



## On Track...

Spring 2020

### “Batty” for New Jersey Bat Sanctuary

By: Fiona Yeung, Woodford Cedar Run Volunteer

On Sunday, November 10th, 2019 we had the privilege to hear from Jackie Kashmer, the director of the New Jersey Bat Sanctuary. A wildlife rehabilitator for over 30 years, she has now made it her duty to rehabilitate injured and orphaned bats in the area. She single handedly has been able to run her organization while rehabilitating all the furry patients in her care. Her dedication and commitment has driven her to save hundreds of bats and she is on her way to save hundreds more. During the lecture Jackie discussed how to set-up for transport to her facility, which was especially helpful. When we receive calls at Woodford Cedar Run Wildlife Refuge pertaining to bats, we always tell the public to contact Jackie since our facility is not licensed for bats.

On one occasion while I was at the wildlife hospital, someone had brought in a small bat that they encountered lying in a mud puddle on a hiking trail. Upon arrival, we saw the bat nestled in a t-shirt and we brought it back and prepared a critter keeper fitted with towels and pillow cases. They were in contact with Jackie and were able to transport it to her using a more comfortable method. Without having the knowledge obtained from this lecture on bat transport, I would not have known the proper measures to take or how to set up a carrier for transport.

Jackie had also discussed her part in successfully rehabilitating white-nose syndrome (WNS) bats during the outbreak. She mentioned how WNS had almost wiped out the entire population of little brown bats hibernating at Hibernia Mine in New Jersey. With rehabilitation of these bats, she has helped stop the spread of WNS and combated the fungus. She has even treated over 300 bats affected by WNS.

She saw much success in combating WNS with a dilute vinegar wash, which stopped the spread of the fungus and promoted healing to their wings. In some cases, she was able to successfully treat WNS, but there was too much irreversible damage to these patient’s wings deeming them non-releasable. For those individuals she was able to house them in a beautiful, indoor enclosure that was fitted with a multitude of cage furnishings that provided hiding spots for these new residents.

NJAWR is an amazing organization to which New Jersey Bat Sanctuary and Woodford Cedar Run Wildlife Refuge belong. This is an organization that I have even had the privilege of personally working with this past fall, as the co-president of Rowan University’s Pre-Vet Club. The NJAWR Bat Rescue and Initial Care lecture was the first large-scale lecture for our club, and it was the first time that we were partnering with NJAWR. We have worked tirelessly as a new organization to further educate students outside the bounds of the classroom and to bring about a variety of experiences. This lecture was engaging, something new that our students have never been exposed to, and an overall awe-inspiring opportunity.



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## IT IS SQUIRREL SEASON AGAIN! HERE ARE SOME SQUIRREL FUN FACTS:

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1. Squirrels are amazing creatures; they can leap 10 times their body length and turn their ankles 180 degrees to face any direction when climbing.
2. They have superb vision, and they learn by quickly copying other animals.
3. Squirrels eyes are positioned in a way which allows them to see behind them.
4. They are not shy of coming out in the daytime, making them one of the rare wild mammals that many of us actually see.
5. In Greek, the word 'squirrel' means 'shadow tail'.
6. The most iconic behavior of squirrels is storing nuts and acorns for winter. This is necessary for the species of squirrel that do not hibernate. They can smell/locate a stored nut under one foot of snow.
7. Squirrels can fall from 30 meters high, without hurting themselves. When jumping, or falling, they use their tail both for balance and as a parachute!
8. An arctic ground squirrel (a species of ground squirrel native to the Arctic.) is the only warm-blooded mammal able to withstand body temperatures below freezing whilst hibernating.
9. The hind legs of squirrels are double-jointed and hyper extendable, which gives them the ability to run up and down trees very quickly. Squirrels are one of the few animals that can descend a tree head first.
10. A male squirrel can actually smell a female in heat, from up to a mile away.
11. Mating season for squirrels is from February to May, with a 44-day gestation period. Generally, two to four young are born per litter.
12. Squirrels have four toes on their front feet, which are extremely sharp and used for gripping tree bark whilst climbing. They also have five toes on their back feet.
13. In addition to residing in the eastern United States, Eastern gray squirrels can be found in many western states, the United Kingdom, Ireland and South Africa.
14. With 285 species of squirrels, they can be found on every continent except Antarctica and Australia.
15. Squirrels can eat their own body weight every week, which is roughly 1.5 pounds.
16. Squirrels are clever creatures and can learn to navigate numerous obstacles to find the most efficient route to food; they are also rather good at finding shortcuts.
17. Squirrels can jump a distance of up to 20 feet. They have long, muscular hind legs and short front legs that work together to aid in leaping.
18. Squirrels have been proven to run at speeds of 20 miles per hour. However, generally, most squirrels run half this speed.

