



# The Swamp Scene

friends of great swamp national wildlife refuge

ISSUE FORTY EIGHT  
JULY 2015

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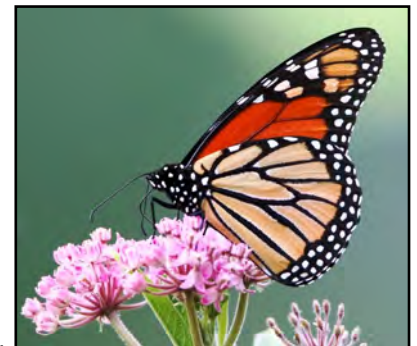


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## WORKING TO SAVE THE MONARCH

By Kathy Woodward

When U. S. Fish and Wildlife Service (USFWS) declared monarch butterflies a “species of concern” in February, 2015, Dan Ashe, Service Director stated, “To save monarchs, we all need to take action today.” Friends of Great Swamp NWR and Refuge staff wasted no time in moving to action. They decided to make monarchs the theme for Fall Festival, 2015, with related displays, activities and information. Outreach events during the spring focused on sharing information about the iconic orange-and-black butterfly.



Monarch (Photo by Robert Lin)

Core to monarch survival is milkweed and specific nectar plants. Great Swamp NWR has an abundance of several varieties of native milkweed and many of the necessary flowering plants. But Friends and staff grabbed an opportunity to create specific habitat for monarchs at the sharp bend on Pleasant Plains Road. The soil in this area was already disturbed because of tree debris removal, so volunteers seeded the half acre with a special pollinator mix. Volunteers are also creating a small demonstration garden near the entrance to the Nature Detective Trail.



Volunteer Dorothy Smullen (in red) explains the new Monarch Demonstration Garden (Photo by Carl Woodward)

The situation with monarchs is dire. Estimates are that the monarch population has declined by 90% in the last 20 years. The reasons are complex. These butterflies fly up to 3,000 miles from their summer homes across the United States, to wintering grounds on a few acres of mountain tops in Mexico. A lot can go wrong on the journey. Milkweed is the only plant on which the monarch lays eggs and milkweed is the only plant that the monarch caterpillar eats. Agricultural and landscaping practices have drastically reduced milkweed. USFWS, working with partners and the public, has committed to restore and enhance more than 200,000 acres of habitat—in public lands, highway rights-of-way, schoolyard gardens, urban parks and backyards—with native plants that will support butterflies.

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Swamp milkweed

You can help in this effort by learning more about monarchs, assisting with habitat renewal and sharing our enthusiasm for a conservation effort where what we do can make a difference. For more information visit: [www.fws.gov/savethemonarch/](http://www.fws.gov/savethemonarch/)

### VOLUNTEERS CONSTRUCT NEW TRAIL

In order to expand the number of recreational opportunities for visitors, the Friends are spearheading the construction of a new trail at the Visitor Center. The trail, about a mile in length, will wind through fields, forest, and brushland providing access to a



Volunteer clearing brush


variety of habitats and a corresponding diversity of wildlife. While flagging the trail this month, volunteers enjoyed hearing a number of bird species, tripped over a

box turtle, startled a garter snake, identified butterflies, and enjoyed a variety of wildflowers and blooming shrubs.

But there is a lot of work to be done. In April, a corporate work group from BASF started clearing the trail by cutting a path through the thicket of young saplings growing in the field. A second work group, from Brother Corporation International, continued cutting the brush to complete that section of the trail at a massive, specimen white oak. There are several ditches along the trail and volunteer George Solovay and his team are constructing bridges to provide easy crossing. This requires design work, cutting the wood for the bridges, carting the wood to the crossing site, and then putting together the actual structure. Still to be done: putting up trail markers, clearing and marking the path through the woods, mowing a trail through the



George Solovay (left) and team construct the bridges.

meadows, putting up posts with blazes, and constructing bog bridges to cross smaller wet areas. Once the trail is completed, there will be regular maintenance required. If you are interested, plan to attend one of our volunteer orientation sessions to learn more. 

