

# Mute Swan Management

## A literature review and discussion document

By Kelly Duffin | Revised and updated February 2024

### 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 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.

This paper is a review of the literature that precipitated Mute Swan Management programs in Canada and the US and of more recent studies and reports. Scientists in relevant disciplines – including ornithology, biology, and ecology – have provided research, expertise, and guidance and have reviewed drafts.

The findings and conclusions of the literature review include:

- The need for Mute Swan management is not substantiated by the scientific evidence. The case that they are harmful is largely anecdotal and observational. The reports that exist are inconclusive. An exhaustive search has found no fulsome environmental impact assessment or reference to one having been done.
- 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.
- If managing 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 have had a self-sustaining population since 2008 and their numbers and range are increasing more rapidly than Mutes’. This is what 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 thirty years or whether, like Mutes were, they have been introduced anew.
- 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 led to blunt instrument-type and often lethal actions against non-natives – despite the fact that the majority of them are benign. Those ecologists argue that a more nuanced approach is needed.

In addition to being a literature review this paper is also a discussion document. It is hoped that the findings herein will open a conversation about eliminating or reducing Mute Swan Management activities and considering more humane alternatives to lethal approaches.

One option proposed is to replace some eggs in Mute Swans’ nests with fake eggs, but to leave two or three in each nest to hatch.

## 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, and lasting pair bonds.

Mute Swans pick a mate at approximately three years old 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<sup>1</sup>. Clutch sizes vary. The pen will begin incubating the eggs in mid- to late-April when the clutch is complete. During incubation 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 24 to 48 hours of each other.

During incubation the pen does not leave the nest often, even to eat, so 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 acres<sup>2</sup>, 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 short time later the family abandons 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.

On average, half the cygnets will survive to fledge (grow feathers and learn to fly away)<sup>3</sup>. 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, over 1,207 young and adult Mute Swans have been killed in Ontario on federal and private property in the decade between 2013 and 2023<sup>4</sup>. 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 1,639 eggs have been destroyed in the province in the same decade.<sup>5</sup>

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<sup>1</sup> 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

<sup>2</sup> *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*.

<sup>3</sup> 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*

<sup>4</sup> Environment and Climate Change Canada Access to Information responses

<sup>5</sup> Environment and Climate Change Canada Access to Information responses

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, sometimes weeks after the normal hatching period, as she is not willing to give up on them. Recently, some conservation 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 in July.

For both would-be parents this practice 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. Preventing 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.”<sup>6</sup>

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.<sup>7</sup>

## Stated reasons for Management

Municipalities, conservation and wildlife 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 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.**

### Competition with other waterfowl

Like most 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

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<sup>6</sup> *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

<sup>7</sup> Toronto and Region Conservation Authority, personal communication

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."<sup>8</sup>

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 swans<sup>9</sup>, 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).<sup>10</sup> 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."<sup>11</sup>

A 2022 webcam study also by Kevin A. Wood again found that most Mute Swan "aggression is directed towards conspecifics."<sup>12</sup> The resulting 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<sup>13</sup> "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."

### 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.<sup>14</sup>

It is not uncommon for species considered native to fare poorly once their traditional 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."<sup>15</sup>

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<sup>8</sup> *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*.

<sup>9</sup> *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*.

<sup>10</sup> Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

<sup>11</sup> 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

<sup>12</sup> *Assessing trade-offs in avian behaviour using remotely collected data from a webcam*, Kevin A. Wood, Rebecca Lacey, and Paul E. Rose, 2022

<sup>13</sup> 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.

