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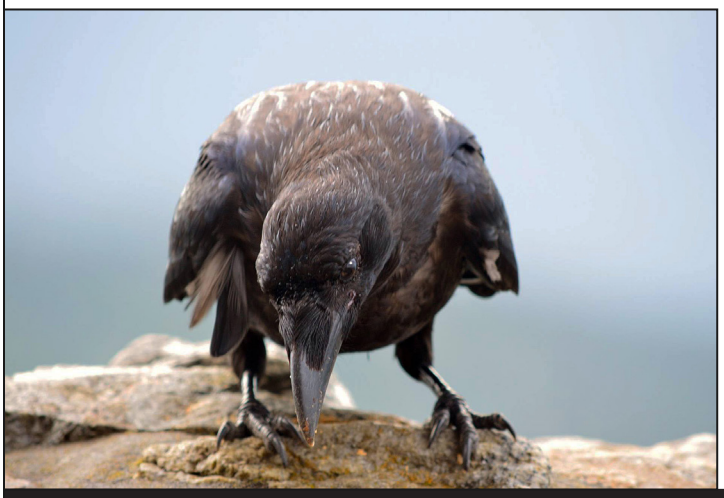

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The Delaware Valley Eagle Alliance

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https://www.naturesartproductions.com/wildlife-projects.html

BLACK BEAR ENCOUNTERS

by Yoke Bauer DiGiorgio

Director, Delaware Valley Eagle Alliance, Naturalist, Filmmaker, Author

It was an early afternoon in late September several years ago. The air was crisp despite a bright sun, and the fall colors were just beginning to emerge. My husband, John and I were up in the Rockies photographing the elk in rut. Always exploring and searching out places where we might observe wildlife, we found ourselves hiking along a ridge overlooking a creek. Looking down, we could see a large black bear (a sow) stretched out over a rock basking in the sun asleep. We looked around at the nearby trees and spotted two cinnamon cubs curled up on a limb, also sleeping.

Despite their common name, black bears are not always black. Across Northern America, they may be black (most common in the east) or shades of brown, including cinnamon and blonde (more common in the west). In addition, black bears in the west are smaller their counterparts in the east. While Rocky Mountain males rarely exceed 400 pounds and females 230, males in the east average 600 pounds and females average 350.

The sow began to stir. We could hear her make a grunting sound and her two cubs came down from the tree. Together, they proceeded to walk along the creek feeding on the ripened berries along the way. We were amazed at how nimble their paws were, pulling down individual branches and delicately picked off the berries with their mouths. The cubs were playful, a pair of fat fur balls wrestling with each other. As first year cubs, they would have spent the past six months growing and developing rapidly, watching their

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TOP: *Female osprey on nest with 3-chick brood on a tributary of the Chesapeake Bay.* ***INSERT:*** *Osprey young in the process of hatching. Young are most vulnerable to poor weather conditions in the week or so before hatching and in the 1-2 weeks after hatching.* *© Bryan D. Watts, Photographer*

TOUGH YEAR FOR
CHESAPEAKE OSPREY

by Bryan D. Watts
Director, Center for Conservation Biology
College of William and Mary and the Virginia Commonwealth University

The grumblings have gotten louder and louder over the past three years and have increasingly come from more corners of the Chesapeake. By the end of the 2017 breeding season, the voices were loud and clear and singing the same tune. The breeding season had been a dismal failure for osprey in the Chesapeake Bay. Not just in one location but in all locations that were under observation. Jan Reese reported that only 3 of 18 nests (17%) around Tilghman Island produced any young. Pam D'Angelo, observing on the Little Wicomico River, reported that the area produced almost no young. Reese Lukei reported that only 30 of 73 nests (41%) produced young on the Lynnhaven River, Pete McGowan reported that half of 23 nests monitored on Poplar Island failed, Greg Kearns working on the Patuxent River reported a 50% success rate, and CCB working on the upper James River recorded 26 of 57 nests (46%) that produced young. The general sense of a poor season did not stem from the low success rate alone but also the reduced brood sizes. On the upper James River surviving broods were mostly 1-2 young where in the past most successful nests produced 2-4 young.

When Bob Kennedy monitored breeding osprey in the lower Chesapeake Bay as a student working with Mitchell Byrd during the early 1970s, hatching rates were only 36%, productivity rates were unsustainable, and the Bay-wide population had reached an all-time low of 1,400 pairs. However, by the mid-1980s productivity had tripled and the population was experiencing rapid growth. This growth would continue to the present time, reaching our current estimate of 10,000 breeding pairs for the tidal reach of the Bay. Andy Glass, working in 2006 in the same study area as Bob Kennedy 35 years earlier, recorded 95% hatching rates.

Observations and concerns over the past few years have led to questions about causation. What is behind the success rates that are lower than what we have become accustomed to seeing? Most biologists working with the population believe that failures are being driven by three factors, including 1) food stress from reduced fish stocks, 2) predation, and 3) poor weather. Broods that are not provided enough food by adults to fuel growth form dominance hierarchies where high-ranking young get most of the food and low-ranking young get leftovers. If

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TOUGH YEAR FOR CHESAPEAKE OSPREY

the food shortage increases, the lowest ranking young will die in a process that we refer to as brood reduction. In severe cases, all young will die and the nest will fail. Lower brood sizes generally are indicative of brood reduction and are accompanied by low young weight or other behavioral signals.

As the populations of bald eagles and great horned owls have recovered from the DDT era and the number of mouths to feed has soared, the energy demand has spilled out onto species that would not be considered traditional prey. Osprey fall into this category and there have been numerous documented broods lost to both predators. Lastly, most raptors are susceptible to cold rains during the critical development period when eggs are near hatching or chicks are too young to thermoregulate on their own (first two weeks). It is certainly possible that poorly timed storms could have caused some of the failures in 2017 and other years.

All of these factors have likely been acting within the Chesapeake in recent years and have contributed to poor performance. We do not currently know which of these factors may be dominant or how they may be distributed throughout the Bay. You can help answer some of these questions by joining OspreyWatch and recording your observations about productivity of your nest.

For More Information: ***http://www.osprey-watch.org/***

OSPREY FACTS (*Pandion haliaetus*)

Osprey can be found on every continent except Antarctica; near water, either fresh or salt, where large numbers of fish (their main source of food) are present.

Range in size from 20-24 inches long with a wingspan of 5 to 5 ½ feet. Females are larger than males.

Fly with a marked kink in their wings, making an M-shape when seen from below.

Are brown above and white below. The head is white with a broad brown stripe through the eye. Young birds have bright red eyes compared to the bright yellow eyes of the adults.

Construct large stick structure nests often built in trees or man-made structures near or over water.

Lay 2-4 eggs (typically cream-colored base with blotches of some secondary color). Both adults alternate incubating eggs for approximately 35 days before hatching. Males are responsible for most of the hunting in the early part of chick rearing while females brood and feed the chicks. Young grow rapidly and begin to fly around 8 weeks.

Typically breed for the first time at 3 to 4 years old or older. Adults have high mate fidelity and many pairs mate for life.

