Turtle Mitigation for Road and Highway Projects

Pembroke District MNR – Interim Guidelines
Version 1.0 (April 2014)

Photo: Gerald Rollins

Draft Turtle Mitigation for Road and Highway Projects
Pembroke District MNR Interim Guidelines
(Version 7 – April 2, 2014)

General Overview

The purpose of these guidelines is to provide advice on preventing or minimizing adverse effects on turtles, particularly Species at Risk (SAR), during road and highway projects. Proper planning and implementation of recommended mitigation measures **can** result in:

- More efficient work plans and reduced costs
- Reduced risk or the elimination of harm to turtles
- Demonstrating due diligence with respect to the Endangered Species Act, 2007 (ESA)[1]

Please note that these guidelines are a work in progress and Pembroke District MNR encourages feedback.

These guidelines can be used anywhere turtles are known, or suspected to occur, or when working adjacent to suitable habitat. Information on known occurrences and or areas of high likelihood or suitability for turtles can be gathered during pre-consultation with MNR and from previously conducted environmental studies.

Road mortality is a major threat to all reptiles, including turtles, as they are often attracted to the warm road surfaces and tend to be slow-moving across roads. Turtles will also often stop on the road and retract into their shells in response to traffic. Female turtles are attracted to gravel shoulders during the nesting season.

A Blanding's Turtle along a Renfrew County Road (June 2004, Daryl Coulson)

[1] It is the proponent's responsibility to identify endangered and threatened species and their habitat within the study area prior to undertaking work, and to ensure that the work will not result in a contravention of the ESA or other applicable legislation. Proponents are encouraged to consult with their local MNR district office if they have questions about the *Endangered Species Act, 2007*.

A Midland Painted Turtle preparing to cross a gravel road during nesting season (D. Coulson)

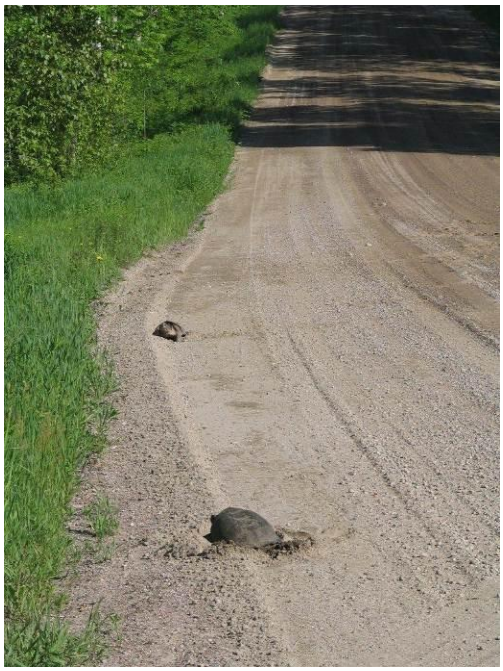
In addition, loose soils and gravel associated with roads are attractive nesting areas, particularly in proximity to wetlands, watercourses, ditches and cross drainage areas.

Blanding's Turtles nesting along a Renfrew County road (June 2013, A. Mitchell & D. Coulson)

Snapping Turtles nesting at water crossing (A. Mitchell)

Blanding's Turtle Eggs related to size of a toonie (D. Coulson)

There are 8 species of turtles known to occur in Ontario, with 7 known to occur in Renfrew County. Four turtle species and their habitat are protected under ESA in Renfrew County: Wood Turtle, Blanding's Turtle, Spiny Softshell Turtle and Eastern Musk Turtle and all turtles are protected under the Fish & Wildlife Conservation Act (FWCA). It is not uncommon to see turtles along roads in the spring, early summer and fall. Blanding's Turtles, Snapping Turtles and Painted Turtles are the most common species. In Renfrew County, the active turtle season is generally between April 1st and September 30th. Nesting usually occurs between late May and the end of June. Nests incubate until they hatch usually between mid to late September, followed by hibernation. Refer to Appendix A for pictures and key identification features of the most commonly seen turtles along Renfrew County roads.



Two Snapping Turtles nesting along a freshly graded gravel road (D. Coulson)

Under the ESA, endangered and threatened species and their habitat are protected, and certain activities related to road and highway projects may require authorization. However, in many situations avoidance measures can be used to comply with the ESA and eliminate the need for an authorization. It is the proponent's responsibility to identify endangered and threatened species and their habitat within the study area prior to undertaking work, and to ensure that the work/activity will not result in negative impacts and/or a contravention of the ESA. Proponents are encouraged to consult with their local MNR district office if they have questions about the *Endangered Species Act, 2007*.

Some road and highway projects may be eligible for new ESA regulatory changes that came into effect on July 1st, 2013. These new changes allow for projects that may affect endangered or threatened species to proceed without authorization, provided they register their activity and follow the rules in regulation. One example is the provision for "non-imminent threat to health and safety" (O. Reg. 242/08 sec. 23.18). For example road and highway projects that involve maintenance, repair, removal, replacement or upgrade of existing structures within their original footprint may be eligible. For further details about this provision please see the following link:

http://www.ontario.ca/environment-and-energy/health-and-safety-projects-threatened-and-endangered-species. The new regulatory changes require a mitigation plan to minimize adverse effects and these guidelines may be useful in their preparation.