<sup>14</sup> 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*

<sup>15</sup> Cornell Lab of Ornithology

Declines in other species are far less likely to be due to Mute Swans and far more likely the result 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 earnest in and around Chesapeake Bay, they represented only .5% of the waterfowl in the Bay<sup>16</sup>. 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."<sup>17</sup>

In fact, numerous studies have established that SAV has severely declined in Chesapeake Bay in distribution and abundance in recent decades due to anthropogenic (human) activity, including runoff from industry, agricultural pollution, waste water treatment, deforestation, urban and suburban shoreline development, and wetland destruction.<sup>18</sup> 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."<sup>19</sup> The water quality in Chesapeake Bay still received a D+ in 2022 despite the near-elimination of Mute Swans in Maryland by 2013.<sup>20</sup> Clearly Mute Swan grazing was not a leading cause of SAV declines 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."<sup>21</sup>

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] by Europe's Bewick swans resulted in deeper burial of tubers, an adaptive response that occurred over approximately 20 years."<sup>22</sup> 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.<sup>23</sup>

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."<sup>24</sup>

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<sup>16</sup> 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*

<sup>17</sup> *Maryland Mute Swan Task Force Recommendations*, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

<sup>18</sup> *Water Quality Standards Attainment and Monitoring*, Chesapeake Progress, Chesapeake Bay Program reports, Chesapeake Bay Foundation reports, and others

<sup>19</sup> *Water Quality Standards Attainment and Monitoring*, Chesapeake Progress, Chesapeake Bay Program reports, Chesapeake Bay Foundation reports, and others

<sup>20</sup> Chesapeake Bay Foundation, 2022 State of the Bay Report

<sup>21</sup> *Mute Swans: an ecological overview with an emphasis on the lower Detroit River*, Craves J.A. and D.J. Susko 2010

<sup>22</sup> *Mute Swans: an ecological overview with an emphasis on the lower Detroit River*, Craves J.A. and D.J. Susko 2010

<sup>23</sup> *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

<sup>24</sup> *Alien swans create controversy in Michigan* in the Examiner, July 2021.

## 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.<sup>25</sup> Statistics on swan attacks are also not available through TRCA, Ontario's Ministry of Natural Resources and Forestry, or Canadian Wildlife Service.<sup>26</sup> 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 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 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, adding or puncturing, birds will persist in defending the area until they give up on the nest."<sup>27</sup>

## 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.**

### Population, range, and distribution

As of the 2017 Midsummer Mute Swan Survey (the last one flown), 4,251 Mute Swans were counted both in the aerial and ground parts of the survey. In the Lower Great Lakes only, 4,103 were counted.

They are a small percentage of other waterbird species. The 2022 Christmas Bird Count found 2,800 Mute Swans in Ontario while the same survey counted 196,742 Canada Geese (*Branta canadensis*) and 74,424 Mallards (*Anas platyrhynchos*).

The Great Lakes Marsh Monitoring Program (MMP) 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, Relative Abundance below). The MMP also found that Mute Swans were decreasing inland.

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<sup>25</sup> Barry Kent McKay, letter to Birds Studies Canada

<sup>26</sup> Access to Information and Freedom of Information responses, 2023

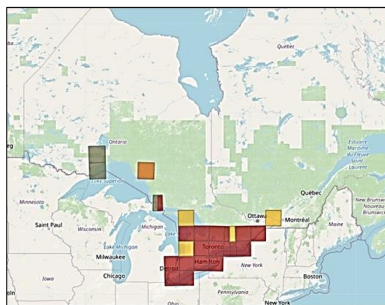
<sup>27</sup> Decision and Finding of No Significant Impact for the Environmental Assessment: Mute Swan Damage Management in Michigan

The 2017 Midsummer Mute Swan Survey showed that Mute Swan numbers – including numbers of adults – declined significantly between 2014 and 2017 in one stretch of the GTHA:

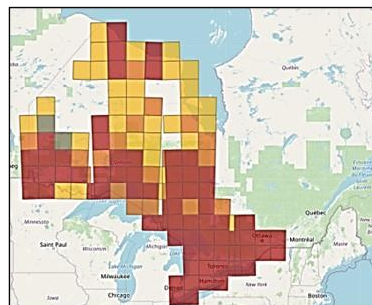
Humber Bay to Hamilton Harbour <sup>28</sup>	Adults	Cygnets	Total Birds
<b>2014</b>			
	127	7	134
<b>2017</b>			
	96	0	96
<b>Change</b>			<b>-38</b>
<b>Annual growth</b>			<b>-28%</b>

