



NETWORK

news

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2004

Issue 27

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Migratory Bird Permits

Back in the early 90's, when it occurred to me that I might need a permit to possess certain species of native birds, in my case for the purpose of rehabilitation, I phoned the Canadian Wildlife Service (CWS) to inquire. At the time, I was told simply to send them a letter outlining what I was doing. They said that once they received the letter, they would, if satisfied, issue to me a Migratory Bird Permit. I did, they did.

Times have changed!

Currently, if you wish to obtain a Migratory Bird Permit, which is required in order to legally possess certain species of native birds (i.e. those species covered federally under the *Migratory Birds Conven-*

tion Act) you will have to fill out an application form. This form is available from your local CWS office upon request. Along with the completed application form, you will need to submit two letters of reference (from a qualified ornithologist, veterinarian or official of a Federal or Provincial Game Management Authority who are familiar with your work).

To make this application process go smoothly and quickly, I suggest that you write your own letters of reference and just have your references sign on the dotted line. In the letters, include details such as:

- how long the individual has been acquainted with you

and your work;

- if, and in what capacity, they have been involved with your efforts (e.g. Does the local bird-bander band your rehabilitated birds prior to release?); and
- the fact that they have seen your facilities and are satisfied with the quality of care, caging, environmental enrichment, etc. that you provide.

I would also suggest that you include, with your application, a photo or two of your flight cage/s and rehabilitation facility.

When you submit your application, be sure to ask the CWS for a list of the *Birds Protected in Canada under*

(Continued on page 5)

Just in Case You Had Any Doubts ...

You Know That You're a Wildlife Rehabilitator When...

1. No one wants to sit in the back seat of your car (or anywhere else in your car for that matter!)
2. Friends and neighbours feel free to call and tell you that there is fresh road kill on such-and-such a road (and you rush out to

get it before someone else does, while still in your pajamas!).

3. You bring home groceries, and your child needs to clarify which food is for them, and which is for the animals.
4. You call home from a hospital 45 minutes away, not because you have been bitten by a rabid animal (which you actually have been) but to let

them know that the dinner guests will be arriving any minute and as soon as the "human" health officials figure out what to do with you, you will be on your way.

5. Your spouse accepts that your idea of "dress-up" clothes, are the T-shirts that you bought at the last wildlife rehab conference.

(Continued on page 2)

Rabies at My Facility

After attending the NY State Wildlife Rehabilitator's Conference and participating in their RVS certification I found myself mentally reliving the summer of 2002. I would like to share my sad experience with the rest of you in hopes that it might raise your awareness of this disease.

Those of you who know me are well aware that raccoons are my number one favorite. They are smart, funny, incredibly endearing and also very unpredictable to rehabilitate. The 2002 season took me through the worst experiences of my 12 years of rehabilitation.

My nightmare began on Sunday evening June 30, 2002. While cleaning my large raccoon cage prior to going to work, I noticed one of the little females was ever so slightly wobbly on her feet, not the rear end paralysis that we hear about in conjunction with rabies or distemper but just a very slight unsteadiness of gait.

After watching her for a few minutes while trying to decide if she really was ataxic I decided to remove her from the cage and confine her for observation and isolation.

Before Monday was out she was dead and on Tuesday morning I submitted her for testing. Wednesday evening when I returned from grocery shopping I noticed 3 calls on my caller ID from the health department. At this point I got a very bad feeling...they were already closed for the Fourth of July holiday so I could not get any information until Friday the 5th. At eight o'clock Friday morning I got the call that everyone dreads...the test was positive for rabies!!!!!!

I've had my pre-exposure vaccinations and was somewhat protected from any accidental exposure I may have incurred in handling this raccoon, but her cage mates and siblings were not. Anyone who has ever handled adolescent raccoons is fully aware of the rough horse-

play they engage in.

There is a great deal of normal play biting and chewing on each other's ears, tails, etc., that they engage in. As a matter of fact just a few days earlier, my husband had called me to the window from which he was watching their horse-play. Tim was convinced they were nearly killing each other, but we know they weren't. They were simply playing in typical raccoon fashion and in this manner, undoubtedly passing the rabies virus to one another.

I elected to take the post exposure boosters simply as a precaution due to the close contact I had with these animals. Although I wear gloves, and observe safety precautions with them, the risk of accidental exposure (am I or am I not 100% protected?) is something I chose not to use myself as a clinical experiment.