Activities involving increased footprints such as twinning and new road construction may require an ESA permit. These guidelines can be used as a means to minimize adverse effects in an ESA application. Further details regarding ESA permits can be found at: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_PERM_UND_ESA_EN.html

Overall, three types of mitigation measures are recommended: worker awareness, timing of activities and species exclusion. Table 1 provides a summary of activities commonly associated with road and highway projects and means for achieving avoidance or minimizing adverse effects. In general, for activities that are strictly limited to the existing paved lanes and paved shoulders (i.e. no change in footprint), worker awareness should suffice. Any activities that involve alteration or disturbance to gravel and natural surfaces (such as gravel roads, unpaved shoulders, culvert or bridge replacement and ditching) require additional mitigation measures. If you are unsure how to categorize your project or activities please contact your local MNR office for advice.

Table 1: Summary of Road and Highway Project Activities and Recommended Turtle Mitigation Measures[1]

Activity	**Mitigation Measures[2]**		
	Awareness	**Timing**	**Exclusion**
Mill & pave existing travelled lanes and paved shoulder	**X**		
Rumble strips on paved surfaces	**X**		
Pothole repair	**X**		
Ditching and ditch maintenance	**X**	**X**	
Guard rail post replacement and digging	**X**	**X**	**X**
Open trench culvert replacements and installations	**X**	**X**	**X**
Expansion of road width and/or road bed (e.g. passing or turning lanes)	**X**	**X**	**X**
Lowering of road bed	**X**	**X**	**X**
Installation of light standards at intersections	**X**	**X**	**X**
Bridge repair, replacement, construction	**X**	**X**	**X**
Road re-alignment	**X**	**X**	**X**
Upgrading gravel roads to hard surfaces	**X**	**X**	**X**
Shoulder sealing, especially near watercourses/wetlands	**X**	**X**	**X**
Granular shouldering infilling, grading and compaction	**X**	**X**	**X**
Other activities altering or disturbing road shoulders or ROWs	**X**	**X**	**X**

[1] To be implemented in the vicinity of known or high potential habitat (see discussion under "Where") .

[2] All projects should use worker awareness as part of their mitigation. Timing is the best way of mitigating adverse effects with exclusion being an alternative when timing mitigation is not feasible.

Mitigation Measures

Worker Awareness

It is highly recommended that worker awareness be implemented in all road and highway projects.

Worker awareness can be as simple as a tailgate meeting conducted by someone knowledgeable about turtle ecology that informs site workers (including heavy equipment operators) about turtles and their protection. Daily inspection of the work area for turtle activity is important for mitigation to be successful. Should a turtle be encountered on site, construction activities that disturb or could harm the turtle must stop. If the turtle appears to be simply moving through the area a worker trained in safe handling of turtles should carefully move the turtle out of the work site to a safe and suitable location nearby. All turtle observations and relocations should be documented. If the turtle has already begun to nest, (i.e. digging and/or sitting in a nest pit), construction activities must stop and the turtle be allowed to finish nesting and leave the area on its own. Pembroke District MNR should be contacted for advice on protecting and/or relocating the nest and regarding any suspected nests. Most observations of turtles will occur during the spring and early summer during the nesting season. Turtle hatchlings may be observed in early spring and again from late August to end of September. There is also a fall migration (late September to early October) where some turtles move to overwintering habitat. Please report any turtle sightings (alive or dead), especially SAR turtles, to the Pembroke District Management Biologist for further advice (see appendix B for a reporting form).

Timing

Conducting activities outside the active turtle nesting and incubation season is the best way of avoiding and mitigating potential negative impacts for these species. Generally turtle activity in Renfrew County runs from April 1st to September 30th. However, turtle nesting activity typically runs the first 3 weeks of June. Most nests will hatch by the end of September and the turtles will leave the nest and move to water. If work can be planned to be completed before the nesting season begins or after incubation has ended, exclusion fencing would not be required for turtles. However, if construction must occur between June 1st and the end of September exclusion fencing is required to be in place prior to nesting season so construction can proceed.

Since there may be a requirement for silt fencing to reduce erosion/sedimentation to protect fish habitat and address fisheries concerns, the two requirements can easily be met at the same time by a properly installed single fence. The majority of water bodies in Renfrew County require “in-water” construction to occur between July 15th and September 30th to protect fisheries. In this case (to cover both requirements) fencing would need to be installed by June 1st to address turtle requirements. Seeking advice from the local MNR Management Biologist may be the best way to resolve any conflict between the two timing windows. For larger projects that extend throughout the active turtle season, consider scheduling activities that alter or disturb the shoulders or ROWs outside of the active season and conducting activities that are limited to the existing paved surfaces during the active season.

Fencing

There are two types of fencing presented below: Exclusion fencing and Confinement fencing. The type of work or project and the habitat will help you decide which method to use.

Exclusion Fencing:
The goal of exclusion fencing is to prevent or minimize the risk of harm to turtles (including nests and eggs) by physically preventing turtles from entering the work area at any time prior to and during construction, particularly during the nesting season. Fencing can be installed to exclude turtles from work areas, particularly road shoulders, along areas where turtles and/or habitat are known or have the high potential to occur. Often, the fencing specifications and installation are consistent with those required for sediment and erosion control for fisheries and water quality protection. This technique also works well for excluding other reptiles and amphibians.

When:
It is critical that this fencing be installed prior to the nesting season (i.e. June 1st) if the construction activity is to occur at any time during nesting or incubation (June through September). The goal is to prevent turtles from entering and/or nesting in the shoulders within the work area by using exclusion fencing.

