumpeter Swans observed during an Ontario Trumpeter Swan survey[61]
Today	Over 1,166 killed and over 1,859 eggs destroyed in Ontario in the decade between 2014 and 2023[62]	Danger and Damage permits are not issued for Trumpeter Swans

[55] In Ontario "For several years, mute swan eggs have been removed and replaced with trumpeter swan eggs under foster mute swan parents as a method of introducing trumpeters and controlling mute swans (Harry Lumsden, retired Ontario MNR, pers. comm.) Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

[56] Colour morphs, downy and juvenile plumages of Trumpeter and Mute Swans, Harry G. Lumsden, Ontario Birds August 2016 and Toronto Field Naturalists presentation on March 6, 2022 by Donna Lewis, who cares for a flock of Trumpeters on Magna headquarters property in Aurora

[57] Birds Canada and Environment and Climate Change Canada. 2024. The State of Canada's Birds

[58] Birds Canada and Environment and Climate Change Canada. 2024. The State of Canada's Birds

[59] The Status of Mute Swans in Ontario, 2024 (Midsummer Mute Swan Survey), Environment and Climate Change Canada

[60] The TSCO 5-Year Trumpeter Swan Survey, Trumpeter Swan Conservation Ontario, 2025

[61] The TSCO 5-Year Trumpeter Swan Survey, Trumpeter Swan Conservation Ontario, 2025

[62] Environment and Climate Change Canada, Access to Information responses. Several reports are incomplete so the eggs destroyed and swans killed exceed these numbers. Note that eggs destroyed would not equal number of cygnets hatched otherwise as a) both first and second clutches were destroyed and b) hatching success if not 100%.

Attributes

Trumpeters are celebrated while Mutes are vilified but, since Trumpeters are larger, eat more, and are more aggressive than Mutes,[63] the characteristics attributed to Mutes as negatives cannot in themselves be reasons to limit Mutes' population, or Trumpeters would not be promulgated.

Relative to aggression and territory, Trumpeters have been observed attacking Mutes 22 to 55 times more frequently than the reverse.[64] A study published by Harry Lumsden himself reports that "during the breeding season trumpeters consistently dominate mutes in Ontario…" and "Domination by trumpeter pairs of mute pairs in breeding areas is usually accomplished by direct attack."[65] The same article provides extensive observations of Mute Swan eviction from long-standing territory and Mute cobs being badly beaten such that Mutes "often must yield their territories to trumpeters."[66]

This leads to Lumsden concluding: "Trumpeters will prove to be very formidable competitors with the more established mute swans and I suggest they will eventually occupy the best habitat within the present Ontario Mute Swan range."[67]

Population, distribution, and relative abundance

The active Trumpeter re-introduction program ended in 2006 as targets were hit. By 2008 waterfowl biologists declared that Ontario had a successful and self-sustaining population, and as noted in Population, range, and distribution above, there were 45,000 Trumpeters in Canada by 2021, outnumbering Mutes 8:1.

While there were some differences in the areas surveyed, the Ontario Midsummer Mute Swan Survey counted 158 Trumpeter Swans in 2014 and 535 Trumpeter Swans in 2024, an increase of 377 birds or 239% over 11 years.[68]

Most recently, on February 1, 2025, Trumpeter Swan Conservation Ontario surveyed wintering Trumpeter Swans in Ontario. The survey counted 3,167 Trumpeter Swans (2,456 adults and 692 cygnets) from Windsor to Brockville and north to Sudbury. The report states that this represents an approximately 100% increase over the last count in 2020, "a testament to the continued growth and resilience of the population." It also notes that, since 28% of the birds were cygnets (compared to just 11% of Mute Swan cygnets counted in the 2024 Midsummer Mute Swan Survey) the findings "reflect a very successful 2024 breeding season and a strong, healthy population age structure."[69]

One thousand one hundred and twelve (1,112) Mute Swans were observed in the same survey.[70]

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[63] Cornell Lab of Ornithology

[64] Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

[65] Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016. In spring, most aggression is Mute on Mute; next is Trumpeter on Mute; then Trumpeter on Trumpeter; and last is Mute on Trumpeter. In winter, most aggression is Trumpeter on Trumpeter; Trumpeter on Mute; Mute on Mute; last is Mute on Trumpeter. Trumpeters attack Mutes 22 times more frequently than the reverse in winter, and 55 times more frequently in spring.

