# Turtle Nest Protection Symposium 2025

## Summary Report

UNIVERSITY OF TORONTO MISSISSAUGA
Centre for Urban Environments

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Office of the Vice-Principal, Research and Innovation

## Turtle Nest Protection Symposium 2025

22 March 2025
University of Toronto Mississauga (UTM Room)
3359 Mississauga Rd, Mississauga, ON L5L 1C6


## Funded By

Office of the Vice-Principal, Research and Innovation at University of Toronto Mississauga
Centre for Urban Environments at University of Toronto Mississauga
Heart Lake Turtle Troopers sponsored by Schad Foundation


## Planning Committee

Tharusha Wijewardena, Postdoctoral Fellow, University of Toronto Mississauga
Ruth Takayesu, Executive, Heart Lake Turtle Troopers
Lori Leckie-Addison, Executive, Heart Lake Turtle Troopers

## Zoom Host

Hannah McCurdy-Adams, Reptile and Amphibian Program Development Coordinator, Wildlife Preservation Canada

## Volunteer Note-takers

Achilles Constance Groot (Heart Lake Turtle Troopers)
Dianne Dillabough (Halton Hills Turtle Guardians)

## Expert Panel

Dr. Julia Riley, Assistant Professor, Mount Allison University
Joe Crowley, Species-at-Risk Biologist, Government of Ontario
Joe Hathaway, Founder, Scales Nature Park and Saving Turtle at Risk Today (START) project
Kassie McKeown, Project Lead, Cambium Indigenous Professional Services

## Summary Report Created By

Tharusha Wijewardena, Postdoctoral Fellow, University of Toronto Mississauga
Ruth Takayesu, Executive, Heart Lake Turtle Troopers

## Reviewed By

Hannah McCurdy-Adams, Reptile and Amphibian Program Development Coordinator, Wildlife Preservation Canada
David Seburn, Canadian Wildlife Federation

# Disclaimer

This is a summary report of the discussions of the turtle nest protection symposium on March 22, 2025. You may use this report as an *unofficial* guide to look for additional information.

We have provided information that could be useful. When in doubt, reach out to an expert before implementing any actions.

While there may be some common concepts across provinces, these recommendations are for freshwater turtle nest protection in Ontario only.

Do not cite this report or rely strictly on the information available in this report.

Legislation may be open to interpretation and may have changed since the time this report was created. Always ensure you have up-to-date information if you are engaged in turtle conservation.

Date created: 08 Oct 2025

Version: 2025ver1

# List of Topics

# 1) Permit requirements for turtle nest protection

## 1.1) What authorizations or permissions are required to install a nest cage/ nest protector?

In Ontario, provincial permits are not required for nest caging that directly affects the nest itself *as long as* eggs or nest environment are not disturbed, and hatchlings can escape the nest protector on their own.

However, additional authorizations or permissions may be required depending on where you are working (e.g., private lands, protected areas, municipal lands including roadsides, First Nations lands, and federal lands). You will need to reach out to the relevant government agency or landowner (which includes lands trusts, conservation authorities, and conservancies) for the detailed permit requirements. For example, some townships or municipalities may not allow nest protectors close to the road or only allow if they are installed behind a guard rail.

Note: Keep in mind that once a nest protector is installed, it will require regular maintenance depending on the location. Nest protectors can become overgrown with plants (Figure 1). Heavy plant growth can shade the ground, cooling the nest, and the roots can interfere or damage the eggs in the nest.

Figure 1: Overgrown vegetation inside a nest protector. (© David Seburn)

## 1.2) Are permits required for incubating eggs?

For the provincial government in Ontario, the following authorizations are typically required for incubating eggs in a facility.

- An authorization under the Fish and Wildlife Conservation Act (FWCA), which is usually a Wildlife Scientific Collector's Authorization (WSCA), is required to excavate and incubate turtle nests of any turtle species in Ontario. The FWCA is administered by the Ministry of Natural Resources (MNR). As part of the application process for this authorization, you will also need an Animal Care Protocol that is approved by the MNR. If you are affiliated with an academic institution, you may also obtain an Animal Care Protocol with the institution's Animal Care Committee.
- An authorization under the Ontario Endangered Species Act (ESA) is required to excavate and incubate the nests of a species that is listed as threatened or endangered under that Act. The ESA is administered by the Ministry of the Environment, Conservation and Parks (MECP). Inquiries about authorizations under the ESA can be sent to SAROntario@ontario.ca

Remember that you may need additional authorizations depending on where you are working. (e.g., private lands, protected areas, municipal lands including roadsides, First Nations lands, and federal lands, lands trusts, conservation authorities, and conservancies).

