Clamming | Bronx River | Mayday!

NEW YORK STATE

Conservationist

AUGUST 2016

Flying Dragons

NEW YORK STATE
Conservationist

Volume 71, Number 1 | August 2016
Andrew M. Cuomo, Governor of New York State

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The *Conservationist* (ISSN0010-650X), © 2016 by NYSDEC, is an official publication of the New York State Department of Environmental Conservation published bimonthly at 625 Broadway, 4th Floor, Albany, NY 12233-4502. Telephone: (518) 402-8047

Manuscripts, photographs and artwork will be accepted if accompanied by SASE. Please write to the above address with an author's query or to request a Contributor's Guide. The publisher assumes no responsibility for loss or damage of unsolicited materials.

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Please allow 6 to 8 weeks for new subscriptions or changes of address. Periodical postage paid at Albany, NY, and additional mailing offices.

Send check or money order payable to:

Conservationist
NYSDEC
625 Broadway
Albany, NY 12233-4502

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Dear Reader,

Outdoor recreation is a strong part of our state's proud heritage, and increasingly more important for our health. In late June, I participated in Governor Cuomo's inaugural Catskill Summer Challenge to highlight the world-class outdoor opportunities and activities that make the Catskills such a popular destination. Regardless of your experience or skill level, you can enjoy a wide range of outdoor activities in the Catskills— and be sure to check out the new resources available on our website to find an exciting adventure in the amazing Catskill Park. In July, the Governor also held his annual Adirondack Summer Challenge, a very popular summer event that highlights all the Adirondacks have to offer as well.

In places like the Catskills and Adirondacks, these wonderful outdoor experiences are the result of many partnerships that advance the on-the-ground conservation and management that's needed to protect and maintain these jewels. In this edition of *Conservationist*, we focus on a strong partnership that has helped restore an amazing river habitat. The story on the Bronx River Alliance illustrates how New Yorkers can take an active role to clean up and enhance the environment, expand recreation access, and improve their community. The dedicated environmental stewards in the Alliance are bringing new life to a neglected resource, promoting recreation on and along the river, and demonstrating how a waterway can be the cornerstone of a community, even one that's nestled in a dense urban area.

Through our ongoing investments in the Environmental Protection Fund and NY Works program, we are creating new and enhancing existing access points across the state, making it easier and more inviting for all residents and visitors to enjoy our diverse and abundant natural resources. This summer, get outside, explore and unwind, take a hike along steep mountain terrain or a leisurely walk along a pristine beach, visit places for the first time or return to a favorite park or campground. The opportunities are endless—and often close to home.

Be sure to stay safe as you're enjoying all New York has to offer on land and in the water, and don't forget to send us your photos and videos of what you're seeing on Facebook and Twitter!

All the best,
Basil Seggos, Commissioner

NEW YORK STATE | Department of Environmental Conservation

DEC photo

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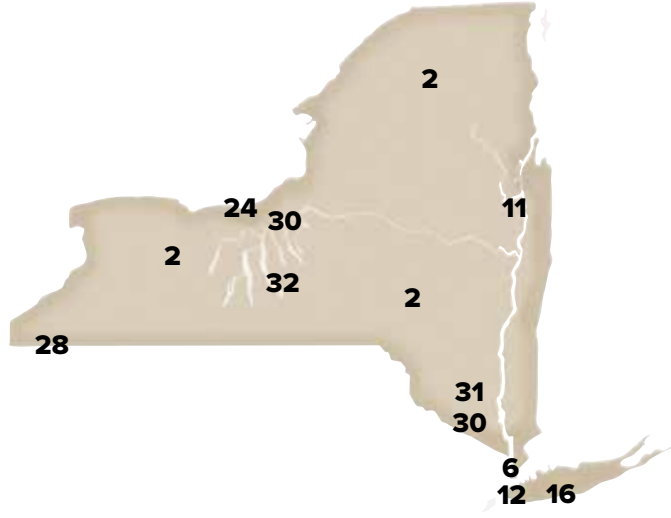


Departments

Front cover: Male widow skimmer by James Craft
Back cover: Indian pipe by Luke Ormand

Pondhawk

WINGED DRAGONS AND DAMSELS

By James Craft
Photos by author

Once an avid trail runner, I spent many a lunch hour exploring (or should I say touring) the area surrounding 25–acre Cedar Pond, adjacent to the DEC Avon office where I work. But the creep of time and injury slowly turned my runs to walks.

Walking opened up a whole other world. Instead of running through the area, I now stopped to take a closer look at the local inhabitants, often photographing them. I quickly gained a greater appreciation for the complex web of life at the pond.

The area attracts great numbers of migrating waterfowl and songbirds, as well as a wide variety of pollinators. But another less obvious group of fliers increasingly caught my eye: dragonflies and damselflies. What were just "blurs" while I was running came into focus as colorful combatants in constant competition for food, mates and space.

Dragonflies and damselflies comprise one of the most distinctive and intriguing groups in the animal kingdom. Classified under the Order Odonata (meaning "toothed ones," referring to their serrated jaws), odes (as they're affectionately known) are carnivorous insects commonly seen flying near water during warmer months. There are more than 7,000 species worldwide, including 194 species known to occur in New York. I've personally observed and photographed 35 ode species at Cedar Pond.

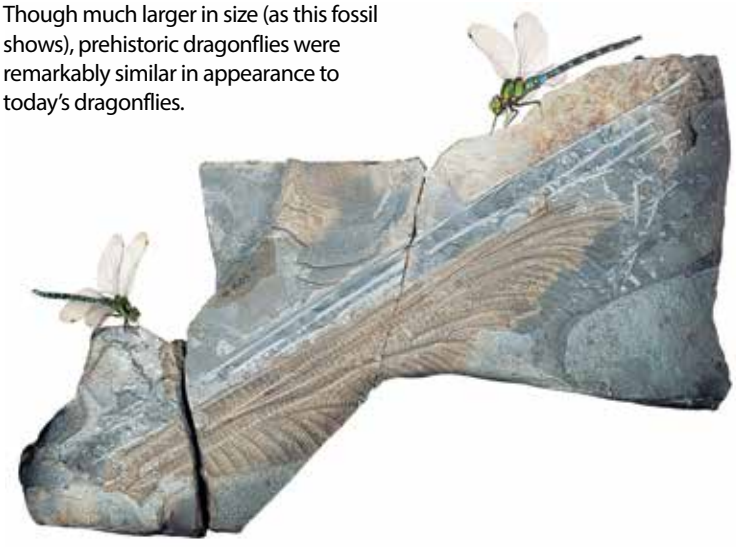
Having sleek, aerodynamic bodies, huge eyes, and two pairs of independently controlled wings, odes are fascinating to watch as they zoom around in search of food. The larger of the two groups of odes are dragonflies, measuring 1.5″– 3″ in length. These robust–bodied insects are strong fliers, with asymmetric wings held perpendicular to their bodies. In contrast, damselflies are thin–bodied, measure 0.75″ – 1.5″ long, and are weak fliers. At rest, they hold their symmetric wings along their abdomens.

Ancient Insects

As a group, dragonflies and damselflies have been around for more than 300 million years. The fossil record indicates that they survived two major extinction events during which up to 90% of Earth's species perished.

The early and largest odes had $2^1/_2$-foot wingspans and date back to the Carboniferous Period when evolving trees flourished in vast forested wetlands. As plants diversified and created new habitats, estimated oxygen levels reached 35% (vs. 20% in the air today). Since insect size is largely limited by oxygen transfer within their primitive breathing systems (tracheal pores and tubes), higher oxygen levels allowed larger insects to evolve. Over time, changes in atmospheric oxygen and pressure from predators may have assisted in the "downsizing" of odes through natural selection.

Though much larger in size (as this fossil shows), prehistoric dragonflies were remarkably similar in appearance to today's dragonflies.



White–faced meadowhawk

Odes have two bulbous eyes that provide a nearly spherical field of view.

Excellent Fliers

Odes are incredible fliers, performing amazing mid–air acrobatics. They can rapidly reach speeds of 30+ mph, and can literally turn on a dime. Separate muscles within the thorax (portion of body between the head and abdomen) can variably control each of four wings at 20 to 40 flaps per second. This enables them to perform complex maneuvers and to hover.

Ode wings are independently controlled, allowing nimble powerful flight and swift aerobatic maneuvers in any direction, including reverse—a feat shared only with hummingbirds. A structural network of supportive veins, transparent "panes" of chitin (a major constituent of the exoskeleton), and corrugations (alternating ridges and grooves) on ode wings provide high strength, low weight, and variable flexibility for peak performance and efficiency. These amazing fliers can skillfully maneuver to precisely alight on tiny twigs, plant tips, and leaves, and to efficiently snatch prey out of the air, virtually at will.

Mating bluets form a "heart–shaped" wheel.

Remarkable Dragonfly Traits

Prehistoric Lineage—Ancient dragonflies had wingspans of up to 2½ feet and ruled the skies for approximately 100 million years. Exceptionally preserved fossils from the Jurassic age are remarkably similar in appearance to modern dragonflies.

Acute 360^{O} Sight—Two bulbous compound eyes, each with up to 30,000 lenses, cover most of the head and provide a near–full spherical field of view. Along with three small simple eyes (ocelli) sensitive to movement, little goes unnoticed.

Agile 360^{O} Flight—Four, independently controlled wings enable dragonflies to quickly move in any direction, and also to hover.

