

Amphibian Voice

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Living in Harmony with Bats

By Dianne Devison

Bats have been flying the skies for over 50 million years and these ancient bats are virtually indistinguishable from the bats flying about today.

Bats are feared only to the extent that they are misunderstood which leads to a great deal of embellished myth and superstition. For example, people still believe that bats are blind and that they become entangled in people's hair. Neither is true. In fact, all bats can see. Many bat species also have the ability to use sonar to locate prey. A bat's sonar ability is so sophisticated that it can detect



Children construct a bat box to install near their school

importance. 70% of all bats eat insects and are the major predators of night flying insects. All 8 species of bats found in Ontario are insectivorous.

Bats are important indicators of a healthy environment and should be a welcome part of our neighbourhood, cottage life or local wetland. As more people learn not to fear bats, an increasingly frequent question is "Do they really eat mosquitoes?" Bats probably have a

much greater impact than the famed purple martins or electric bug zappers. Most bats in Canada include mosquitoes in their diets and the smaller species like the little brown bat, consume more. Bats also eat numerous agricultural pests including corn borers, grain and cutworm moths, potato beetles and grasshoppers.

Residents of neighbourhoods that have encouraged bats to live nearby report a

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objects far smaller than a human hair and intercept that object at speeds of over 30 km/h. Bats are far too agile to get caught in someone's hair!

With over 900 species of bats world wide, it is no wonder that bats are of great ecological

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significant decrease in insect populations and this is an environmentally friendly alternative to chemical forms of mosquito control.

Although it is preferable to leave bats in their traditional roosts, if you would like to invite bats to take up residency nearby, alternative housing can be offered by installing a bat box. Bat boxes are not meant to encourage eviction of bats from existing locations, however, they do offer alternative housing for bats when possible roosting sites are few in number and when bats have been evicted from their present location. Contact "Friends of Bats" at the Toronto Zoo or go to the Adopt-A-Pond website to obtain plans to construct a bat box.



A bat box, installed near a wetland

The Toronto Zoo bat box program has been working with Ontario residents for 14 years and our experience indicates following the criteria listed below for successful bat box installation:

1. Bat boxes require a minimum of 7 – 10 hours of direct sunlight
2. Caulk or seal all cracks, joints etc. to weather and light proof your box
3. Paint the exterior of your bat box a dark brown or black colour to increase heat absorption
4. Ensure the interior of the bat box is rough, or install horizontal grooves or 1/4" mesh inside to ease the roosting ability of the bats
5. Bat boxes should be mounted 5 to 7 meters above the ground, preferably on a pole or building, not on a tree and free of flight obstacles
6. Install your bat boxes close to a water source

Remember patience is a virtue. Not all bat boxes will be used. Bats may be quite happy in their present roost. However, bats are naturally

inquisitive and if all the criteria are met, they may find your box and hopefully move in.



Little Brown Bats Photo Credit: Bat Conservation International

Bats are an important link to our ecosystems, a link that should not be ignored or taken for granted. We should only disturb or evict bats when absolutely necessary.

You can assist bat conservation efforts by performing your own bat house experiments and reporting the results both successful and not, to "Friends of Bats" c/o Toronto Zoo, 361A Old Finch Avenue, Toronto, ON, M1B 5K7.

Bats of Eastern Canada

BIG BROWN BAT—Wingspan: 32-39 cm. Brown fur, darker above, lighter below. Small ears. Often found in human dwellings.

LITTLE BROWN BAT—Wingspan: 22-27 cm. Fur variable: upperparts yellowish to dark brown. Underparts lighter. Juveniles darker in colour. Most common and widely distributed Canadian bat. Often found in human dwellings.

EASTERN SMALL-FOOTED BAT—Wingspan: 21-25 cm. Glossy brown fur, golden sheen, black ears and flight membranes. Small feet compared to other species in Canada. Roosts under rock slabs and in mines. Relatively uncommon.

NORTHERN LONG-EARED BAT—Wingspan: 23-26 cm. Brown fur, guard hairs not glossy. Black ears, longer than other bats. Often roosts under tree bark or inside caves.

SILVER-HAIRED BAT—Wingspan: 27-31 cm. Heavily furred. Black or dark brown fur with white-tipped hairs. Roosts under tree bark or wood piles.