Over a longer time horizon, the Midwinter Waterfowl Count shows a largely stable Mute Swan population in the Niagara, Hamilton, and Toronto regions between 2002 and 2023. <sup>29</sup>

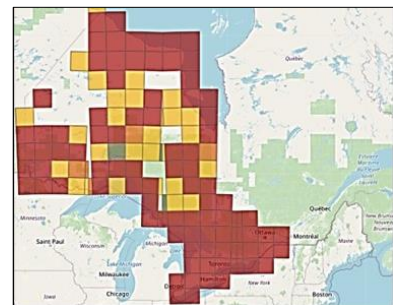
Their range is also not expanding. The Third Ontario Breeding Bird Atlas (2021-2025, 2021-2023 to date) illustrates that they are concentrated in the Lower Great Lakes and largely urban coastlines. This is very similar to their range and distribution in the Second Atlas (2001-2005). Other species, including Canada Geese, and Mallards, have comparatively larger ranges and are more distributed across the province.



Mute Swans



Mallards



Canada Geese<sup>30</sup>

### 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.

<sup>28</sup> The Status of Mute Swans in Ontario, 2017 (Midsummer Mute Swan Survey), Environment and Climate Change Canada

<sup>29</sup> 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.

<sup>30</sup> Third Ontario Breeding Bird Atlas, 2021-2025 (2021-2023 to date)

Mute Swans have a 40-56% survival rate to age one.<sup>31</sup> Most mortality occurs in the first two weeks of life.<sup>32</sup> Young cygnets' most common causes of death include cold and storms and predation.<sup>33</sup> 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, rats, gulls, owls and other avian predators, fishes, opossums, skunks, and raccoons are all predators of swans.<sup>34</sup> 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.<sup>35</sup>

Mute Swans' average life expectancy in the wild is 11 years.<sup>36</sup>

### Carrying capacity

Based on the 2017 Midsummer Mute Swan Survey count of 4,103 in the Lower Great Lakes, these birds had reached less than 15% of their carrying capacity (which is the maximum population that can be sustained in a given environment).

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.<sup>37</sup> 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."<sup>38</sup>

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 taken by "immigrants," resulting in little to no net reduction.<sup>39</sup>

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<sup>31</sup> 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

<sup>32</sup> Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

<sup>33</sup> Mute Swans: an ecological overview with an emphasis on the lower Detroit River, Craves J.A. and D.J. Susko 2010

<sup>34</sup> 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

<sup>35</sup> Midsummer Mute Swan Survey 2017

<sup>36</sup> Maryland Mute Swan Task Force Recommendations, Maryland Department of Natural Resources' Mute Swan Task Force, January 2001

<sup>37</sup> 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.

<sup>38</sup> Nonlethal Techniques to Reduce Animal Problems by Priscilla Feral, in Mute Swans and Their Chesapeake Bay Habitats: Proceedings of a Symposium

<sup>39</sup> 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.



