LETTER OF PROFESSIONAL OPINION

Date: **14 February 2024**

To: **Karen Bittner**
The Corporation of the Town of Blind River
11 Hudson Street
Blind River, ON
P0R 1B0

From: **Kelly Major**
TULLOCH Engineering
1942-L Regent Street
Sudbury, ON
P3E 5V5

Subject: Shirvon Park Reclamation – Professional opinion on the best practices for park naturalization and turtle nest protection.

To Ms. Bittner,

TULLOCH Environmental, a division of TULLOCH Engineering Inc. ('TULLOCH') was retained by the Town of Blind River (the 'Town') to provide a letter of professional opinion on the reclamation of Shirvon Park located on Shirvon Drive, Blind River, Ontario (the 'Park'). The Park is currently a playground with aging equipment that abuts the Blind River river system. In 2023, proposed facility upgrades were halted when it was discovered that the Park is subject to active turtle nesting. The species nesting at this site has not been confirmed, but nesting by most local turtle species receives protections under provincial policies and/or legislation. The Town has subsequently decided to decommission the park and promote its re-naturalization. The purpose of this letter is to outline best practices for (1) the removal of existing playground equipment, (2) the encouragement and maintenance of park re-naturalization, and (3) ensuring turtle nest protections in conformance with the Endangered Species Act ('ESA').

The Park and Habitat Overview

The Park is a small (~0.2ha) recreational municipal playground located on the shoreline of Blind River, in Blind River, Ontario. Coordinates of the approximate center of the Park are UTM (NAD83) 17T 348518 5117196. The Town seeks to remove existing playground equipment and allow the space to naturalize.

The Blind River system is fringed by riverine marshes that could support up to four turtle species known to occur in the North Shore area; Midland Painted Turtle (*Chrysemys picta*; not at risk), Snapping Turtle (*Chelydra serpentina*; Special Concern), Norther Map Turtle (*Graptemys geographica*; Special Concern) and Blanding's Turtle (*Emydoidea blandingii*; Threatened). Under provincial policies, nesting by Special Concern turtles can qualify as a Significant Wildlife Habitat type, and nesting by threatened Blanding's Turtle is protected under the Endangered Species Act. A marsh exists along the northern edge of the Park bordering the river. The Park itself consists of manicured lawn, scattered shrubs, and exposed sandy substrate around the existing playground equipment.

Blanding's Turtle (Threatened)

TULLOCH has advised the Town that, in an absence of nesting studies, activities performed in the Park should be undertaken with the assumption that turtle nesting on site could be Blanding's Turtle and subject to Endangered Species Act protections. Blanding's Turtle is a pond turtle species that typically occupies wetlands and eutrophic waterbodies with soft substrates and minimal flow. Common examples include ponds, beaver impoundments, and shallow marshes adjacent to lakes and slow-moving rivers. Blanding's Turtle typically nests in vicinity of a suitable wetland where sandy substrates are present and exposed to direct sunlight.

This letter considers turtle habitat according to the Ministry of the Environment, Conservation and Parks' General Habitat Description for Blanding's Turtle, which establishes three categories of habitat for this species:

> **Category 1 Habitat** includes nests and the area within 30 metres or overwintering sites and the area within 30 metres.
> **Category 2 Habitat** includes the wetland complex (i.e. all suitable wetlands or waterbodies within 500 metres of each other) that extends up to two kilometers from an occurrence, and the area within 30 m around those suitable wetlands or waterbodies.
> **Category 3 Habitat** includes areas between 30 metres and 250 metres around suitable wetlands/waterbodies identified in Category 2, and within two kilometers of an occurrence.

Wetlands adjacent the Park contain habitat suitable to support for Blanding's Turtle, with permanently flooded sections of the wetland potentially suitable for overwintering habitat. Sandy substrates within the Park are ideal for the species' nesting. If Blanding's Turtle are present, provincial guidelines indicate that habitat would be considered all wetlands adjacent to the Park, as well as the entirety of the Park itself.

Best Practices

A summary of best practices for the removal of the playground equipment, and the re-naturalization / maintenance of the Park, is provided below. Emphasis is placed on promoting Endangered Species Act compliance for Blanding's Turtle, but these recommendations will also safeguard and promote habitat for all other local turtle species.