RED BAT—Wingspan 28-33 cm. Colour of fur varies: yellow-red, orange or yellow-grey. Roosts almost exclusively in foliage of trees.

HOARY BAT—Wingspan: 20-26 cm. Silver-white tipped hairs on back. Thick coat. Often roosts in tree foliage. Largest bat in Canada.

EASTERN PIPISTRELLE—Wingspan: 20-26 cm. Tricoloured fur: base dark grey, middle yellowish brown, tips brown. Premolar in upper and lower jaw. Rarely found in buildings. Relatively uncommon.

Bats in the Belfry

The following is reprinted from "Bat Conservation Program", a joint publication by the Toronto Zoo and the Montreal Biodome. For a copy of this publication, please contact Adopt-A-Pond.

Why would a bat come into my house or cottage?

Depending on the time of year, there may be several explanations why a bat has found its way into your home. If the bats are roosting in the walls or attic, they occasionally end up inside rather than outside. An unscreened chimney or fireplace is also a way of entry into your home. If you find a bat during the summer, chances are that it is this year's young learning to fly, whose navigation and "sense of direction" are not fully developed. For some reason, this holds true for the occasional adult as well.

Occasionally during the winter, temperature will increase enough to wake bats from hibernation. At these times, a bat may find its way into your home and be found in the bathroom or laundry room sink. The bats become dehydrated during the over-wintering process and are seeking water.

Place the bat in a cardboard box with a small bowl of water. Close the lid, keeping it dark and quiet. At dusk, release the bat outside. It should find its way back to the roost. If you must remove the bat immediately, use the capture method described below and take the bat outside. Place it on the trunk of a tree, don't leave it on the ground where it could fall prey to predators.

Don't take any chances!

It is essential that people, especially children be cautious about the potential dangers of contact with unfamiliar animals. They should be warned that any bat that can easily be caught is more likely than others to be sick and should not be handled. The same caution applies to all wild animals.

If you must handle a bat, wear leather gloves. Remember the bat is frightened and as with all wild animals, may bite in self-defence.

Keeping Bats Out!

It is preferable to look upon bat eviction as a last possible alternative. In some cases, there is no reason why bats should not roost in a building,

especially if no one else lives there. Bats do not gnaw or cause structural damage. Offering bat boxes as alternative housing may help to increase available roosting sites and eliminate any unnecessary killing of bats.

What to Do when a Bat Gets in Your House

If the bat is almost hairless, it cannot fly and still depends on its mother to look after it. If possible, place the youngster near or on the roost so its mother can retrieve it, otherwise, it is likely to die.

If the bat is flying about, try to contain it in one room. If this happens at night, open a window and turn off the lights. The bat will usually find its own way out. If this method does not work, try throwing a tea towel or light weight blanket over the flying bat, capture it and move it outside.

If the bat is roosting, take a waste paper basket, put it up over the bat, slip a magazine between the ceiling and the basket, and gently push it along to get the bat to drop into the basket and then move outside. Regardless of the reason for being in your house the bat's main objective is to find the quickest way out!

Editor's note: If you are interested in learning more about Toronto Zoo's Bat Box Education Program or are interested in building your own bat box and wish to obtain plans, contact "Friends of Bats" c/o Toronto Zoo, 361A Old Finch Avenue, Toronto, ON, M1B 5K7.

Stormwater Ponds: Creating Viable Habitat

By Jessica Steiner

The term "stormwater" refers to precipitation, such as rainfall and snowmelt, which runs off the land and into storm sewers, streams and lakes. Stormwater also includes runoff from various activities such as washing cars, watering lawns and draining backyard pools. Urban development has altered the nature of the landscape such that there is increased stormwater runoff. Roads, buildings and other hard surfaces are impervious to water. As a result, excess water which would normally seep into the

soil flows overland, creating floods, increasing erosion, and ultimately disrupting the hydrologic cycle. As the water travels across the surface of the land, it picks up pollutants such as metals, pesticides, herbicides, bacteria and petroleum products. Because of the risk of flooding and the potentially high concentration of pollutants, control of stormwater is legally required. Stormwater management plans aim to maintain the hydrologic cycle, protect water quality and prevent increased erosion and flooding.