RESOURCES:
https://www.allaboutbirds.org/guide/Osprey/id#
http://www.audubon.org/field-guide/bird/osprey
http://www.osprey-watch.org/

TOP / CENTER © Bryan D Watts, Photographer
BOTTOM © Andy Glass, Photographer

TOP: *Telltale sign of food stress is a bald spot on the nape of a young chick where dominant young have pulled out feathers to reinforce the dominance hierarchy and to control access to food. This sign has been common throughout the Bay in recent years.* ***CENTER:*** *Runt osprey with larger siblings. This bird was only half the weight of its siblings. Development and weight disparity within the brood is an indication of food stress.* ***BOTTOM:*** *Feathers from osprey brood killed and eaten by a larger bird of prey in the nest. Both bald eagle and great horned owl predation has increased within the Chesapeake Bay as their populations have recovered.*

THE CENTER FOR CONSERVATION BIOLOGY (CCB)

CCB is a research group within The College of William and Mary and the Virginia Commonwealth University; a group of professionals, students, and citizens dedicated to the vision that the natural environment is an important part of our quality of life. All of our research and operating costs come from gifts, grant awards, and contracts.
For more information: http://www.ccbbirds.org

LEFT: *Turtle Back Zoo's original main entrance is still recognizable today. Construction to update the entrance will begin in 2018.* ***RIGHT:*** *Our state-of-the-art animal hospital provides medical care to the entire ambassador animal population at Turtle Back Zoo.*

TURTLE BACK ZOO
ON A MISSION

by Marguerite Hunt
Curator of Education, Turtle Back Zoo

A Little History

When Essex County Turtle Back Zoo (TBZ) opened its doors in 1963, we were a small Hans Christian Andersen themed animal park that catered to local families with small children. A visit to our 16 acre campus might include a picture with an Aldabra Tortoise, a walk through the "Okky the Giant Octopus" exhibit to see the fish tanks, or a stop at the Mayflower as you entered the Children's Zoo. Of course, no visit was complete without a ride on our zoo train, which carried visitors from the Zoo out into the pine forest adjacent to the Orange Reservoir at the South Mountain Reservation. Indeed, many of our adult visitors recount to us their fond memories of visiting TBZ as youngsters.

In our earliest days, we showcased about 140 animals spread over 40 species and were an exciting destination for the growing Essex County region. Over the years, TBZ grew as well, adding new animals and exhibits, and adding or repurposing buildings and spaces as we expanded. In accordance with greater societal concern over conservation issues, Turtle Back Zoo also shifted its focus to Conservation Education, both at the zoo and within the greater community. By the early 1970s, a full staff of Zoo Educators were teaching animal- and conservation-themed programs to more than 15,000 outreach and 36,000 visiting students per year. Keeper Talks at the exhibits allowed visitors to meet a Keeper and animal up-close. Dedicated professional Educators, Keepers, and Docents (our volunteer department began in 1984) reached thousands of adults and children with up-close experiences, sharing their passion for the animals with appreciative audiences.

By the early 1990s however, Turtle Back Zoo had fallen out of favor and was suffering. A lack of funding from the former county administration and an unwillingness to support an outdated zoo left TBZ in danger of closing. At the same time, TBZ was trying to earn its Association of Zoos and Aquariums (AZA) accreditation, and wouldn't be able to do so without costly improvements that were now unavailable. It was a dire situation. But in 1996, with the rallying support of the Zoological Society of NJ and the renewed commitment of the Essex County community and the Board of Chosen Freeholders (led by future County Executive, Joseph DiVincenzo Jr.) we were afforded a second opportunity to be a valued community resource. Since then, Essex County Turtle Back Zoo has not only recovered, but is thriving and serving a mission of conservation, education, research, and recreation for the community.

Realizing Goals and a New Vitality

With the renewed support from Essex County, Turtle Back Zoo has expanded the zoo's footprint to over 25 acres and updated or added new exhibits with a wider collection of animals. Most significantly, we were finally able to complete the updates necessary for attaining AZA accreditation in 2006, an important milestone that propelled us to a higher level as a modern, forward-thinking zoo. The updates included the addition of the state-of-the-art Essex County Animal Hospital, complete with a fully functional surgical suite and quarantine areas, and replacing 1960s-era

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TURTLE BACK ZOO ON A MISSION

enclosures with thoughtfully-planned, culturally connected, naturalistic, and immersive exhibits that promote excellent health and natural behaviors in the animals.

Accreditation is an important continuing goal for TBZ. Currently, we maintain accredited status from the Association for Zoos and Aquariums (AZA) and the Zoological Association of America (ZAA), and we recently earned our Humane Certified designation from American Humane. These organizations set the highest standards of care for our animals and perform inspections, ensuring that the needs of the whole animal – mental, emotional, and physical – are met while under our care. Essex County Turtle Back Zoo and our partner organizations are caretakers and environmental advocates, dedicated to providing the healthiest environments for the animals that serve as conservation education ambassadors.

Many people don't appreciate that zoo animals are ambassadors. However, every individual animal – from hissing cockroach (yes!) to giraffe – represents and advocates for its wild counterparts and native habitats. Ambassador animals are the essential connections between zoo visitors and wildlife that are paramount to creating public advocates and better environmental stewards. Turtle Back Zoo provides our community with accessible and educational family-friendly learning experiences that support investment in the environment, especially for visitors that may never have opportunities to travel the world.

As a continuing member of AZA, Turtle Back Zoo participates in three global conservation initiatives: conservation project funding, Saving Animals from Extinction (SAFE) program, and Species Survival Plan (SSP) program. In 2016, AZA-accredited facilities contributed over $200 million to conservation initiatives around the world; Turtle Back Zoo's $200,000 share of that is contributed by the Zoological Society of NJ, the non-profit arm of TBZ. These funds benefitted over 800 species and supported many projects spearheaded by individual zoos. The SAFE program (https://www.aza.org/aza-safe) is a global conservation program sponsored by AZA, and is instrumental in developing immediate conservation strategies that increase the survival of several critically endangered species, including the African Penguin (a TBZ ambassador animal).

AZA "Species Survival Plans" (SSPs) are specialized breeding programs that create compatible animal pairs based on genetic and behavioral characteristics. Creating compatible breeding pairs is painstaking, but SSPs ensure that zoos need not remove animals from their wild environments. Eventually, AZA breeding programs may become solely responsible for the survival and management of critically endangered species and species

© Photographs provided by Turtle Back Zoo

***TOP:** Wolf Woods opened in 1990 - Arctic Wolf; **CENTER:** Turtle Back Zoo's premier Giraffe exhibit opened in 2016. The exhibit celebrates the natural history of its species by highlighting how multiple species share and interact within the same space. Multispecies exhibits promote better health and more natural behaviors; **BOTTOM:** White-cheeked Gibbon, NA River Otter, and Amur Leopard are part of Turtle Back Zoo's Species Survival Plan (SSP).*