After notifying all the pertinent people

(Continued on page 4)

You Know That You're a Wildlife Rehabilitator When...cont'd

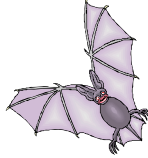



(Continued from page 1)

6. Your idea of jewelry is a stethoscope and penlight.
7. Your teenager says, "We're not a normal family are we?"
8. You get a phone call saying your mother has broken her hip, and they start to explain what a bone reduction is, and you jump in and say that there is no need to explain, as you have just recently seen one done on a porcupine.
9. You learn something every day and realize that you have so much more to learn.
10. You spend the family vacation helping friends build their deer pen, and your child tells you "This is the coolest vacation ever".
11. You tell your family doctor that she can give you the second rabies booster in the deltoid, (because you read the package insert), as the previous shot in the backside is still putting a spring in your step.
12. You can still eat spaghetti after deworming the raccoons. (If necessary, you can eat spaghetti WHILE deworming the raccoons!)
13. Your entire wardrobe smells of Esbilac (and you kind of like it).
14. You really, truly, absolutely, do not want to answer the phone. But you do.
15. You spend every last cent to get to the wildlife rehab conference, because there is always something to learn.
16. Your friend understands that you're late for the dinner party because the baby beaver wouldn't poop.
17. You have experienced the discomfort of a porcupine quill in your underwear.
18. You know that that chipmunk's teeth really will go right through your finger. (And stay there!)
19. You realize that one second of distraction, while handling the red fox, can cause you permanent nerve damage, BUT, since the injury is on your middle finger, you can take advantage of holding it up without offending anyone.
20. At some point you've had to extract a talon, quill or tooth from some part of your body.
21. You start to think that meal worms really do look tasty.
22. Sleeping in becomes a luxury. Eating becomes a luxury. But flea baths (for you) become a necessity.
23. You release a bird and watch it fly as far as you can see, and as it fades from view, you can't express the emotion in words.
24. You have learned that the general population is fairly ignorant when it comes to wildlife.
25. You can vaccinate 22 skunks without getting sprayed, but get nailed by one while taking a stroll in the evening.
26. You have your tire blow out and you have a red-tailed hawk and a merganser in the car.
27. When people ask what you do, you tell them you work at a very nice department store (it's just easier).

By Liz Springall

Rabies Cases in Ontario in 2003

122 cases of rabies were reported in 2003 in Ontario. They are shown here listed by county and by species.
(Data source: Agriculture and Agri-Food Canada) Updated lists available at: <http://www.gis.queensu.ca/rreporter>

by County	No. of Cases	by County	No. of Cases		by Species	No. of Cases	
Bruce	8	Middlesex	2		Big Brown Bat	68	
Dufferin	2	Niagara	7		Bovine	5	
Durham	1	Ottawa-Carleton	5		Caprine	1	
Elgin	1	Oxford	2		Equine	1	
Frontenac	4	Peel	1		Hoary Bat	1	
Grey	12	Perth	1		Little Brown Bat	3	
Haldimand-Norfolk	1	Peterborough	3		Raccoon	16	
Halton	4	Prescott-Russell	1		Red Fox	5	
Hastings	2	Simcoe	10		Striped Skunk	21	
Huron	2	Sudbury	1		Wolf	1	
Kent	4	Victoria	2				
Lambton	4	Waterloo	1				
Lanark	2	Wellington	9				
Leeds-Grenville	20	Hamilton-Wentworth	6				
Lennox-Addington	1	York	3				
						Total Cases 2003	122

To Bleach or Not to Bleach? How Effective is Sodium Hypochlorite?

How effective is sodium hypochlorite (5.25% household bleach) against pathogens? You might be surprised.

Sodium hypochlorite effectively kills many bacteria, molds, and mildews, and inactivates (kills) lipid and non-lipid viruses. The effectiveness of sodium hypochlorite is dependent upon the amount of *available chlorine*.

The table of Dilution Efficacy Levels is based upon scientific studies previously summarized by researchers.

Manufacturers recommend higher concentrations to ensure adequate *available chlorine* and counter act the presence of any organic matter.

1:32 dilution is the general recommended all purpose use.

That translates to 4 ounces of (5.25%) bleach to each gallon of hot water.

(To kill viruses, the dilution needs to be a minimum of 1:20 so the general 1:32 dilution is more than adequate)

Always measure and be sure!

Dilution Efficacy Level		
Desired Concentration	Effective Disinfection Level	Dilution of Household Bleach (5.25%)
100 ppm	G+ / G- Bacteria	1:500
500 ppm	<i>Bacillus subtilis</i> spores	1:100
1000 ppm	Micobacterium minimum	1:50
2400 ppm	Virucidal	1:20
5000 ppm	Micobacterium tuberculocide	1:10
52,500 ppm (household bleach)	High level disinfectant not bacterial spores	1:1
<i>Adapted from Rutala, 1996(4).</i>		

OWREN Directory Correction

Page 23 of the 2003-2004 Directory
Gignac, Colleen
Change email to:
naturespromise@sympatico.ca

If there are any other errors, please send them to: owren@email.com
Subject: Directory Correction. We'll list them in this space. Thank you.

