**Gray Ratsnake Nesting Box Program Protocol**

**Purpose:** To enhance and provide nesting habitat for gray ratsnakes within the Frontenac Arch range of the species in partnership with landowners and public agencies.

**Background:** For several years, the Leeds Grenville Stewardship Council has been working in partnership with OMNR to implement and monitor gray ratsnake nesting boxes. To date, the program has been a tremendous success in that it has produced sites where snakes are actively and successfully laying eggs and this is the only known example in the area where this type of habitat provision and use has been documented.  Even locations that have not been used by gravid female snakes can provide information as to possible nest site preferences.

**Protocols/ Site Details:**

* Refer to <http://www.lgstewardship.ca/nesting-box-plans.html> for nesting box construction plans.
* Materials for inside the nesting box should be a well composted mix of hay, woodchips and soil.
* Place new materials for the nesting box early in the spring as to allow for time to adequately start the composting process.
* Monitoring times have been adjusted from the fall to the spring each year due to the late emergence of juvenile snakes at specific sites that have shown success. It is possible that some of the juvenile snakes could use the nesting boxes as first year overwintering locations so spring monitoring will now ensure that there are no disturbances during fall emergence to the snakes directly or the temperature regimes of the nesting boxes themselves. Close to the May long weekend is considered the optimal time to monitor the nest boxes.
* Through previous years monitoring it is possible to make some general statements about optimal site characteristics though these should not be taken as the only characteristics to look for:
	+ Areas where gray ratsnakes have been observed foraging
	+ Areas close to shelter (man-made such as sheds or natural such as rock outcrops). 3 successful sites have been located directly adjacent to such shelter
	+ Areas that may provide extra moisture during the incubation period – ie next to shelter where rainwater can runoff onto nesting box materials
	+ Areas that receive significant sunlight – though one successful location is quite shaded
* Nesting box locations should be significantly away from possible mortality triggers such as roads and known higher predator populations.
* When monitoring the nesting boxes in spring, gently remove the nest box materials with pitchfork and hands. Remove the materials in a layered process from top down looking for white oval egg shells about 5cm in length. If multiple females are using the site to nest, you will typically find different nests at different layers of the nesting box.
* Temperature gauges can be provided by LGSC and OMNR. Ideal temperatures seem to be about approximately 30degrees Celsius.
* Count the number of egg shells uncovered and record.
* Provide the information to the Leeds Grenville Stewardship Council.
* In 2013 one nesting box location had an example of parasitism on gray ratsnake eggs from the larvae of the postulated carrion beetle.  At one location where nesting boxes have been successful, evidence on some of the eggs showed that they had been destroyed by the beetle larvae which emerge and predate upon the incubating eggs.  This site is used communally by gravid ratsnakes and one belief is that these communally used sites can be more susceptible to this parasitoid.  If during monitoring it is noticed that some eggs did not incubate successfully, look for small round holes in the egg shell that could be the entry point of the beetle larvae.
* If parasitism has occurred at a site, it is recommended that the nesting box material be removed and all fresh material be used the following spring.
* If parasitism at one site continues yearly, it may be recommended that the site location be changed.