



NETWORK

news

November 2002

Issue 25

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Changes In Rabies Vector Species Policy

In July 2002, OWREN received word that, in order to help control the spread of wildlife rabies in Eastern Ontario, the Ontario Ministry of Natural Resources, in conjunction with the Rabies Research and Development Unit, had enacted an emergency measure under the Fish & Wildlife Conservation Act. The focus of this action was to restrict the movement of rabies vector species (raccoons, skunks and foxes) originating inside the designated rabies high risk areas and as a result, rehabilitation of those species within areas designated as high risk was disallowed.

In order to fully address concerns and questions relating to these changes, and to open up a dialogue between authorized wildlife custodians and the Ministry, OWREN felt it pru-

dent to invite Ministry and Rabies Research and Development Unit staff to address its members at the OWREN AGM held on October 6th, 2002 in Vineland, Ontario. It should be noted that all authorized wildlife custodians in the province, OWREN members or not, received notice of this meeting.

During the course of the meeting, it came to light that there were two main issues of great concern to custodians. The first one being the fact that, in light of these new restrictions, members of the public - if given no other option - would choose to harbour injured or orphaned RVS rather than see them euthanized; potentially increasing the possibility of human exposure to the rabies virus. The second major issue of concern was the one kilometre



Skunks, raccoons, and foxes constitute Ontario's primary vectors for wildlife rabies.

release restriction for rehabilitated animals. Many custodians felt that this restriction, particularly as it applied to orphaned animals, was too prohibitive, and that it affected their ability to perform rehabilitation appropriately. In order to effectively and fairly address these con-

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What is a wildlife rehabilitator anyway?

You can read many books on rehabilitation, go to many seminars, work part-time with an established 'rehabilitator' and do a hundred and one things that lead up to being a 'rehabilitator'.

Rehabilitate, according to the dictionary, means: "restore to privileges, reputation, or proper condition, reinstate; return to previous state after lapse or cessation or occurrence of opposite state or action." Hence, a

rehabilitator is one who performs this task.

Then you should sit back, assess it all, and ask yourself, "Why would I want to be one?" The answer could come in all different manners:

"I'm going to do my part to save the planet's wildlife."

"I want to get close to nature and help out."

"I want to learn more about wildlife."

"I want to heal and end the

suffering."

For whatever reason you choose to aid the wildlife of our world, one question you should ask yourself is, "Can I handle this - do I have the stamina?"

From the perspective of an 'infant' rehabilitator (that being someone relatively new to it all), I would just like to say that there are going to be many times when you question yourself. "Am I doing it right? ... Is

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What Is A Wildlife Rehabilitator Anyway - cont'd

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there a better way? ... Could I have done something different?"

Where necessity is the mother of invention, experience is the growth of the infant. Experience comes in many forms: the successful healing and rehabilitation back to the wild for the patient in your care; the day-to-day observations you glean into the world of wildlife; the opportunity to watch or get information from someone who has been at it for many years; and yes, even your own trials and errors.

It also comes in the form of not being successful or having to make the decision to euthanize because to continue the suffering of your patient is not an option.

The ups and downs of being a rehabilitator can sometimes make you think you are attached to a yo-yo string and you question yourself again. I have learned that it is okay to question yourself, it's not a sign of being unsure of yourself - it's a way to find out the answers. It is also a way of sorting things out in your own mind and knowing if you truly care about what you are doing.

It is okay to get attached to one of your charges and feel they're special in a way. It is okay to feel frustrated when things are not going the way you thought they should. It is okay to cry or feel sad over one you lost... after all, you would rejoice in the success.

All these things, I have found are building blocks, but, one of the things I've found to be the biggest building block, is that I have found I care for the charges in my care. Deeply.

With caring comes all the emotions that bind you to the wildlife you look after. The emotions can give you strength and can drain you, but the caring allows you to find the strength to go on despite the misgivings and the defeats.

We as a species have always contended that we are the ones who are dominant and will prevail forever! The 'sub-species' will eventually die out and we will have to contend ourselves with a photographic or hand-drawn facsimile of what once was. Chief Seattle said, back in 1854, "What is man without the beasts. Man would die of a great loneliness without the beasts. For whatever happens to the beasts, will happen to man".

In my anger, I have often countered that, there are creatures on this planet that have

been around for over 150 million years as we see them today and that it's only been in the last couple of 100 years (especially the last 100) that species have been dying out. Largely due to man and his progress.

Don't get me wrong! I'm not against progress. I am against not being able to control it or have antidotes to it. For example, why did it take the Peregrine Falcon 50 million years to get into the classification of endangered species - because, it took that long for the development of D.D.T.! We haven't banned its use worldwide - we ship it to other countries where the bird sometimes migrates! Yet, we clap ourselves on the back for doing the good deed of getting it out of our country. Therein lays the lack of control and an antidote.



"What is man without the beasts. Man would die of a great loneliness without the beasts. For whatever happens to the beasts, will happen to man".

Chief Seattle 1854

Yet, somewhere in the scheme of things, small voices are shouting out to be heard. Those voices are demanding changes for all living things on this planet and some of those voices are taking action with those words and doing what they can to accept the responsibility of our actions.

These people are the REHABILITATORS. They are the ones that will slog out on a cold winters night to affect a rescue of an injured animal, work in 90 degree weather to keep a bird cool, trundle into the water to untangle a creature caught in a cast-away fishing line or a net long forgotten or spend sleepless nights trying to nurse some poor creature carelessly shot or poisoned. They are the ones who do so without thought of recompense. They do so because they care and want to make a difference - not for themselves or others but for the wildlife they hold dear and near.

It can sound so romantic - curing, reha-

bilitating and releasing back to the wild. Yet, as every rehabilitator knows, it's long hours, little thanks and lots of hard work. Yeah, there are the easy days, few and far between. There is the self-gratification when the success is there and the self-recrimination when failure rears its ugly head.

It's, for the most part, a thankless job when it comes down to others of our own species. They think it's great we do what we do, but wouldn't consider spending the time themselves. "Become a rehabilitator! What for?" you say.

I will tell you why. It's the look you see in the eyes of the injured creature as it first comes to you - that look of defeat, shrouded in pain. It's the look of mistrust as you tend to its wounds. It's the look of fear as you manipulate the injured area in physiotherapy. It's the look of semi-trust but not one of giving in, when you catch it up to transport for release. More than anything, it's the look you don't see as it rushes off in its release to be free and wild once more. It is the joy you feel within yourself. All of a sudden there is a balance in what you do and the pay off is not in the thanks you'll never get from them but in putting them back where they belong and giving them that second chance.

I know I am just an 'infant' compared to some, but, I will learn to do better than what I did even yesterday, because I care to. I'm not an idealist who thinks I can save the whole of the species I have chosen to help, but I can help a bit - one at a time. Every journey starts with one step. I once read on one of those fancy bookmarks, "Reach for the moon, even if you miss, you'll still end up among the stars." In experiencing comes answers, in the answers come more questions and with the question the seeking to find the answers and the seeking leads to more experiences.

So yes, I will be a rehabilitator for the long haul and I will keep on finding out how little I really know about it all. Stay an 'infant'. There is something to be said about *not* growing up. ☺

*by Carol Ricciuto
MNR authorized wildlife custodian
Open Sky Raptor Foundation,
Grimsby, Ontario*

Board Briefs

Organizations like OWREN are served by a group of volunteers. By definition, volunteers are people who often give up large amounts of personal time to improve things for the members and have a strong belief in the group mandate. They willingly do so without remuneration of any kind. Most OWREN board members are also working full time as rehabilitators or at other outside jobs, and somehow manage to find and set aside time to work with the board.

The OWREN board is grateful to the following members who served on the board during 2000 - 2001: Alison Cooper, Cindy Pyves, Dr. Heather Reid, and Ofer

Pittel. We thank them greatly for the contributions they made to OWREN during their terms.

New members were appointed to the board for the interim in 2002 to continue this work, and attain some very simple goals. Collectively, we are working to make membership in OWREN a genuine benefit to all rehabilitators in Ontario. They board members for 2002 are:

Chair: Mary Catharine Kuruziak
Phone: 905-735-9556
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Treasurer: Ellen Hedges
Phone: 519-733-3426
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Book Reviews

Parasitic Diseases of Wild Mammals

edited by William M. Samuel, Margo J. Pybus, and A. Alan Kocan. - 2nd ed. 2001
Iowa State University Press
ISBN 0-8138-2978-X

When the first edition of this book was published in 1971 wildlife parasitology was still in the stages of documenting the presence and identity of parasites in mammalian hosts. This new edition is a benchmark of references for parasites and parasite groups. Most published parasitology texts seldom contained anything but a passing mention of *Baylisascaris pro-*

cyonis, a significant, emerging zoonoses for anyone working with raccoons. This edition contains 38 pages on the parasite and is an example of how up to date and valuable this reference text is to any rehabilitator who works with wild mammals.