### GREAT SWAMP NWR TEAMS UP WITH NATIONAL PARK TRUST IN NEWARK OUTREACH




Great Swamp NWR Visitor Services staff teamed up with National Park Service, National Park Trust, Newark Public School System, New Jersey Historical Society, and several other partners to spend a day with 200 City of Newark school children at an event titled, “Kids to Parks Day National Kickoff”.

Jonathan Rosenberg, David Sagan, and Jerfelis Pimentel represented U.S. Fish and Wildlife Service and engaged the students with a variety of fun and educational activities.

Six different groups rotated for 25 minute long sessions. The students:

- learned how fast buffalo run on their hooves with a bison race,
- improved habitat observation skills by describing objects they saw within a hula hoop placed on the ground,
- tested their scientific skills with a game called heads and tails where they had to match real tails of mammals to their respective pictures,
- gained an appreciation for birds by learning cool facts about hummingbirds and by comparing their wing-

spans with that of several raptors. Other activities held that day included a scavenger hunt, yoga, an introduction to the process of inventing, line dancing, as well as building seed balls the students were able to take home and plant at their own houses. It was a rewarding day for the students and the staff. 



### DO YOUR PART FOR CONSERVATION—BUY A FEDERAL DUCK STAMP

It's not about hunting. It's actually about buying habitat for waterfowl—and for the songbirds and other wildlife that benefit. Stamp sales, which are used to buy land for refuges, have declined over the past 30 years, a loss of more than

\$10 million annually. Less habitat, fewer birds.

Unlike hunters, birders, photographers, and those who enjoy nature are not required to purchase the stamp, but we all enjoy the benefits of wetlands and refuge lands.

It's really simple. If wetlands become housing developments, shopping malls, and corn and soybean fields, there are fewer birds of any kind. We all have to do our share. Stamps are available at the Helen C. Fenske Visitor Center, open daily.



## WOOD TURTLE HEAD-START PROJECT MOVING FULL SPEED AHEAD IN 2015

By Colin Osborn and Kurt Buhlmann

This spring we broke the 100 mark with the return of our 28 head-starts from Bristol County Agricultural High School in Dighton, MA. To date, we have reintroduced 22 for Cohort 1 (2011s, released late May 2012), 24 for Cohort 2 (2012s, released late May 2013), 28 for Cohort 3 (2013s, released late May 2014), and now 28 for Cohort 4 (2014s, released late May 2015)—giving us a total of 102 released at the Refuge! The public got a chance to meet some of these Cohort 4 "celebrity" turtles as they were welcomed home at the annual Endangered Species Day program on May 23, hosted by the Refuge and the Friends of



From 2011 Cohort, head-start turtle (left) and direct release sibling (right)

Great Swamp. A subset of 6 (21%) of these Cohort 4 turtles have been fitted with radios this year, one from each female who contributed hatchlings to the head-start program last year. Along

with them, we have 7 radios on Cohort 1 turtles (32% of the cohort total), 7 radios on Cohort 2 turtles (29% of the cohort total), and 3 radios on Cohort 3 turtles (11% of the cohort total). This summer, biological intern Dan Hannon will be working hard tracking all of these individuals on a regular basis.

As of the writing of this article, wood turtle nesting season has finished and we have protected a total of eight nests. So as usual, come August, we should have a good batch of hatchlings for the high school students to raise during the winter months. We will also release (direct-release) a number of them to hibernate during the winter on the refuge.

Perhaps the most exciting discovery this year has been the recapture of a 2011 direct release individual. Turtle #457 was found in April and is only the second direct release that we've ever seen in a subsequent year and is the first direct release that we've ever seen more than a year after it was born. It was comparable in size to one of the recently released Cohort 4 head-starts (remember that head-starting advances the turtles by about 3-4 years in size and mass!) and was now large enough to carry a radio transmitter. It is being tracked along with the aforementioned 23 head-



Kurt Buhlmann holding wood turtle Female 26 (left) and her offspring from the 2011 Cohort. Female 26 is carrying a clutch of eggs which will be part of the 2015 Cohort.

starts and should provide some interesting comparative data—especially to the head-starts that are its same age (Cohort 1) and similar in size (Cohort 4). Also this spring, we have recaptured several head-starts that were not previously radio-tagged and have added them to the pool of tracked individuals.