For more info, refer to these websites.

Wildlife Scientific Collector's Authorization: https://www.ontario.ca/page/keep-wild-animals-captivity

Species At Risk Act: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/permits-agreements-exceptions/permits-agreements-information.html

Endangered Species Act: https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization

Fish and Wildlife Conservation Act: https://www.ontario.ca/laws/statute/97f41

### 1.3) Can salvaging eggs from a deceased adult be done under an Authorized Wildlife Custodian permit, or are additional permits required?

A wildlife rehabilitator with permits can confirm whether the adult is deceased and salvage eggs. If a nest is at immediate risk, a wildlife rehabilitator with permits can salvage eggs. Extracting eggs from turtle nests requires training to ensure the viability of eggs. For example, rotating eggs is typically fatal to the eggs.

### 1.4) If a predated nest is exposed and there are still exposed [viable] eggs, can they be brought to a wildlife rehabilitator without permits?

In this case, exposed eggs are considered in harm's way. Therefore, you can extract these eggs and take them to an authorized wildlife rehabilitator or conservation organization. If possible, it is better to provide the location and ask the representative to directly extract the eggs. Extracting eggs from turtle nests, including partially predated nests, requires training to ensure the viability of eggs. Keep in mind that rotating eggs is typically fatal to the eggs.

### 1.5) Permits take a long time to acquire. Why is it so hard to get these permits?

Provincial and federal wildlife legislation exists to ensure that wildlife are not harmed. It is best to consult with a local expert or organization in the area for emergencies and for additional information on permits, training, and resources needed for long-term conservation actions. Some organizations employing turtle experts are listed below:

Ontario Turtle Conservation Centre
Website: https://ontarioturtle.ca/

Toronto Zoo's Adopt-A-Pond Wetland Conservation Program
Website: http://www.torontozoo.com/AdoptAPond/

Upper Thames River Conservation Authority
Website: http://thamesriver.on.ca/

Scales Nature Park
Website: https://www.scalesnaturepark.ca/conservation

Canadian Wildlife Federation
Website: www.helptheturtles.ca

### 1.6) Are eggs considered animals when conducting research projects?

Eggs are not considered animals under Animal Care Protocols in many academic institutions. However, turtle eggs are considered to be animals by the Fish and Wildlife Conservation Act, meaning that animal care protocols are required to obtain authorizations under that Act.

### 1.7) Do new nest protection designs require additional permits?

Any nest protector design must allow hatchlings to escape on their own, and the nest protector should not alter the nest environment. It's imperative that you contact the permit authority for advice regarding new designs.

### 1.8) What are your recommendations for acquiring permits in other provinces?

Contact the relevant municipal, provincial, and federal government agencies for more information regarding permit requirements in other provinces.

## 2) Dealing with natural predators of turtles

### 2.1) Who are the natural nest predators of turtles?

Most common nest predators are raccoons, skunks, and foxes. Other predators include birds, (e.g., crows and ravens), mammals (e.g., chipmunks, coyotes, opossums, moles, mustelids including weasels, otters, minks, and rats) and reptiles (e.g., snakes). Additionally, insects such as ants and sarcophagid flies may also eat turtle eggs. Feral cats and dogs, as well as pets, may predate and disturb turtle nests.

### 2.2) Can you protect a turtle nest without a nest cage/nest protector?

Predators use multiple cues to find turtle nests (e.g., visual, olfactory, and auditory cues). Many different ingredients have been used in the past with very little success (e.g., coffee grounds, cayenne pepper, peppermint tea leaves, etc.). Currently, there are no effective methods for protecting 100% of turtle nests (sometimes even with nest cages/protectors). Identifying new, effective methods requires rigorously documenting, analyzing, and publishing methods in peer reviewed journals.

## 2.3) Why is it an issue to place a flat mesh over a turtle nest when eggs will not hatch in the next few days/weeks until a proper nest protector can be installed?