Rabies at My Facility...cont'd

(Continued from page 2)

beginning with my licensing agency, who by the way were very kind and sympathetic, I was left with the heart-breaking task of euthanizing five beautiful and to all outward appearances, apparently healthy animals.

I've been asked many times since then, "Why couldn't you just keep them in quarantine for 6 months like they do for dogs?" The answer is no, that is not possible because the quarantine period for raccoons is unknown and animals have broken with the virus as much as 1 year after exposure.

That was not an ethical or responsible option. Not to mention that the state of Georgia would never have permitted such a thing because of the risk these

raccoons were to passing wildlife who might come into contact with them while they were quarantined.

I cannot possibly convey the heartbreak I experienced that week in July. I still cannot get the vision of those trusting little faces out of my mind.

The reason I am sharing this with my friends in the rehabilitation community is to remind you that the next time you handle your orphaned raccoons, please remember they could look fine and still be shedding the virus. Mine was "healthy", bright eyed and playful on Saturday but had probably been shedding the virus for at least 8-10 days prior to that...possibly longer.

If you allow foster care, or non-permitted or unvaccinated people to help you raise them, you may have to later

answer some very difficult questions for your Ministry and health departments should this happen in your facility. Not to mention the obvious...did you put these people or anyone else at risk?

Are they sending animals that die suspiciously in their care out for specific testing? Are they notifying the proper authorities? Is there a paper trail that can be turned over to the Health Department just in case? Necropsies alone are not adequate because they won't detect rabies.

Never say never when it comes to rabies.

*Bobbie Binns
bbinns@mindspring.com
Hamilton, Georgia USA
State 13 years /Fed. Subpermit
NWRA, IWRC, NYSWRCA
Small Mammals, Hummingbirds, RVS*

Need A Receipt?

For those members who require an OWREN receipt for your membership fees, directory purchase, course registrations, or donations, please direct your request to OWREN's Membership Secretary.

Rather than incur the expense of a mass

mailing to members who may simply have no need of a receipt, we've elected to issue them for the above purposes, only upon request.

While a receipt from OWREN cannot currently be used for income tax purposes, some members may have their

fees paid through a sponsoring organization, and a require a receipt for that reason.

Colleen Gignac
OWREN Membership Secretary
Phone: (519) 734-8165
Email: owren@email.com

CAHT Trap Evaluation Workshop

As a board member and education co-chair for OWREN, I attended the Canadian Association for Humane Trapping (CAHT) Trap Evaluation Workshop in June 2003. I wasn't quite sure what to expect. I did some juggling to get the day off work, and away I went. What an incredible day it turned out to be!

I always enjoy meeting different people and sharing points of view. What an eclectic group it was! There were 25 people in attendance from all walks of life.

We started the day with coffee and baked goods. Next, we were briefed on the requirements for traps under the International Agreement. As of 2007, all traps, including box/live traps, for 13 species will have to be certified by CAHT.

I thought, "What's the big deal? A live trap is a live trap, right?" Wrong!

We split up into 6 teams. Each team was to evaluate a total of 36 box/live traps. Each trap was marketed for certain species. All traps were purchased by CAHT, so quality control etc., was not tampered with. They were exactly as if 'Joe Public' had purchased them.

The evaluation consisted of: being user friendly, animal friendly, door mechanisms, trigger mechanisms, stress and injury to the captured animal, appropriateness to marketed species, best feature, and worst feature.

We only had 5 traps at our centre where I worked, and honestly I have never given a live trap much thought. I just presumed that they were all humane. We only use box/live traps, and only to capture injured wildlife.

My team consisted of myself, (a wildlife rehabilitator), a technician from the OMNR Rabies Research and Development Unit, a

fur trapper, and a supervisor from Toronto Animal Services. I found it interesting that we each looked for different qualities in the traps. All of our needs were different.

There we were out in the parking lot of the Mohawk Inn. It was a beautiful day, and collectively we chose to be outside. Some of the local gentry did a double take. Some folks came over to investigate the variety of traps, while others looked at us as if we were out on a 'day pass'.

As the day wore on I found myself to be more critical, which is exactly what the CAHT was looking for. I was surprised to learn that most people only check traps once every 24 hours. If I loan out a trap, it's on the stipulation that it be monitored every half an hour. However, this is impractical for other people's purposes.

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Migratory Bird Permits...*cont'd*

(Continued from page 1)

the Migratory Birds Convention Act.

(It's a good idea to keep a current version of this list at your facility for future reference). The species listed there are the ones that are covered by a Migratory Bird Permit.

