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# HIGHWAY 413: The Road to Our Ruin



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The view from Linda's farmhouse across the meadow, woodlot and the Grand River Valley captured her love of nature and the importance of the preservation of Ontario's green space and its flora and fauna.

## DEDICATION

This report is dedicated in memory of Linda Van Duzer Saul. Linda's passion for nature was rooted in her youthful adventures at her family cottage on Four Mile Lake and the 27 years she spent at the Saul family farm on the banks of the Grand River upstream from Belwood. A "farm" that was populated exclusively by the wildflowers, birds, deer and other wildlife that she cherished so much. Over the years, Linda witnessed the devastating effects of extensive urban sprawl eradicating farmland, especially along highways 10 and 410. Linda would have been fiercely opposed to the construction of Highway 413, especially its detrimental effects on species at risk.

# The Road to Our Ruin

## How Highway 413 would impact threatened and endangered species

This report is by Environmental Defence.

ENVIRONMENTAL DEFENCE is a leading Canadian advocacy organization that works with government, industry and individuals to defend clean water, a safe climate and healthy communities.



## ACKNOWLEDGMENTS

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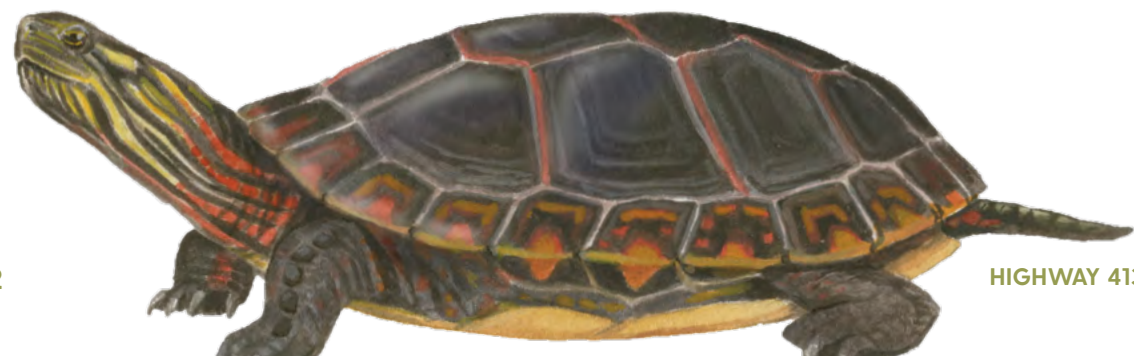
# Table of Contents



<b>Introduction</b>	<b>4-5</b>
<b>Birds</b>	<b>6-7</b>
Bank Swallow	8-9
Barn Swallow	10-11
Bobolink	12-13
Canada Warbler	14-15
Chimney Swift	16-17
Eastern Meadowlark	18-19
Eastern Wood-pewee	20-21
Grasshopper Sparrow	22-23
Least Bittern	24-25
Red-headed Woodpecker	26-27
Short-eared Owl	28-29
Wood Thrush	30-31



<b>Amphibians, Reptiles &amp; Fish</b>	<b>32-33</b>
Blanding's Turtle	34-35
Eastern Milkshake	36-37
Eastern Musk Turtle	38-39
Eastern Ribbonsnake	40-41
Jefferson Salamander & Unisexual Ambystoma	42-43
Midland Painted Turtle	44-45
Northern Map Turtle	46-47
Redside Dace	48-49
Snapping Turtle	50-51
Western Chorus Frog	52-53
<b>Insects &amp; Trees</b>	<b>54-55</b>
Bumble Bee	56-57
Black Ash	58-59
Butternut	60-61
Monarch Butterfly	62-63
Rapids Clubtail	64-65
<b>References</b>	<b>66-71</b>





# The Road to Our Ruin:

## How Highway 413 would impact threatened and endangered species

Highway 413 is a proposed mega-project that would fuel more urban sprawl, put more greenhouse gas pollution into our atmosphere, cut through the Greenbelt, destroy fertile farmland and pave over important species habitat, pushing threatened species even closer to the brink.

To better understand the risk to endangered and threatened species, Environmental Defence commissioned biologists at the University of Guelph to review available information and identify what at risk species have been sighted near the proposed route for Highway 413, and how the construction of the highway would impact the future of each at risk species in the region.

The analysis revealed that Highway 413 would have some serious impacts to natural areas and species. If built, the highway would:

- **Negatively affect a minimum of 29 species listed under the federal Species at Risk Act**, and 122 species of birds protected under the *Migratory Birds Convention Act*.
- **Cross an estimated 132 streams and rivers**, many of these fish-bearing and at least a quarter of them being cool water streams, supporting important aquatic communities.

- **Result in the loss of around 1000 hectares (400 acres) of significant natural areas and/or Greenbelt land**, much of it the headwaters of rivers and streams.
- **Compromise the ecological integrity of the Nashville Conservation Reserve**, an important protected area rich in biodiversity and one of the most intact forested areas in the Greater Toronto Area.
- **Cumulative effects from urban sprawl encouraged by the highway are expected to result in widespread habitat fragmentation**, and the further degradation of many natural communities and at risk species populations.

This report looks at 29 at risk species identified by the biologists, their status and the threat posed if Highway 413 is built. Each species is identified by its common name in English, its scientific name in Latin, its current status according to Canada's federal *Species At Risk Act*, a map of the area near Highway 413 with locations where a species was sighted, and an illustration of the species.

## How the Study for this report was done:

The biologists, Karl Heide and Dr Ryan Norris, of the University of Guelph, compiled information on the habitat requirements and threats associated with species at risk known to occur in Southern Ontario. They then used data from the Government of Ontario's Natural Heritage Information Centre (NHIC) to map sightings of these species in the proximity of the proposed route of Highway 413.

To confirm whether the sightings were accurate and current within the area of Highway 413, the scientists also analyzed data from the past five years from eBird,<sup>1</sup> Inaturalist,<sup>2</sup> the Ontario Breeding Bird Atlas,<sup>3</sup> the Ontario Butterfly Atlas,<sup>4</sup> the Ontario Reptile and Amphibian Atlas,<sup>5</sup> the Ontario Ministry of Natural Resources and Forestry,<sup>6</sup> and recent reports from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

## What's next for Highway 413?

In May 2021, Highway 413 was designed for a review under Canada's *Impact Assessment Act*. When this report was published in October, 2022, the

Impact Assessment Agency had not yet decided whether to conduct an impact assessment nor the scope of that assessment. However, it was expected to make those decisions in the near future.

Due to the number of species at risk impacted and the breadth of environmental impacts more generally, we recommend that the Impact Assessment Agency proceed with a full federal Impact Assessment – the most comprehensive assessment possible – and conduct a thorough assessment of the risks and impacts to federally listed species at risk.

In recent years, Ontario has watered down the *Endangered Species Act*, removing protection for species that are endangered locally but also live elsewhere, an approach that scientists have condemned. Ontario also launched the controversial “pay to slay” fund that allows developers to destroy endangered species habitat, provided they pay into a fund managed by the province.

Given the province's track record on endangered species, there's a real need for federal oversight and a full federal Impact Assessment.

**Now let's meet the 29 species most at risk if Highway 413 is built – including birds, fish, amphibians, reptiles, insects and trees!**





# Birds



# Bank Swallow

*Riparia riparia*

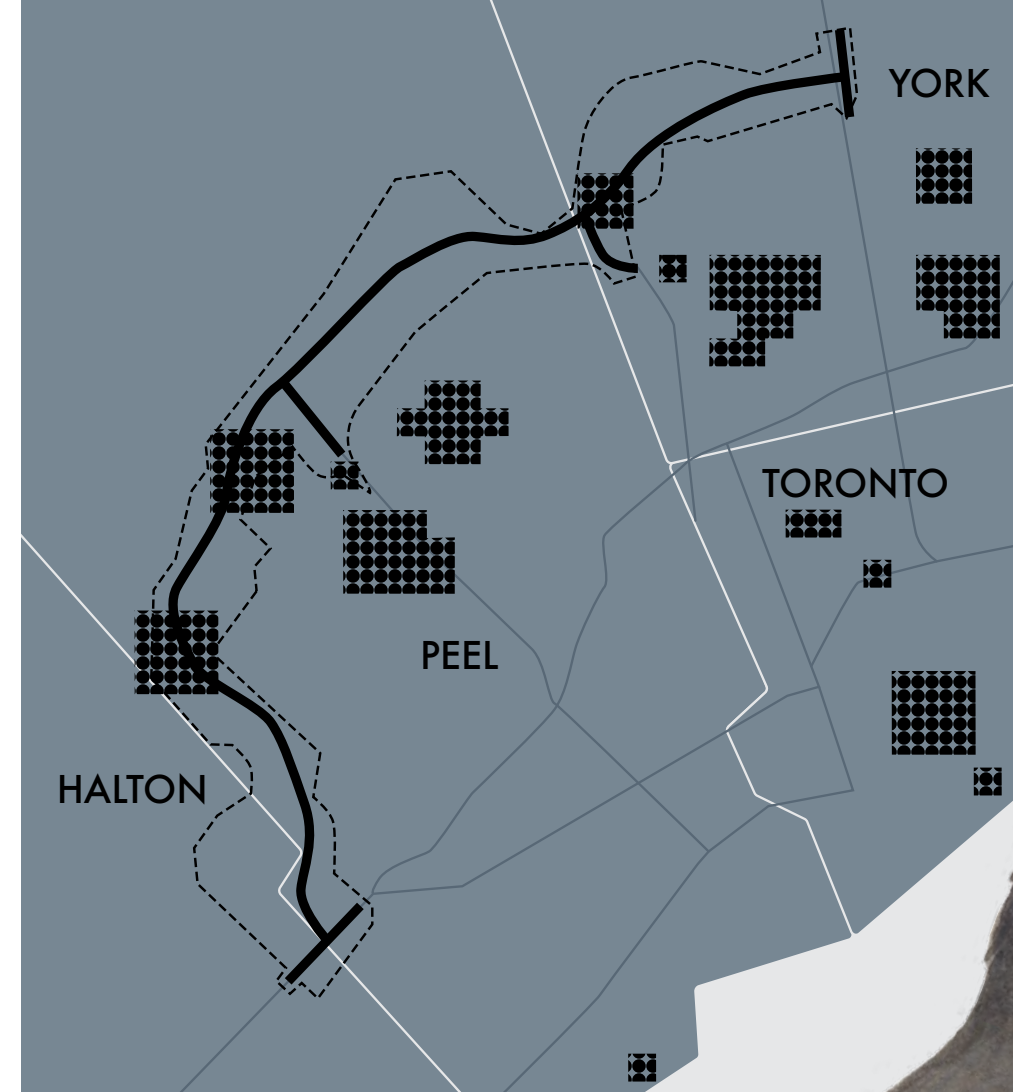


The Bank Swallow is a small songbird that can be distinguished in flight from other swallows by its quick, erratic wing beats and its almost constant buzzy, chattering vocalizations.

Bank swallows build their nests on eroded banks, bluffs, and today in road cuts, and in mounds of earth produced by human activities.<sup>7</sup> The North American Bank Swallow population has declined dramatically, largely due to erosion control

measures which tend to eliminate bluffs,<sup>8,9</sup> and the destruction of nesting colonies during road construction.<sup>10</sup>

It's estimated that at least three colonies likely exist within the route of Highway 413. Due to its history of fast-tracking transit project permits that negatively impact the Bank Swallow,<sup>11</sup> there are concerns with the Ontario government's ability to identify and protect this at risk species.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Bank Swallow





# Barn Swallow

*Hirundo rustica*

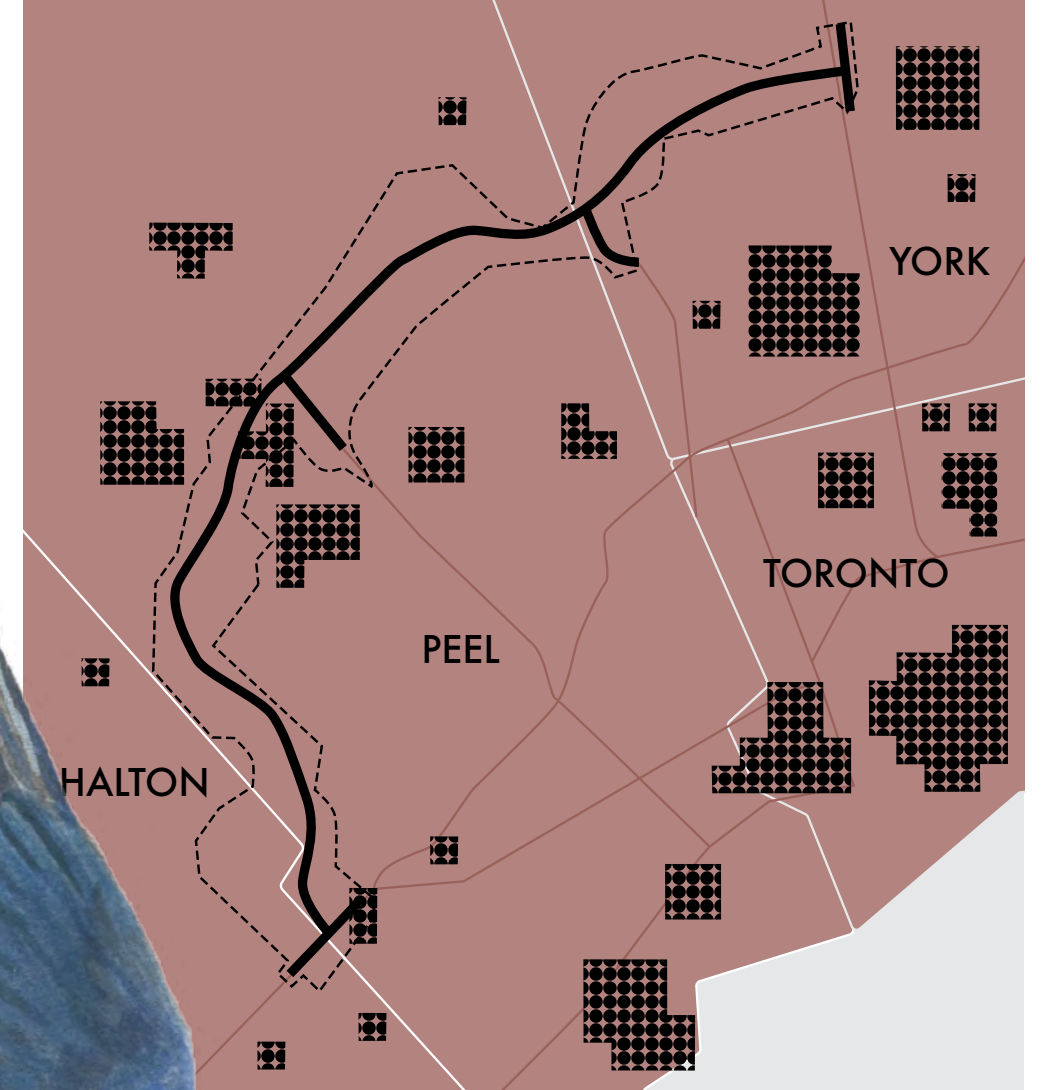


A familiar summertime sight around barns and other structures near water, the Barn Swallow is a globally distributed bird that has suffered steep declines in North America.<sup>12</sup> Declines have occurred due to a number of human caused pressures, with loss of suitable nesting structures being one major threat.<sup>13</sup>

Highway 413 and accompanying sprawl may require the demolition of old structures used by Barn Swallows for nesting. Culverts and bridges may lead to an ecological trap whereby birds foraging near their nests become vulnerable to road mortality.

