

Mute Swan Management

A literature review and discussion document

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Introduction

“Mute Swan Management” programs, which entail the destruction of Mute Swan eggs and nests, have been in place across Ontario for at least two decades. The species is federally protected under the Migratory Birds Convention Act, but Canadian Wildlife Service within Environment and Climate Change Canada (CWS/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.

For many people along the Toronto shores of Lake Ontario who watch, enjoy, and value Mute Swans, this is devastating. Those people would like Mute Swans to be allowed to live wild lives, including breeding and raising their young. “Resource management policies require a combination of what we know about the world with what we value in the world”¹ so public values are and should be a part of what informs conservation practices.

But recognizing that there are other considerations as well, I embarked on an extensive review of the literature that precipitated Mute Swan Management programs in Canada and the US, as well as other relevant research. I also had scientific advisors – an ornithologist, a naturalist, a biologist, and an ecologist – who have provided expertise and guidance throughout and reviewed earlier drafts of this document.

I hope the findings will open a conversation about Mute Swan Management and, because I know that conservation authorities are proactive in exploring humane alternatives to lethal approaches, also hope that it creates an opportunity to consider alternatives.

¹ Michigan Mute Swans: A Case Study Approach to Ethical Argument Analysis, thesis by Corey A. Jager

About Mute Swans

Mute Swans (*cygnus olor*) are the intelligent, majestic, orange-beaked water birds 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, and lasting pair bonds.

Mute Swans pick a mate at two or three years old and begin breeding soon after. The cob (male) selects a nest site agreed to by his mate (the pen) and they spend approximately three weeks in late March and early 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 eggs². Clutch sizes vary. The pen will begin incubating the eggs in mid- to late-April when the clutch is complete. During incubation she will stay on the nest and rarely leave it. She develops 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. Approximately 35 days after incubation starts, all eggs will hatch within a day of each other.

Because the pen does not leave the nest often, even to eat, she grows weaker and increasingly vulnerable. The cob sleeps on land near her at night (not on the water, as both would often do at other times of year), to protect her and the eggs. The balance of the time he can often be found patrolling their territory, which averages 15 acres³, to prevent the incursion of other swans.

Within 24 hours of the cygnets (babies) hatching the parents lead them into the water to learn to swim, eat, drink, and preen and a few days later they have abandoned the nest, though the parents will likely return to the site next spring as swans tend to use the same nest sites year after year if they have been successful.

Approximately half the cygnets will survive to fledge (grow feathers and learn to fly away)⁴. They will leave their parents after six to ten months and may join a flock of non-paired subadults for a year or two before selecting a mate and beginning their adult own lives.

While this is the natural life cycle of Mute Swans, conservation authorities are dramatically altering their life cycle through “Mute Swan Management Programs.”

Under Danger and Damage Permits issued by Environment and Climate Change Canada, over 1,206 young and adult Mute Swans have been killed in Ontario on federal and private property since 2011⁵. The same Permits enable conservation 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 1,569 eggs have been destroyed in the province since 2011.

Oiling the eggs starves the developing cygnets of oxygen so they die. It also causes the pen to stay on the

² 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

³ *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*.

⁴ 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*

⁵ Environment and Climate Change Canada (Freedom of Information response)

nest longer, sometimes weeks after the normal hatching period, as she is not willing to give up on them. Recently, conservation authorities began destroying nests around mid-June, several weeks after the final oiling is applied, as the pen is otherwise often near starving when she finally abandons the nest in July.

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

Objectives of Management

While Mute Swan Management does not entail biological control (which uses parasites, predators, and/or pathogens), Management objectives are similar. “The aim of classical biological control is to reduce the growth, fecundity and competitive ability of unwanted species...” and “not necessarily to eradicate them.”⁶

Indeed, for one conservation authority at least, the objective of the Mute Swan Management program is not to eliminate the birds but rather to reduce the natural rate of population increase. There are no specific targets.