As always, we thank the Friends of Great Swamp NWR for their generous and consistent funding of this groundbreaking project.

### RANGER DAVE IS MOVING ON

He came for two years ... and stayed for more than four, but now Dave Sagan has accepted a new position as Partners Biologist at Silvio O. Conte NWR in the 7.2 million acre Connecticut River Watershed. He is looking forward to working with individuals, communities, and many partners across four states to promote conservation ethics, provide environmental education, and encourage and support habitat restoration on public and private lands.

He reflects: Great Swamp is an awesome Refuge; how much he appreciated and admires the strong volunteer and partner base here at Great Swamp; what a strong team the staff and Friends are together; how much this refuge is loved by the community and supported by Friends members and volunteers. Some of his most rewarding experiences have been with school groups, exposing young people to nature for the first time, and watching their eyes light up when they see a snapping turtle slowly rising from the muddy bottom. Dave will be sorely missed; he was generous with his time, his expertise, and his smile. We wish him well as he moves on in his career.



## U.S. FISH AND WILDLIFE SERVICE NEWS STORIES

*Credit: U.S. Fish and Wildlife Service, Friends Newswire; Photos: USFWS*

### FOR THOSE WHO ARE COUNTING—MOUNTAIN BOGS NATIONAL WILDLIFE REFUGE IS NUMBER 563!

The new Mountain Bogs National Wildlife Refuge in western North Carolina, formally established in April, is devoted to the conservation of southern Appalachian mountain bogs, one of the rarest and most imperiled habitats in the United States.

Mountain Bogs Refuge is the nation's 563<sup>rd</sup> national wildlife refuge. North Carolina is home to 11 refuges; Mountain Bogs Refuge is the first one west of Charlotte.

"The establishment of Mountain Bogs National Wildlife



Bog Turtle

Refuge marks a turning point in the efforts of a number of dedicated partners in preserving this unique and

threatened habitat," said U.S. Fish and Wildlife Service Deputy Director Jim Kurth. "It will provide a focal point for mountain bog conservation in the area, and highlights the importance of our National Wildlife Refuge System in preserving our nation's spectacular biodiversity for future generations of Americans."

The Nature Conservancy donated an easement on a 39-acre parcel in Ashe County, which formally established the refuge.

Less than 20 percent of the mountain bogs that once existed still remain. They are typically small and widely scattered across the landscape, often isolated from other wetlands. Important to wildlife and plants, mountain bogs are home to five endangered species – bog turtles, green pitcher plant, mountain sweet pitcher plant, swamp pink, and bunched arrowhead.

Bogs also are habitat for migratory birds and game animals, including mink, woodcock, ruffed grouse, turkey and wood duck. They also provide key benefits by their natural capacity for regulating water flow, holding floodwaters like giant sponges and slowly releasing water to nearby streams, decreasing the impacts of floods and droughts.

Bogs are breeding habitat for many species of amphibians, especially salamanders, of which the Southern Appalachians have the greatest diversity in the nation.

The refuge may eventually grow to 23,000 acres, depending on the willingness of landowners to sell and the availability of funds to purchase lands. To guide acquisition of land and conservation easements and bog conservation in general, the Service has identified 30 sites—or Conservation Partnership Areas—containing bogs and surrounding lands.



Swamp Pink

Funding to acquire land and easements would likely come from the Land and Water Conservation Fund, funded by fees collected from the sale of publicly-owned offshore oil and gas drilling leases.

More information may be found at: <[www.fws.gov/mountainbogs](http://www.fws.gov/mountainbogs)>.