[66] Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

[67] Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

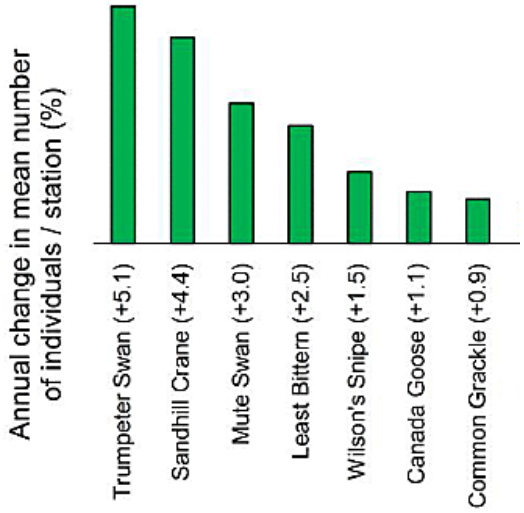
[68] The Status of Mute Swans in Ontario, 2024 (Midsummer Mute Swan Survey), Environment and Climate Change Canada

[69] The TSCO 5-Year Trumpeter Swan Survey, Trumpeter Swan Conservation Ontario, 2025

[70] The TSCO 5-Year Trumpeter Swan Survey, Trumpeter Swan Conservation Ontario, 2025

In addition to outnumbering Mutes, Trumpeters' population is growing more rapidly and their range has expanded more significantly than Mutes'.

The Marsh Monitoring Program shows Trumpeters increasing at a rate of 5.1% a year versus Mutes at 3% between 1995 and 2023:



[71]

While there are many variables in the Christmas Bird Count (including number of participants and survey sites), the results show a similar trend in Ontario over the last decade:

	Mute Swans	**Trumpeter Swans**
2014 count	2,590	575
2023 count	3,979	1,576
Growth rate between counts	54%	174%
Annualized growth rate	5%	17%

Trumpeters Swans are increasing in both inland and coastal wetlands but at a greater rate inland.[72] Of the 535 Trumpeter Swans observed during the 2024 Midsummer Mute Swan Survey, only 30 were on the Lower Great Lakes shorelines.[73] However, in the winter, according to the Midwinter Waterfowl Count, in Toronto, the number of Trumpeters slightly surpassed the number of Mutes for the first time in 2023. In Hamilton region (which includes Burlington and LaSalle Park, the site of intense efforts to bring Trumpeter Swans to southern Ontario), the count of Trumpeters frequently exceeds Mutes, often by two or three times.[74]

[71] The Marsh Monitor, Fall 2024 Number 30, Birds Canada

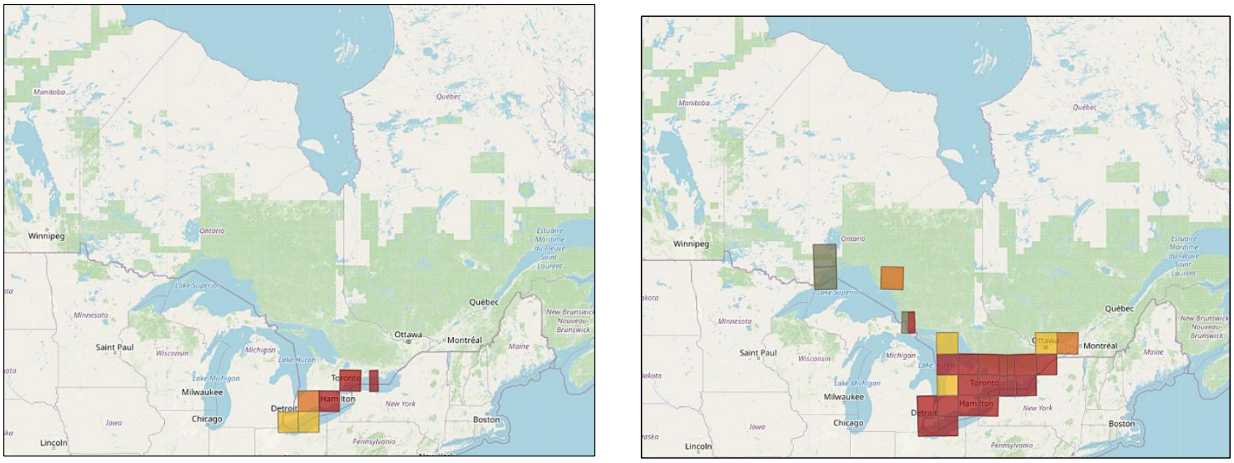
[72] The Marsh Monitor, Fall 2023 Number 29, Birds Canada