## A tale of two swans

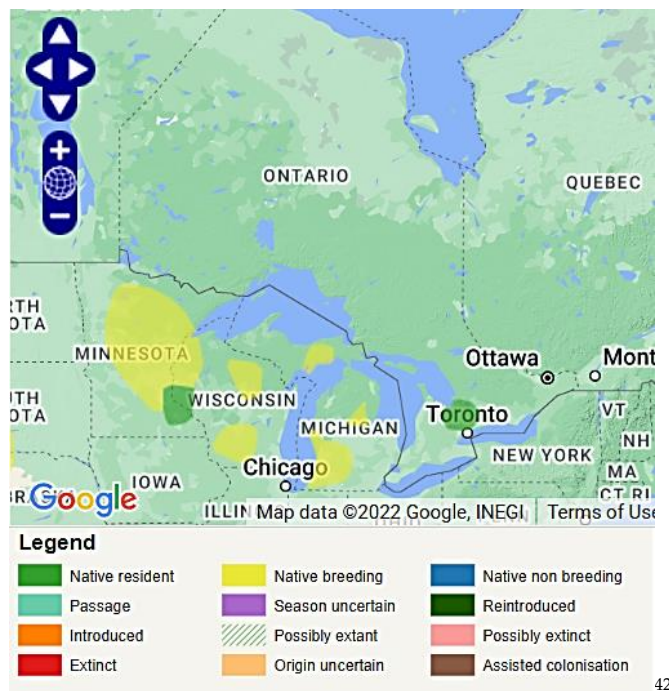
While research that counters the prevailing bias against Mute Swans is provided above, the other reason for targeting Mute Swans is to make way for the “re”-introduction of Trumpeter Swans<sup>40</sup> (*Cygnus buccinator*).

### History

Mute Swans were “introduced” to North America anthropogenically (humans brought them). They are now “naturalized,” having lived and bred on the continent for over 66 years and more than 18 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 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”<sup>41</sup> and the Bird Life species factsheet shows that Trumpeters’ native breeding range (in yellow) did not include Ontario:



<sup>40</sup> 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

<sup>41</sup> **Complete Birds of North America**, National Geographic, edited by Jonathan Alderfer and Jon L. Dunn

<sup>42</sup> 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 by humans 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	<b>Eggs and birds purchased and brought from Europe to North America for captive and ornamental purposes</b>	Nearly extirpated (hunted for their feathers)
	<b>Some escaped/were released</b>	
1950s	Began nesting in southern Ontario	
1980s onwards		Re-introduction campaign begins and includes: <ul style="list-style-type: none"> <li>▪ <b>Eggs and birds purchased and brought from Alaska and the American Midwest and reared in captivity</b></li> <li>▪ Some eggs matured in incubators</li> <li>▪ Some Mute eggs replaced with Trumpeter eggs for Mutes to hatch and raise<sup>43</sup></li> <li>▪ Trumpeter cygnets hatched by Mutes dyed so cobs wouldn't reject them for being the wrong colour<sup>44</sup></li> <li>▪ <b>Some were released</b> (breeding stock was kept in captivity)</li> <li>▪ Flocks fostered and fed by a network of "cooperators"</li> <li>▪ Some Trumpeters pinioned</li> <li>▪ Tagging and tracing programs were established</li> </ul>
2000s	Management programs, including egg destruction and killing of young and adults begins in Canada and the US	
Today	Over 1,207 killed and over 1,639 eggs destroyed in Ontario in the decade between 2013 and 2022 <sup>45</sup>	574 cygnets released; self-sustaining population now over 2,800 in Ontario <sup>46</sup>

### Attributes

**Trumpeters are celebrated while Mutes are vilified but, since Trumpeters are larger, eat more, and are more aggressive than Mutes,<sup>47</sup> the characteristics attributed to Mutes as negatives cannot in themselves be reasons to limit Mutes' population, or Trumpeters would not be promulgated.**

<sup>43</sup> 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

<sup>44</sup> Toronto Field Naturalists presentation on March 6, 2022 by Donna Lewis, who cares for a flock of Trumpeters on Magna headquarters property in Aurora

<sup>45</sup> Environment and Climate Change Canada, Access to Information responses

<sup>46</sup> Toronto Field Naturalists presentation on March 6, 2022 by Donna Lewis, who cares for a flock of Trumpeters on Magna headquarters property in Aurora

<sup>47</sup> Cornell Lab of Ornithology

Relative to aggression and territory, Trumpeters have been observed attacking Mutes 22 to 55 times more frequently than the reverse.<sup>48</sup> 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.”<sup>49</sup> 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.”<sup>50</sup>