Infectious Diseases of Wild Mammals

Edited by Elizabeth S. Williams and Ian K. Barker - 3rd ed 2001
Iowa State University Press
ISBN 0-8138-2556-3

20 years have passed since the 2nd edition

of this book was published. The original work was updated and summarizes new information in the field of wildlife diseases of wild mammals for anyone who is concerned with wildlife zoonoses. This knowledge has been greatly expanded in the past two decades and now covers a wide array of infectious agents affecting all orders of mammals. Recommended as an excellent companion edition (to *Parasitic Diseases of Wild Mammals*) in the reference library of any rehabilitator who works with mammals.

*Reviewer: Mary Catharine Kuruziak
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OWREN-MAIL **New!! Internet Mailing List for OWREN Members**

OWREN is pleased to announce the formation of an Internet mailing group for OWREN members who have a computer and an Internet connection. Mailing lists, for those not familiar with them, work just like private email between two individuals, with one difference; posts are automatically distributed to every member of the list.

Mailing lists allow for fairly rapid responses to questions. If you establish the habit of checking your email daily, you'll be certain to see that days group postings and be able to respond. Asking a question is as simple as sending an email to the list address and can be done anytime your email program is on.

OWREN-MAIL (OM) is designed for OWREN members to discuss clinical rehabilitation and other issues related to wild-

life in the province of Ontario. List members must belong to OWREN (Ontario Wildlife Rehabilitation and Education Network) to be eligible to join. Posts will be moderated as needed. This list is not open to the public and is a unique mailing list specifically for OWREN members to enable better networking and helping one other in our clinical work and with issues common to us all.

In order to join OWREN-MAIL [OM for short] you must first become a member of Yahoo Groups. Yahoo provides a free service for many different NPO organizations. (The service supports itself through a bit of advertising, but it is easy to ignore.)

There are two simple ways to join. Point your browser to: <http://groups.yahoo.com/> and in the onscreen box under 'Join a Group' type in: OWREN-MAIL. (case

sensitive.) Follow the instructions from there, or alternatively you can send a blank email (leave the subject area blank and no text in the message body) to: OWREN-MAIL-subscribe@yahoo.com Follow the directions in the email reply you receive and sign on.

There will be some simple guidelines established for list members to ensure we do not stray from the intended purpose of the list. You will receive those once you have joined.

For those without Internet access, we will compile some of the best questions and answers from the mailing list exchanges for inclusion in upcoming newsletters so everyone can benefit.

See you on the OM mailing list!
The OWREN board of directors.

Flying Squirrels, The Night Gliders

A thorough understanding of the natural history of a species should be just as important as knowing the basics of hydration and diet. Two of the most fascinating creatures that can come in to rehabilitation are the northern flying squirrel (*Glaucomys sabrinus*) and the southern flying squirrel (*Glaucomys volans*). Both squirrels are in the genus *Glaucomys* (Greek for gray mouse). The second part of their name, *sabrinus* (Latin for river nymph) and *volans* (Latin for flying) denotes the species.

Natural History

Northern and southern flyers are almost entirely nocturnal. Their eyes are equipped for low light conditions, however they cannot see in total darkness. Activity peaks for several hours shortly after sunset and again just before dawn. Neither species hibernates, and communal nesting is also common. For the northern, 6 to a den is normal with the southern averaging 3 to 10. Both have a gliding membrane (patagium) that attaches to the front and hind legs which, when extended, gives them aerodynamics much like that of a hang glider. While glides for both species have been recorded from 295-299 feet, glides of 20-66 feet are more common. The broad, flat tail also adds surface area that increases the squirrels total airfoil.

Northern and southern flying squirrels, while alike in many ways, also have some marked differences. The northern's range and habitat can vary widely, and while they are mostly associated with fairly dense conifer forests, they are also known to habitate conifer-deciduous forests, but rarely in pure stands of deciduous hardwoods. The northern's diet primarily consists of fungi and lichens, but also includes flowers, pollen, fruit and insect matter. Nesting sites can include cavities in trees or snags, "witches broom" (a tangled mass of vegetation caused by rust) or under logs. Northern's may use coniferous branch materials such as cedar, spruce or hemlock for the exterior of their nest, and shredded bark, lichen, and moss on the interior.

The southern flying squirrel, while smaller than it's northern cousin, also appears to be the more opportunistic of the two species. Like its northern cousin, it has very large eyes and extremely fine dense silky fur. The southern is primarily associated with hardwood forests; it will however, inhabit conifer and mixed conifer hardwoods and may also be found in wooded city/urban parks as well as resi-

dential areas. Nesting sites are a natural wood cavity or old woodpecker holes in live or dead trees, however, they also construct outside nests in trees or masses of hanging vines. There is evidence that they may also nest at ground level or even underground. Human dwellings, attics, insides of walls and crawl spaces are also attractive nesting sites.

The southern's diet consists of a wide variety of foodstuffs: fruits, nuts, seeds, bark, buds, flowers and sap. Like their larger cousins, they also consume fungi and lichens, and because of the dispersal of mycorrhizal fungi in their feces, which is believed to be essential for tree growth and maintenance, flyers are considered a major contributor to overall forest health. They are also more carnivorous than many other squirrels, eating insects, birds, eggs, nestlings, mice and occasionally carrion.



By Richard Alan Wood/ANIMALS ANIMALS

While the *Sciurus* part of the family tree are scatter hoarders, southern's are known as larder hoarders, preferring their cache all in one of two spots. On occasion they have been known do a bit of scatter hoarding.

In some areas, the northern and southern flying squirrels cross paths, with not always pleasant consequences for the northern. If you happen to live in an area where this could occur, it is important to be able to distinguish between the two species. The southern flying squirrel may not only be a superior competitor for nesting sites, but routinely carries a nematode parasite which is debilitating to the northern, but apparently harmless to the southern (Weigl P.D. 1999). While housing such like species together in a rehab situation may seem harmless, obviously it is not the case. If you can determine age - then size is a good marker (juvenile flyers have a more pointed face than adults, and as they mature the face becomes broader). If you can determine accurate geographical range, then where it was found is a good marker.

Color of belly hair where it meets the skin is a good marker, but be forewarned, there are times when this marker is not infallible. Steve Patterson, Grey-Bruce Project, (*pers. communication*) states, "Personality is another marker, but this is not a scientific measurement. I find *volans* to be much more aggressive, and they bite way more than *sabrinus*!"

Rehabilitation

The basics are always warmth and hydration. Because neonatal flyers are so small, little pouches made of a non-loopy fabric such as fleece keep the little ones in a nest-like environment. Put the pouch in a small container and place this on a heating pad set on low. Turn the babies every so often to warm them on all sides equally. Incubators are excellent for warming. A hypothermic baby will not be able to absorb subcutaneous fluids, so warm the baby first. Noninvasive methods are always best, and if the animal is conscious and can take fluids orally, that is the best route.

Once the animal has been warmed and hydrated, gradually start introducing formula. If the animal maintains hydration we have found that using plain water works well for the formula break-in period. Time between feedings depend on the age and condition of the baby. If they are emaciated, small frequent feedings are in order. Neonatal flyers should be fed every 1½ hours to start, with one late feeding at 2 a.m. and the next feeding no later than 6 a.m. If you can see the 'milk line' on the abdomen, it can be used as an excellent gauge as to how often to feed. Never let the milk line completely vanish before the next feeding. Times between feedings can gradually be increased by ½ hr. increments as the squirrel grows.

A simple way to figure amount to be fed (using the 5% rule) is to multiply the weight in grams by .05. E.g.; for a 15 gram squirrel, 0.5 of the gram weight is 0.75 ml/cc's per feeding. (15gm x 0.5 = 0.75) While this is a good guideline, starting out with a bit less with very small babies is advisable. We have found that using 4 to 4.5% (of body weight) works well with the tiny neonates. Weigh daily in the morning, before the first feeding. Flyers are very fast growers, so the amount of formula per feeding will need to be adjusted daily. A word of warning - neonate flyers, because of their small size, can dehydrate right before your eyes, so addi-

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Flying Squirrels, The Night Gliders - cont'd

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tional humidity of some sort should be provided and extra heat supplied until after their eyes open.

Formula

Using the correct replacement formula is of vital importance for any animal we rehabilitate. The only mother's milk analysis available is for the E. Grey Squirrel. While it's not perfect, it is a formula that works well for flyers. We recommend using Zoologic 33/40 (PetAg®). If the babies are very tiny (unfurred) mix 1 part powder to 2 parts water, gradually working up to 1 part powder to 1½ parts water as they grow. PetAg® also recommends that MultiMilk (or Zoologic 30/55) should not be added until the eyes are close to opening. In personal experience we have found that a gradual addition of either of the above works best.