[73] The Status of Mute Swans in Ontario, 2024 (Midsummer Mute Swan Survey), Environment and Climate Change Canada

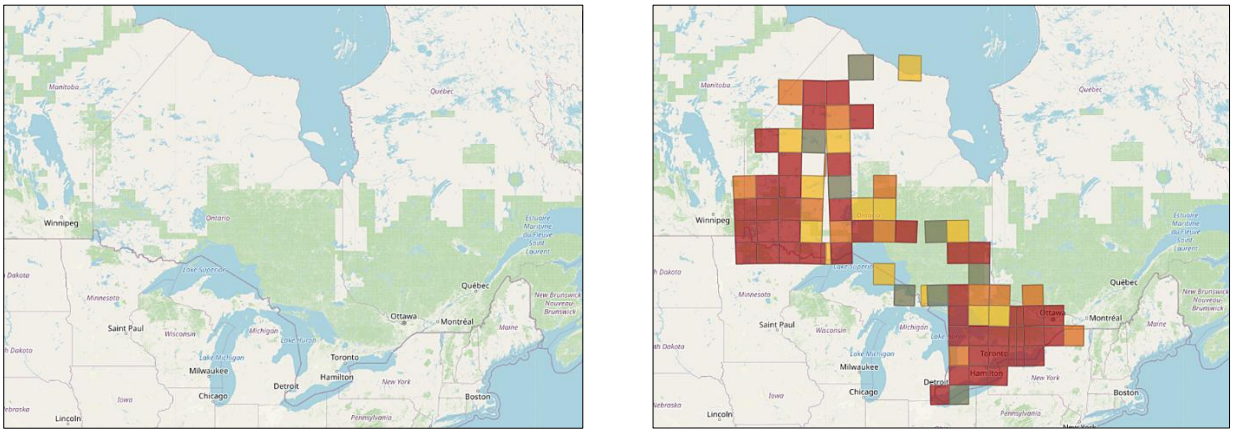
[74] Midwinter Waterfowl Count, conducted by Ministry of Natural Resources and Forestry, Environment and Climate Change Canada, Bird Studies Canada, Toronto Ornithological Club, and numerous volunteer observers. "Please note that there is some overlap of survey areas between the ground and aerial surveys and that some areas may have changed slightly over time. Because of the overlap of some areas, this data should only be used for trend estimation and not total abundance." Email from Ministry of Natural Resources and Forestry.

The Ontario Breeding Bird Atlas shows the relative range expansion. Mutes have increased largely in southern Ontario while Trumpeters, who were not present at all in the First Atlas (1981-1985), appear across the province by the Third Atlas 2021-2025 (2021-2024 to date):

Mute Swans First Atlas 1981-1985 versus Third Atlas 2021-2025 (2021-2024 to date)



