



GUIDING SOLUTIONS IN THE
NATURAL ENVIRONMENT

Wildlife Management Plan

4134 16th Avenue (York Downs Golf and Country Club)

City of Markham

Prepared For:

Sixteenth Land Holdings Inc.

Prepared By:

Beacon Environmental Limited

Date: *Project:*

March 2018 215200

Table of Contents

	page
1. Introduction.....	1
2. Land Use and Design	1
2.1 The Greenway System	1
2.2 Connectivity.....	2
2.3 Restoration and Enhancement	2
3. Wildlife Mitigation during Construction.....	3
3.1 Proactive Mitigation	3
3.1.1 Erosion and Sediment Control.....	3
3.1.2 Wildlife Exclusion Fencing.....	4
3.2 Fish	5
3.2.1 Crossing Installation and Removals.....	5
3.2.2 Pond Removal	6
3.3 Amphibians.....	6
3.4 Reptiles	7
3.5 Birds	8
3.5.1 Species at Risk	8
3.5.2 Tree Removal and Potential Nesting	9
3.6 Mammals.....	9
4. Post Construction Stewardship.....	10
4.1 Dedication of Lands to Public Authority	10
4.2 Ecological Monitoring	10
4.3 Public Awareness	10
5. References	13

Figures

Figure 1.	Site Location.....	after page 2
Figure 2.	Greenway System and Ecological Linkages	after page 2
Figure 3.	Existing Conditions Wildlife.....	after page 6

1. Introduction

This Wildlife Management Plan (WMP) has been prepared by Beacon Environmental Limited (Beacon) for the property located at 4134 16th Avenue, henceforth referred to as the “subject property” (**Figure 1**). The subject property is a total of 168.64 hectares (416.72 acres) bounded by 16th Avenue (south), Major Mackenzie Drive (north), Warden Avenue (west), and Kennedy Road (east) in the City of Markham, Regional Municipality of York. Opened in the early 1970’s, this property currently exists as a golf and country club. These lands are proposed to be developed as residential community and parkland. Existing residential development surrounds the property on all sides.

This WMP has been prepared on behalf of Sixteenth Land Holding Inc. to address concerns regarding the protection of wildlife and their habitats prior to, during and post construction. None of the items addressed in this plan require approvals or permits under any form of legislation. Rather, this document is intended to satisfy concerns regarding potential harm to urban wildlife that may be inhabiting the subject property.

The WMP will demonstrate the due diligence to be taken in order to ensure the highest quality of safety and planning with regard to wildlife before, during, and after construction. This report will address possible management strategies for all species of wildlife found throughout this site.

2. Land Use and Design

Careful consideration is taken during the process of developing land use plans to ensure any impacts to wildlife are minimized to the extent possible. The means by which this is achieved typically focuses on the delineation of a natural heritage system (i.e., Greenway System), which is based on the features present on the site and consideration of aquatic and terrestrial wildlife which utilize the site.

2.1 The Greenway System

The Environmental Report within the Master Environmental Servicing Plan (MESP) identified Bruce and Berczy Creek valleys, the eastern woodlot (Feature 1), and a Bruce Creek Tributary as part of the Greenway System. The purpose of the Greenway System is to:

- Support ecological function;
- Provide access to natural areas; and
- Provide continuous trails linking the City’s Greenway System with the Rouge Park, the Oak Ridges Moraine, and the Don River south of Steeles Avenue.

As shown on the development plan (**Figure 2**), the features on the subject property have been maintained with appropriate buffers in order to ensure their continued function, to promote connections to neighbouring wildlife communities and to allow for safe wildlife passage. Animals will be free to travel safely throughout the development and beyond without being isolated to individual areas. This level of

connectivity will ensure their continued ability to migrate throughout the region for the purposes of foraging, breeding, and expanding their habitats.

2.2 Connectivity

The design of the subdivision itself plays an important role in minimizing interactions between humans and wildlife. Accessibility between ponds and wetlands through the use of stream and habitat corridors should minimize the likelihood of any negative interactions. Berczy and Bruce Creek connect the wildlife habitat within the subject property with large areas of similar habitat elsewhere within the Greenway System. Existence of this corridor system will allow animals to separate themselves from construction activities without reducing the amount of habitat available to them. These same passageways will also allow animals to re-enter the subject lands after construction is complete.

