

APPENDIX I

Nest Protection Program Results – Pilot Year (2014) – KNL 7 & 8 (DST 2014)

KNL Developments Inc.
2193 Arch Street
Ottawa, Ontario, K1G 3H5

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DST File No.: OE-OT-015982

Attn: Mary Jarvis, Vice President of Land Development

Re: Nest Protection Program Results – Pilot Year (2014) – KNL 7 & 8

1.0 INTRODUCTION AND PURPOSE

DST Consulting Engineers (DST), was retained by Kanata Lakes North Developments Inc. (KNL Developments) to conduct the pilot year (2014 nesting season) of the Blanding's Turtle nest protection program within the KNL 7 & 8 lands (Refer to Figure 1). At the time of report preparation, a draft *Overall Benefit Permit* application under clause 17(2)(c) of the Ontario Endangered Species Act (2007) (amended July 2013) was nearing completion (DST 2014). As discussed with the Ontario Ministry of Natural Resources and Forestry (OMNRF) staff, KNL agreed to move forward with the pilot year of the nest protection program while the permit remains in draft, in order to test the methodological effectiveness of the program and to gather additional information on areas to be targeted during post construction monitoring.

Blanding's Turtle nests experience a very high rate of predation (Congdon et al. 1983; 1993; 2000; 2008). As outlined in detail in the *Overall Benefit Permit* application, the nest protection program is designed to ultimately reduce the degree of predation of nests immediately after the eggs are laid, and hence increase the amount of nest and hatchling survivorship. The goal of this program is to reduce nest mortality in order to provide an enhancement of turtle recruitment in the population. This nest protection program is specified as one of several *Overall Benefit* measures within the draft permit application. The rationale for this program is discussed in greater detail in DST (2014).

As discussed with OMNRF, the 2014 pilot year of nest protection will be followed by two (2) additional years of nest protection which are to take place in 2015 and 2016 in conjunction with

the post construction monitoring program for the KNL 7 & 8 developments. In the long term (if successful), DST and KNL will work with the City of Ottawa to transition the nest protection program to a community stewardship project which will provide long term enhancement to the viability of the population as a whole and will provide considerable benefit to the regional population in the long term. This program ultimately should increase the probability of overall population growth.

Note that figures are taken from the draft *Overall Benefit Permit Application* (DST 2014) and figure numbering and titles have not been altered from the permit application in order to maintain consistency.

2.0 METHODOLOGY

DST's methodology for the nest protection program is based primarily on the successful nest protection program implemented at Kejimikujik National Park in Nova Scotia which has been in place for more than twenty (20) years and has also been transitioned into a community stewardship project (Smith & Caverhill 2014). DST conducted fifteen (15) night time nesting surveys for Blanding's Turtles with a twenty-one (21) day period between June 9th and June 29th, 2014 (see Table 1 below). Surveys for nesting Blanding's Turtles were carried out along transects located within the KNL 7 & 8 study area, specifically within the following areas:

- Existing Category 1 nesting areas within KNL 8 (Figure 5a and 5b);
- The gravel shoulders of the Nepean Arnprior Rail Line and Goulbourn Forced Road (Figure 1); and
- Open spaces in the 'tree massacre' site on the northwest of the Kizell Cell, the First Line Road Allowance, and on the other open patches north of the Kizell (Figure 1 and Figure 5a).

These surveys were undertaken by walking a nightly transect route starting at the east side of the Kizell Cell and progressing north along Goulbourn Forced Road until reaching the Nepean Arnprior Rail Line. From here the rail line was followed west and the open areas/fields around the rail line were searched using systematic transects. The rail line was followed west to Terry Fox Drive, and then the surveyors proceeded south along the First Line Road Allowance until reaching the west side of the Kizell Cell (Figure 1). A team of two (2) experienced biologists searched throughout known nesting areas at least one (1) hour after dusk until approximately 2 am, or until all known nesting locations were searched. These surveys were undertaken in periods without rain, and searches were conducted with systematic transects across the known nesting areas using spotlights to aid in the location of nesting females.