Once the baby's eyes are open or close to it, adding a good commercially prepared staple food item such as lab blocks (also known as rodent blocks) is advisable. This will get them used to what will eventually make up 80% of their diet while in rehabilitation. The other 20% of the diet should include various fruits and vegetables, a few native nuts when available, or other in-shell nuts. (Note: Peanuts are not nuts, but legumes). Treats from outside can also be provided: buds, bark and various insects, crickets, June bugs and Asian ladybugs are favorites. Mealworms now and again are also appreciated. Water, once they are up and about, should always be in the cage, in small, shallow, heavy crockery bowls or water bottles. The weaning and pre-release diets are critical. Because of their light bone structure, metabolic bone disease (MBD) can set in quickly. Obviously, such a condition is much easier to prevent than try to correct. Like any species they should not be raised as singles. Because of the flyers natural social behavior, it is doubly important that they be placed with conspecifics.

Housing

Neonatal and eyes-closed babies do well in small containers like plastic totes with small air holes punched in the top. Incubators, commercial or homemade, are the best choice; ones with added humidity are optimal. Once eyes are open, they can be



moved into a small cage (bar spacing is never more than ½" in one direction) or aquariums with secure tops. Flying squirrels are escape artists and if they can get their head through, the rest of the body follows nicely. Small, wicker wren houses hung on the side of the cage make nice inside nest boxes. Various small branches and limbs are added for exercise and exploration, bones and/or pieces of deer antler should be available in all cages. Cage size should be increased as they become more active. At approximately 8 weeks of age, they are ready to be moved outside into the pre-release pen(s) with suitable wooden nest boxes, warm bedding and other standard cage furniture: i.e. limbs, logs etc. Now is a good time to add more of the natural foods they would find in the wild and keep human contact to a bare minimum. Cages should meet or exceed NWRA/IWRC minimum standards as recommended for squirrels.

Release

After about 2 - 3 weeks in the outside pen, the flyers should be ready for release. By observing them at dusk, you should have a good idea of their gliding skills and over all condition. They should be in good weight, quite active, and readily opening nuts. If you can, release on-site into an established flyer colony. Let them come and go from the pen, providing back up food until they blend into the local population.

If, like many of us, you have to find a suitable off-site release area, it is important to establish if there are actually flyers in residence and if they are the same species as the ones you are about to release. Flying squirrels of both species prefer older growth woods, with plenty of rotten logs, den trees and access to some sort of water source. Since northern flyers are often found in isolated pockets due to loss of habitat, a call to Natural Resources might be in order since there is a good chance they will know where these established pockets are. For southern flyers, we take a walk through the woods during the daylight and look for nuts that have been eaten. Flyers have a unique "nut opening" pattern that is theirs alone. An empty nut-shell with a round smooth-edged opening at one end is an unmistakable sign that flyers are in the area. Red (pine) squirrels also make a single round opening but the

edges are quite jagged; white-footed mice must gnaw several smooth edged openings to get at the nutmeat. Other tree squirrels such as the fox and gray tear the nut to pieces. Once you have a spot picked out, there are several ways the release can be accomplished. We have pens set up on-site and it is a simple procedure to put wire over the nest box hole, while they are inside, and move the nest box, squirrels and all to the release site and new pen. After about 3-4 days, the release hatch is opened. If it is midsummer, we provide back up food for a few days, if the later summer mast (nut crop) is on, we make a couple checks back at the pen, and that's it. If you don't have, or are unable to set up a pen at the chosen release site, cover the hole (again while they are inside) and take the den box and all and simply hang it in a suitable tree at the site you have selected. Let the squirrels settle a bit if they have woken up during the move. Remove the wire from the hole and leave. Back-up food should be provided for a few days, depending on the time of year, if such a release is done.

By Nonda Surratt,
Cedar Hill Wildlife Care, Hebron, Ohio
Ohio State Cat.2 DNR Permitted Rehabilitator

(See charts on page 6)



Southern Flying Squirrel (*Glaucomys volans*)

A note for Ontario wildlife custodians

Condition 5 of your wildlife custodian authorization states in part, "that the wildlife custodian shall notify the OMNR within 24 hours when a specimen that is on the VTEEE list is received by a rehabilitation facility". The southern flying squirrel (*Glaucomys volans*) appears on this list. Information on VTEEE species can be accessed from the Ministry's website: www.mnr.gov.on.ca/MNR/fwmenu.html

Identification Fact Sheet: Northern and Southern Flying Squirrels

Northern Flying Squirrel (*Glaucomys sabrinus*)

- Larger than southern flyers
- Total length: 275-342 mm (10.8-13.5")
- Weight: 75-140 grams; a lactating female can reach 175 grams
- Dorsal color: pale cinnamon brown to dark ash brown.
- Hair is longer than southern flyer
- Under parts are usually creamy white, fur next to skin is washed with gray
- Usually one litter per year, in late spring
- Average litter size is 2-4; can go as high as 6
- Gestation: 37-42 days
- Babies born blind and hairless except for the vibrissae, and short hairs on chin and snout
- Birth weight: 5-6 grams
- Born with patagium
- Teeth begin to erupt at approximately 26 days
- Eyes open at approximately 32 days
- Explore outside nest at 40 days; can take solid food at that time
- Weaned at approximately 60 days
- Young often stay with mother a few more months, and many times, through the winter
- Life span in the wild approximately 4-5 years
- Home range: 0.8 ha (1.98 acres) to several kilometers

Southern Flying Squirrel (*Glaucomys volans*)

- Approximately one-third the size of the northern flyer
- Total length: 198-255 mm (7.7-10")
- Weight: 46-85 grams
- Dorsal color: grayish-buff, may have some golden tint
- Under parts are white through to the skin
- Often have 2 litters per year, breeding season varies with latitude
- Average litter size is 3; but ranges from 1-6
- Gestation takes 40 days
- Babies born blind, mostly hairless except for the vibrissae and short hairs on snout and chin
- Ears are sealed shut at birth
- Birth weight is approximately 4 grams
- Born with patagium
- Ears become erect between 2-6 days of age
- Hair visible over most of body at 7 days
- Eyes open at approximately 24-30 days
- Weaning is completed by 5-7 weeks when their approximate weight is 43 grams. Resemble miniature adults then
- Young begin to molt to first adult pelage at 12 weeks of age
- At 12 weeks still usually with mother and may stay with her until she gives birth to another litter
- Life span in the wild is approximately 4-5 years

Charts compiled by Nonda Surratt, Cedar Hill Wildlife Care, Hebron, Ohio

Changes In Rabies Vector Species Policy - cont'd

(Continued from page 1)

cerns, Tom Cumby, Wildlife Services Coordinator, Wildlife Section, OMNR, offered to establish a meeting of interested parties and Ministry staff.

As news of this proposed meeting grew, so too did the number of parties that wished to have input. After some deliberation, the Ministry opted to collect input from all interested parties via a written forum. A five question survey was established and distributed to those who had indicated that they wished to participate in the process. OWREN, in turn, forwarded a copy of this survey to all of its members, either via email or regular post, thus ensuring their opportunity to participate. All responses OWREN received from its members were then compiled, in their en-

tirety, into a 45 page reply and submitted to the Ministry by the specified due date.

The Ministry is currently reviewing and assessing the responses to the survey. The result of this process remains to be seen, but it is OWREN's hope that the Ministry will opt to reconsider the policy changes implemented in July.

OWREN would like to thank all of its members that took the time to participate in this process. It would also like to thank the Ministry for allowing custodians the opportunity to have input into these issues in this manner.

When the Ministry's review is complete, OWREN will be notified, and will, in turn, notify its membership of the results. Any policy changes that result from his process, will be posted for review on the Environ-

mental Bill of Rights (EBR) website: http://204.40.253.254/samples/search/Ebrquery_REG.htm for a 30 day period to allow for public comment. OWREN urges its members to participate in this process. It is their chance to be heard.

In closing, please keep in mind that as professional wildlife custodians, we must be concerned with disease spread in wildlife. We must work in association with the Ministry of Natural Resources, and other agencies, to ensure that we do not contribute to this problem, but rather that we are part of the solution. The future of wildlife rehabilitation in this province is in our hands.

*By Mary Catharine Kuruziak
and Michelle Bartlett-Rozad*

Questions and Answers about West Nile Virus In Raptors

Q: What are the symptoms of West Nile virus in raptors?

A: There seem to be three phases, specifically -

Phase 1: Depression, anorexia, weight loss (in proportion to duration of anorexia), sleeping, pinching off blood feathers. Elevated white cell count.

Phase 2: In addition to the above, head tremors, green urates (indicating liver necrosis), mental dullness/central blindness and general lack of awareness of surroundings, ataxia (clumsiness), weakness in legs.

Phase 3: More severe tremors, seizures.

Q: Is there any treatment for West Nile virus in raptors? What is the bird's prognosis at each stage?

A: There is no prescribed treatment. But supportive care can be provided and it is possible for birds to recover. In general, the likelihood of recovery depends on what phase the bird is in. **Phase 1** birds respond reasonably well to supportive care. Once they reach **Phase 2**, some birds respond to supportive care, but others do not and proceed to phase 3. Complete recovery is uncertain. Birds suffering from the severe tremors and seizures characteristic of **Phase 3** are close to death. Intervention is probably not going to alter the course.

Q: How can birds be protected from West Nile virus? Is there a vaccine?