Stated reasons for Management

Conservation authorities throughout Canada and the United States engaged 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 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 food by overgrazing.**

Finding: This is not substantiated by the evidence.

Competition with other waterfowl

Like all species, Mute Swans will defend their nests, young, and territories. They occasionally kill the young of other birds, most often 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

⁶ *The implications of accepting untested hypotheses: A review of the effects of purple loosestrife (Lythrum salicaria) in North America*, Heather A. Hager and Karen D. McCoy, in *Biodiversity and Conservation*, July 1998

waterbird taxa.”⁷

Multiple studies, including the one by the Wetlands International Swan Specialist Group cited above and another conducted in Detroit, establish that the vast majority of Mute Swan aggression is towards other swans⁸, with Canada Geese in second place. The remaining 7% of aggressive encounters was spread over 12 other waterbird species (i.e., less than 1% per species on average).⁹

The Detroit study also found that many waterbirds were found closer to Mute Swans than at randomly placed control sites, suggesting there are greater benefits than perils to sharing territory. These findings led the authors 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

Similarly, in a study conducted over seven years in Chesapeake Bay¹¹ “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.... [T]hey 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.”

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.¹²

It is not uncommon for native species to fare poorly once their habitat is reduced or compromised, whereas introduced species, if they survive the introduction, tend to be more adaptable. Indeed, “Mute Swans do well in degraded environments.”¹³

This should make us wonder if declines in other species are truly due to Mute Swans or because of our actions, and other species’ inability to adapt to the ecosystem we have left them.

Overgrazing

Mute swans are a tiny percentage of wetland waterfowl. When Mute Swan Management began in

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 *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.

⁹ Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 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 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.

¹² 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

¹³ Cornell Lab of Ornithology

earnest in and around Chesapeake Bay, they represented only .5% of the waterfowl in the Bay¹⁴. Even in a paper seeking to justify their Management, the presenter acknowledged that “the biomass of SAV [subaquatic vegetation] currently being consumed by the Chesapeake Bay mute swan population is almost certainly negligible.”¹⁵

In fact, SAV has severely declined in Chesapeake Bay in distribution and abundance in recent decades due to “decreased sunlight penetration...by excessive algae growth on SAV plant surfaces, caused by nutrients and sediments that run into [the Bay] from surrounding watershed. These environmental factors are the primary cause of SAV declines in Chesapeake Bay.”¹⁶

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.”¹⁷

Mute Swans’ impact is grossly overstated but even if Mute Swans were a 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] in Europe’s Berwick swans resulted in deeper burial of tubers, an adaptive response that occurred over approximately 20 years.”¹⁸ 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.¹⁹ If this were not so, one observer wondered how the birds “stay in the same locations year after year if they are depleting all the vegetation.”²⁰

2. Accusation: Mute Swans are aggressive.

Finding: As noted above, like all 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 mostly during breeding season to protect eggs and cygnets. While people occasionally hurt themselves evading a busking swan, calls to all Toronto area hospitals yielded 0 reports of swan attacks requiring treatment.²¹ It is more far 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 easily resolve 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-

¹⁴ 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*

¹⁵ Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources’ Mute Swan Task Force, January 2001

¹⁶ Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources’ Mute Swan Task Force, January 2001

¹⁷ Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

¹⁸ Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

¹⁹ 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

²⁰ *Alien swans create controversy in Michigan* in the Examiner, July 2021.

²¹ Barry Kent McKay, letter to Birds Studies Canada

harassment regulations and engaging and educating the community.