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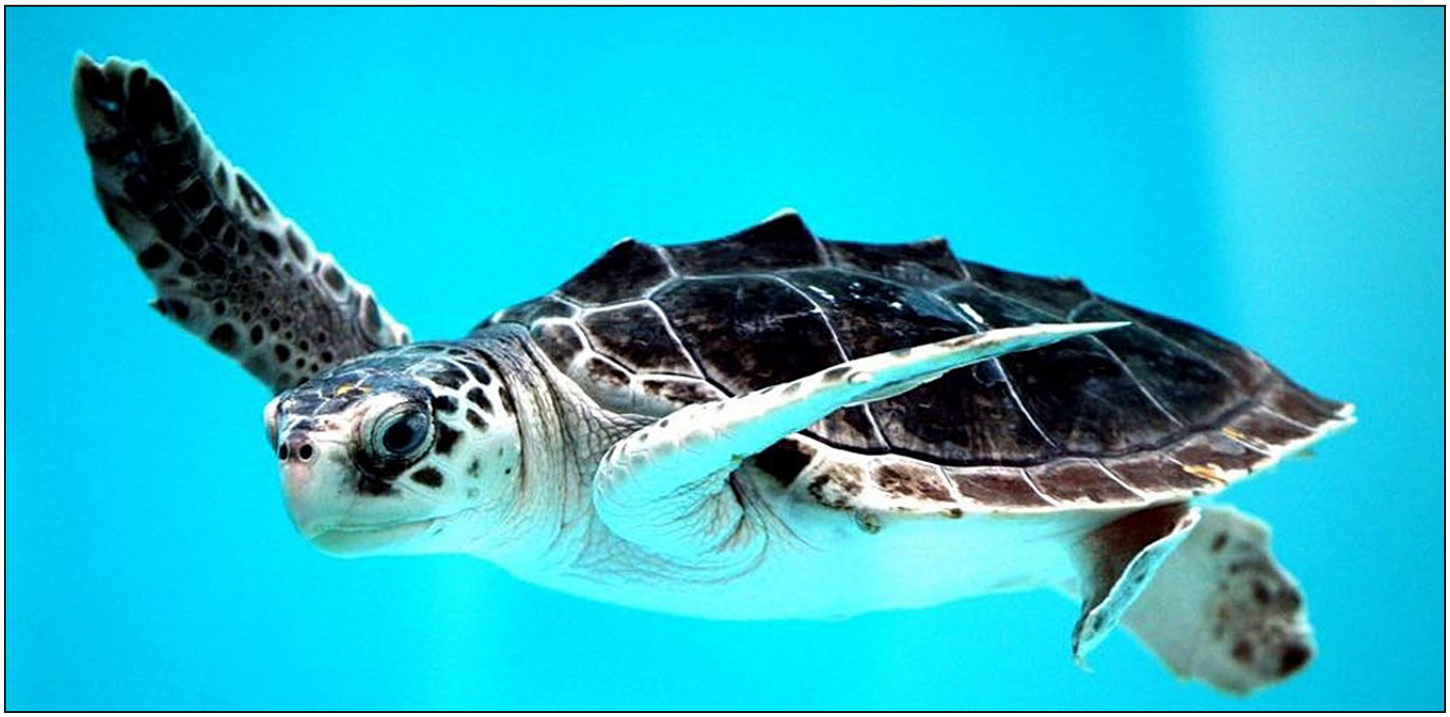
TURTLE BACK ZOO ON A MISSION



Rehabilitating sea turtle at Essex County Sea Turtle Recovery. Once recovered, the sea turtles are released back into the ocean.

© Photograph provided by Turtle Back Zoo

that have been extirpated from the wild due to population or habitat collapse.

Turtle Back Zoo's Future

As a modern zoo, our grand mission is conservation, education, research, and recreation; we are proud to be a conservation resource and teaching facility for our community. TBZ participates in local, regional, and global initiatives that positively impact our world and we promote and model better stewardship attitudes and behaviors for over 800,000 annual visitors. Every day, our passionate and devoted zoo professionals help the community make the connections to their environments that are vital to promoting investment in wildlife and wild places.

As we face the first mass extinction to be caused by humans, zoos will be an integral part of global conservation. Along with other conservation organizations, we must assume an increasing role as guardians of and advocates for the global environment. Essex County Turtle Back Zoo's commitment to local, regional, and global conservation will continue with our financial contributions to conservation initiatives through our Zoological Society and participation in AZA's SSP and SAFE programs, as well as tackling new conservation opportunities as they arise.

We also will continue to evolve as a modern zoo, incorporating new best practices in husbandry, veterinary care, enrichment and habitat design, and conservation programming. In the last two years we debuted several new exhibits including Masai Giraffe, Maned Wolf & Giant Anteater, Andean Condor, and African Lion & Spotted Hyena. These new exhibits were thoughtfully and carefully designed to champion the wonder and excitement that is inherent to those animals. Essex County Turtle Back Zoo, the Zoological Society of NJ, Prudential, Horizon Blue Cross Blue Shield of NJ, PSE&G, Matrix Development Group, and Sea Turtle Recovery collaborated to create the Essex County Turtle Back Zoo Sea Turtle Recovery – a 4,000 square foot rehabilitation facility that provides medical care to ill or injured sea turtles and then returns them to the ocean. This partnership was a natural extension of our commitment to conservation, and has been a wonderful experience for the visitors, staff, and partners. We hope to create more conservation partnerships in the future.

Turtle Back Zoo will continue to update and expand; zoos are dynamic spaces and should constantly change and adapt to best practices. For TBZ in 2018, that means updating our main entrance to better accommodate our growing number of visitors. It's also time to design and build a new enclosed habitat for our endangered African Penguins so they can enjoy successful breeding. Many visitors remark that TBZ looks different every time they visit. We're proud of the changes and improvements, and the hard work and commitment that makes our evolution a reality. TBZ strives to offer the best experience to our visitors, each visitor becoming a better environmental steward in turn. A lofty, but worthwhile mission indeed.

Come visit Essex County Turtle Back Zoo!

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TURTLE BACK ZOO ON A MISSION

African Penguins are a temperate species native to southern Africa. Experiencing a very rapid population decline, their conservation status was promoted to "endangered" in 2010.

© Photograph provided by Turtle Back Zoo

A NOTE TO THE ZOO VISITOR

You are vital to the continued success of your local zoo's mission of conservation and education. Turtle Back Zoo's ambassador animals, exhibits, and staff are here to provide a conservation-based context to your interest in animals. Here are a few important points for you to consider when you visit our, or any accredited zoo, aquarium, or nature center.

Patronize institutions that are accredited, certified, or members of professional oversight organizations. Institutions work hard to earn those badges of honor, and they assure visitors of a high standard of care.

Become a member and learn how your financial contribution supports the institution. Take part in the benefits that membership has to offer. This may include special members-only events, early access to events, or reduced fees for programs. Take ownership. Share your pride of the institution.

When you visit, you are supporting the mission of the institution. Do you know what the mission is? Talk with the educators, docents, and keepers; ask questions about the animals that you visit and learn something new. Make that connection, then ask how you can get involved.

Learning about animals is a great way to get outdoors, connect with your environment, and become a better environmental steward. Have fun!