### TWENTY MOST-VISITED REFUGES

National wildlife refuges attracted almost 47 million visitors in fiscal year 2014. According to the Refuge Annual Performance Plan, here are the 20 most-visited refuges:

- 1 – Oregon Islands National Wildlife Refuge, Oregon
- 2 – Havasu National Wildlife Refuge, California/Arizona
- 3 – Upper Mississippi River National Wildlife and Fish Refuge, Minnesota, Wisconsin, Iowa and Illinois
- 4 – Wichita Mountains Wildlife Refuge, Oklahoma
- 5 – Pea Island National Wildlife Refuge, North Carolina
- 6 – Chincoteague National Wildlife Refuge, Virginia
- 7 – Merritt Island National Wildlife Refuge, Florida
- 8 – Kenai National Wildlife Refuge, Alaska
- 9 – Crab Orchard National Wildlife Refuge, Illinois
- 10 – J.N. "Ding" Darling National Wildlife Refuge, Florida
- 11 – Wheeler National Wildlife Refuge, Alabama
- 12 – Don Edwards San Francisco Bay National Wildlife Refuge, California
- 13 – National Elk National Wildlife Refuge, Wyoming
- 14 – Cape Meares National Wildlife Refuge, Oregon
- 15 – Horicon National Wildlife Refuge, Wisconsin
- 16 – Great Meadows National Wildlife Refuge, Mass.
- 17 – Kilauea Point National Wildlife Refuge, Hawaii
- 18 – Hanalei National Wildlife Refuge, Hawaii
- 19 – Okefenokee National Wildlife Refuge, Georgia
- 20 – Tennessee National Wildlife Refuge, Tennessee

## BEAVERS ON THE PASSAIC RIVER

By Leo Hollein, Volunteer

Beavers have been present on a section of the Passaic River that separates Lord Stirling Park from the Great Swamp National Wildlife Refuge for at least six years. Their dam is a few hundred yards upstream of the namesake white bridge on White Bridge Road. They built two lodges not too far



Section of beaver dam on Passaic

upstream from the dam. The dam and these lodges are difficult to access. In 2014 the beavers built a very large lodge in front of the Lord Stirling Park's East Observation Tower. The best place to view the lodge is from this tower that can be reached by following the well-marked paths from the Lord Stirling parking lot. Maps are available at the trail head.

The North American Beaver (*Castor canadensis*) is the largest rodent in North America. Beavers continue to grow throughout their lifespan, which averages about 20 years in the wild. They reproduce only once a year. Adults on average weigh about 40 pounds and are over three feet long. These semi-aquatic herbivores have webbed hind feet, large incisors and a broad flat scaly tail that is slapped on the water to warn others of danger. Beavers live in family groups made up of a breeding male and female and their juvenile offspring. They are primarily nocturnal. Beavers do not hibernate and are active all year long.

Beavers were eliminated from much of their range in the late 1800s by unregulated trapping to harvest their lustrous

fur that was prized for clothing. They are now common in much of their former range due to the combination of a decline in demand for their pelts and wildlife management. Beavers are best known for building dams which create ponds that beavers can use for their lodges. The photo (left) shows part of their dam on the Passaic River. These dams create wetlands that provide habitat for a variety of wildlife.

The photo below is a picture taken of the large domed beaver lodge. The lodge is made of mud and sticks and is robust enough to withstand break-in attempts by coyotes or bears. The lodge has an underwater entrance that also deters predators from entering their living quarters. Beavers use the safety of their lodge during daylight hours and to escape from potential predators. It is also where beavers have their young and spend the winter. This photo was taken in the fall. It shows a large pile of sticks and branches to the left of the lodge—food gathered for the winter and stockpiled within easy reach of the lodge. The pile was gone in the spring.

Beavers fell trees for building material and food. They also girdle trees for food. The bulk of the beaver's diet is made up of tree bark and cambium, the soft tissue that grows under the bark of a tree. They



especially like the bark of maple, birch, aspen and beech trees which are common in the Refuge. They also eat a variety of aquatic vegetation. When beavers fell a sapling, they leave visible teeth marks on a cone shaped stump. They consume the bark and small branches. The remaining wood is used in building dams or lodges. Beavers also girdle large trees by gnawing a wide strip of bark and cambium around the circumference of the tree. This tree eventually dies allowing sunlight to penetrate the forest floor stimulating the growth of saplings that will, in time, provide more food for the beavers.