Note: A rehabilitator who is rehabilitating species **solely** covered by the Federal *Migratory Bird Convention Act* **does not** require an Ontario provincial Wildlife Custodian Authorization to do so. However, a rehabilitator who rehabilitates both migratory species **and** game wildlife or specially protected wildlife (as scheduled in the *Fish and Wildlife Conservation Act*) requires both a Wildlife Custodian Authorization **and** a Migratory Bird Permit.

Some non-native species (e.g. Rock Doves, English Sparrows, and Starlings) are *not* protected, either federally or provincially.

When you receive your Migratory Bird Permit you will see that you are bound by a set of conditions. (These conditions are separate from those associated with a Wildlife Custodian Authorization). This federal permit requires, among other things, that you:

- house the birds in question *solely* at the address on the permit
- may not transfer a bird to anyone who does not have a federal permit;
- may not transport birds to and from your place of work;
- must euthanize any non-releasable bird; etc.

(More detailed information is on the permit application form).

You will also be required to keep a logbook similar to the one required by the OMNR in association with a Wildlife

Custodian Authorization. In addition to the information required by the OMNR, federal conditions stipulate that you also include treatment provided and date of final disposition. To make things easier (since I rehabilitate both migratory species and those scheduled in the *Fish and Wildlife Conservation Act*) I have set up one logbook form on Excel that fulfills the requirements of both agencies.

When it comes time to submit my records, I simply print two copies.

To Clarify Section 44 of the Fish and Wildlife Conservation Act as it relates to birds.

Clause (2) *The Minister may authorize a person to keep injured, sick or immature game wildlife or specially protected wildlife in captivity for the purpose of rehabilitating or caring for them.*

Birds Protected by OMNR Schedule 8 in the Act (not protected by Environment Canada's Migratory Bird Convention Act)

Brewer's Blackbird
Rusty Blackbird
Yellow-headed Blackbird
Blue Jay
Gray Jay
Belted Kingfisher
White Pelican
Common Raven

Most of these birds are migratory. The Crows & Jays don't do a true migration but do shift territories seasonally according to accessibility of food.

All native Raptors Schedule 7 in the Act

Birds not protected either by Provincial or Federal regulations: see Section 5, clause 2, paragraph (a)

American Crow
Brown Headed Cowbird

Common Grackle
Starling
House Sparrow
Red Winged Blackbird
Cormorant
Rock Dove (Pigeon)

Protected Game Birds Schedule 3 in the Act. (OMNR Permit required)

This list covers all our native Grouse, Partridges, Pheasants, Quail & Turkeys.

Northern Bobwhite
Ruffed Grouse
Sharp Tailed Grouse
Spruce Grouse
Gray (Hungarian) Partridge
Ring-necked Pheasant
Rock Ptarmigan
Willow Ptarmigan
Wild Turkey

These birds are non-migratory. Canadian Geese (as are all native geese, ducks & swans) are not mentioned in the act as they are migratory birds and a CWS license would be required to rehabilitate them.

I discovered that the Mute Swan (an introduced species) is protected by Federal regulations. Although the American Black duck and Mallard cross are not mentioned on the Federal list I would imagine they would be protected under the name of either species, as this cross is a natural occurrence. In fact all subspecies of (CWS) listed nominate species are protected.

I hope this helps simplify things just a bit.

By Judi Drake, S.O.A.R.
Songbirds Only Avian Rehabilitation
Rockwood ON
drake@sentex.net

The OWREN Directory

In late fall of 2003 it was brought to our attention that the OWREN Directory had been 'harvested' and some of you found yourselves receiving mail from a non-wildlife rehabilitation related organization. The OWREN directory was created and is maintained for a simple purpose - to be a networking tool—a means for custodians

in Ontario to connect with one another for the purpose of wildlife rehabilitation and to assist them or other agencies in locating custodians not in their area. Any other use of the OWREN directory is highly unethical and irresponsible and is in direct violation of the copyright contained in the directory's introductory pages.

We are greatly saddened that the names in the directory were used in this manner. Some members have expressed concerns about being the recipients of this type of unwanted communication. It is our belief that as a result of this type of intrusion,

(Continued on page 7)

Squirrel Cage Plans

These plans for a permanent 8' x 6' x 6' wire mesh covered cage are intended as simple guidelines only. The cage can be made longer or shorter but the height and width must stay at 6' to accommodate the 6' width of the 1"x 2" mesh wire.

The ideal location to build this structure would be in a partially shaded area with trees in close proximity. Good drainage is also a factor.