One of the many measures and controls used by stormwater practitioners is the construction of stormwater ponds. There are two main types of stormwater ponds. "Dry ponds" store stormwater runoff temporarily and release it at a controlled rate. They only become filled with water after a storm and otherwise remain dry. Although effective for erosion and flood control, they have no means of controlling water quality. "Wet ponds" differ from dry ponds in that they maintain a permanent pool of water between storm events. Wet ponds are the most common type of control used in Ontario. The design of a wet pond allows it to control water quality as well as erosion and flooding. Stormwater first flows into a sediment forebay where most of the suspended particles in the water settle to the bottom. The forebay is periodically dredged to remove the accumulated material. Water then flows from the forebay into the main pond, which is a permanent pool of water. Here, stormwater is diluted and further sediment settles. The effectiveness of this setup can be improved by lengthening the channel of water between the forebay and main pond and planting it with emergent vegetation. Vegetation enhances water quality by filtering out contaminants. Water exiting the main pond can potentially meet government quality standards. Just such a setup has been successfully implemented in Whitchurch Stouffville.

Left to naturalise, wet ponds closely resemble natural wetlands. As a result, wetland species that are displaced from their natural habitat by development often choose these "man-made" habitats as replacements. On one hand, stormwater ponds provide valuable habitat and breeding sites for wetland species, where development has destroyed natural areas and disrupted wildlife corridors. Any open water with vegetation will undoubtedly attract frogs, and

eventually reptiles and other wetland species that have been displaced. Stormwater ponds can and do support large populations of reptiles and amphibians and could potentially serve to augment populations. On the other hand, concerns have been raised over whether wildlife should be allowed to inhabit these ponds knowing the dangers they pose. It is clear that these ponds contain chemicals and that organisms are exposed to them to some extent, however it is still unclear what the effects of exposure are. The presence of toxins in the water can also lead to bioaccumulation, which may then harm birds and mammals that feed on stormwater pond organisms. In addition to the chronic effects of chemical exposure, there may be acute effects from hydrological impacts. Rapidly fluctuating water levels in these artificial ponds often have drastic effects on the reproductive efforts of breeding amphibians and shore-nesting birds. Because of these effects, the ponds may be acting as ecological sinks, attracting species and then causing them harm and leading to population declines.

Not allowing wildlife to use the ponds is easier said than done. It would be logistically very difficult to exclude organisms from the ponds and prevent their colonisation. However, the design of stormwater ponds can help to drastically reduce the amount of pollutants and stabilise water levels, thus alleviating some of these concerns. Outlets can be designed to allow stored water to empty at different rates, thereby maintaining a more constant water level. By allowing water to flow through lots of emergent vegetation before reaching the main pond, a natural filtration system is created which can eliminate many of the chemicals. Small buffers of trees placed around the ponds will also act to filter out sediments and pollutants, maintaining a cleaner and more productive site. Proper maintenance of ponds to remove accumulated sediment and garbage ensures that their ability to remove pollutants remains efficient and that the ponds themselves remain healthy.

Concerns over the effect of contaminated ponds on wildlife cannot be isolated to stormwater ponds alone. "Natural" ponds perform the same functions as stormwater management systems, collecting runoff and drainage from surrounding land. Acid rain containing volatile chemicals falls

on all bodies of water. It is likely that most breeding ponds, whether natural or man-made, are impacted by pollutants. Storm water management, like other conservation initiatives, should include educating residents to reduce pollution by teaching them the effects of using pesticides on lawns, washing cars in driveways and pouring chemicals into sewers. Stormwater ponds can be of conservation value but their ecology and toxicology must be understood in order to manage them appropriately. If stormwater ponds are constructed to retain their intended function as well as provide viable habitat, the results can be beneficial to both humans and wildlife.

West Nile Virus: Avoiding mosquito bites

By: Jessica Steiner

Although the weather is cooler, mosquitoes are active into October and the risk of West Nile Virus is still present. Cities across Ontario have increased their surveillance activities and control measures in order to protect their communities. It is important to take proactive measures to prevent mosquito bites. It is your duty to stay properly informed and understand what the possible risks are and the preventative measures available.