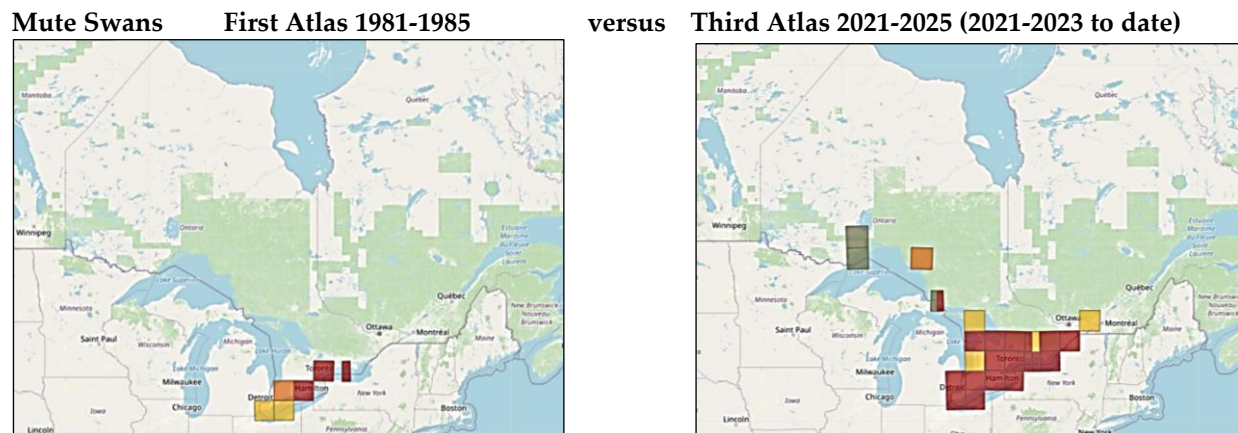
This leads to Lumsden concluding: “Trumpeters will prove to be very formidable competitors with the more established mute swans and I suggest they will eventually occupy the best habitat within the present Ontario Mute Swan range.”<sup>51</sup>

### Relative Abundance

Trumpeters outcompeting Mutes for habitat may already be occurring. The stretch of the GTHA which saw a reduction in the Mute Swan population between 2014 and 2017 (see Population, range, and distribution above) includes Burlington and LaSalle Park, the site of intense efforts to bring Trumpeter Swans to southern Ontario. Twenty-five of the 61 Trumpeters observed in the 2017 Midsummer Mute Swan Survey (the only year that the Survey counted Trumpeters) were between Bluffer’s Park in Scarborough and Cootes Paradise in Hamilton.

More recent surveys establish that Trumpeters’ population has grown more rapidly and their range has expanded more significantly than Mutes’.

The Ontario Breeding Bird Atlas shows the relative range expansion. Mutes 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 (2021-2023 to date):



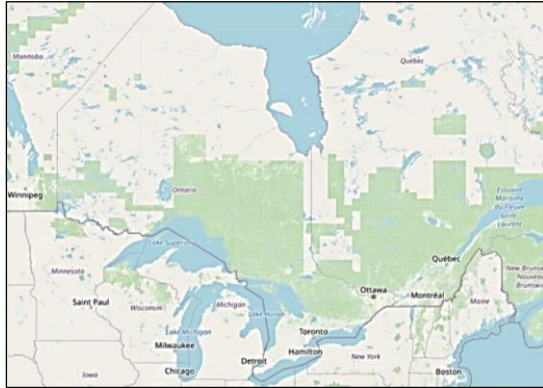
<sup>48</sup> Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

<sup>49</sup> 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.

