

WRNC



Sharing information and knowledge for the benefit of native wildlife.

A Quarterly Newsletter

Issue 37 September 2009

Rabbits 101

Eastern cottontails present a challenge to rehabbers. Learn what makes these animals unique.
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Change in formula prompts a study

The ingredients are the same but a new manufacturing process may be causing diarrhea in juvenile squirrels. Shirley and Allan Casey report preliminary findings of their study.
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Looking for an article? Check our index.

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WRNC proposes special RVS permit

BY JEAN CHAMBERLAIN

WRNC has renewed its effort to persuade the North Carolina Wildlife Resources Commission to allow the rehabilitation of rabies vector species (RVS) in our state. We have written the director of the commission, proposing the state establish a permit that would allow specially trained wildlife rehabilitators to provide care for RVS. This special permit would be similar to permits established by most other states on the East Coast. It would require applicants to have RVS training, pre-exposure rabies vaccinations and appropriate housing.

We have offered to arrange RVS training for those who wish to apply for the permit. We would like to offer the training for the first time at our symposium in January. Applications for the permit could then be made in spring in time for the next baby season.

In North Carolina, raccoons, skunks, fox, coyotes and bats are considered at a high risk of spreading rabies.



Photo by Beth Knapp-Tyner

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RABIES

Every year animal control organizations, police departments, veterinarians, wildlife rehabilitators and Wildlife Resources Commission officials face the dilemma of dealing with orphaned and injured rabies vector species across our state. Currently, there is no channel to deal with these species that is viewed morally acceptable by many residents or which minimizes public health risks. We wish to provide a way for the public to surrender these animals with the confidence they will receive appropriate care. Without such an alternative, untrained private citizens often try to raise these animals, exposing themselves and others to the risk of parasites and zoonotic diseases that may be life threatening.

RVS proposal history

WRNC formally proposed a special RVS permit in 2003 as part of the Wildlife Resources Commission's regular annual policy change process. It was re-submitted in 2004. Both times the proposal was rejected.

A survey of rehabilitators in North Carolina was done by Drs. Schopler, Hall and Cowen in 2003. It was published in 2005 (Schopler RL, Hall AJ, Cowen P. Survey of wildlife rehabilitators regarding rabies vector species. *J Am Vet Med Assoc.* 2005 Nov 15;227(10):1568-72).

In late 2006 postcards seeking support of our proposal were sent to all the health departments and animal control agencies in the state.

In May 2007, several members of the WRNC's RVS committee and Dr. Peter Cowen met with Daron Barnes and Brad Gunn of the permit office in Raleigh to explain the importance of changing the policy. Dr. Cowen and Dr. Schopler reviewed the study they published in 2005 and lent their support for our proposal.

The request was delayed last year because of the nationwide shortage of the rabies pre-exposure vaccine.

WRNC submitted a letter June 3, 2009, to Gordon Myers, executive director of the state Wildlife Resources Commission.

Sample of the findings from the RVS survey

North Carolina rehabilitators were surveyed* about rabies and rabies rehabilitation in 2003. The survey showed that many rehabilitators would like to rehabilitate some of the rabies vector species and would be willing to complete the proposed permit requirements to obtain an RVS permit. Of the more than 200 rehabilitators who responded:

- 73% said they would be willing to work with raccoons if the policy were changed.
- 50% said they would work with bats.
- 89% said they were willing to be vaccinated or were already vaccinated.
- 85% said they were willing to take an RVS training workshop.

*Schopler RL, Hall AJ, Cowen P. Survey of wildlife rehabilitators regarding rabies vector species. *J Am Vet Med Assoc.* 2005 Nov 15;227(10):1568-72

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Update: GI conditions, changes with Esbilac®

BY SHIRLEY AND ALLAN CASEY, WILDAGAIN WILDLIFE REHABILITATION INC.

Earlier this summer, some wildlife rehabilitators feeding milk replacement formula to small mammals noticed the incidence of gastrointestinal problems in their animals was considerably higher than in previous years. These rehabilitators used Esbilac® powdered milk replacer as a base formula for squirrels, opossums and several other species. Since many rehabilitators had used Esbilac® for years and considered it to be a reliable and quality product, they first tried to eliminate factors that could cause severe diarrhea and other gastrointestinal disturbances. Other rehabilitators, however, did not report any unexpected gastrointestinal problems when using Esbilac® with wildlife.

Once variables that could cause diarrhea in wild mammals were eliminated in the growing number of cases, some of the rehabilitators began to wonder if the Esbilac® product was causing the diarrhea. A few of these rehabilitators contacted PetAg, the manufacturer of Esbilac® puppy milk replacer and similar products for other species.

PetAg's Lot Code

PetAg uses a 'Julian date' to assign lot codes. Such that 3528E is comprised of 3 components: 352-8-E. The **352** indicates the day of the year (or December 18 in a non-leap year). The **8** refers to the year (or 2008). The **E** refers to Esbilac.

A lot code of 0189E indicates a lot later than 3528E since it was produced on January 18, 2009.

Manufacturing change revealed

The rehabilitators were informed PetAg had changed from using a multi-step drying manufacturing process to a single-step dry process in December 2008. PetAg believed that returning to this drying method, one that is used with most of its other products and with Esbilac® prior to 1993, was a small, unnoticeable improvement that often occurs in manufacturing. That was indeed the result in many cases as owners of puppies using Esbilac® powder and some wildlife rehabilitators who use Esbilac® as a base formula for

About the authors

Allan and Shirley Casey, co-founders of WildAgain Wildlife Rehabilitation, Inc. in Evergreen, Colo., have been licensed rehabilitators since 1986. The Caseys conduct research on a variety of rehabilitation related subjects, including nutrition, squirrel health, wildlife regulations and rehab trends. They co-authored the *Squirrel Rehabilitation Handbook*, as well as 100+ articles and present at many rehab conferences.

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wild mammals in rehabilitation did not report any differences.

PetAg said they had not altered the Esbilac® recipe or contents. Also, the guaranteed analysis had, they said, stayed the same. They explained that a single-step drying process tends to result in 1-3%

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more digestible proteins and fats.

PetAg suggests adjustments

PetAg said that perhaps some animals needed more time to adjust to the new Esbilac®, which was more digestible and thus slightly richer in fats and proteins. They suggested several things: temporarily dilute the formula a bit more (1 part Esbilac® powder to 2½ or 2¼ parts water); mix with very hot water for at least a minute (and not in a blender); turn the can over several times to make sure the powder is evenly distributed and not ‘packed tightly’ when measured; and strive for accurate measurements.

Problems continue

Rehabilitators tried these suggested changes. Unfortunately, the gastrointestinal problems continued even after adjustments to the measuring, mixing process and dilutions suggested by PetAg. Gastrointestinal upset seemed worse with younger animals (i.e., eyes not yet open).

Some rehabilitators also reported the juvenile animals were ravenous and gaining weight slowly. This was not unexpected since they were having gastrointestinal upset

Not a Wildlife Rehabilitator?

There are many requirements to care for orphaned or injured wildlife besides formula. Please take injured or orphaned wildlife to a wildlife rehabilitator. Contact veterinarians, humane societies or wildlife agencies for the name of a local wildlife rehabilitator.

and were being fed dilute formula. However, a few of the rehabilitators feeding full strength formula mentioned similar observations.

Change in weight, kcals, nutrients

As a result of these observations and concerns, WildAgain Wildlife Rehabilitation, Inc. asked PetAg to provide the Typical Nutrition Analysis for Esbilac® manufactured with the single-step dry process since December 2008, including the weight. In addition, WildAgain and others weighed the new Esbilac® hundreds of times at their rehabilitation facilities.

The new Esbilac® weighs 7% less than it did in 2007 according to the Typical Nutrition Analysis provided by

PetAg. Since the product weight is the basis for calculating kcals and nutrients, it was no surprise that these had decreased.

Comparing the weight, kcals and nutrients in new Esbilac® with the Typical Nutrition Analysis of 2004 shows a decline over a five-year period.

The analysis also reveals that mixing the “new” Esbilac® with extra water, a commonly used method to help the animal adjust to new formula and reduce gastrointestinal difficulties and recommended by PetAg, significantly reduces the number of kcals and nutrients in the resulting formula. This nutritional and caloric deficiency is likely a key reason the animals were so hungry, had decreased weight gains and other health issues. More information is available at <http://www.ewildagain.org/Nutrition/esbilacupdatesept3.htm>

Rehabilitators made changes

By late August, an increasing number of rehabilitators switched to the ‘old’ Esbilac® or

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Change in formula values of powdered Esbilac mixed with water

Mix ratio	Typical analysis date	Solids	Protein	Fat	Carb	ME kcal / cc	Dry Weight 1 TBSP
1:2	09/2004	17.3%	5.9%	7.6%	2.4%	0.94	6.36
1:2	08/2007	16.4%	5.8%	7.0%	2.5%	0.88	5.95
1:2	08/2009	15.3%	5.7%	6.3%	2.5%	0.82	5.53
	Change 2004 to 2007	-5.2%	-1.7%	-7.9%	4.2%	-6.4%	-6.4%
	Change 2007 to 2009	-6.7%	-1.7%	-10.0%	0.0%	-6.8%	-7.1%
	Change 2004 to 2009	-11.6%	-3.4%	-17.1%	4.2%	-12.8%	-13.1%

ESBILAC

to another milk replacer product, such as Zoologic® Milk Matrix 33/40. They reported that most of the gastrointestinal problems they were seeing resolved within 24 hours. Interestingly, Zoologic® Milk Matrix 33/40 was the 'original' Esbilac® formula used with puppies and many wild orphans prior to 1993.

The fact that the gastrointestinal problems resolved so quickly when rehabilitators switched to a different milk replacement product strongly suggests that something is problematic with the "new" Esbilac® in addition to changes in nutrient levels and energy values.

Next steps

Rehabilitators who see good health and no gastrointestinal problems when feeding the "new" Esbilac® may certainly choose to continue using it, but they will want to consider adjusting for the decrease in nutrition and kcals. However, we believe that it still is too early in the process to know the exact changes to make in order to address concerns with the "new" Esbilac®. In addition, species, age of animal, health of the animal, and other considerations, may require even more formula adjustments. Each rehabilitator meanwhile should continue their normal practice of monitoring the health and development of every animal in their care and respond accordingly.