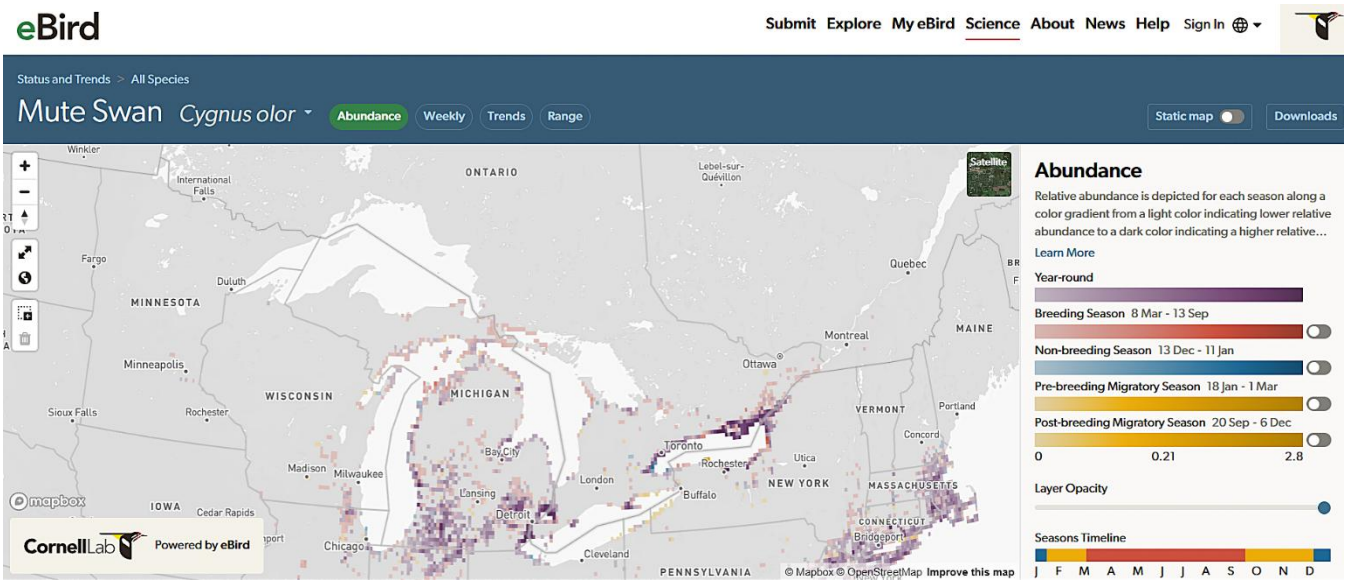
Trumpeter Swans First Atlas 1981-1985 versus Third Atlas 2021-2025 (2021-2024 to date)[75]

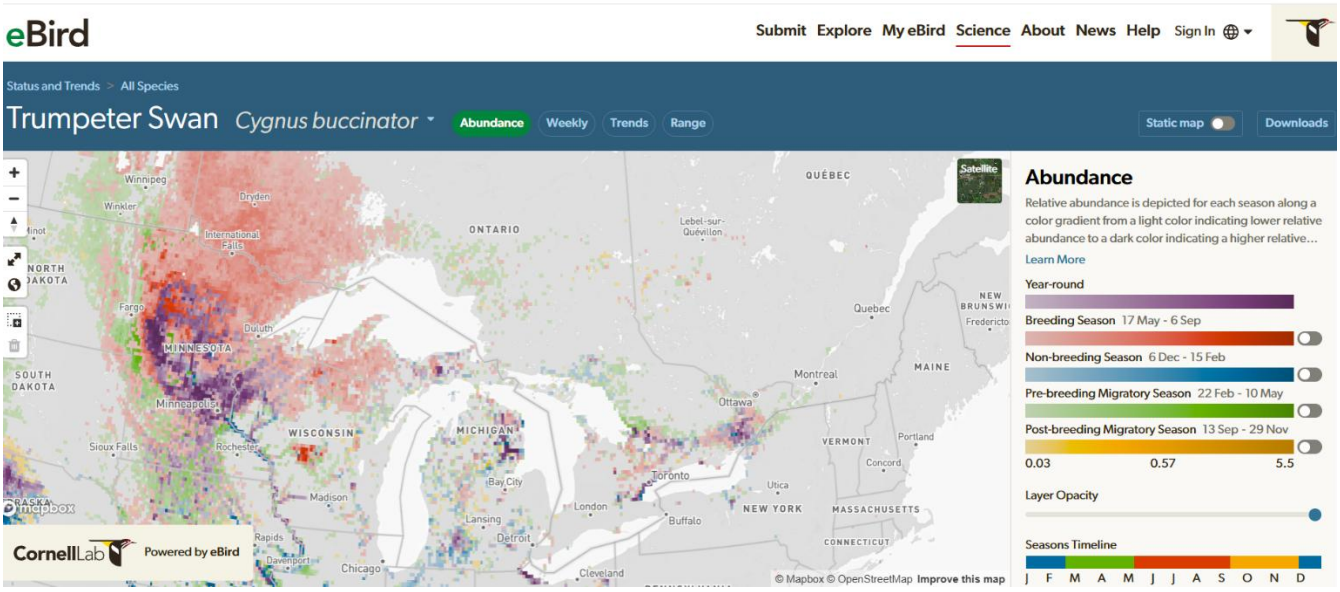


As noted above in Population, range, and distribution, the Marsh Monitoring Program found that Mute Swans are increasing in coastal wetlands along the Lower Great Lakes but declining inland. This is consistent with the Breeding Bird Atlas data (above).