The development has been designed to allow connectivity throughout both valleylands, as well as from these valleylands to adjacent woodlots, parks, and ponds. These ecological linkages are illustrated on **Figure 2**.

To maintain connectivity along Bruce Creek valleyland, the crossing at Street A will be designed with a span large enough to accommodate natural channel migration, provide riparian habitat and have consideration for terrestrial wildlife passage. Sloped walls of the valley will facilitate the movement of animals through this open passageway as opposed to traveling up slope and being put at risk by vehicles by crossing the road.

There are no other road crossings proposed over Bruce or Berczy Creeks, and only three trail crossings have been proposed over Bruce Creek, in existing golf cart path crossing locations. The number of crossings has been minimized so as to limit impacts to the valleyland. Existing golf cart path locations were chosen to capitalize on the areas of disturbance which currently exist within the valleyland.

Stormwater Management (SWM) ponds are not explicitly designed as habitat; however, they often provide habitat for both terrestrial and aquatic species. Further, they provide transition areas between urban areas and the Greenway System. These SWM ponds have been located adjacent to Bruce Creek to extend the Greenway System and provide this transition.

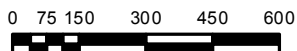
Although parks are not naturalized environments, these open spaces are landscaped and provide habitat for many common mammals and birds. The large park blocks replicate some of the golf course habitat these animals are used to. The parks are easily accessible, and provide increased habitat area for utilization by these species.

2.3 Restoration and Enhancement

The valleylands of both Bruce and Berczy Creeks are proposed for restoration and enhancement as part of the overall compensation and enhancement plan for the subject property. This includes buffer plantings and landscaping of the golf course area within the valley. These areas will be fully landscaped with the outer edges of the valley rehabilitated to forest cover, and the inner riparian area rehabilitated to open grass areas. These open grass areas are most beneficial to Redside Dace (*Clinostomus elongatus*), as it provides a good food source. The areas also replicate some of the open areas of the



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Subject Property




Wildlife Management Plan 4134 16th Avenue

FIGURE 1 Site Location

First Base Solutions Web Mapping Service 2015
UTM Zone 17 N, NAD 83

Date: March 2018





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Legend

Subject Property

Development Plan

Watercourse

Greenway System

Constructed Wetland

Ponds to be Removed

Pond to be Retained

Ecological Linkages

JD Barnes: Aerial Photograph, 2015.
MBTW: Subject Property, 2015, Development Plan, 2017.
Beacon Environmental, 2017. All other data.

Wildlife Management Plan

4134 16th Avenue

FIGURE 2: Greenway System and

Ecological Linkages

UTM Zone 17 N, NAD 83

Project 215200

March 2018

golf course that currently provide foraging for open habitat specialists such as Barn Swallow (*Hirundo rustica*).

3. Wildlife Mitigation during Construction

There are a wide variety of wildlife mitigation techniques used during all phases of construction. As work is being conducted within or adjacent to various habitat types, mitigation strategies will be implemented to protect the wildlife community, as required. Site wide, proactive mitigation strategies are outlined below, followed by a discussion of more specific mitigation strategies for various groups including birds, reptiles, fish and amphibians.

3.1 Proactive Mitigation

A wide variety of mitigation strategies can be utilized prior to the commencement of construction. Careful measures are taken in order to reduce erosion and sedimentation and maintain existing habitat. During the construction period, urban wildlife commonly finds refuge in the nearby woodlands and wetland areas.

3.1.1 Erosion and Sediment Control

Robust erosion and sediment control (ESC) practices are necessary and a benefit to all species (including humans). The primary risk is the contribution of sediment into watercourses. Increasing the volume of total dissolved solids (TDS) within a watercourse negatively impacts the ability of fish to effectively feed, reproduce, and respire. Increases in turbidity aggravate and clog gill filaments, causing swelling and decreasing the effectiveness of the respiration process. Visual feeders such as the Redside Dace also struggle to locate prey in turbid or murky waters. Fish lay their eggs in areas of gravel and the addition of sediment to these areas can prove very detrimental, suffocating eggs within the substrate. Wetlands and woodlots can also be impacted by sedimentation, which can negatively affect the terrestrial animals who inhabit these areas, both acutely and longer term.

Prior to any construction, a detailed ESC Plan will be developed using the Greater Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guidelines for Urban Construction (2006). It will detail all necessary measures.