Tool List:

- Circular saw
- Electric drill and bits (including screw driver bits)
- Carpenters square
- Saw horses (recommended)
- Hammer
- Level
- Shovel or pick axe

Material List:

- 8 - Concrete blocks 4"x8"x16" (for the foundation)
- 7 - 2x6x8' treated (for floor structure)
- 18 - 1x6x8' treated (for floor covering and top trim)
- 4 - 2x4x8' treated (for cage walls)
- 28 - 2x4x6' treated (for cage walls and roof support - frame for floor hole)
- (Some places sell 6' 2x4s - others don't. You can substitute fourteen 12 foot 2x4s and cut them in half).
- 5 - 1x4x8' treated (for door frame)
- 1 - 50' roll of 1"x2" mesh, 6' wide welded wire. (It takes about 35' to build this cage.)
- 1 - 10' roll of 1/2"x 1/2" mesh, 2' wide welded wire or hardware cloth. (for door and floor hole)
- 3 - 8'x2' PVC or tin (for roof covering

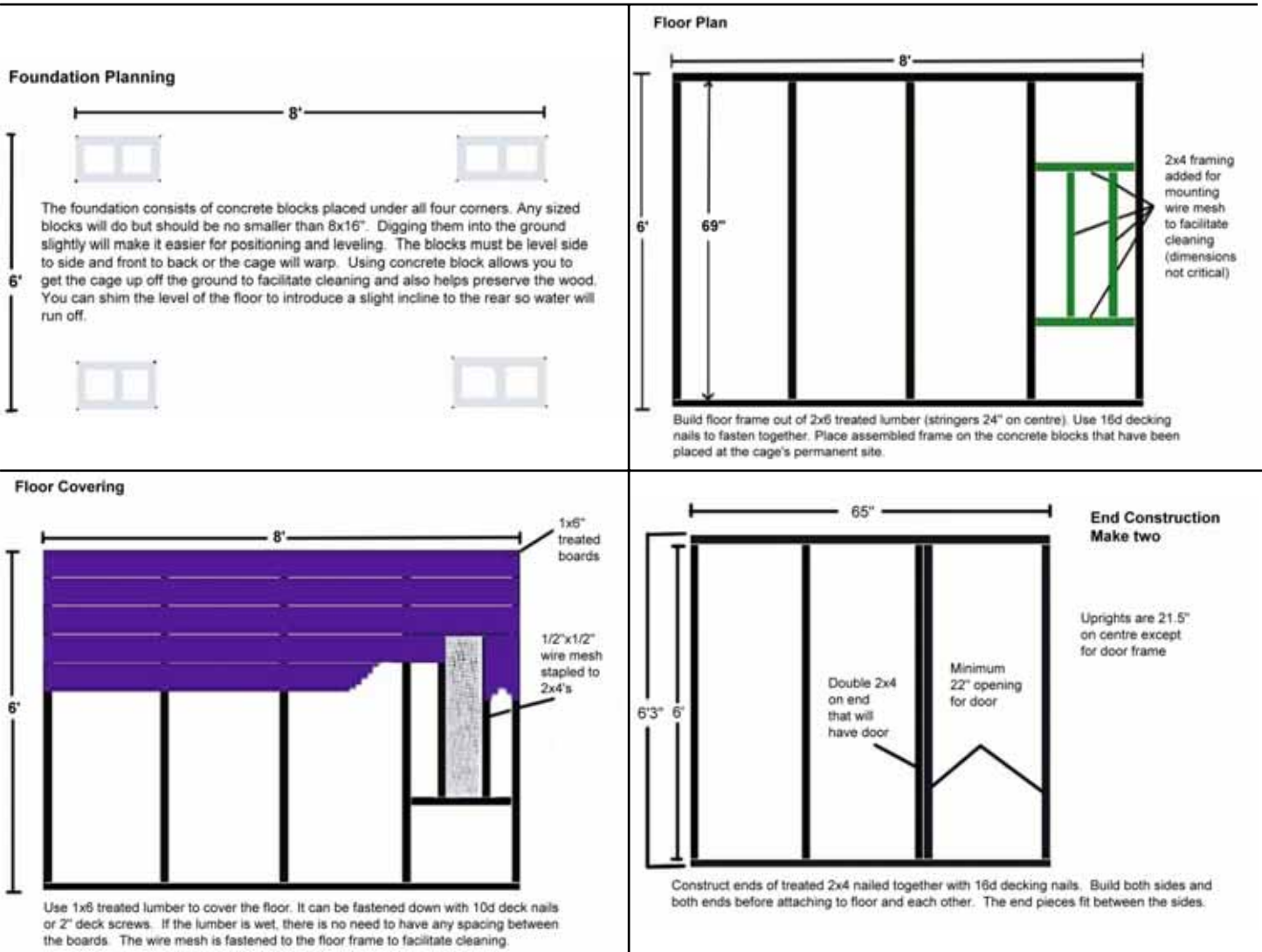
material- don't forget the mounting hardware)