It is also consistent with the eBird Status and Trends distribution maps (below), which also show the vastly larger range for Trumpeters. This, combined with the other data, illustrate that, while both species must winter far enough south to be in open water, their preferred ranges during breeding season may differ.

[75] Third Ontario Breeding Bird Atlas, 2021-2025 (2024 to date)





All of these studies confirm that Trumpeters' abundance is increasing and range is expanding more and more rapidly than Mutes'.

To be very clear, there is no cause for alarm with respect to Trumpeters' population growth and no call to control them in any way. But the same is true for Mutes. With Trumpeters now outnumbering Mutes and able to fend for themselves, the two species may be left to work it out without the need for continued human intervention in the form of Mute Swan management.

A word about "potential"

It is important to acknowledge that conservation and wildlife authorities see themselves as engaged not only in addressing real dangers, but in anticipating and preventing *potential* harm. Indeed, despite a lack of evidence that Mute Swans are doing actual harm (the definition of which is itself values-based), the US

studies cited invariably concluded that the Mute population should be managed – for fear that they *might* do harm. While this may be well intentioned, the result is the assumption that Mute Swans are "guilty until proven innocent."[76]

This focus on potential harm is a risk in conservation biology because it can cause us to take actions "'before knowing all the facts…, and is an approach that generates susceptibility to confirmation bias." "Moreover, it requires the construction of an ideal state of nature which we aim to 'restore' or 'conserve' against change" based on the belief that we know "how nature *should be*."[77]

For more on those considerations, we next explore the range of possible outcomes when introduced species gain a foothold in their new environments.

Native versus Non-Native (often conflated with Invasive)

Since Mutes and Trumpeters have essentially the same attributes and behaviours, with no concerns expressed by wildlife authorities about Trumpeters' ecological impact, the matter appears to come down, not to genuine damage being done by swans, but to a preference for the species considered native.

The native/non-native framework has become a reflexive way of categorizing species and "is [now]… so ingrained in [North] American consciousness that it's taken on a life of its own, coloring the way we judge the health of ecosystems and neatly dividing life on Earth into native and invasive…. For decades, invasion has been a defining paradigm in environmental policy, determining what gets done with limited conservation budgets. Species deemed invasive have often been killed in gruesome ways.. [e]ven though... many non-native species never become problematic." [78]

Indeed, according to the UN's Intergovernmental Platform on Biodiversity and Ecosystem Services less than less than 10% of introduced species are harmful.[79]

Furthermore, "nativeness is not a sign of evolutionary fitness or of a species having positive effects. The insect currently suspected to be killing more trees than any other in North America is the native mountain pine beetle *Dendroctonus ponderosae*."[80]

Conversely, introduced species can be benign or beneficial. "Increasingly scientists are reporting examples of positive roles non-native species play such as providing food for native species, creating habitats or playing a role in ecosystem restoration. For example, native butterflies in Vancouver Island's endangered Garry Oak savanna ecosystem were found using non-native flowers for nectar, particularly in

[76] Ricciardi and Simberloff 2009 in Conciliation biology: the eco-evolutionary management of permanently invaded biotic systems, Scott P. Carroll

[77] Ecologists, *Environmentalists, Experts and the Invasion of the 'Second Greatest Threat,'* Matthew Chew, International Review of Environmental History, Volume 1 2015

[78] It's Time to Stop Demonizing "Invasive" Species, Pitchstone Waters, December 9, 2021

[79] Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) 2023 report. Of 37,000 introduced species 3,500 are harmful.