For culvert locations that are to be disturbed during June, the segment of fencing within the construction disturbance zone can be removed immediately before necessary work but must be replaced and fully secured at the end of each work day during nesting season. This is to make certain turtle nesting does not occur within work area. Please keep in mind that the fisheries in-water timing may still apply.

Where:
Fencing should be placed strategically where turtles are most likely to occur, so as to maximize effectiveness and potentially minimize costs and/or delays. It is not needed at every location. Focus should be in areas identified as having turtles or as being high potential, such as stream/river crossings, lake shores, ponds, wetlands, dips or valleys between rock outcrops, wetted ditches connected to natural water features (see Figures 1 to 4 below for examples). The preferred habitats of turtles are those areas having standing water in May and June. Therefore, wherever such habitat areas are in proximity to a road, the risk of a turtle encounter is high. You can consult with local MNR Management Biologist for advice and clarification.

Keep in mind that there may be areas within the work zone that may not have been identified as high potential for exclusion fencing, however workers on the ground may feel this is suitable habitat or may observe turtles in the area. These guidelines are meant to be adapted to site conditions and Pembroke District MNR encourages site workers to be proactive and take ownership and responsibility by adding more fencing when justified.

Exclusion Fencing Examples: culvert replacement or installation

Install exclusion fencing for a minimum distance of 10 meters beyond the actual footprint of your work area. Exclusion fencing should be placed on both sides of the road and both sides of the culvert. It should be installed so that there are no gaps at the culvert and extend **along the water's edge** at right angles away from the culvert. Fencing should be angled 45 degrees up the bank, terminate before it becomes a safety risk to drivers, and then angled back down the bank at 90 degrees for an additional 1-2 metres (to direct turtles away from the road). If the road is closed to traffic, closing the road off with fencing at night from turtles entering the work area is the best method for effective exclusion.

Temporary fencing specifications and installation methods are generally consistent with those required for fisheries sedimentation erosion control and water quality protection. However the extent of the fencing may be greater due to the extent of habitat within the work area and must be angled up toward the road to exclude turtles from work area (see examples below).

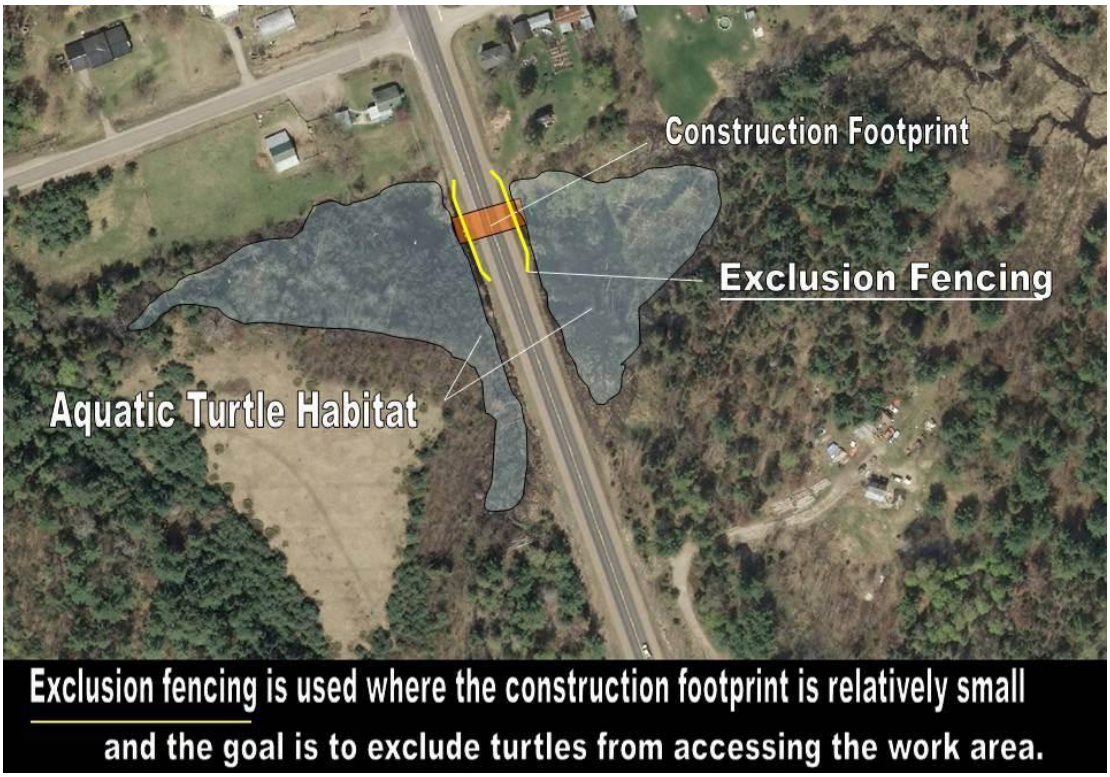


Figure 1: For minor culvert replacement projects exclusion fencing should extend a minimum of 10 meters from the limit of construction disturbance.