It is exciting that signs of these iconic animals in the Refuge are present for all to view. Take the opportunity to hike to the tower to view the lodge and harvested trees.



## VOLUNTEERS ARE RECOGNIZED FOR THEIR MANY CONTRIBUTIONS TO GSNWR

*Photos by Carl Woodward*



The 29th annual Volunteer and Friends Recognition Event was held on Saturday, June 6, 2015 to recognize and celebrate the exceptional contribution of volunteers and Friends to Great Swamp National Wildlife Refuge. This year the event was again held in the Richard J. Guadagno Pavilion. Ninety volunteers, staff, interns, and guests enjoyed a buffet dinner followed by the awards ceremony.

Friends President Elaine Seckler (shown left) and Visitor Services Manager Jonathan Rosenberg presented the certificates and milestone awards to volunteers. Visitor Services Specialist Dave Sagan concluded the program with thanks to all of the volunteers for their help in so many different areas of the Refuge—habitat and wildlife, visitor services, maintenance, and Friends administration. He thanked all volunteers and Friends for being so dedicated, enthusiastic, and generous with their donation of time to Great Swamp National Wildlife Refuge. Volunteers really do make a difference!



100 Hour Club (left to right) Kathie Willwerth, Alex Schmidt (front), Barbara Whitmore, Ellen Greenhorn (front), Brian Osborn, Jim Marquis, Maryann Higgins



Volunteers enjoy a delicious buffet dinner under sunny skies and perfect temperatures.

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### NOTABLE VOLUNTEER MILESTONES

#### 100 HOUR CLUB

Caroline Beardsley, Dan Boston, Lois Boston, Ellen Greenhorn, Maryann Higgins, Bill Koch, Jim Marquis, Jim Mulvey, Brian Osborn, Alex Schmidt, Barbara Whitmore, Kathie Willwerth

#### 250 HOURS

Joe Balwierczak, John Berry, Jen Dawson, Georgia Eisenhart, Greg Henderson, Bill Koch, Lorrie Lane, Joe Nally, Emily Scully, Rachel Swanwick, Walter Willwerth, Luke Wlasniewski

**500 HOURS:** Betsy Boles, Teri Catalano, Elaine Taub, Justin Bower, Samantha Neuman

**1,000 HOURS:** Nancy Felicito, Elaine Seckler, Melissa Gallo, Megan Spindler, Casey Wagnon

**1,500 HOURS:** Randi Emmer, George Solovay

**2,000 HOURS:** Nancy Schenck

**3,500 HOURS:** Laura Nally

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*Feeling gratitude and not expressing it is like wrapping a present and not giving it.*

~William Arthur Ward

## REFUGE VOLUNTEERS AND FRIENDS DONATE 13,240.5 HOURS IN FISCAL YEAR 2014

*Listed below are the active volunteers with the total number of hours contributed since becoming a volunteer (through March 31, 2015)*