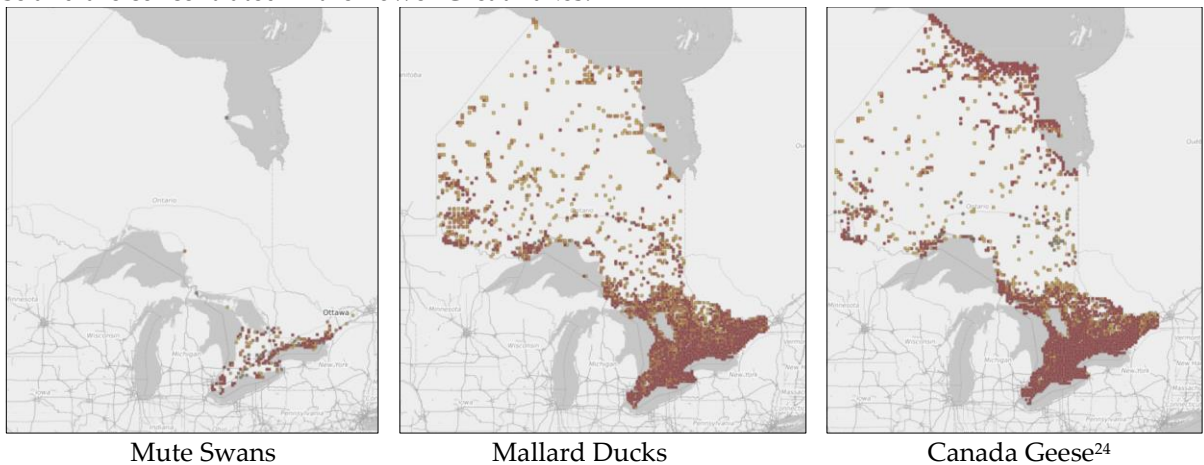
Furthermore, Mute Swan Management does not reduce but extends aggression. Notes a Michigan Environmental Assessment²²: “If eggs are left in the nest but rendered unviable through oiling, adding or puncturing, birds will persist in defending the area until they give up on the nest.”²³

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.

Actual population

As illustrated below, Mute Swans are a fraction of the population of Mallard Ducks and Canada Geese and are concentrated in the Lower Great Lakes.



Recognizing that Mute Swan Management reduced hatchings and Danger and Damage Permits allowed for the killing of young and adult Mute Swans, Mute Swan numbers – including numbers of adults – decreased significantly between 2014 and 2017 in one stretch of the GTHA:

Humber Bay to Hamilton Harbour ²⁵	Adults	Cygnets	Total Birds
	2014		
	127	7	134
	2017		
	96	0	96
	Change		-38
	Annual growth		-28%

²² Decision and Finding of No Significant Impact for the Environmental Assessment: Mute Swan Damage Management in Michigan

²³ Decision and Finding of No Significant Impact for the Environmental Assessment: Mute Swan Damage Management in Michigan

²⁴ Ontario Breeding Bird Atlas 2021, Birds Canada

²⁵ The Status of Mute Swans in Ontario, 2017 (Midsummer Mute Swan Survey), Environment and Climate Change Canada

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 one²⁶. Most mortality occurs in the first two weeks of life.²⁷ Young cygnets' most common causes of death include cold and storms and predation.²⁸ For post-fledging cygnets 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, rats, gulls, and raccoons are all predators of swans, and injure or kill swans much more frequently than the reverse.²⁹ 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 2017.³⁰

Mute Swans' average life expectancy is 11 years.³¹

Carrying capacity

Importantly, as of the 2017 Midsummer Mute Swan Survey (the last one flown), these birds had reached less than 15% of their carrying capacity (which is the maximum population that can be sustained in a given environment). The Survey counted 4,103 Mute Swans.

Canadians Scott Petrie and Charles Francis project the carrying capacity 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.³² 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."³³

It is typical for a species' population to 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

²⁶ 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

²⁷ Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

²⁸ Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

²⁹ 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

³⁰ Midsummer Mute Swan Survey 2017

³¹ Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

³² 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.