Although this may be a well-meaning solution, there is a risk of individuals forgetting to remove the flat mesh. This could lead to the mortality of hatchlings because they could be trapped. Therefore, flat mesh is not a viable solution without authorization under provincial legislation. There are a few nest protector designs that are commonly used (Figure 2 and 3)

Figure 2: Above-ground nest cage
(© Julia Riley)

Figure 3: Above-ground wooden-sided nest cage
(© Tharusha Wijewardena)

## 2.4) Why is a nest protector needed?

Usually, the underlying problem is that there are unnaturally high levels of natural predators (i.e., subsidized predators) in the area because our garbage provides them with abundant resources. In these cases, it is better to start addressing the root cause of nest predation, especially in large urban areas (e.g., Greater Toronto Area). Think about actions that can be taken to reduce garbage.

Also, keep in mind, sometimes, it is not possible to save 100% of the turtle nests. What is of equal value is to report predated nests to your local turtle conservation group and checking that they will submit that data to a central data repository, so that we can collectively have a better understanding of the nest predation rates. This could inform whether additional actions are required to save the local turtles.

Nest predation is a natural process, and turtle populations have evolved to cope with reasonably high levels of natural nest predation. For example, it may not be unusual for 50% of the nests, on average, to be predated. However, extremely high rates of nest predation in areas with large populations of subsidized predators are likely not sustainable over the long-term. We currently lack a clear understanding of what level of nest predation is sustainable for the long-term viability of many turtle populations, especially given elevated road mortality across all age classes. For example, if adult turtle numbers are declining due to roadkill, higher than normal rates of nest predation are likely to limit population stability over the next few decades.

Additionally, consider what could be done to ensure that female turtles can have access to better nesting areas in your locality. (E.g., Improving access to suitable nesting areas or creating artificial nesting beaches).

## 2.5) When do we need to protect turtle nests and can protecting turtle eggs have impacts on other wildlife?

Turtle eggs are an important food source for many animals. While nest predation rates of 50–80% are typical in many natural areas, close to 100% predation of turtle nests could decrease long-term viability of turtle populations.

The level of protection needed also depends on the turtle species. If the species in question is a species at risk, such as the Blanding's Turtle, it is important to protect all the nests. In the case of common species, such as Painted Turtle, it *may be* ok if most nests are predated. That said, we need more studies to understand what level of nest predation is sustainable for the long-term viability of our turtle populations.

Turtles provide an important ecosystem function by transferring energy and biomass between terrestrial and aquatic ecosystems. Many other animals cannot do that, so turtles are extremely beneficial for the ecosystem. Turtles take 10–20 years to sexually mature, whereas many other wildlife species (e.g., mammals, birds) sexually mature much earlier and replace themselves in the population faster. Ultimately, we need to think about the goals of protecting turtle nests and act according to what makes sense for the local wildlife populations.

## 2.6) Which species overwinter in the nest, and how do they do it? Does predation occur during fall or winter for overwintering nests?

Painted Turtle hatchlings use two strategies to overwinter, including supercooling and freeze tolerance. Map Turtle hatchlings and Box Turtle hatchlings (in the US) can also overwinter terrestrially.

Anecdotal evidence also suggests that Snapping Turtle and Blanding's Turtle hatchlings can successfully overwinter on land, but there is little evidence of these species employing this strategy in Ontario. For Snapping Turtles, this is probably due to warmer winters experienced in certain regions of southern Ontario.

Predation rates are site-specific and depend on the predator population. In the summer, nest predation rates are highest in the first 24–48 hours after nest laying. Nest predation rates can be high again in the fall as eggs hatch and release fluids. Spring predation rates of nests are understudied, but anecdotally, it is not very high. This is likely because the visual and olfactory cues are significantly reduced in the spring for predators. However, predators can still see and smell hatchlings digging out of the nest and smell deceased hatchlings that did not survive the winter.

## 3) Helping turtles hit by vehicles

Although this topic was not covered in detail at the symposium, we have added some basic guidelines about ways to help road-hit turtles.

### 3.1) When is it ok to help a turtle that has been hit on the road?

First, make sure *you are safe* when helping a road-hit turtle (e.g. you can pull completely off the side of the road, you turn your four-way flashing lights on, there is low traffic volume, and you are wearing a safety vest, etc.). You should only help a turtle if/when it is safe to do so.