- **Remove existing equipment outside of the turtle active period.** Undertake the removal of existing playground equipment from October 15 to April 30 (of the following year) while turtles are restricted to overwintering habitat (i.e., not active or nesting in the Park).
- **Retain sandy nesting habitat.** After the existing playground equipment is removed, it is recommended that portions of the Park adjacent to the river (within approximately 15-20m of the river, and relative to turtle nesting locations in previous years) be allowed to naturalize. We do not recommend further habitat alterations, but simply halting Park maintenance and allowing the grassy vegetation to grow un-mowed into a meadow. Sandy habitat within this space (formerly associated with the playground equipment), should be kept in place and not re-seeded. This sandy habitat should be raked level, or mounded slightly, upon equipment removal; do not leave depressions. Sand salvaged from other portions of the Park (beyond the 15-20m) can be used to fill depressions left by removed equipment, if necessary. Consider posting signage informing the public that habitat restoration is in progress.
- **Revegetate any sandy areas beyond the retained habitat.** Any sandy substrates beyond the above retained habitat should be revegetated to a dense grass cover. This may require the placement of topsoil and hydroseeding. Restrict public access to this area while the new vegetation and root systems are being established. If this regreening must be performed between May 1 and October 14, it is recommended that temporary reptile exclusion fencing be erected around it prior to May 1 of that year to ensure that no turtle eggs are deposited in that habitat prior to alteration. Reptile fencing best practices are provided in Attachment I. Remove fencing once grass is well established.
- **Controlled public access**. If the Town seeks to facilitate public access through the Park, such as to allow pedestrian travel between Shirvon Drive with Longview Avenue, it is recommended that a clear pathway be established outside of the retained habitat recommended in Bullet 2, above. This may be as simple as only mowing the desired pedestrian areas and allowing the remainder of the Park to grow up into dense meadow. Other options could include signage, trail markers (e.g., boulders, posts, ornamental trees) or surfacing of the trail. Should the trail be surfaced, coarse compact gravel (without sandy inclusions), asphalt, or similar hard resistant materials are recommended. Do not place sand or finer gravel on the trail as this may encourage further turtle nesting. If space allows, consider the addition of a picnic table within mowed areas (away from the shoreline) to promote continued enjoyment of the greenspace and passively redirect recreational activities away from the retained habitat areas.
- **Safe turtle encounters.** Town staff, and their contractors, must remain vigilant for turtles when undertaking Park maintenance or other activities during the turtle active season (May 1 to October 14). If Blanding's Turtle is encountered at any time in the Park, any activities that could harm or harass the species must stop and the species

must be provided with a reasonable amount of time to vacate on its own accord. Any other turtle species can be safely relocated to the adjacent Blind River. If turtle nests are discovered, they should be marked and avoided.

- The Species at Risk Branch of the Ministry of the Environment, Conservation and Parks administers the ESA. If any activity must be undertaken that risk harm or harassment to Blanding's Turtle, or the destruction of its habitat, the Ministry should be consulted to review project compliance with the ESA. We recommend a qualified Environmental Professional be retained to undertake that consultation.

Other general best practices recommended for work proposed near Blind River and its wetlands:

- **Prevent contamination and spills at the worksite.** All construction equipment should arrive clean and mechanically sound to avoid leaks and spills. All filling and storage of equipment fluids (hydraulic fluid, grease, fuel, etc.) should be performed >30 m from Blind River, and in an area that would not drain directly to the watercourse should a spill occur. A spills kit with contents appropriate for the types and quantities of deleterious substances on site should be kept on site while work is underway. All spills must be immediately reported by phone to the Ontario Ministry of the Environment Spills Action Centre (24-hours a day) at 1-800-268-6060.
- **Proper containment of sediments.** Any sediments generated on site, such as by earthworks or equipment removal, should be contained and not allowed to wash into Blind River. Sediment and erosion control should be planned in advance of the work; especially if rain or snowmelt is a forecasted.
- **Prevent the spread of invasive species.** Prevent the spread of invasive plant species by ensuring that machinery arrives washed and free of soil and plant debris. If soil is brought from off-site, ensure that it is sourced as locally as possible and not from an area prone to invasive plants.

Closing

TULLOCH is pleased to provide this Letter of Professional Opinion in support of the Town of Blind River's efforts to reclamate Shirvon Park. Please contact the undersigned with any question or clarifications.

Kelly Major, M.Sc. EP
Senior Terrestrial Ecologist
Certified Environmental Professional