³³ Nonlethal Techniques to Reduce Animal Problems by Priscilla Feral, in Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium

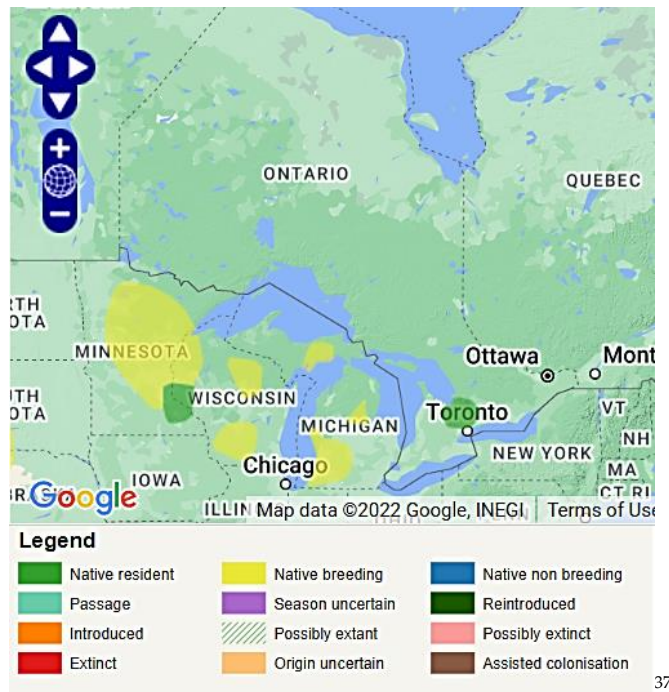
taken by “immigrants,” resulting in little to no net reduction.³⁴

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 is to make way for the reintroduction of Trumpeter Swans³⁵ (*cygnus buccinator*).

Mute Swans were introduced to North America anthropogenically (humans brought them to the continent). They are now “naturalized,” having lived and bred on the continent for over 65 years and more than 18 generations. Trumpeters are considered “native” and increasing their numbers has been an objective of both conservationists 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.

However, there are ironies in this tale of two swans. For one thing, there is no evidence that Trumpeters nested as far south as 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 reintroduced – or, as Mutes were, introduced anew as a breeding species in the region. Indeed, National Geographic calls it a “(re-)introduction” noting “the former range in eastern N.A. is very unclear”³⁶ and the Bird Life species factsheet shows that Trumpeters’ native breeding range (in yellow) did not include Ontario:



³⁴ 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.

³⁵ 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

³⁶ **Complete Birds of North America**, National Geographic, edited by Jonathan Alderfer and Jon L. Dunn

³⁷ Trumpeter Swan (*Cygnus buccinator*) – Bird Life species factsheet

In any case, the way that both species arrived or re-arrived is strikingly similar. Trumpeters were brought from the US, were fed, pinioned (which renders them flightless), and had their eggs and cygnets often in captivity and cared for at the same time 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		Reintroduction campaign begins and includes: <ul style="list-style-type: none"> ▪ 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 raise³⁸ ▪ Cygnets hatched by Mutes dyed so cobs wouldn't reject them for being the wrong colour³⁹ ▪ 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	
Today	Over 1,206 killed and over 1,569 eggs destroyed in Ontario just since 2011 ⁴⁰	574 cygnets released; self-sustaining population now over 2,800 in Ontario ⁴¹

Trumpeters are celebrated while Mutes are vilified – but, since Trumpeters are larger, eat more, and are more aggressive than Mutes,⁴² 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.⁴³ A study published by Harry Lumsden himself reports that "during the breeding season trumpeters consistently dominate mutes in Ontario..." and "Domination by trumpeter

³⁸ 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

³⁹ Toronto Field Naturalists presentation on March 6, 2022 by Donna Lewis, who cares for a flock of Trumpeters on Magna headquarters property in Aurora

⁴⁰ Environment and Climate Change Canada, Freedom of Information response

⁴¹ Toronto Field Naturalists presentation on March 6, 2022 by Donna Lewis, who cares for a flock of Trumpeters on Magna headquarters property in Aurora

⁴² Cornell Lab of Ornithology

⁴³ Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

pairs of mute pairs in breeding areas is usually accomplished by direct attack.”⁴⁴ 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.”⁴⁵