Barn Swallows are among the species most affected by poor enforcement of Ontario's *Endangered Species Act*. Evidence has found that constructing shed-like structures may not be an effective offset for the loss of existing nest substrates,<sup>14</sup>

yet the government continues to grant permit approvals that rely on such structures be created, often in an expedited manner.<sup>15</sup> Until we learn more about the nesting requirements of Barn Swallows, the removal of any nest site should be considered to be a significant adverse impact on Barn Swallows.



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Barn Swallow



# Bobolink

*Dolichonyx oryzivorus*



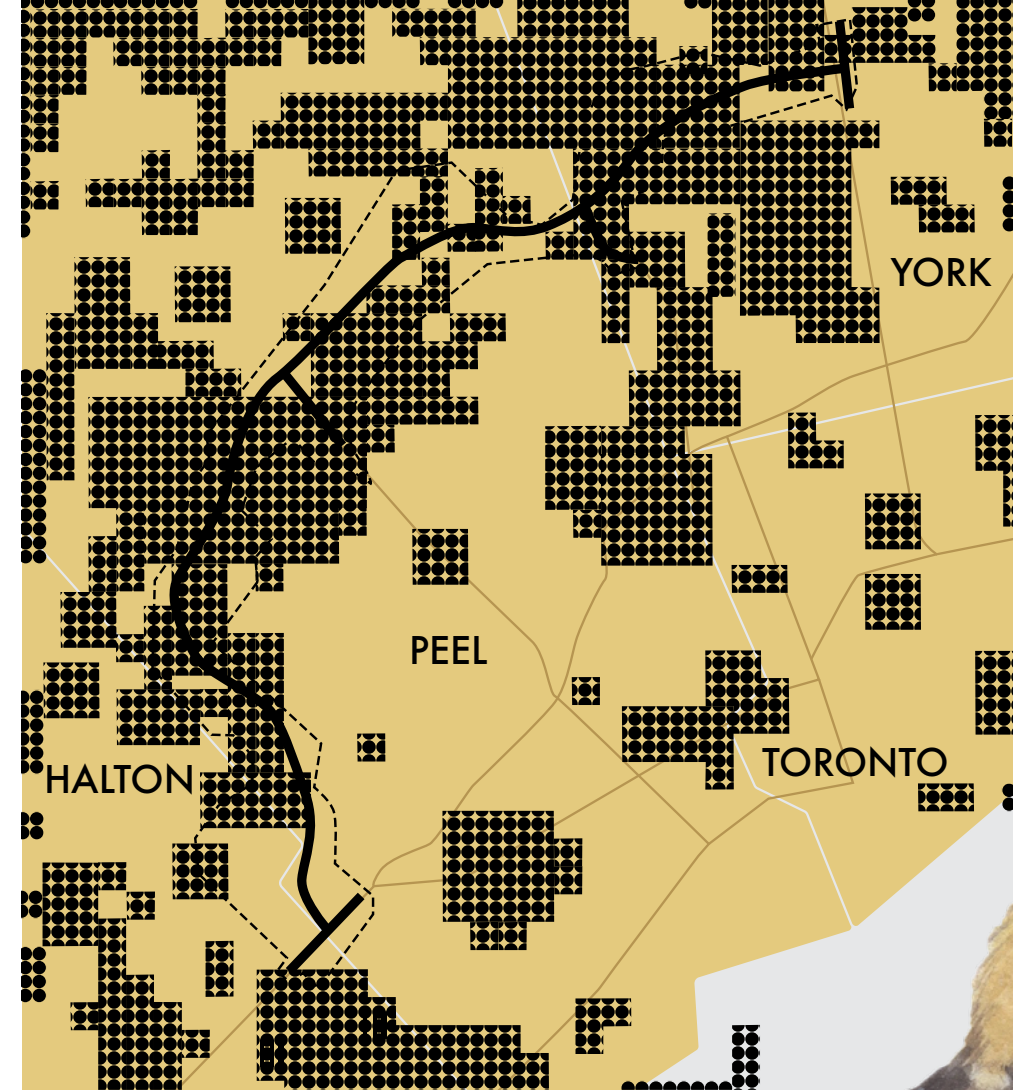
The Bobolink is a songbird that breeds in grasslands across North America and winters in South America.<sup>16</sup> It has declined severely due to a number of threats, including the loss of tallgrass prairie and disturbance to its nest sites from mowing and other human activities during the breeding season.<sup>17</sup>

In Ontario, Bobolinks primarily nest in areas of low-intensity agriculture such as along the Niagara escarpment and Oak Ridges Moraine.<sup>18</sup> The Ontario Breeding Bird Atlas reports that the area immediately north of the Greater Toronto Area supports some of the highest Bobolink occupancy rates in the province.<sup>19</sup>

So far, Ontario's endangered species legislation has failed to protect Bobolinks, issuing 2,010 conditional exemptions and 39 permits affecting the species since 2007, often with no follow-up monitoring

or transparent reporting of outcomes.<sup>20</sup> The majority of these permits and exemptions have been issued to the infrastructure (such as roads and highways) and development sectors.<sup>21</sup>

A highway development project in this area would result in the permanent displacement of many breeding pairs that may struggle to find suitable nesting habitat elsewhere. Based on Canada's Annual Crop Inventory data,<sup>22</sup> Highway 413 is proposed to eliminate roughly 439 hectares of suitable pasture habitat. Moreover, sprawl enabled by the highway could destroy or degrade up to an additional 3,900 hectares of pasture within the area near the highway.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Bobolink





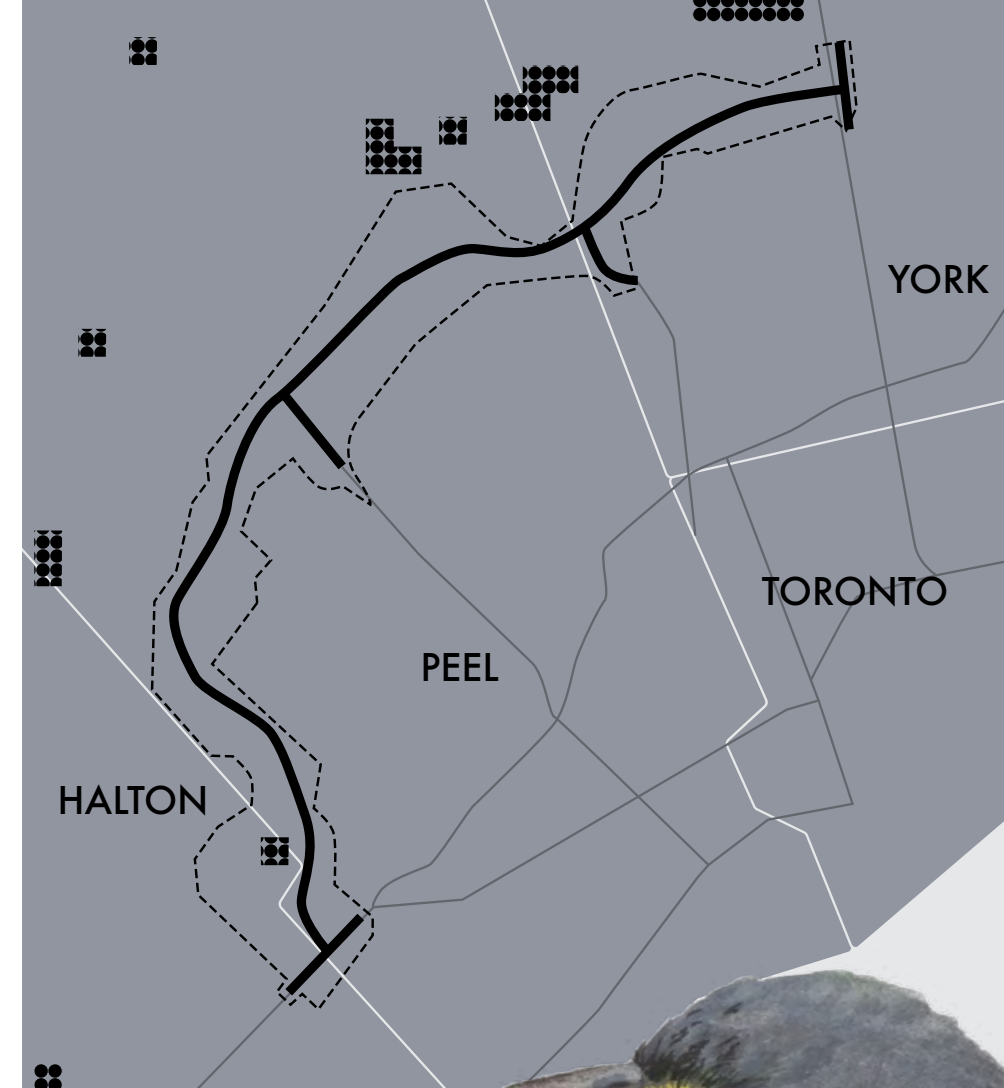
# Canada Warbler

*Cardellina canadensis*

The Canada Warbler is a migratory songbird that breeds in mixed forests with a dense understory and an abundance of moss.<sup>23</sup> In the spring, males can be heard singing a distinctive song of clear, liquid notes ending emphatically.

While it is unknown whether any breeding populations exist within the areas closest to Highway 413, suitable habitat is present there and data suggest at least one occupied area along the Credit River near Highway 413's proposed interchange with Bovaird Drive. Similar habitat exists along the Humber River where the highway is slated to be built.

Canada Warblers are negatively associated with roads in the landscape,<sup>24</sup> and their specialized habitat requirements mean that a new highway could wipe out any small, potentially unknown populations, leaving them with nowhere to relocate.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Canada Warbler





# Chimney Swift

*Chaetura pelagica*



Chimney Swifts originally nested in large, hollow dead trees. But since the removal of most old-growth forests during the industrial revolution, they have become reliant on chimneys and other manmade structures.<sup>25</sup>

While removal and modernization of chimneys is largely responsible for the steady declines seen in this species over the past several decades,<sup>26</sup> collisions with vehicles have also been reported in large numbers when Chimney Swifts forage low to the ground.<sup>27</sup> Chimney Swifts nesting in Georgetown and at sites along the west

edge of Brampton may forage over the nearby Highway 413, putting them at a high risk of road mortality.

The provincial government has not only failed to protect Chimney Swifts by issuing expedited permits for projects negatively affecting them,<sup>28</sup> it also recently down-listed the level of protection.<sup>29</sup> But that's no reason to put local populations at risk by building Highway 413.



## MAP LEGEND

- Highway 413
- Highway 413 Planning Area
- Chimney Swift



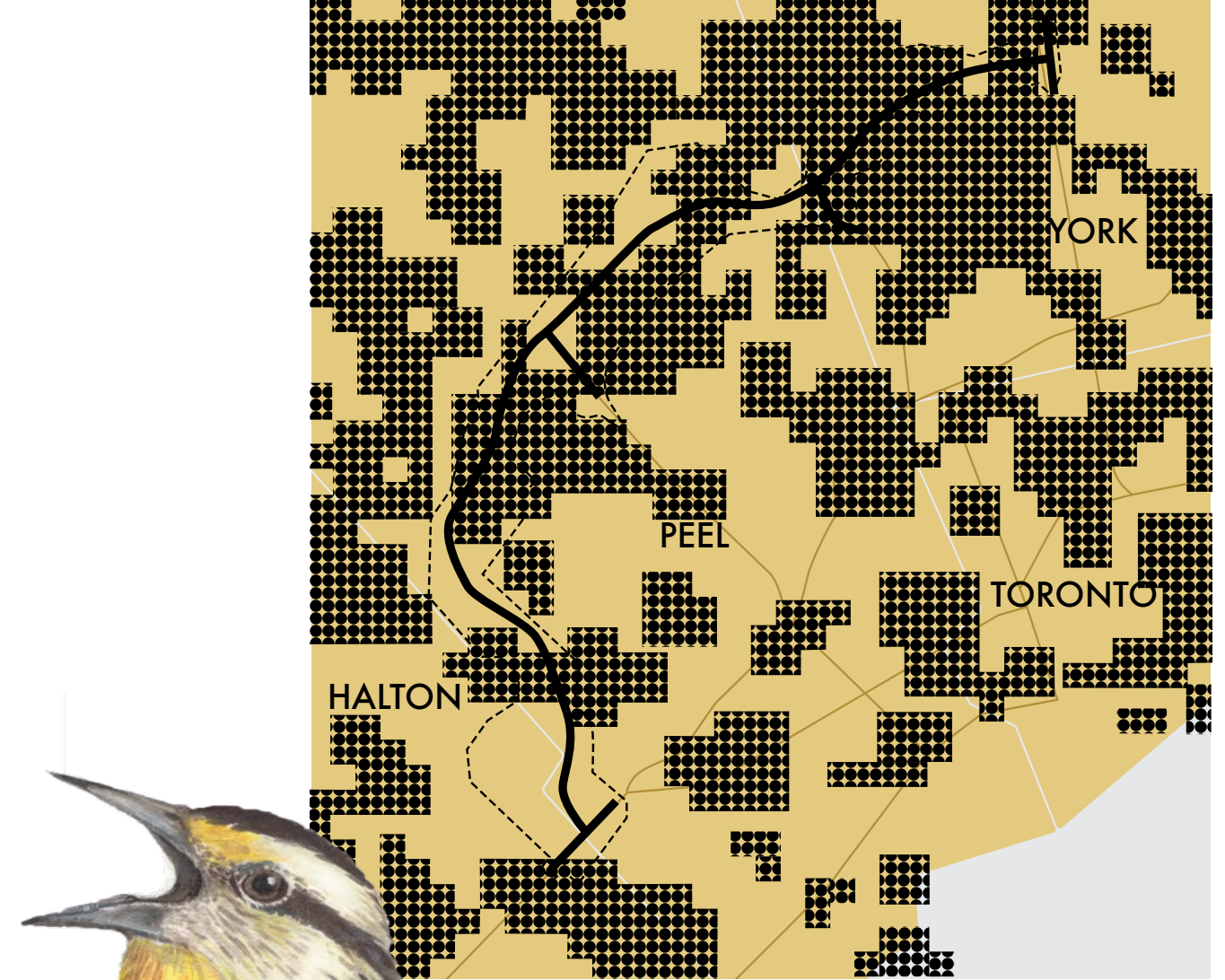
# Eastern Meadowlark

*Sturnella magna*

Eastern Meadowlarks are relatively common in open country, inhabiting areas such as hayfields, pastures, abandoned fields, roadsides and even airport grounds.<sup>30</sup> Studies indicate that more than half of the area near Highway 413 is occupied by meadowlarks during the breeding season.

One of the key drivers of decline for the Eastern Meadowlark is loss of habitat resulting from urbanization. A new highway and consequent suburban sprawl would disrupt or permanently destroy large portions of its habitat.