Peerless Predators—Constantly on the hunt, dragonflies intercept and consume large numbers of flying insects (up to 20% of their body weight per day) including many pests such as mosquitoes. They have a 95% prey–capture rate, far greater than most predators. Below water, ode nymphs use their barbed lower lip to snag various larvae, tadpoles and even minnows.

Long–distance Migrants—A few ode species migrate south, with flight distances likely exceeding 1,000 miles. Wandering gliders are known to cross oceans and fly more than 4,500 miles!

Mating "Hearts"—After transferring sperm from his lower to upper abdomen, the male grasps the female behind her head with his terminal appendages (claspers). The female then curls her abdomen to join the male, forming a heart–shaped wheel. Following mating, females deposit fertilized eggs on or in aquatic vegetation, or directly into the water.

Tiny Eggs to Winged Dragons—Eggs may develop quickly into nymphs or overwinter in the pond. Nymphs feed voraciously for months to years. Growth occurs in stages (molts/instars) until they finally undergo metamorphosis to emerge as adults. During this emergence, the wings unfurl from tiny wing pads and are pumped with fluid into final form, perhaps 20X the initial size. Until wings dry and harden, the teneral ode is very vulnerable.

Colorful Critters—Odes come in a variety of colors and patterns. Color, as well as wing pattern, size and shape, can be very useful in identifying species.

Band-winged meadowhawk

Widow skimmer with mating blue dashers

Seasons of Odes at Cedar Pond

I love visiting Cedar Pond, no matter the season. My regular visits, usually with camera in hand, allow me to observe and document the various species and life stages of these fascinating critters.

When I first started photographing odes, I used a simple 3X–zoom pocket digital camera. This taught me patience and stealth, and I was able to capture plenty of damselflies and perchers, who would remain in place and "pose" nicely for the camera. It wasn't long before I upgraded to a super–zoom camera (eventually getting a digital SLR) and was able to photograph the more elusive fliers and rarely–seen odes. Through trial and error (and many missed shots), I discovered that some odes tolerate a slow approach (stalk and shoot often), while for others it's best to settle into a popular spot and wait.

Spring

Come April, warm days with southern breezes herald the appearance of dragonflies and damselflies. After overwintering beneath the ice—where some nymphs actively fed and grew, while others, and some eggs, were in diapause (dormancy)—the first species to typically emerge from the aquatic realm is the hardy but dainty damselfly, known as the eastern forktail. Common here, it keeps a low profile, inhabiting dense vegetation near water, gleaning small insects and avoiding predators.

One year, a few weeks after the first forktail sighting, I saw dozens of large dragonflies patrolling and sparring over the water. Two species—the common green darner and black saddlebags—had not been there the day before. The sudden and early appearance of large numbers of mature dragonflies of these two species indicated a migration wave from the south.

The early emergence of forktails and early arrival of migrant species are competitive strategies for survival. Less competition and predation on the nearly empty pond promotes greater success for individuals and populations. Some migrants move on after replenishing their energy reserves, but others remain to mate and lay eggs. Where migrating and resident populations co–exist, genetic vigor, dispersal and success of the species are enhanced.

By May, the pond is hopping with an assortment of baskettails, clubtails, dot–tailed whitefaces and bluets. Perhaps to blend in with still–developing plants, many of these early odes lack the flashy color of the summer species.

Summer

Early summer brings the greatest diversity of ode species as new emergents (eastern pondhawks, blue dashers and prince baskettails) mix with the spring fauna. By the end of June, numerous widow skimmers, Halloween pennants, eastern pondhawks and eastern amberwings dominate the shoreline. With this peak in diversity and abundance, intra– and inter–species competition for space and mates is constant. For example, male widow skimmers are very territorial and drive off any species, especially their own, from their patch of shoreline. In contrast, Halloween pennants are non–territorial and can be found far from water. Since both of these species are perchers,

Halloween pennant

Counting Dragonflies

Scientists from the U.S., Canada and Mexico are working together to better understand the migratory patterns of dragonflies. This relatively new study provides a variety of opportunities for citizen scientists to contribute to the research. Since raptor migrations often include dragonflies, bird watchers can help record observations of them. Citizen scientists can also participate in Pond Watch (**http://www.xerces.org/dragonfly–migration/pondwatch/**), whereby they visit a pond and record the number of dragonflies they see.

Become part of this continent–wide effort to learn about how, where and when dragonflies migrate. Visit the Migratory Dragonfly Partnership website for more information. **www.migratorydragonflypartnership.org**

I've been able to take a number of nice photos of them. It's the fliers that are difficult to photograph.

By late August, if you look closely, you may spot empty nymph skins (called exuviae) of black saddlebags attached to cattails. And if you're lucky, you might even spot a newly–emerged (teneral) dragonfly. I've been fortunate enough to see a number of them: just emerged, not fully capable of flight, drying their magnificent wings. These are likely the progeny of spring migrants, just emerged for a probable return trip down south. It's amazing to watch the rapid transformation from a stubby, one–inch–long aquatic nymph into one of the largest dragonflies, with a four–inch wingspan primed for long distance flight.

Fall – Winter

With many of the summer species in decline or gone (having completed their life cycle by mating and depositing eggs in the pond), brilliant–red meadowhawks become the dominant odes, along with spreadwings and familiar bluets. Dainty and approachable, these colorful autumn meadowhawks blend well with fall vegetation. Their distinctive tan legs distinguish them from the other meadowhawks (band–winged, white–faced and ruby/cherry–faced).

Autumn meadowhawks are the last dragonflies seen flying here. In a flurry of breeding activity, they mate well into October to propagate the species before the onset of winter. Resident odes overwinter underwater as aquatic nymphs for one or more seasons (most of their life cycle) before emerging in spring when they will start the cycle again.

During the course of my daily walks, I've taken thousands of pictures of dragonflies and damselflies. I never grow tired of watching the aerial antics of these beneficial and beautiful creatures. I have also grown to appreciate the importance of, and need to conserve, the wetland habitats that are home to the seemingly endless variety of odes and many other critters.

Next time you are near a waterbody (or even in your own backyard), be sure to stop and watch the various dragonfly and damselfly species as they zoom and dive around the area. You'll surely be entertained. And if you have a camera handy, snap a few pictures.

Ode enthusiast **James Craft** is an engineering geologist in DEC's Avon office.

BRONX'S BEST-KEPT SECRET

—Alliance helps local residents enjoy nature while exploring the Bronx River

By Ellen Bidell

Photos provided by Bronx River Alliance, unless otherwise noted

"To walk along the Bronx River today is to enter a world slightly apart from the city, where the cry of the red-winged blackbird is louder than the hum of cars not twenty feet away."—Bronx River Alliance

History of the Bronx River

The Bronx River has undergone a dramatic transformation over the past several centuries. Named "Aquahung" or the "River of High Bluffs" by the Lenape people, this pristine 23–mile river once teemed with wildlife like beaver and fish. European traders were drawn to the area in the early 1600s to trap beaver. Harnessing the power of the river, mills began to flourish over the next century. The surrounding valley, extending from Westchester County to the East River in New York City, was heavily forested and the water pure enough to drink.

As the railroad arrived in the area, more industry followed. The once pristine river that served as a source of food and power was—by the nineteenth century—an open sewer.

To improve the area, in the early 1900s the city created the Bronx River Parkway Reservation: 15.5 miles of parks, lakes, limited access roads and a landscaped recreation zone. At the time, it was the world's first limited access auto parkway, designed to restore and transform the area into a linear park. However, the Bronx River fell back into a state of pollution and neglect in the mid-twentieth century.

Formation of the Alliance

In 2001, a group of dedicated community members formed the Bronx River Alliance to "protect, improve and restore the Bronx River corridor and greenway so that they can be healthy ecological, recreational, educational and economic resources for the communities through which the river flows."

In less than two decades, the Alliance has reversed centuries of neglect. The lower eight–mile section of the river, the Bronx River Blueway, is designated a National Water Trail by the National Park Service in recognition of how far the Alliance has come in reclaiming the river as a recreational asset. Beaver and alewife have returned to the river after hundreds of years.

To achieve a river renaissance, the Alliance works with more than 120 public and private partners, including community groups, non–profits, and federal and state governments. Community residents from the diverse neighborhoods along the river, including working class, low–income and immigrant neighborhoods, govern the board of the Alliance. The organization has grown from an all–volunteer effort to a model organization featuring nearly 15,000 people volunteering more than 110,000 hours to restore and enjoy their river.

A Destination in the City

Winding through New York City from Yonkers in Westchester County to the Bronx, the Bronx River provides opportunities for fishing, canoeing, bicycling, enjoying nature, hiking and just getting away from it all. The surrounding community takes great pride and fosters a sense of stewardship for the river. Thousands of people are drawn to the river and parkway each year, enjoying guided walks, canoe trips and bike rides. More than 40 local schools and youth and community organizations help children understand the science of the river and enjoy all it offers.

Each year, numerous canoeists participate in the Bronx River Flotilla near the Concrete Plant Park.