Those who observe gastrointestinal problems, poor weight gain, increased hunger or other related problems when using the "new" Esbilac® may want to consider switching to another product that meets the animal's nutritional and digestive needs, such as Zoologic® Milk Matrix 33/40. In addition, rehabilitators should consider other factors that also can affect the animal's health (examples are available at http://www.ewildagain.org/pubs/factors_affecting_gi_problems_in.htm).

Continuing data collection

PetAg is continuing testing of the Esbilac® to identify potential contaminants, pathogens and other causes. The PetAg nutritionist explained that people using the Esbilac® with puppies and some of the rehabilitators had not reported any problems. PetAg's nutritionist also suggested rehabilitators may prefer to use ZMM 33/40 or Goats Milk Esbilac® if they have problems with or concerns about Esbilac®. Problems should be reported at PetAg.com (include product name and lot number).

In the meantime, WildAgain along with rehabilitators and veterinarians are trying to identify the factors causing these problems and possible solutions. If you would like to offer observations on your experiences using the "new" Esbilac® lot numbers or ask questions, contact us at wrehabproject@aol.com. Further articles and the Nutrition calculator with revised kcals are available www.ewildagain.org.

Thanks to all the wildlife rehabilitators and veterinarians caring for and working with wildlife, and an extra thanks to those sharing information and helping with this research.

Resources

- Casey, Shirley and Allan Casey. 2003. *Squirrel Rehabilitation Handbook*. WildAgain Wildlife Rehabilitation: Evergreen, CO. Available at www.ewildagain.org
- Casey, Shirley and Mackenzie Goldthwait. 2009. "Factors Causing Gastrointestinal Problems in Juvenile Squirrels." www.ewildagain.org.
- Casey, Shirley. 2009. "Ten Common Causes of Stool Problems in Juvenile Squirrels." www.ewildagain.org. Nutrition calculator. Provides nutrition and kcal information on milk replacement products and a downloadable calculator in Excel for easy use. Download at www.ewildagain.org.



Illustration by Deanna Epps

Taming a conflict

BY GEORGE EWING

An opossum has been spotted in a neighborhood park near the playground. Reports have been made to local wildlife rehabilitators that it looks sick, or maybe even injured. Local residents have called the Homeowner's Association president and the Animal Control office about a "rabid" animal stalking the playground. Children, pets and others may be at risk. The opossum may be hurt and in need of medical attention and extended rehabilitation....

When a human-wildlife conflict arises in a community or

neighborhood like the scenario above, there are countless wildlife organizations and a myriad of community, municipal, county and state government entities available to offer advice and assist in resolving the conflict. When an animal is hurt or stranded, the trained and able wildlife rehabilitation specialist comes to the rescue. In this situation, the opossum is found to be injured, and the case is referred to a local veterinarian and a network of wildlife rehabilitators by the animal control officer. The

community is reassured there is no reason to suspect rabies.

The human-wildlife conflict is solved and everything is back to normal, right?

But what happens when the conflict is between the veterinarian or wildlife rehabilitation personnel concerning animal care or the best practices to be used to rehabilitate the animal in question? What if the community perception of wildlife management and protection is contrary to good

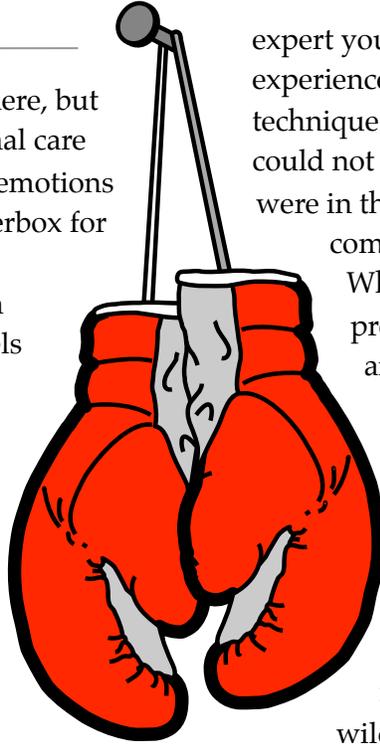
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CONFLICT

wildlife stewardship? Conflict is everywhere, but when that conflict involves issues of animal care or opinions about wildlife rehabilitation, emotions can run high, and the stress can be a tinderbox for conflict.

There are processes and procedures in place for wildlife rehabilitation and models created for human-wildlife conflict (even for wildlife-wildlife conflict in some regions) designed to help with issues and challenges that arise in wildlife management and care. But what do you do when you begin to feel the strain and stress of a conflict with your fellow wildlife rehabilitators, representatives of local, county, or state wildlife management or other experts or agents in the wildlife management field?

During the wildlife care and rehabilitation process, it sometimes becomes apparent that it is actually the wildlife rehabilitator who needs to be rescued or saved from a protracted conflict involving their well-intentioned colleagues. Networks of wildlife rehabbers in your region most likely have procedures in place for chains of contact, as well as venues for sharing knowledge and experiences. You probably know the most skilled individuals and groups specializing in avian, mammal, reptile and amphibian rehabilitation and care and have a host of experience interacting with these experts. These interactions usually are constructive and positive and help you become a better rehabber. Sometimes, there are unintended consequences. Have you ever had an experience where you initiated contact with an “expert” or requested help with a particular wildlife rehab case and were ignored, had your opinion discounted, or came away from the interaction with hurt feelings or a lingering resentment against a colleague? Or, did the “expert” abruptly take over the case and institute a plan of care and rehabilitation that you did not agree with? Other than becoming frustrated, withdrawn and angry, what were the outcomes? Did future wildlife rehabilitation cases potentially suffer because you were weary of reaching out or contacting a specific colleague or



expert you had had a conflict with? Did you experience a breakthrough or did you invent a technique that could benefit specific cases that you could not share with another “rehabber” because you were in the midst of an impasse or weren’t

communicating because of a recent conflict?

Whether you answered “yes” or “no” to the previous questions, conflict has probably had an impact on some of your rehabilitation

cases, and if not, most likely will in the

future. Knowledge is power. Sharing

knowledge creates better wildlife

rehabilitators. If conflict is preventing you

from giving an animal the care it needs or

keeps you from sharing your experiences

or learning from your colleagues, here is a

model that can help resolve conflict in

wildlife rehabilitation situations, as well as in

any other aspect of your life. An example of a real

conflict and resolution that took place at a wildlife

rehabilitation center here in North Carolina has been

included to show how the model can be used.

A Model for Solving Conflicts:

Step 1: Cool off.

Conflicts cannot be solved in the face of hot emotions and exasperation. Take a step back, breathe deeply and gain some emotional distance before trying to talk things out. Take the time to regain the focus required to create an opportunity to **choose** a response rather than to simply react. If you try to skip this step, your words may be too emotionally loaded and may escalate the conflict.

EXAMPLE: You are the senior volunteer “rehabber” at a local wildlife center and you just walked into the rabbit holding area to see that your volunteer colleague did not clean the rabbit cages as promised (and was committed to doing per the schedule of duties). There is a terrible mess, and you still have to feed the other animals and meet with and interview two new prospective volunteers this afternoon. You are

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furious! You don't have time to do everything. You want to explode! You can't think straight! Here comes your colleague right now....What do you do?

Take a break, take a walk, or breathe deeply and calm down before you say a word.

Step 2: Share what is bothering you using "I messages."

"I messages" are a tool for expressing how we feel without attacking or blaming the other party. By starting from "I," we take responsibility for the way we perceive the problem and the conflict. This is in sharp contrast to "you messages" which immediately puts others on the defensive and closes the doors to communication.

EXAMPLE: A statement like, "You've left the rabbit cages a mess again! Can't you ever clean up?" will escalate the conflict.

Now take a look at how differently an "I message" comes across.

EXAMPLE: "I'm upset because I thought we agreed you'd clean up the rabbit cages this week. What happened?"

When making "I" statements, it is important to avoid put-downs, guilt-trips, sarcasm and negative body language. Your "I message" needs to come from a place inside that is non-combative and shows a willingness to compromise. In conflict resolution, it is "Us against the problem," not "Us against each other."

Step 3: Each person restates what they heard the other person say.

Reflective listening demonstrates that we care enough to hear the other person out, rather than merely focusing



on our own point of view. It fosters empathy and understanding. Remember, "No one cares how much you know until they know how much you care." Let the other party know that you have heard them. Some examples of ways to start a reflective listening conversation are below.

"This is what I think I hear you saying..."

"I'm picking up that..."

"As I hear it, you..."

"I'm not sure I am with you....Do you mean....?"

EXAMPLE: In this scenario, an emergency call came into the center and your colleague had to go assist in picking up an injured animal. In reflectively listening to their explanation, your reply may be:

"Let me see if I understand you. You weren't able to clean the rabbit cages because an emergency call came in to the rehab center and you had to pick up an injured squirrel at the community center, and you did not have time to get to it?"

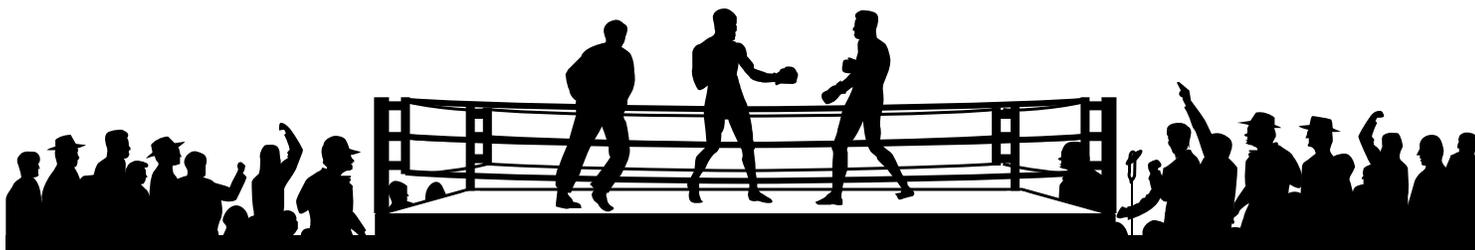
Step 4: Take responsibility.

In the majority of conflicts, both parties have some degree of responsibility. However, most of us tend to blame others instead of examining our own role in the problem. When we take responsibility for our own culpability within a conflict, we shift the resolution process into an entirely different gear; one where a win-win resolution is possible.