Issuing 1,964 conditional exemptions for the Eastern Meadowlark under the *Endangered Species Act* shows the Ontario government has been less ambitious than the recommended long-term goal outlined in the recovery strategy for the species.<sup>31</sup>



## MAP LEGEND

- Highway 413
- Highway 413 Planning Area
- Eastern Meadowlark





# Eastern Wood-pewee

*Contopus virens*

The Eastern Wood-pewee is a member of the family *Tyrannidae* (Tyrant flycatchers).<sup>32</sup> It winters in South America and breeds in mature deciduous forest of Eastern North America, where its whistled song is one of the most commonly-heard summertime sounds.<sup>33</sup>

In Canada, it occupies almost any small patch of suitable forest,<sup>34</sup> but it can be sensitive to development,<sup>35</sup> and a recent steep population decline has placed it on Schedule 1 of the Federal *Species At Risk Act*. Forest loss, including the narrowing of riparian forest corridors (where forests meet streams), is the main reason why this species has declined.<sup>36</sup> Provincial legislation has failed to protect habitat for the Eastern Wood-pewee.



A new highway such as the 413, regardless of the path chosen, would result in the loss of important breeding habitat for the Eastern Wood-pewee.



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Eastern Wood-pewee





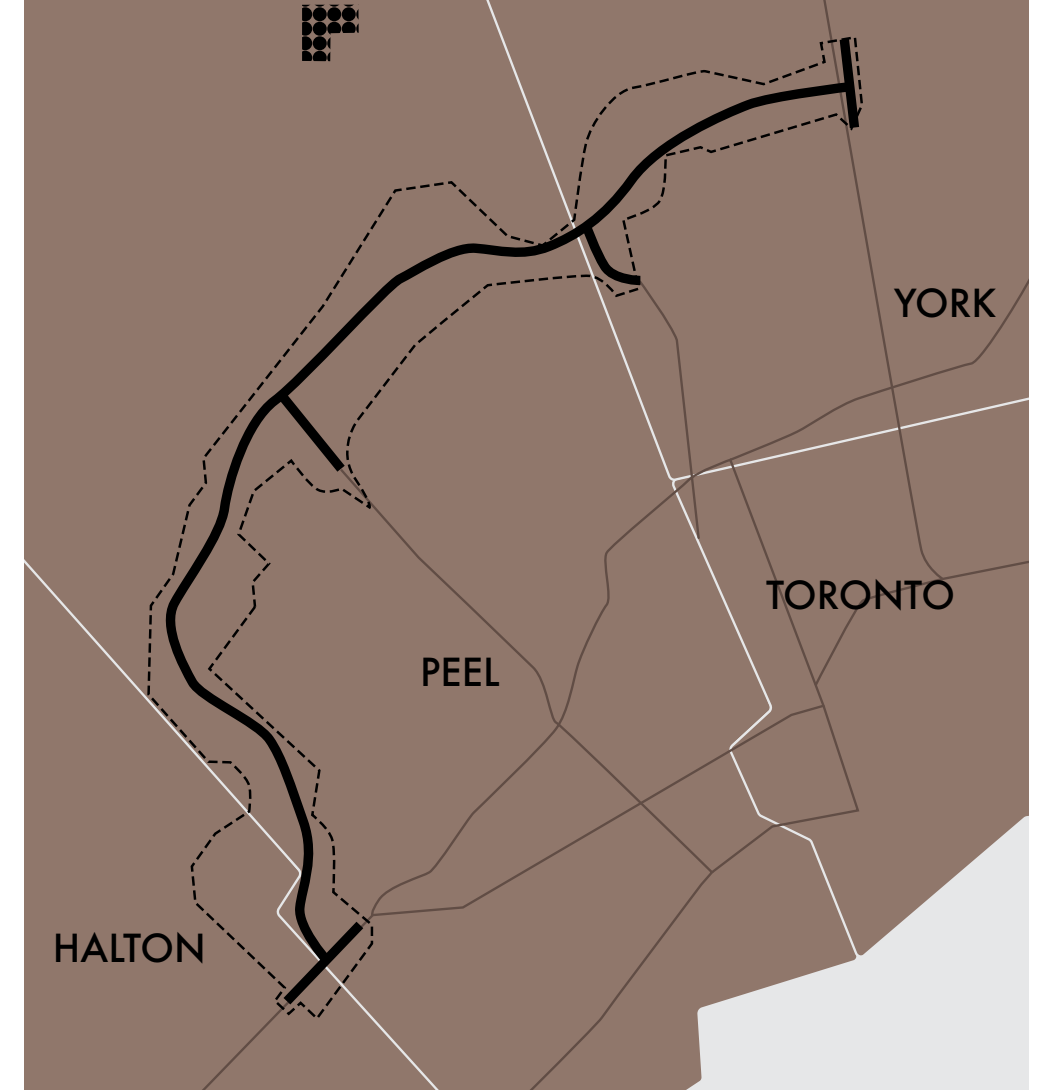
# Grasshopper Sparrow

*Ammodramus savannarum*

A tiny songbird of tallgrass prairie,<sup>37</sup> the Grasshopper Sparrow is highly area-sensitive, requiring large expanses of native or cultivated grassland with few shrubs.<sup>38,39</sup> Its nests are well-hidden in the field and woven from grasses in a small cup-like shape

Because of their secretive nature and quiet vocalizations, Grasshopper Sparrows are easily overlooked by all but the most experienced naturalists.<sup>40</sup>

But detections during June and July in Nashville Conservation Reserve and at one location along the west edge of Brampton suggest Grasshoppers Sparrows are near the proposed route of Highway 413.



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Grasshopper Sparrow





# Least Bittern

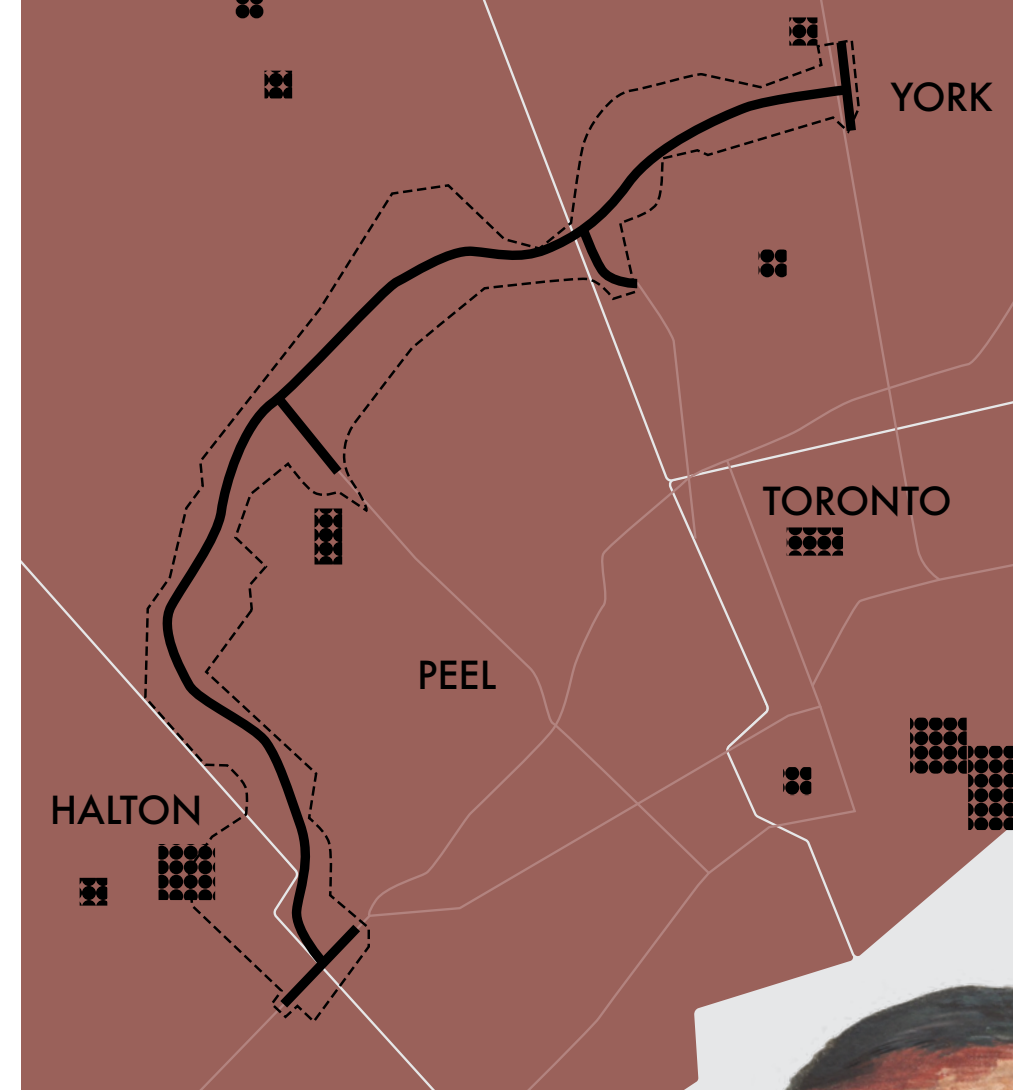
*Ixobrychus excillis*

A cryptic member of the Heron family, the Least Bittern is seldom seen but occasionally heard uttering its jug-jug-jug call from dense marsh vegetation, especially cattails.<sup>41</sup>

Least Bitterns are known to breed in several places near the proposed Highway 413, including Heart Lake Conservation Area. Given their extremely low detection rate<sup>42</sup> and the lack of data from many privately-owned, unevaluated wetlands, Least Bitterns are probably present in scattered locations elsewhere throughout the area near Highway 413.



Major threats to this species include loss and contamination of wetland habitat and, because they fly low to the ground, collisions with motor vehicles.<sup>43</sup> One study found that Least Bitterns were area sensitive and therefore would be negatively affected by the fragmentation of wetlands which Highway 413 would cause.<sup>44</sup>



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Least Bittern



# Red-headed Woodpecker

*Melanerpes erythrocephalus*

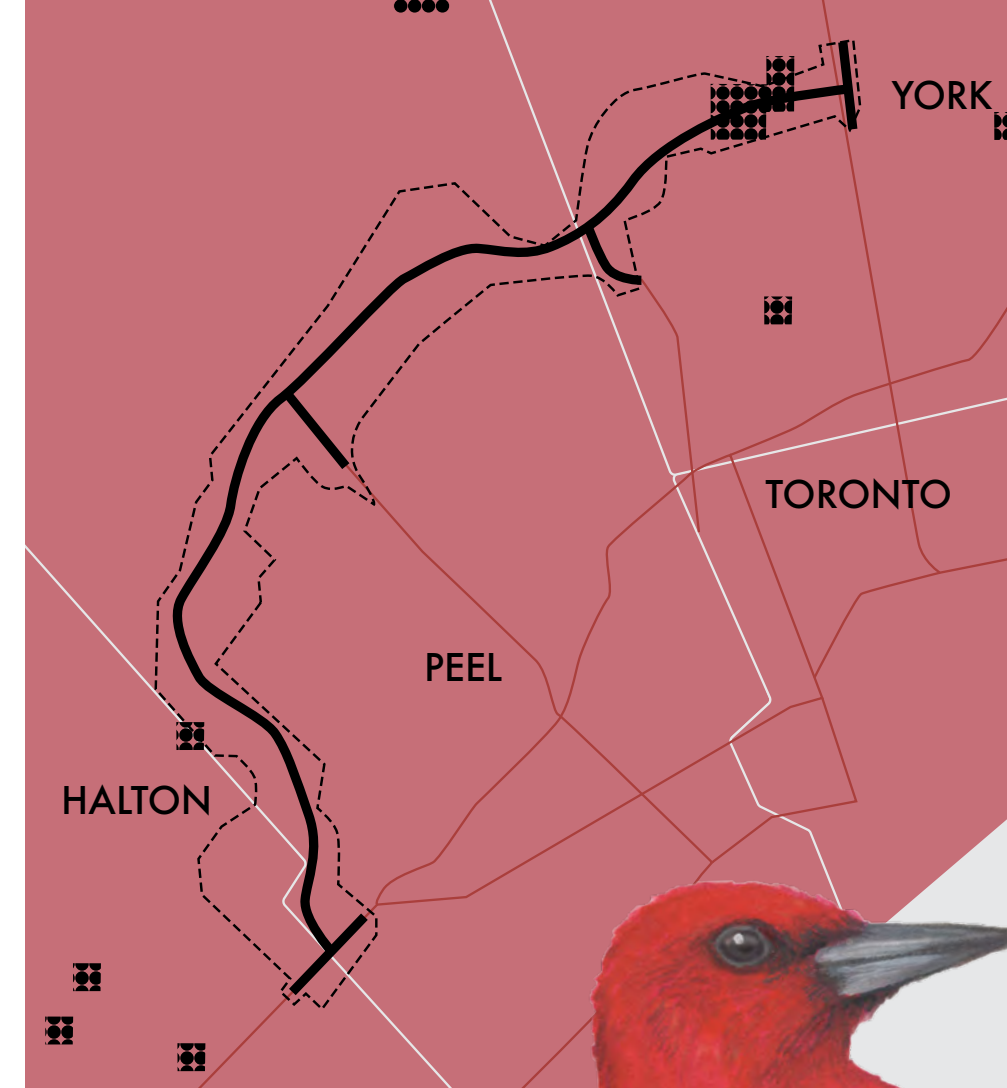
Red-headed Woodpeckers were once abundant across North America, But today, intensifying agriculture, fire suppression, and loss of habitat have driven them out of many areas.<sup>45</sup>

They depend on open deciduous woodlands, savannas, hedgerows and other semi-wooded landscapes, particularly with an abundance of large dead trees.<sup>46,47</sup> Remaining suitable habitat for the Red-headed Woodpecker disproportionately occurs along roadsides, making this species especially vulnerable to collisions with vehicles.<sup>48</sup>

The Ontario population is extremely fragmented, yet Highway 413 is slated to slice through a core area of occurrence in the vicinity of Kipling Avenue and Pine Valley Drive. The highway would likely destroy important