ADDITIONAL INFORMATION

Turtle Back Zoo is a facility of the Essex County Parks Department. Funded by the County of Essex as a service to the residents of the County and the surrounding areas, its mission is to provide an enriching recreational experience that fosters excellence in wildlife education and wildlife conservation, so that present and future generations are inspired to understand, appreciate and protect the fragile interdependence of all living things.
http://turtlebackzoo.com/

The Zoological Society of NJ, Inc. is the fundraising branch of Turtle Back Zoo; a not-for-profit organization that helps - to raise funds for improvements / to stimulate the public's interest in the growth, improvement, and development of Turtle Back Zoo through education and research with an emphasis on natural conservation of all species of animals.
http://zoologicalsocietyofnj.org/

County of Essex New Jersey
http://essexcountynj.org/

Duane Raver art, courtesy US Fish and Wildlife Service

AMERICAN SHAD

LIFEBLOOD OF THE DELAWARE RIVER

by Don Hamilton

Resource Management Chief, National Park Service, Upper Delaware Scenic and Recreational River

In May of 1992 I got my first glimpse of American shad, from my canoe. A pod of six, each about eighteen inches long, was headed upstream, not far below the surface, ghostly gray against the dark brown/green background of the Delaware River's depths. Determined voyagers, they were on a mission, in exploration of a river they'd never seen as adult fish, but familiar to them by its taste and smell. They would continue upstream until instincts told them that conditions and water temperatures were favorable, about 68 degrees F. Then, under the cover of darkness, females and males would swirl throughout the river's pool areas, with females dispersing their eggs as serial, broadcast spawners, and the males following closely to fertilize them with expelled clouds of milt.

These broadcast eggs would tumble along the riverbed, providing food for other opportunistic aquatic life, with the surviving ones hatching in six to 12 days, depending on water temperatures. In four to 6 weeks, these young-of-year shad would closely resemble miniature versions of adult shad. They would spend the first six months of their lives here, swimming in schools, feeding and growing and testing the river's currents, rising to intercept and evaluate as food any particles carried in the water column, their sides shimmering in shafts of sunlight penetrating the water's surface. At dusk they would dart vertically to feed on tiny insects in the river's surface film, dimpling the expanse of pools otherwise placid at dusk. Their biomass in the river is considerable, as seine net sampling carried out by resource agencies here sometimes nets an average of a young-of-year shad for every two square meters of the river swept. Everything that preys upon small forage fish in the Delaware River during the summer months is probably very well-fed.

Fall's shortening days and cooler water temperatures signal that change is afoot, and instinctually these now three to 4 inch long fish head downstream. This several hundred mile journey may be aided by higher flows associated with heavier rains or hurricanes, but water temperatures dipping into the 50s is likely the strongest cue.

Upon entering saltwater, evidence suggests that these young shad continue in a southerly direction, moving into winter feeding grounds off the Carolinas. They feed primarily on zooplankton, tiny free-swimming animals found in the water column, which they ingest while swimming with their

© Peter Kolesar, Photographer

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AMERICAN SHAD LIFEBLOOD OF THE DELAWARE RIVER

mouths open, their gill rakers acting as fine-toothed combs that glean these organisms as the water flows through them. A spring migration brings shad up the Atlantic Coast, where mature adults (males 3-5 years old, females 4-6 years old) stage off the mouths of rivers such as the Susquehanna, Delaware, Hudson, and Connecticut. They'll wait for the right combination of cues such as changes in flow volume, salinity, the scent of their natal waters, water clarity, rising water temperatures, and lengthening daylight to begin spawning runs upstream. Immature shad will continue up the coast to rich summer feeding grounds in the Gulf of Maine and the Bay of Fundy off the coast of Nova Scotia. As efficient filter-feeding planktivores, shad can utilize a variety of low-light conditions, from ocean depths to 700 feet to the shallow turbid waters of the north-Fundy basins, to take advantage of rich food sources that sight-oriented planktivores may not be as able to easily exploit.

American shad are transformed by their ocean odyssey, travelling about 2,000 miles a year at sea, while increasing their body weight upwards of 160 times from the three to 4-inch fish that entered saltwater in the fall of their first year. A storehouse of carbon, energy, and nutrients amassed from this ocean realm, shad are a pulse of life that brings this beneficial biomass inland during spring spawning runs, providing a rich food source for numerous species, including humans who settled here, timed perfectly after a spare winter for inhabitants such as hungry bald eagles feeding their growing young. Most all of those fish not consumed by other animals then die and decompose, as a final beneficial

© Randy Harris, Photographer

***TOP:** Seine netting on the Upper Delaware River; **BOTTOM:** Sorting young-of-year shad and other fish species caught: **INSERT:** Young-of-year American shad at about 5 months of age.*

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AMERICAN SHAD LIFEBLOOD OF THE DELAWARE RIVER

contribution to a river that had afforded their first sources of sustenance many years earlier. Life-giving nutrients are thus provided to enhance the growth of aquatic vegetation, which in turn are fed upon by macroinvertebrates and other animal life. A small percentage of shad survive the rigors of these runs to return to the ocean and repeat spawn in subsequent years.

Still utilized by American shad and other sea-run migratory fish, important historic spawning and rearing habitat in the Delaware system can extend 330 miles inland up the unimpeded Delaware, and perhaps another 25-40 miles up the East Branch of the Delaware and into the Beaverkill, in this last major river on the Atlantic Coast undammed the length of its main stem. These migratory fish serve as but one of many key ecological components in a flourishing and largely intact array of native organisms and communities that depend on the connected habitats and the quality of the Delaware River and its tributaries.

Pre-colonial-settlement runs of American shad up Atlantic Coast rivers once may have numbered in the tens of millions of fish, or more, in each major river. George Washington is said to have caught half a million fish in one day at his Mount Vernon estate on the Potomac River. Historically, the Delaware had the largest annual commercial shad harvest of any river on the Atlantic Coast, and several times that of any other river. In the late 1890s, American shad harvest estimates on the Delaware ranged up to 19 million pounds, or approximately 5 to 6 million fish. And those harvested fish were only a fraction of the total run.

Indeed, those past shad runs made quite an impression on local residents.

"*I've looked in that river when the shad used to run full force. You'd stand on the bridge and look down and you could not see the water for the shad. It was just one solid mass of fish and just very dark. You wouldn't even know this was water. We don't get runs like that anymore…*"
Russell "Doc" Homer, Lordville, NY, 1920-2001 (Interview date: December 3, 1987)

While greatly diminished from their historic numbers, American shad runs are still a significant component of the Delaware River's ecosystem. In this free-flowing river, such cycles that have occurred for thousands of years are still relatively intact, contributing to ecological integrity that is exceptional among the large river systems of the mid-Atlantic and Northeastern U.S.

With this in mind, the Atlantic States Marine Fisheries Commission (http://www.asmfc.org/) has developed management plans and guidelines aimed at maintaining stocks and monitoring progress. Resource agencies from the states of Delaware, New Jersey, New York, and Pennsylvania, as well as the U.S. Fish and Wildlife Service,

Graphic (Map of Migration Routes) courtesy of PA Fish and Boat Commission

the National Park Service, and the Delaware River Basin Commission have engaged in a collaborative, long-term sampling effort to assess recruitment and establish Juvenile Abundance Indices for young-of-year YOY American shad at six locations over a nearly 200-mile reach of the non-tidal Delaware River. Such efforts are meant to better keep a finger on the pulse of one of the river's vital signs, and to maintain a key component of an age-old cycle of biomass interchange between Atlantic Coast rivers and the ocean central to transporting nutrients and energy between these two realms, and completing an ecological link that is beneficial to both systems.