It is not always easy to know whether a turtle that has been hit on the road is alive or dead. Sometimes eggs of dead females can survive up to 3 days. If in doubt, call the Ontario Turtle Conservation Centre for more information. https://ontarioturtle.ca/ourmission/drop-off/#injured

### 3.2) How to transport a road-hit turtle to a veterinarian or a wildlife rehabilitator?

Usually, it is best to get veterinary assistance as soon as possible. Call the Ontario Turtle Conservation Centre for more info, as this can be very case-specific.
https://ontarioturtle.ca/ourmission/drop-off/#injured

## 4) How and when to recover flooded nests?

### 4.1) Turtle nests get flooded and expose eggs. When to recover these eggs?

Depending on how long the nest was flooded, the eggs can become non-viable.

If eggs are flooded, those eggs *may* now be considered at-risk of imminent harm and be dug up and taken to a wildlife rehabilitator. However, consult with the local MNR or MECP office.

Depending on where the nest is (e.g., private lands, protected areas, municipal lands including roadsides, First Nations lands, and federal lands, lands trusts, conservation authorities, and conservancies) you may need additional authorizations.

### 4.2) How long can an egg remain viable if flooded?

It depends on the species. A nest could also be partially flooded even if you do not see the flooding above. Hypoxia (lack of oxygen) for an extended period of time is fatal. There is not a lot of quantitative work on this. A few minutes to an hour may be ok, while few days may be fatal.

## 5) Indigenous Knowledge

### 5.1) What is the protocol for implementing Indigenous engagement?

There isn't one protocol for implementing Indigenous engagement. It largely depends on the Community/Nation/Organization you want to engage with and why. Some might have consultation departments or consultation protocols. You can try these avenues first.

It is important to know if the Community has similar programming or initiatives underway, you can figure this out by using the internet to research about the community, following the community Facebook page or even just calling the administration office and asking to speak to the most relevant staff about your initiative. Also, before engagement, you need to understand your intention for engaging. Make sure you are not being extractive or performative and ensure there is reciprocity within what you ask for.

### 5.2) What are ways we can design spaces so that we can elevate Indigenous voices, to increase representation and amplify those voices?

These spaces need to be co-designed and co-created. It has to be this way at the onset of your initiative. You really need to understand your intentions for engaging/elevating and ensure that what you want to do is what will also work for Indigenous voices. You can only do this by working with them. It is important to understand your positionality when approaching Indigenous Nations/Communities/Organizations about turtle conservation. It is important to listen and not push your ideas.

Understand your positionality - The idea of "conservation" was a traditional way of life for Indigenous people before it was stolen from them, and they were removed from their land. Now, non-Indigenous people work towards conservation when this way of life was inherent to Indigenous peoples. As a conservationist and as person who lives on Treaty land, you have a responsibility and are in a good position to actively work towards reconciliation with Indigenous peoples.

### 5.3) What are some other things that volunteer groups with no funding can do to work towards Indigenous relationships?

It does not take money to reach out to Indigenous Communities and begin building relationships by being visible in Community. It is important to communicate initiatives, invite Indigenous Communities (urban or nearest First Nation) and provide that space for them to be involved, if they wish. There might be ways that you can contribute to their understanding of turtle conservation. Sharing knowledge and opportunities for capacity building through knowledge exchange and attending events are great ways to approach relationship building that does not cost money.

Universities and other large entities with funding can offer honoraria for knowledge exchanges or the creation of Indigenous Advisory Circles to guide turtle initiatives. They can work

collaboratively with First Nation communities on research and offer capacity building opportunities for Indigenous students and youth.

### 5.4) What are the responsibilities of non-Indigenous researchers and practitioners working with Indigenous Knowledge?

You need to truly understand why you want to incorporate Indigenous Knowledge in the first place. There are many reasons why you *should*, that can only be understood by understanding history and Indigenous approaches to knowing.

If you truly want to incorporate Indigenous Knowledge, you need to do a little bit of research into United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the Truth and Reconciliation Commission's Calls to Action, but also consider why we even need or have these initiatives in the first place (i.e., think about colonialism and deconstructing your understanding of "science" and what is considered science).

Indigenous knowledge is science. When you deconstruct the colonial way of seeing and understand the importance of two-eyed seeing (two kinds of understanding that compliment each other/provide a deeper understanding of the subject), you can then understand Indigenous Knowledge as a form of science and understand your responsibility to increase the presence and visibility of this way of knowing.