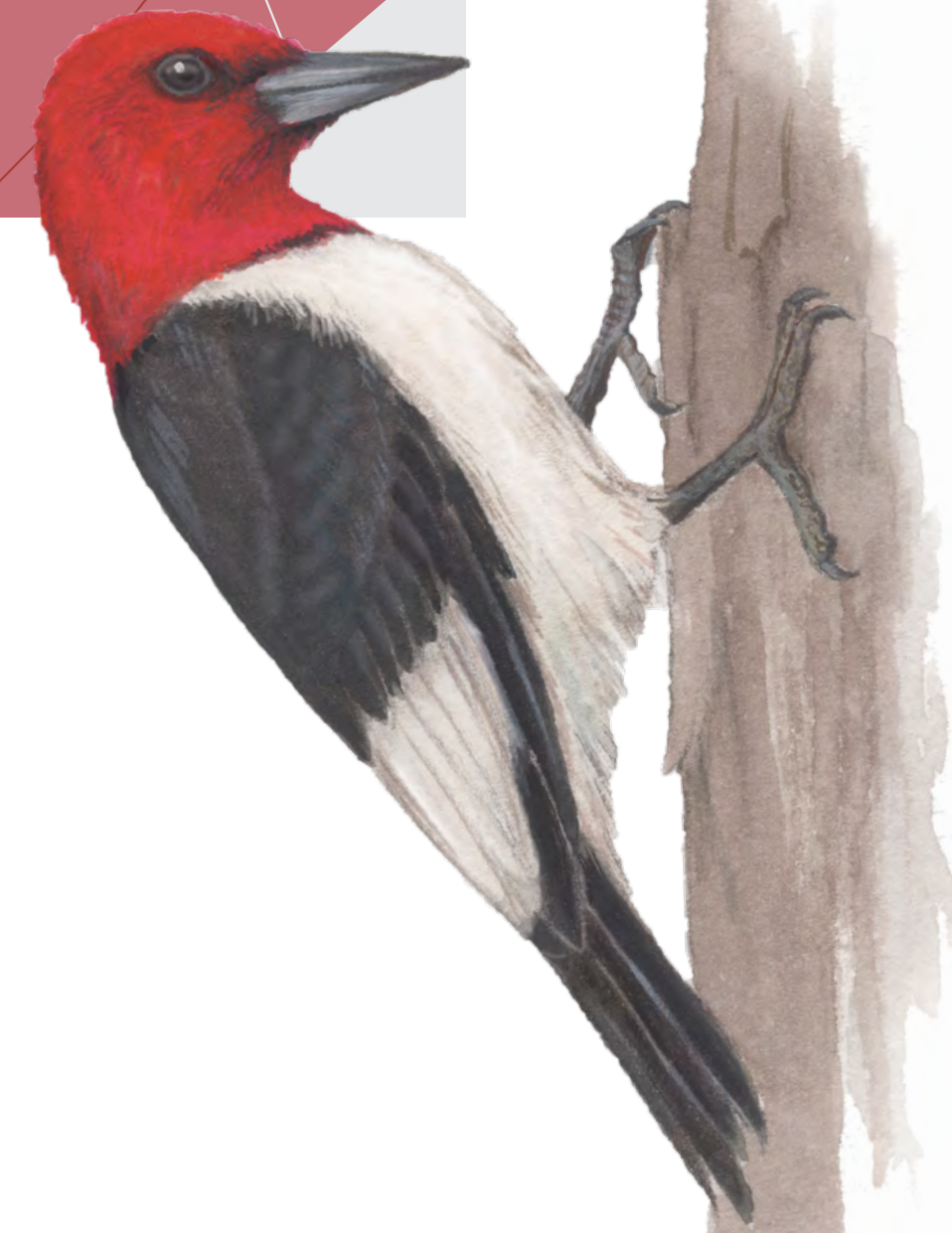
breeding habitat and contribute to road mortality of the Red-headed Woodpecker in this area and other possibly occupied places nearby.

There has been little to no reporting on recovery efforts at the provincial level.<sup>49</sup> Building highway 413 would have a major impact on the Red-headed Woodpecker.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Red-headed Woodpecker



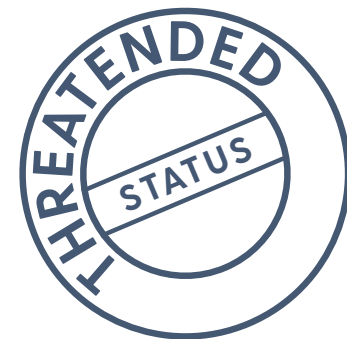


# Short-eared Owl

*Asio flammeus*

The Short-eared Owl is a year-round resident of Ontario, where it breeds in grassland and winters in a wide variety of open habitats.<sup>50</sup> This species has suffered one of the steepest declines of any bird listed by the Federal *Species at Risk Act*, with over 90 per cent of its Canadian population lost since 1966. Habitat loss and fragmentation are thought to be key drivers of this decline.<sup>51</sup>

Short-eared Owls are extremely uncommon in the Greater Toronto Area but they are known to occur at the east end of Highway 413, where it is proposed to connect with Highway 400. Disturbance in this area resulting in the loss of grassland or other open habitats could drive away any remaining individuals in this population.



Moreover, roads are one of the primary sources of mortality for owls due to their hunting strategy, and this applies especially to above-grade roads with high speed limits bordered by wide verges of herbaceous vegetation like the proposed Highway 413.<sup>52</sup>



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Short-eared Owl

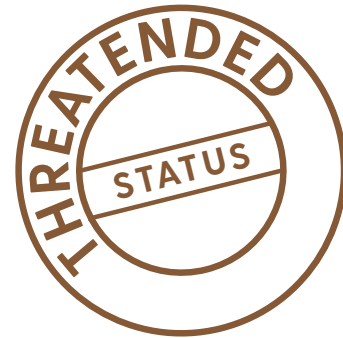


# Wood Thrush

*Hylocichla mustelina*

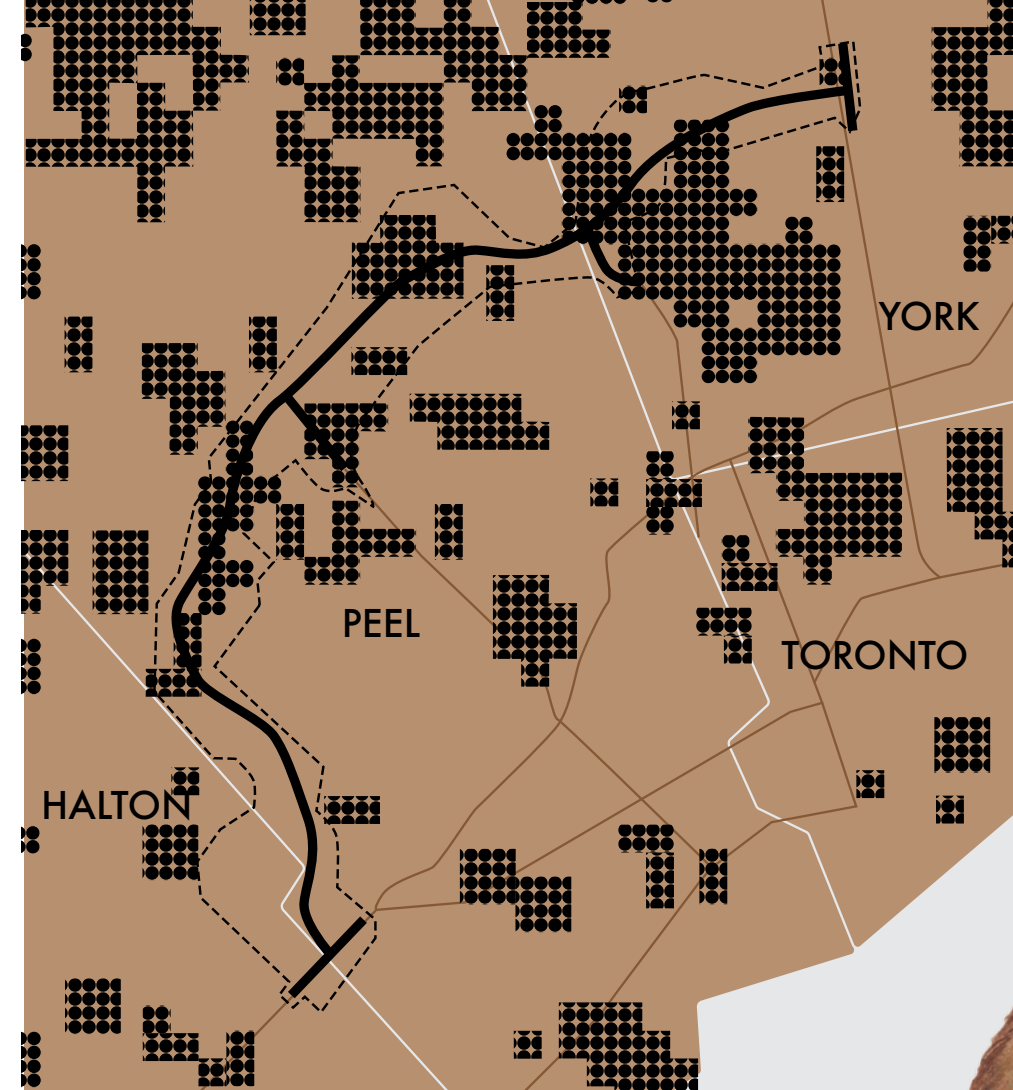
The Wood Thrush is a relative of the better-known American Robin that breeds in dense deciduous forest across Eastern North America and winters in Central America.<sup>53</sup> Though wood thrush have been found nesting in forest fragments as small as two hectares,<sup>54</sup> populations thrive in landscapes with a high degree of forest cover and core areas of interior habitat.<sup>55</sup>

Wood Thrush may benefit from small-scale disturbances and can be tolerant of nearby development, yet large amounts of urbanization in the landscape have been shown to lead to localized population declines.<sup>56</sup> A theory is emerging that persistent noise near breeding habitat, such as that produced by highway traffic,



may interfere with vocalizations of Wood Thrush and other migratory songbirds, resulting in breeding territories being abandoned.

Studies suggest that roughly half of the forest fragments near the proposed route of Highway 413 are occupied by Wood Thrush. Therefore habitat for this declining species would most likely be degraded indirectly by impacts of noise and/or increasing urbanization in the landscape facilitated by the highway.



## MAP LEGEND

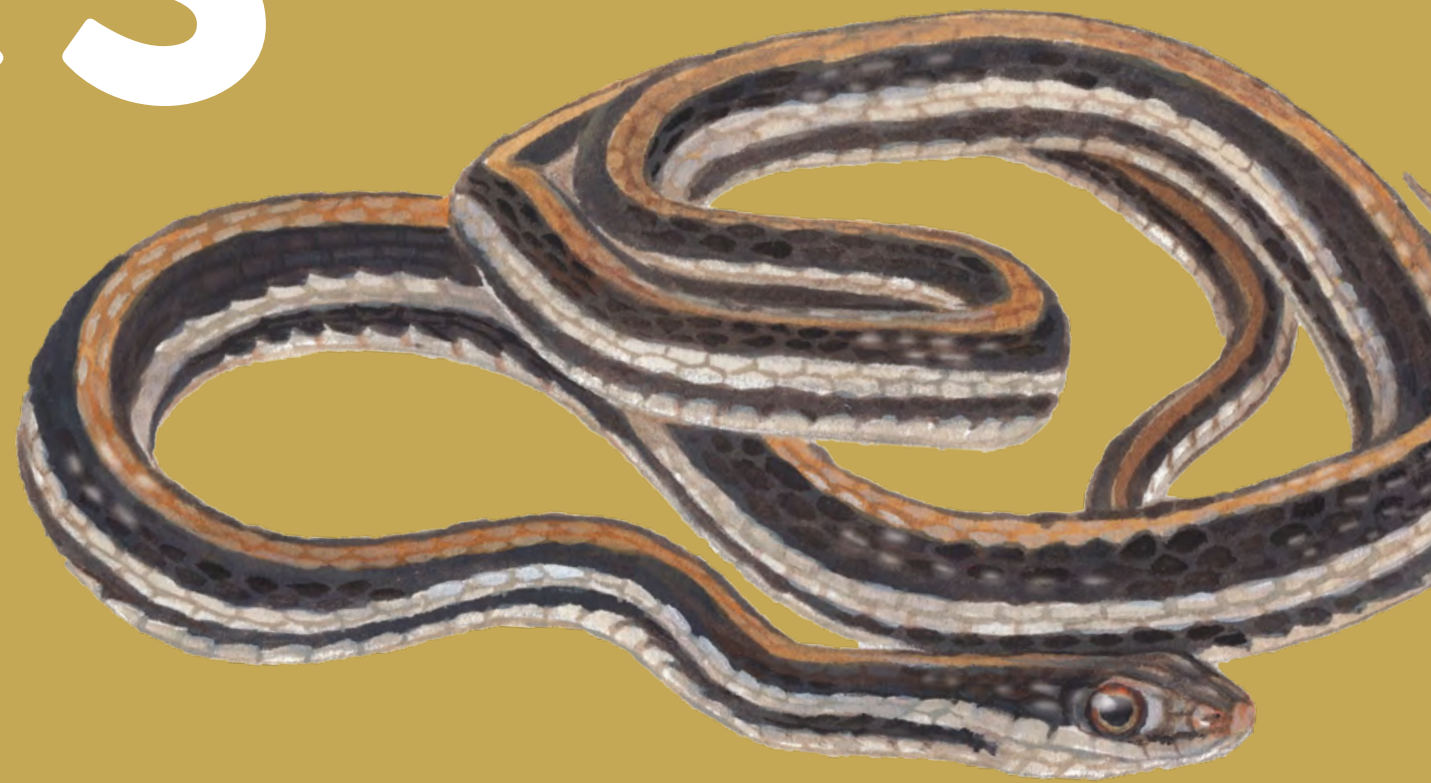
- Highway 413
- - Highway 413 Planning Area
- Wood Thrush







# Amphibians Reptiles & Fish



# Blanding's Turtle

*Emydoidea blandingii*

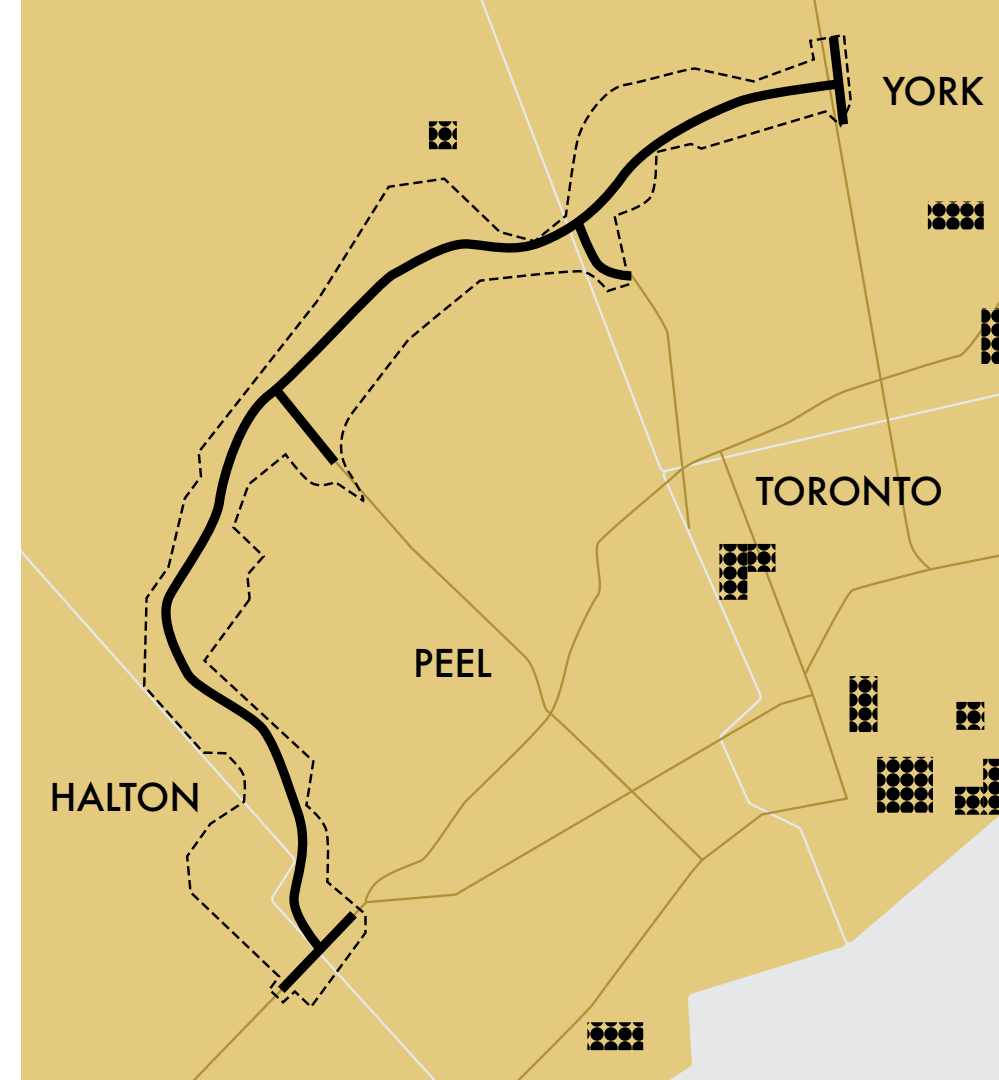


Blanding's Turtles require shallow water bodies with clean water and mucky bottoms and are restricted to a relatively small global range.<sup>57</sup> Their Canadian population has been severely diminished by wetland loss, shoreline alteration and road mortality.<sup>58</sup>