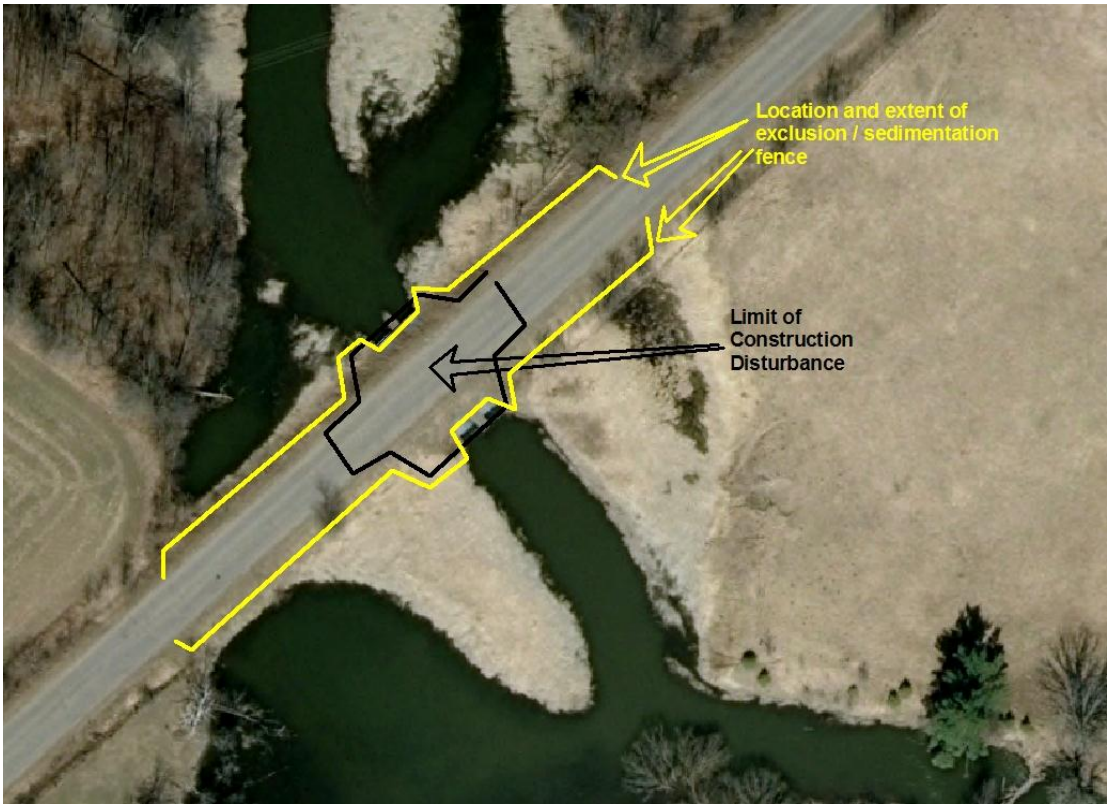


Figure 2: For larger culvert replacement projects exclusion fencing should extend a minimum of 20 meters from the limit of construction disturbance. Note the 4 locations where turtles could potentially enter the work site. Inspecting work area every morning is important

Confinement Fencing:

The goal of confinement fencing is the same as for exclusion fencing. It is to prevent or minimize the risk of harm to turtles (including nests and contents) by physically preventing turtles from entering the work area at any time during construction, particularly during the nesting season. The difference with the confinement fencing approach is that due to the construction area being so large and extensive, it is more appropriate to attempt to confine the turtles to the wetland or their habitat.

When: Same as Exclusion Fencing

Where:
Fencing is installed on both sides of the road along areas where there is any open water habitat during May-June (see discussion under exclusion fencing).
The primary difference with confinement fencing is that this fencing extends along the entire stretch of adjacent wetland habitat terminating a minimum of 10m past the extent of the habitat. Also, the terminating wing walls of the fencing angle back towards the wetland in order to encourage any turtles following the fencing to be redirected back to the wetland away from hazardous environments associated with the road.
By leaving at least some of the south-facing embankment slope that is outside of the construction zone available for access and use of the turtles on the wetland side of the fence, it may provide for safe alternative nesting opportunities.

Examples of Road and Shoulder Improvements:

Where suitable habitat exists along the highway ROW, fencing should be installed along the outside of the shoulder, inside of the ditch. If the work area extends past the ditch, additional fencing should be installed at the ends of the work area to prevent turtles from travelling along the ditches into the work area.

The focus should be in areas that have high potential such as stream/river crossings, lake shores, ponds, wetlands, dips or valleys between rock outcrops, wetted ditches connected to natural water features. Please consult with Pembroke MNR Management Biologist for advice and clarification on sites where there are questions.

Fencing should be installed a minimum of 10 meters beyond the extent of the turtle habitat feature. However, in situations where suitable habitat like water features end or is bound by rock outcrops silt fencing should be installed between the two faces with no gaps (See Figures 3 &4 below). Rock or suitable fill may be required within the ditch along a rock cut to support the exclusion fence or seal off any gaps.