Attachment I – Reptile Fencing Best Practices

Attachment I

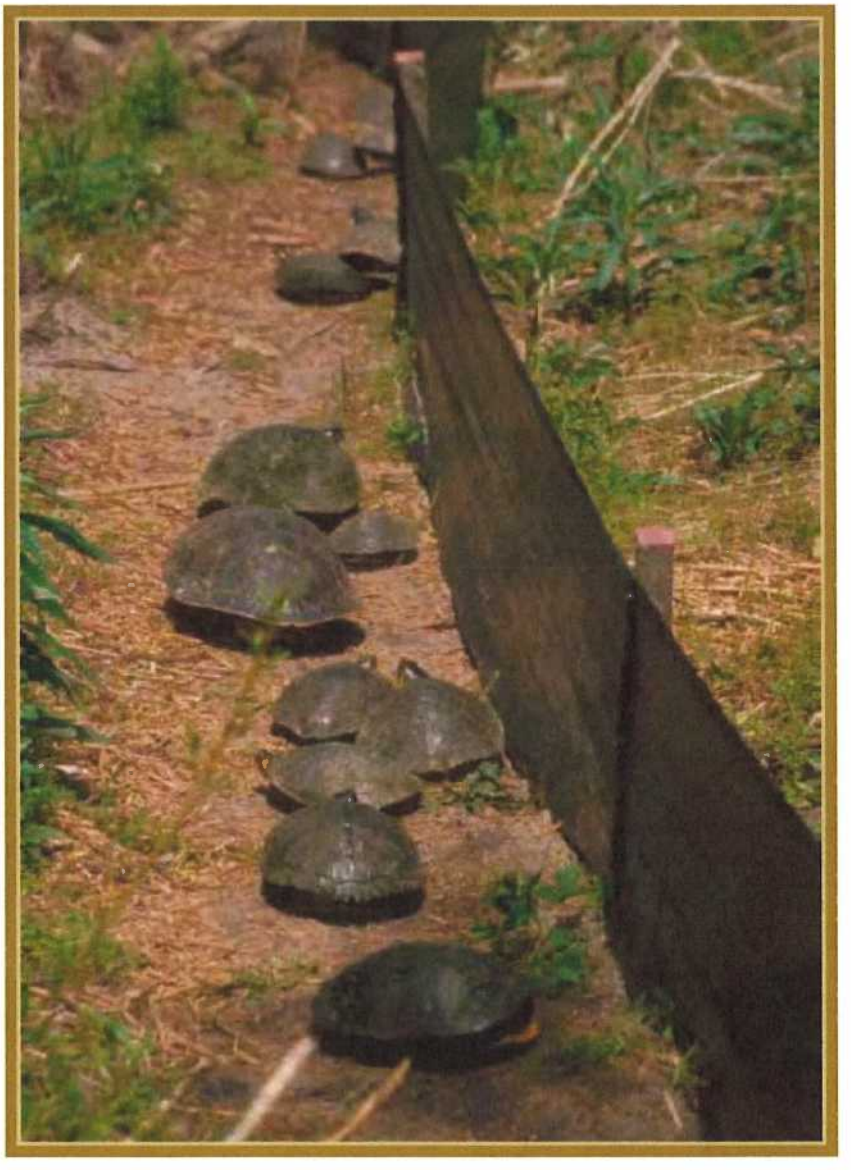
Reptile Fencing Best Practices

SPECIES AT RISK BRANCH
BEST PRACTICES TECHNICAL NOTE

REPTILE AND AMPHIBIAN EXCLUSION FENCING

Version 1.1

July 2013



Ministry of Natural Resources

Ontario

July 2013

Ontario Ministry of Natural Resources
Species at Risk Branch

Recommended Citation:
OMNR. 2013. Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. Species at Risk Branch Technical Note. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. 11 pp.

Cover illustration: Photograph by Matthew J. Aresco, Conservation Director, Nokuse Plantation

Before an activity can be initiated, permissions, approvals or authorizations may be required from MNR (e.g. Endangered Species Act authorization, Wildlife Scientific Collector's Authorization) or other agencies, levels of government (e.g. a conservation authority, municipality, federal or provincial government), or landowners. It is your responsibility to ensure that all necessary permissions, approvals and authorizations are acquired prior to proceeding with your activity.

This document presents information as of the point in time of publication and is meant to be updated through time as improved information becomes available.

Cette publication hautement spécialisée, Reptile and Amphibian Exclusion Fencing Best Practices n'est disponible qu'en anglais en vertu du Règlement 671/92 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec le ministère des Richesses naturelles au Pamela Wesley,705-755-5217.

Document History

Revision Number	Revision Date	Summary of Changes	Originated	Reviewed	Authorized
1.1	June, 2013	Pre-publishing edits	June, 2013	June, 2013	June, 2013

REPTILE AND AMPHIBIAN EXCLUSION FENCING - BEST PRACTICES -

The purpose of this guidance document is to provide an overview of proven design and installation techniques for reptile and amphibian exclusion fencing. Though this document points to site and species-specific design requirements, it is important to recognize that every situation is different. This guidance is not meant to replace site-specific advice obtained from local MNR staff or experienced exclusion fencing contractors. Moreover, exclusion fences are only effective when well planned, properly constructed, and maintained.