In the Greater Toronto Area, Blanding's Turtles occur in a few scattered locations along the lower Humber, Credit and Don Rivers. Because water quality is important to their survival, any upstream activities that may leach contaminants, such as the proposed Highway 413 with its multiple river crossings, could hinder the long-term viability of these populations. In addition, Blanding's Turtles travel several kilometres between breeding and overwintering sites and adding new roads to the landscape only increases the probability that turtles will cross a road during this journey.<sup>59</sup>

With 1,403 habitat alteration permits impacting them since 2007, Blanding's Turtles are a prime example of how provincial legislation has failed species at risk in Ontario.<sup>60</sup> There have been many cases of harmful activities being permitted without appropriate habitat replacement or follow-up monitoring, yet permits for activities benefitting the species have been delayed, negatively impacting conservation efforts.<sup>61</sup>

The scale of Highway 413's effects on the Blanding's Turtle will likely vary depending on the actual amount of road mortality that occurs, which in turn may depend on a variety of factors including future development projects stimulated by the highway, and cumulative effects of other current development projects in the area.



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Blanding's Turtle





# Eastern Milksnake

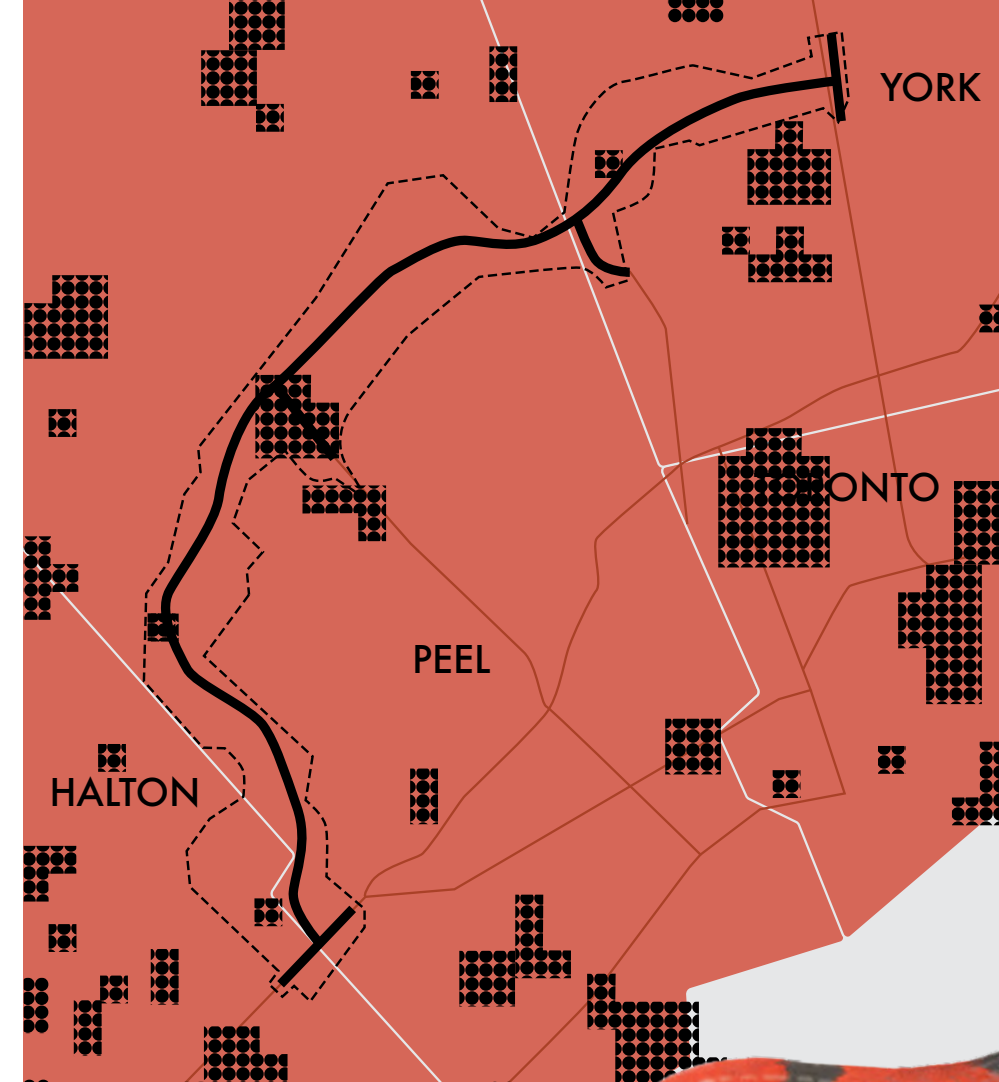
*Lampropeltis triangulum*

This non-venomous member of the Kingsnake family is often mistaken throughout its global range for venomous lookalike species.<sup>62</sup> In Ontario, it can be found in rocky outcrops, along forest edge and in rural areas around barns.<sup>63</sup> In addition to deliberate persecution by misinformed people, Eastern Milksnakes are threatened by road mortality and habitat loss due to road construction.<sup>64</sup>

Eastern Milksnakes are long-lived, have delayed sexual maturity, and females may only lay a clutch of eggs every second year. As a result, even slight increases in adult mortality can cause populations to decline.



Milksnakes occur in various places throughout the area near Highway 413 and are particularly abundant along the proposed Highway 410 extension. Because of the area's importance to reptile diversity, Highway 413 would lead to a decline of this diversity.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Eastern Milksnake



# Eastern Musk Turtle

*Sternotherus odoratus*

The Eastern Musk Turtle can be found in shallow, slow-moving water bodies with a soft bottom.<sup>65</sup> It is threatened by wetland loss and shoreline alteration throughout its Eastern North American range, and like all turtle species, is highly vulnerable to road mortality.<sup>66</sup>

Eastern Musk Turtles are uncommon in the Greater Toronto Area, occurring only in a few localized areas. One such locality is Heart Lake Conservation Area in Brampton, less than one kilometre from where Highway 413 would connect with Highway 410.



Habitat degradation such as sedimentation or salinity caused by the construction of a nearby major highway interchange could threaten one of the few remaining populations of the at risk Eastern Musk Turtle in the Greater Toronto Area.



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- ⊠ Eastern Musk Turtle





# Eastern Ribbonsnake

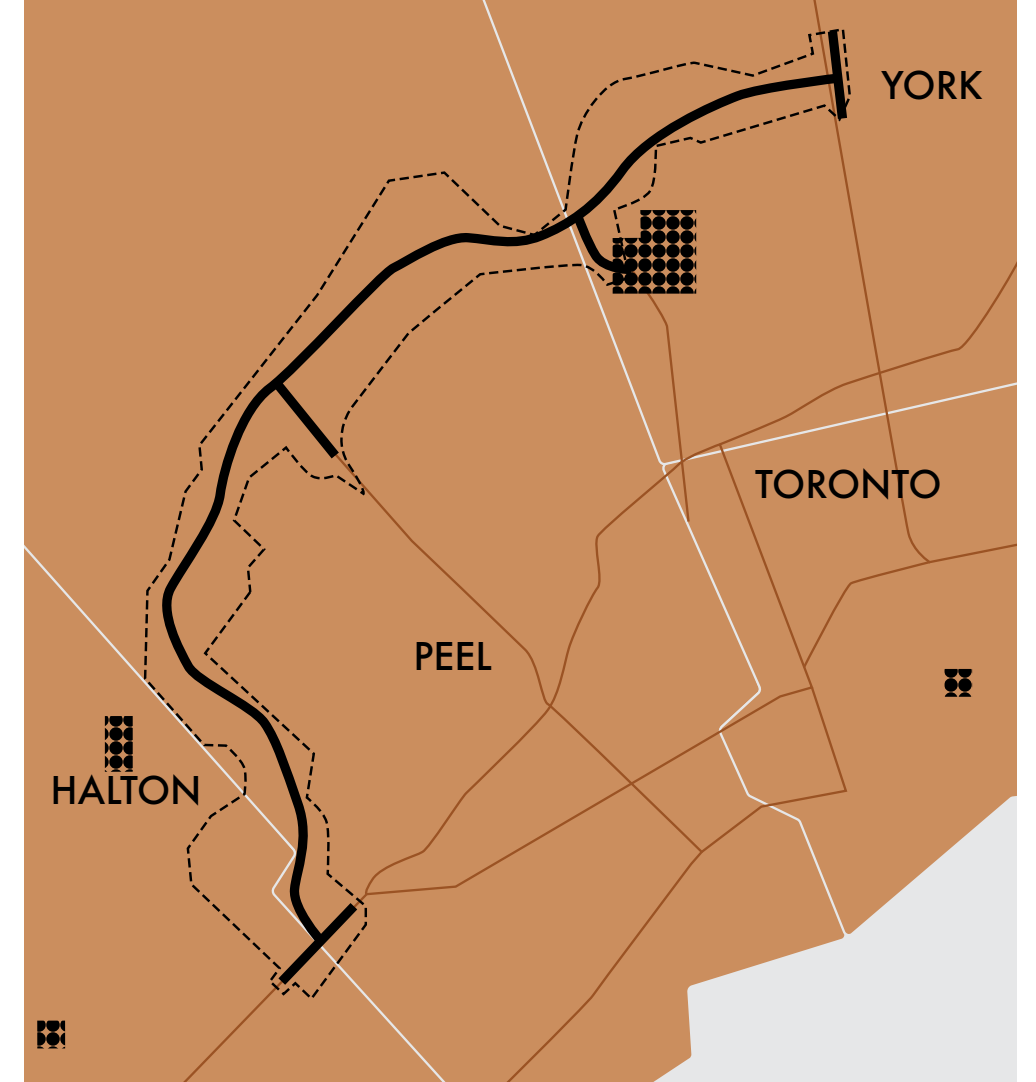
*Thamnophus sauritus*



The Eastern Ribbonsnake is a non-venomous semi-aquatic snake that requires wetlands and riparian zones with forest cover in the surrounding area.<sup>67</sup> Wetland loss, pollution and road mortality are some of the primary threats it faces.<sup>68</sup>

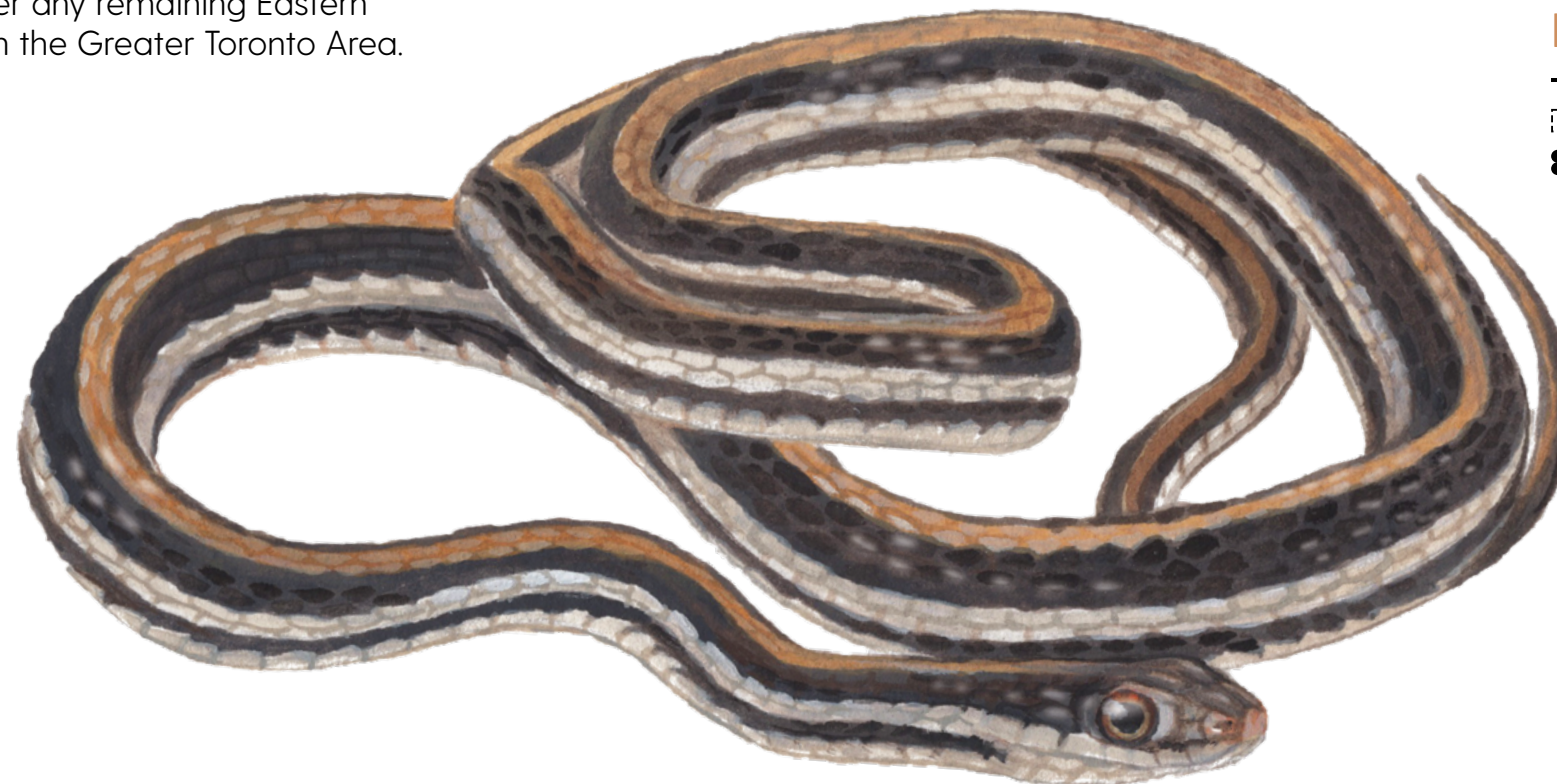
In the area near Highway 413, Eastern Ribbonsnakes have been found along the west side of the Humber River between Rutherford Road and Kirby Road. The proposed connector with Highway 427 would put significant pressure on any population that may still persist in this small area.