EXAMPLE: "I know we are short-staffed, and there is a lot going on right now."

Step 5: Brainstorm solutions together and come up with one that satisfies both people.

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Resolving conflict is a creative act that can be stimulating and satisfying for both parties. There are many solutions to a single problem; just make sure you enter this step with the willingness to seek out compromises.

EXAMPLE: “If I help you clean the rabbit cages now, can you help me conduct one of the two interviews of the prospective volunteers coming by in an hour? Afterward, we both can go look in on the emergency squirrel case!”

Step 6: Affirm, forgive, or thank.

A handshake, hug, or kind word gives closure to the resolution of a conflict. Forgiveness is the highest form of closure available to us in conflict resolution. The affirmation of reaching out to the other party or

extending the hand of understanding and friendship creates a mood where animosity and bitterness disappear and the rehabilitators can move forward and focus on animal care.

EXAMPLE: “I appreciate your hard work and all you do as a volunteer here at the center. When the new volunteers come on board, we will have more time to focus on specific cases, and I will have time to show you more about baby rabbit care.”

This conflict resolution sample case was a simple and easy one to solve. However, keep in mind that this model can be used with any conflict you are experiencing regardless of complexity or emotion involved. You will be a more effective rehabilitator when you are an expert in solving conflicts and finding ways

to move past issues and challenges and feel comfortable sharing your expertise with all of your colleagues. Unresolved conflicts hinder you from reaching out to others and learning from them as well. When you experience a human-human conflict, use these six steps designed for the wildlife rehabilitator to acknowledge, reframe, brainstorm and affirm your way to a win-win resolution.

George Ewing is a PhD. candidate in Conflict Analysis in Resolution at Nova Southeastern University in Fort Lauderdale, Fla. He is the President of Win-Win Resolutions, Inc., the premier conflict resolution nonprofit organization in the Southeast and conducts conflict resolution and organizational development workshops throughout North Carolina.

ABOUT YOUR NEWSLETTER

This newsletter is your tool for reaching everyone in WRNC. Submit comments, corrections and announcements to editor Brenda Hiles at bhiles919@earthlink.net, or by phone at 336-420-5581. The next editorial deadline is Nov. 15.

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What's up, Doc?

Rabbits 101

BY RANDY ATKINSON, SHAINA WIRTH AND CHRIS LEWIS

Photo by Randy Atkinson

So, let's be honest: lately we've all become saddened when we get the following phone call..."Hi, we found some baby cottontails, and we gave them milk."

It seems the cottontail population has been the talk of the wildlife world this past season. The survival rate seems to be decreasing, and rehabbers are trying to figure out why.

It is important to understand the inner workings of the species you are dealing with and, as we all know, rabbits are certainly different.

Rabbits belong to the order Lagomorph; they are NOT rodents. The evolutionary split between the two occurred about 30 million years ago. There are 16 species of wild rabbits in the United States. Four species are native to North Carolina, including the Eastern Cottontail, the Marsh Rabbit and the Swamp Rabbit from the East and the Appalachian Cottontail from the western part of the state. While all rabbits can swim, Marsh and Swamp rabbits can submerge in water to escape a predator. Studies indicate the population of Appalachian Cottontails is declining because of habitat loss and the encroachment of the stronger Eastern Cottontail.

Rabbits are crepuscular, meaning they are most active at dawn and dusk. Wild rabbits are rarely seen at midday.

Rabbits have extremely strong muscles but a weak skeletal system. The skeletal system makes up only about 7% to 8% of their body mass. This makes them lighter so those strong hind leg muscles can accelerate them to about 35 mph in short bursts. But this also makes the spine very weak. Traumatic spinal injuries can be suffered if a rabbit is

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improperly picked up by a human or a predator such as a dog. A full force unopposed kick of the hind legs will many times result in a spinal luxation — or dislocation — at the 7th lumbar vertebrae. While we have successfully resolved some paralysis issues, those successes are the exception, not the rule.

Rabbits are creatures of habit. Cottontails tend to do the same thing the same way each time. It is important to learn the habits of your rabbits, domestic or wild, because a change in habits usually indicates a problem.

Rabbits are territorial, especially males. Their entire world rarely exceeds a couple of acres. That helps us as rehabbers because we can monitor our release numbers so as not to overpopulate. Rabbits have excellent memories and will memorize everything in their territory. This makes it easier to escape a predator. In domestics, this memory serves a blind rabbit well, and they can lead very active lives. Wild rabbits will tend to attempt escape by running in an ever enlarging circle, using its memory of obstacles in that area to facilitate an escape route.

Rabbits are “induced ovulators,” which means they technically don't have an estrus cycle. The doe becomes fertile shortly after she is mounted by a male. They can deliver kits every 28-30 days. Does have a double horned uterus and can conceive a new litter shortly after delivering a litter of kittens (baby rabbits are called kittens). Most does nurse only once a day — usually early in the morning, though others follow a different schedule. She stands over her babies as she nurses. She can nurse, groom and stimulate the bowels in less than five minutes. Since mom doesn't stay with the babies, many well intentioned people “kidnap” Cottontails that really don't need to be rescued. In most of North Carolina, the breeding season starts in late February to mid-March and continues until fall. But in the Cape Fear area, baby cottontails were present all year. The rabbits born early in the season will breed by the end of the year. Males reach sexual maturity by about three months and the does by six months. Population studies indicate that less than 10% of cottontails see their first birthday.

Baby rabbits are born sterile. They have no bacteria in the GI to digest food. And they have no real immune system. Even a healthy adult rabbit has a very weak immune system. Cat bites, even the nick of a tooth, are life-threatening in a rabbit. Rabbits are very susceptible to developing major issues from a bacteria known as *Pasteurella multocida*. It's a particularly difficult pathogen to treat in rabbits because most of the drugs that are bunny safe are not so effective against this bacteria.

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About the authors

Randy Atkinson has worked with rabbits for nearly 30 years. In 2000, he and his wife began rescuing “special needs,” domestic rabbits, and their interest quickly evolved to include wildlife populations. Atkinson, a licensed rehabber who lives in Nash County, is also a member of the newly formed rescue group Rocky Mount Wildlife Rehabbers. He also operates Sabrina's House Rabbit ResQ. In the past year, he has enlisted support in the veterinary community to help with wildlife rehab. He recruited Shaina Wirth, a rehabber and veterinary technician, as well as Chris Lewis, a physical therapist, and other rehabbers and veterinary professionals. Wirth and Lewis are also members of Rocky Mount Wildlife Rehabbers

About this article

In this first article, we'll provide basic information necessary to understanding what makes rabbits so different from other species and why they can present a challenge to wildlife rehabbers. In the past, much of the information available about rabbits was folklore. Today, we have many rabbit-savvy vets and clinically proven information to guide us. Two universities in particular, Cornell and Tufts, have active wildlife research and rehabilitation services and advanced information such as blood chemistries available for the asking. In our next article, we will introduce rehabbers and veterinarians to some of our advanced treatment protocols not available in reference manuals. The medical treatments we will discuss in future articles are also applicable to the treatment of domestic rabbits.



Photo by Randy Atkinson

RABBITS

Rabbits control their body temperature through their ears. A large vein in the ear provides radiational cooling. In addition, small, inefficient sweat glands are located near their noses. If they become overheated or severely stressed, they will appear to be “foaming at the mouth.” Heat stroke or stress will normally occur when temperatures reach higher than 85 degrees. For this reason, rabbits normally hunker down in the cooler underbrush during the hottest part of the day. To cool an overheated rabbit, cool water can be misted among their ears. Normal temperature for a rabbit is between 101 degrees and 103 degrees.

Rabbits have open-rooted teeth that constantly grow (up to 5 inches per year). The lower teeth tend to grow faster than the top. Rabbits have 28 teeth: 22 curved pre-molars and molars and 6 incisors. The upper mouth arcade consists of 4 incisors and the lower arcade has 2. Behind the upper front incisors are 2 “peg” teeth that appear to aid in tearing vegetation. The visible part of the tooth is coated with an enamel-like covering while the back part is softer. This anatomy allows for a “chiseled” effect that makes the teeth very effective in tearing vegetation. Rabbits also chew from side to side, not up and down. This mechanism allows their primary foods, plants and grasses, to be folded and more easily consumed for digestion.

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A tough year for cottontails

This has certainly been a challenging rescue season, with a marked weakness in all species.

In our rescue, our intake numbers are far below previous years, and we are experiencing losses in much higher percentages. And in no species is this more evident than in cottontails.

I have been receiving information from various parts of the state about seemingly healthy cottontails that “just die.”

We experienced this issue very early in the year and made some adjustments. The situation improved. But recent rescues again seem to be suffering.

Symptoms appear quickly. They include rapid weight loss, lethargy, dehydration and abdominal distress, including green mucus in the fecal material. Mucus in the fecal material usually indicates some type of irritation to the lining of the GI tract. Some reports have indicated some degree of paralysis in the hind quarter. We are working diligently to identify the cause of this difficulty. I am currently looking into the possibility of a parasite, possibly a protozoa, or bacterial imbalances in the GI.

In domestics with a condition known as “cecal dysbiosis” (a condition that closely mimics the GI conditions in a weaning rabbit) we have had some success with drug treatment using Metronidazole and sometimes Questran. Metronidazole has the added benefit of some anti-inflammatory qualities that may help with GI events.

My current working hypothesis, still lacking clinical proof, is that we are dealing with a particularly vigilant strain of a bacteria, most likely a strain of *Clostridium* and/or *E coli*.

Ideally, I would be able to perform a targeted necropsy on two cottontails that succumb to these symptoms but have not been in contact with a cat, suffered any other trauma and that have been fed a proper and controlled diet.

We are also starting to test an equine product called Biosponge. This product has been found to successfully bind the toxins caused by *Clostridium*. Since the GI of horses and rabbits are quite similar, this product should be helpful to our cottontails as their gut weans. We hope to have some qualified findings this season if we have more cottontails come into rehab.