- 1box 16d decking nails (approx 5 lbs.)
- 1box 10d decking nails (approx 2 lbs.) (or 2" decking screws if you prefer)
- 1box 1 1/4" galvanized #8 wood screws (approx. 30 or 40 screws are needed to assemble the door)
- 1box 1/2" galvanized U-staples (approx. 2 lbs.)
- 2 hinges (for door)
- 3 hooks and eyes (for door)

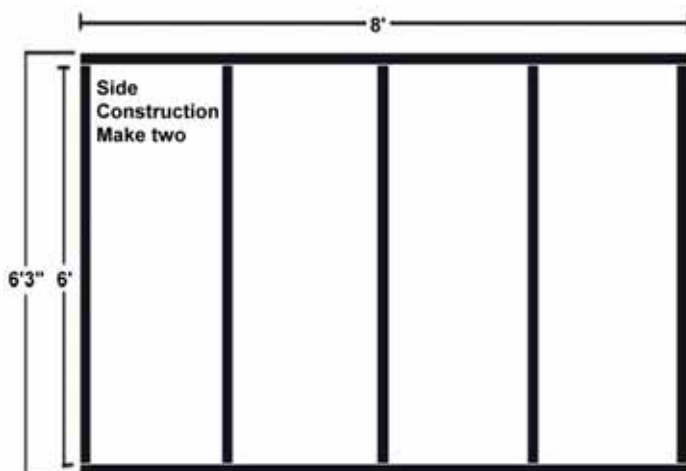
© 2002

Jim Isaacs, Fort Mill, SC

Used with permission Note: The authors wife Pat Isaacs, has successfully housed and rehabilitated hundreds of squirrels in pens built using treated wood, and observed no adverse effects, you may choose to use non-treated wood in your application of these plans. Ed.



Squirrel Cage...cont'd



Construct sides of treated 2x4 nailed together with 16d decking nails. Build both sides and both ends before mounting to floor with 16d nails.



CAHT Trap Evaluation Workshop...cont'd

(Continued from page 4)

Some of the traps were all sheet metal, meaning that if an animal were caught in the A.M., it would virtually be cooked by the following A.M., when it would be checked again!

There were a couple of heavy-duty plastic traps, with poor ventilation that would actually steam the animal to death! Some of the traps were broken or deemed non-functional by the time my team got to evaluate them.

All factors were considered, and each team had to come to a collective agreement as to the best trap in each category. FYI, each of the teams had *very* different viewpoints!

This data will be compiled and made available to the manufacturers in near future. I will certainly keep you posted on the outcome. All in all, it was a fascinating day.

I think the most interesting thing for me, was the sharing of needs, by a variety of people. It was most educational.

At the end of the day, all traps were raffled off to the attendees. I donated two traps that I had won to OWREN's Silent Auction at recent conference held in Guelph. One was my team's first choice in that category!

by Liz Springall
Education Co-Chair
OWREN
lizspringall@rogers.com

Directory...cont'd

(Continued from page 5)

over 36% of our members have indicated that they do not wish to be listed in the directory and almost 45% have informed us they do not give their consent to share their contact information with others. If this continues, the OWREN board is concerned that there won't be a directory left to publish, and OWREN will no longer be able to provide this valuable networking tool as a resource for our members.

The future of the OWREN Membership Directory rests entirely in your hands. Please, use it wisely.

OWREN Board of Directors

London 2003 Conference Memories



Telephone Hotlines presentation
Erin Luther, Toronto Wildlife Centre



F.L.A.P. (Fatal Light Awareness Program)
Carolynn Parke, Michael Mesure



OWREN Icebreaker, Friday evening.
Networking in action!



Banquet Keynote Speaker
Jane Schnelker, Ohio



Mammal Necropsy—Saturday
Colleen Gignac, Liz Springall



Brown Bag Draws, Silent Auction
Ellen Hedges



OWREN Banquet—Saturday evening
Good food, GREAT friends!



Avian Necropsy—Saturday
Instructor Dr. Nancy Mehi, Liz Springall (back row)

Our Thanks to the London 2003 Conference Contributors!

PRESENTERS

Lorraine Bannerman;
Laura Bruce; MNR Rabies Research
Dr. Doug Campbell; CCWHC, University of Guelph
Dr. Andrea Coombs;
Alison Cooper; Toronto Wildlife Centre
James Cowan; Canadian Raptor Conservancy
Dr. Tyrell de Langley; Western University
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Nathalie Karvonen; Toronto Wildlife Centre
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Paloma Plant; THS Wildlife Dept
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Liz Springall;
Nonda Surratt; Cedar Hill Wildlife Care, OH
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Dr. Ian Welch; Western University

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The OWREN board of directors appreciates the generous donations made by the individuals and companies listed here. Because of each of you, our conference was a wonderful success. Thank you!