An encouraging sign was recently documented when 2017's August-October sampling of YOY American shad in the Delaware set a new time-series high for the number of fish caught, a record dating back to 1988, according to provisional data provided by the Pennsylvania Fish and Boat Commission. Though this single data point should not allay concerns over the serious decline of the shad population from previous levels, and future sampling will determine if there is any discernable trend in their numbers, it is at least one new ray of hope for this important fish.

Jake (LEFT) and Ray (RIGHT) two Common Ravens that live at the Raptor Trust, NJ. *© Alyssa Frediani, Photographer*

THE REMARKABLE RAVEN

by Alyssa Frediani
The Raptor Trust

"Cr-r-ruck, cr-r-ruck!" The harsh, grating call of a raven breaks the morning silence at the Raptor Trust. The Common Ravens that reside at the Trust, Jake and Ray, are among the most vocal of the permanent resident birds here. Ravens have been recorded making over 20 different categories of vocalizations, which are used for social interactions, alarm calls, chase calls and fight calls. In addition to having their own "language," ravens are skilled mimics. Jake and Ray are constantly amusing the staff and visitors with their wide array of calls, including popping calls, croaking, knocking and even the call of a peacock!

The largest passerine, or songbird, ravens are clever, curious and have a commanding presence. They have an intellect that is on par with human children and great apes and have proven capable of solving complex puzzles. They have shown the ability to use tools in completing multi-step processes. They can remember faces and even specific voices for several years. Research has suggested that ravens build up a sort of social capital that is reciprocated over time. Favors in the form of preening, or aid in a fight, are given to ravens that are in good standing with each other. In our case, Jake and Ray certainly seem to remember who feeds them the most often and they have their favorites among the staff.

At the other end of the spectrum, they also remember those who have "wronged" them, in their eyes at least. The senior staff members who are responsible for doing wellness checks are not warmly welcomed when they enter the ravens' aviary. Last fall I decided to carve pumpkins and hide treats for the ravens in them. I brought the pumpkins in and offered them to Jake and Ray, who promptly decided pumpkins were terrifying. They jumped around, calling out in alarm until I removed the pumpkins from their aviary. For weeks after the pumpkin incident, I could not enter their aviary without them calling warnings at me to stay away. Adult ravens, as smart as they are, develop a phobia of new things as they mature.

Ravens in general are very playful and young birds are especially inquisitive. They have been observed performing acrobatics in flight, diving and rolling in the air. One young bird was observed flying upside down for over a half a mile! They are one of the only animals known to make their own toys, in the form of broken off sticks. They will drop the sticks repeatedly and catch them mid-flight. They have also been observed tossing stones back and forth to each other. On the occasion that wild ravens come to The Raptor Trust, we have observed them passing sticks through the roof of Jake and Ray's aviary, and the vocalizations they make to each other sound like they are having a conversation.

Historically, Common Ravens were driven out of the eastern United States, due to habitat loss and advancing civilization. They are a bird that prefers open and forested habitat, including high desert, sea coast, tundra, grasslands and sagebrush. More recently, they have been adapting to the growing human population and are moving back into rural and suburban areas. They have learned to scavenge for food in human garbage and unattended food and picnic items. They have even been observed undoing Velcro and unzipping zippers at campsites to steal food. Ravens are omnivores and generalists and will eat almost anything they can find including small animals, eggs, beetles, and fish. Our ravens eat a wide variety of food, including mice, quail, peanut butter, berries, melons, and mealworms.

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THE REMARKABLE RAVEN

Ravens' intelligence makes them formidable predators in the wild. They have been known to work in pairs to raid the nests of seabirds. One bird will distract the parent while the other grabs eggs or babies from the nest. Their superior ability to raid nests is causing problems for species that are already at risk, such as Marbled Murrelets, Least Terns, Greater Sage-Grouse, and even Desert Tortoises. Ravens also seem to have formed a sort of partnership with wolves in the west. They have been observed following wolf packs and stealing from their kills quite frequently. In some cases, they have even been known to call out when they encounter an injured animal, alerting wolves to an easy kill. Ravens seem to be able to use their intelligence to put together cause and effect. They will investigate after hearing a gun shot in the area, presumably to find a carcass, but will ignore other similarly loud noises such as a car door slamming. Their hunting prowess means that they have virtually no natural predators as adults. Though their fledglings are vulnerable to predation from owls, hawks and eagles, the greatest threat to ravens is humans.

Common Ravens will defend their young very aggressively against predators. They are usually successful at driving predators away and have been known to drop rocks on predators that venture too close to their nests. Their nests are very large, constructed from sticks and lined with mud, animal fur and grasses. The nest is generally 5 feet across and about 2 feet tall. They prefer to nest on cliffs, in trees or on man-made structures such as power-line towers, telephone poles, billboards and bridges.

Common Ravens are becoming more common in the eastern half of the United States. They are beautiful, large, silky black birds that are easy to identify. The telltale, echoing "c-r-r-oak" of a raven in flight is an ever more common sound in our area. In flight they are larger and more graceful than crows, but thinner with longer, narrower wings. They also have a long, distinctive, wedge-shaped tail, differing from the more fan-shaped and rounded tail of the American Crow. While Common Ravens can be spotted regularly in the more open areas of Sussex and Warren County along the Appalachian Mountain Range, they are sometimes found throughout the area, even in unexpected locations like landfills and around dumpsters.

THE RAPTOR TRUST is a private not-for-profit conservation organization in Morris County, NJ that provides free medical care to over 4,000 injured and orphaned wild birds each year. The Raptor Trust also provides educational programs both on site and throughout the area.

We receive no government support and rely on private contributions for our day-to-day survival. For more information, or to make a donation, please go to:

www.theraptortrust.org

© Alyssa Frediani, Photographer

ABOVE: *Young wild Common Raven in New York State.*

COMMON RAVEN (Corvus corax) are among the smartest of all birds. Also known as the northern raven, it is a large all-black passerine bird. Found across the Northern Hemisphere, it is also the most widely distributed of all corvids.

Lifespan 10–15 yrs; Mass 1.5–4.4 lbs; Wingspan 3.3–4.9 ft.; Length: 1.8–2.6 ft.