A: There is a vaccine for horses that can be used in birds, but we don't know how well it works for birds. The best way to prevent West Nile virus in birds is by protecting birds from mosquito bites.

Caring for Raptors Infected with the West

Nile Virus

Q: In addition to supportive care (fluids, nutrition, warmth), should we be doing something to treat the associated spinal/brain inflammation? I assume it would have to be a non-steroid anti-inflammatory. We are not presently using Dexamethasone on these birds because of immune-suppressant concerns.

A: Histologically, what is seen mostly is necrosis and vacuolization, with varying degrees of inflammation. By all means, do not use Dexamethasone. Meloxicam, Banamine or Celebrex are indicated.

Q: Should antibiotics be used preventatively for any possible secondary bacterial infections?

A: It's a judgment call. You may just set yourself up for yeast infections. I probably wouldn't unless there was GI stasis and risk of anaerobic overgrowth, in which case I'd use metronidazole.

Q: Is there any recommended vitamin supplementation?

A: Vitamin B (thiamine) may be helpful and is routine with neurological conditions. We recommend 10 mg/day.

Q: If a bird has apparently recovered, when can we safely put them outside - that is, when are they virus-free so they wouldn't infect more mosquitoes if bitten again? Is there a "rule of thumb" on the period of infection?

A: Recovered birds may have cleared the virus or they may have become asymptomatic carriers - we have no way of knowing. As a guideline, I would hold them in for two weeks after they have recovered, not so much as to prevent them being a source of virus to

mosquitoes, but mostly to make sure they won't relapse - we don't know the course yet. In general, however, recovered birds would have very low virus counts in their blood - probably not enough to be an immediate infection source.

Q: Are there likely to be birds that will have permanent neurological damage, even if they have survived the virus infection? If so, how much time should we allow for recovery before euthanizing a bird? We have some that have been "hanging in there" for close to two weeks, but don't seem to be getting any better.

A: No one knows. I suspect that if they plateau, that's about as much as they are going to recover.

Q: What about the equine vaccine that can possibly be used in birds? What dosage would you recommend?

A: What we know so far is that two doses can be given three to four weeks apart with no apparent side effects, at least in birds tested so far (some raptors and cockatiels). If possible, give the entire 1 cc dose (usually possible in birds more than 300 grams). Give it intramuscularly. In small birds, use small doses, but don't try to scale it on the basis of body weight as you would an antibiotic. We have no idea if this confers protection on vaccinated birds, but it doesn't appear to do any harm and it may prep the immune system to react more vigorously if the bird becomes infected.

Q: Regarding human risk, is the mosquito absolutely necessary for transmission of West Nile, or can it be passed from bird to person

(Continued on page 12)

Thank You! Merci!

We would like to express our gratitude to the following members who went beyond simply renewing their memberships during 2001-2002, by making a donation to OWREN. Your support of OWREN does not go unnoticed. Wherever you folks are, please stand up and take a bow! We thank you for your generosity!!

Brad Gates, *President, AAA Wildlife Control Inc.*

Lorraine Bannerman

Laurel Beechey

Bev Bezpaly

Ray and Marg Bookman

Edythe Butler

Kit and Robin Chubb

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Gartly Wagner

Lori Welsh

Top 10 Reasons to Support OWREN

Top 10 reasons why you should be an OWREN member

10. You'll be part of an elite group of people that can say "Ontario Wildlife Rehabilitation and Education Network" really fast
9. OWREN needs your money! The students in our basic rehab skills class got a little carried away with Robert Jones bandages; we need to replace our supply of clinging gauze rolls.
8. We keep your mailbox from being empty.
7. We always have good snacks at our meetings and workshops.
6. Because we have better bucket draws than anybody else!
5. We're not going to stop bugging you until you join!
4. We'll send you one of those really cute membership cards with your name on it
3. You can take credit for that new batch of basic skills graduates running around saying "Now which end did they say this tube is supposed to go in?"
2. All contributions will be acknowledged in the newsletter -- ok, so your name won't be in lights -- but it will be in print!

and the number one reason....

1. Everyone else is doing it so come on, don't be left out!

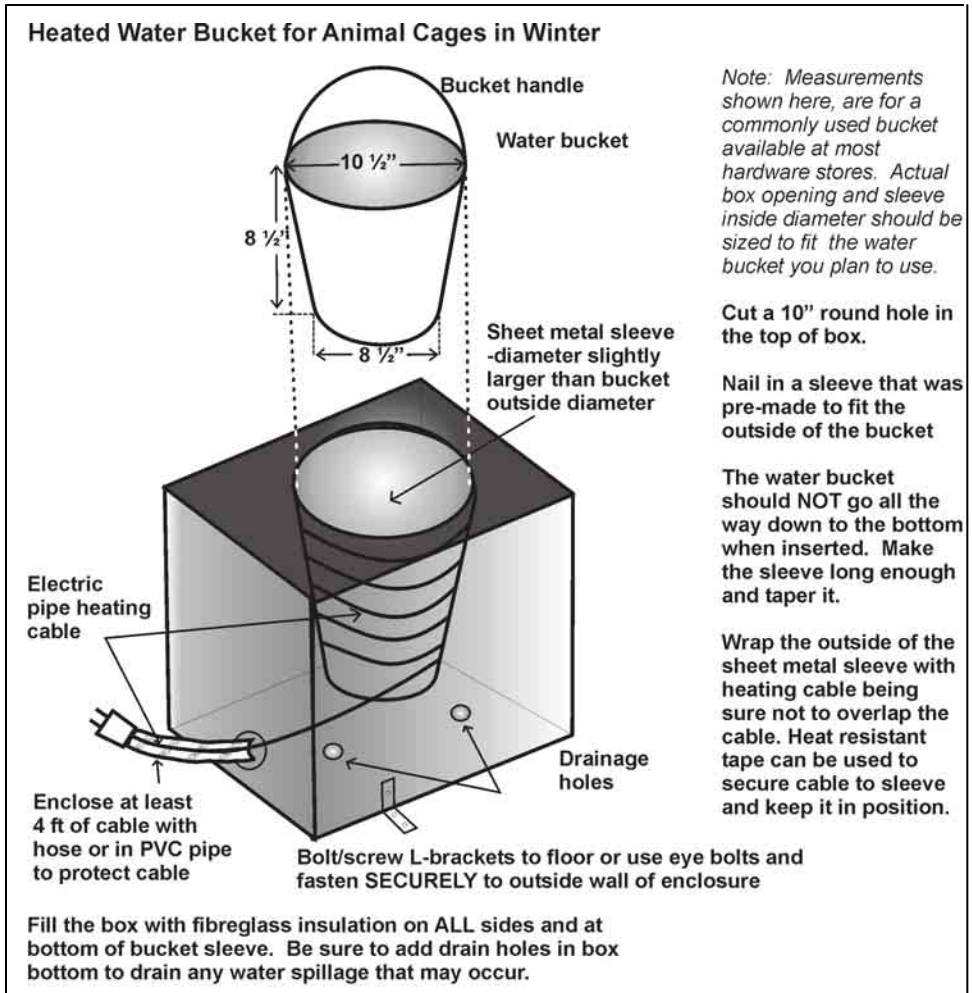
No-Freeze Water Bucket

If you've been looking for a way to keep drinking water from freezing up in your large mammal enclosures for the winter, here's a inventive way to accomplish that. Obviously, in order for this to be successful you need access to electricity. It is also a good idea to check with a qualified electrician to see if they would recommend adapting pipe heating cable for use in this manner. It keeps the water just above freezing, and for those of us who have adapted this for use in our raccoon enclosures, it has been successfully used in for many winters now.

One important caveat to keep in mind is that a bored raccoon will attempt to pull the box away from the wall, so it **must** be securely fastened to an outside wall in the pen. The cable should exit directly in the centre and back panel of the box, near ground level, and **MUST** be enclosed in either thick hosing or PVC pipe, so those intelligent and deft fingers cannot pull the cord inside the pen and harm themselves by chewing on it. Use only CSA approved outdoor extension cords, plugged into a GFI receptacle.

This simple design has successfully been adapted using two buckets. The inner bucket (handle removed) should have drain holes drilled at the bottom of it, and acts the same as the sheet metal 'sleeve' shown here. Be sure to fasten the inner bucket to the top of the box securely. When assembling, the last piece to assemble is the box bottom. This set up works just as well with no insulation in the box, keeping the water just above the freezing point.

Cleaning and refilling is as simple as re-



moving the outer bucket and replacing it. If you are using fiberglass insulation and the sheet metal sleeve, make sure that a raccoon cannot pull the bucket out, and reach into the box and get at the insulation, or cut their fingers on the sharp edges of the sheet

metal. Tape or file any sharp, exposed edges and extend the sheet metal to the box bottom so there is no gap there and they cannot get at it. Keeping the bucket full also helps weigh it down making it harder to lift out.