Proposed erosion controls include the phasing of earthworks, seeding or hydro seeding, using erosion control blankets or the implementing of scarification, to limit the amount of exposed soil during construction.

Sediment controls will include mud mats at construction entrances, sediment control fencing and tree protection fencing, temporary sediment control ponds, temporary sediment traps and diversion swales with rock check dams. These measures will allow sediment to settle, and prevent sediment laden water from entering watercourses and other natural features. It will also keep public roadways free of debris during the construction period.

3.1.2 Wildlife Exclusion Fencing

Wildlife exclusion fencing can be used in order to dissuade animals from entering construction zones (**Photo 1**). Exclusion fencing is widely utilized and is proven to be one of the most effective mitigation strategies available. The fencing design should consist of a solid and durable framework able to withstand variable weather conditions. Chain link and snow fence are not recommended as many of the animals meant to be excluded can fit between the gaps of the fencing. MNRF *Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario* (2016) recommends that hardware cloth or heavy-duty plastic designed for wildlife be utilized, geotextile fence can also be used in non-permanent situations, such as during construction. In case of geotextile fencing, the wooden posts of the fencing are always to be located on the interior side of the fencing. This ensures that no animals have the ability to ascend up the post, reaching the interior side. This also provides optimal panel stability, ensuring that no animals have the ability to push the panels of the fence forward and enter underneath. Page wire fencing with a buried edge and filter cloth will also provide an appropriate barrier.



Photo 1. Wildlife Exclusion Fencing

Exclusion fencing is most effective when it encompasses an entire area, however it can also be utilized in specifically targeted areas such as road crossings when connectivity is not a concern. The intended purpose of the fencing in these situations would be to exclude the animals from high risk areas such as roadways, instead diverting them back to adjacent suitable habitat.

3.2 Fish

Both Bruce and Berczy Creek have been identified by MNRF as occupied Redside Dace habitat (**Figure 3**). The Redside Dace is a small colourful minnow that reaches a maximum length of about 12 cm. This species is listed as Endangered by COSSARO and is therefore protected under the Ontario *Endangered Species Act* (ESA, 2007). It has also recently been uplisted to Endangered on Schedule 1 under the federal *Species at Risk Act* (SARA; 2002), and therefore receives protection from Fisheries and Oceans Canada (DFO). Due to the presence of this fish species, stricter than normal mitigation strategies will be implemented during the construction process. These creeks will have extensive erosion and sediment control measures installed and closely monitored. Sedimentation of the watercourse can be very detrimental to fish species, damaging their gills and impeding their ability to feed. The Ministry of Natural Resources and Forestry (MNRF) regulates Redside Dace habitat, and DFO protects fish. These agencies will be consulted and discussions will be ongoing to ensure all works are in compliance with the *ESA* and *SARA*.

3.2.1 Crossing Installation and Removals

As noted in Section 2.2, three trail crossings and one road crossing are proposed over Bruce Creek (**Figure 2**). The road crossing is being designed to avoid any in-water works; however it will likely be subject to a permit under Section 17(2)(c) of the *ESA* as works will need to be undertaken within the regulated habitat of meander belt + 30 m. The conditions of this permit are being discussed with MNRF. Although the installation of the trail crossings will also not require in-water works, the rehabilitation of these crossings (e.g., updating or replacing footings) and the removal of existing crossings not proposed for use with the trail, will require in-water work. These crossings should be removed and the creek banks stabilized and revegetated to provide an increase in natural riparian habitat.

The Ministry of Natural Resources and Forestry (MNRF) enforces strict timing windows in order to ensure reproductive efforts by resident fish species are not negatively impacted by construction activities. During these timing windows no work is permitted in or adjacent to the watercourse. These windows have been developed according to spawning times of the fish species known to inhabit each watercourse. As both Berczy Creek and Bruce Creek are designated Redside Dace habitat, works within the regulated habitat (meander belt + 30 m for occupied and in water works for contributing features) must be conducted from July 1 to September 15, unless otherwise directed by MNRF. The restrictive timing window of this spring spawning species is intended as extra protection against sedimentation of the watercourse.