— *Randy Atkinson*

RABBITS

Rabbits are considered to be obligate herbivores, meaning they eat plant material. Lagomorphs have developed a very specialized digestive system known as “hind gut fermentation,” similar to that of horses. This process uses a high population of beneficial bacteria to digest food. Additionally, they practice “coprography.” This is a highly specialized fecal-type pellet that forms in the cecum. It contains beneficial bacteria, vitamins and undigested food. We call these fecal pellets “cecal.” Rabbits can stimulate the anus and excrete and reingest these pellets. This allows the GI to maintain a high level of bacteria, and it extracts nearly all the nutrients from low-quality food such as grass. This system is also very sensitive to certain antibiotics, especially broad spectrum antibiotics that affect gram-positive bacteria. They are lactose intolerant and can NOT digest dairy products. Cow’s milk or goat milk is a known death sentence among experienced rehabbers. Hearing anything with the word “milk” in it makes us cringe and our hearts sink. Try as we may, once a rabbit has been fed milk, there is little chance of success.

In addition, rabbits cannot handle processed sugars such as Karo Syrup or sugar water. Sugar is extremely devastating on the immature bacterial flora in their digestive tract. Sugar, in other forms, can usually be handled by rabbits with a mature digestive system but only in very limited amounts.

Our next article will consist of rabbit behavior and digestion as well as how to know if a cottontail truly needs to be rescued and what to do if the answer is “Yes.” We will also cover wound and pain management as well as antibiotics that are safe for rabbits.



Photo by Randy Atkinson

TRAINING

IWRC Education Symposium, Nov. 10 – 14, Virginia Beach, Va. For more information, go to: http://www.iwrc-online.org/conf/edsymp2009_coming.html

Carolina Raptor Center, Husbandry and Training Workshops, 8:30 a.m. – 4:30 p.m., Saturday, Dec. 5. The workshop is targeted toward beginner and intermediate-level educations, trainers and caregivers. A workshop for intermediate and advanced professions is 8:30 a.m. – 4:30 p.m. Sunday, Dec. 6. For more information, go to: http://www.carolinaraptorcenter.org/pdf/2009_All-Seminar.pdf

Basics of Wildlife Rehabilitation and Advanced Wildlife Rehabilitation, 6-9 p.m. Mondays and Wednesdays Jan. 11- June 9 at Coastal Carolina Community College in Jacksonville, N.C. Basic and advanced classes will be offered in the same six-month course. Prepare for entry level and intern positions in nature centers, wildlife centers and animal sanctuaries, and meet the requirement for specific training needed to apply for the North Carolina wildlife rehabilitation permit. 910-938-6294 or www.coastal.cc.nc.us





Photo by David Hurt

Making the most of Winter

BY CAROL KACZMAREK

As fall approaches, wildlife rehabilitators begin to see the light at the end of the tunnel. Many bird species have raised their babies and are preparing to migrate south for the winter. Chimney Swifts need to be released into an existing colony before they migrate to South America.

The babies in the second litter of squirrels have started arriving. Soon decisions must be made about which animals need to be over-wintered and released

in the spring. Injured animals also need to be evaluated for release.

And when that's done, rehabbers can catch their breath. They can have an extra cup of coffee in the morning or take a vacation, even if it is only one day. Fall is here and winter will not be far behind. That's the time to prepare for the coming year and make a few resolutions about being kinder to Mother Earth.

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It's winter: Now what?

PHYSICAL WORK AND EQUIPMENT CARE

- 🧰 Cleaning, disinfecting and sanitizing are essential. This includes floors, walls, cages and equipment. Some items such as walls and floors may need painting as well.
- 🧰 Experiment during the winter to find out if your ideas are practical for the busy season. You may want to use recycled paper products or wash laundry in cold or warm water rather than hot. Or you may want to go back to the old tried and true cleaning solutions our grandparents used such as vinegar, bleach, baking soda and ammonia.
- 🧰 As you clean, examine everything so you can repair or replace damaged or dangerous items, such as towels and other linens with holes or raveling threads or bowls and aquariums that are cracked. Repair, if possible, or recycle rather than discarding them.
- 🧰 Shop at thrift stores and yard sales for items such as linens and bowls.

PAPERWORK

- 🧰 File papers left over from the past season or scan records into the computer.
- 🧰 Finish reports for 2009.
- 🧰 Consider ways to cut down on the amount of paper you generate. Use both sides of the paper, and keep partially used pieces of paper to use as scrap.
- 🧰 Use your computer to store records and as much of your paperwork as possible.
- 🧰 Use e-mail rather than snail-mail whenever possible. It's faster and paperless.
- 🧰 Prepare a list of items you will need to order such as formulas and medicines. Decide when you will need to

CLEANING, THE OLD-FASHIONED WAY

Green cleaning supplies can save money and the environment. Of course, sanitation is especially important when working with sick and injured animals so you need to select your cleaning supplies carefully. Items cleaned with green products still need to be disinfected with bleach or Nolvasan.

- ✓ To clean windows and glass: Mix 2 cups of water, ¼ cup white distilled vinegar and ½ tsp Dawn in a spray bottle. Use newspaper to dry the windows.
- ✓ Use bleach at 1 part bleach to 10 parts water to sanitize cages and laundry.
- ✓ For floors: add 1c vinegar to 1 gal. water.
- ✓ There are several new products available today such as Green Works, which use more natural ingredients.

place the order so you'll have supplies when the first babies arrive.

- 🧰 Prepare a wish list of supplies to post on your website.
- 🧰 Be sure you have your licenses and permits in order. You need a state license for mammals and a federal license for birds.
- 🧰 Update your web site.

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🐾 Write an article for your group's newsletter.

EDUCATIONAL ACTIVITIES

🐾 Increase handling of your education animals. Prepare them for the programs you will be doing.

🐾 Fall and winter are excellent times to present programs. Set up a calendar to schedule programs and decide how many you wish to do. You may already be receiving calls about presentations. If not, contact those you've done programs for in the past to see if they'd like to schedule another.

🐾 Review current programs and revise as needed.

🐾 Prepare new programs. (See WRNC newsletter, Vol. 36, June 2009.)

🐾 It's helpful to have handouts that include your name and phone number. The handouts could vary depending on your audience. Coloring pages are suitable for younger children; booklists, pamphlets, brochures or business cards for older audience members.

OUTDOOR ACTIVITIES

🐾 Collect nuts, seeds and berries for animals being over-wintered or to freeze for next season.

🐾 If you had a garden this year, prepare the area for next year.

🐾 If you didn't plant a garden, now is the time to think about one next year. Select your location. You can start small, perhaps with a container garden.

🐾 Do your homework. Decide what kind of veggies will grow well in your area. Get seed

GET THE WORD OUT

✓ Handouts can be used in education program, given to veterinarians or to people who bring injured animals to your facility. Attach digital handouts (saved as pdf.) to e-mail.

✓ You may use something as simple as a business card and include as much information as you can. Use both sides of the card to make use of all the space available.

✓ Prepare a brochure about "what to do if you find an injured or orphaned animal." Double-check your information and use an attractive and easy-to-read format. Many software programs include templates for newsletters, pamphlets and fliers.

✓ Consider a bookmark format, using a narrow piece of brightly colored paper and a simple list, such as "Checking for wildlife before doing yard work."

✓ Prepare handouts for special occasions like Earth Day or Migratory Bird Day.

✓ Coloring pages and easy puzzles and games, available online, are useful with class groups or other groups of youngsters. Add your contact information to the pages.

Some sources include: <http://www.edupics.com/en-coloring-pages-pictures-photo-wildlife-c127.html> and <http://www.nwf.org/kidzone/kzPage.cfm?siteId=2&departmentId=160>

✓ Book lists can be wonderful handouts, especially for older children. A visit to your local library will start you out with some excellent children's books. You can also look online for information about books dealing with wildlife.



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catalogs to peruse on a rainy, dreary day. Research what will grow best in your area and what you need most for the animals you usually receive.

- 👉 Purchase seed and start them indoors, or buy plants locally.
- 👉 Check with your Cooperative Extension agent. Cooperative Extension offices offer Master Gardening programs and provide a wide range of information about planting crops and flowers.
- 👉 Plant a tree. It provides shade, helps the air quality, provides beauty and, depending on the kind of tree, may provide food for your rehab animals.

- 👉 Plant a butterfly bush and begin a butterfly garden.
- 👉 Turn your yard into a natural habitat (get more information on registering your garden from the National Wildlife Federation). (See WRNC newsletter, Vol. 36, June 2009.)
- 👉 Begin composting.

OTHER OFF-SEASON ACTIVITIES

- 👉 Do some fundraising. Compile a list of possible donors. Send e-mail or a letter describing your activities and asking for a donation.
- 👉 Get together with other rehabbers in the area to see if you can work together on fundraising. Also discuss ways you can cooperate during the busy season to make things easier on all.



Photo by David Hurt

- 👉 Request donations of materials and services from local businesses, especially those you patronize.
- 👉 Ask friends to host small lunches or dinners to raise money.
- 👉 Recruit volunteers and provide training.
- 👉 Consider doing a newsletter a few times a year to discuss your successes and your needs.
- 👉 Take a class. If your computer skills leave something to be desired, take a computer class. The N.C. Office of Environmental Education presents several classes designed for teachers that also are helpful to rehabbers, including

Project Wild and Project Wild Aquatic. Wildlife rehabilitation groups across the state offer classes at community colleges. The International Wildlife Rehabilitation Council also offers several online classes every year.

- 👉 Attend the WRNC Symposium in Raleigh the last weekend in January. It's an educational and fun weekend that allows rehabbers to network and prepare for the new season.
- 👉 Take a field trip to a zoo, animal sanctuary, butterfly garden or other such activities for fun. You also may learn something about husbandry and housing of animals, as well as get ideas for programs.
- 👉 Sponsor a booth at a winter event such as a cat or dog show in order to publicize your rehab services and perhaps get some donations.

Perhaps the last thing I will suggest you do this winter is to spend time learning more reducing your environmental impact. Some information in this article came from a book called "Green Greener Greenest: A Practical Guide to Making Eco-Smart Choices a Part of Your Life," by Lori Bongiorno, a Perigee Book, 2008. After all, we need to save the environment so our rehab animals have a home to return to.



Geese release

Photo by Leslie Wieser

After several baths to remove the oil, it's time to fly

Volunteers with Carolina Waterfowl Rescue near Charlotte rescued 18 goslings and 10 adult Canada geese in June, after the birds were discovered coated in oil at a business park.