Did you know? Ravens have been observed undoing Velcro fasteners and unzipping zippers to steal food.

https://www.allaboutbirds.org/guide/Common_Raven/id
http://www.audubon.org/field-guide/bird/common-raven
https://www.nationalgeographic.com/animals/birds/c/common-raven/

© Photographs: INSERT by Barbara Haddock Taylor, Baltimore Sun; and TOP by John A. DiGiorgio, Photographer

***INSERT:** Guy Willey (10/3/1930 – 1/16/2017). Guy's career was dedicated to protecting the marsh and its ecosystems at Blackwater NWR. After his retirement, Guy helped to restore the Delmarva Fox Squirrel population in hishome state of Maryland. **TOP:** Matt Whitbeck speaking at Blackwater NWR*

PASSING ON THE BLACKWATER LEGACY

by Matt Whitbeck
Supervisory Wildlife Biologist, Blackwater National Wildlife Refuge

Dramatic change doesn't always start dramatically. It can often take a lifetime to see the extraordinary which is unfolding, imperceptibly, day-by-day. At Blackwater National Wildlife Refuge (NWR), located on the eastern shore of the Chesapeake Bay in Maryland, the slow breakup and conversion of tidal marsh to open water was observed and documented for six decades by my colleague and friend Guy Willey. Guy began his 33-year career at Blackwater NWR right out of high school, and remained active in protecting our local ecosystem and wildlife after his official retirement 1985. Guy was an astute observer of the natural world with an incredible memory, so I took every opportunity to talk with him about the history and landscape at Blackwater when I was assigned here in 2008.

Guy spoke of the slow changes that took place in the marshes of the Blackwater River. When he started at the Refuge, the marshes were dotted with little ponds, only flooded with saltwater on the highest tides. Some of the larger ponds bore names like "Quinn Pond" and "Cold Creek." Over the years, these isolated ponds merged as the marsh between them broke apart and converted to open water. Quinn Pond and Cold Creek are now lost to history, now part of what we know as "Lake Blackwater."

The loss of tidal marsh means different things to different people. To some, it might mean loss of nursery areas for recreationally and commercially valuable finfish and shellfish. To others, it might mean the loss of breeding habitat for specialized marsh birds like the black rail or saltmarsh sparrow. Everyone can agree that the benefits of wetlands to water quality and flood protection are critical. Bottom line—the loss of wetlands affects most everyone.

Using aerial imagery we are able to quantify some of what Guy observed over the years from the tiller handle of a johnboat. Since Blackwater was established in 1933, more than 5000 acres of tidal marsh have been lost to open water. The combination of rising sea level, subsidence (sinking land), and destructive effects of nutria (invasive rodents that feed on the roots and leaves of marsh plants) is

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PASSING ON THE BLACKWATER LEGACY

Blackwater NWR *© Whitney Flanagan,, Photographer*

responsible for the vast majority of this marsh loss. The Chesapeake Bay Nutria Eradication Project has made phenomenal progress towards eradicating nutria from the area. This is a critical step towards slowing the rate of marsh loss and allows us to think about restoration and building marsh resiliency.

To that end, The Conservation Fund and Audubon Maryland-DC helped us develop a Sea Level Rise Adaptation Plan for the Refuge. Completed in 2012, this plan spells out the changes that have been observed on the refuge over the years, looks at all of the scientific research into the cause of these changes, and uses predictive models developed by Maryland Department of Natural Resources to help understand what the future may look like.

In 2016 we were able to implement one aspect of the plan by building 30 acres of resilient tidal marsh on the refuge. With federal Superstorm Sandy relief funding, The Conservation Fund worked with Audubon Maryland-DC and the Refuge to pump mud from the bottom of the Blackwater River and place it in a thin layer across the marsh. This built up the elevation of the marsh, increasing plant vigor and increasing the longevity of the marsh. This project should be a big benefit to salt marsh obligate species like the saltmarsh sparrow.

Most importantly, this plan recognizes the dynamic nature of the Refuge's natural systems. We need to think not only about managing the current condition of these natural resources, but also their future status. The original boundary of Blackwater NWR was drawn to protect a vast system of highly productive tidal marsh that existed in 1933. With sea level rise and land subsidence we have lost much of that historic marsh, while new marsh is forming in the adjacent uplands. Dying trees at the marsh edge and the presence of old tree stumps in tidal marsh habitats provide evidence that these tidal wetlands have been migrating upslope and will continue to expand beyond Blackwater Refuge's original boundaries. Planning for where the largest tidal marshes will likely be in 2050 or 2100 is critical for the long-term viability of tidal marshes in the area.

This represents an important shift in the way we think about habitat conservation at Blackwater. Maintaining historic conditions is the benchmark for many natural resource managers. While this is clearly an important standard, recognizing the dynamic nature of these systems is becoming more important as we come to understand the impacts of climate change. Maintaining critical habitats and ecosystem services on the landscape—even if not in the exact historic location—is an important way in which we are redefining conservation.

Guy's observations, made over a lifetime of living and working in the marshes and forests of the Chesapeake Bay, provide an important lesson on the dynamic nature of these systems. In the years following his retirement from Blackwater, Guy was awarded the Distinguished Service Award (the highest honorary recognition an employee can receive within the Department of the Interior) for his exceptional contributions, and his dedication to wildlife conservation continued in many forms until his death in January 2017. My conversations with Guy about changes to this treasured landscape during his lifetime are forever imprinted in my memory, and he will be missed. Recognizing that these systems are changing and explicitly planning for these changes is essential as we move forward, and will honor Guy's legacy of protecting the unique Blackwater ecosystem.

ADDITIONAL INFORMATION:

"Passing on the Blackwater Legacy" first appeared in Redefining Conservation, a blog of The Conservation Fund: ***https://www.conservationfund.org/blog/1503-passing-on-the-blackwater-legacy***

Matt Whitbeck and The Conservation Fund's Erik Meyers have contributed to several recent articles about the

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PASSING ON THE BLACKWATER LEGACY

INSERT: *Dredged material is applied to the wetlands at Blackwater NWR to elevate the marsh and compensate for rising sea level and sinking land mass.*
TOP: *Blackwater NWR*

changing conditions at Blackwater NWR:

"Path to Improving Atlantic Flyway at Blackwater Is Filled With Mud"
http://www.bayjournal.com/article/path_to_improving_atlantic_flyway_at_blackwater_is_filled_with_mud

"At Blackwater Refuge, Rising Sea Levels Drown Habitat"
http://www.baltimoresun.com/news/maryland/bs-md-blackwater-marsh-restoration-20161231-story.html

ADDITIONAL RESOURCES:

https://www.fws.gov/refuge/Blackwater/
https://www.fws.gov/chesapeakenutriaproject/
https://www.conservationfund.org/projects/blackwater-national-wildlife-refuge-2100
https://www.conservationfund.org/projects/blackwater-national-wildlife-refuge
www.friendsofblackwater.org
https://www.facebook.com/BlackwaterNWR/

TO DOWNLOAD BLACKWATER NWR BROCHURE:

https://www.fws.gov/uploadedFiles/Region_5/NWRS/South_Zone/Chesapeake_Marshlands_Complex/Blackwater/BlackwaterBrochure.pdf

MORE ABOUT THE CONSERVATION FUND

The Conservation Fund has proven again and again that it can address the big challenges and achieve enduring change through purposeful conservation.

At the Fund, we make conservation work for America. By creating solutions that make environmental and economic sense, we are redefining conservation to demonstrate its essential role in our future prosperity. Top-ranked for efficiency and effectiveness, we have worked in all 50 states to protect more than 7.8 million acres of land since 1985.