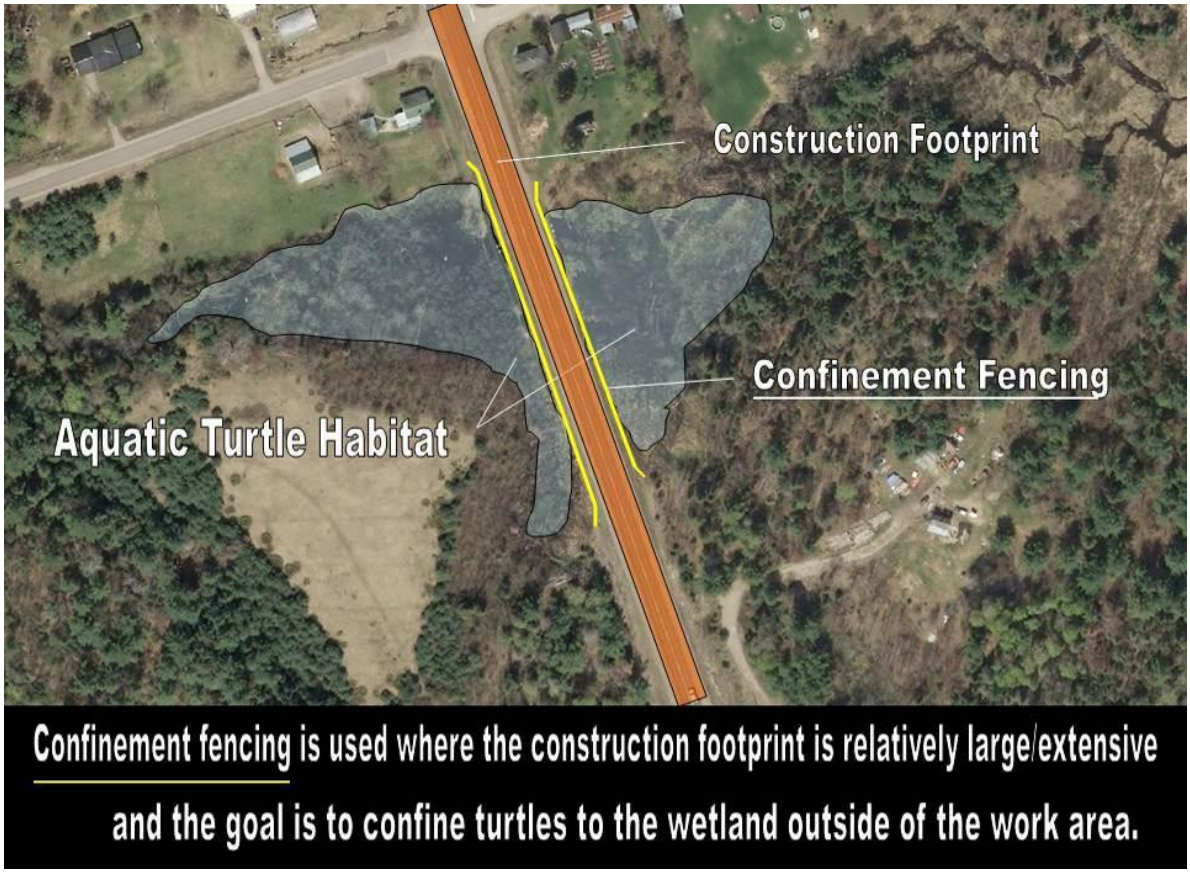


Figure 3: For road and shoulder improvement projects confinement fencing should extend a minimum of 10 meters past the extent of the habitat.

Figure 4: Using the natural features such as rock outcrops as barriers can help to reduce excessive and unnecessary fencing which can exclude or confine turtles from the work area

How:

Both exclusion and confinement fencing (geo-textile) must be installed in the following manner (Figure 5):

- Fabric must be attached to wooden, heavy plastic or metal stakes
- Stakes must be securely driven into the ground on the inside of the construction area, and placed no more than 2 metres apart
- The fabric must be pulled tight when staking to reduce sag and possibly allow animals such as turtles to climb over
- The bottom apron of the fabric must be buried at least 10 cm down with an additional 10 cm fencing lip extending outwards 90 degrees to deter animals from digging under it, and the lip should be facing the direction of construction
- The trench must be backfilled and soil compacted on both sides to secure buried lip from becoming exposed

*****Please remember that as important it was to install the fencing for construction purposes it is just as important to remove the fencing when the work is completed.