West Nile Virus is spread by the bite of an infected mosquito. Mosquitoes become infected when they feed on infected birds. The virus finds its way into the mosquito's salivary glands, where it is ready to be injected into the insect's next meal. Not every mosquito carries West Nile Virus. Early in the year the virus is spread by mosquitoes that feed primarily on birds, thereby maintaining the virus mostly within bird populations. The most common mosquito species to carry the virus in Ontario is *Culex pipiens* (commonly known as the rain barrel mosquito) which usually only appears in later summer. Because this species feeds on both birds and humans, it is able to transmit the virus to a person.

Although the majority of infections have occurred in birds, West Nile virus has been shown to infect humans, horses, cats, bats, chipmunks, skunks, squirrels, and domestic rabbits. However,

the chances of a person contracting the virus are very small. Even in areas where the virus is circulating, very few mosquitoes carry the virus. If an infected mosquito does bite you, the chances of transmission and illness are less than 1%. Symptoms may arise from anywhere between 3 to 15 days after exposure and can vary from mild illness such as "West Nile Fever", to serious neurological illness such as encephalitis (inflammation of the brain). While many viruses can be spread from one person to another through direct contact, West Nile Virus cannot - you cannot get the disease from touching an infected person or animal. There is currently no vaccine against this virus.

INFORMATION.

A POWERFUL MOSQUITO REPELLENT

West Nile Virus is on a lot of people's minds these days. While it's important to keep the health risk in perspective, there are also a few things to know about what you - and we - can do about it.

For starters, eliminate mosquito breeding sites by getting rid of small pools of stagnant water. Around the house, that means you should regularly empty bird baths and wading pools, clean up old tires and debris, and clean out eavestroughs. If there is a catch basin (sewer grate) on your property, put a screen on it and keep it clean so water filters through.

The City of Toronto is applying a larvicide in catch basins on city property. This program is designed to reduce adult mosquito populations in an environmentally safe way. The application will occur at least twice this summer across the city. Residents can phone or check the City's web site for specific times and locations.

Toronto Public Health is monitoring mosquitoes and birds for West Nile Virus and will provide timely information on any human cases that may appear. While the chance of serious illness is extremely low, we should all take common sense precautions to reduce risk.

Avoid areas with mosquitoes, especially during dawn and dusk when they are most active. Wear light coloured clothing and cover up whenever possible. Use insect repellent on exposed skin and always follow product instructions.

Stay informed and have a healthy summer. To find out more, visit toronto.ca/health or call the West Nile Virus hotline at 416-338-7600.



The best way to protect yourself is to avoid mosquito bites! You and your family can take the following precautions:

Protect yourself from mosquitoes outdoors:

- If you're spending time outdoors, use DEET-based repellent on exposed skin. Also spray the outside of clothing with repellent. Be sure

to read and follow the manufacturer's directions. Do not apply repellent to your pets – talk to your vet to determine the best method of prevention.

- Cover up! When possible, wear long-sleeved shirts, pants and closed shoes when outdoors. Also, try to wear light-coloured clothing, which is less attractive to mosquitoes.
- Dawn, dusk and early evenings are peak mosquito biting times, so consider staying indoors at these hours.

Protect yourself from mosquitoes indoors:

- Use fine-mesh screens on windows and doors.
- Make sure existing screens do not have holes and fit tightly.

Eliminate breeding sites outdoors:

- Don't allow water to collect in the bottom of garbage cans, plant containers, swimming pool covers, buckets, barrels, etc.
- Clean roof gutters, downspouts and eavestroughs regularly.
- Clean birdbaths and trays under potted plants twice a week.
- Turn over plastic wading pools and wheelbarrows when not in use.
- Change and empty water from outdoor dishes for pets.
- Remove any discarded items that could collect water, such as old tires

Encourage natural mosquito predators:

- Consider building a bat box. A single little brown bat is capable of eating up to 600 insects in an hour.
- Encourage wetland restoration in your area. Healthy wetlands tend to *reduce* the mosquito populations. Wetlands support over 400 species of wildlife including frogs, salamanders, fish, birds, bats, dragonflies, damselflies, water striders, diving beetles and other animals that eat mosquitoes.

Although the risk of illness is small, it is up to you to take the necessary precautions to protect yourself now, and in future summers. Now that the virus has made its way to the Western Hemisphere, it is here to stay. Prevention should become a way of life during mosquito season, which generally lasts from April to October.