Returning Indigenous Ways of Knowing to the land, to turtle conservation - you are actively working towards reconciliation. You must do this in a good way, by pursuing meaningful relationships with Indigenous peoples. Allow for the space and time to acknowledge grief, listen, share and take time to build relationships.

### 5.5) Are there additional resources to learn about Indigenous Knowledge?

Indigenous Awareness Training Workshops by Cambium Indigenous Professional Services: https://www.indigenousaware.com/indigenous-awareness-training-1

Toronto Zoo's Turtle Island Conservation: https://www.torontozoo.com/tz/ticresources

United Nations Declaration on the Right of Indigenous Peoples: https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

Backgrounder: United Nations Declaration on the Rights of Indigenous Peoples Act: https://www.justice.gc.ca/eng/declaration/about-apropos.html

Truth and Reconciliation Commission of Canada Calls to Action: https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/indigenous-people/aboriginal-peoples-documents/calls_to_action_english2.pdf

## 6) Dealing with invasive species

### 6.1) What is an invasive species?

According to the Invasive Species Centre definition based on Western Science (https://www.invasivespeciescentre.ca/invasive-species/), "Invasive species are plants, animals, insects, and pathogens that are introduced to an area and cause harm to the environment, economy, or society." Sometimes, these negative effects are difficult to measure, and a native species may even be considered invasive if climate change enables them to spread rapidly to new areas and significantly impact other species in the ecosystem.

Current Indigenous Research provides a different perspective. According to authors' understanding and reflection of Indigenous Science and based on Anishinaabe perspective (https://indigenousclimatehub.ca/2022/07/indigenous-perspectives-to-understanding-invasive-species/), 'invasive species' are not simply defined as harmful outsiders to an ecosystem. They are understood in terms of relationships and our responsibilities to the nature around us. Indigenous teachings view plants and animals as our relatives and as a result, 'invasive species' are not framed as threats. Instead, we should ask the question why are these new plants and animals here in the first place and what role they can play in their new ecosystem? This way, Indigenous Science focuses on how these species can contribute to human or ecological well-being instead of focusing solely on their removal. By focusing on a kinship-based approach, Indigenous Science provides an alternative to conventional Western Science based ecological definitions and policies around 'invasive species.'

In this discussion, we are talking about Red-eared Sliders and other turtle species from the pet trade that have been introduced into the wild.

### 6.2) Are Red-eared Sliders outcompeting native turtles?

Not yet. There have been many instances of Red-eared Sliders living naturally in urban ponds. There is no information to suggest that they are spreading in a concerning manner. The biggest issue is pathogen introduction into native ecosystems. If a Red-eared Slider has been around many years in a pond alongside native species, this is likely no longer an issue. However, a new pet release could introduce pathogens.

There are cases where Painted Turtles have been observed to be ill and found to be infected with herpes virus, which is prevalent in Red-eared Sliders. In one case, the entire population of turtles in a wetland had to be euthanized.

That said, from an Indigenous Science perspective, Red-eared Sliders are living beings, have a spirit, and act as a teacher, and they bring many of the same potential benefits as native turtles.

In some situations, you may be required to euthanize Red-eared Sliders as part of a permit condition. Otherwise, there is generally no need to capture or euthanize Red-eared Sliders that are already naturalized. Many groups still protect the mother turtle and allow them to nest but do

not protect the nest. There are organizations such as 'Little RES Q' that can help to rehome unwanted pet turtles, but many times, they are at capacity as well.

The pet industry has discussed this issue, and the industry has changed over the years for other species. Red-eared Sliders can still be bred in Canada and sold in pet stores, but some turtles are being brought in that have been pets for 40 years. More signage, education, and community outreach can help. Some people move native turtles into other wetlands because of lack of education and incorrectly think bringing the wildlife to urban areas is noble.

### 6.3) Are there other invasive species that could impact turtles?

Plants such as Phragmites and Dog-strangling Vine can affect turtle nests. They are not easy to remove as they can spread readily with windborne seeds. Sometimes the removal can be detrimental to the turtles as well. Thought and care is required.

### 6.4) How to make sure we do not incubate Red-eared Slider eggs?

The best way to avoid incubating slider eggs is to take a picture of the nesting turtle. In case you do not know whether the eggs belong to a slider or not, it may be best not to protect those eggs. Other wildlife needs eggs as a food source too.