Our focus is on conservation and communities - creating as many pathways possible for people and organizations to protect their natural resources and save the places that matter most - properties with ecological, historic and/or cultural significance. We deliver conservation and economic vitality through strong partnerships with government, business and colleague organizations.

We are independent and do not have a membership, and thus appreciate the dedicated support of a nationwide community of individuals and organizations who agree with our vision and approach. Working efficiently and effectively, the Fund devotes 96% of its annual budget directly to conservation programs and just 1% to fundraising.

https://www.conservationfund.org

HORTICULTURAL THERAPY

USING THE MAGIC OF THE PEOPLE / PLANT CONNECTION

by Joel Flagler

Agricultural Extension Agent (Professor) County Extension Dept. Head /
Rutgers Cooperative Extension of Bergen County / Rutgers University SEBS / Horticultural Therapist

Horticultural Therapy (HT) is really nothing at all new. In fact it is one of the oldest of the healing arts and has been used for thousands of years in many different cultures. In America we recognize Dr. Benjamin Rush as the Father of HT. He is also credited with being the Father of Modern Psychiatry, and a signer of the Declaration of Independence. Dr. Rush was the first to document the benefits observed in his patients who worked in the gardens and the fields, tending vegetables and flowers. Dr. Rush was known to prescribe such activity for those who were considered 'untreatable'-- and found remarkable results. Now, as then, people are better around plants. That is the whole truth.

So HT is the process and the practice and the profession that uses gardens and greenhouses and live plants in the healing and rehabilitative processes. The magic of the people-plant connection has never shown more potential and promise than it does today. The real excitement is that we are finally learning to recognize and utilize plants and the natural environment for improved mental, physiological and social health, much as our knowledge of the plant's role in medicine and nutrition has already led to improved physical health.

We are now able to prescribe horticulture for cognitive and psycho-social improvement; for individuals with PTSD, depression and Asperger's. 'Goals' is what makes HT special. Vocational, Therapeutic, and Social goals can all be addressed using plants and plant-related activities. Since they are so adaptable and diverse, plants can be available year-round to bring the unique benefits to the client/participant in a structured HT program.

Rutgers University SEBS has one of the few accredited Degree and Certificate program in the nation. HT classes are filled with registrants coming from a wide assortment of majors. HT has cross-over appeal to the people sciences (psychology, sociology) the green sciences, nutrition, exercise science, and many other disciplines. Since a humble start in 1996 when Bergen County Agricultural Extension Agent Joel Flagler delivered the first HT classes at SEBS --there has been a marked increase in interest in the people-plant connection and human issues in horticulture. The Rutgers HT Certificate program, in particular, attracts individuals from diverse backgrounds including alumni, Master Gardeners, Veterans, retirees, and career-changers.

Rutgers Master Gardeners, trained through Cooperative Extension, are assisting in the delivery of many horticultural therapy programs throughout the state. These programs are now commonplace in nursing homes, hospitals, special service school districts, corrections, and many facilities serving individuals with special needs. Cooperative Extension fact sheets and support teams assist schools and communities to create new gardens and horticultural engagement. In fact, one of the key programmatic theme area for the Rutgers Dept of Agriculture and Natural Resources (aka the Ag Agents Dept) is "Horticulture for the Health of It". This acknowledges the many layers of benefits at hand for people who participate in growing food and ornamental plants. It also speaks to the many requests for new community, therapy and school gardens coming to Extension offices statewide.

Research is what funders and the health care community understand and appreciate; anecdotal evidence is not enough. An increasingly large body of research has become available, with publications in a wide range of peer-reviewed journals. The data supports what has been observed for thousands of years. People prefer plants. People prefer settings that include plants. People are more comfortable and productive around plants. People everywhere relate to plants, as part of the overall milieu of human experience. It is a common denominator, crossing all ethnic and cultural lines. People of all ages and abilities can participate in growing plants, and adaptive-enabling tools and devices help make the horticultural experience enjoyable in the presence of physical deficits and challenges. It is this universal appreciation for plants that lends them for use in therapy and rehabilitation.

One of the most exciting new developments has been the partnership with the Veterans Administration (VA) Medical Center in Lyons, NJ. This 350 acre facility serves Veterans of all ages with a wide array of capabilities and needs. Our first HT program started there in 2015 in the secure unit known as Sunshine City, serving Veterans with Alzheimer's disease and dementia. Several other programs quickly followed, including a popular one in the Community Living Center for male and female Veterans. The Rutgers SEBS HT interns who created these programs are Althea MacDonald, Gary Altman, and Linda Brown-Kuhn. Joel Flagler, Rutgers Agricultural Extension Agent and Professor of HT at Rutgers SEBS has provided supervision and direction, with ongoing support from Dr. Don Kobayashi, Chair of the SEBS Dept. of Plant Biology. At the VA there are also programs and gardens for the hospice unit called Promise House, and the Domiciliary—a residential treatment program for homeless Veterans. A singular opportunity arose last year when care was needed for a large indoor atrium filled with tropical trees and plantings. The Rutgers interns use this peaceful oasis garden year-round to teach hands-on horticultural skills to the Veterans in that unit, providing career-readiness and awareness.

Veterans have embraced the chance to work with plants both inside and out. For high-functioning individuals the choices of plant- related activities are endless. They are growing food in raised beds outside and building confidence as their efforts reap tangible rewards.

For more challenged and regressed Veterans the sensory

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HORTICULTURAL THERAPY
USING THE MAGIC OF THE PEOPLE / PLANT CONNECTION

stimulation (tactile, olfactory), improved focus, and memory stimulation can be important goals. Additional goals for these groups include improving hand strength and dexterity, mental stimulation, socialization and orientation in time and season. In 2016 the HT programming expanded to the Women's Sexual Trauma Unit (one of a handful of such units in VA facilities nationwide). Plant care and nature craft engage the participants as they savor their successes with plants, which help lead to other successes in their lives.

In fall of 2016 the Rutgers interns were invited to present at national conferences in Dallas and Los Angeles for the VA Arts, Health, and Well-Being Project being implemented at Veterans medical facilities throughout the country. All expenses were paid plus speaker honoraria were provided, and the Rutgers interns shared the story of their N.J. successes with hundreds of others.

Another recognition for the Rutgers SEBS program focused on Amanda Rodriguez-Mammas, a 2016 graduate. She was awarded the prestigious Linda Ciccantelli Memorial Scholarship from the Mid-Atlantic Hort Therapy Network. Amanda contributed greatly to the HT program at the Douglass Developmental Disabilities Center on campus, enriching the program for young adults with autism. She also completed an internship at NYU Langone Medical Center Rusk Institute of Rehabilitation. Today Amanda is with the Visiting Nurse Association of Somerset Hills.

New for 2017-2018 is another grant from the VA administration to expand HT into their E.Orange Medical Center facility, addressing the needs of Veterans with spinal cord injuries. The newest interns who will deliver the new programming are, indeed, Veterans themselves. They are Theresa Schneider and Lyon Henry. Both are completing their HT Certificate at Rutgers and will bring much to the VA program. The newest round of funding speaks to the high value the VA places on therapeutic horticulture, as part of the overall treatment for Veterans. Using plants in the healing and rehabilitative processes makes good sense, and it works; even when other interventions fail---as an increasingly large body of research attests.