Cumulative effects with existing development projects, such as two large subdivisions under construction on the west side of Kleinburg, and the recently-completed extension of Highway 427 to Major Mackenzie Drive, are likely to further endanger any remaining Eastern Ribbonsnakes in the Greater Toronto Area.



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Eastern Ribbonsnake





# Jefferson Salamander & Unisexual Ambystoma

*Ambystoma jeffersonianum*

*Ambystoma laterale-(2) jeffersonianum*

The Jefferson Salamander and its genetically-dependent hybrid lookalike, the Unisexual Ambystoma, are both endangered species with their Canadian ranges restricted to a few localities in Southern Ontario. Habitat fragmentation and road mortality are the key threats to this species complex.<sup>69</sup>

Because their life-cycle requires them to migrate annually between breeding ponds and forest, these salamanders are much more vulnerable to road mortality than other species of salamander.<sup>70</sup> Highway 413 will affect Jefferson Salamander and Unisexual Ambystoma in at least one key area around the proposed interchange with Highways

401 and 407. Several of the ponds in this small area are known to contain these salamanders, and the existing highways already constitute a large danger. Additional disturbance by Highway 413 will not only contribute to possible water contamination, but may also cut off key routes used by the salamanders to navigate between ponds and nearby forest.



## MAP LEGEND

- Highway 413
- Highway 413 Planning Area
- ||| Jefferson Salamander
- ▣ Unisexual Ambystoma





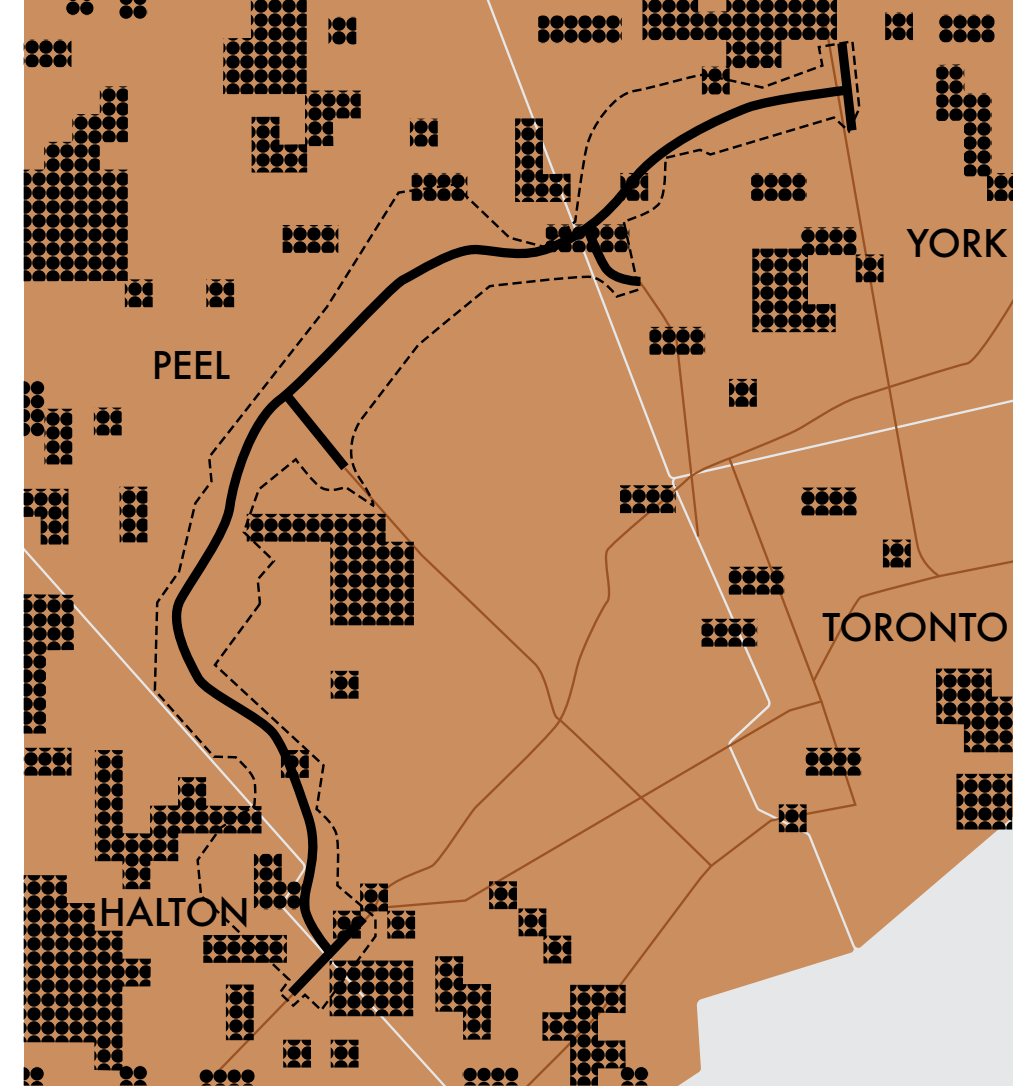
# Midland Painted Turtle

*Chrysemys picta marginate*

The Midland Painted Turtle, Ontario's most common turtle, is listed as "special concern" by the federal government due to ongoing threats posed by wetland loss and road mortality.<sup>71</sup> Midland Painted Turtles inhabit all types of wetlands, slow-moving watercourses, lakes and ponds,<sup>72</sup> and can be found throughout the area near Highway 413, especially where the highway is proposed to cross the Humber and Credit rivers.

Because Midland Painted Turtles are long-lived, the loss of even a single individual can have serious impacts on a population.<sup>73</sup> Recent changes to Ontario's *Endangered Species Act* put the Midland

Painted Turtle at risk of losing protection in the province.<sup>74</sup> This change, coupled with the recent Minister's Zoning Orders that have allowed destruction of provincially significant wetlands,<sup>75</sup> could lead to further declines of the species, especially in the Greater Toronto Area.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Midland Painted Turtle



# Northern Map Turtle

*Graptemys geographica*

Northern Map Turtles gather in groups along large, shallow water bodies with soft bottoms.<sup>76</sup> Female Northern Map Turtles can grow to about twice the size of males in length. Another difference between males and females is choice of their diet. Females eat molluscs, including clams and snails, as well as crayfish and some fish. The male and young Northern Map Turtles mainly eat insects and crayfish.

In addition to wetland loss, shoreline alteration and road mortality, Northern Map Turtles are particularly sensitive to water pollution causing the die-off of their mollusk prey.<sup>77</sup>



Populations downstream of the proposed highway 413 along the Credit and Humber rivers likely already experience a great deal of pressure from a variety of urban pollutants,<sup>78,79</sup> and adding the highway – an additional upstream source of contamination – could have further negative effects. As with other turtles, road mortality is also a significant threat.



## MAP LEGEND

- Highway 413
- ⋮ Highway 413 Planning Area
- Northern Map Turtle







# Redside Dace

*Clinostomus elongatus*

The Redside Dace is an endangered minnow with a global range restricted to certain tributaries of the lower Great Lakes.<sup>80</sup> In Canada, it has recently only been found in a few rivers connecting to Lake Huron, Erie and Simcoe, and around a dozen rivers connecting to western Lake Ontario, all of which flow through the Greater Toronto Area.<sup>81</sup> It is one of the country's most endangered fish species

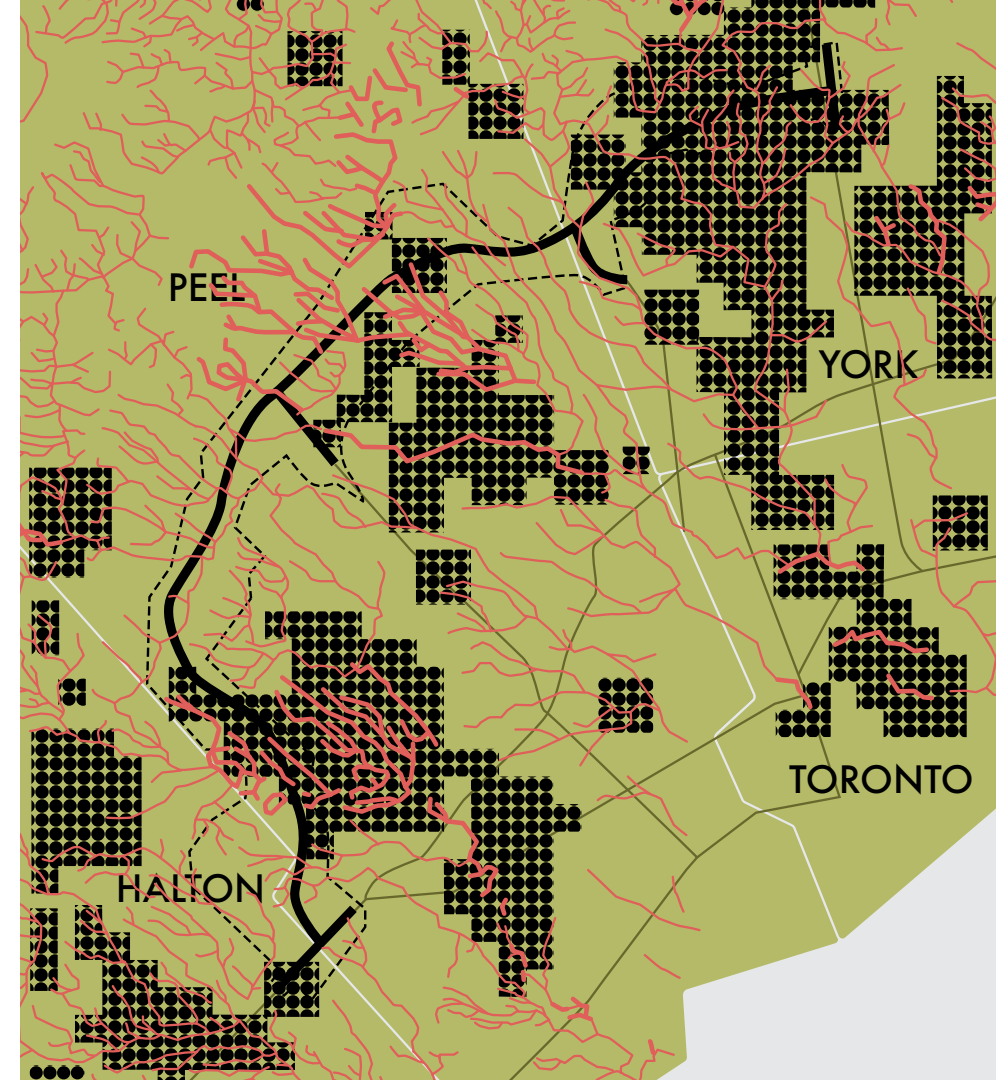
Redside Dace have specific habitat requirements: clear rivers and streams with a sand or gravel bottom less than 10 metres wide with slow-moving sections, pools and overhanging vegetation, and a temperature of 14-23 degrees Celsius.<sup>82</sup>

Because of the intense urban development that has occurred in the Greater Toronto Area, many sections of rivers no longer meet these requirements and Redside Dace have been pushed upstream to occupy headwater sections that have experienced less adjacent and upstream disturbance.<sup>83</sup> Primary threats to the species include pollution of streams resulting in turbidity or water temperature increases, and removal

of vegetation next to streams.<sup>84</sup> Despite this range loss, the Ontario government continuously grants permits for projects that negatively affect Redside Dace.

Highway 413 would require roughly 132 river and stream crossings, many of them small headwater streams with suitable Redside Dace habitat. While sampling<sup>85</sup> has detected the species in at least 22 streams proposed to be crossed by the highway, as many as 22 additional streams along the highway's path may contain the species based on historical records<sup>86</sup>. Most affected streams are connected to either the Credit River, the Humber River, or the Sixteen-mile Creek, and these are the only three watersheds in Canada to be designated as having "wide" occurrences of Redside Dace.<sup>87</sup>

Since downstream populations in these watersheds have been greatly reduced, this means that the core of the species' occurrence in Canada may fall within areas close to Highway 413.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- River and Streams
- Redside Dace



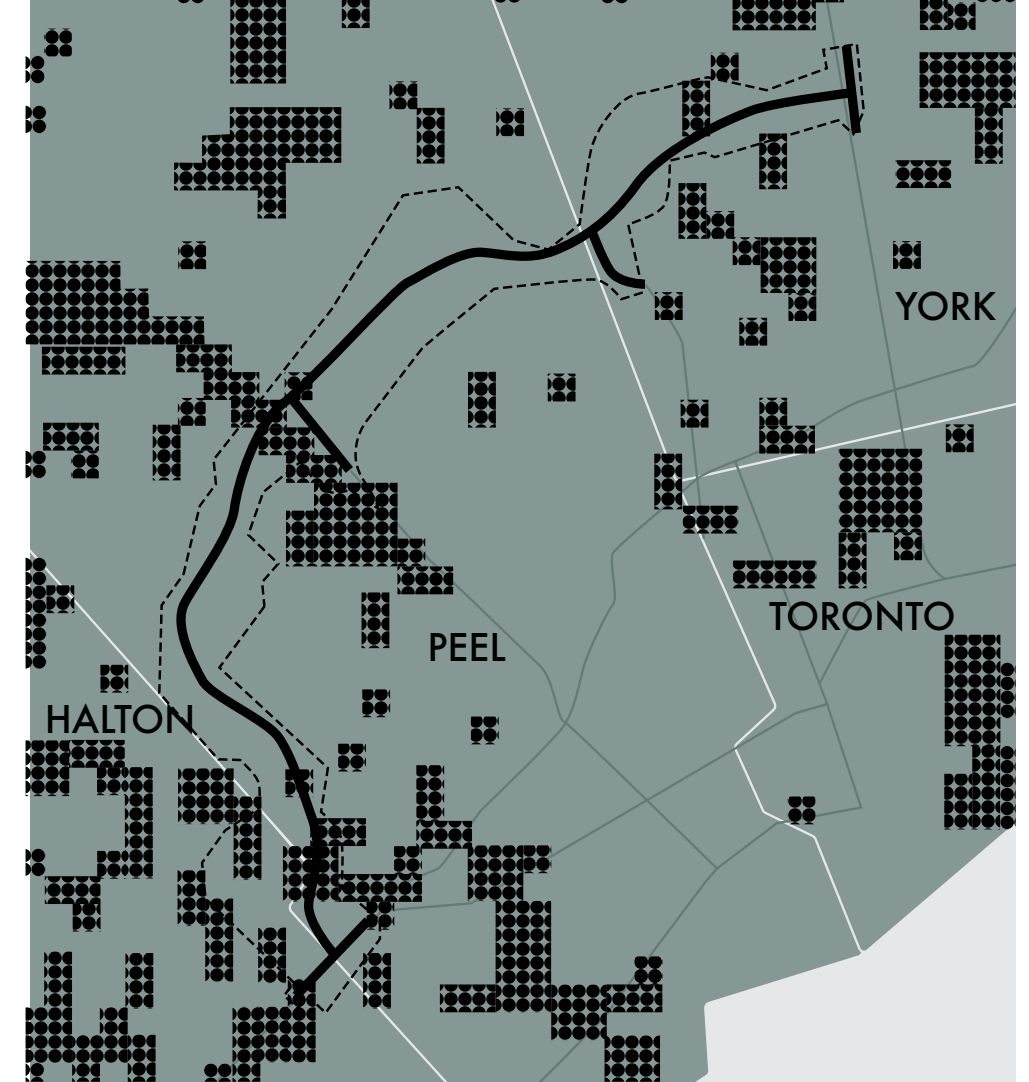
# Snapping Turtle

*Chelydra serpentina*

Canada's largest land turtle, the Snapping Turtle utilizes all types of shallow water bodies with a soft mud or sand bottom and abundant vegetation, including roadside ditches and ephemeral wetlands.<sup>88</sup>