In most circumstances, the standard operating procedure required in working around streams involves utilization of a coffer dam to completely isolate the portion of the stream under construction. This isolation allows for a buffer area wide enough to mitigate any negative effects to that portion of stream while still allowing the stream to continue to flowing, either by a passive or pump bypass around the work area. Following isolation and prior to any dewatering or construction beginning, the isolated portion of stream will be evacuated of any fish (and other wildlife) present. Fish and wildlife rescues require a Scientific Collectors Permit (SCP) from MNRF, and in the case of a watercourse occupied by Redside Dace, a *SARA* permit from DFO will need to be obtained as well. The details of these permits will be established in consultation with the agencies, but will mostly likely involve the relocation of all species to a downstream area.

3.2.2 Pond Removal

Three golf course hazard and irrigation ponds are located within the Bruce Creek valley. These ponds operate in a series and continually discharge to Bruce Creek, increasing water temperatures and decreasing water quality. There are four additional golf course hazard and irrigation or SWM ponds located on tableland. All of these ponds are proposed for removal. The ponds likely provide habitat for warmwater tolerant fish species, and provide limited habitat for common breeding amphibians; however, they are not considered natural habitat and they are not necessary in the development scenario. Further, most of these ponds negatively impact the adjacent natural features (i.e., Bruce Creek).

To remove these ponds, all fish and wildlife will be removed, as per the conditions of the SCP obtained from MNRF. The water will be slowly drawn down to a point where the wildlife community residing within the waterbody becomes concentrated and easy to locate, and remove. At this point, a team of ecologists enters into the system to collect the specimens remaining within the pond. Location and collection can be achieved utilizing a variety of different methods including seine nets or dip nets, but is often conducted using electro-fishing gear. Not until the team is satisfied that they have collected all the wildlife at that location will construction begin.

3.3 Amphibians




Breeding amphibian surveys were completed in 2016. All areas that provide potential breeding amphibian habitat (ponds, wetlands, etc.) were surveyed from a distance that would enable calling amphibians to be heard. Only those areas which support amphibians are illustrated on **Figure 3**. A total of three species were identified through the surveys, all of which are widespread and common in Ontario. Green Frogs (*Rana clamitans*) are mostly aquatic, rely on permanent water and may be present in relatively poor quality water. American Toads (*Bufo americanus*) are habitat generalists and will use a variety of wetland or pond types for both breeding and summering. They require burrowable soil for hibernation. American Bullfrog (*Lithobates catesbeianus*) is the largest North American frog, they require larger bodies of water to breed but can be found in smaller ponds and along well-vegetated shorelines.

All of the amphibian species found within the property possess the adaptive skills required in transitioning through the construction period. The individuals will be transferred to suitable locations and are expected to thrive in their new habitats post construction. Wildlife exclusion fencing discussed in Section 3.1.2 can often be used very effectively in controlling amphibians on site. Proper installation to ensure no gaps exist within the fencing, and an effective sweep of the area to remove species from within can substantially decrease the likelihood of any negative interactions.

All amphibians (including any tadpoles) will be removed and relocated from any ponds proposed for removal according to the conditions of the SCP obtained from MNRF. Capture methods are likely to include seine nets and dip nets.

Captured amphibians will be transferred to a variety of locations. One large naturalized pond adjacent to Bruce Creek in the southeast corner of the subject property is being retained (see **Figure 3**). Further, a portion of one pond will be converted into naturalized wetland habitat, and brought “offline” (i.e., no longer drain to Bruce Creek). This wetland area will continue to provide habitat for local amphibians, and captured amphibians may also be transferred to this location. Further, although SWM ponds are





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Legend

Subject Property

Watercourse

Amphibians

Barn Swallow Nest Location

Eastern Wood Pewee Observation

Limit of Redside Dace Habitat

JD Barnes: Aerial Photograph, 2015.
MBTW: Subject Property, 2015.
Beacon Environmental, 2017. All other data.

Wildlife Management Plan
4134 16th Avenue

FIGURE 3: Existing Conditions Wildlife

UTM Zone 17 N, NAD 83

Project 215200
March 2018

not designed as habitat, all four SWM ponds constructed for the development will provide habitat for amphibians.

3.4 Reptiles

Field investigations did not identify any reptiles within the subject lands. Common reptile species inhabiting southern Ontario that may exist within the vicinity of the subject lands include the Painted Turtle (*Chrysemys picta*), Snapping Turtle (*Chelydra serpentina*), and Garter Snake (*Thamnophis*). Snapping Turtle is a provincial SAR species, and listed as “Special Concern” under the ESA. It is Canada’s largest freshwater turtle and spends most of its time underwater. The Snapping Turtle is readily distinguished from other freshwater turtles in Canada by its large size and long tail.