Thanking some of the wonderful members who volunteered and helped us.



James Cowan
Canadian Raptor Conservancy



West Nile Virus presentation
Dr. Doug Campbell, CCWHC, U of Guelph

Avian Aspergillosis

Aspergillosis is a very common avian disease, particularly in captive waterfowl, wading birds, penguins, raptors, pheasants, and passerines. Among pet psittacines, it is frequently seen in Amazon parrots and African grey parrots. The causative organism is usually *Aspergillus fumigatus*, although *Aspergillus flavus* and *Aspergillus niger* infections also occur.

Clinical Signs

Clinical signs vary with the anatomic site of infection, but they can be generally thought of as reflecting disease of the respiratory tract and/or occasionally the CNS. There are three common presentations of this disease:

1. Diffuse lower respiratory tract disease,
2. Syringeal granuloma, and
3. Focal CNS granuloma, particularly in the brain.

Diffuse Lower Respiratory Tract Disease -

A bird with diffuse lower respiratory tract disease often presents as being obviously dyspneic, (open-mouth breathing, bobbing motion of tail, increased respiratory rate or effort at rest, prolonged tachypnea following manual restraint, wide-based stance on perch) and may or may not also have the generic "sick bird" appearance of being fluffed and less active. This presentation is particularly common in passerines, psittacines, and raptors. Diffuse lower tract disease is also common in waterfowl and wading birds, but frequently these species will show acute death with little or no premonitory signs, although chronic weight loss may be noted in many cases if body weights have been followed prior to death.

Syringeal Granuloma - Birds with syringeal granuloma may have lower respiratory disease as well, but frequently they have only a single lesion at the syrinx. The classic sign which helps identify many birds with this form of aspergillosis is a change in the pitch or quality of the voice. Psittacines, passerines, and waterfowl are the species which most commonly present in this way. If the syringeal granuloma is large enough to substantially obstruct the airway, many of the signs of dyspnea mentioned above may also be apparent.

Focal Granulomas - Focal granulomas in the brain can occur in any species, but they are most often seen in waterfowl, especially eider ducks. Central nervous system signs such as ataxia or torticollis may be present. As with the syringeal granuloma presentation, the lower respiratory tract may simultaneously be affected, or the CNS granuloma may occur as a single lesion. Focal granulomas may also occur outside the CNS, causing signs such as unilateral paresis or unilateral pectoral muscle atrophy.

Diagnosis

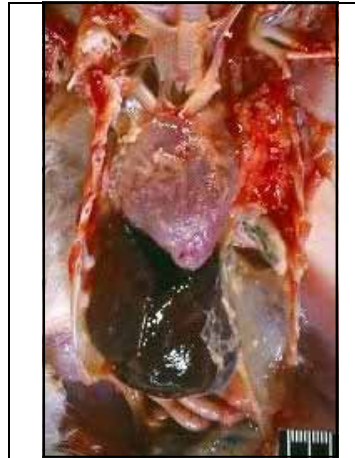
Physical exam findings may include increased respiratory rate and effort, increased pulmonary sounds, obvious respiratory distress, prolonged tachypnea following manual restraint, CNS signs, change in pitch of vocalizations, and thin body condition. Anorexia may or may not be present. Occasionally there will be no abnormal findings on physical exam.

For birds in which clinical signs or history make aspergillosis likely, endoscopic exam can provide a quick diagnosis when disease is advanced enough such that white patches of fungal elements can be directly observed on the air sacs. The appearance is fairly characteristic; but diagnosis can also be verified by endoscopic sampling of the affected tissue for cytology, culture or biopsy if so desired. An air sac wash can also be performed for cytology and culture. Tracheoscopy using a flexible pediatric bronchoscope or a rigid small bore endoscope may be used to visualize syringeal granulomas.

Whole body radiographs can be helpful in diagnosis; syringeal granulomas, multifocal air sac granulomas, or diffuse increased opacity in the lower respiratory tract may be observed. If disease is advanced to the point where lesions can be observed on radiographs, particularly in the air sacs or pneumatic bones such as the humerus, prognosis is guarded.

Bloodwork results vary, but infected animals will frequently have a substantial leukocytosis with total white blood cell count greater than 30,000. Monocytosis may or may not be present depending on the chronicity of the disease. Chemistry panel results are often unremarkable. Ancillary testing available for birds includes an aspergillus antibody titer available through the Raptor Center at the University of Minnesota and antibody/antigen testing available through the University of Miami School of Medicine (see "Contact Information").