Recreational opportunities on and along the river get into full swing beginning in April and continue throughout the summer and into fall. For those who prefer dry land, the Bronx River Greenway includes nearly 19 miles of trails and greenspace along the length of the river, redesigned for bicycles and pedestrians. “Bronx River Rambles” are free, volunteer–led walks along the river and its adjoining neighborhoods, where people can learn about the social, cultural and natural histories of the area. Participants can search for traces of the long–lost French Charley’s Island and hear the story of L’Hermitage, a restaurant visited by Mark Twain and Henry James. One excursion takes visitors to a Scarsdale churchyard to explore a possible route through the Underground Railroad. Another trip highlights tales of customs and architecture of the old neighborhoods.

For those willing to try watersports, public canoe tours begin in May and range in length and skill level. Canoe trips can include paddles through: Shoelace Park, which features a granite

Muskrat Cove is named for the population of muskrats that can be found along its shores.

obelisk dedicated to the local soldiers who were killed in WWI; the Bronx River Forest, which boasts many trees more than 100 years old; and the NY Botanical Garden and the Bronx Zoo, where paddlers can catch a glimpse of turtles, egrets and herons. Group paddling adventures are offered into early October. More than 18,000 people have paddled the river, either in organized programs or river expeditions.

"Canoeing down the Bronx River is a fantastic way to see a side of NYC and the Bronx that you may have never known existed," said Maggie Greenfield, Deputy Director of the Bronx River Alliance. "In some sections, such as paddling through the Bronx River Gorge in the NY Botanical Garden, you feel as though you have fully escaped the city. In other sections, you see a side of the city that you can only see from the water—an active working waterfront and historic features, such as dams and waterfalls from historic mills."

Pope Jackson, a regular volunteer and river enthusiast, remembers the river in years past as a place to avoid. According to Pope, before the river was cleaned up, fear of contamination or a run-in with a junkie made it undesirable. "Now I'm on the river at least five times a month, volunteering whenever I can. Having family and friends out on the river with me is one of my favorite experiences. So many, like myself, had no idea it was possible to enjoy the river, and being able to share it with folks is a true joy," said Pope.

Charles Berenguer, Jr.

Autumn is a great time to enjoy places like Shoelace Park.

Charles Berenguer, Jr.

Have An Adventure!

Canoeing

On Your Own: There are two suggested canoe routes: Border to Mouth, and Estuary Paddles. The Border to Mouth run involves two to three portages (land areas between waters where canoes must be carried), some of which are challenging for those whose balance is unsteady. The Estuary Paddle involves two tides a day, when the river rises and falls about eight feet. The current isn't strong, but constant paddling is necessary when traveling against the current. Permits are required. The Bronx River Blueway Paddling Guide is a map of the entire canoe route. **http://paddle.bronxriver.org/**.

Join an Organized Paddle: Admission ranges from free events to $45. All paddling equipment is provided, and the routes take about 2 ½ hours. Registration is required: **http://bronxriver.org**

What to Bring:

- Personal flotation device
- Snacks and bottled water (even though you are in the heart of the city, there are few stores along the shore);
- Sunscreen and insect repellent;
- Sport sandals (with toe protection) or old shoes for sure footing during portages;
- Extra lightweight clothing in case you get wet.

Hiking or Bicycling the Greenway

Visitors pass through various parks and open spaces as they walk or ride along the river. There are three suggested walking itineraries, ranging in length from 2.3 miles to 4 miles. A turn–by–turn cycling guide is also available for the full 23 miles of the river. In addition, the Alliance organizes bike rides, sponsors a 25–mile bike ride, and also hosts learn-to-bike clinics for kids.

For maps and suggested routes: **http://bronxriver.org**

"In some sections you see the ways in which a bustling city impacts its waterways, such as outflow pipes and garbage booms, but you also see signs of a rebounding river: stabilized and reforested banks, a fish passage making way for migrating fish, and restored salt marshes. If you're lucky, you might even see a beaver lodge on the upper river or a bit of the oyster reef at the mouth of the river," Deputy Director Greenfield explained.

Not everyone visits the river to hike or paddle. Charles Berenguer Jr. enjoys the peace and tranquility he finds there. "I usually photograph the flora and fauna around the watershed. Generally, the river, the greenway, the whole expanse of the watershed is my place for self–renewal and spiritual inspiration. It's where the world converges for me in an envelope of creative engagement," explained Berenguer. He often visits the river and takes photographs of others enjoying the river in their own way. (In fact, some of the photos in this article were taken by Berenguer).

A Serious Mission

The Alliance is dedicated to more than just recreation. There are five teams that work to restore all aspects of the river:

The Ecology Team includes scientists, regulatory agencies and community–based organizations who work to improve the health of the river through cleanup and restoration efforts. The Bronx River Conservation Crew organized the clearing of 657 tons of garbage, 89 abandoned cars, nearly 30,000 tires, and discarded appliances, bicycles and furniture. Volunteers have planted more than 100,000 trees, shrubs and other plants along the length of the river.

The Greenway Team brings together community–based and agency planners to focus on planning and realization of the Bronx River Greenway: a bike/pedestrian path and linear park along the full length of the Bronx River. Over the past two decades, the team has added 19 new acres of parkland along the river, 10 miles of new or improved trails, and 7 new boat launches.

The Education Program involves teachers, community–based educators, and scientists to educate students and the community about the river, and to train volunteers to monitor river conditions. More than 6,500 students have attended programs on the river, and nearly 1,800 educators have used the river as an outdoor classroom. This team also encourages residents to create rain gardens and use rain barrels to promote environmental goals.

The Outreach Program includes community, civic and business representatives who promote the goals, programs and vision of the Alliance. This group organizes major annual events such as the Amazing Bronx River Flotilla and the Bronx River Festival.

The Recreation Program develops and expands recreational opportunities for community members and visitors, including bike and canoe trips.

Positive Changes for the Future

According to Deputy Director Greenfield, the Alliance will move into Bronx River House in 2016, "a community gathering space, boathouse, and our new headquarters, directly on the banks of the Bronx River. We anticipate that this move will open up opportunities to expand our recreational programs, especially paddling."

The Alliance is always looking for volunteers to help improve the beauty of the area.

Charles Berenguer, Jr.

Visitors can find tranquility along the river.

How You Can Help

You don't have to make a long–term commitment to help restore and maintain this wonderful resource. The Bronx River Alliance has a variety of opportunities and suggestions to get involved:

- Adopt a section of the river that you will check on a regular basis and organize a shoreline cleanup/planting in the fall and spring;
- Take photos or sketches of the river and exhibit them;
- Team up with one of the programs based on your interests: improve the river, advocate for environmental justice, learn to paddle;
- Enjoy the river and all it has to offer;
- Participate in an event:

  — During "A Day in the Life of the Bronx River," participants assist professional scientists in a research study about the plants, trees, insects, fish and water of the river. Scheduled for Saturday, August 13, 2016. (Cosponsored by NYC Parks.) Check out **www.nycgovparks.org/parks/bronx-park**.

  — "Wade into the Bronx River" involves a hands–on workshop at the river's edge to guide citizens and educators on how they can monitor water quality. Scheduled for Saturday, August 13, 2016 as part of "*A Day in the Life…*"

  — "The Amazing Bronx River Flotilla" is a five–mile community paddle held in May. Teams raise money to fund canoe trips for local youth.

Some people, like Pope Jackson, who owns an award–winning film and theatre production company, are regular volunteers. "Any way I can help the Alliance I do, either on water or with my professional expertise," he said. "The river is the best kept secret, the experience that many people travel or pay a premium for is right in your backyard. It needs some TLC, but it's an awesome experience that everyone should try at least once," said Pope.

Ellen Bidell is a citizen participation specialist in DEC's Albany office, and a frequent *Conservationist* contributor.

Training Future Stewards

Through its Community Impact Grant Program, DEC's Office of Environmental Justice supports the Bronx River Alliance's mission to protect, improve and restore the Bronx River.

In 2013, DEC awarded a $10,000 grant to help the Alliance develop an environmental science curriculum for ninth–graders at Fannie Lou Hamer Freedom High School in the Bronx. The "Starlight Park Education Initiative" gives urban students an opportunity to obtain hands–on experience with green infrastructure and learn about the environmental risks and damages that affect their community.

Sonia Manzano, known to many as "Maria" from Sesame Street, entertains children at the Bronx River Festival.

Students in the program perform water quality monitoring, use filtration methods, and create and implement measures to mitigate the effects of stormwater runoff. They are encouraged to explore new ideas to improve their neighborhood and share what they learned with members of the community.

Through this and other programs, the Bronx River Alliance is providing valuable tools to young people to help them understand how remarkable the environment is and how they can be active environmental stewards and bring positive change to their neighborhoods.

On Patrol

Carl Heilman II

Real stories from Conservation Officers and Forest Rangers in the field

Contributed by ECO Lt. Liza Bobseine and Forest Ranger Capt. Stephen Scherry

Bear Rescue—Rockland County

On June 6, ECO Tom Koepf was contacted to respond to a nuisance black bear creating problems in the village of Suffern. Upon his arrival, Koepf observed a 90–pound black bear approximately 25 feet up a tree near the shoulder of a road. DEC's Region 3 office was contacted for assistance and ECO Koepf kept onlookers away from the bear until Biologist Matt Merchant arrived. Merchant and two wildlife technicians safely tranquilized the bear. Staff tagged the bear's ears for identification, and took several measurements of the animal. DEC staff released the bear in the Catskill Park later that day.