The U.S. Fish & Wildlife Service was notified of the contamination. So far, the source of the oil has not been determined. Workers from the Mecklenburg Water Quality Department found no sign of oil in the water. Jennifer Gordon, director of Carolina Waterfowl Rescue, said it was possible the oil was sprayed on the geese.

Carolina Waterfowl Rescue received a call about noon on June 9 that a bird in Steele Creek was covered in oil. Other geese were soon found near the Westlake Business Park. Volunteers worked until midnight that day bathing the birds in dish soap to remove the oil.

The geese were bathed several more times during the next two weeks to remove the residue.

"It was physically and mentally exhausting," said Jennifer Gordon. "We had six to eight hours at a time where we were washing birds, day after day," she said.

Oil destroys the waterproofing in feathers, making it difficult for birds to fly or swim.

"It just really hurts to see that people can be so cruel to animals," said Deanna Epps, a volunteer with Carolina Waterfowl Rescue. "Yeah, a lot of people complain that [the geese are] a nuisance, but they don't deserve to be mistreated and abused like they are."

All 28 survived geese survived. Twenty-six were released into a pond between Indian Trail and Waxhaw in July. The other two geese required additional treatment.

PLANNING AHEAD

PART III: Disaster's over — now for the recovery

By Elizabeth Hanrahan

The response to a disaster depends on if the disaster occurs with little warning or if it's a developing emergency. Tornadoes, hazardous material incidents or fire often occur with little warning. But when a "warning" or "watch" alert is issued, such as for a hurricane or flood, implement your disaster plan immediately.

Recovery is probably the most difficult aspect of a disaster. A rehabilitation facility often receives orphaned and injured wildlife immediately. Expect the facility to be operating at less than 100 percent. Staff and volunteers may not be available. The entire community may be disrupted, adding to the burden.



Photo by Mike Abraczinski via NOAA

- Begin recovery by assessing the disaster's impact on the facility, on wildlife and on the community. Quickly determine the extent of damage and what immediate steps can be taken to minimize the impact while protecting people, property and animals in rehabilitation. Make safety repairs immediately.

- Check all animals on site. If there are injuries, provide first aid and get veterinary treatment as soon as possible.

- Survey the facility. Is there damage? How extensive is it? Can all or part of the building or cages be used safely after simple repairs? Is there danger from collapsing walls or roofs? Are electrical lines damaged? Is there electricity and water? If in doubt, call experts for assessments. "Safety first" is the key. You cannot care for the wildlife entrusted to you if you are injured or become sick. Safety should be the top priority in animal rescues.

- Determine accessibility of the property. Can volunteers and the public get to the facility? Are downed trees or floodwaters blocking roads? Will the animals need to be evacuated to a safer, more accessible location?

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DISASTER

- Check equipment, supplies and medication.

What survived, and how much damage was done to equipment and supplies. Did animal feed and bedding get wet or contaminated?

- Keep a record of the assessment. Make written assessments of the building, its contents and caging. Photograph the damage, and match the photos with the original inventory photos taken before the disaster.

- Notify outside agencies of the facility's status.

The sooner other agencies are notified, the sooner help will arrive. Several agencies in North Carolina, including Humane Society chapters and feral cat organizations, are willing to provide supplies and assistance to wildlife rehabilitators. Make a list of these agencies and contacts before a disaster hits. A Google search for animal organizations in North Carolina or your community will provide names and addresses. Stay in touch with your local Humane Society or animal shelter.

- You will find links to The North Carolina Division of Emergency Management at: <http://www.dem.dcc.state.nc.us/index.htm>. For links to local and county Emergency Management sites, go to: <http://www.dem.dcc.state.nc.us/Localem.htm>

- It may take several days for relief supplies to reach you, especially if the disaster affects a large area. Anticipate what you will need.

- Begin to rebuild. If damage is extensive to the wildlife rehabilitation facility or the community, rebuilding may take a long time. Once the assessment is completed and emergency repairs are done, a plan should be developed for long-term repair or rebuilding. The plan should identify what areas need to be repaired or rebuilt immediately as well as the areas that can wait.

- Consider the impact of a disaster on the wildlife rehabilitators and wildlife in neighboring areas. Local rehabilitation facilities may have received requests to take animals evacuated from other areas. This can create a ripple disaster if the host rehab facilities are unprepared.

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Case Study: Almost a flash flood

It had been a wet spring. Rain totals for the month were 9 inches, and it was only April 17.

On April 29, a low settled over the area and brought another 6 inches of rain during the night. It was beginning to flood. Water in the yard was up to the ankles of the wildlife rehabilitator. It was raining hard, and the forecast called for heavy rain all day, with up to 6 more inches anticipated.

By 8 a.m., the water was still rising, reaching the first step into the house. It was almost 6 inches deep.

An hour later, the water was 18 inches and rose to 3 feet deep — twice — with each rising tide.

The wildlife rehabilitator did the following:

- Moved 18 baby ducklings, two common loons, a mallard pair and two goslings in wildlife rehabilitation into a storage building on 4-foot stilts.
- Moved four terns into separate carriers and brought them into the house to an unused bathroom.
- Moved everything off the floor in the clinic area.
- Moved all records and supplies into the house.
- Unplugged the freezer, refrigerator and all appliances in the clinic.
- Put new, unpacked, chest freezer (which had been delivered the previous day) on 2 foot blocks outside the clinic.

Things she learned from the experience:

- Freezers on 2-foot blocks can float a mile away.
- Freezers that float will still work when they dry out
- Remember to take water and food dishes for the animals moved to safety
- Take stacks of newspapers and trash bags to clean cages of animals that were moved quickly
- Keep at least one case of bleach in stock at all times to clean after a flood.



Photo by Darin Figurskey via NOAA

DISASTER

It is important to review the facility disaster plan on a regular basis; at least annually.

Finally, get involved with the local Emergency Management team in your community. Each county in North Carolina has an Emergency Management director and team. If the Emergency Management team in your area does not have an animal or wildlife component, ask to become a part of the group. Work with other wildlife rehabilitation and humane organizations in your area to develop a community animal disaster plan. Through such planning and cooperation, wildlife rehabilitators and rescuers can alleviate problems when disaster strikes.

Case Study: The snow storm

The weather has been warm for midwinter. A dusting of snow is forecast for evening. When you awake at 5 a.m., 14 inches of snow is on the ground, and it is still coming down. The Weather Channel reports the temperature is 21 degrees and will continue to drop throughout the day. Blip! The power goes off. You have six birds in outside cages and seven squirrels in pre-release cages.

Two days later the power is still off, the snow has frozen and the pipes are frozen.

What is the best way for the wildlife rehabilitator to handle this situation? What actions should be taken? What might you learn from the experience?

Keeping connected: a listserv for rehabbers

WLREHAB is a listserv that allows wildlife rehabilitators around the world to share stories and information. To subscribe to WLREHAB, send the following command to listserv@listserv.nodak.edu in the BODY of your email message (not the subject line):

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subscribe wlrehab yourfirstandlastname
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The list generates between 20 to 100 email messages every day. If this volume is too much for you, you may switch to a digest or index option. The easiest way to do this is through the website at <http://LISTSERV.NODAK.EDU/archives/wlrehab.html>.

BEGINNER BASICS*Before physical exam, take time to observe*

BY JEAN CHAMBERLAIN

Before taking an injured or orphaned animal out of the container it is brought in, observe it. Note how alert it is. Does it watch you? Is it sitting or standing normally? Is there blood anywhere? Check for life-threatening conditions: heavy loss of blood, shock, and abnormal breathing.

Once you have taken the animal out of the container, check for other serious problems. Check its temperature. Is it overheated or cold? Is the animal extremely dehydrated? (see 'Dehydration 101: Getting Plenty of Fluids' in the August 2006 issue) Check capillary refill time by pressing the skin or gums and noting the time before the pinkish color returns. Check skin turgor by lifting the skin and releasing. How long does it take to return to normal? In a well-hydrated animal the skin will immediately return. Is the mouth pale and dry? Are the mucous membranes tacky or ropy in appearance? Do the eyes appear sunken? A pale mouth, tacky mucous membranes and sunken eyes are signs of dehydration.

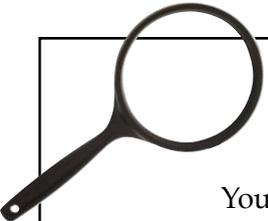
Is the animal emaciated? Does it appear thin? Compare its weight to normal for the species. For mammals, check the muscles along the spine. An emaciated animal has little muscle tissue.

Treat any life-threatening conditions and be sure the animal is stable before proceeding with a full physical exam.

The next Beginner Basics article will cover principles to follow in performing a physical exam.



Before removing an animal from the carrier, observe it to determine if there are life-threatening conditions.



Test your diagnostic skills

Your neighbor brings you a juvenile Virginia opossum the dog brought home. A complete physical reveals the opossum is in good health and should do well in rehabilitation. So, you begin to care for this singleton.

Questions for the case:

1. What would be in the animal's best interest?
2. What is one of the first things you should do after making the animal comfortable?
3. What is the likelihood of successful release of the opossum?
4. What are the behavioral considerations of this case?
5. What are the risks associated with this lone orphan?

Answer on Page 32

On the trail of bacteria

BY MELISSA TURNER AND CHRISTOPHER S. DEPERNO, PHD.

For most wildlife biology graduate students, learning does not stop when the semester ends. For me, the learning had just begun when I traveled to Chesapeake Farms in Chestertown, Md., in June to capture white-tailed deer fawns. My goal was to test the heads and nasal passages of fawns for a bacterium called *Arcanobacterium pyogenes* that is associated with intracranial abscesses.

I am a master's candidate in the Fisheries and Wildlife Science program at N.C. State University. My research focuses on management, ecology and genetics of white-tailed deer at Chesapeake Farms. Chesapeake Farms is owned by DuPont Crop Protection and located on the Eastern Shore of Maryland. The property is used for a variety of purposes and managed to foster a healthy, balanced deer population. These goals have made Chesapeake Farms a perfect site to study deer ecology and the effects of deer management, and my work builds on decades of research by N.C. State students.