Source: <https://www.thefactsite.com/fun-squirrel-facts/>

## President's Message

We have entered an unprecedented time this year with the SARS-CoV-2 pandemic. Make sure you are following CDC guidelines to keep everyone safe while our community continues to tend to wildlife in need of assistance.

I want to thank everyone who currently serves on the NJAWR Board of Directors and to those who have previously served. Without your commitment, NJAWR would not be here today to assist the wildlife rehabilitation community.

I would also like to officially welcome Heather Evans to the board. Welcome! We are delighted to have you as part of the team.

Congratulations to Cathy Malok on receiving the NJAWR Lifetime Achievement Award! You are definitely one of the pillars in this community! Nominations for the 2020 NJAWR Lifetime Achievement Award are now being accepted. Nominees do not have to be a NJAWR member. If you previously selected someone who did not win this year or in a previous year, please consider nominating them again for another chance to win this award!

Congratulations to Adriana Manchen on receiving the NJAWR Rising Star Award! Keep up the great work! Nominations for the 2020 NJAWR Rising Star Award are now being accepted. Again, nominees do not have to be a NJAWR member. Please take the time at some point before the annual deadline (October 31st) to nominate someone from your facility that is consistently working hard. Recognition of someone's hard work and dedication is paramount for continued success.

Stay healthy and safe!

Cheers,  
Denise Hassinger, MSc.  
NJAWR President



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## Invasive species alert!

By: Heather Freeman

We, as rehabilitators and volunteers, have the responsibility to properly identify every animal that comes in for care. What happens when we get in an animal that is not native to New Jersey? Many rehabilitators already have policies in place for this, but are we all aware that this issue continues to grow? For example, as a reptile and amphibian rehabilitator, we often get calls about red-eared slider turtles. Whether found in the wild or a surrendered pet, we cannot release these back to the wild so our policy is to refer these callers to centers that work with rehoming. We had a new situation this winter where we got a call about a tree frog found indoors on a potted plant. The frog came to our center and it was immediately obvious it was not a native species. We identified it as a Cuban tree frog. After further information was gathered we confirmed that identification, because it was actually found at a plant exchange warehouse the day after a shipment in from Florida! These frogs are known for hitchhiking on shipments! Thankfully, we were able to find it a home at an education center since it could not be released. That was a new one for us!



## Avian Bandaging Workshop

By: Ally Horan



On Sunday, February 16th, exotics veterinarian Susan J. Tyson-Pello, VMD, MS, of Mount Laurel Animal Hospital lead an interactive avian bandaging workshop. Participants were able to work hands-on with birds of prey cadavers, wrapping a number of leg and wing fractures. The workshop began with a presentation. Dr. Tyson-Pello gave an overview of the initial intake process of avian species. She explained the types of fractures that wildlife rehabilitators and veterinary staff typically see in avian species. Then she discussed different styles of bandaging that exist and when each style should be used. The presentation was informative, but short. Dr. Tyson-Pello wanted the attendees to spend most of the workshop practicing the wraps and receiving feedback from the professional staff, which included Mount Laurel veterinary technicians and licensed wildlife rehabilitators.

For the next 90 minutes, participants referred to their avian bandaging handouts to choose the appropriate bandaging style for their fractured “patient”. Each person was given all the medical supplies necessary for each style. Many participants practiced multiple wraps on their cadavers or worked as a team with the individuals sitting at their table to practice even more styles on other birds. Participants accessed their bird’s injury, chose the appropriate bandaging style for the injury and often received immediate feedback from the friendly professional staff walking around the room.

The cadavers ranged from Cooper’s hawks to red-tailed hawks to great horned owls and osprey, each with fractures that wildlife rehabilitators often see in their patients. Participants practiced ball bandaging and interdigital bandaging and quickly learned exactly how resourceful wildlife rehabilitators are when they were instructed to use pool noodles to provide support in shoe bandaging (plantar cast)! Most participants practiced some kind of wing fracture bandage, like the figure-of-eight bandage, which included the addition of body wrapping for support. Toward the end of the workshop, participants were even practicing the basic application of a tail guard. Participants left the workshop with the knowledge and confidence of bandaging that many of them did not have walking into the room.