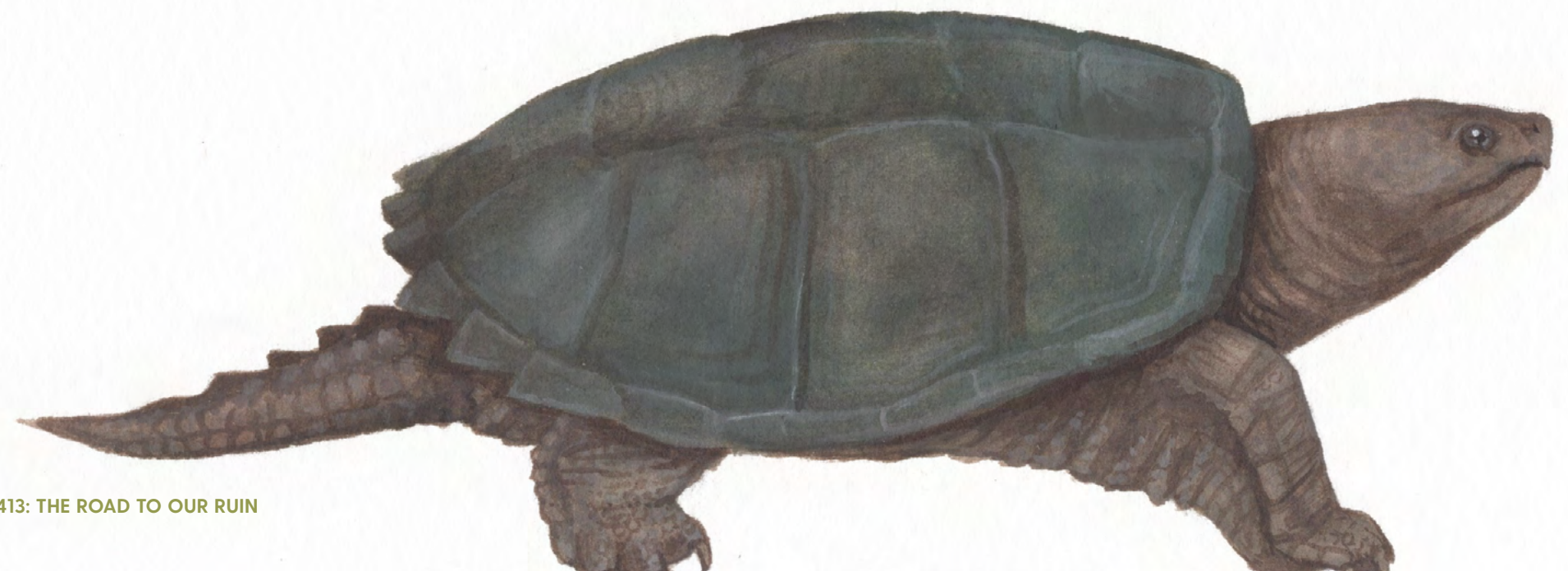
Because of their habit of burrowing into gravel road shoulders for nesting, Snapping Turtles are frequently reported as road casualties.<sup>89</sup> This is a serious problem for the species, whose long-lived, slow reproductive strategy means that the loss of even a few individuals can lead to population decline.<sup>90</sup>

Snapping Turtles are abundant throughout area near Highway 413, particularly in the southern end and along the proposed Highway 410 connector where they are often found dead along many country roads.<sup>91</sup> Introducing a new road with an even higher speed limit to this landscape would likely result in further casualties.



## MAP LEGEND

- Highway 413
- - - Highway 410 Planning Area
- Snapping Turtle





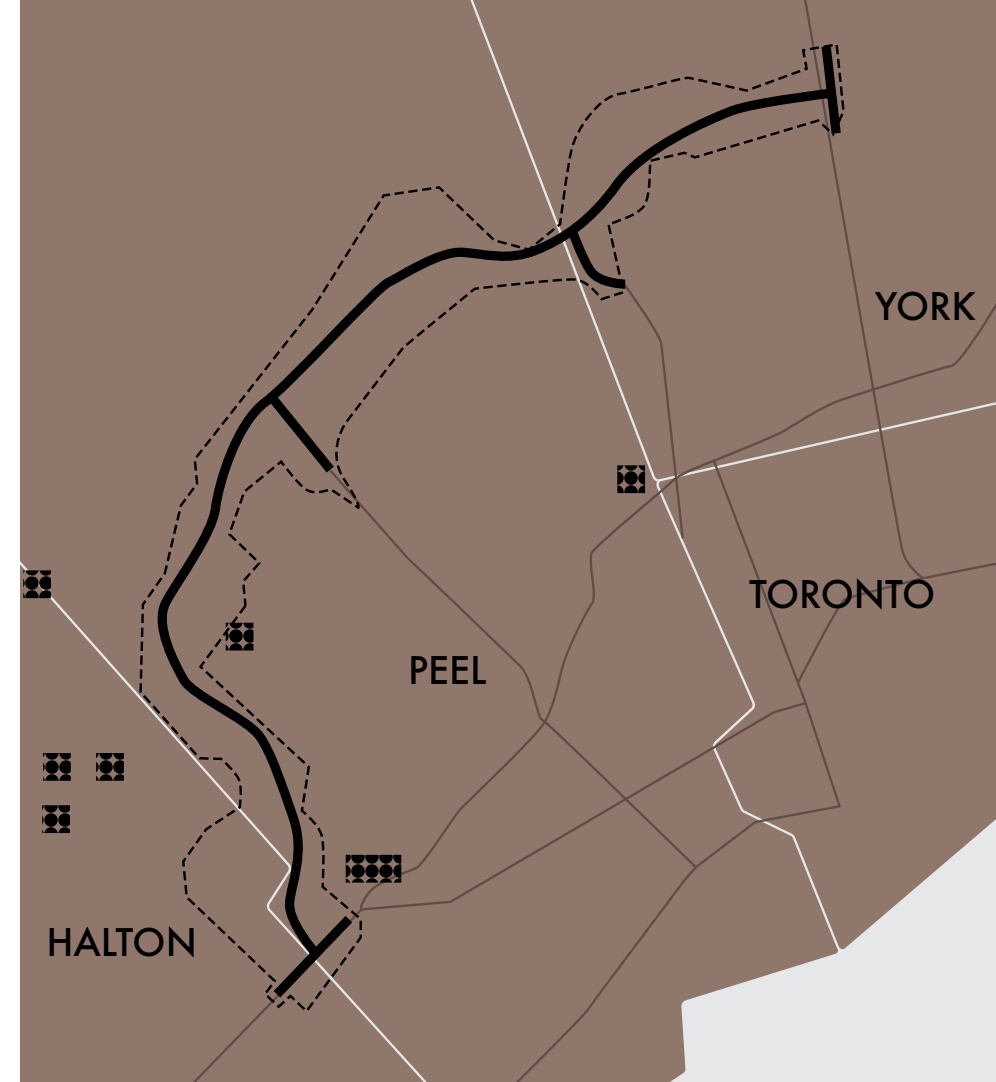
# Western Chorus Frog

*Pseudacris triseriata*

Western Chorus Frogs get their name from their throaty, drawn-out call which resonates from ephemeral wetlands in early spring, delivered by many individuals at once.<sup>92</sup> Though not common in the Greater Toronto Area, Western Chorus Frog populations have been found in select localities near the edge of the proposed route of Highway 413. Habitat loss and degradation due to urban expansion is likely one of the primary reasons this species has declined in Southern Ontario.<sup>93</sup>

Any activity that alters water quality can be extremely problematic for frogs, which breathe through their skin and are highly sensitive to contaminants

such as road salts.<sup>94</sup> Even with careful control measures in place, Highway 413 will still likely leach sediment and pollutants into waterways that would travel downstream into ephemeral wetlands used by Western Chorus Frogs, particularly along the west edge of Brampton.



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- ⊠ Western Chorus Frog





# Insects & Trees





# Bumble Bee



- Rusty-patched Bumble Bee (Bombus affinis)*
- Yellow-banded Bumble Bee (Bombus terricola)*
- American Bumble Bee (Bombus pensylvanicus)*

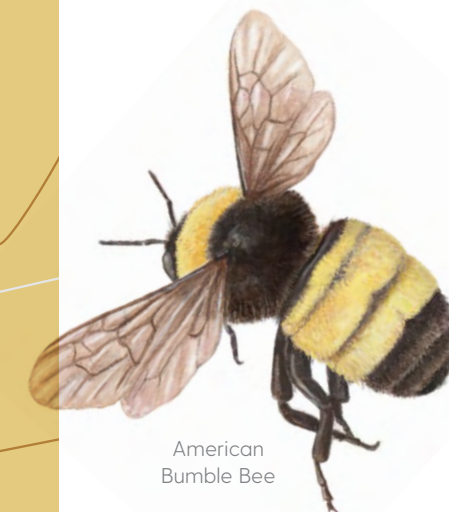
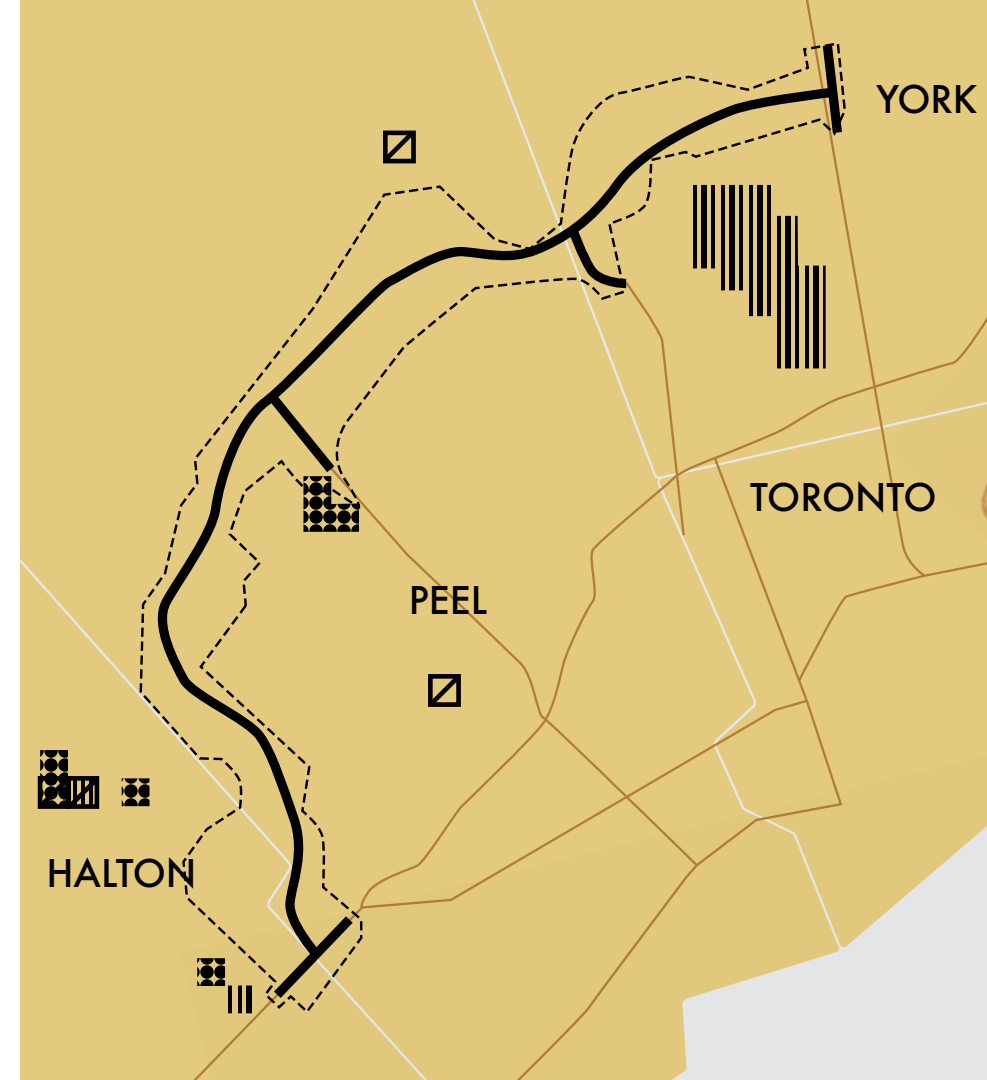
Three native *Bombus* species listed at risk by the Canadian government may be present in or near Highway 413. Of these, the Rusty-patched Bumble Bee is the most at risk of imminent global extinction.

All three species have declined substantially across their range since the 1970s.<sup>95</sup> Bumble Bee declines are likely a result of several factors working together, which include pesticide use, habitat loss, and climate change.<sup>96</sup>

American, Yellow-banded and Rusty-patched Bumble Bees are all habitat generalists, meaning they use a wide range of open and semi-wooded environments for foraging and pollinate a variety of native wildflowers and crops.<sup>97</sup> The Yellow-banded Bumble Bee occurs in low numbers throughout the area near Highway 413, and the Rusty-patched Bumble Bee historically occurred along the East Humber River just south of where the highway would be. The American Bumble Bee has historically been found in scattered locations across the Greater Toronto Area and could theoretically still be present anywhere throughout the area in very low densities.

A large-scale development project such as a major highway may affect struggling bee populations both directly through the loss of habitat, and indirectly by contributing to climate change. As stated in the Committee on the Status of Endangered Wildlife in Canada status report for the American Bumble Bee, "Any activities that have impacts on nesting sites and/or local floral resources potential could impact colony success."<sup>98</sup> The same is assumed to be true for the other two species under consideration. Many Bumble Bee species, especially the Yellow-banded and Rusty-patched, are restricted to temperate climates and are highly sensitive to rising temperatures linked to climate change.<sup>99</sup>

Vehicles burning fossil fuels are a major source of climate change-inducing carbon emissions,<sup>100</sup> and evidence suggests that Highway 413 will encourage people to drive more.<sup>101</sup> In fact, research shows that Highway 413 will create over 17 million tonnes of greenhouse gas emissions by 2050, and may contribute to the loss of available habitat for at-risk Bumble Bees and many other species.