A few species, such as great horned owls, may have fulminant aspergillosis despite negative antibody titer results. Serum protein electrophoresis, also available through the University of Miami laboratory, may help elucidate the presence of chronic inflammation consistent with this disease. Finally, Magnetic Resonance Imaging (MRI) may be useful in cases where a focal granuloma of



Barn Owl with granulomatous air sacculitis caused by *Aspergillus* sp. (Image courtesy of Dr. Brian Stacy, DVM, Zoological Society of San Diego)

the brain is suspected.

Epidemiology

Aspergillus sp. are ubiquitous, and the disease may be found wherever environmental conditions are favorable for fungal growth. Straw bedding which is contaminated with fungal spores as well as the feeding of moldy grain will expose birds to high numbers of fungal organisms.

Housing situations which provide necessary pools of water and have poor ventilation predispose birds to this disease. In a veterinary hospital, this disease is a frequent secondary infection in an already stressed or debilitated bird.

The disease is not considered contagious by horizontal or vertical transmission; however, more than one bird in a group is frequently affected due to exposure to the same stressors or other environmental conditions [1].

Treatment

If the bird presents in acute respiratory distress, as frequently occurs in cases of syringeal granuloma, an indwelling air sac cannula may need to be placed before proceeding with further diagnostics and treatment. This cannula allows the bird to breathe directly into the air sacs, thus circumventing the granuloma which is functioning as an upper airway obstruction.

Treatment of aspergillosis includes the use of one or more systemic antifungal agents. If a syringeal aspergilloma is present, manual debridement under anesthesia via tracheoscopy is usually required in conjunction with systemic antifungal agents. For many years, nebulization with antifungal agents has been used in conjunction with systemic antifungals in an effort to "topically" treat the lungs and air sacs of birds with lower respiratory tract disease. Clotrimazole (10 mg/ml polyethylene glycol, 30 - 60 min), terbinafine (1 mg/ml aqueous solution), and amphotericin B (1 mg/ml sterile water or saline, 15 min q 12h), have all been used in this modality.

Recently, studies have brought into question the efficacy of nebulization in delivering antifungal agents into the air sacs, but the treatment is still commonly used. If the bird is breathing through an air sac cannula, the likelihood of the antifungal agent effectively combating air sac disease is probably increased.

(Continued on page 12)

Avian Aspergillosis...cont'd

(Continued from page 11)

Care should be taken to prevent exposure of human caretakers to aerosolized amphotericin B due to the propensity of this drug to cause nephrotoxicity. Another topical use of amphotericin B is direct infusion of the injectable liquid through the glottis into the trachea (1 mg/kg IT q 8 - 12h).

A variety of systemic antifungal agents, including ketoconazole (30 mg/kg PO q 12 h), itraconazole (10 mg/kg PO q 12 h), fluconazole (15 mg/kg PO q 12 h), terbinafine (10 - 15 mg/kg PO q 12 - 24h), and amphotericin B (1.5 mg/kg IV q 8h x 3 days) have been used successfully in the treatment of avian aspergillosis.

For cases where CNS penetration is desired, fluconazole is the systemic drug of choice. Fluconazole is also the drug of choice for all forms of the disease in African grey parrots, since this species appears particularly susceptible to liver failure and death following treatment with itraconazole.

At the San Diego Zoo, itraconazole or a combination of itraconazole and terbinafine are used for typical cases of aspergillosis of the syrinx or lower respiratory tract. Amphotericin B is used initially in some very severe cases due to its fungicidal nature and quicker onset of clinical effect than fungistatic drugs, and nebulization with clotrimazole and oxygen therapy is added to the regimen in severe cases [2,3].

Prevention and Control

To help prevent exacerbation of aspergillosis in the veterinary hospital environment, hosing or washing of enclosures should be followed by drying the area with towels whenever possible, rather than drying by evaporation. Daily disinfection a quaternary ammonium agent such as Roccal is recommended.

Only fresh straw should be used for bedding and grain or other feed should be fresh to guard against mold contamination.

Efforts should be made to reduce stress by keeping the area quiet, avoiding prolonged hospitalization, providing a visual barrier such as paper across the front of cages, and restricting manual restraint to the minimum necessary for diagnostic testing and treatment. Pools will need to be provided to reduce stress for waterfowl, and ventilation must be adequate to keep this from substantially elevating humidity levels in the enclosure.

Prevention in the bird's normal home or zoo enclosure should follow the same principles of disinfection, ventilation, and stress reduction, with the additional stress factors of cagemate interactions, competition for food, or interactions with family members and mammalian pets taken under consideration.

Smoking in the home environment should be eliminated, since this causes respiratory tract irritation and predisposes birds to aspergillosis as well as other diseases.

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