Book Reviews - cont'd

(Continued from page 3)

It's A Wild Life by Gary Bogue
Published by Leshar Communications
Inc. 1989
ISBN 0-9623012-0-5



a kindred spirit. It is very moving, and a quick easy entertaining read.

Reviewer: Liz Springall

This book is a collection of the author's favorite newspaper columns that he wrote over a period of 18 years. Gary Bogue started the first wildlife rescue hospital in the United States, and this book is a culmination of his experiences. He has rehabbed everything from hummingbirds to mountain lions.

It is written with a passion and sense of humor that I feel other rehabbers can truly appreciate. All of the animals we deal with touch our lives, however briefly, and he expresses it so eloquently. I at once felt he was

Beavers Eh to Bea: tales from a wildlife rehabilitator by Lillian Anderson
Turnstone Press, 2000. (Contains illustrations and colour photographs.)
ISBN 0-88801-249-7

We are all inexorably drawn to our own kind and this wonderful book reads much like a conversation between two close friends. It tells a story of two orphaned beaver kits, aptly named 'Eh' and 'Bea' and of other animals in her life as a rehabilitator in north-western Ontario. Skilfully woven throughout the pages is information about the species, their care and their natural

habits.

A Fish & Wildlife Technician with the Ministry of Natural Resources, Lil also operates "Iggy's Wildlife Rehab Centre" in Kenora, Ontario. She relies not just on scientific information, but uses her gifts of intuition and respect for native wildlife to return her patients back to their wild habitats. Things don't always go as we want sometimes, and she shares some of the heartbreak that being in this profession brings. Well written, full of truths and insight, this book is a beautiful testimonial to her work - and to ours. I'd highly recommend adding this book to your library. Beware though - once you begin reading - it is impossible to put down!

Reviewer: Mary Catharine Kuruziak



Portable Cage Building Plans

In 1992 we purchased a cage similar to the wire mesh cage plans (*shown on page 11*) for use in squirrel rehabilitation. It then cost us \$18.00 (US). The following year, the cost went up to \$20 and so on. My husband Jim sat and looked at it and simply said, "I can build one, cheaper and better than this."

We went out and measured to see what would fit through the back door of our car, and on the seat as well. We came up with 3' by 18" by 18". Then we had to work out the door opening size. To keep the cage 'rigid' and not easily bent, we worked out a maximum opening of 10" by 10".

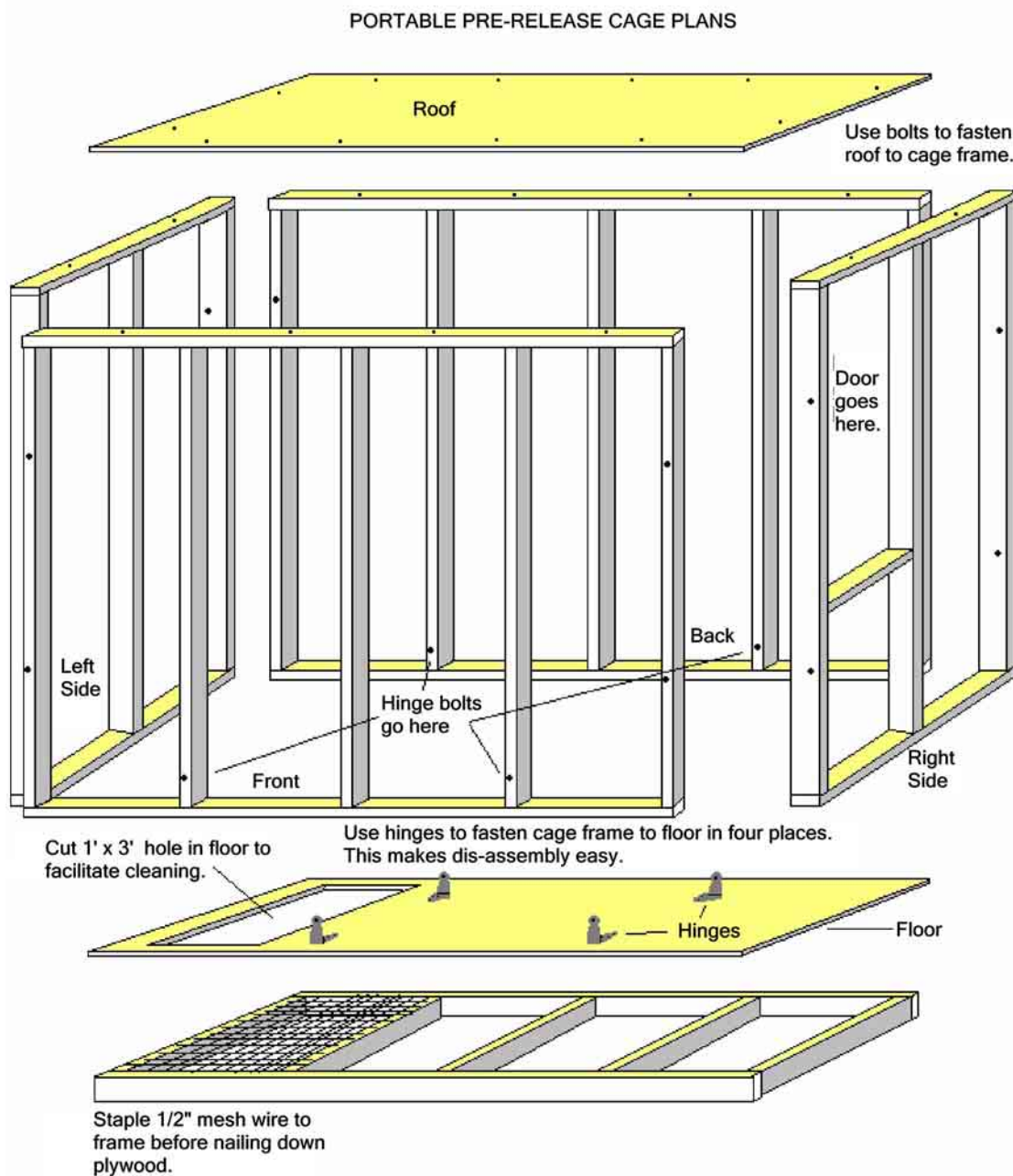
Our next thought was of a wooden den box for the squirrels that could easily slide in and out of the cage (instructions and diagram) on page 11) for their housing needs. It had to be easy enough to bring the little ones out that were not yet weaned but on their way to becoming wild, but were still at the stage where they would not voluntarily come out for a feeding. We also wanted it to be versatile and moveable - when they are very young, the den box can lay on it's side, on the inside bottom of the cage (they are not climbing then), and you can later turn it upright when they begin to start to explore, then fasten it higher on the sides when they become a bit more mobile.

The wire cage can also be utilized in the same way. When their eyes are just opening, it can remain flat, with it's 3' length along the floor bottom, later it can be flipped up so that the 18" ends lay on the floor, giving the squirrels 3 feet of climbing room. The den box can be moved to correspond to whichever way you have laid the cage down. This cage is suitable for grey squirrels, fox, or flying squirrels.

The wooden port-a-cage (*instructions on page 10, diagram below*) was the result of a necessity we had that Jim was creatively able to solve. We needed to be able to soft release small groups of raccoon orphans. The various sites we had chosen for release, were great sites, but none of the landowners had suitable caging to allow for slow releases. We had a small pick up truck, so Jim designed the plans so that two persons could assemble and move this cage in a very small truck to a release site and back. This cage can also be built and used permanently for opossums or squirrels.

We have been using both types of cage successfully for years now, and in our area we offer a class in constructing the wire mesh squirrel cage for the newer rehabilitators in our group ARC (Animal Rehabilitators of the Carolina's) a few times a year. It's always a great success, as the cages themselves have proven to be.

*Pat Isaacs, Fort Mill, South Carolina.
Pat holds a South Carolina Wildlife Permit for Mammals and is a member of ARC (Animal Rehabilitators of the Carolina's).*



Cage Building Plans - cont'd

PORTABLE PRE-RELEASE CAGE PLANS (shown on page 9)

Finished cage dimensions:

5 ft high x 8 ft long x 4 wide.

Read all instructions completely before you begin construction!

This cage is designed so two persons can easily disassemble it and move it to a location for reassembly in a short period of time. When disassembled, it will fit in the back of a pickup truck for easy transport.

Tool list:

Hammer, Circular Saw, Saber Saw, Electric Drill, Extension Cord, Pencils, Square, Screwdrivers, Wire Cutters, 1/2" Wood Bit (at least 8" long), 3/8" Metal Bit, 1/2" wrench, 9/16" wrench.