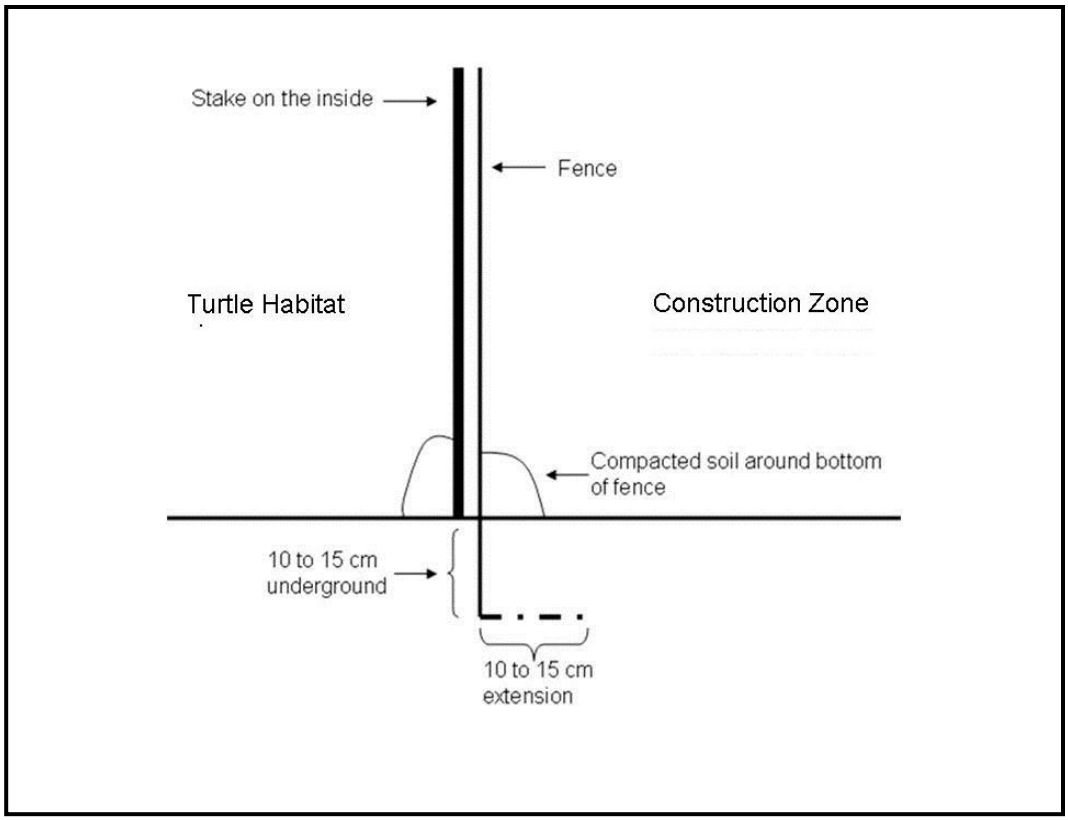


Figure 5: Proper installation of geotextile exclusion fencing for turtle mitigation

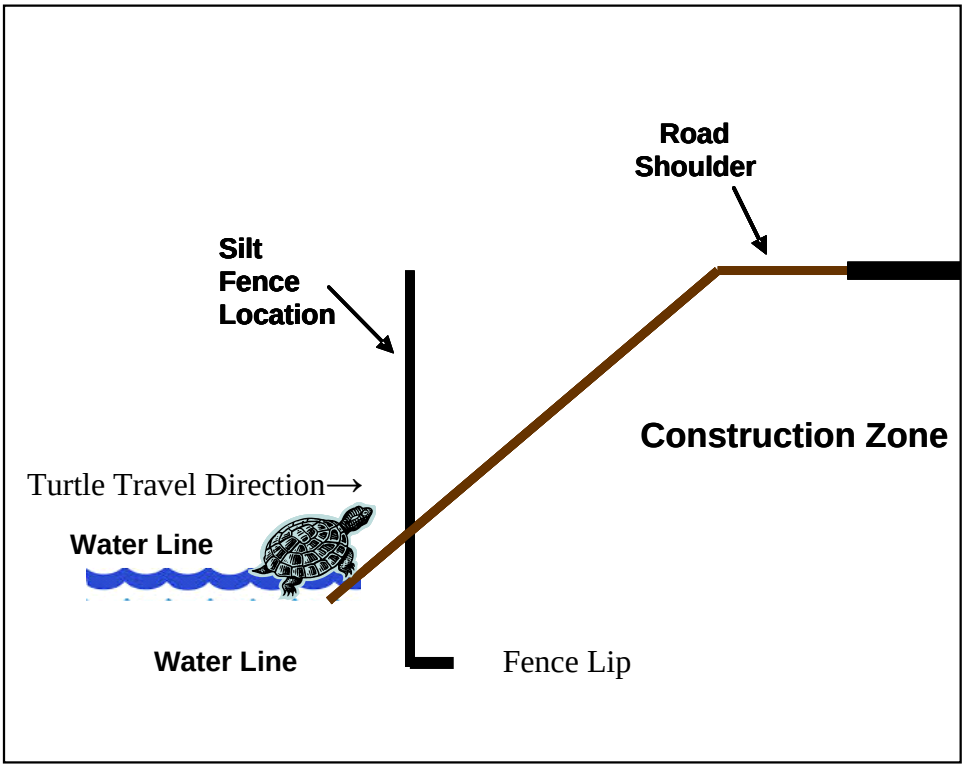


Figure 6: Location of exclusion fence should be placed near to the water to deter nesting. Typically fencing lip would be in direction of travel but turtles are not that strong

Daily Inspections of fencing and or enclosed areas

Inspections should occur on a daily basis to look for breaches in the fencing where turtles or other reptiles may be able to pass through. Larger wildlife such as deer, moose, bear and even beavers regularly cross highways and will have no problem breaching these fences. Any breaches should be repaired immediately.

There is no requirement to have a qualified biologist to monitor exclusion fencing. A worker who is trained, and who is given the responsibility of being the project's environmental officer, is the ideal person to maintain and inspect the fencing and document any turtle observations. The enclosed work area must be inspected daily for turtles before operations begin and before any heavy equipment starts working. Document and relocate any turtles found to a safe place outside the enclosure. Awareness training about turtles at daily tailgate meetings should suffice for all other workers on site.