Exclusion fencing seeks to eliminate access to specific areas where activities that could harm animals are occurring (e.g. active aggregate operations, construction sites, and roads). The selection and installation of exclusion fencing can present some challenges, particularly if multiple species are being excluded. For example, some reptiles and am phibians are able to dig under fencing while others can climb over. Some may also take advantage of burrows dug by other animals. To maintain effectiveness, the bottom of the fence should be buried or secured firmly to the ground and minimum height recommendations (Table 1) are considered.

Exclusion fence design should consider the target species as well as those that might be unintentionally impacted. Fenc ing material should not pose a r isk of entanglement or permit individuals to pass underneath or between openings. Landscape features such as topography and substrate need to be considered as they may constrain fencing design.

Including plans for fencing in advance of a project can increase efficiency and f ence effectiveness. For example, long-term road projects that will include a permanent sound barrier could design the sound barrier such that it also meets the specifications of the required exclusion fence.

EFFECTIVE FENCE CHARACTERISTICS

The fence burial and hei ght recommendations listed in Table 1 below have been c ompiled from scientific literature, established management practices, and pr actitioner best advice. These are general recommendations and at times other specifications may be more appropriate. For instance, in areas where the substrate does not permit fence burial, weighing down the fence with heavy items (e.g. sand bags) or backfilling may be acceptable. Where needed, speak with your local MNR staff or experienced exclusion fencing contractor to develop site-specific plans.

If multiple species are being excluded from the same area, and t he species-specific fencing specifications differ, the uppermost minimum height and greatest depth recommendation should be used (Table 1). If you are excluding both Blanding's Turtle and Gray Ratsnake, for example, the exclusion fence should be a m inimum of 2 m tall (see Gray Ratsnake section below for additional details).

Exclusion fences should be installed prior to emergence from hibernation. A survey of the enclosed/secluded area should be conducted immediately following fence installation to ensure that no individuals have been trapped on the wrong side of the fence.

Table 1. Recommended burial depth and height requirements of exclusion fencing for reptiles and amphibians. Recommended height is the height of the fence after it has been installed including the buried components and any installed overhangs or extended lips.

SPECIES	RECOMMENDED DEPTH OF FENCE BURIED (cm) *	RECOMMENDED HEIGHT OF FENCE (cm) **
Turtles – general	10 – 20	60
Eastern Musk Turtle, Wood Turtle	10 – 20	50
Massasauga, Eastern Hog-nosed Snake, Butler's Gartersnake, Queensnake	10 – 20	60
Gray Ratsnake & Eastern Foxsnake	10 – 20	200
Fowler's Toad	10 – 20	50
Snakes - general	10 – 20	100
Common Five-lined Skink	10 – 20	unknown
Salamanders	10 – 20	30

*** does not include the 10 cm horizontal lip that should extend outward an additional 10 – 20 cm (see Figure 2)**
**** the height of fencing has been provided as an approximate. Fencing materials may in fact not be available in proportions that would allow for these precise measurements. It is most effective, if the height and burial depth recommendations are met.**

DURATION OF ACTIVITIES & DEGREE OF ANTICIPATED DISTURBANCE

The type of disturbance, the proximity to disturbance, and the planned fence longevity are factors that influence which type of exclusion fence is most effective. For short-term activities (i.e. 1 to 6 months) such as minor road repairs, a light-duty geotextile fence is appropriate. Longer term or permanent fencing projects, however, require more durable materials such as – heavy-duty geotextile, wood, concrete, woven-wire, sheet metal, vinyl panels, or galvanized mesh.

GEOTEXTILE FENCES

Geotextile fences (e.g. silt fences) come in many types and qualities. They can be very effective for the temporary exclusion of reptiles and amphibians. For the purposes of this document, temporary use ranges from a few months up to 2-3 years. Winter weather is generally damaging to geotextile materials and the cost of maintenance over the long-term should be considered during the planning phase. Depending upon the quality, geotextile can be resistant to UV degradation and the bio-chemical soil environment.

Light-duty Geotextile Fencing:

Light-duty geotextile fencing is made of nylon material and is typically purchased with wooden stakes pre-attached at 2 m to 3 m intervals (Plate 1). It can also come without pre-attached stakes. Light-duty geotextiles are largely intended for projects with shorter durations of only a few months in duration and up to one season.

Geotextile fencing with nylon mesh lining should be avoided due to the risk of entanglement by snakes.