Material List:

- 25' of 1"x2" mesh woven wire 5' high
- Small roll of 1/2" mesh wire (need piece approx. 2' x 4')
- 12 - 8' length, 2x4 pressure treated (for framework)
- 8 - 10' length 2x4 pressure treated (for framework)
- 2 - 4' x 8' sheets of 3/4" treated plywood for roof and floor (thinner will do if you can find it)
- 1 lb. of 16d decking nails for framing
- 1/2 lb. 8d deck nails for fastening floor to frame
- 1 lb. 1/2" wire staples
- 4ea - 5/16" x 4" carriage bolts with nuts & washers (for fastening cage frame to floor through hinges)
- 8ea - 3/8" x 6" carriage bolts with nuts & washers (for fastening sides together)
- 12ea - 5/16" x 3" carriage bolts with nuts & washers (for fastening roof to frame)
- 4ea - 5 1/2" metal hinges & screws for fastening sides to floor
- 2ea - smaller metal hinges & screws for door
- 2ea - door locking mechanisms (hasps & hooks)
- 1ea - small piece of plywood for door (approx. 2' x 3')

Assembly Instructions:

Read instructions once more before you begin, and keep a copy of the plans in front of you!

Cut all 2x4's to length as detailed below.

Floor:

- 2 pcs. 8' long
- 5 pcs. 45" long

Front:

- 2 pcs. 8' long
- 5 pcs. 57 1/2" long

Back:

- 2 pcs. 8' long
- 5 pcs. 57 1/2" long

Left side:

- 2 pcs. 41" long
- 3 pcs. 57 1/2" long

Right side:

- 2 pcs. 41" long
- 3 pcs. 57 1/2" long
- 1 pc. Cut for door frame after cage is assembled

Nail floor framework together first. Cut a 1' x 3' hole in plywood that will be used for the floor. (This is to facilitate cleaning so make it on the opposite side from the door). (see plans for location). Staple 1/2" mesh wire to floor frame so that it will be directly under hole in plywood. Permanently nail plywood to floor frame.

Nail framework for each individual side together. With the help of an assistant--- stand all 4 sides up on top of the floor. Center up and square to floor. Tack lightly

together with a few small nails. (They will have to be removed after the bolts are put in).

Drill 1/2" holes through corners and fasten together securely with 8 ea. 5/16 x 6" carriage bolts. (The cage should now stand by itself).

Mount the top piece of plywood (roof) to cage frame using 12 ea. 5/16 x 3" bolts.

Mount hinges permanently to floor as shown in drawing. Enlarge top hole in hinge to 3/8" and mark and drill 1/2" holes for bolts. Secure cage frame to floor using 4 ea. 5/16 x 4" carriage bolts. Remove any nails holding sides to each other.

Wrap 1" x 2" mesh wire around cage and staple to frame securely with 1/2" staples approx. every 2-3".

Cut wire on all four corners so cage can be disassembled into 6 pieces. (4 sides, top and floor). Trim wire away from door area.

Build the door large enough to allow easy entry. (Use your imagination!) Now, stand back and admire your work!!

Designed by Jim Isaacs, Fort Mill, S. Carolina

Squirrel House (Bed Box) Plans

SQUIRREL HOUSE* (right)

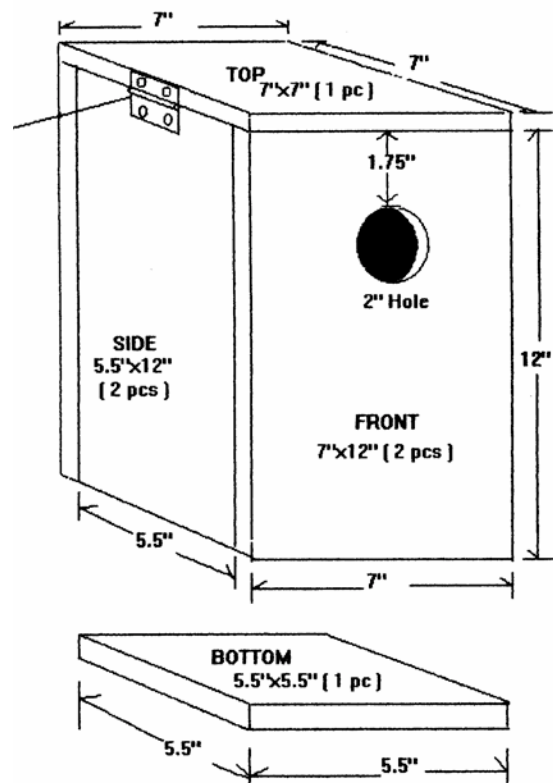
This is designed for use with the wire mesh cage (page 11)

Attach the top using a hinge. The sides and bottom may be fastened together with nails or screws. You do not have to glue. Box is constructed of 3/4" plywood or other stock

Squirrels are not particular about the quality of construction of their homes. They will enlarge the hole as they grow. Please do not paint or apply a finish as it may be toxic. This box will be their home until they are released and build their own.

**Not designed to be hung in trees after release.*

Designed by Jim Isaacs, Fort Mill, S. Carolina



Constructing a Wire Mesh Cage

Instructions

Tool List:

- J-Clip Pliers
- Side Cutters (heavy duty)
- File (or other metal smoothing tool)
- Tape Measure (or ruler)
- Black Magic Marker
- Wood 2x4 (one piece about 4' - 6' long)
- Wood 2x4 (one piece about 2' long)

Material List:

- Roll of 1/2" x 1" welded wire mesh (36" wide)
- (Length is dependent upon number of cages desired — allow 10' length per cage, as there will be some waste)*
- "J" Clips (approximately 100 per cage)
- "Spring Hooks" (one per cage-for door closer)

Cage dimensions are 18"x18"x36. They are made of 1/2"x 1" welded wire mesh with a door opening of 10"x 10". The door cover (12"x 14") is cut from the same material with a 2" overlap on the 3 sides that are not attached to the cage with J-clips.

Making the main part of the cage:

The wire may be obtained in 36" wide rolls of any length. For the main cage body, roll out 6' of wire from the roll and cut off with side cutters or side grinder. Be sure to remove any sharp edges with a file or other metal smoothing tool.

Place wire on a solid floor and flatten as best possible. Mark both sides of piece with magic marker at 18" intervals down the length of it.

Lay a 2x4 across wire and line up squarely with the 18" marks. Bend wire up to a 90 degree angle. A helper makes this much easier. (Tapping the wire against the 2x4 with the butt end of the short piece of wood will make the bend much better.)

Repeat this at all of the marks until one end meets the other and forms an 18" square. Fasten together with J-Clips at approx. 3" intervals. A slight amount of bending is necessary to square up the body. (It seems flimsy at this point but will firm up when the ends are attached).

Making the ends:

The ends are 18"x 18" pieces that are cut from the same roll of wire. Again, make sure there are no sharp edges.

Once cut, fasten the two ends into position on the main body using more "J" clips. At this point your cage should be square and sturdy with no way for an animal to get in or out.

Making the door:

Mark for a 10"x 10" hole in the middle portion of any long side of the cage (not the ends). Cut out with cutters or grinder. Smooth the rough edges with a file or other type of abrasive tool.

Cut a 12"x 14" piece of the same wire mesh for the door. Allow for a 2" overlap on the 3 sides not attached to the cage. Fasten the remaining side using J-clips. Your door should swing open easily and lay flat against the cage body when closed. To secure the door closed, use a spring hook fastened in position with J-clips.

Figure 1, shows the items that are sometimes hard to locate. Most places that sell caging supplies carry these items. Check your local farm supply or hardware store.

*Designed by Pat & Jim Isaacs,
Fort Mill, South Carolina USA*

Creative Ideas?

Do you have creative ideas or plans like these to share? Articles about rehabilitation? Light hearted humour? Tips or hints you'd like to share with other rehabilitators? We invite you to send them in -

By email: OWREN@email.com

By mail: OWREN Network News, c/o 461 Wright St., Welland ON L3B 2K6.

Please attach plans or photos of your submissions, if applicable. We'll share the best of them with our readers.

The National Wildlife Rehabilitators Association Presents "REHABILITATION AND BEYOND, BROADENING OUR HORIZONS" Symposium 2003
11- 15 March 2003, Newport, RI
Newport Marriott Hotel
Host: Tufts Wildlife Clinic
Contact Information:
NWRA Central Office, 14 7th Avenue North, St. Cloud, MN 56303, (320) 259-4086,
email nwra@nwrawildlife.org
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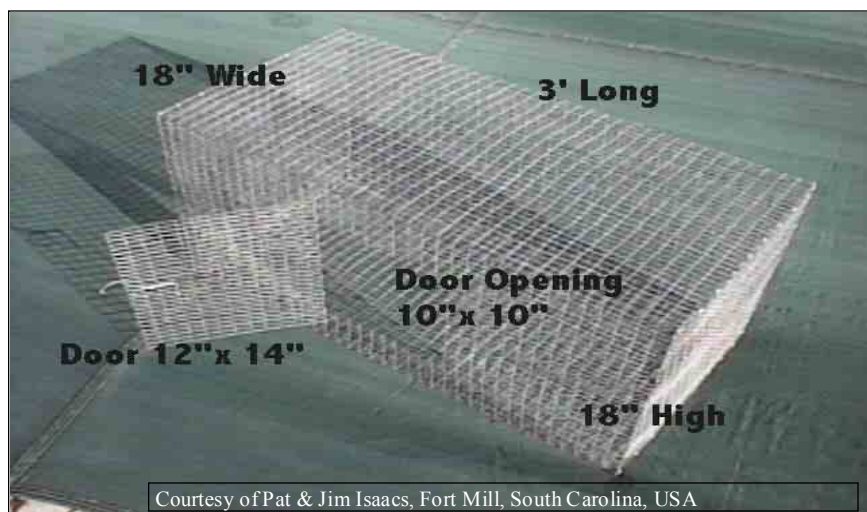


Figure 1

OWREN Presents 'New Beginnings' Conference 2003 February 25 - March 2, 2003 in London, Ontario

What better way to celebrate all the new beginnings on the horizon than by having a conference? OWREN is pleased to announce we will be hosting a late winter conference in London, Ontario from February 25 to March 2, 2003 at the Four Points Sheraton - London - Hotel and Suites. Just in time to banish those winter blues, and rejuvenate everyone's spirits!