What to look for during pre-construction planning phase – indications that the site has high potential for turtles:

- Signs of turtle nesting or digging
- Predation of nest and egg shell fragments
- Suitable habitat (wetlands, wetted ditch) adjacent to construction area or culvert being replaced

References

OMNR 2013. Species at Risk Branch Best Practices Technical Note.
Reptiles and Amphibian Exclusion Fencing Version 1.1

http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@species/documents/document/mnr_sar_tx_rptl_amp_fnc_en.pdf

Appendix A

TURTLES OF ONTARIO

Illustrations are half life size.

toronto zoo

torontozoo.com/adoptapond

Eastern Musk

Sternotherus odoratus

- 6-11 cm, record 13 cm
- Carapace narrow, smooth, light olive to black, high domed
- Plastron is yellow-brown and gives little protection to legs
- Hinge runs across the front of the plastron allowing it to close upward to protect the head
- Two light stripes on each side of the head
- Fleshy projections (barbels) on chin and throat
- Named for musky odour produced when handled (formerly known as Stinkpot Turtle)
- Lays 2-7 oval, white, hard-shelled eggs
- Species at Risk

Midland Painted

Chrysemys picta marginata

- 11-14 cm, record 19 cm
- Smooth, olive to brownish grey carapace with orange-red margins
- Yellow plastron with dark central blotch
- Neck, legs and tail striped with red and yellow
- Yellow blotch behind each eye
- Males have very long nails on front feet
- Often seen basking on logs
- Lays 3-15 oval, white, smooth-shelled eggs

Spotted

Clemmys guttata

- 9-11 cm, record 12 cm
- Smooth black carapace with bright yellow or orange spots; spots fade in older turtles
- Plastron yellow-orange with large black blotch on each scute
- Males have tan chin and brown eyes females have yellow chin and orange eyes
- Head, neck, limbs and tail are grey to black with yellow spots
- Inside of legs washed with orange
- Lays 2-6 oval, white eggs
- Species at Risk

Western Painted

Chrysemys picta bellii

- 9-18 cm, record 25 cm
- Light, irregular lines on olive to brownish grey carapace
- Yellow plastron with large, dark, irregular shaped central blotch
- Often seen basking on logs
- Lays 3-20 oval, white, smooth-shelled eggs

Wood

Glyptemys insculpta

- 14-20 cm, record 23 cm
- Carapace rough, heavily sculptured, brown or greyish brown, often with central keel or ridge and raised concentric growth rings on each scute
- Rear margin of carapace serrated
- Plastron is yellow with black squares
- Head black, skin brown, adults with orange or yellow on neck and legs
- Found on land (the most terrestrial turtle in Ontario) and in or near streams and wet meadows
- Lays 3-12 oval, white, thin-shelled eggs
- Species at Risk

Blanding's

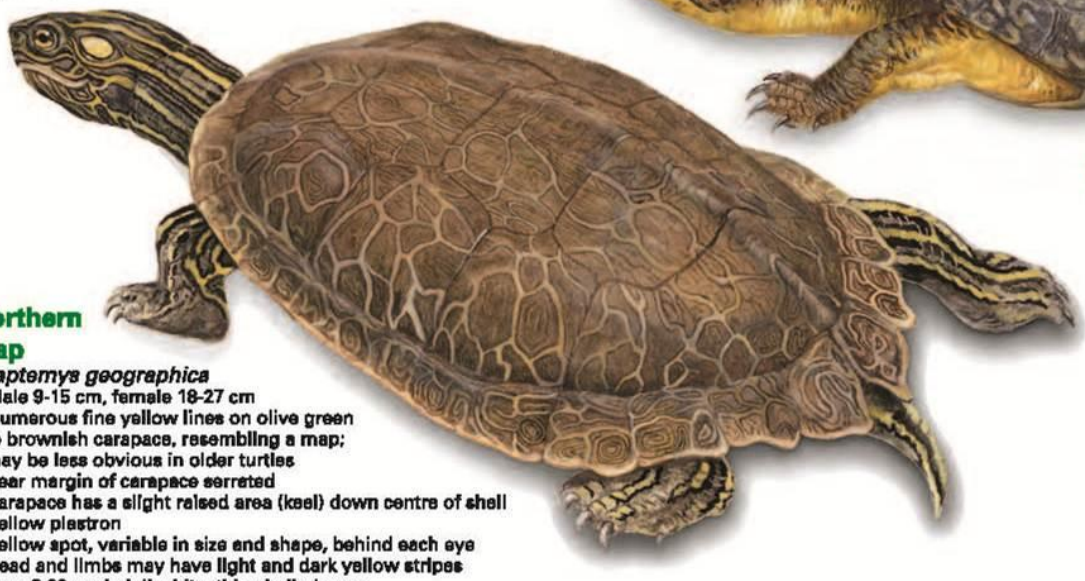
Emydoidea blandingii

- 12-18 cm, record 27 cm
- Carapace black to greyish brown with numerous yellowish spots or streaks
- Plastron has a flexible, grooved hinge that allows lower shell to close upward to protect head and legs
- Bright yellow on chin and throat
- Protruding eyes
- Domed shell obvious while basking on logs, rocks, or clumps of vegetation
- Lays 4-13 oval, dull white, hard-shelled eggs
- Species at Risk

Northern Map

Graptemys geographica

- Male 9-15 cm, female 18-27 cm
- Numerous fine yellow lines on olive green to brownish carapace, resembling a map; may be less obvious in older turtles
- Rear margin of carapace serrated
- Carapace has a slight raised area (keel) down centre of shell
- Yellow plastron
- Yellow spot, variable in size and shape, behind each eye
- Head and limbs may have light and dark yellow stripes
- Lays 6-20 oval, dull white, thin-shelled eggs
- Species at Risk