"Painted" Turtles—Saratoga County

ECO Steve Shaw responded to the City of Saratoga Springs to investigate an odd complaint. A caller claimed that an individual was spray painting turtles, including their heads and eyes, in an attempt to kill them. Officer Shaw located the suspect and interviewed him at length regarding the allegation. The suspect first stated he was "painting the turtles to count how many there were." ECO Shaw showed him a photograph provided by the complainant, to which the suspect responded, "Ok I'm spray painting them so I can see them at night and not run over them with my vehicle." Eventually the suspect admitted to spray painting the turtles because he didn't like them, there were too many, and they were a nuisance. The man was charged with injuring wildlife.

Missing Person—Oswego County

On June 11, Forest Rangers were requested to assist with a search for a missing 71–year–old female in the Town of Schroeppel. Forest Rangers Joan Oldroyd and Anne Staples arrived on scene at 4:15 PM. The Rangers received a briefing from Roger Fox of Oswego Search and Rescue and Oswego County Sheriff's Department investigators, informing them the woman was diagnosed with dementia and that her husband first noticed she was missing from her residence at approximately 7:00 AM. The woman's son and Oswego County Sheriff's Deputy Charles Castello searched the residence and property, as well as neighboring properties by foot and ATV, before requesting assistance. Neighboring residences were then notified and checked, as well as the church and nearby businesses that the subject frequented. All proved negative. Rangers planned searches of the neighboring properties and the surrounding roads by foot. At approximately 4:55 PM, the subject was found sitting down in a grassy/brushy area, in good health, by a neighbor to the west who was cutting through the properties to offer his assistance in the search. All resources demobilized and the incident was closed.

Wall Street Woodcock—New York County

While on patrol in New York City, ECOs Brad Buffa and Jeannette Bastedo were contacted about an injured bird found in the Wall Street area of Manhattan. The officers responded and found that the caller had an American woodcock inside a small box. The American woodcock is one of New York State's most unique–looking upland birds. This bird did not have any apparent injuries, but was given to staff at the Wild Bird Fund in Manhattan for a thorough checkup before being released.

(*Editor's note: Quite likely the bird was stunned by hitting a window. See: "When Birds and Glass Don't Mix" in the April 2016* Conservationist.)

Flight 1549 passengers stand on the plane's wings awaiting rescue after Captain Sully navigated a successful emergency landing in the Hudson River.

MAYDAY! MAYDAY!

—Heroic jet landing in the Hudson highlighted the threat of bird strikes

REUTERS/Brendan McDermid

By Peter Constantakes

It happened more than seven years ago, but we all remember the event and its hero, a veteran pilot known as Captain "Sully."

The trouble began less than two minutes after U.S. Airways Flight 1549 took off from LaGuardia Airport on January 15, 2009. Communication between the airplane and control tower tell the story:

3:24:54 p.m. – [Tower] "Cactus 1549, runway 4 clear for takeoff."

3:25:39 p.m. – Flight takes off.

3:25:51 p.m. – [Capt. Chesley "Sully" Sullenberger] "Cactus 1549, seven hundred, climbing five thousand."

3:26:00 p.m. – [Airport Departure Control (APD)] "Cactus 1549 New York departure, radar contact, climb and maintain one five thousand."

3:26:10 p.m. – [Capt. Sully] "Climb set."

3:26:16 p.m. – [First Officer Jeffrey Skiles] "And flaps one please."

3:26:17 p.m. – [Capt. Sully] "Flaps one."

3:26:37 p.m. – [Capt. Sully] "What a view of the Hudson today."

3:27:07 p.m. – [Capt. Sully] "After takeoff checklist complete."

3:27:10 p.m. – [Capt. Sully] "Birds."

3:27:11 p.m. – [First Officer Skiles] "Whoa."

3:27:11 p.m. – Sound of thumps/thuds (later confirmed to be contact with Canada geese), followed by a shuddering sound

3:27:12 p.m. – [First Officer Skiles] "Oh (expletive)."

3:27:13 p.m. – [Capt. Sully] "Oh yeah."

3:27:13 p.m. – Sound similar to a decrease in engine noise

3:27:14 p.m. – [First Officer Skiles] "Uh, oh."

3:27:28 p.m. – [Capt. Sully] "Loss of thrust on both engines."

3:27:32 p.m. – [Capt. Sully] "Mayday, mayday, mayday. This is Cactus 1539 (sic). Hit birds. We've lost thrust in both engines. We're turning back towards LaGuardia."

3:27:42 p.m. – [ADC] "Ok, uh, you need to return to LaGuardia? Turn left heading of uh two two zero."

The pilots begin a series of actions to check what is possible with the damaged plane.

3:28:05 p.m. – [ADC] "Cactus 1529 (sic) if we can get it for you, do you want to try to land runway one three?"

3:28:10 p.m. – [Capt. Sully] "We're unable. We may end up in the Hudson."

Crew continues to assess plane's capabilities.

3:28:30 p.m. – [First Officer Skiles] "Distress message, transmit. We did."

3:28:31 p.m. – [ADC] "Alright. Cactus 1549 it's gonna be left traffic for runway three one."

3:28:35 p.m. – [Capt. Sully] "Unable."

3:28:36 p.m. – [ADC] "Okay, what do you need to land?"

3:28:37 p.m. – [First Officer Skiles] "(He wants us) to come in and land on one three...for whatever."

3:28:45 p.m. – [Voice from automated Predictive Windshear System] Go around, windshear ahead.

3:28:46 p.m. – [ADC] "Cactus 1529 (sic) runway four's available if you want to make left traffic to runway four."

3:28 49 p.m. – [Capt. Sully] "I'm not sure we can make any runway. Uh, what's over to our right, anything in Jersey, maybe Teterboro?"

3:28:55 p.m. – [ADC] "Ok, yeah. Off your right side is Teterboro airport."

3:29:02 p.m. – [ADC] "You want to try and go to Teterboro?"

3:29 03 p.m. – [Capt. Sully] "Yes."

3:29:11 p.m. – [Capt. Sully on public address system] "This is the Captain, brace for impact."

3:29:16 p.m. – [First Officer Skiles] "Engine master two, back on."

3:29:18 p.m. – [Capt. Sully] "Back on."

3:29:19 p.m. – [First Officer Skiles] "On."

3:29:21 p.m. – [ADC] "Cactus 1529 (sic) Turn right two eight zero, you can land runway one at Teterboro."

3:29:21 p.m. – [First Officer Skiles] "Is that all the power you got? ... Number one?"

3:29:25 p.m. – [Capt. Sully] "We can't do it."

3:29:26 p.m. – [Capt. Sully] "Go ahead, try number one."

3:29:27 p.m. – [ADC] "Kay. Which runway would you like at Teterboro?"

3:29:28 p.m. – [Capt. Sully to control tower] "We're gonna be in the Hudson [River]."

3:29:33 p.m. – [ADC] "I'm sorry, say again Cactus?"

3:29:37 p.m. – [Enhanced Ground Proximity Warning System (EGPWS)] "Too low terrain" (repeated 3 times over six seconds)

3:29:45 p.m. – [Capt. Sully] "Ok. Let's go put the flaps out. Put the flaps out."

3:29:45 p.m. – [EGPWS] "Caution terrain" (repeated twice over three seconds)

3:29:53 p.m. – [ADC] "Cactus 1549 radar contact is lost. You also got Newark Airport off your two o'clock in about seven miles."

3:29:55 p.m. – [EGPWS] "Pull up. Pull up. Pull up. Pull up. Pull up. Pull up. Pull up."

3:30:01 p.m. – [First Officer Skiles] "Got flaps out."

3:30:03 p.m. – {First Officer Skiles} "Two hundred fifty feet in the air."

3:30:04 p.m. – [EGPWS] "Too low. Terrain."

3:30:09 p.m. – [Transmission from another airplane] "Two one zero uh forty seven eighteen. I think he said he's going in the Hudson."

3:30:14 p.m. – [ADC] "Cactus 1529 (sic), uh, you still on?"

3:30:22 p.m. – [ADC] "Cactus 1529 (sic) if you can, uh, you got uh runway uh two nine available at Newark. It'll be two o'clock and seven miles."

3:30:24 p.m. – [EGPWS] "Terrain. Terrain. Pull up. Pull up" (repeated till the end of the recording)

3:30:38 p.m. – [Capt. Sully] "We're gonna brace."

3:30:43 p.m. – Recording ends.

(For a full transcript of the cockpit voice recording, visit **http://www.tailstrike.com/150109.htm**)

We know the incident had a happy ending. The actions of Captain Sully and his crew over a period of about 3½ minutes that winter afternoon were instrumental in safely landing the distressed jetliner in the Hudson River, approximately 8.5 miles from where it took off. All 155 passengers and crew were safely evacuated from the plane.

The world cheered Sully's heroic efforts. The subsequent accident report by the National Transportation Safety Board (NTSB) noted that "the decision–making of the flight crewmembers and their crew resource management during the accident sequence" contributed to the survivability of the accident.

But even before the passengers and crew were safely back on land, people began asking questions about air safety: How could geese weighing approximately 6 pounds apiece disable a 150,000–pound jet and force an emergency water landing? More importantly, what could be done to improve air safety to reduce the chance of a similar incident in the future?

Plane collisions with birds or other wildlife aren't new. The first reported "wildlife strike" causing a fatality occurred on April 12, 1912, when a gull became lodged in the flying controls of a Wright Flyer airplane.