Efforts were made to avoid directly shining the spotlight on any turtles unless absolutely necessary when tracking them through thick vegetation. Upon discovering a turtle, DST staff members would remain silent and motionless to avoid disturbing the turtle and would proceed to quietly track its movements in hopes of observing nesting behaviours. Occasionally a turtle would

be tracked that did not exhibit nesting behaviours, however it was followed for as long as possible in order to determine if it appeared likely the turtle would nest.

Upon discovering a potential nest, DST staff members were prepared to place a nest protection box overtop of the nest so that the middle of the box was over top of the disturbed soil where eggs would have been laid. The box would then be staked into the ground on either side of the potential nest and available stones and soil would be placed around the exterior walls to prevent predation. Stones would also be added to the top of the box to provide additional weight and prevent a predator from lifting it up. As seen below in Photograph 1, the boxes were constructed out of pressure treated wood, wooden stakes and wire mesh. The nest protection box in Photograph 1 was used to protect a potential Blanding's Turtle nest observed along the rail line on June 19, 2014 (see Table 1). This box was left in its position and was checked on June 20th and July 4th, 2014. As discussed below, it was later determined that this was a false nest.



Photograph 1: DST nest protection box overtop of potential Blanding's Turtle nest during a daytime visit on June 20, 2014.

3.0 RESULTS

The results of the 2014 pilot year are summarized in Table 1 (below). Surveys were conducted between June 9th and June 29th, 2014 with a total of fifteen (15) survey nights, excluding nights when weather conditions were unfavourable (heavy rain or thunderstorms). During the survey program DST encountered four (4) turtles moving across the terrestrial landscape – all of whom were walking along the rail line. Turtles were observed on June 15th, June 19th, June 22nd and June 23rd (Photographs 2 & 3). The turtle observed on June 23rd was checked and found to be gravid. This illustrates that female turtles continue to be active in these areas over the nesting season.

During this program extensive false nesting behavior was observed. This included observations of a minimum of fifteen (15) false nests which consisted of shallow nests dug by turtles and then abandoned without laying eggs. Each of these false nests were carefully excavated by hand by DST staff and no eggs were found. Photograph 3 (below) shows a female digging one such nest on June 19th. This female was observed to excavate and then cover over the nest. DST did not observe egg laying directly but nonetheless placed a nest box over this nest (Photograph 1). To exercise caution and avoid unnecessary monitoring to the potential nest, DST conducted a site visit on July 4th, 2014 to check to see if the nest contained Blanding's Turtle eggs. A hole approximately 50 cm deep was carefully excavated by hand and revealed that this area did not contain any eggs (Photographs 4 & 5). As such, it appears that the nesting behavior observed on June 19th was another false nest. The prevalent behavior of digging numerous false nests represented a significant challenge to locating and protecting nests during this study. No actual nests were found during the pilot year, despite extensive observations of false nest activity and locating four (4) turtles in terrestrial nesting areas during the survey.

Table 1. Blanding's Turtle nest protection survey results.