To use light-duty geotextile fencing:

- Fencing fabric is effective if attached to wooden, heavy plastic or metal stakes using heavy-duty wire staples or tie-wire (Figure 2).
- Secure the fence on posts that are placed at 2 m to 3 m apart. If using the greater recommended distance between posts, additional maintenance may be required to maintain effectiveness.
- Securely drive the stakes into the ground to a recommended depth of 30 cm. The fencing fabric should be buried to the recommended specifications in Table 1 and back-filled with soil.
- For snakes, supporting posts should be staked on the activity side (e.g. on the side facing the aggregate stock pile or the road - Figure 2).
- Light-duty geotextile fences are not effective where rocks or other hard surfaces prevent proper anchoring of fence posts and burial of the fence fabric.
- Light-duty geotextile fences are not effective where a large amount of concentrated run-off is likely or to cross streams, ditches or waterways without specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice and recommendations.
- See general best practices section below for additional details.

Generally, light-duty geotextile fences are not effective if they exceed 1 metre in height unless purposely manufactured for greater height (e.g. stakes placed at closer intervals or cross braces). If greater height is required consider using heavy duty geotextile, hardware cloth or other fencing materials.

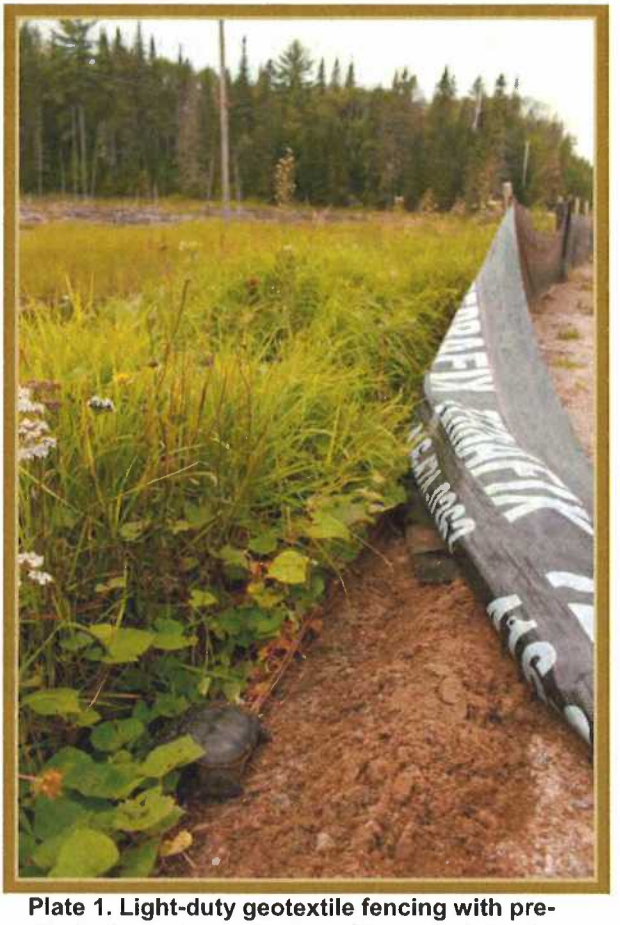


Plate 1. Light-duty geotextile fencing with pre-attached wooden stakes used to exclude turtles from a road as seen on a regular maintenance check (photo credit: Brad Steinberg).

Heavy-duty Geotextile Fencing:

Heavy-duty geotextile fencing is typically constructed of a thick felt-like fabric. It may also be called 'double row' or 'trenched' fencing. For support, this fencing uses a woven wire fence (e.g. chain link) or some other structure (Plate 2). It is recommended that a minimum density of 270R or equivalent woven geotextile fabric is used.

Heavy-duty geotextile material can be effective for up to 2 or 3 years with proper maintenance. This type of fencing can be damaged by small mammals chewing through or torn by heavy debris (e.g. tree branches). Therefore, it may be best suited to turtles, which are less likely to take advantage of holes or tears in the fabric. If

used to exclude snakes or other animals, more maintenance may be required.

Heavy-duty geotextile fencing:

- The wire fence should be installed on the activity side to prevent animals from leveraging and climbing into the exclusion area while allowing the animal to escape if they find themselves on the wrong side (Figure 2).
- Geotextile fences across streams, ditches or waterways should have case-specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice.
- See light-duty geotextile section above and g eneral best practices below for additional details.

Plate 2. Example of a heavy-duty geotextile fencing used to exclude snake species (photo credit: Jeremy Rouse).

HARDWARE CLOTH FENCES

Hardware cloth (also known as galvanized mesh or Birdscreen) is durable, cost effective and us eful for excluding reptiles and amphibians. The fence should be made of heavy galvanized hardware cloth with a ¼ inch mesh. For fences intended to exclude small snakes, a ⅛ inch mesh may be more effective. In contrast, fencing intended to exclude turtle species can have a larger mesh size (e.g. ½ inch). Lar ger mesh may have a l onger lifespan as it is constructed from a thicker material compared to smaller mesh sizes.