February 25 & 26, 2003 (Tues/Wed) are scheduled for the **Basic Rehabilitation Skills Workshop**. If you missed this class which was recently held in Vineland, this is your chance to sign up. 31 enthusiastic and wonderful people graduated from the Vineland class and by all accounts it was a success! You won't want to miss this one.

Thursday February 27, 2003 is set aside for a one day **Advanced Skills Seminar on Euthanasia**, being held at the University of Western Ontario in London.

On **Friday February 28, 2003** we're offering a one **day tour** to a nearby facility

(location TBA) for those of you who enjoy or are interested in working with raptors.

The main conference programs get underway with early bird speakers on Friday February 27th, and runs through until Sunday March 1, 2003 at noon. There will be mammal topics, avian topics and related veterinary topics and other great speakers.

Plan to purchase your tickets for the Saturday evening banquet - we promise a great menu and wonderful fun with a silent auction, bucket draws and raffles for everyone!

Our hotel is the beautiful 4 Points Sheraton - London - Hotel and Suites, conveniently located just off Hwy. 401. Special conference rates with double occupancy and tastefully appointed rooms and suites are available.

Mark this week down on your calendar, and set this time aside - start making your plans to attend. Call your friends and encourage them to join you.

We've enclosed a call for speakers - if you would like to apply for this conference, please fill out the application and send it to us by the specified deadline.

Donations for our silent auction and bucket draws and raffles are being sought, if you or your organization has any great items to offer, please contact our fundraising chair, Ellen Hedges at 519-733-3426.

Keep an eye on your mailbox for your registration and invitation to the conference! We guarantee you that there will be something there for everyone. We urge you to take advantage of this wonderful opportunity to renew old friendships and make new ones.

OWREN is a network and there's no better place to see that network in action than with your peers at the conference - 'at home' - right here in Ontario! See you there!

The OWREN board of directors

Questions and Answers about West Nile Virus In Raptors - cont'd

(Continued from page 7)

via blood-to-blood contact or otherwise?

A: For all intents and purposes, it needs a vector to transmit it. There is some very weak anecdotal evidence to the contrary (this was a bird-to-bird via fecal/oral), but given the growing number of people that have worked with sick birds in a variety of circumstances and no evidence of transmission to people, I would say there is little risk. Precautions for hygiene and sanitation are always in order when handling sick animals, and these should be satisfactory here also.

Q: What do you recommend for protecting collections of birds?

A: Protect them from mosquitoes by moving them indoors, covering the facility with mosquito netting, and/or using a USDA-approved carbon dioxide mosquito trap. Isolate infected birds in mosquito-proof areas away from other birds that may be at risk, and incinerate carcasses of dead birds. Long-term, be prepared to deal with an ongoing threat of West Nile virus for the foreseeable future.

Q: Where can I get more information about West Nile virus?

A: The following Web sites have more information:

www.cdc.gov/ncidod/dvbid/westnile/index.htm

http://cindi.usgs.gov/hazard/event/west_nile/west_nile.html

*By Patrick T. Redig, D.V.M., Ph.D.
Director, The Raptor Center*

Editors note: In Ontario, there is a lack of specific information on WNV in wildlife species. Health departments are tracking human cases, and most are no longer taking submissions of species in for testing - it's established that the virus is present in mosquito pools in Ontario. The Canadian Cooperative Wildlife Health Centre website: www.wildlife.usask.ca/english/content.htm has not been updated in some time (we suspect they are very busy) and seeking information is a futile chase through cyberspace. The most up to date information so far is from US based sites; links have been provided for you in the addendum. If you would like to submit, a specimen, a report submission form for the CCWHC available on their website at: (call first to ensure they will accept it) <http://wildlife.usask.ca/WestNileAlertHTML/ON%20Surveillance%20Form%202002.pdf>

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Colleen: 519-734-8165, or
email: bernie@mnsi.net*

Network News is the newsletter of OWREN (Ontario Wildlife Rehabilitation and Education Network), a not for profit organization. Your feedback and letters are welcome. Please submit articles and comments to:

Editor, *Network News*, 40-1110 Finch Avenue West, Suite 1071, Toronto ON Canada M3J 3M2.

Editing and desktop publishing by Mary Catharine Kuruziak/Niagara Wildlife Haven

Special thanks to the following who helped produce this issue:
Michelle Bartlett-Rozad, Colleen Gignac, Liz Springall.

Species Found Positive for West Nile Virus in Surveillance Efforts Last Updated: November 25, 2002
National Wildlife Health Center U.S. Geological Survey - Madison, Wisconsin