Remember to be informed. Stay up to date on the results of mosquito and dead bird surveillance

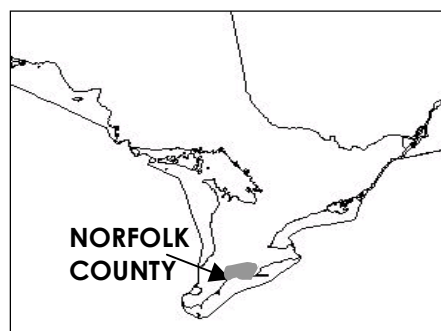
and testing in your region. Your local Public Health Unit will keep up to date postings on the virus' activity in your area. For more information on West Nile Virus, contact your local Health Department.

See www.health.gov.on.ca/english/public/contact/phu/phuloc_mn.html for a listing of Public Health Units and their contact information. For details on Ontario's 2003 West Nile Virus prevention plan visit www.health.gov.on.ca/english/public/pub/ministry_reports/wnv_plan_2003/wnv_plan_2003.pdf.

Storing Water Naturally: Norfolk County's Wetland Drain Restoration Project

By: Jessica Steiner

Extensive networks of agricultural drains are used in Southern Ontario to efficiently remove surface water from the land. However, it is being realised that the drains are *too* efficient. Lack of precipitation and a lowered water table in recent years, in conjunction with drainage, means that many streams and aquifers cannot meet water use demands. Another factor is the lack of wetlands. Much of the original wetlands in Southwestern Ontario have been converted to other uses through drainage. In today's climate it has become apparent that wetlands have a natural capacity to store and transmit water in times of need as well as improve water quality and groundwater supplies. Without the storing capacity of wetlands, excess water is simply drained away and is not available for discharge later in the season. An innovative project in Norfolk County is looking at using drains to hold back water in order to enhance water supplies and water quality.



Although drains are important for removing water during rainy periods allowing farmers to crop the

fields, the Wetland Drain Restoration Project recognises that they can also serve as water conservation systems. The project identifies drains that remove water from wooded wetland areas and converts them into water storage and discharge areas, i.e. a restored wetland. Retaining water in drains for longer periods can help raise water tables and improve water quality, which improves on the crop yields experienced. The idea is that these areas will act as giant sponges, absorbing water during rainy periods and releasing it slowly during the drier months.

The Wetland Drain Restoration Project has been an ongoing effort by the Ministry of Natural resources, Norfolk County, and other partners since 1999. The goal is to realise the benefits of water quality improvement and water quantity regulation in association with restored wetlands. This is very important when considering the high demand for water for irrigation purposes and domestic use. Since then, the project has successfully restored numerous wetlands in Norfolk County. Restored wetlands provide numerous benefits to the local community. Benefits include water purification, groundwater recharge and discharge, the maintenance of base flow in streams, sustained soil moisture for better crop production, improved ecosystem health and the provision of fish and wildlife habitat. Active wetland restoration is required to re-establish ecological functions, and the associated economic, social and cultural benefits.

It is intended that this project help guide similar initiatives and facilitate successful wetland restoration efforts throughout Southern Ontario. The project has received enthusiastic support with landowners, drainage superintendents, municipalities and resource management agencies throughout the agricultural belt of Southern Ontario. It is evident that there has been an increase in understanding of the social and community benefits provided by wetlands and their associated functions.

Editor's note: Special thanks to Peter Bryan-Pulham (Senior Drainage Supt.) and Dave Richards (Biologist in charge of the project) for providing information and feedback for this article. Watch for Adopt-A-Pond's new Pond Guardians Programme where other wetland restoration projects will be listed.