For many years, the staff and students at Chesapeake Farm have captured fawns, collected tissue samples for DNA analysis (another component of my research), and inserted ear-tags for individual identification. Upon the animals' death, the ear-tags provide accurate age information, which is



N.C. State students swab a fawn at Chesapeake Farms in Maryland for a study on intracranial abscesses.

Photos by Steve Allen

essential to many aspects of deer management. My study added a third purpose to capturing fawns: we were swabbing for bacteria associated with intracranial abscesses in adult males.

Intracranial abscesses are present at low levels in deer across the United States, and are thought

to have minimal affect on white-tailed deer populations. However, the Chesapeake population has a high incidence of these abscesses. Intracranial abscesses are infected wounds that become fatal once they penetrate the skull. Past research has shown

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infection is limited to older males and tends to appear in the fall when males engage in rutting behavior that can create wounds around the antler base. Our objective was to explain why these abscesses are so prevalent at Chesapeake Farms. The most recent N.C. State student working at Chesapeake found the bacteria around the antlers and in the nasal passages of living adult males. So, we wondered, is this bacteria carried across the population? Could it be analogous to *staph* in humans, always present but only occasionally problematic? Testing the skin and nasal passages of fawns was designed to help answer that question.

However, before testing fawns, we had to undertake the formidable task of catching them. How? Walk and look. It's that simple. The mother will stay away from her fawns and return to them every three to four hours to nurse or groom them. While alone, the fawn's instinct is to remain still and silent in the presence of danger. This is why a fawn found alone has not been abandoned and should not be touched. Most likely, the mother is very close, watching and listening and will return. Often, people compromise the survival of the fawn if they remove it from the wild.

The hiding instinct makes the youngest fawns easy to capture, but within just a few days of birth, they are fast enough to outrun the fastest human, and as soon as our search team got close to one, it would bolt out of sight. We spent a lot of time sprinting through tall grass with blackberry vines ripping across our skin. Even more frustrating than repeatedly flushing fawns without catching one is not seeing any at all. We spent the weekend trying to figure out a formula for catching fawns. After hours of searching dense blackberry patches, we decided they were a waste of time, and then found a one-day-old in a thick, prickly nest. We sought areas full of deer beds – evidence of deer activity — only to find relatively few fawns. We decided not to waste time searching the middle of vast fields in the heat of the day, only to find a newborn, piebald white-tailed deer fawn next to the site where he was born, midday sun beating down.

We learned fawns can be anywhere, including an empty agricultural field devoid of vegetation. In the end,



Photo by Steve Allen

we caught 11 fawns in diverse habitat, averaging about one every two hours. Most were newborn to about 2 days old. A couple of fawns were clearly older, including a 5-day-old fawn that wandered up to our team veterinarian.

As is typical in science, our testing for *Arcanobacterium pyogenes* has provided some answers and more questions.

We did not find the bacteria on the fawns. It appears the young fawns are not being exposed to the bacteria from the mother and that the bacteria is not carried across the population but encountered in the environment. More research is necessary to determine when and how the deer at Chesapeake Farms become exposed to *Arcanobacterium pyogenes*.

Future research will include swabbing adult females to see if they carry the bacteria. However, the work will help explain what has become an important question at Chesapeake Farms and contribute to the vast field of white-tailed deer ecology.

And, of course, capturing and releasing fawns unharmed is as good as field work gets.

Melissa Turner is a master's candidate in the Fisheries and Wildlife Sciences Program at N.C. State as well as a journalist.

Christopher S. DePerno, Ph.D. is an assistant professor and wildlife extension specialist in the Fisheries and Wildlife Sciences Program and the Department of Forestry and Environmental Resources at North Carolina State University.

In the spotlight

Name: Anne Mathis

Organization: Wildlife Rescue Center, Sanford, N.C.

How did you get started in rehabbing? I initially became interested in working with raptors after making a trip to the Carolina Raptor Center during the winter of 1993. I was hooked! I started volunteering and traveling to CRC a couple of times a month to volunteer in Resident Bird Care and assist with exhibits. I also volunteered to transport animals. After four-and-a-half years of traveling to the center, I decided to concentrate more of my time and energy with our local rescue group in Sanford. I came to Sanford in 1971 initially to study veterinary medical technology at the community college. Although I had not worked in the field for many years and had decided to never work with animals again, the desire to try and help these beautiful creatures changed all that. I started attending workshops and symposiums to make sure this was something I wanted to do. I eventually located a sponsor, built my aviaries and applied for my permit.

How long have you been rehabbing? Over five years.

Who was your mentor or who is someone you admire? I really admire some of the rehabilitators I have met over the years. The dedication, sacrifice and hard work they demonstrate is really admirable. My father volunteered with the S.C. Center for Birds of Prey for a while, when my parents were living at the coast, and he often remarked that he couldn't understand how people could work that hard for so little money!

What animals do you work with? Raptors.



What type of set-up do you have? One 50 foot L-shaped flight cage that can be divided into two smaller aviaries. A small 8 x 8 aviary divided into two stalls for preconditioning smaller raptors.

Any pets? Three dogs, two cats.

Any non-animal family members? Thomas, my fiance.

What are your hobbies? Beading, doll collecting, historical costuming, collecting raptor stuff, dance.

If you're employed, what type of "day job" do you have? I'm not currently employed.

Tell us about an accomplishment of which you're proud: The completion of my 50-foot flight cage. It

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SPOTLIGHT

took Thomas and me almost three years to finish. We paid for it as we went along, and we built it ourselves.

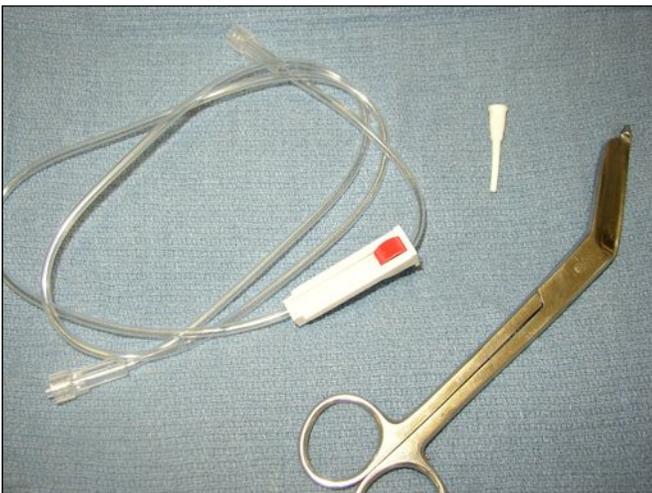
If you could have dinner with one person alive or no longer living, who would it be? This is a hard question. There have been so many interesting people that have made wonderful contributions to our society that I would like to meet. Prior to becoming involved with wildlife rehabilitation, my life outside of work revolved around dance. I studied classical ballet for almost 30 years. If my childhood plans had come true, I would hopefully have eventually met George Balanchine, founder and master choreographer for the New York City Ballet. Mr. Balanchine transformed dance as it was known at the time, trained some of the finest dancers to ever grace a stage and, through the Ford Foundation, made it possible for thousands of children to realize their dreams of a professional career through a scholarship program. I have had the good fortune to take classes under some of his dancers who became teachers upon their retirement from the stage. I only wish I could have observed him teaching class and choreographing a dance on one of his fabulous dancers!

What do you like about being a part of WRNC? I really enjoy meeting and networking with other rehabilitators I have met at workshops and symposiums. I enjoy the newsletter — it imparts so much valuable information and tips from knowledgeable rehabilitators in North Carolina.

Pearls of Wisdom

Need a feeding tube in a hurry? Make one quickly by cutting the appropriate length from an extra IV tube and inserting a cannula tip onto one end. The cannula tip can then be inserted into a syringe, giving you a perfect, and inexpensive, set up for gavage feeding or fluid therapy.

Do you have a tip that makes your job easier? Send your favorites to Toni O'Neil at oneil9734@yahoo.com





Same design, a new color

The lack of new T-shirt screen design submissions for our 2009 WRNC T-shirt competition has spoken. There were none. That response tells us Wanda Burton's award-winning screen design in 2007 is still so popular and well loved that we will be happy with just a new color.

So . . . that is the plan. WRNC will have a fashionable and luscious new color available for purchase during the WRNC Symposium, Jan. 29 – 31 in Raleigh. The new T-shirts will be on sale for the very reasonable price of \$12, as in the past. The remainder of our stylin' steel-green T-shirt inventory will be available at a discounted \$10.

Linda Bergman-Althouse

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About Us

This is a quarterly newsletter produced by Wildlife Rehabilitators of North Carolina (WRNC). WRNC was organized in 1999 with a mission to share information and knowledge about wildlife rehabilitation.

The opinions, techniques and recommendations expressed in the articles of this newsletter are those of the authors and do not imply endorsement by WRNC.

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Book Corner

In nature, hope springs eternal

Summer World – A Season of Bounty

Bernd Heinrich

Ecco

230 pages

\$26.99

BY BRENDA HILES

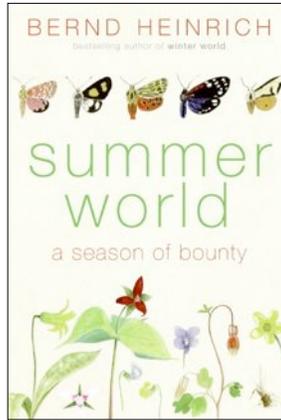
“Summer World” brings to mind the first day each year when one becomes aware of life stirring just below the surface. In North Carolina that day usually falls some time in February when the temperature hits 75 and the sky is a shade known as Carolina Blue. Flocks of robins descend on winter-weary lawns and Great Blue Herons nest in the tops of the still-bare trees. Listen closely, and you’ll hear frogs singing.

In Maine and Vermont where Bernd Heinrich spends his time, the beginning of summer is evident even under a layer of snow as woodpeckers drum on the trees and chickadees welcome the dawn, which arrives a little earlier each day.

“Summer is a time of green, urgency, and lots of love lost and found,” Heinrich writes. “Almost overnight there is a wild orgy of courting, mating and rearing young.”

And so begins the yearly resurrection that to rehabbers means the beginning of baby season.