[80] *Don't Judge Species on their Origins* by Mark Davis and 18 ecologists in Nature

the late summer when native flowers are scarce."[81] Non-native plants have proven better than natives at preventing erosion in coastal ecosystems.[82] Non-native species can also increase regional biodiversity.[83]

"A growing community of scientists and environmental philosophers now question whether a concept defined by a species' geographic origin can capture the ethical and ecological complexities of life on a rapidly changing planet. In the 21st century, there's no such thing as an undisrupted ecosystem, and this will only become truer as climate change and habitat loss accelerate."[84] Those biologists and ecologists are calling for a more nuanced view of species in "conciliatory" or "compassionate conservation."[85]

Leaders in this area of study, Mark Davis and Matthew Chew, along with 16 other ecologists writing in *Nature* conclude that "many of the claims driving people's perception that introduced species pose an apocalyptic threat to biodiversity are not backed by data. Take the conclusion made in a 1998 paper[86] that invaders are the second-greatest threat to the survival of threatened or endangered species after habitat destruction. Little of the information used to support this claim involved data, as the original authors were careful to point out. Indeed, recent analyses suggest that invaders do not represent a major extinction threat to most species in most environments — predators and pathogens on islands and in lakes being the main exception.[87] In fact, the introduction of non-native species has almost always increased the number of species in a region." [88]

In a study focused on Canada (contrasted with the United States) and published in *Bioscience*, introduced species were found to be even less of a threat. The researchers' findings included that: "the importance of introduced species as a cause of endangerment in the United States contrasts strongly with our results, which identify introduced species as the **least common broadscale threat in Canada** [emphasis added]…. We believe the heightened importance of introduced species in the United States can be explained by the large number of Hawaiian species included in Wilcove and colleagues' (1998) analysis and the widespread effects of introduced species on the islands. For instance, the authors included 456 Hawaiian plants and birds, of which 99% were threatened by introduced species."[89]

There are also some fundamental problems with this paradigm with respect to time and place. It is hard to see how the boundaries within which species are native and outside of which they are non-native can be maintained, since plants and animals are mobile. Ranges of plants and animals are dynamic even without human intervention and no ecosystem is static.

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[81] Good or Bad? Some 'invasive' species can help native ecosystems thrive, Heather Kharouba and Stephanie A. Rivest, University of Ottawa, February 22, 2023

[82] Conciliation biology: the eco-evolutionary management of permanently invaded biotic systems, Scott P. Carroll and described in Indirect effects of invasive species removal devastate World Heritage Island, Dana M. Bergstrom et al

[83] Good or Bad? Some 'invasive' species can help native ecosystems thrive, Heather Kharouba and Stephanie A. Rivest, University of Ottawa, February 22, 2023

[84] It's Time to Stop Demonizing "Invasive" Species, Pitchstone Waters, December 9, 2021

[85] These scientists and publications include: Brendon Larson (see *Friend, Foe, Wonder, Peril* and *13 Ways of Looking at Invasive Species*; and *As Canadian As… The Norway Maple*, and Seeking Citizenship: The Norway Maple in Canada); *Don't Judge Species on their Origins* by Mark Davis and 18 ecologists in Nature; **The New Wild: Why Invasive Species will be Nature's Salvation** by Fred Pearce; Ken Thompson **Where Do Camels Belong? Why Invasive Species Aren't All Bad** by Ken Thompson

[86] Wilcove, D. S., Rothstein, D., Dubow, J., Phillips, A. & Losos, E. *BioScience* 48, 607–615 (1998).

[87] Davis, M. A. **Invasion Biology** (Oxford Univ. Press, 2009).

[88] Davis, M. A. **Invasion Biology** (Oxford Univ. Press, 2009) and *Don't Judge Species on their Origins* by Mark Davis and 18 ecologists in Nature

[89] Threats to Endangered Species in Canada in Bioscience, Oscar Venter et al

The era in which species were in their "proper" native space is rarely if ever defined. It was just eight million years ago that camels stopped roaming North America, where they first evolved and where they lived the longest,[90] but most people would not think of them as natives today. More recently, just "10,000 years ago, iconic elements of the Sonoran Desert flora and fauna including saguaro cacti…arrived in what we now call Arizona and supplanted the region's former occupants,"[91] writes Matthew Chew.

Indigenous ecologist Dr. Jennifer Grenz gives a Canadian example. Western Red Cedar is now "our keystone species in the Pacific Northwest," but 5,000 years ago would have been considered invasive "under today's evaluation of whether a plant is invasive or not." Dr. Grenz goes on to describe the Indigenous perspective she uncovered completing her PhD, saying in an interview: "We really have gotten into this almost xenophobic approach … " In asking elders from different nations what their views were of native and non-native species, she found that "it was a lot less polarized than I had experienced asking that question within western scientific context… we have this tendency to want to hit pause on our ecosystems but we live on a dynamic and changing planet and even more so because of climate change and so maybe we need to have that same epistemic openness to how we think about other species."[92]

Indeed, while this issue should seize us today it will become more pressing in the face of climate change. Plants and animals are being displaced in unprecedented numbers because of climate change – either fleeing climate-induced natural disasters such as floods and forest fires or shifting to cooler regions as their native ranges heat up. Will they be welcomed as the climate refugees they are – or be targeted for elimination as unwanted invaders?