American Bumble Bee

## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Rusty-patched Bumble Bee
- ||| Yellow-banded Bumble Bee
- ⊠ American Bumble Bee



Yellow-banded Bumble Bee



Rusty-patched Bumble Bee



# Black Ash

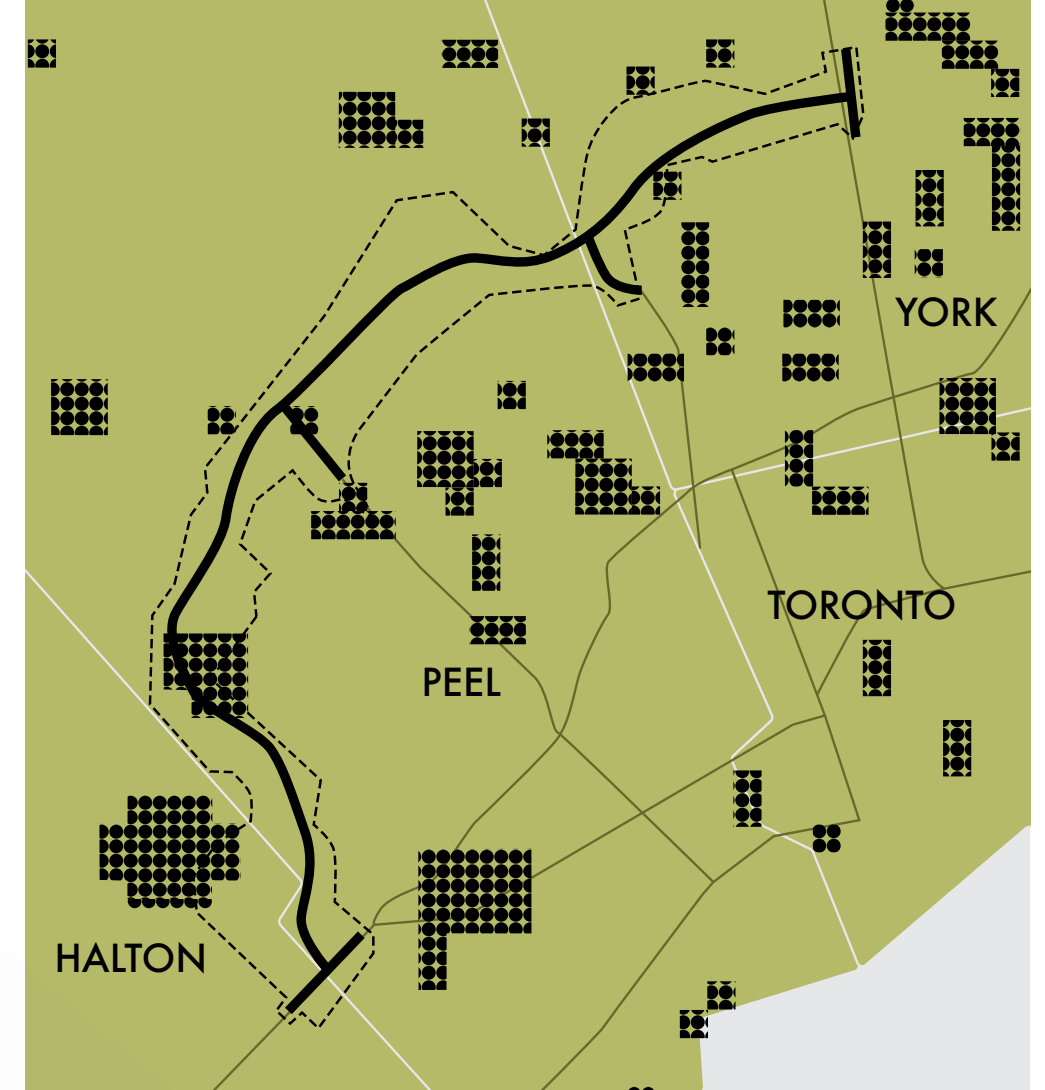
*Fraxinus nigra*

The Black Ash occurs in seasonally flooded wetlands with at least some alkalinity on a wide variety of soils, and occasionally in moist upland sites.<sup>102</sup> All native ash trees including the Black Ash have suffered catastrophic effects of the introduced Emerald Ash Borer.<sup>103</sup> In addition, Black Ash is vulnerable to wetland loss and flooding for hydroelectric projects.<sup>104</sup>

Several Black Ash populations are known to be within the Highway 413 planning area, including two along the proposed Highway 410 connector and one along the Humber River. If the highway involves any alterations to the local hydrology, these populations could be negatively affected.



Although Black Ash has recently been added to Ontario's list of species at risk, it is also subject to a temporary two-year suspension of protections that began in 2022, leaving it essentially unprotected at the provincial level during the planning stages of Highway 413.<sup>105</sup>



## MAP LEGEND

- Highway 413
- - - Highway 413 Planning Area
- Black Ash





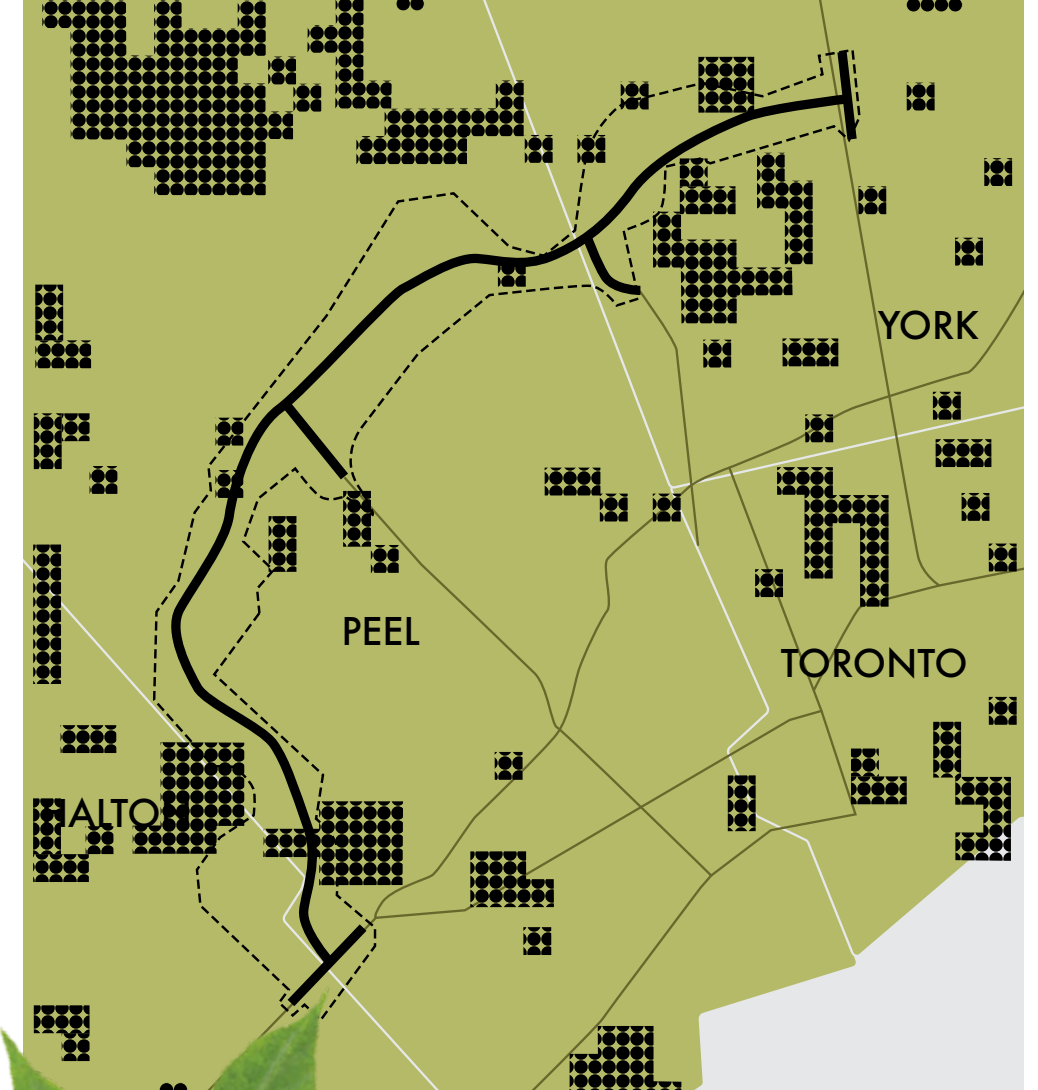
# Butternut

*Juglans cinerea*

Butternut trees grow in mesic forests – those that have a moderate or well-balanced supply of moisture – with neutral or calcareous soil over limestone, especially in floodplains.<sup>106</sup> Their population has been decimated by the invasive butternut canker, a fungal disease.<sup>107</sup> Few living trees in eastern North America are completely disease-free, and those with disease resistance are highly important to the future of the species.<sup>108</sup>

Mature Butternuts are scattered throughout the Greater Toronto Area in low densities, including in several woodlots and isolated locations within the area near Highway 413.

Although Butternut is listed provincially as endangered, it has received little protection. Permits have routinely been granted for the removal of Butternut or the destruction of its habitat without any requirement for compensation.<sup>109</sup>



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Butternut



# Monarch Butterfly

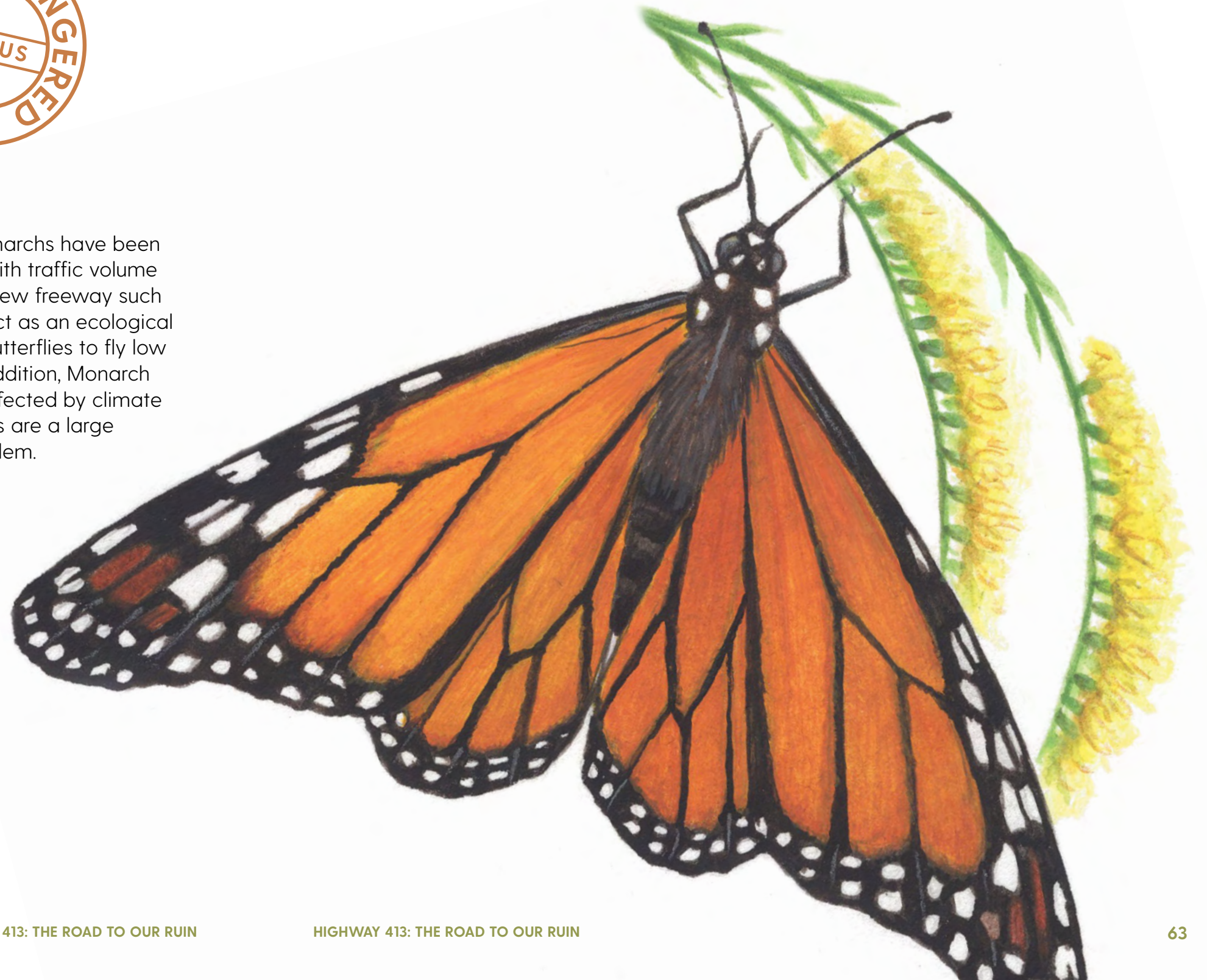
*Danaus plexippus*



One of North America's best-known butterflies, the Monarch Butterfly has experienced steep declines, largely due to pesticides and to the loss of its Milkweed host plants.<sup>110</sup> 11 of 14 Milkweed species in Canada are used by Monarchs, and the butterflies can be found in any habitat where these plants grow (typically meadows, agricultural areas and roadsides).<sup>111</sup>

Data from the Ontario Butterfly Atlas indicate that Monarchs are relatively common in the Greater Toronto Area, but occur in slightly lower abundance there than more rural parts of the province, possibly due to lack of habitat.<sup>112</sup>

Road casualties of Monarchs have been reported to increase with traffic volume and road width.<sup>113,114</sup> A new freeway such as Highway 413 may act as an ecological trap by encouraging butterflies to fly low over the roadway. In addition, Monarch populations may be affected by climate change<sup>115</sup> and highways are a large contributor to this problem.





# Rapids Clubtail

*Gomphus quadricolor*

The Rapids Clubtail is an endangered dragonfly that lives along medium to large rivers with muddy pools and shallow gravel areas lined by riparian forest.<sup>116</sup> This dragonfly is extremely sensitive to degradation of river conditions from pollution (erosion, runoff) and dams.<sup>117</sup>

In Canada, Rapids Clubtail currently occur along just four rivers, two being the Humber and the Credit.<sup>118</sup> The Humber River population is restricted to the upper west fork between roughly Rutherford Road and Kirby Road, and recent Inaturalist records indicate that this population is still thriving.<sup>119</sup> Highway 413 would intersect this stretch of river no matter the route chosen.



At a minimum, Highway 413 would be likely to introduce some level of contaminants to the river system and would destroy a substantial amount of riparian forest and wetland. As well, because of recent legislation changes, the Rapids Clubtail may also be in danger of losing protection in Ontario.

Little is known about how Rapids Clubtail populations may respond to structures such as bridges being built within their habitat. In a worst case scenario, Highway 413 may eliminate the entire Humber River population of Rapids Clubtail.



## MAP LEGEND

- Highway 413
- - Highway 413 Planning Area
- Rapids Clubtail



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Highway 413  
would impact  
29 species  
at risk