To use hardware cloth fencing:

- Secure the fence on posts placed a recommended 2.5 m apart with the stakes on the activity side (Figure 2).
- Pull the mesh taught and staple or secure with screws and a m etal stripping to prevent the mesh from being ripped when pressure is applied.
- Installing a top rail or folding the mesh over a taut smooth wire reduces tearing (Plates 3 and 4).
- An outward facing lip installed on the species side ensures that snakes and amphibians are unable to climb or jump over the fence (Figure 2; Plate 4)
- Tears can be mended with 18-gauge galvanized wire.
- See general best practices section below for additional details.

Plate 3. Example of a galvanized mesh fencing used for the long-term exclusion of snakes and turtles from the adjacent highway (photo credit: Megan Bonenfant).

Plate 4. Long-term to permanent exclusion fencing using galvanized mesh with over-hanging lip to prevent animals from climbing or jumping over (photo credit: Megan Bonenfant).

WOOD LATH SNOW FENCING

In certain circumstances, wood lath snow fencing can be effective at excluding turtles. This fencing is typically constructed from soft wood slats that have been w oven together with 13-gauge wire and is then attached to steel fence posts which have been driven into the ground.

Wood lath fencing is cost effective and can easily be laid down during the winter to prevent damage. The durability of the material, however, is not meant for very long-term use (e.g. more than 3 y ears), unless regular maintenance occurs.

To use wood lath snow fencing:

- The fencing should be attached to heavy plastic or metal stakes using heavy-duty wire staples or tie-wire.
- The stakes are recommended to be placed at 2 to 3 m intervals and securely driven into the ground 30 cm or more.
- Wood lath snow fencing across streams, ditches or waterways should have case-specific modifications.
- Wood lath snow fencing lends itself well to being combined with other types of material to ensure complete exclusion.
- See general best practices section below for additional details.

Plate 5. Example of a wood lath snow fencing used to exclude turtles (photo credit: Karine Beriault).

EXCLUSION FENCING FOR GRAY RATSNAKE AND EASTERN FOXSNAKE

Gray Ratsnake and Eastern Foxsnake are the largest snakes in Ontario - reaching nearly 2 m in length. They are also excellent climbers. For this reason, fencing intended to exclude either of these species has additional recommended design specifications.

- The fence should be at least 2 m high.
- The material on the species side (Figure 2) should be smooth to prevent the snakes from climbing into the excluded area.
- Stakes should be on the activity side of the fence (Figure 2).
- Due to the increase in fence height, it is valuable to decrease the distance between posts or install diagonal braces.
- See general best practices section below for additional details.

CONCRETE, SHEET METAL & VINYL WALLS

Concrete, metal or vinyl walls can stand alone or be combined with woven wire or chain link fences. They are durable, require minimal maintenance and are effective in excluding target species from high risk areas and guiding them to crossing structures or other desired locations (Plates 6 and 7). This fence type is comprised of a continuous vertical face of concrete, metal or vinyl sheeting with no gaps. Concrete walls can be installed as either pre-cast sections or pour directly in place.

Plate 6. Stand-alone continuous concrete wall used to exclude salamander species installed as pre-cast forms (photo credit: Steven Roorda).

Plate 7. Pre-formed vinyl sheeting fence intended to exclude salamanders for a construction site (photo credit: Herpetosure Ltd.)

The wall height depends upon the target species, but they are usually between 45 and 60 cm tall and buried 25 cm. Concrete, metal or vinyl exclusion fencing is most appropriate for salamanders, skinks, small snakes, and small turtles. For large turtle species, a chain link fence can be installed directly on top of the concrete wall for complete exclusion.

HABITAT CONNECTIVITY

Habitat connectivity is the connectedness between patches of suitable habitat or the degree to which the landscape facilitates animal movement. Exclusion fencing installed along roads or other large projects can effectively reduce or eliminate habitat connectivity for animals. In these scenarios, exclusion fencing should be considered with eco-passages in order to maintain connectivity. Fencing in isolation should be viewed as a temporary method to reduce mortality until species movement can be restored. Where eco-passages are not feasible they should be identified for consideration with any future road work or development to improve connectivity.

During the installation of fencing with an eco-passage, it is important that the fencing sits flush with the passage to ensure that

there are no gaps where animals can squeeze through.