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.”⁴⁶

This may already be happening. The stretch of the GTHA which saw a reduction in the Mute Swan population between 2014 and 2017 (see Actual population) includes Burlington and LaSalle Park, the site of intense efforts to bring Trumpeter Swans to southern Ontario. In the same stretch, TRCA has noted a decline in Mute Swan nests, from 30 to 10, in Tommy Thompson Park in Toronto, which corresponds to Trumpeters beginning to nest there.⁴⁷

The active Trumpeter re-introduction program ended in 2006 as targets were hit, and by 2008 waterfowl biologists declared that Ontario had a “successful, self-sustaining population of Trumpeter Swans.”

With Trumpeters now able to fend for themselves and with some evidence they are already doing so, the two swans 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 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 US studies cited invariably concluded that the Mute population should be managed – for fear that they *might* do harm. While this is without a doubt well intentioned, the result is the assumption that non-natives are “guilty until proven innocent”⁴⁸ and are sentenced to death and destruction before determining whether they are “benign players or allies.”⁴⁹

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, the matter appears to come down, not to genuine damage being done by swans, but to a preference for the species considered native.

⁴⁴ 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.

⁴⁵ Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

⁴⁶ Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

⁴⁷ Personal communication

⁴⁸ Ricciardi and Simberloff 2009 in Conciliation biology: the eco-evolutionary management of permanently invaded biotic systems, Scott P. Carroll

⁴⁹ Conciliation biology: the eco-evolutionary management of permanently invaded biotic systems, Scott P. Carroll

Indeed, one principle that has dominated approaches to conservation for several decades now is that what is deemed “native” flora and fauna are largely good and to be fostered, and conversely, that “non-native” flora and fauna (which is sometimes referred to as “introduced”⁵⁰ in this paper), are undesirable, likely if not inevitably invasive, destructive, and are to be discouraged and reduced.

Some fundamental problems with this paradigm include issues of time and place. 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,⁵¹ but most people would not think of them as natives today. The era for native consideration is therefore much more recent than that though it is usually considered pre-industrial. But industry and other human activity have so degraded original wetlands, “[i]t is impractical to try to restore ecosystems to some ‘rightful’ historical state.”⁵² Similarly, 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.

“An emerging body of literature confirms that IS [invasive species] may not be so much a cause as a consequence.... [These] studies... raise questions about whether IS are too often scapegoats; they may be as much a result of landscape changes we have caused as the cause of such changes themselves.”⁵³

Today, many biologists and ecologists are calling for a more nuanced view of species in “conciliatory” or “compassionate conservation.”⁵⁴

In part, this is because “[n]ativeness 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*.”⁵⁵

Introduced species can be benign or beneficial. Non-native plants have proven better than natives at preventing erosion in coastal ecosystems.⁵⁶ Honeysuckle was purposely introduced by the US Department of Agriculture in land reclamation projects in the US to improve bird habitats then later became the target of eradication efforts. “Recent data suggest that the agency’s initial instincts may have been more appropriate. In Pennsylvania, more non-native honeysuckles mean more native bird species. Also the seed dispersal of native berry-producing plants is higher in places where non-native honeysuckles are more abundant.”⁵⁷

A leader in this thinking, Mark Davis and 18 ecologists writing in *Nature* conclude that “many of the claims driving people’s perception that introduced species pose an apocalyptic threat to biodiversity are

⁵⁰ “Introduced” implies anthropogenic or human action and sometimes even intention, which is not the case for the arrival of every species considered “non-native,” but as this paper is focused largely on Mute Swans, which were anthropogenically introduced, we will often use this term. Of course, we humans were obviously also anthropogenically introduced.