Survey Date	Temperature (°C)	% Cloud Cover/Weather Conditions	Nests	Observations
9-Jun	20	0%	1 suspected false nest along rail line (south side), approximately 100 m east of rail line and Terry Fox Intersection	Kizell wetland has a big beaver dam on the west side. There are many pools along the Second Line Road Allowance that may be useable as movement corridors.
13-Jun	18	85%	5 false nests on the train track - 3 south side (marked with flagging tape) and 2 north of track	None
14-Jun	15	60%	No nests found	None
15-Jun	13	20%	No nests found	Found 1 turtle (Easting: 0426089, Northing: 5020272) - turtle observed for approx. 4 hours (until 2 am) with no nesting occurring.
16-Jun	18	70%	No nests found	None
17-Jun	17	100% cloud cover, light rain, stopped raining around 12:00 am	No nests found	None
18-Jun	17	20%	No nests found	None
19-Jun	15	35%	Turtle appeared to be nesting at (Easting: 0426319, Northing: 5020298) - at 12:15 am - later found to be false nest.	Turtle was observed covering nest. Nest was protected with a nest protection box.
20-Jun	13	20%	No nests found	None
21-Jun	15	0%	3 false nests found 100 m west of Goulbourn Forced Road/Rail Line Intersection	None
22-Jun	20	10%	No nests found	Came across one turtle along the train track but retreated into bush (Easting:0426310, Northing: 5020441). Turtle most likely had already laid eggs. Turtle still has the radio tracker from Dillon Consulting.
23-Jun	21	0%	6 false nests on the rail line, approximately 200 m east of rail line and Terry Fox Intersection	Gravid female found (Easting: 0450993, Northing: 5028227) she was tracked but did not show nesting behavior.
26-Jun	23	5%	No nests found	No turtle
28-Jun	27	Not Recorded	No nests found	None
29-Jun	26	70%	No nests found	None



Photograph 2: Blanding's Turtle female observed along the rail line on June 23, 2014. Female was found to be gravid but did not lay while being tracked on June 23rd, 2014.



Photograph 3: Blanding's Turtle female observed covering false nest area just north of the rail line on June 19, 2014. Investigation of nest found no eggs to be present.



Photograph 4: Nest protection box at suspected nest on July 4, 2014 during confirmatory egg check.



Photograph 5: An approximately 50 cm deep hole excavated by DST staff on July 4, 2014 under nest box shown in Photograph 4. No turtle eggs were found, indicating this was another false nest.

4.0 DISCUSSION AND RECOMMENDATIONS

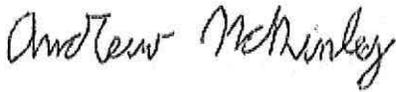
The extensive false nesting behavior coupled with the low density of nesting turtles (estimated to be no more than approximately 20 to 30 nesting females in the KNL lands (DST 2014) resulted in no actual nests being found. The pilot year confirmed that nesting females occur in the areas identified and that the focal point of turtle activity is along the loose fill and gravel shoulders of the Nepean Arnprior Rail Line, where four (4) female turtles and approximately fifteen (15) false nests were observed. While the night time search methodology was effective at locating some turtles and did confirm priority areas of nesting activity, the low density of turtles, false nesting behavior, thick vegetation creating low search visibility in the open areas around the rail line, and low probability of encountering a turtle during active nesting resulted in no nests being found. Moving forward, it is recommended that the methodology be refined to identify and radio tag females early in the active season so that they may be consistently relocated every night during the nesting season. In future years (2015 and 2016) the nest protection program will be undertaken concurrently with the post construction monitoring program. The post construction monitoring will include an initial capture period using hoop nets when turtles will be radio tagged, and then turtles will be tracked continuously during the post construction monitoring. When radio tagging turtles for this program, females should be emphasized and radio tagging of those females will allow them to be relocated on a nightly basis during the 2015 and 2016 nesting seasons. This will greatly increase the number of turtles encountered over the course of the nest protection program and will also increase the probability of observing a turtle nesting by locating the same gravid females every night until they are no longer gravid. Radio tracking will also allow turtles to be relocated consistently in low visibility areas such as the long grass in the fields between KNL 7 & 8. The results of the pilot nest protection year should be used to prioritize areas for nightly radio tracking during 2015 and 2016 - specifically, the emphasis for future nest searches should be around the rail line where the majority of turtle activity was observed, as well as the known Category 1 nesting areas in KNL 8 and the future artificial nesting areas that will be built as part of the KNL habitat compensation program (DST 2014).

5.0 CLOSURE

We trust that the above information is sufficient, should you have any questions or require further information, please do not hesitate to contact the undersigned at your convenience.

Sincerely,

For **DST Consulting Engineers Inc.**,



Andrew McKinley, PhD, MA, BA (Hons.), EP, RP Bio
Senior Biologist



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Senior Technical Advisor

6.0 REFERENCES

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