The hands-on approach to this lecture was an excellent way for participants to learn, practice and then receive feedback on their bandaging techniques. Throughout the workshop, participants worked together assisting one another and giving feedback, which further enhanced their understanding of the bandaging styles. With “baby season” fast approaching, wildlife rehabilitators will find the newfound knowledge and confidence of volunteers who attended this workshop to be an excellent asset in the wildlife hospital.



## Murmurations of starlings: abstract art in the air

By: Bill Saidel

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The painted bunting (*Passerina ciris*) is arguably the most colorful bird in the United States. It is breathtakingly beautiful, but unfortunately, its range is limited to a few southern states. Even so, a flat, digitized, static picture of a painted bunting alone might induce one to stop any activity and admire it. The flight of a bald eagle is equally as breathtaking and eye grabbing but is not as unique in soaring. Here in New Jersey, just watch a red-tailed hawk (*Buteo jamaicensis*) or even the dramatically ugly turkey vulture (*Carthartes aura*) in its aerial environment. They are all majestic. Birds just have a gobstopping effect on people. Hummingbird aficionados know that in spades.

The pinnacle of bird behavior, not just individual appearance, may be an avian act that can be described as unique, amazing, remarkable, and both spectacular and a spectacle: the movement of a large flock of European starlings (*Sternus vulgaris*). Individually, a starling is not one of the more dramatic-looking birds. However, no other species seems to reach the majesty of its collective movement. This movement is called a *murmuration*. It is a special flocking association in which hundreds to hundreds of thousands of starlings fly in a collective flock as one. They swoop, they curl, and they create abstract art in the air. They form changing shapes that literally boggle one's eyes.

The word “murmuration” was first used between 1350 and 1500 to describe a mass mobbing of starlings. The word was used to describe the sound produced by a mass of birds. Why call the movement of starlings a murmuration when murmurs are sounds? With so many individuals in a single location, their twitter magnifies into a constant murmur. In medieval Latin, *murmuratio* means “grumbling.” Anyone who sees them flying in a murmuration doubts whether they are grumbling. They seem to enjoy flying in the same direction at the same time *albeit* noisily.

Still, the scientist in me wants to understand how this movement works because it is a remarkable example of something called “collective behavior.” How does collective behavior arise? Collective behavior by humans means follow the leader. I look at the youtubes and vimeos of European murmurations wondering how hundreds of thousands of closely-flying birds fly in such a coordinate manner. Despite the changing shape and direction of the flock, individuals do not collide with each other. What are the influences that hold such a large group together and how does a leader induce the flock to change direction in such a fluid manner? That is what I will answer.

Many years ago (1974), Frank Heppner distinguished the many patterns in which birds fly into aggregations and flocks. A degree of cohesion distinguishes between these two descriptions. Aggregates are individual birds flying in the same airspace at the same time to the same place. Flocks do all that but in addition coordinate their travel behaviors such as turning, speed, spacing, direction, and even take-offs and landings. Most interesting is that the average spacing between two individuals in a flock is smaller than in an aggregation. One might say a murmuration is an extreme example of a flock.

One physical parameter of flocks is the aerodynamic effects of one individual on its neighbors. Large winged birds such as geese, pelicans, and storks form the famous V formation or a straight line (which is one half of the V). This pattern is the result of minimizing flying effort. Bicyclists and race car drivers know how to do that. They draft. That is, the individual in front of another generates an aerodynamic pattern that allows the following individual some small benefit in reducing the latter's muscular effort. In addition, the upswing of a wing from a leading individual imparts an aerodynamic flow that reduces the efforts of a following individual. Hence, the V formation is the formation that reduces effort for all the birds within it. By contrast, small, compact birds do not form geometrically

neat patterns. One might say they form a mob flying together as a flock. Their pattern is like the inside of a balloon, a bounded volume with distinct edges. We might infer then that these types of moving flocks do not provide the same kind of drafting effects.

Collective animal behavior is a hot topic these days. A foundation study examining murmurations occurred in Italy in 2008. (This article can be found in vol. 105 of the *Proceedings of the National Academy of Science*, p. 1232-1237.) To study the collective behavior of a flock of starlings over the main train station in Rome, a group of physicists in Italy performed a difficult and computationally intensive experiment (that means they could not have done the experiment without the power of computers). The Rome train station provided a roost for a large flock of starlings. They used two cameras to simultaneously video the flock flying over the train station and a third camera close to the second. The data from the two cameras allowed them to computationally identify each bird by triangulation, identify its position in space at the beginning of the video, and then follow the path of each bird. (The third camera was used to determine their error in positioning the birds.) The experiment followed up to 2600 birds at one time (hence the need for computers to do the arithmetic). They found that each bird travels, for the most part, in accordance with 6-7 neighbors. Their difficult study found the rule: “do what your 6-7 neighbors do.” But each bird is an interlocking part of other neighbor groups, so when one group moves, it also determines in part how adjacent groups move and so forth.