Sonya Ahamed (3.5)	Rich Dufort (794)	Helen Hoffman (217.5)	Chris Petrillo (105)
James Ahlstrom (31)	Sarah Dunham (2)	Bob Hofmann (405)	Gail Petrillo (136)
Patrick Ambrosio (20)	May Duttenhoeffer (20)	Victoria Hogg (1.5)	Louis Pisane (3,688.5)
Garry Annibal (43.5)	Tyler Eccles (10)	Leo Hollein (4,404)	Sandra Pruzansky (120.5)
George Apgar (31.5)	Georgia Eisenhart (256)	Linda Jadach (6)	Gail Rapaport (578)
Joann Apgar (290.5)	Randi Emmer (1,746.5)	Nanying Jia (1.5)	Marjorie Remeika (544)
Fabian Aquino (4)	Karen English (2,482.5)	Sue Kander (38)	Brett Riggi (3)
Pete Axelrod (409.5)	Christine Epp (3)	Brian Katz (14)	Edythe Risberg (1,306.5)
Joseph Balwierczak (429.5)	Nancy Felicito (1,053)	Charlie Keating (17)	Carolyn Rubinfeld (54)
Caroline Beardsley (103)	Paul Fenske (672.5)	Sara Ketelsen (11)	Michael Rubinfeld (12)
Jane Bell (36.5)	Andrew Ferreira (1,082.5)	Missy Klingenburg (83.5)	Michael Sagan (32)
Imen Ben Niticha (9)	Don Florio (47)	Neil Klingenburg (708.5)	Deb Scala (1,718.5)
John Berry (327)	Paul Ford (306)	Mary Ann Kluiber (76.5)	Joe Scala (408)
Daniel Bertram (1.5)	Alyssa Frediani (508)	Bill Koch (455.5)	Nancy Schenck (2,120)
Ian Bertram (4)	Charlie Friedman (49.5)	Lauretta Koch (7)	Alex Schmidt (108.5)
Maira Blake (48)	Susan Garretson Friedman (2,315.5)	Shmuel Korengut (49.5)	Judy Schmidt (6,614)
Betsy Boles (573)	Melissa Gallo (1,005.5)	Alice Koster (7)	Mary Ann Schmit (43)
Dan Boston (119)	Pat Garvin (1,150.5)	Melene Kubat (9)	Stephen Schoeman (1.5)
Lois Boston (121)	Morris Germansky (5.5)	Peter Kubat (13.5)	Joyanne Schoeman (1.5)
Brenda Bourassa (11.5)	Jim Gilbert (13)	Zaven Kubat (13.5)	Ben Schumer (1.5)
Justin Bower (500)	Lynda Goldschein (22)	Terry Kulmane (50.5)	Ginnie Scott (37.5)
Barry Bowman (1.5)	Russell Gonier (30.5)	Bonnie Kushnerick (109.5)	Emily Scully (487.5)
Dennis Branden (1009.5)	Charles Gould (225)	Sue Lamothe (7)	Elaine Seckler (1,125.5)
Eloise Branden (358.5)	Laurel Gould (8,562.5)	Andy Lamy (12)	Donna Sharpe (43)
Ann Breault (10)	Eduardo Goya (9)	Lorrie Lane (265)	Gina Smith (165.5)
John Breault (409)	Ellen Greenhorn (134.5)	Bonnie Langdon (26.5)	Bill Smullen (164.5)
Maggie Brucker (19)	Steve Gruber (686)	Schwinne Lee (1)	Dorothy Smullen (3,157)
Bridget Burns (5.5)	Jim Halsey (1.5)	Robert Lin (38)	George Solovay (1,608)
Ann Campbell (60)	Mary Beth Hansbury (182)	Daria Lisco (28.5)	Megan Spindler (1,000)
Mark Canavan (33)	Anne Hebenstreit (238)	Ruth Lloyd (791)	Janet Stadelmeier (90)
Terry Carruthers (181)	George Helmke (1,042)	Ray Lord (206)	Chris Stadtmueller (285)
Teri Catalano (540)	Greg Henderson (287)	Jim Marquis (99.5)	Matt Steffens (174.5)
Janis Cole (228)	Ernie Mazzarisi (33.5)	Judy Marsh (15.5)	Kent Stevens (64)
Lora Cooper (68)	Justin Henry (18.5)	Denise Meyer (15)	Ed Sullivan (65.5)
Jennifer Dawson (253)	Mayra Henry (12.5)	Betty Mills (14)	Rachel Swanwick (480)
Lee Delitzscher (132.5)	Anna Herbotzheimer (6)	Zulefika Mofokeng (14)	Elaine Taub (503.5)
Danny Dente (76.5)	Jack Higgins (1,869.5)	Ruth Morgan (820)	Andrew Tsai (20)
Jim Detizio (1,320.5)	Maryann Higgins (104)	Evelyn Morton (35)	Casey Wagnon (1,000)
Judi DiMaio (192)		Bridget Mracek (292)	Mary Jane Walsh (340.5)
		David Mracek (1,618.5)	Kevin Ward (83.5)
		Fiona Mulvey (14.5)	Olivia Ward (3)
		Jim Mulvey (148)	Esther Warner (411)
		Wendi Mulvey (30)	Larry West (189.5)
		Joe Nally (263.5)	Elaine Weyuker (151.5)
		Laura Nally (3,604)	Barbara Whitmore (130)
		Susan Nanney (21)	Chuck Whitmore (1,017)
		Samantha Neuman (527.5)	Kathleen Willwerth (122)
		Amanda O'Connor (6.5)	Walter Willwerth (323)
		Arlene O'Connor (6.5)	John Wilmot (1,699.5)
		Bonnie O'Connor (28)	Luke Wlasniewski (480)
		John O'Connor (15.5)	Carl Woodward (581.5)
		Kristen Oplinger (39.5)	Kathy Woodward (5,727)
		Brian Osborn (107)	Don Young (1)
		Claudia Osborn (181)	
		Peter Osborn (174)	
		Tom Ostrand (179.5)	
		Jane Parks (4)	
		Candace Paska (620)	
		Jennifer Percival (4)	