Also new in 2017 are partnerships being forged with The Center For Discovery in Monticello, serving a wide range of clients and students with developmental disabilities. They do this on 1,000 acres of farmland and grow, bake and consume only fresh & high-nutrition foods. This is a wonderful new linkage, and they welcome Rutgers interns who will bring HT to the mix--as another opportunity for treatment, and training, and personal discovery.

ADDITIONAL RESOURCES

Horticultural Therapy Certificate Program at Rutgers SEBS: ***http://plantbiology.rutgers.edu/horttherapy/***

American Horticultural Therapy Association: ***http://www.ahta.org/***

Photo courtesy of Dorothy Feske/USFWS

NEW ENGLAND COTTONTAIL
UPDATE: NYS DEC CONTINUES SURVEYS

From Wildlife, Fish, and Marine Life Newsletter:

"This winter, DEC staff in the Capital Region (Region 4) will be surveying sites potentially used by the New England cottontail, which are listed as "special concern" in New York. They are also the only native cottontail in the state east of the Hudson River. Since New England cottontail do not hibernate, winter is a perfect time to collect pellet samples, which are then sent for DNA analysis. The pellets are easier to see on the snow, and the colder temperatures preserve DNA.

New England cottontail prefer dense, shrubby areas within forested habitats, which are scarce in New York due to development that destroys or fragments their habitat. While crawling through thick, often thorny brush isn't glamorous work, the monitoring efforts contribute valuable information about cottontail distribution. Results from last year's surveys identified New England cottontail at two sites, including a new site close to the newly acquired Doodletown Wildlife Management Area (WMA)....."

Over the last 50 years the range of this once-common native rabbit has shrunk and its population has dwindled. A critical threat is the loss of habitat, rabbits don't generally live in older woods. NYS DEC's Young Forest Initiative is helping to create much needed young forest thickets on WMAs for the New England cottontail and a variety of other species.

So what is a "Young Forest"? A Young forest is an early stage of forest with tree seedlings, saplings, woody vines, shrubs, grasses, and flowering plants grow together. Young forests are approximately 0-10 years old. Historically, young forests were created by natural disturbances (fire or flooding, insect outbreaks, changes to the landscape by beavers, or human activities, such as logging and farmland abandonment). DEC will create patches of young forest through timber cuts; use responsible forest management techniques to create gaps in the tree canopy so sunlight can reach the forest floor and spur the regeneration of shrubs, woody vines, and tree seedlings needed by a variety of wildlife species.

RESOURCES:
https://content.govdelivery.com/accounts/NYSDEC/bulletins/1cbe952
https://newenglandcottontail.org/
http://www.dec.ny.gov/outdoor/104218.html

WE ARE FAMILY

Have you heard of a "murder of crows?" A "gaggle of geese?" Have you often wondered what other animal families are called? Southwest Wildlife Conservation Center, has several animal families with rather unique names. Some species have more than one term to describe their family:

Foxes: Leash, Skulk, Earth, Band, Troop

The term "skulk" may be used for any animal considered vermin, but it is especially associated with foxes in Europe and Great Britain due to their high numbers. At Southwest, they are some of our staff and volunteers' favorites!

Coyotes: Band, Pack, Rout

Coyotes are members of the Canidae family and share a lot of the same traits as their relatives: wolves, dogs, foxes, and jackals. We love it when our pack sings at Southwest!

Raccoons: Gaze

Raccoons are sociable animals within the family group. It's clear from this photo, why their family is called a gaze.

Skunks: Surfeit

A skunk can spray 10 feet with accuracy. It also can control just how much they spray. They may be little stinkers, but we love them.

SOUTHWEST WILDLIFE CONSERVATION CENTER / SCOTTSDALE, ARIZONA
SAVING WILDLIFE, ONE LIFE AT A TIME
www.southwestwildlife.org

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BLACK BEAR ENCOUNTERS

DISCOVERING NATURE

© John A. DiGiorgio, Photographer

DID YOU KNOW? The calluses (keratinized portion) on the pads of a black bear's feet are shed each year during it's late winter dormancy. The new pads are sensitive and may bleed when the emerging bear first walks on them.

http://bearstudy.org/website/images/stories/Publications/Shedding_of_Foot_Pads_by_Black_Bears_During_Denning.pdf

mother's every move and learning by imitating her.

Cubs are born in den during January or February and are utterly helpless. By late March or early April when the family leaves the den, the cubs at three months old, weigh about 10 pounds. Now in the fall, weighing 60 – 70 pounds, enough to survive their first winter, they would be denning with their mother shortly, for the last time. In fact, the family would be disbanding the following summer, as their mother would again be ready to breed.

Black bears breed in June and July. It is not until the fall, however, that the fertilized eggs attach themselves to the female's uterine wall and begin to grow. Implantation takes place only if the female has gained enough weight to assure sufficient production of milk for the litter's survival. If not, the pregnancy will self-destruct.

Black bears are pretty tolerant of humans and "our" bear family spent a leisurely afternoon by the creek. Never showing any signs of being disturbed or threatened, they allowed us to observe them for over an hour before finally disappearing.

Black bears are shy, intelligent and exceptionally adaptable. Given a chance, they can live near us without much conflict. If we are tolerant and educate each other about the ways of black bears, the realty of the threat they pose is small. I feel fortunate for having encountered and been able to observe them as often as I have.

Our forests would be empty without them!

THE DELAWARE VALLEY EAGLE ALLIANCE

working towards the conservation of our wildlife and natural resources

ABOUT US

The Delaware Valley Eagle Alliance is a 501 (C)(3) not-for-profit organization; our mission: to increase awareness, understanding and promote conservation of our wildlife and the natural environment.

We believe that raising awareness and understanding will change attitudes toward conservation and our natural resources. We are committed to this because we believe that it is essential to enabling all life to exist and prosper on Earth.

We are dedicated in our focus to bring awareness through our publications, projects and programs.

John A. DiGiorgio, Chairman and President
Richard Crandall, Director and Vice President
Yoke B. DiGiorgio, Director and Treasurer
Debra Reimer, Secretary

THE *NATURE'S NEWSLETTER*

Facilitating the free access and exchange of information of critical issues in the world today; to educate, inspire and empower all to take part and take action to enable all life to exist and prosper on Earth.

PROJECTS AND PROGRAMS

We are available to work closely with biologists and conservation groups to document ecological and wildlife research on rare, sensitive and endangered wildlife and environmental issues. We collaborate with communities and other organizations to develop and organize wildlife and environmental educational and entertaining programs.

SUPPORT

The Delaware Valley Eagle Alliance grew out of a grassroots effort of individuals to help protect our wildlife and habitat. Our organization depends on individuals and organizations who share our concern for wildlife and the environment. Our publications, projects and programs would not be possible without the generosity of our supporters and sponsors.

For more information and/or to make a tax deductible donation please contact Yoke Bauer DiGiorgio at: yokedvea@gmail.com; or call 201-841-5168

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