They also found that a murmuration lacks a leader. This movement is leaderless. It does not divide the flock into a leader and many followers. It does not require knowledge of where they are going to finish. It only requires collective behavior in that one bird pays attention to where its neighbors are going and goes along with them. This is truly a domino effect. The result is that all the birds move in the same direction at the same time and at approximately the same distance from each other. This constraint - acting like its neighbors - defines the essence of a murmuration because this rule ties together the birds.

This rule also provides for two more solutions to a typical murmuration. A murmuration swoops and turns and splits into two and joins from two into one. What could influence the murmuration to do that (and by the way, this dancing and fractioning of the flock is partly what gives a murmuration its beauty)? Let us consider a turn. When a murmuration turns, how is it that no birds collide? Since each bird is a member of several 6-7 individual collectives, then as a collective in front turns, the ones associated with those individual will turn, too, with a short time delay. The time delay will prevent collisions and as the time delay propagates through the flock, the following individual collectives will turn with a delay that represents the time needed to reach a bird and its associated group behind the turning point of the murmuration. Thus, the answer is straight forward and again follows the domino effect. Moreover, the 6-7 rule guarantees that turning starts from in front.

If the “6-7 individual following rule” plays the central force for holding the flock together, then why should a flock ever change direction? The answer to this question is a central aspect of nature. After the constraints of the natural world such as Newton’s laws of physics, nature itself includes random influences. Let us consider an individual at the front edge of a murmuration. That individual will have neighbors at each side, but not in front. That means the rule (“be consistent with the 6-7 neighbors”) is loosened and random individual changes in direction may happen. Thus, this individual randomly changes its direction slightly, but enough for the collectives immediately behind to follow and, once again like dominoes, the collectives behind that one change and so forth. So the murmuration may split into two or it may change direction. The same argument holds with birds at the edges of the flock. Since one side lacks the restriction of neighbors, a random deviation from the main flock can lead to a split. Both splits and directional changes can be seen in the accompanying pictures or in murmuration videos at youtube.com. Similarly, if two ‘murmuring’ flocks move near to each other, they may rejoin into one group because bird groupings that were unconstrained on one side will now be constrained by birds from the other flock.

One more point about murmurations must be raised. Why murmurate at all? Murmurations seem to

to occur near sunset at roosting sites. So why do starlings murmur? One answer has been the notion that the more individuals of a species are located at one place, the less likely an individual will be preyed upon. It is the theory of safety in numbers. Another is protection from weather. Because murmurations occur more often during the winter months, and because starlings roost at sunset after the murmurations have ended, the most rational interpretations of their behavior lead one to believe that roosting sites might also offer nighttime protection from the weather. Murmurations collect individuals to a specific roost resulting in collective settling to the ground for the evening. Other than these ideas, no one has a particularly clear idea as to why they murmur when they do.

Starlings are an invasive species. The immigration into the United States from Europe is a classic story of an invasive species that lacks a predator in its new home. (For details see [https://en.wikipedia.org/wiki/Eugene\\_Schieffelin](https://en.wikipedia.org/wiki/Eugene_Schieffelin)) I can only say with some solace to farmers that I wish we had more so we might more often watch the poetry of hundreds of thousands of starlings in murmurations of swoops and curls and bulges. Just amazing!



The left column contains images from the youtube video: <https://www.youtube.com/watch?v=pi0HP16YtQ8w>, Dance of the Starlings - Murmuration at Sunset; the middle column contains images from the youtube video: <https://www.youtube.com/watch?v=NelPf2s73EE>, A Starling murmuration; the right set of images is from several different murmuration videos illustrating a variety of displays including [https://www.youtube.com/watch?v=V4f\\_1\\_r80RY](https://www.youtube.com/watch?v=V4f_1_r80RY), <https://www.youtube.com/watch?v=eakKfY5aHmY>, <https://www.youtube.com/watch?v=5J3FXhX9io8>, <https://www.youtube.com/watch?v=AYXtkfMnSI>, <https://www.youtube.com/watch?v=zP1Cs82JX14>