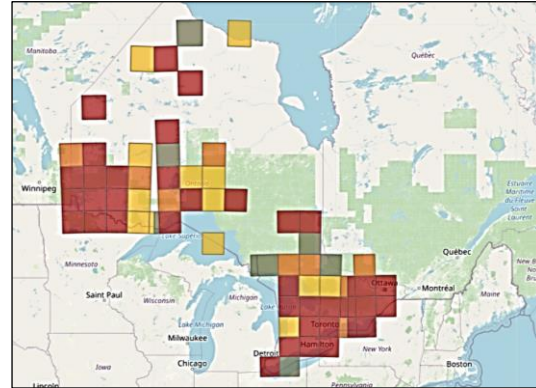
<sup>50</sup> Trumpeter Swans and Mute Swans compete for space in Ontario, H.G. Lumsden in Ontario Birds, April 2016

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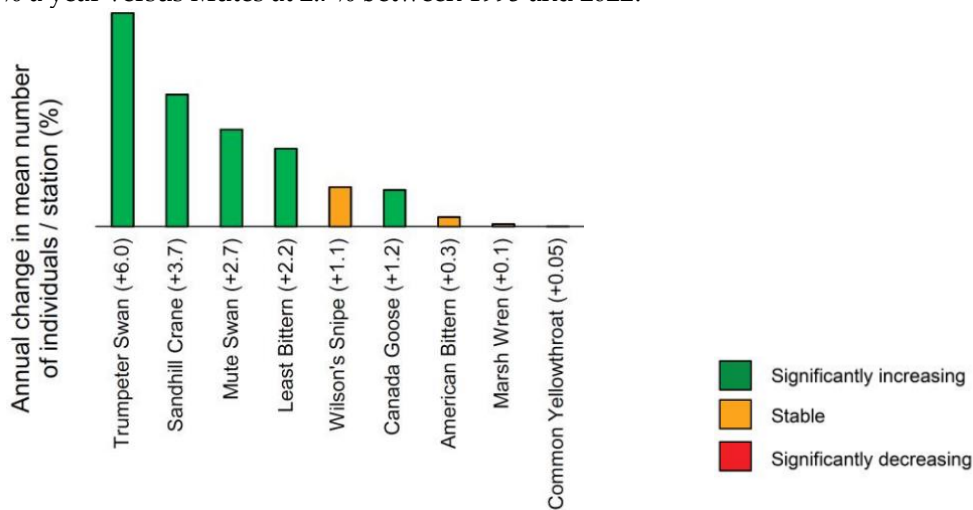
**Trumpeter Swans First Atlas 1981-1985**



**versus Third Atlas 2021-2025 (2021-2023 to date)<sup>52</sup>**



Relative to population growth, the Great Lakes Marsh Monitoring Program shows Trumpeters increasing at a rate of 6% a year versus Mutes at 2.7% between 1995 and 2022:



53

As noted above in Population, range, and distribution, the MMP illustrates that their ranges differ, with Mute Swans increasing in coastal wetlands but declining inland. Trumpeters are increasing in both inland and coastal wetlands but at a greater rate inland<sup>54</sup>, which is consistent with the Breeding Bird Atlas data (above).

The Christmas Bird Count shows similar trends over the last decade:

Christmas Bird Count - Mute Swans		
	2012	2022
Count	2,100	2,800
Growth rate between surveys		133%
Annualized growth rate		3%

Christmas Bird Count - Trumpeter Swans		
	2012	2022
Count	332	1,508
Growth rate between surveys		454%
Annualized growth rate		9%

<sup>52</sup> Third Ontario Breeding Bird Atlas, 2021-2025 (2023 to date)

<sup>53</sup> The Marsh Monitor, Fall 2023 Number 29, Birds Canada

<sup>54</sup> The Marsh Monitor, Fall 2023 Number 29, Birds Canada

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 count of Trumpeters frequently exceeds Mutes, often by two or three times.<sup>55</sup>

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

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 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 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."<sup>56</sup>

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*."<sup>57</sup>

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,

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<sup>55</sup> 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.