⁵¹ **Where Do Camels Belong? Why Invasive Species Aren’t All Bad**, by Ken Thompson

⁵² *Don’t Judge Species on their Origins* by Mark Davis and 18 ecologists in *Nature*

⁵³ *13 Ways of Looking at Invasive Species*, Brendon M.H. Larson

⁵⁴ 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

⁵⁵ *Don’t Judge Species on their Origins* by Mark Davis and 18 ecologists in *Nature*

⁵⁶ 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

⁵⁷ *Don’t Judge Species on their Origins* by Mark Davis and 18 ecologists in *Nature*

not backed by data. Take the conclusion made in a 1998 paper⁵⁸ 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.⁵⁹ In fact, the introduction of non-native species has almost always increased the number of species in a region.”⁶⁰

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: “Habitat loss and introduced species are the leading threats to imperiled species in the United States, affecting 89% and 49% of species, respectively... While habitat loss is equally important in both countries..., 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.... 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.”⁶¹

There is also the matter of when we humans choose to dislike natives and when we don’t, which is more subjective than scientific. No one fishing complains about coho salmon, which is an introduced species. People love their pet dogs and cats (serious predators)⁶², also non-native. Our capital city hosts a festival of tulips, which were a gift from the Dutch royal family in 1945. “[I]n many areas we’ve extinguished most of the original landscape and replaced it with invasive agricultural species. Now we eradicate weeds from these places.”⁶³ We fertilize, water, and mow the introduced bluegrass on our lawns.

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?

We are not advocating for more species to be introduced, we do support habitat restoration, and we recognize that human comforts will inevitably lead to some decisions and actions around how our environments are maintained, enhanced, or reduced 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.”⁶⁴

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

⁵⁸ Wilcove, D. S., Rothstein, D., Dubow, J., Phillips, A. & Losos, E. *BioScience* 48, 607–615 (1998).

⁵⁹ Davis, M. A. *Invasion Biology* (Oxford Univ. Press, 2009).

⁶⁰ 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*

⁶¹ Threats to Endangered Species in Canada in *Bioscience*, Oscar Venter et al

⁶² “House cats are serious predators and are not native to North America. It is estimated that cats kill more than a billion birds a year in North America (and even more small mammals)...Feral cats living in the wild are responsible for most of those bird deaths, but even well-fed pet cats kill hundreds of millions of birds every year.” **What It’s Like to Be a Bird**, David Allen Sibley

⁶³ *Friend, Foe, Wonder, Peril*, Brendon M.H. Larson

⁶⁴ *13 Ways of Looking at Invasive Species*, Brendon M.H. Larson

Summary 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, do not irreparably deplete SAV, and Management does not resolve, but extends, aggression. Given the distinct possibility that Mute Swans are scapegoats for ecosystem decline wrought by humans, the mere *potential* for them to do harm should not be enough to justify destroying them.

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.

If the real reason for Management was to give Trumpeters the advantage, that has been achieved. Trumpeters are now well established in Ontario with predictions by the father of their reintroduction that they will outcompete Mutes without further help, which recent observations suggest may be happening already in the GTHA.

For all these reasons, Mute Swan Management is not or no longer required and continuing to 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. And Mute Swan Management is a lethal strategy. Oiled eggs do not survive.

It must also be noted that oiling every known egg is consistent with a goal of eradicating a species. As that is not the objective (see Objectives of Management), oiling every egg is excessive. If Management does continue, it should be more reflective of the stated objective.

There is an ethical argument for more humane options to be examined. Those options include ending Mute Swan Management. If it continues, options include leaving some eggs to hatch by oiling a percentage but not all eggs in each nest (percentage to be determined), or replacing a percentage but not all eggs in each nest with fake eggs.

These are workable alternatives to achieve the goal and Mute Swans are the perfect species with which to pilot compassionate alternatives.

Concluding questions

Mute and Trumpeter Swans exhibit largely the same attributes and behaviours in the same territories 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 likely that both have been introduced as non-native breeding species in this region.

How might this impact our conceptualization and characterization of each species?

Mute Swans are a naturalized species having reproduced in the wild in Ontario for over 65 years or 18 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 in existing Mute regions, the goal has been achieved. Trumpeters were a self-sustaining species by 2008 and are capable of wresting nesting territory from Mutes.

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?