Native North American Bird Species

Bittern, Least - <i>Ixobrychus exilis</i>	Grouse, Ruffed - <i>Bonasa umbellus</i>	Pigeon, White-crowned – <i>Columba leucocephala</i>
Blackbird, Brewer's – <i>Euphagus cyanocephalus</i>	Gull, Great Black-backed - <i>Larus marinus</i>	Rail, Virginia - <i>Rallus limicola</i>
Blackbird, Red-winged – <i>Agelaius phoeniceus</i>	Gull, Herring - <i>Larus argentatus</i>	Raven, Common - <i>Corvus corax</i>
Blackbird, Rusty - <i>Euphagus carolinus</i>	Gull, Laughing* - <i>Larus atricilla</i>	Robin, American - <i>Turdus migratorius</i>
Bluebird, Eastern - <i>Sialia sialis</i>	Gull, Ring-billed - <i>Larus delawarensis</i>	Sanderling - <i>Calidris alba</i>
Bobwhite, Northern - <i>Colinus virginianus</i>	Hawk, Broad-winged - <i>Buteo platypterus</i>	Sapsucker, Yellow-bellied – <i>Sphyrapicus varius</i>
Cardinal, Northern - <i>Cardinalis cardinalis</i>	Hawk, Cooper's - <i>Accipiter cooperii</i>	Scrub-Jay, Western – <i>Aphelocoma californica</i>
Catbird, Gray - <i>Dumetella carolinensis</i>	Hawk, Harris' - <i>Parabuteo unicinctus</i>	Shrike, Loggerhead - <i>Lanius ludovicianus</i>
Chickadee, Black-capped – <i>Poecile atricapillus</i>	Hawk, Red-shouldered - <i>Buteo lineatus</i>	Skimmer, Black - <i>Rynchops niger</i>
Chickadee, Carolina - <i>Poecile carolinensis</i>	Hawk, Red-tailed - <i>Buteo jamaicensis</i>	Sparrow, American Tree – <i>Spizella arborea</i>
Cormorant, Double-crested - <i>Phalacrocorax auritus</i>	Hawk, Rough-legged - <i>Buteo lagopus</i>	Sparrow, Fox - <i>Passerella iliaca</i>
Cowbird, Brown-headed - <i>Molothrus ater</i>	Hawk, Sharp-shinned - <i>Accipter striatus</i>	Sparrow, Savannah – <i>Passerculus sandwichensis</i>
Crane, Mississippi Sandhill – <i>Grus canadensis pulla</i>	Hawk, Swainson's - <i>Buteo swainsoni</i>	Sparrow, Song - <i>Melospiza melodia</i>
Crane, Sandhill* - <i>Grus canadensis</i>	Heron, Great Blue - <i>Ardea herodias</i>	Swan, Tundra - <i>Cygnus columbianus</i>
Crane, Whooping - <i>Grus americana</i>	Heron, Green - <i>Butorides virescens</i>	Swift, Chimney - <i>Chaetura pelagica</i>
Crow, American - <i>Corvus brachyrhynchos</i>	Hummingbird, Ruby-throated - <i>Archilochus colubris</i>	Thrasher, Brown - <i>Toxostoma rufum</i>
Crow, Fish* - <i>Corvus ossifragus</i>	Ibis, Scarlet - <i>Eudocimus ruber</i>	Thrush, Hermit - <i>Catharus guttatus</i>
Cuckoo, Yellow-billed – <i>Coccyzus americanus</i>	Jay, Blue - <i>Cyanocitta cristata</i>	Thrush, Wood - <i>Hylocichla mustelina</i>
Dickcissel - <i>Spiza americana</i>	Jay, Steller's - <i>Cyanocitta stelleri</i>	Titmouse, Tufted - <i>Baeolophus bicolor</i>
Dove, Mourning - <i>Zenaida macroura</i>	Kestrel, American - <i>Falco sparverius</i>	Towhee, Eastern – <i>Pipilo erythrophthalmus</i>
Duck Bufflehead - <i>Bucephala albeola</i>	Killdeer - <i>Charadrius vociferus</i>	Turkey, Wild - <i>Meleagris gallopavo</i>
Duck, Cinnamon Teal - <i>Anas cyanoptera</i>	Kingbird, Eastern - <i>Tyrannus tyrannus</i>	Turnstone, Ruddy - <i>Arenaria interpres</i>
Duck, Common Goldeneye - <i>Bucephalac langula</i>	Kingfisher, Belted - <i>Ceryle alcyon</i>	Veery - <i>Catharus fuscescens</i>
Duck, Mallard* - <i>Anas platyrhynchos</i>	Kite, Mississippi - <i>Ictinia mississippiensis</i>	Vireo, Black-whiskered - <i>Vireo altiloquus</i>
Duck, Merganser - <i>Mergus merganser</i>	Lorikeet, Rainbow – <i>Trichoglossus haematodus</i>	Vireo, Warbling - <i>Vireo gilvus</i>
Duck, Wood - <i>Aix sponsa</i>	Kite, Swallow-tailed - <i>Elanoides forficatus</i>	Vulture, Black - <i>Coragyps atratus</i>
Eagle, Bald* - <i>Haliaeetus leucocephalus</i>	Magpie, American* - <i>Pica hudsonia</i>	Vulture, Turkey - <i>Cathartes aura</i>
Eagle, Golden - <i>Aquila chrysaetos</i>	Magpie, Black-billed - <i>Pica pica</i>	Warbler, Blackpoll – <i>Dendroica caerulescens</i>
Egret, Great - <i>Ardea alba</i>	Martin, Purple - <i>Progne subis</i>	Warbler, Black-throated Blue – <i>Dendroica striata</i>
Falcon, Peregrine* - <i>Falco peregrinus</i>	Merlin - <i>Falco columbarius</i>	Warbler, Canada - <i>Wilsonia canadensis</i>
Falcon, Prairie - <i>Falco mexanicus</i>	Mockingbird, Northern – <i>Mimus polyglottos</i>	Warbler, Hooded - <i>Wilsonia citrina</i>
Finch, House - <i>Carpodacus mexicanus</i>	Nighthawk, Common - <i>Chordeiles minor</i>	Warbler, Kentucky - <i>Oporornis formosus</i>
Finch, Purple - <i>Carpodacus purpureus</i>	Night-Heron, Black-crowned* - <i>Nycticorax nycticorax</i>	Warbler, Nashville - <i>Vermivora ruficapilla</i>
Flamingo, American – <i>Phoenicopterus ruber</i>	Night-Heron, Yellow-crowned - <i>Nyctanassa violacea</i>	Warbler, Yellow - <i>Dendroica coronata</i>
Flicker, Northern - <i>Colaptes auratus</i>	Nuthatch, White-breasted – <i>Sitta carolinensis</i>	Warbler, Yellow-rumped – <i>Dendroica aestiva</i>
Flycatcher, Traill's – <i>Empidonax traillii/alnorum</i>	Oriole, Baltimore - <i>Icterus galbula</i>	Waterthrush, Northern – <i>Seiurus noveboracensis</i>
Goldfinch, American - <i>Carduelis tristis</i>	Osprey - <i>Pandion haliaetus</i>	Waxwing, Cedar - <i>Bombycilla cedrorum</i>
Goose, Canada - <i>Branta canadensis</i>	Ovenbird - <i>Seiurus aurocapillus</i>	Wigeon, Eurasian - <i>Anas penelope</i>
Goose, Emperor - <i>Chen canagica</i>	Owl, Barn - <i>Tyto alba</i>	Woodpecker, Downy - <i>Picoides pubescens</i>
Goose, Snow - <i>Chen caerulescens</i>	Owl, Barred - <i>Strix varia</i>	Woodpecker, Red-headed – <i>Melanerpes erythrocephalus</i>
Goshawk, Northern - <i>Accipiter gentilis</i>	Owl, Eastern Screech - <i>Otus asio</i>	Wren, Carolina – <i>Thryothorus ludovicianus</i>
Grackle, Boat-tailed - <i>Quiscalus major</i>	Owl, Great Horned - <i>Bubo virginianus</i>	Wren, Winter - <i>Troglodytes troglodytes</i>
Grackle, Common - <i>Quiscalus quiscula</i>	Owl, Northern Saw-whet – <i>Aegolius acadicus</i>	Yellowthroat, Common – <i>Geothlypis trichas</i>
Grackle, Great-tailed – <i>Quiscalus mexicanus</i>	Owl, Short-eared - <i>Asio flammeus</i>	
Grebe, Pied-billed - <i>Podilymbus podiceps</i>	Owl, Snowy - <i>Nyctea scandiaca</i>	
Ground-Dove, Common – <i>Columbina passerina</i>	Parula, Northern - <i>Parula americana</i>	
	Pelican, American White – <i>Pelecanus erythrorhynchos</i>	
	Phoebe, Eastern - <i>Sayornis phoebe</i>	

Species Found Positive for West Nile Virus in Surveillance Efforts - continued

Other Free-Ranging Bird Species

Budgerigar* - *Melopsittacus undulatus*
Collared-Dove, eurasian - *Streptopelia*
Dove, Rock (pigeon) - *Columba livia*
Lorikeet - *Trichoglossus haematod*

Pheasant, Ring-necked - *Phasianus colchicus*
Sparrow, House - *Passer domesticus*
Starling, European - *Sturnus vulgaris*
Swan, Mute - *Cygnus olor*

Free-Ranging Mammal Species

Bat, Big brown - *Eptesicus fuscus*
Bat, Little brown - *Myotis lucifugus*
Bear, Black – *Ursus americanus*
Chipmunk, Eastern - *Tamias striatus*
Deer, White Tailed - *Odocoileus virginianus*

Goat, Rocky mountain – *Oreamnos americanus*
Raccoon - *Procyon lotor*
Skunk, Striped - *Mephitis mephitis*
Squirrel, Grey - *Sciurus carolinensis*
Wolf, Eastern timber – *Canis lupus lycaon*

Pet and Other Domesticated Species

Alpaca
Bovine
Cat, domestic
Chicken
Cockatiel*
Cockatoo*
Dog, domestic
Donkey
Finch, Zebra
Goat, Mountain

Goose, domestic
Horse, domestic
Llama, domestic
Macaw*
Mule
Parakeet*
Peacock*
Rabbit, domestic
Sheep, Suffolk
Turkey, domestic

Exotic and Zoo Species

Alligator, American
Bat, Fruit
Bustard
Condor, Andean*
Cormorant, Guanay*
Crane, West African Crowned
Duck, Bronze-winged*
Duck, Yellowbilled
Emu
Flamingo, Chilean*
Goldfinch, European
Goose, Nene
Goose, Red Breasted
Gull, Silver
Lorikeet, Violet Necked
Lory, Forsten
Macaque, Barbary
Ostrich

Owl, Tawny
Parrot, Red-crowned
Peafowl
Penguin
Penguin, Black Footed*
Penguin, Humboldt
Pheasant, Himalayan Impeyan
Reindeer (captive)
Seagull
Seal, Harbor
Stork, Adjutant
Stork, Saddlebilled
Teal, Puna
Tern, Inca
Tit, Varied
Tragopan, Blythe's*
Vulture, Cinereous

National Wildlife Health Center

URL: http://www.nwhc.usgs.gov/research/west_nile/wnvaffected_text.html

This list is derived from several sources, most heavily from those of the USGS National Wildlife Health Centers and ProMed lists. Species listed with an asterisk (*) were of initial individuals in captivity and may or may not be from the New World.

Summary of West Nile virus-positive findings from **March 2002 through November 25, 2002:**

3735 (215 deaths) Humans, 13577 Equines, 13 Other Mammals, 13252 (7522 crows) Birds, 4906 Mosquito Pools, and 366 Sentinel Chicken Flocks (source: CDC/ProMed)

States/Provinces where positive animals (mosquitoes, birds, and/or mammals) have been found:

Maps available at CDC: <http://www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm>

Canada	District of Columbia	Michigan	Pennsylvania
Manitoba, Nova Scotia,	Georgia	Minnesota	Rhode Island
Ontario, Quebec,	Florida	Missouri	South Carolina
Saskatchewan	Illinois	Montana	South Dakota
	Indiana	New Hampshire	Tennessee
USA	Iowa	New Jersey	Texas
Alabama	Kansas	New Mexico	Vermont
Arkansas	Kentucky	New York	Virginia
California	Louisiana	North Carolina	Washington
Colorado	Maine	North Dakota	West Virginia
Connecticut	Maryland	Ohio	Wisconsin
Delaware	Massachusetts	Oklahoma	Wyoming