Turtles in Ontario are protected under the Fish and Wildlife Conservation Act. If you see a turtle, please do not disturb it or remove it from its habitat. If you see a turtle wandering over land in spring or early summer, it is most likely a female about to lay her eggs. Watch it, love it, but leave it! We all have a role to play in protecting wetland habitat and turtle nesting areas. Seven of eight Ontario turtles are currently at risk. Observations help to identify important turtle habitats. Submit sightings to **Ontario Turtle Tally** at **torontozoo.com/adoptapond/TurtleTally.asp**

These turtles are not found in all Ontario regions. Consult a field guide for maps of turtles in your area. The size of turtles includes U.S. populations as listed in: *Roger Conant and Joseph T. Collins, A Field Guide to Reptiles and Amphibians of Eastern and Central North America, 3rd edition. Houghton Mifflin Co.: Boston, 1991.*

FEMALE

MALE

same species

Spiny softshell

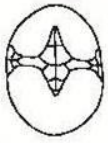
Apalone spinifera

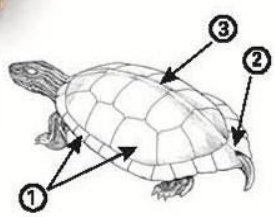
- Male 12-23 cm, female 18-43 cm
- Carapace is flat and olive-grey to brown with yellow border edged in black around margin of carapace
- Males and juveniles have large yellow spots outlined in black; females have brownish blotches
- Small tubercles or spines on edge of shell above neck
- Two dark bordered, light yellow lines on each side of head
- Very long neck, tubular "pig like" snout
- Often buries itself in sand or mud
- Lays 3-43 round, white, hard-shelled eggs
- Species at Risk

Snapping

Chelydra serpentina

- 20-36 cm, record 49 cm
- Carapace is light brown to black
- Young turtles have three longitudinal keels on carapace, carapace of older turtles is almost smooth
- Plastron is yellowish, small, and cross-shaped, legs and skin not well protected
- Large head, two barbels on chin, rounded tubercles on neck
- Head, limbs and tail are brown
- Tail is long, same length or longer than carapace with "dinosaur-like" triangular scales projecting from the upper side
- Lays 9-66 round, white eggs
- Species at Risk





1. -scutes
2. -serrated marginal scute
3. -longitudinal keel
4. -hinge on plastron

Red-eared slider

(not illustrated)

Trachemys scripta elegans

The red-eared slider is often sold in pet stores, but is not native to Ontario. **Do not release pet turtles into the wild.** They may carry diseases that threaten our native turtles, and they are not likely to survive.

Appendix B

Turtle Mitigation Toolkit & Observation Report Form

This reporting form is intended for feedback from the user on how the turtle mitigation toolkit has assisted them in helping to mitigate for turtles during a construction project. It is also a venue for collecting occurrence information on turtles observed by the work crews.

The report is not a mandatory requirement for anyone using the toolkit. However, we encourage your comments and feedback, which will help to further refine this document and procedures and make improvements where needed. Our intent here is to work closely with our industry partners to help increase efficiency and effectiveness of turtle mitigation for road related construction projects within Renfrew County.

Please specify type of work the toolkit was used for:

☐ Culvert / Bridge Replacement ☐ Ditching / Drain Maintenance

☐ Grading Maintenance ☐ Re-surfacing

☐ Guardrail Replace / maintenance ☐ Other Specify: _____

_____

Date When Work Was Conducted: _____

Location Description: This can be road name and intersection proximity, name of watercourse, County water-crossing # _____

Did you find this Toolkit helpful: _____

_____

Were there any turtles observed within and or near the worksite during your work or construction check box: ☐ Yes or ☐ No (if no survey is complete, please fill address on back of form & return)

Most Commonly Observed Turtles

☐	Blandings Turtle	
☐	Midland Painted Turtle	
☐	Snapping Turtle	

Least Commonly Observed Turtle

☐	Wood Turtle	
☐	Stinkpot (Musk) Turtle	
☐	Northern Map Turtle	

Certainty of Observation: (please choose one)
Please submit photographs whenever possible to verify species identification.
____ I am positive I've identified the species correctly
____ I am pretty confident I've identified the species correctly
____ I am unsure whether I've identified the species correctly

Date: _____**Time of observation:** _____ AM/PM

Number of Turtles: _____

OBSERVATIONS / LOCATION DESCRIPTION

Please provide an accurate account of your sighting here - a detailed description of the species you observed (this is especially important if you are not including a photograph with your submission), and location details of where you made the observation.
Please provide the most specific information available about the location of your turtle sighting, including nearest named place, street address or postal code if possible: (e.g. turtle was heading west towards the Bonnechere River, crossing River Road at 911 # 237 near intersection of River Road and Highway 17 near Renfrew, Ontario, OR turtle was seen basking on a log in wetland .5kms south of Cobden, Ontario

_____
_____
_____
_____
_____

Latitude / Northing: _____ Longitude / Easting: _____

Estimated Accuracy of Location:
____within 5 m ____within 10 m ____within 50 m ____within 100 m ____within 500 m
____within 1 km

Turtle Behaviour: Please choose one
____Basking (sunning itself) ____Nesting
____Swimming ____Alive on Road
____Walking ____Dead on Road
____Other (please specify):_____

Nearest distance to water in meters: _____

Contact Information: Name or Company: _____

Telephone:_____ Email:_____

Please return to form to:

Kirby Punt, Management Biologist
Ontario Ministry of Natural Resources
31 Riverside Drive, Pembroke, Ont. K8A 8R6
Tel: 613-732-5565, Email: kirby.punt@ontario.ca