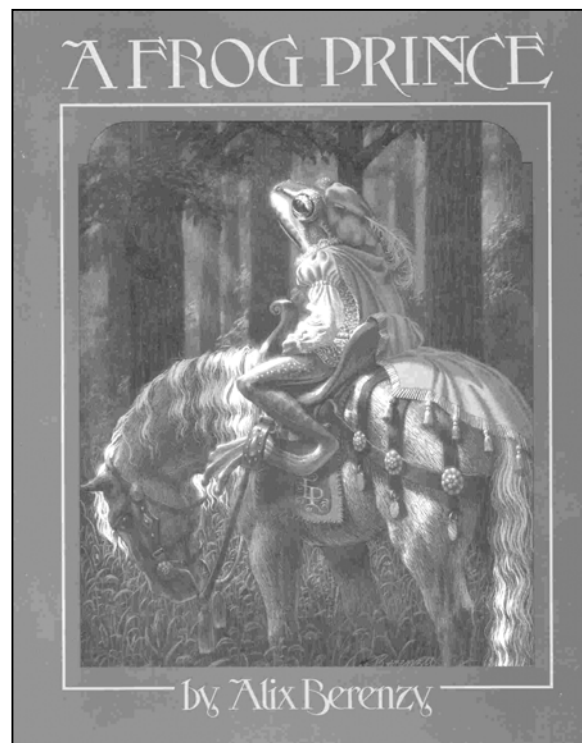
Ribbet's Review

By Jessica Steiner

A Frog Prince

By Alix Berenzy

Published by: Henry Holt & Company Inc
ISBN: 0805018484



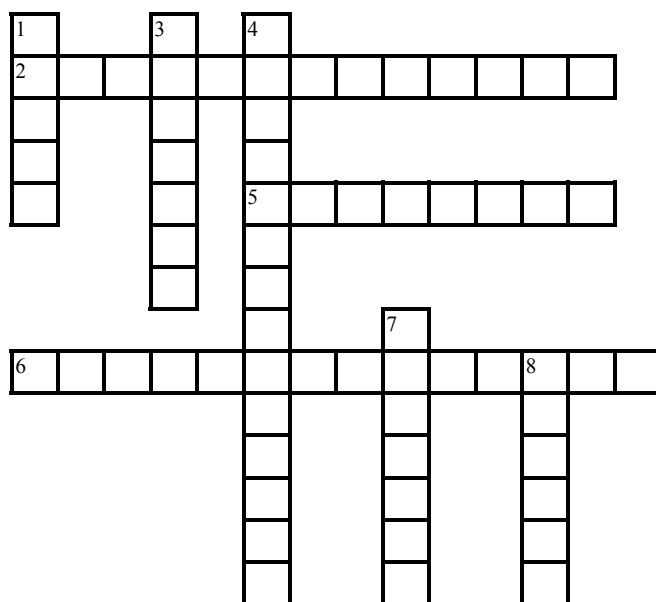
This is the classic tale of the Frog Prince, but with a twist! After retrieving the princess' golden ball from the swamp in exchange for friendship, which he is then denied, this frog sets out to find his true love. We follow him on his journey to the edge of the world, battling ogres and witches, his bravery making him many new friends along the way. Then he stumbles upon a castle. But will this plain frog in princely clothing be noble enough to win the heart of the princess inside? Or will she also dismiss him as an "ugly toad"?

This beautifully illustrated book draws you into a fantasy land of kings and witches, where frogs can talk and ride horses. A spin on a classic fairytale, this book will delight children of all ages and the young at heart.

Amphibian Voice

"Test Your Knowledge"

Cross-Word Puzzle



DOWN

1. The majority of West Nile Virus infections have occurred in this type of animal.
3. Type of habitat that supports over 400 species of mosquito-eating wildlife.
4. Body of water that collects runoff after a rainfall. (2 words)
7. This county has implemented an innovative project to restore local wetlands using agricultural drains.
8. Structure that can be built as alternative housing for bats where natural roosting sites are scarce. (2 words)

ACROSS

2. All 8 species of bats found in Ontario are _____, meaning they eat only insects.
5. Type of insect that transmits West Nile Virus to humans.
6. This Ontario bat species is capable of eating up to 600 insects an hour. (3 words)

ALL OF THE ANSWERS ARE FOUND IN THIS ISSUE OF
AMPHIBIAN VOICE!

ANSWERS: 1) Birds; 2) Insectivorous; 3) Wetland; 4) Storm water pond; 5) Mosquito; 6) Little brown bat; 7) Norfolk; 8) Bat box

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Amphibian Voice is distributed to schools and communities participating in the Adopt-A-Pond programme. The purpose of this newsletter is to provide information on amphibian, turtle and wetland conservation issues and efforts in Ontario.

Send in your stories, drawings and photographs to the address below and we will "hoppily" include them in future issues.

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We welcome support of our programme! Please make cheques payable to "Toronto Zoo" and send them to the following address. Thank you!

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