All of these species possess the necessary capabilities required in successfully adapting to the various phases of construction, however mitigation strategies can still be utilized to minimize the likelihood of interactions. Similar to the mitigation strategies implemented for amphibians, wildlife exclusion fencing is often the most effective, as discussed in **Section 3.1.2**. Once ESC and exclusion fencing is in place, and prior to the commencement of construction, the areas to be disturbed can be scoured by ecologists and any turtles can be relocated inside the fencing. Ramps (see **Photo 4**) can be put in place in strategic areas near wetlands to allow for any remaining animals to enter the protected valley system on their own.

There are many design criteria used to deter road crossings for any turtles that may use the site. SWM ponds, which may provide some habitat, are immediately adjacent to the valleylands, which allow for safe passage to these natural areas. Roads are paved, eliminating risk associated with potential roadside nesting. Snapping turtles utilize sandy/gravel areas for nesting, which is why they are often found on rural roadsides and susceptible to being hit by motorized vehicles, which is not the case in this urban environment.

Landscaping will also be used adjacent to road and trail crossings to discourage movement of reptiles (and all wildlife) from crossing over the road and trails. Instead, they will be directed to safe passage through culvert spans and under bridges. Further measures to protect wildlife such as turtles are discussed in **Section 4**.

Should a turtle be injured, the Kawartha Turtle Trauma Centre (KTTC) are turtle specialists located in Peterborough, Ontario. The centre provides a great deal information for free on their website including how to differentiate the native and invasive turtle species of Ontario, the dangers of turtles and roads, information on the shells of turtles, and instruction regarding how to deal with injured turtles. In the very unfortunate circumstance that a turtle is found in distress after being hit by a car or harmed in some other way, the KTTC rehabilitates injured turtles to be released back into the wild. The contact information for the KTTC is listed below:

Phone	(705) 741-5000
Website	http://ontarioturtle.ca
Address	1434 Chemong Rd. #4, Peterborough, ON K9J 6X2

3.5 Birds

The breeding bird community on the subject lands was identified in June 2016, when surveys of singing birds were conducted. These surveys are conducted at a time of year when most breeding birds are singing in order to maximize the likelihood of identification. Over the period of these surveys 47 different bird species were identified. Although most species identified are common and abundant, some species deserve particular attention. Species of note include the Eastern Wood-Pewee (*Contopus virens*) and Barn Swallow (**Figure 3**). Eastern Wood-Pewee is listed as Special Concern nationally by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and provincially by the COSSARO. Barn Swallow is listed as Threatened by both COSEWIC and COSSARO. Both species have been listed due to declines in populations, however both are still quite common and widespread throughout southern Ontario.

3.5.1 Species at Risk

The Eastern Wood-Pewee is an aerial insectivore, a group of birds that has been declining rapidly in the past few decades. Like many other aerial insectivores, pewee populations have declined due to a variety of factors including potential changes in insect populations and loss of habitat on their wintering grounds in Latin America. Though pewees have declined by about 25% in the past decade, they are still common in forests throughout eastern North America and seem to be able to breed in relatively small forest patches and woodlots. Three Eastern Wood-Pewee territories were recorded on the subject lands in wooded patches across the golf course. Several blocks of open space in combination with the remaining block of woodlot habitat will provide ample breeding opportunity for this species moving forward. The variety of park blocks interspersed throughout the development will also provide quality foraging habitat.

Barn Swallow is an aerial insectivore, and is still a common species of rural landscapes. It nests in barns and other buildings while foraging mostly over fields, pastures, and water bodies. It was listed in January 2012 due to population declines that began in approximately the 1980s in both Ontario and Canada. The reasons for the declines are not known, but hypotheses relate to potential changes in insect populations, changes in habitat in their wintering grounds in Latin America, or changes in farming practices in North America (COSSARO 2011). The numerous park blocks implemented across the entirety of the development will continue to provide the Barn Swallows with desirable foraging locations in open habitats. SWM ponds also provide an abundance of foraging habitat, and the breeding and nursery ground for their food source. Proposed valleyland restoration of golf course areas includes large areas of grasses and shrubs, providing natural open areas throughout both Bruce and Berczy Creeks for Barn Swallow foraging.