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) Wildlife Services program has been tracking these incidents for the Federal Aviation Administration (FAA) since 1990. Most strikes occur in the airport environment: less than 1,500 ft. altitude and within close proximity to the airport. At takeoff, planes need the most power and are moving at rapid speed. When a fast–moving object like a plane collides with another object—even if it's a small mass—simple laws of physics mean there is enough energy to cause damage. Close to one–half of all aviation strikes with the culprit in Sully's flight—Canada geese—involve multiple birds, which increases damage potential.

USDA Wildlife Services

A brant is a type of goose species drawn to some airports, where it can present an aviation hazard.

According to a report from the National Wildlife Strike Database, 151,267 bird strikes were reported between 1990 and 2014, along with 4,847 strikes involving other wildlife. Although most don't cause damage, wildlife strikes still account for an estimated $700 million in civilian aircraft damages each year.

"In the aviation environment, our operations and research staff work with state, federal, military and private partners to identify hazards and methods to reduce the risks of wildlife strikes through education, habitat management, and direct operations at airports," said Allen Gosser, director of the Wildlife Services program in New York. "We have worked with New York City airports at some level since 1973 and began on–site operations at JFK Airport in 1990."

Most preventive strategies focus on reducing bird and wildlife populations on or near airport properties, where historically 74 percent of strikes occur. Habitat modification and wildlife dispersal keep birds and wildlife away from runways, taxiways and runway approaches. Wildlife Services typically employs non–lethal methods such as loud noises to scare off birds and wildlife, fencing around airports, removal of water sources and garbage that attract birds and other animals, and capture and relocation of wildlife.

What's Happened Since the "Hudson Miracle?"

Since the Flight 1549 incident, airports across the country are more attuned to the wildlife strike issue. In 2009, the New York City Mayor's Office and Port Authority of New York and New Jersey (PANYNJ) created a steering committee to address wildlife strike risks, and established a management plan to increase aviation safety. A major element of the plan was to reduce strike risks related to abundant Canada geese populations within five miles of PANYNJ airports (later increased to seven miles). From 2009–2015, a total of 4,315 resident Canada geese were removed from 30 New York City parks and public lands during summer molt periods.

At LaGuardia Airport, where Flight 1549 originated, management activities have decreased the number of observed geese near the airport by 80 percent since 2009. At JFK Airport, removal of Canada geese within a five mile radius around the airport reduced goose strikes by 50

NTSB

percent compared to the previous year. No strikes causing substantial damage, and only one strike resulting in minor damage, have occurred with resident Canada geese at the three major New York City and Newark airports since the effort began.

Of course, Flight 1549 did not strike birds near the airport environment; the plane was in–flight eight miles from the airport when the incident occurred. The NTSB report encouraged Wildlife Services to continue to research in–flight methods to reduce strikes. The program's research center is carrying out research into lighting treatments that could potentially help birds detect and avoid aircrafts. In conjunction with other agencies and researchers, Wildlife Services also continues to evaluate the capacity for bird–detecting radar in airport settings.

Potential hazards exist along all transportation routes—city streets, bike lanes, highways and the "usually–friendly" skies. Pilots and crews receive extensive training to prepare them to respond quickly and effectively when threats or emergencies occur in the air. At the same time, USDA Wildlife Services continues to review data and incorporate greater safety measures to diminish flight risks due to wildlife strikes.

As Alexander Graham Bell once noted "There are two critical points in every aerial flight—its beginning and its end." The continuing efforts of Wildlife Services have expanded those critical points to include pre–emptive actions to reduce risks before a plane even leaves the ground. These ongoing efforts reflect the words of the now–retired Captain Chesley Sullenberger: "We owe it to our passengers to keep learning how to do it better."

NTSB

Peter Constantakes is a public information specialist with *Conservationist*.

Mike Begier (left and in top image), national coordinator of the USDA Wildlife Services airport wildlife hazard program, and Allen Gosser (right), USDA Wildlife Services State Director, collect biological samples as part of the Flight 1549 investigation.

Canada Geese: Former Migrant Can Be a Resident Nuisance

During the past few decades, a growing number of Canada geese have become year–round residents in New York. Many make their homes on lands and waters near airports and try to "share the skies" with planes. As Sully's tale illustrates, birds like Canada geese can cause wildlife strikes that damage aircraft and endanger those on board.

According to the FAA, from 1990–2014, gulls were the most common species involved in aircraft strikes. Waterfowl (ducks and geese) ranked ninth and were involved in just 7 percent of the total number of strikes, but they were responsible for 30 percent of wildlife strikes that caused aircraft damage. Canada geese alone accounted for nearly 18 percent of financial losses associated with bird strikes: $125.4 million; the highest of any bird type.

Resident goose populations significantly expanded in the 1950s and 60s, and now total approximately 257,000—well above DEC's target population of 85,000. This has created a nuisance problem—including bird strikes—that requires active management to ensure the safe and peaceful co–existence between the birds and people who live, work and play in New York.

In conjunction with USDA APHIS efforts to reduce risks near airports, DEC has implemented management plans to control the Canada goose population. Actions include an expanded hunting season, capture and removal efforts, and techniques to discourage the settlement of geese in unwelcome or unsafe areas (habitat modification, fencing, etc.).

Canada geese are protected by state and federal laws and regulations.

For more information on Canada geese, visit: **www.dec.ny.gov/animals/34434.html**.

To see strategies to deal with nuisance problems, visit: **www.dec.ny.gov/animals/7003.html**.

DIGGING FOR BURIED TREASURE—Clamming in New York's waters

By Stephanie Rekemeyer
Photos provided by author

Imagine a young girl playing in the sand at the water's edge: she's using her hands to dig into the wet sand, hoping to locate some clams. Farther out, her father is using a hand–rake to carefully search the bay bottom. Suddenly, her older brother comes rushing back from down the beach, a clam held in each hand. The two of them grab her bucket and quickly run back to the location of his buried treasure, hoping to add to his find.

On the other end of the beach you see another group of people who are waist deep in the water, using only their feet to explore the bay floor. Suddenly, squeals of excitement erupt from the group as one person happily displays a large clam he found buried in the sandy bottom.

With luck, after a full day of playing and searching in the water, both groups will have enough clams to bring home and host their very own clambake, chowderfest, or any other shellfish–inspired feast.

Scenes like this are common on Long Island beaches, as people head to ocean bays on hot summer days to take a dip in the cooling waters. While there, a number of these folks try their luck at digging up a delicious clam dinner. In fact, during the summer, it's not unusual to find people gathered on the shore searching for these edible buried treasures.

Clamming is a fun activity that can be enjoyed by anyone. The most important tool you need is a container in which to keep your catch. This can be a cooler with ice, a mesh bag, or even an old kitchen colander. A small hand shovel or rake can aid in your pursuit of these tasty bivalves, but if you don't have either, your hands and feet will work just fine.

The best time of day to start your quest for clams is at low tide, when the water recedes from the shore. As the tide moves out, more of the sandy bottom is exposed and accessible to dig in, making it easier to notice signs of life below the surface. So be sure to check your local tide table before you venture out!

When selecting your digging site, look for small holes in the sand at the water's edge and farther out: tell–tale signs that there's life below. Depending on the size and species of the clam creating them, these holes can vary from as small as the tip of a pencil to about the size of a penny. You may also notice slight depressions in the sand that seem out of the ordinary—another good indicator that there may be a clam hiding below.

You can use whatever hand tools you have to dig into the exposed sand or

Before You Go

Before heading to the beach to try clamming, be sure to familiarize yourself with state and local laws and regulations pertaining to the area. These regulations exist to protect human health, and to ensure that these animals are managed properly for the use and enjoyment of future generations.

When choosing a location for clamming, check to see which areas are certified or open for shellfish harvesting. For information on certified areas, check out DEC's website at **www.dec.ny.gov/outdoor/103483.html**.

For more information on species of clams found in New York waters (including species identification), visit DEC's website at **www.dec.ny.gov/animals/69730.html**.

For a complete list of recreational shellfish possession and size limits, check **www.dec.ny.gov/outdoor/29870.html**. DEC does not require a permit for recreational clam harvesting; however, some towns do, so be sure to check with the respective town in which you are harvesting. If you can't get a permit from a town where one is required, try clamming an area managed exclusively by New York State. Visit DEC's website at **www.dec.ny.gov/docs/fish_marine_pdf/underwaterlands.pdf** to review the State's Underwater Lands.

For more information about clamming, please visit **www.dec.ny.gov/outdoor/345.html** or call DEC's Shellfish Information Line at 631–444–0492.

Atlantic surfclams are an important commercial fishery. These clams are commonly used for preparing clam strips, baked clams, and clam chowder.

probe the bottom of the bay. Once you've located and collected a clam, you'll need to identify the species and measure it. The most commonly sought species is the hard clam, which must be greater than an inch in thickness (measured perpendicular to the hinge holding the two shells together) to be kept legally.

If the clam is large enough to keep, you can place it in a flow–through mesh bag or wire basket and keep it by your side. Some people add floats to the wire basket so they can drag it along with them while they're searching in deeper water.

If you don't have a container to keep your clams floating in the natural seawater, then use a cooler with ice. It's essential that clams are properly stored. If not, bacteria can grow and/or the clams can contract diseases that can make people sick. To protect your family and friends from illness, keep clams cool, out of the melted ice or standing water, and shaded from the summer sun.