<sup>56</sup> Ricciardi and Simberloff 2009 in *Conciliation biology: the eco-evolutionary management of permanently invaded biotic systems*, Scott P. Carroll

<sup>57</sup> Ecologists, *Environmentalists, Experts and the Invasion of the 'Second Greatest Threat'*, Matthew Chew, *International Review of Environmental History*, Volume 1 2015

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.”<sup>58</sup>

Indeed, “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*.”<sup>59</sup>

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 the late summer when native flowers are scarce.”<sup>60</sup> Non-native plants have proven better than natives at preventing erosion in coastal ecosystems.<sup>61</sup> Non-native species can also increase regional biodiversity.<sup>62</sup>

“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 21<sup>st</sup> century, there’s no such thing as an undisrupted ecosystem, and this will only become truer as climate change and habitat loss accelerate.”<sup>63</sup> Those biologists and ecologists are calling for a more nuanced view of species in “conciliatory” or “compassionate conservation.”<sup>64</sup>

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<sup>65</sup> 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.<sup>66</sup> In fact, the introduction of non-native species has almost always increased the number of species in a region.”<sup>67</sup>

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<sup>58</sup> It’s Time to Stop Demonizing “Invasive” Species, Pitchstone Waters, December 9, 2021

<sup>59</sup> *Don’t Judge Species on their Origins* by Mark Davis and 18 ecologists in *Nature*

<sup>60</sup> Good or Bad? Some ‘invasive’ species can help native ecosystems thrive, Heather Kharouba and Stephanie A. Rivest, University of Ottawa, February 22, 2023

<sup>61</sup> 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

<sup>62</sup> Good or Bad? Some ‘invasive’ species can help native ecosystems thrive, Heather Kharouba and Stephanie A. Rivest, University of Ottawa, February 22, 2023

<sup>63</sup> It’s Time to Stop Demonizing “Invasive” Species, Pitchstone Waters, December 9, 2021

<sup>64</sup> 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

<sup>65</sup> Wilcove, D. S., Rothstein, D., Dubow, J., Phillips, A. & Losos, E. *BioScience* 48, 607–615 (1998).

<sup>66</sup> Davis, M. A. **Invasion Biology** (Oxford Univ. Press, 2009).

<sup>67</sup> 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*

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."<sup>68</sup>

There are also some fundamental problems with this paradigm with respect to 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,<sup>69</sup> 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 [their iconic] saguaro cacti...arrived in what we now call Arizona and supplanted the region's former occupants,"<sup>70</sup> writes Matthew Chew.

The "cutoff" to be classified as native is therefore much more recent than that, though it is rarely defined and differs from continent to continent. In North America it is usually considered pre-European and pre-industrial.<sup>71</sup> 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."<sup>72</sup> 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. Ranges of plants and animals are dynamic even without human intervention and no ecosystem is static.

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."<sup>73</sup>

Categorizing species by their origins can no longer be an excuse to "demonize [them] and exclude them from moral consideration."<sup>74</sup>

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

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<sup>68</sup> Threats to Endangered Species in Canada in *Bioscience*, Oscar Venter et al

<sup>69</sup> **Where Do Camels Belong? Why Invasive Species Aren't All Bad**, by Ken Thompson

<sup>70</sup> 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*, 1<sup>st</sup> edition

<sup>71</sup> In Europe it typically goes back farther, and can predate human occupation, though knowing what species were present before humans were there to observe them invites questions.

<sup>72</sup> *Don't Judge Species on their Origins* by Mark Davis and 18 ecologists in *Nature*

<sup>73</sup> *13 Ways of Looking at Invasive Species*, Brendon M.H. Larson

<sup>74</sup> Arian Wallach, quoted in *It's Time to Stop Demonizing "Invasive" Species*, Pitchstone Waters, December 9, 2021

## 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.

If the real reason for Management was to give Trumpeters the advantage, that has been achieved. Trumpeters are now well established in Ontario and their population growth and range expansion are outpacing Mute Swans'.

For all these reasons, Mute Swan Management is not justified 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.

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. If it continues, it should be more reflective of the stated objective and less lethal. Options include replacing some eggs in each nest with fake eggs but 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 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.

*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 66 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?*