## 7) Data Management and Sharing

### 7.1) Why do we collect data and why is it important?

Data collection now means being able to compare data in the future. Sometimes, it seems like it is not needed but the relevance may be seen later, as turtles live a long time. Data can also support any changes to laws and regulations currently in place.

### 7.2) What are some best ways to share data?

There are many ways to record and share data. iNaturalist is a free mobile phone app and website that can be used to record observations like live turtles, dead turtles, predated eggs, and nests. There is also the Natural Heritage Information Centre (NHIC) that maintains provincial data from various sources, including iNaturalist.

However, duplicate data is a concern as it can cause confusion.

While sharing interesting wildlife observations on social media platforms like Facebook or Instagram can help raise awareness, these platforms are not ideal for data storage or long-term research use. For observations to meaningfully contribute to conservation, it is important to also report them through more robust and accessible data management systems, such as iNaturalist or published field notes, which support long-term storage, retrieval, and scientific analysis.

You can also share data with Indigenous leaders and communities who may find the information both useful and meaningful. While conservation organizations/researchers have legal obligations

to report certain species observations to the Natural Heritage Information Centre (NHIC), especially those involving Species at Risk, data sharing can also be viewed as a form of reciprocity or offering to First Nations, whose stewardship and knowledge of the land are longstanding and ongoing.

### 7.3) How to record sensitive species data?

Sensitive species data should always be obscured. iNaturalist does automatically obscure species at risk turtles in terms of space and time, but if you are in a location doing many other iNaturalist observations (e.g., birds, plants, etc.) then it doesn't take a lot to figure out the location of the sensitive species location based on those other observations. So be mindful when sharing data. Some of the rarest species observations may be better to share directly to NHIC and local conservation-minded landowners through other means.

### 7.4) What kind of data should we be collecting to improve turtle conservation efforts?

The most basic information you can collect are species, location (as accurate as you can get), date, time, and whether the turtle is alive, injured or dead, and the behaviour (basking, nesting, walking) of the turtle. A photograph is especially useful for rare species as it can help with identification.

To correctly identify turtles, head and carapace (top shell) photos are very useful. Photographs also record metadata such as when the photograph was taken.

Regarding photo management, it can be overwhelming to deal with a large number of photos. Every time we take a photo we record the date, time, and notches, so that it is in the photograph. Having it within the photo itself is very useful.

However, individual animals should not be disturbed carelessly when collecting data.

### 7.5) Is there a central repository for data?

The Natural Heritage Information Centre (NHIC) is the central data repository for Ontario. This database is where the various governments go to see what info is available to inform a permit in the area. This website is also used to check which species are affected if a habitat is destroyed. This is why it is crucial to record observations, especially of rare turtles.

NHIC also has data sensitivity training modules on their website.

Data from Mergin Maps (via Scales Nature Park), Survey123 (via other organizations such as the Toronto and Region Conservation Authority), and iNaturalist feed into NHIC.

## 8) Disease monitoring of turtles

This topic was not exclusively discussed during the symposium. However, we have included some basic information about diseases in turtles

### 8.1) What kind of diseases affect turtles?

Sometimes, turtles can be sick but not show any symptoms. Currently, the main concerns are ranavirus and herpes virus in freshwater turtles. The first report of ranavirus in Ontario was from 2018. Refer to research article "Evidence for low prevalence of ranaviruses in Ontario, Canada's freshwater turtle population" (DOI 10.7717/peerj.6987) for more information.

If you suspect that a turtle is infected, contact the Ontario Turtle Conservation Centre or the Canadian Wildlife Health Cooperative for next steps.

## 9) Best ways to release hatchlings

### 9.1) What is the best way to release hatchlings?

Ontario Turtle Conservation Centre recommends releasing hatchlings in permanent or semi-permanent, shallow aquatic areas with abundant plants growing out of the water. This can include ponds, marshes, swamps, lakes, or slow-moving creeks and rivers. Hatchlings need lots of vegetation to hide from predators. Do not put them in open water as they will quickly become prey for other species (e.g., frogs and fish).

Do not release all hatchlings in a cluster. Space them apart, for example, 1 m apart, so they have a better chance of survival. Always release hatchlings in the wetland or other suitable habitat nearest to the nest and no more than 1 km from where they originated. If no wetland or other suitable aquatic habitat is accessible within 1 km of their original location or nest, then consult an expert.

Also, while we care about the wellbeing of the hatchlings, also remember that hatchlings are a part of the food web and feed many other species.