Clams are just one type of bivalve mollusk. Other species include mussels, oysters and bay scallops (New York's official state shellfish). Delightful additions to a delicious dinner, these bivalves are called filter–feeders because they obtain food by constantly pulling water into their shells—via an organ called a siphon—and filtering out necessary nourishment. This process allows bivalves to readily obtain nutrients from algae and other microscopic plants and animals suspended in the seawater, and also to retrieve oxygen that is dissolved in the water. Waste and water are then exported out of their shells through their siphons.

Hard clam shell found on Short Beach, Nassau County.

DEC biologists conducting a surfclam survey in the Atlantic Ocean. Surfclams are collected, counted, and measured to determine population size. This information is essential for establishing sustainable harvest limits.

(Note: in polluted waters, bivalve mollusks unfortunately take in pollutants at the same rate at which they take in nutrients. For this reason, DEC continuously tests water quality to ensure that shellfish in all marine waters of the state are safe for human consumption. For your health, and also to avoid a costly ticket and violation fee, it is important to know what areas are certified for harvesting—see "Before You Go.")

The presence of shellfish can dramatically affect the surrounding environment. As filter–feeders, bivalves remove microscopic particulates from the water column, greatly enhancing water clarity and quality. This allows more sunlight to reach the bottom, which in turn, affects surrounding organisms. For example, seagrass grows on the seafloor and requires a substantial amount of sunlight to survive. If bivalves are removed, the water clarity can decrease, making it difficult for seagrass to obtain light and grow. This change can have a domino effect on the rest of the ecosystem that relies on these aquatic plants for food and habitat. Keeping shellfish populations healthy is essential to maintaining biodiversity and a healthy coastal ecosystem.

Shellfish harvesting has been a longtime tradition on Long Island and in many other coastal communities. Historically, Long Island's shellfish industry was one of the most prosperous in the nation. Years of overharvest and naturally occurring storms and disasters, however, have adversely affected present–day populations. To ensure that today's population remains sustainable, DEC sets a daily limit on the number of shellfish you can keep. Different species of shellfish have varying daily possession limits. For the state's most common species, hard clam, the daily limit is 100 clams a day, per person.

Spending a hot summer day digging for clams can be a fun and rewarding family activity. So if you find yourself on Long Island's shores, try clamming. You'll get to experience the excitement of searching for buried treasure, and enjoy the taste of these dynamic creatures for yourself.

Stephanie Rekemeyer is a fish and wildlife technician in DEC's Division of Marine Resources in East Setauket.

Indian pipe

David Taft

Parasitic Plants of New York

By John L. Turner

Like a climax scene from an old, grainy, horror film, the stubby, waxlike "fingers" slowly penetrate the duff on the forest floor, as if someone, or something was buried here, but not quite deeply enough. This plant's habit of resembling the unburied hand of a dead person has given rise to several fascinating, yet macabre names, including "dead man's fingers," and "corpse plant."

Over time, this relatively common, yet altogether strange plant has earned several other common names, including "ice plant," due to the waxy–white appearance of its stem, almost devoid of leaves; and "convulsion weed" from its apparent ability to cause vomiting if ingested, first discovered by Native Americans. But it's most well–known name is Indian pipe, a reference to its rather striking resemblance to an Indian peace pipe. Even its Latin name (*Monotropa uniflora*) is descriptive, meaning "one turn, one flower," highlighting the fact the lone nodding flower turns upward after pollination.

But what makes Indian pipe look this way? And why is it so different from many other plants?

Unless you are a mycologist who studies fungi, or a plant ecologist, you may not know about the intricate tussles that go on just underneath the soil's surface. There, plants and fungi are locked in battle: competing for resources and nutrients on a tiny, but ubiquitous scale. And while the battle rages, some plants sit on the sidelines, waiting for an opening. Welcome to the gritty underworld of parasitic plants.

A fascinating plant in its own right, the Indian pipe doesn't have even a smidgen of the food–producing, green pigment chlorophyll anywhere to be seen in the plant. So how does it gain the necessary energy to survive since it can't produce its own food through photosynthesis? Well, Indian pipe derives its nutrients and minerals from an outside source, meaning the plant, like a tapeworm or head lice, is parasitic. And there are more than three thousand species of parasitic plants worldwide.

In the case of Indian pipe, the plant taps into the abundant strands of fungal hyphae (branching filaments) that form a dense and interwoven network in most forest soils. These mycorrhizal fungi, notably those strands that produce the common and familiar Russula and Lactarius mushrooms, tie into the roots of trees, mostly oaks, gaining nutrients from the trees. Indian pipe turns the table on them by tapping into their filamentous hyphae made nutrient–rich by their exploitation of the tree.

Indian pipe

Luke Ormand

How was this intimately interwoven subterranean relationship revealed? Through experiments using radioactive carbon dioxide gas. Plastic bags were placed around leaves and radioactive gas was injected into the bag. This gas, a basic ingredient that drives the photosynthetic process, is readily assimilated by the tree. The carbon works its way into the wood and downward to the roots where it is captured first by the fungus and then by the Indian pipe, a fact confirmed by measuring the radioactivity levels in the plant.

There are a few additional species of parasitic plants found in New York's forests that employ the same indirect way of gaining nutrients by using mycorrhizal fungi as an intermediate. One of these is pinesap (*Hypopitys monotropa*), a close relative of Indian pipe. As the name suggests, pinesap taps into fungi that have tapped into pine trees. Its appearance is similar to Indian pipe; the main difference being that pinesap has multiple flowers per stem (as few as two to as many as twelve), and is pale yellow or cream in color compared to the ghost white of Indian pipe. A similar-looking red plant is known as red or hairy pinesap, *Hypopitys lanuginosa*. The specific name *hypopithys* means "beneath the pines," the type of habitat in which the plant is almost always found.

Other parasitic plants tap directly into their host plants through the use of a modified root tip known as a haustorium. The haustorium penetrates the roots of the host plant, intertwining and interconnecting with them to absorb water and nutrients (mostly carbon).

A mid–summer to late–autumn walk through a beech forest will often reveal a common-to-abundant parasitic wildflower that taps into the roots of beech trees, scattered in clumps throughout the forest floor. Known as beechdrops (*Epifagus virginiana*), with slender stems that rise as high as a foot above the leaves, its Latin name means "growing upon beech," an apt description of this plant's strategy. If you take a moment to look closely at a beechdrops plant, you'll see the pretty tan–and–purple striped tubular flowers emanating from a light–brown colored stem. In coloration, they resemble tiny candy canes.

Beechdrops has a more robust–looking cousin growing in the same mixed deciduous forests of New York: squawroot (*Conopholis americana*). Also referred to as bear corn, squawroot is a parasite of oaks. It was used by Native Americans for a variety of medicinal purposes, including treatment for menopause.

Another related parasitic species which has arguably the most beautiful flower is the one–flowered broomrape (*Orobanche uniflora*), also known as cancer–root. It has a white five–petaled flower with fine pink lines in the petals. It is widespread in the state.

Beechdrops, squawroot and one–flowered broomrape are members of the broomrape family, a cosmopolitan group of plants which in some parts of the world are serious agricultural pests, parasitizing important food crops. Affected crops include tomatoes, potatoes, celery, carrots, cabbage, eggplant and various bean species. In severe outbreaks they can cause total crop loss.

David Taft

Yellow pinesap

David Taft

Red pinesap

Significant agricultural losses occur in the countries around the Mediterranean Sea, parts of the Middle East, and Australia. The family name broomrape refers to a tuber or 'rapum', which grows on species of broom, a plant found commonly in Great Britain and throughout Europe.

The orchid family has a few parasitic plants of its own in the form of the genus *Corallorhiza*, a group of species known as the coralroots, so named because their rhizomes or root masses are shaped like small clumps of coral. The most widespread species of coralroot in New York's forests is the autumn coralroot (*Corallorhiza odontorhiza*). This plant parasitizes mycorrhizal fungi of several well–known species, including mushrooms belonging to the genus *Russula*.

Not all parasitic plants tap into their host underground through the intricately interwoven complex of roots, rootlets, hyphae and mycelium. Two plants that take a different approach are the dodders and dwarf mistletoe. Dodder, a member of the morning glory family, is a flowering vine of which there are about nine species native to New York. Its most distinctive trait is its threadlike stem, which has given rise to some of its common names: hairweed, lady's laces, wizard's net, goldthread, angel hair, witches' hair, devil's hair, pull–down, strangleweed, and my favorite: devil's guts.

A dodder plant starts out like other plants. A seed lands in suitable soil and germinates. The shoot grows upward, but in the case of dodder it isn't growing toward sunlight nor expending energy setting roots. Rather, it elongates and using chemosensory clues, which remarkably involves being able to detect volatile organic chemicals emitted from suitable host plants, it grows in their direction.

Once a dodder plant makes contact with a host, it quickly coils repeatedly around the stem, and through the use of numerous haustoria, penetrates the plant. This anchors the dodder. At this point, the vine is no longer connected to the soil. It gains all its sustenance from its host and continues to entangle and intertwine with adjacent plants. Over time, the scene looks a bit like an unhappy chef tossed a large bowl of cooked angel–hair pasta onto a meadow of wildflowers!

New York's one native mistletoe, dwarf mistletoe (*Arceuthobium pusillum*), takes a different tack. This species is able to invade the vascular tissue of its host (primarily black spruce) through its branches, invading the tree's xylem (for upward movement) and phloem (for downward movement) to gain the nutrients and water it needs. This attack causes the tree to produce a dense packet of branches referred to as "witches' brooms," which are quite noticeable during a forest hike.