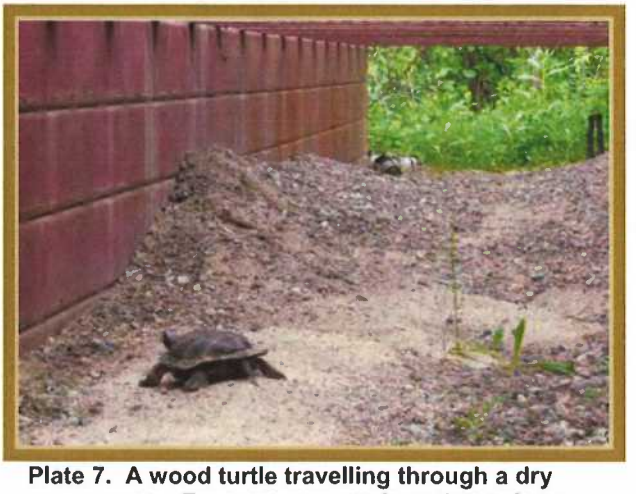


Plate 7. A wood turtle travelling through a dry eco-passage. Ecopassages such as this help to ensure the long-term connectivity of seasonal habitat for this and other reptile and amphibian species (photo credit: Amy Mui).

GENERAL BEST PRACTICES:

- To deter digging, bury the fence 10 cm down with an additional 10 cm horizontal lip (Figure 2).
- Backfill and compact soil along the entire length on both sides of the fence (Figure 2).
- Once the fence is installed, a survey should be done to ensure that no individuals have been trapped inside (speak with MNR for survey advice).
- Exclusion fencing intended to exclude snakes should have the stakes installed on the activity side (opposite the normal requirement for sediment control fencing) to prevent snakes from using the stakes to maneuver over the fencing.
- For snakes and toads, the fence should have an overhanging lip on the species side (Figure 2).
- Fences should be inspected after spring thaw and at regular intervals throughout the active season, especially following heavy rain events. This is particularly important for geotextile fences. Any damage that affects the integrity of the fence (e.g. tears, loose edges, collapses, etc.) should be fixed promptly.
- Tall or woody vegetation on the species side of the fence should be managed if there is a risk that it may enable the animals to climb over. This is most important during spring and fall. Proceed cautiously to not harm animals protected plant species during vegetation removal.
- When installing an eco-passage, fencing or exclusion walls should be used as a guiding system to direct animals to passage openings.
- Natural screens such as trees or shrubs can help to reduce road access and can be combined with fencing to provide protection of individuals from predation.
- Install fences with a turn-around at the ends furthest from the wetland habitat and at any access areas to assist in redirecting animals away from any fence openings (Figure 1).
- Curving the ends of the fencing inward (i.e. away from the road or construction site) may help to reduce access to these locations. The ends may also be tied off to natural features on the landscape such as trees or rock cuts.

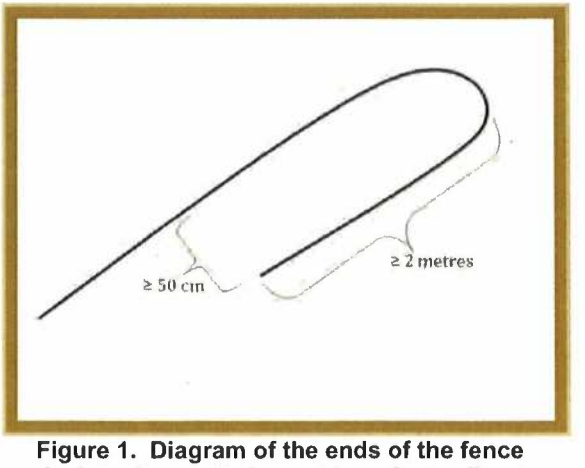


Figure 1. Diagram of the ends of the fence designed to curve inward in order to direct animals away from the area of exclusion.

WATER MOVEMENT & DRAINAGE

- In areas where surface water run-off may erode a s oil-based backfill, consider using rocks or sand bags. Ensure these materials cannot be used by animals to climb over the fence.
- Where possible, minimize the number of water crossings: when necessary, it should occur where flow is minimal.
- Fence posts in waterways or areas prone to seasonal flooding should be driven rather than dug – unless following established best practices.
- Fencing should be placed above the high water mark anticipated for high water events such as spring freshet or periods of heavy or continuous rainfall.

TOPOGRAPHY:

- Fence posts should be closer together in undulating topography.
- Fences installed on s lopes have a different effective height depending upon whether the animal will be approaching from the up or down slope. T he fence height can be adjusted accordingly.

Improvements or questions regarding exclusion fencing can be brought to the local MNR Species at Risk Biologist or other MNR staff.