Heinrich takes readers on an adventure reminiscent of being a child with an entire summer to wade through ponds, collect frogs and follow caterpillars on their annual journey. That’s because at 69 years old, Heinrich, a professor emeritus of biology at the University of Vermont, retains the curiosity of a youngster and an insatiable desire to figure out why things work the way they do. He is so attuned to nature that he can detect the sound of caterpillar feces raining on the leaves of a tree at night. His curiosity is infectious. His gift is the questions



he asks: Why do ruby-throated hummingbirds risk appearing in Maine before nectar-bearing flowers are in bloom? (Their return coincides with that of the yellow-bellied sapsucker, which drills into the trees, providing sap for the hummingbirds to eat.) Why do wood frogs sing when the females don’t choose their mates? (Because their chorus acts like loud music at a frat party, attracting females).

Heinrich’s Vermont countryside is full of miracles. Finding yellowish green moss on rocks under a tree, Heinrich peels it off and puts it in a bowl of water in the sun. In seconds it turns green. In an hour, silvery bubbles form – oxygen – evidence of respiration. It’s alive!

The description of a caterpillar’s metamorphosis into a moth reads like part science fiction, part fairy tale. It’s that sense of wonder that makes “Summer World” a riveting read.

Summer may be about life and the rush to procreate, but death is never far off. The two exist side by side as prey tries to outwit predator. Death is an essential element of life as illustrated by a moose carcass Heinrich finds near a wall of his cabin in Maine one winter. The moose first became food for coyotes. Next came the ravens. After the snow melted, the beetles and flies had their share. When the carcass was reduced to hair and bones, the chickadees and other birds took lining for their nests. Squirrels and mice chewed on the bones. Nothing is wasted.

A lot of activity is packed into the three months of summer. But as the days grow shorter and the nights cooler, life slows down. The birds begin their annual

migration, leaves fall from the trees. The frogs, which will be frozen during the winter, already carry the eggs that will be laid on a pond in spring. In the harshest winter, the seeds of summer are already taking root.



BRIEFS

Mark your calendars for Symposium 2010

The WRNC Symposium 2010 will be held at the North Carolina School of Veterinary Medicine in Raleigh on Jan. 30-31. The new location has ample space for our sessions. We are excited that we will be able to hold our workshops in fully equipped laboratories that will accommodate a large number of participants. See the December issue of the newsletter for more symposium information, including a schedule of sessions, activities and events. Information also will be posted on our website as it becomes available.

Wildlife Resources sets fee for rehab permits

The state began charging a \$5 fee for wildlife rehabilitation permits on July 1 that will have to be renewed every year. In the past, there was no charge for permits, which were good for three years.

The change was made to offset administrative costs of issuing the permits, said Daron Barnes of the Wildlife Resources Commission.

“This has become even more necessary with the current and future budget reductions occurring within state government,” Barnes said.

As of June, there were 831 permitted rehabilitators in the state.

Red wolf numbers on the rise in N.C.

Forty-one red wolf pups were born in the wild this spring in North Carolina, a higher-than-average whelping rate for the state’s red wolf recovery program.

The program, which began in 1987, covers 1.7 million acres and spans three National Wildlife Refuges.

Wildlife officers found 11 litters for 15 packs this spring.

Red wolves were once plentiful in the United States, but by the 1970s, hunting and habitat destruction had reduced the wolf population to 17, according to a

press release from the U.S. Fish and Wildlife Service.

The wolves prey on small rodents and deer.

Storage space needed for medical supplies

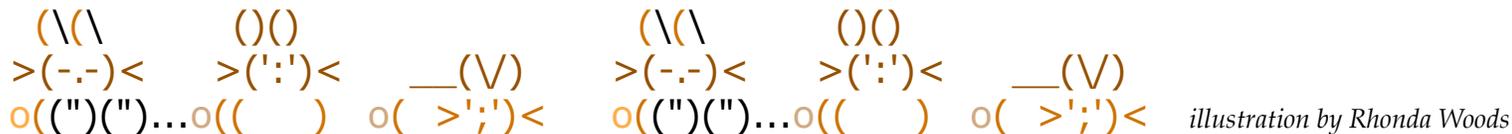
A cool, dry storage area is needed to store medical supplies that will be offered at the 2010 symposium. If you can help, contact Toni O’Neil at oneil9734@yahoo.com

Exxon Mobil fined in death of birds

Exxon Mobil is paying \$600,000 after pleading guilty in federal court to causing the death of migratory birds across the Midwest.

About 85 birds, including waterfowl, hawks and owls, died in natural gas well pits and water storage areas in Wyoming, Kansas, Oklahoma, Colorado and Texas since 2004.

The penalties paid by Exxon will go toward protecting wetlands. The company also said it would work to prevent similar deaths in the future.



Join us online!

WRNC has set up a listgroup on Yahoo! for members to share information, ask questions, network and get to know each other. To join, go to:

<http://groups.yahoo.com/group/WRNC/> or send an email to: WRNC-subscribe@yahoogroups.com.

Case Studies

Deciding right from wrong

Case 11

The wildlife rehabilitator needs another, larger cage. Over the years she has given presentations to civic groups and worked with several Scouts on merit badges. She knows of a Scout who is looking for an

activity for his Eagle Scout project. She meets with the boy and his Scout Master and enlists him and other Scouts to build a large cage.

The Scout develops a great set of plans. The wildlife

rehabilitator works to get all the building materials donated. It should take about a month, on weekends, to build the cage.

On a bright, fall Saturday, the Scouts and Scout Master arrive at the center to start building. The wildlife rehabilitator shows them where the cage is to be built and leaves them alone.

Boys will be boys. They play their radio and “horse around” making a lot of noise. They come in and out of the center asking questions, eating and trying to pet the animals.

“Only 3 more weekends to go!” says the rehabilitator that evening.

♣ How does this relate to the Wildlife Rehabilitator’s Code of Ethics?

♣ Which Code (s) might apply?

The Wildlife Rehabilitators Code of Ethics is available in the IWRC’s Minimum Standards, which can be found at: <http://www.iwrc-online.org/documents/MSWR.pdf> on Page 7.

Answers to previous ethics cases

Case 10

You have a state permit which allows you to rehabilitate small mammals and turtles. On a Saturday evening you receive a hawk. You know that legally you can keep it for 72 hours but must transfer it to a wildlife rehabilitator with a federal license.

On Sunday afternoon you locate and arrange to transfer it to someone you had met last year who has a federal license and “does raptors only.” You pack up the bird and drive the 50 miles to his rehabilitation facility.

On arrival you notice 10 hawks and owls of various species in the same room in pet carriers. You have not noticed any large flight cages. The cages are dirty, the place smells terrible and food and soda bottles are in the animal care area.

Though it is getting late, you ask to see the flight cages. The only cage is about 6’x 8’x 8’ and has some kind of falcon, a Barred Owl and Red-tailed Hawk in it. Humm.....

How does this relate to the Wildlife Rehabilitator’s Code of Ethics?

Which Code (s) might apply? **Code 1:** Strive to achieve high standards; keep informed on current rehabilitation methods and regulations. **Code 4:** A wildlife rehabilitator should establish safe work habits and conditions, abiding by current health and safety practices at all times.

Code 8: Strive to provide professional and humane care, respecting the wildness and maintaining the dignity of each animal.

New clinic opens in Raleigh

The Triangle Wildlife Rehabilitation Clinic (TWRC) is a new organization that has opened a wildlife hospital in Durham County near the Research Triangle Park.

The new center hopes to fill the void created when Piedmont Wildlife Center closed its hospital in early July. As a public service to the Triangle area, TWRC, along with an extensive network of wildlife rehabilitators, transporter and veterinarians will appeal to the community to help support the center.

TWRC has hired Dr. Leslie Martin as a part-time veterinarian, but is otherwise staffed by volunteers.

One of the biggest needs for wildlife assistance lies with songbirds and raptors. TWRC will be treating songbirds and raptors as well as turtles and other reptiles. TWRC will also be treating adult mammals and will be working closely with home rehabilitators for placement of baby mammals.

Two training sessions have already been held for volunteers. Volunteers are needed to work in the clinic, help feed animals, clean cages, wash dishes and prepare food. Other duties include washing and folding laundry, carpentry and fund-raising.

The phone number for the clinic is 919-544-3330. The website is <http://www.trianglewildlife.org/>.



Photo by Ann Rogers

Dr. Leslie Martin examines an Eastern Cottontail at Triangle Wildlife Rehabilitation Clinic.

Piedmont Wildlife Center focuses on education

The Piedmont Wildlife Center in Durham is focusing on education programs and conservation efforts since it closed its wildlife clinic in June.

Officials at the center at Leigh Farm Park said it was no longer financially feasible to keep the center open as donations decreased by 50% during the nationwide financial meltdown.

“Within our present constraints, we believe our chance of having the greatest impact on native wildlife populations is by teaching children, adults and families to value wildlife and by showing them how to change their actions to prevent wildlife injury and suffering, and how to better coexist with our wildlife neighbors,” officials said in a press release in July.

The center is looking for volunteers to help educate the public about wildlife issues. For more information, go to www.piedmontwildlifecenter.org or call (919) 489-0900.

Diagnostic skills: Were you right?

1. It would be in the best interest of the animal to find placement with another litter.
2. Call fellow rehabilitators to see if they have a litter of babies of that approximate age, and arrange for transfer.
3. Animals must recognize their own kind and know how to interact. They must recognize predators and humans as enemies. Releasing a singleton habituated to humans sets them up for disaster. Once their eyes open, keep handling to a minimum. Raising with conspecifics promotes development of normal behavior. The thing that separates you from the general public is that you have the knowledge and ability to consider the animal's needs. The best thing to do is to get it with another.
4. Successful release is dependent on both normal physical and behavioral characteristics. They must have the ability to interact with their species, find food and shelter.
5. Habituation and lack of species-appropriate survival and social skills.



Online

A wide variety of information about wildlife and exotic animals is available online. Share your favorite websites with us.

• Exotic DVM

<http://www.merckvetmanual.com/mvm/index.jsp>

• Corky's Cave (rabbit information)

<http://www.corkyscave.net/links.htm>

• Rabbit References

<http://homepage.mac.com/mattocks/morfz/rabrefs.html>

• Veterinary Clinics of North America

<http://www.vetexotic.theclinics.com/home>

• International Veterinary Information Services

<http://www.ivis.org/home.asp>

• ABC Homeopathy

<http://www.abchomeopathy.com/>

• American Veterinary Medical Association

<http://www.avma.org/>

• DVM 360

<http://www.dvm360.com/veterinary/Rabbits>

The gift of WRNC

Membership in WRNC makes a thoughtful gift for the rehabber in your life.