How does the mistletoe succeed in colonizing branches? By using two ingenious adaptations, both relating to its seeds. The seeds are dispersed under pressure, exploding from the fruit at speeds as fast as 50 mph. This enables mistletoe to disperse seeds upward onto nearby tree branches. The seeds' sticky coating makes it more likely they'll adhere to the surface they've contacted.

One-flowered broomrape David Taft

Squawroot John Heidecker

Whether looking for "dead man's fingers" arising from the ground, bowls of "pasta" adorning meadow flowers, or mistletoe's "brooms of witches" amidst the branches in the forest canopy, New York's parasitic plants are an interesting and unique part of our flora.

Retired as the Director of Environmental Protection for the Town of Brookhaven, **John Turner** also teaches at Stony Brook University. He was a co–founder of the Long Island Pine Barrens Society, and recipient of Newsday's "Everyday Hero" award. John runs a natural history tour company called Alula Birding.

Jim Clayton

STONE STORIES

—The rocks and pebbles of Lake Ontario's south shore

By Susan P. Gateley
Photos by author, unless otherwise noted

A walk along a beach on Lake Ontario's south shore can be a walk through time. In fact, no other upstate environment has geological evidence from a wider timescale. Here, visitors strolling alongshore can see the effects of wave action from a few hours ago superimposed upon rocks formed a billion years in the past. On the beach near my home in Wayne County, ancient rocks from the Canadian Shield lie next to boulders from the Adirondacks and pebbles of local bedrock, all dumped by a glacier ten thousand years ago and washed out of the shoreline bluff by recent storms.

The first thing you may notice on a south shore beach is the variety of pebbles and stones found there. Unlike the uniformity of the sandy shores at the lake's east end, or the limestone ledges up around Sackets Harbor, Lake Ontario's south shore beaches are composed of glacial till that features stones of many origins. Varied colors and sizes greet your eyes as you scan the land beneath your feet.

Waves have sorted the stones so that big ones are in one spot, and little ones are gathered in another area to form a lower ridge or berm near the water. Water continually moves the pebbles around, too. Whenever big waves hit the beach at an angle, shoreline "transport" carries sediment parallel to shore. The result: a continually changing cast of stone characters.

When I stroll along the beach here, I notice all the pebble shapes: flat, thin, round, egg–shaped. I've seen many that resemble hearts, and a few that look like Texas or North Carolina. A friend found a flat sandstone pebble that resembled the Man in the Moon.

A variety of metamorphic pebbles can be found on Lake Ontario south shore beaches.

On a recent visit, a small pebble with silver–colored crystals caught my eye, making me wonder if it was mica or calcite. A few steps later, I spotted another rock with pockets of tiny reddish crystals. Garnet perhaps? Ten minutes more and I found a stone that glittered with some fool's gold. It was a banner day and made me think of the vast throng of stories that lies underfoot.

Perhaps a pretty pebble at your feet will catch your eye and speak to you of its past.

Each rock has a history. The black one with a vein of pure white once cracked in half a mile underground and later was glued back together with calcite–laced water that cooled and crystalized in the gap. It's a "healed" rock. A nearby colorful rock was tortured, compressed and formed by pressure. It was metamorphosed by the experience into a hard polished pebble of rare beauty with colors of orange, pink, pale yellow and cream mixed in a soft blend. It's a standout among the drab pedestrian brown sandstones.

It's not unusual to find pebbles with fossils like this crinoid stem. Also called sea lilies, crinoids are animals related to starfish and sea urchins.

Then there are the fossils found here: gastropods and cephalopods, crinoids and bryozoans, worm holes and tracks. It's hard to imagine that this place was once a warm sunlit shallow sea 400 million years ago. It had to be calm back then for the mud to settle over these little lives and bury them. Where did the mud come from? What geological catastrophe sent it washing over this bed of clams so many millions of years ago?

Of course, there are man–made pebbles here, too; stones that came to be beach pebbles through human action. Water–rounded bits of concrete or brick are fairly common on my neighborhood beach. They are the remains of cottage walls and other man–made structures that have been eaten away by the lake's relentless shoreline erosion. Gray dolomite pebbles appear now and then. They were not part of the original glacial mix; rather these came from boulders brought from a nearby quarry that were piled to defend those receding shorelines. These dolomite rocks are worth a look as they sometimes contain little cavities (called vugs) that may house calcite crystals.

It's great fun to try to figure out rock identities even as the water–polished pebbles afford an endless variety of gneisses, granitic rocks, schists, shales, black mudstones, and white quartzite. I have a green pebble that I'm told is probably serpentine, and have found water–rounded quartz crystals like the famed Cape May diamonds of Delaware Bay. The most common pebbles seen here are the various sandstones. These sedimentary rocks are more easily identified than the older, more varied metamorphic pebbles. Reddish Medina–Queenston and the greenish gray Oswego sandstones make up the majority of the sandstone pebbles on the beach I usually walk on. These stones split readily; nearly all the decent skipping stones are of this type.

The other common, usually gray, sedimentary rock on our south shore beaches is limestone. It is an immigrant, like the colorful metamorphic rocks transported south by the glacier. Most of the limestone along our shoreline is from the Ordovician Period Trenton or Black River formations. It's about 450 million years old and often contains fossils. The most common of these are crinoids (sea lilies), snails, clam–like brachiopods, and ancestors of today's squids that had shells back then. Some of the squid ancestor fossils within the larger cobbles and rocks can be a foot or more in length.

Rounded water–washed rocks generally have rounded fossils that don't look very much like the drawings in the books. Most Lake Ontario fossils are pretty beat up, and sometimes you are looking at cross sections or interior views of an animal. This makes beach pebble fossils tricky to match up with photos in a field guide. But if you are game, look for gray pebbles with white speckles on them. Inspect them closely and you may make out the curve of a gastropod, the cone–shaped shell of a cephalopod, or

Gina Jack

Like many beach pebbles, this small pebble contains fossil hash—a mixture of many different fossils.

This fossil of a cephalopod measured approximately 5 inches long.

Chris Gateley

An aerial photo of the area shows the bluff which is the source for most of the rocks on the beach.

a disc or rod–like structure that was once a piece of a crinoid stem. Most of these fossils are less than an inch across.

The majority of our beach sand consists of quartz grains. Largely made up of silicon and oxygen (the most abundant elements in Earth's crust), quartz is a hard mineral that doesn't easily wear away. When sandstone—primarily made from grains of quartz cemented together—is metamorphosed by heat and pressure it becomes quartzite. Often light in color (snow white, pinkish or pale yellow), a quartzite beach pebble assumes a glossy smooth polish because it is so hard.

Another abundant metamorphic beach stone is gneiss. Many gneisses show bands of color that are dark or black against a light gray, pinkish or orange background. Such banded or layered rocks are said to be foliated. Gneiss types vary with the parent rock from which they formed originally, and there are many grades of gneiss. Granitic, syenite, hornblende and mica gneisses all look different—some are pink, some are gray, and some are a mix. The gneisses are very old Precambrian rocks that make up the Thousand Islands. Some of these rocks formed miles below the earth's surface at pressures thousands of times that at sea level. And today they lie at the surface as "hard heads" in cow pastures and on the sunlit beaches of Lake Ontario.

A collection of sandstone pebbles. The banded one on the top is an older stone known as Potsdam sandstone.

The majority of beach pebbles you encounter have that rounded, polished look from being tumbled around by lake waves. Rocks that have recently eroded out of the shoreline look quite different. They still have edges and angles, and a few of the larger ones may even show scratches on their surface. Those scratches, called striations, were acquired with the grinding of stone on stone as the glacier moved the whole mess south.

One more distinctive metamorphic rock underfoot on the beach is schist. Schists are often dark in color and sparkle in the sun. Their sparkle comes from the flat surfaces of numerous mica crystals. Mica schists may show a silvery–gray color. Darker schists—which may have more of the mineral hornblende—also appear on the beach.

With so many different types of rocks found here, the task of unraveling the story of each different tribe of rocks represented on Lake Ontario's south shore beaches is a formidable one. It is a task that has eluded me thus far, so I must be content for now to simply listen to the grind and growl of pebbles and cobbles tumbled in the surf.

Stories of ancient lava fields, of vast mudslides and flows, of floods, and of glaciers bigger than mountains seem like wild tales today. Perhaps a pretty pebble at your feet will catch your eye and speak to you of its past.

Susan P. Gateley is the author of several books on Lake Ontario. For more information, visit **www.susanpgateley.com**.

Migrating Whales at Risk

Each year, several species of threatened and endangered whales move through NY waters during migration and encounter ships using the busy Port of New York and New Jersey.

In recent years, there has been an increase in ships striking these whales, resulting in more injuries to the whales and sometimes death. This is especially concerning when it affects the critically endangered North Atlantic right whale; the loss of even one of them can affect the entire population.

You can help these animals by reporting sightings or strandings to The Riverhead Foundation at 631-369-9829, to NOAA at 866-755-NOAA or to the U.S. Coast Guard on channel 16. Boaters can also help by not approaching whales, maintaining a safe and legal distance (1,500 feet from right whales, 100 feet from all others), and slowing larger vessels (>65 ft.) to 10 knots when whales are seen.