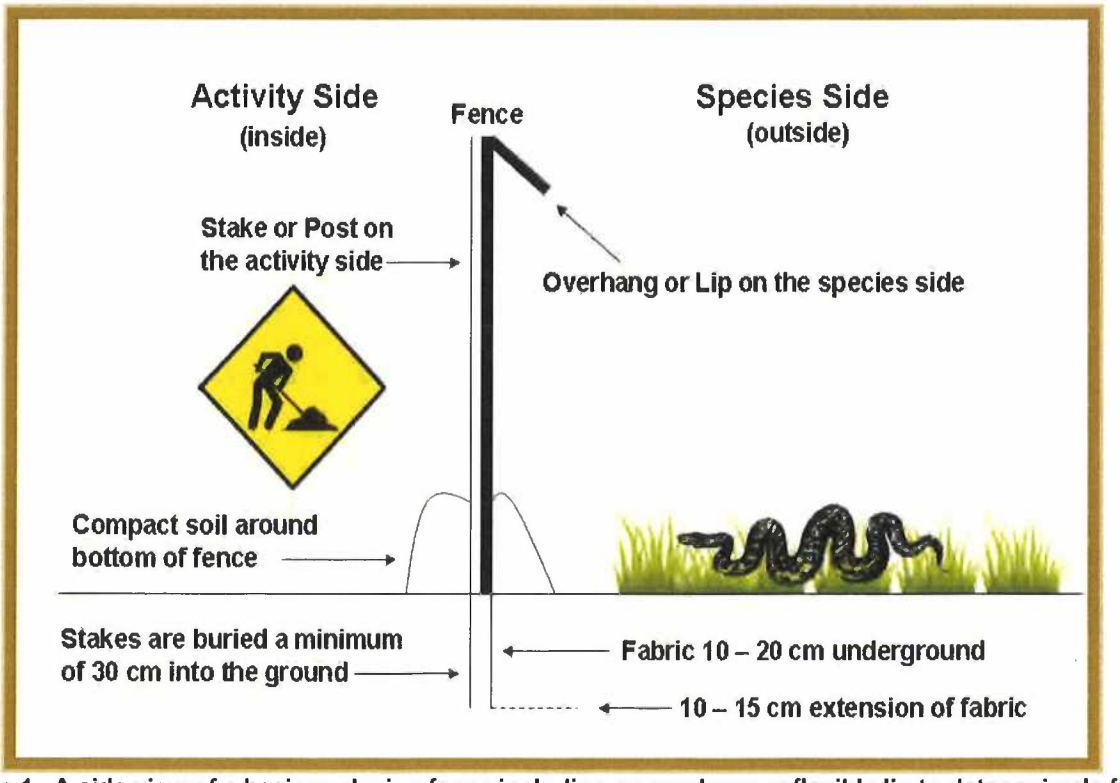


Figure 1. A side view of a basic exclusion fence including an overhang or flexible lip to deter animals from climbing or jumping over the fence. Placement of the stake on the Activity Side or on the inside of excluded area is also illustrated. This is particularly important for snake species which may use the stakes to maneuver over the fence.

RESOURCES:

ACO Systems Ltd., 2007. Wildlife fencing systems. Accessed July 2012. Available at: http://www.acocan.ca/wildlife/fence.htm.

Dodd, C.K, W.J. Barichivich, and L.L. Smith. 2004. Effectiveness of a barrier wall and culverts in reducing wildlife mortality on a heavily traveled highway in Florida. Biological Conservation 118: 619-631

Flat-tailed Horned Lizard Interagency Coordinating Committee. 2003. Flat-tailed horned lizard rangewide management strategy, 2003 revision. 80 pp., plus appendices.

Jochimsen, Denim M., Charles R. Peterson, Kimberly M. Andrews, and J . Whitfield Gibbons. 2004. A literature review of the effects of roads on amphibians and reptiles and the measures used to minimize those effects. USDA Forest Service.

KRCA, 2006. Silt Fence Installation and Maintenance. KRCA, Kawartha Region Conservation Authority Environmental Advisory Services, Port Hope, ON, 2 pp.

Long, K, and A. Robley, 2004. Cost Effective Feral Animal Exclusion Fencing for Areas of High Conservation Value in Australia. The Department of Environment and Heritage. Natural Heritage Trust, Victoria, Australia, 61 pp.

Queensland Department of Transport and R oads, 2010. Fauna Sensitive Road Design Manual, Volume 2: Preferred Practices. Chapter 9, Case Studies, Connecting Queensland, Road and Delivery Performance Division, Queensland Government, 134 pp.

Sarell, M, 2006. Living in Nature Series: How to Snake-proof you House and Yard. South Okanagan-Similkameen Stewardship

Program. The Land C onservancy of BC, Penticton, BC. 8 pp.

TWP Incorporated, Galvanzied Mesh for Snake Control. Accessed July 2012, Available at: http://www.twpinc.com.

For additional information:

Visit the species at risk website at
ontario.ca/speciesatrisk
Contact your MNR district office
Contact the Natural Resources Information Centre
1-800-667-1940
TTY 1-866-686-6072
mnr.nric.mnr@ontario.ca
ontario.ca/mnr