It is wise to reduce or eliminate human introductions that have not yet occurred; to maintain or restore habitats altered by human activity; and to take necessary actions in respect of human comforts and safety in maintaining habitats, but, as Canadian Brendon Larson advocates, "our conceptualization of them [non-native species] needs to be more complex than one based in dualities of good-bad, insider-outsider, natural-unnatural."[93]

Categorizing species by their origins can no longer be an excuse to "demonize [them] and exclude them from moral consideration."[94]

There are opportunities to pursue a more compassionate approach in managing ecosystems and reconsidering Mute Swan management presents such an opportunity.

Conclusions and recommendations

That Mute Swans are detrimental is not substantiated by the evidence. Indications to date are that they do not routinely outcompete other waterbirds for territory and do not irreparably deplete SAV.

The celebrated introduction or re-introduction of Trumpeter Swans in Ontario is further indication that Mute Swans must be benign as Trumpeters exhibit the same behaviours.

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[90] **Where Do Camels Belong? Why Invasive Species Aren't All Bad**, by Ken Thompson

[91] The Rise and Fall of Biotic Nativeness: A Historical Perspective, Matthew K. Chew and Andrew L. Hamilton, 2011 in *Fifty Years of Invasion Ecology: The Legacy of Charles Elton*, 1st edition

[92] Jennifer Grenz, PhD, on CBC Radio Quirks and Quarks, April 19, 2024

[93] *13 Ways of Looking at Invasive Species*, Brendon M.H. Larson

[94] Arian Wallach, quoted in It's Time to Stop Demonizing "Invasive" Species, Pitchstone Waters, December 9, 2021

If the real reason for management was to give Trumpeters the advantage, that has been achieved. Trumpeters are now well established, they outnumber Mutes, and their population growth and range expansion continue to outpace Mute Swans'.

For all these reasons, Mute Swan management is not justified and continuing to kill the swans and destroy all known eggs would be cruel. It causes the pen to sit on the nest longer than necessary waiting for her eggs to hatch. The pen and cob lose their natural opportunity to have and raise their young – in which they would otherwise be engaged for ~80% of their adult lives.

In addition to the scientific reasons, there is an ethical argument for more humane options to be examined. Those options include ending Mute Swan management entirely. Another less lethal option is removing or replacing some swan eggs with fake eggs while leaving two or three to hatch.

This is a viable compromise and Mute Swans are the perfect species with which to pilot a more compassionate alternative.

Concluding questions

Mute and Trumpeter Swans exhibit largely the same attributes and behaviours relative to foraging/grazing, interacting with other waterfowl, inhabiting wetlands, and protecting their young. Neither swan is appreciably "better" or "worse" than the other with respect to their impacts.

Why do we portray Mutes as destructive but express no similar concerns about Trumpeters?

There is no evidence that either Mute Swans or Trumpeter Swans are native nesting species in the Lower Great Lakes including the Greater Toronto and Hamilton Area (GTHA). It is possible that both have been introduced as non-native breeding species in this region.

Why do we characterize Mutes as invasive and Trumpeters as native?

Mute Swans are a naturalized species having reproduced in the wild in Ontario for over 67 years or 19 generations.

What is their path to the protections afforded Trumpeters?

Ecosystems are dynamic. Conservation strategies can also be dynamic and re-evaluated in the context of changes. What was considered necessary or desirable at one point in time may be more or less so at a later point in time. In this case, if the real goal of Mute Swan management was to increase the Trumpeter population by creating nesting opportunities for Trumpeters, the goal has been achieved.

When might we conclude that the methods employed previously are no longer necessary?

Lethal methods should be employed where there is genuine evidence of need and even then, should be proportionate to the problem or objective.

In this case and at this point, isn't oiling all known eggs excessive?

Why wouldn't we try more humane and less lethal methods?