Fish and Eel Ladders Restored

DEC recently unveiled new fish and eel ladders at the restored Edwards Avenue Dam in Suffolk County. The new spillway structure has raised water behind the dam to levels not seen for nearly a decade. The ladders are part of a long-term restoration plan to open 300 acres of critical spawning habitat for river herring and American eels along the Peconic River. Long-term goals focus on expanding alewife spawning habitat. Important forage fish for striped bass, alewife have declined along the Atlantic Coast primarily due to construction of barriers on historic spawning tributaries.

Do Your Homework

Beginning in 2016, all DEC-sponsored Sportsman Education courses will require students to complete homework before attending classroom and field sessions. Homework materials are available on DEC's website (**www.dec.ny.gov/outdoor/7860.html**) and from the course instructor. Completed homework is required for admission to all courses, including hunter, bow-hunter, trapper and waterfowl identification. This will ensure students come to class better prepared, and enhance their in-class experience. Classes fill quickly, so don't delay—register today!

Sauger Restoration

A close relative of walleye, sauger are among the state's most imperiled fish species. They currently occur downstream of the Allegheny Reservoir in Pennsylvania, but are blocked from New York waters by the Kinzua Dam. In 2014, DEC began a five-year stocking program in the Allegheny River watershed to establish a self-sustaining sauger population. DEC received sauger fry donated from the West Virginia Division of Natural Resources and the Kentucky Department of Fish and Wildlife Resources, which were then raised for a short time at the Chautauqua Hatchery. In 2014 and 2015, DEC stocked the upper Allegheny Reservoir with fingerlings. This spring, fry were stocked in the upper Allegheny Reservoir, Allegheny River and Oil and Olean creeks. In June, the reservoir was again stocked with fingerlings; monitoring indicates the fish are growing well there. DEC biologists will continue to assess the status of stocked sauger this fall and check for spawning aggregations next spring as sauger start to reach reproductive age.

Fishing for and possession of sauger is currently prohibited in NY, so anglers must know how to differentiate them from walleye where they may co-exist. Visit **www.dec.ny.gov/animals/7261.html**

DEC photo

Jim Clayton

Accessible Fishing Pier

DEC celebrated Earth Day by opening a new universally accessible fishing pier on Wiscoy Creek in the Town of Pike, Wyoming County. Located at the Wyoming County Fairgrounds, the platform was built on town property and provides the region's first universal fishing access to a wild trout resource.

Montezuma Muckrace

This 24-hour birdwatching competition, the 20th annual, will begin at 7 PM Friday, September 16 and continue until 7 PM on Saturday, September 17. Teams compete to see the most bird species within the Montezuma Wetlands Complex in Cayuga, Wayne and Seneca counties. The competition raises funds for the Friends of the Montezuma Wetlands Complex. For more information, visit **friendsofmontezuma.org**.

Upcoming ECO Exam

Become an Environmental Conservation Officer (ECO) and start an exciting career protecting New York State's natural resources and environment! Don't miss the civil service exam, tentatively scheduled for Saturday, November 19, 2016, with an application deadline of October 5. All trainees will begin their employment with a 27-week residential training program at DEC's Training Academy. Register now to confirm the exam date: **www.cs.ny.gov/announ/emaillist.cfm**

Free Seedlings at 2016 NYS Fair

Get a free tree seedling at the New York State Fair. Visit DEC's Log Cabin, where the Division of Lands and Forests' Saratoga Tree Nursery will give away tree seedlings beginning at 10 AM every day.

Jim Clayton

New digital edition!

Conservationist is excited to announce an interactive digital edition with additional content. It's free to paid subscribers—be sure to check it out at **www.TheConservationist.org**.

DEC photos

Media Corner

DEC's Facebook post with the most views to date—more than 693,000—included photos of a deer in Suffolk County that had gotten its head stuck in a streetlight globe. ECO Jeff Hull responded to the scene and freed the deer from the globe.

Four Little Bears

We captured several trail cam photos of a sow bear with four cubs on our property in Prattsburgh, Steuben County. We think she must be a very healthy bear to have a litter of four!

Betty and Jeff Peters
Spencerport

It's amazing what you "see" by using a trail cam. The number of cubs shown is an indication that this is probably not this sow's first litter, as first litters are generally one or two cubs. Since female bears become sexually mature at two or three years of age, and bears generally give birth every two years, this female is probably at least four or five years old.

—Matt Merchant, DEC Wildlife Biologist

On a Vine and a Prayer

Today while on my lunch walk I found a lovely little praying mantis. It was resting on a wild cucumber vine and was about 3.5 to 4 inches long. I love these creatures and my son finds as much joy as I do when we stumble upon them! Enjoy!

Melissa Starman

What a great photo! We haven't seen a picture of a praying mantis in a while, so thank you for sending it in.

Drink Up

I captured a photo of this rattlesnake drinking from a puddle.

Mike Adamovic
Orange County

You captured a rare opportunity to see a rattlesnake drinking in the wild. Enjoy your hikes and in the event you do encounter a timber rattlesnake, please be respectful and part ways peacefully.

—Bill Hoffman, DEC Fish and Wildlife Technician

Catching a Ride

This blackbird was chasing the eagle, landed on the eagle's back and rode it like a surfboard. I saw this at Three Rivers Wildlife Management Area in Lysander.

Everet D. Regal

It is very common for smaller birds to harass larger birds (often crows or birds of prey) to encourage them to leave an area, but they usually don't latch on. The smaller bird sees the larger bird as a threat, and wants the threat to go elsewhere. Generally speaking, the predator's normal behavior is interrupted by the smaller bird, so there isn't much danger of the irritant becoming lunch. In effect, the tables are turned a bit when the larger bird loses the element of surprise. In addition, smaller birds are often more agile in close quarters. Think of a fighter jet harassing a bomber.

—Dave Nelson, Editor

Fish On!

Lots of readers are bringing another generation fishing, as shown by these photos we received. Do you have a photo you'd like to share of a youngster enjoying a day of fishing? If so, send it to us: **magazine@dec.ny.gov**.

Thomas caught two lake trout on a trip to Lake George. This one weighed in at 8 lbs and was 28 inches long.

Sherri Alberti

Connor caught a 24" walleye in Roundout Creek. The fish was radio–tagged by DEC in March.

Rory Holmes
Montgomery

Four–year old Lauren caught her first fish in a pond.

Elliott Brown
Pendleton

Ask the Biologist

Q: I took this photo in my garden. The slugs were hanging from a thread of slime, and appear to be mating. It looked like one or both ate the blue sac. It was a curious sight!

Carol Zink Skotnicki
Penfield, NY

A: These are spotted garden slugs (also called leopard slugs). They were introduced from Europe. And yes, they are mating—they suspend themselves from a strand of mucus and extrude and intertwine their penises (that's the "blue sac"), which they use to exchange sperm. They're hermaphroditic, which means they have the reproductive organs of both sexes and both individuals will lay eggs after mating.

—Matthew Schlesinger, DEC Chief Zoologist

Contact us!

E–mail us at: magazine@dec.ny.gov
Write to us at: Conservationist Letters
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facebook.com/NYSDECtheconservationist

Back Trails

Perspectives on People and Nature

John Bulmer

Backyard Wild Kingdom

by Todd Miner

Ansel Adams I am not. My camera is neither a Leica, a Hasselblad, nor even a Nikon. My haunts aren't in the same league as Yosemite or the Grand Canyon.

But all that is just fine with me. I get out and enjoy my "backyard"—woods, streams and gorges in the Finger Lakes—without having to drive more than five miles to a trailhead or natural area. I can carry my smartphone in my pocket. And I can wander around, taking my time to admire and photograph the area's many little gems of beauty, free from crowds and tour groups.

As much as I like televised nature programs, I worry: their stunning footage risks seducing us into thinking that majesty and wonder can only be found in the marquee parks of the west, in the wilderness of the far north, or in tropical jungles. Lured in, we risk missing the rich, diverse beauty in our own backyard "wild kingdoms."

A backyard wild kingdom can reveal itself in many ways: the harvest palette of fall foliage; fields of eye-popping wildflowers; the stream-song of falling water; an electric orange eastern newt; the subtle and varied greens of mosses and ferns; and the cardinal's burst of red against a snow-covered scene.

As I amble through our backyard wilds, my smart phone—way smarter than I am—allows me to capture, remember, and treasure the many splendid scenes around me. The phone is almost always with me, so I don't have to think about taking it along, and its small size is easy to carry. And I can take all the digital photos I want—electrons are free!

A friend of mine asked me if taking photos wasn't a distraction from the outdoor experience. In my mind, the opposite is true. When I am in a photo-taking mood, my mind is more attuned to light, to composition, and to beauty. Taking the time to compose a photo makes me slow down and look with intention. I see our backyard in a new light—for the special land and nature that it is.

In some ways, smart phone nature photography is the opposite of the "selfie," a more common use of the technology. Rather than being self-absorbed or inwardly looking, my smart phone camera helps me see and appreciate the wonder and mellow beauty in my own backyard.

So, get out and see the wilderness of the far north, explore tropical jungles, and tramp the great ranges. But don't overlook the backyard. Experience and marvel at your own local wild kingdom.

Experienced mountaineer **Dr. Todd Miner** is an Instructor in the Department of Emergency Medicine at the University of Colorado in Denver. Dr. Miner previously served as the Executive Director of Cornell Outdoor Education (COE), where he co-founded Cornell Wilderness Medicine, a unique collaboration between COE and Weill Cornell Medical College.

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