Members have a link to wildlife rehabilitators across the state. They can access past newsletters as well as up-to-date news on our web site.

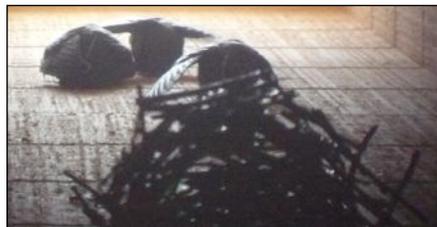
The annual membership fee is \$15.

For an application, go to:
<http://ncwildliferehab.org/whoweare.cfm>

Standing *Tall*

The three 2009 WRNC Chimney Swift tower grant awardees completed their towers in early spring and quickly hung vacancy signs for all Chimney Swifts in their immediate area to see, and “Houston, We Have Residents!”

Avid bird lover Krista Hansen from Oak Path Farm in Council, N.C., who has enjoyed Chimney Swifts on and near her land for many years, immediately saw the value in applying for a Chimney Swift Tower Grant. Her home heating system was updated years ago, which required the sealing of chimneys where Swifts had previously nested. She and her husband, Craig Magill, vowed at that time to find ways to keep Chimney Swifts in their lives. Krista’s determination and passion to provide alternative habitat for the Chimney Swifts in her area were recognized by the WRNC board, and her application was selected to receive a grant during the Symposium Board Meeting in Raleigh on Feb. 1, 2009. As soon as Krista received the word, her husband and his father, Charles, began constructing the tower. A decision was made to abut the tower to an existing horse barn to ensure an abundance of delectable insects and tower stability. After the finishing touches on the tower, the waiting game began. Although told it would be unusual for a first-year tower to house Swifts, Krista and Craig stood fast in their monitoring of the tower, and it finally happened. By May, Chimney Swifts were moving into the tower, and by July babies were onboard.



Krista Hansen of Oak Path Farm in Council paints the Chimney Swift tower adjacent to her horse barn. Babies were in the nest in July.

SEE SWIFTS, PAGE 34

SWIFTS



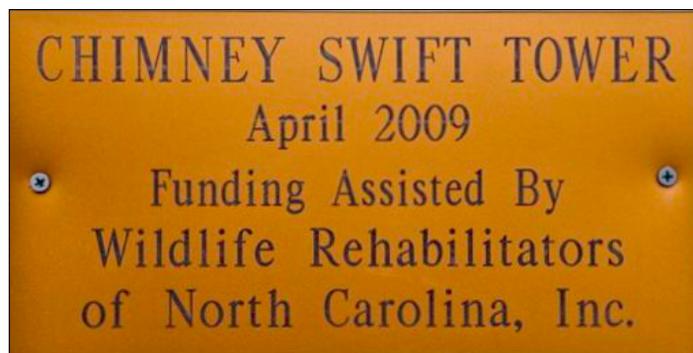
Ed Erkes completed his Chimney Swift tower in Wayne County in April. He's sighted Swifts in the area but none have taken up residence this year.

High atop the Bell Tower at Lee's McRae College in Banner Elk, N.C., acrobatic Chimney Swifts that live on the wing will soon be doing what they are meant to do: raise their young before they return to Peru in late summer and vacuum the sky at dawn and dusk, ridding the

campus of dangerous and pesky insects. Nina Fischesser, instructor of Earth Stewardship and Wildlife Rehabilitation at Blue Ridge Wildlife Institute on Lee's McRae campus, also saw the value in applying for a Chimney Swift Tower Grant, especially since the college's heating system was being updated, which required the closing of chimneys where Swifts had nested for many years. Lee's McRae College in Banner Elk is one of the largest roosting sites for Chimney Swifts in western North Carolina. Nina's initiative, selfless determination and the Chimney Swifts' need for a tower were recognized by the WRNC board, and her application was also selected to receive a grant. As soon as Nina received her selection notice and the weather broke, she put her construction team to work. By early April the tower was up and ready to receive Chimney Swifts. Nina has noticed a number of Chimney Swifts checking out the new tower, but it is not known at this time whether a family took up residence this year.

On 25 acres of undeveloped land in Wayne County, Ed Erkes, naturalist, bird lover and nature photographer from Goldsboro, continues his efforts to groom a valuable wildlife sanctuary and refuge. His desire and efforts to build a Chimney Swift Tower were assisted by WRNC when his tower application was approved to receive a monetary grant. Ed's white, majestic Chimney Swift tower was completed in late April and stands tall awaiting its first family of Swifts. While he patiently waits and monitors Swift interest, he's stocked the pond with fish. His plantings of eastern red cedar, red maple, river birch, flowering dogwood, black cherry, black gum, wax myrtle and inkberry shrubs are growing. Wood duck and Bluebird boxes, as well as Purple Martin condos are in place, and structures to attract more Warblers and Barn Swallows are in the planning stages. Ed has sighted Chimney Swifts in the area this summer feeding over the pond and swooping the tower, but there are no indications of activity inside the tower yet. Maybe next year!

If anyone is interested in constructing and maintaining a Chimney Swift tower to benefit the birds as well as your community, WRNC can help conserve this valuable natural resource and encourage Swifts to return to North Carolina by offering a Chimney Swift Tower Grant to any individual or environmentally active group who will seek appropriate site approval, properly construct and regularly maintain a Chimney Swift Tower in their area. Find the requirements and WRNC Chimney Swift Tower Grant application online at <http://www.newwildliferehab.org>. New applications must be submitted prior to Jan. 5.



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Meet the real ‘Mother Goose’

BY JENNIFER GORDON

Clarice gives a new meaning to the term “Mother Goose.”

The white Chinese goose and her partner were abandoned in a neighborhood pond after their owners moved. Clarice’s mate was killed shortly afterward. Neighbors looked after Clarice, who lived alone on the pond for eight years.

Whenever Canada geese flew in, Clarice called after them. But when they moved on, Clarice was left alone again.

Carolina Waterfowl Rescue (CWR) near Charlotte was called after Clarice was attacked by a predator. Her wing was amputated after severe gangrene set in.

One day I noticed Clarice was pushing against the wall of her pen, straining to get close to the goslings next to her. The goslings, which had been imprinted on humans, were also drawn to her and were sitting as close as they could. CWR volunteers decided to see what would happen if they were allowed them to mingle.

Clarice has now taken over guardianship of every gosling that comes into the rescue. She attacked a mallard who came too close to her “babies,” so we moved her and all the goslings into their own pen. She also gets mad when I pick them up for exams!

Clarice now has a much larger brood of goslings but no matter how many, she accepts them all as her own. We allow her to roam the fenced rescue land during the day when someone is there, and she prepares goslings for flight. It is such a joy to see them outside running and flapping their wings behind Clarice. I think she knows she can no longer fly but she is passing this gift onto “her” goslings.



During this past baby season, Clarice raised up to 50 goslings at a time. She managed to track each one and learned their voices and calls. She also took in two severely imprinted goslings from other rehabbers that she trained to be geese again. When we

went to evaluate releases for the babies, we couldn't even tell which ones had been imprinted. Goslings want to attach to a mother figure so by having Clarice there they were immediately able to bond to a real goose.

The last of Clarice's goslings were released in late July. She still has two babies with her that are nonreleasable but she is happily preparing for next year when she will start all over again.

Some groups of geese offer community baby-sitting where they take in goslings from extended family and swap child care duties. Canada Geese have also been known to practice Levirate type “marriage,” where a gander will assume his brother’s mate upon death and raise the children in addition to his own. Afterward, the widow may choose another mate or choose to be alone.

Canada Geese in the wild have also been known to accept foster goslings similar in size to their own. When introducing goslings to a foster goose, watch for several hours to make sure the mother is accepting them. Geese do imprint strongly and take longer to mature than ducks so they are much better off being raised by adult geese. Just ask Clarice!

Creature FeaturePurple Martin – *Progne subis**Photos by Ali Iyooob*

Description: Purple Martins are the largest swallows (8"). Adult males are dark, glossy and purplish-blue. Females and juveniles are gray below. In flight, males resemble the European Starling. Purple martins are monogamous, but sometimes are polygynous. They nest in colonies.

Weight Range: 49 to 51 grams

Range: They're common east of the Rocky Mountains from early spring through mid-August.

Natural History: Martins nest in cavities or colonial bird houses. They feed "on the wing" and will often drink and bathe "on the wing." House Sparrows and Starlings compete for their nest cavities. Purple Martins winter in South America. They are a "species of concern." Many efforts are being made to monitor nest colonies.

Adult Diet: *Insectivores*. Flying insects are a staple of their diet. Occasionally they feed on ground ants and other insects. They may be fed mealworms, waxworms, crickets, flies and fly larva while in rehabilitation.

Nestlings: The young are altricial and naked with pink skin and pale yellow gape flanges. Their dark beaks are small and pointed. Blue-black feathers on their back and wings emerge at 10 days old. Both parents attend the young. They fledge at 26 to 31 days. The young eat small insects.

Fledglings: House with other birds. Young Purple Martins will continue to accept hand feeding until they are independently self feeding "on the wing." They get along well with most conspecific passerines.

Juveniles: Focus rehabilitation efforts toward self feeding while in flight. Hang fruit in the cage and near perches to encourage "hawking," and "feeding on the wing." Change fruit every day or so to continuously attract flying insects. Do not release until the birds can

self-feed while flying. Continue to hand supplement or offer feeding dishes of insects.

Rehabilitation Notes: Activity aviary requirement: 4' x 16' x 8.' Attract fruit flies and other flying insects to perfect "hawking" skills. Martins enjoy a nest box for hiding and a bowl of sand or dirt for a daily "dust bath" and "anting."

Common Problems: Try to release juveniles with the original colony, if known. Monitor migration dates in your area carefully. Purple Martins gather in enormous pre-migratory roosts near water. It is possible to release at a roost site. Contact local bird clubs for migration information. Pre-migratory roosts are frequently found under bridges. These sites may be dangerous for the wildlife rehabilitator as well as younger birds. Martins can be wintered over if migration has been missed. If wintered over, locate the new nest colony for an early spring release.