Two single nests were found within the subject lands, observed on separate maintenance buildings in the central portion of the site. These buildings will be removed during construction but nesting structures will be installed to compensate for their removal, through the MNRF Notice of Registry Process (**Photo 4**). Nest boxes may also be placed within park structures (i.e., gazebos) to allow for additional nesting opportunities throughout the site.

Additional nests are located offsite immediately to the west. The Barn Swallows using these nests, as well as any that may inhabit the newly created nesting structures, will continue to forage over the open spaces (e.g., valleylands, park blocks, and SWM ponds as discussed above) within the development.



Photo 4. Barn Swallow Nesting Structure

3.5.2 Tree Removal and Potential Nesting

The federal *Migratory Bird Convention Act* (1994) protects the nests, eggs and young of most bird species from harm or destruction. Environment Canada considers the “general nesting period” of breeding birds in southern Ontario to be between late March and the end of August. This includes times at the beginning and end of the season when only a few species might be nesting. In light of this window,, no vegetation clearing or disturbance to nesting bird habitat should occur during the peak period of bird nesting between May 01 and mid-July. In the “shoulder” seasons of April 1 to 30, and July 16 to August 31, vegetation clearing could occur, but only after an ecologist with appropriate avian knowledge has surveyed the area to confirm lack of nesting. If nesting is found then vegetation clearing (in an area around the nest) must cease until nesting has concluded.

3.6 Mammals

Common species of mammal that area likely to inhabit the subject lands include eastern grey squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), eastern coyote (*Canis latrans* var.) and white-tailed deer (*Odocoileus virginianus*). All of these species are extremely urbanized and require very little mitigation in order to successfully avoid development complications. These species are highly adaptable and have proven themselves to thrive in the most urban of settings, development poses no real threat to any of these species. Habitat corridors, as discussed in **Section 2.2** within the subject lands will provide ample opportunities for both immigration and emigration, if desired, by these species.

4. Post Construction Stewardship

4.1 Dedication of Lands to Public Authority

Lands within the Natural Heritage System, including buffer and restoration areas will be dedicated to the City of Markham in order to ensure ongoing stewardship and protection of the lands.

4.2 Ecological Monitoring

A long-term ecological monitoring program will be in place to address any changes that may occur to that natural features and wildlife habitat areas. This program will be designed in consultation with TRCA and the City, but will include monitoring of wetlands, woodlots, and surface water features as well and monitoring of buffer areas for areas of encroachment including illegal dumping, fence removal, or presence of illegal structures. All areas restored as part of the Compensation and Enhancement Plan will be monitored to ensure survivorship of plantings and “as built” conditions.

4.3 Public Awareness

One of the most effective means of mitigation possible is the improved awareness of the general public. Increased awareness can be achieved through a variety of different media. Informing the general population of the best means to take during the case of any interaction with a species works complementarily to all of the other physical mitigation strategies that can be implemented. A well-educated population can prove to be a very efficient monitoring team, as this essentially ensures that areas of high risk are under constant supervision.

Signage

One of the more standard methods of increasing public awareness can be achieved through the installation of signage. These signs can vary in size, detail, and abundance, but should be strategically located to operate most effectively.

In order to educate and inform the local residents and visitors, with respect to the protection of the natural system and the species and habitats it supports, interpretive signage can be installed along the trail system at key locations.

Animal road crossing signs such as the one seen in **Photo 5** are most effective when placed in areas of high wildlife usage. Overabundance of these signs can lead to inattention by drivers. Basic information, such as the months of the year that are applicable to the warning, is useful information to include as it heightens and confirms the sense of urgency felt by drivers within those months.



Photo 5. Example of “Turtle Crossing” Sign

Homeowner Information Packages

Homeowners could be given an information package describing the natural heritage system including its attributes, sensitivities and protection measures, as well as some of the specific species in the area. The information package would provide encouragement to the homeowner to respect the natural heritage system and suggestions on how to avoid impacts to it.

Purchase and Sales Agreements

It is recommended that the Purchase and Sale agreements include information pertaining to the maintenance of LID measures, buffer areas, rear yard fencing and that pool effluent be directed to storm sewers and away from natural features.

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