**MILESTONE AWARDS (left to right)**

500 hours: Teri Catalano, Elaine Taub

1,000 award recipients: Nancy Felicito, Elaine Seckler

## EVALUATING BIRD COMMUNITIES USING EARLY SUCCESSIONAL HABITATS

By Meta Griffin, Graduate student, Frostburg State University, Frostburg, Maryland

As the summer begins, I can already tell that this is going to be a fantastic first field season at Great Swamp! The refuge is very welcoming with an incredible group of staff and Friends group volunteers. I am very excited for what the next two years hold in store for me here.



The goal of my project is to provide the refuge with data on the bird communities that are using early successional habitats. Many bird species that breed in early successional habitat

have become conservation concerns due to population declines. At present, the refuge manages 315 acres of wet meadow/brushland, and 350 acres of grassland habitats through staggered rotation mowing (1-8-year cycles). This research will allow us to determine the most beneficial rotational cuts for focal bird species and make informed management recommendations.

Since early May, I have been conducting point count surveys for birds in the refuge's grassland and brushland management units. During the summer I will also conduct vegetation surveys at each point count location to link species presence with habitat characteristics. This will allow us to see if any bird species have preferences for specific habitat characteristics. In addition, I will also be conducting nest searches and then monitoring nests to determine the benefit of these habitats to breeding birds. In total, I have 90 point count locations and have already located nests for five

bird species (yellow warbler, common yellowthroat, gray catbird, song sparrow, and swamp sparrow). Some of the most common bird species recorded during point count surveys have been gray catbirds, yellow warblers, common yellowthroats, blue-winged warblers, and Eastern towhees.

In the coming fall, I will return to Frostburg State University in Maryland to continue work on my master's degree and begin analyzing the collected data. Next summer I will be back at the refuge for a second field season.

This research project would not be possible without the generous support of the refuge and funding from the U.S. Fish and Wildlife Service. I am extremely grateful for all of the support from the refuge staff, Friends volunteers, and Frostburg State University. I look forward to working with the amazing group of people here over the next two years.

## A RESEARCH STUDY OF CARNIVORES AND THEIR PREY AT GREAT SWAMP NWR

By Casey Wagon, Graduate student, Frostburg State University, Frostburg, Maryland

In April 2013, I humbly accepted a graduate position at Frostburg State University focusing on carnivore camera trap surveys and food habit studies at Great Swamp National Wildlife Refuge. The primary objectives of my study were to: 1) evaluate carnivore detection patterns on/around the refuge's five wetland impoundments using camera trap surveys; and 2) determine the degree of predation on waterfowl by analyzing scat samples of carnivores.

During the course of my camera trap surveys (May 2013- Feb. 2015), I detected more than 40 vertebrate species on the refuge, including a plethora of bird species, several small mammals, and three turtle species. Of the nine carnivores officially documented at the refuge (raccoon, red fox, grey fox, coyote, mink, river otter, striped skunk, long-tailed weasel, and black bear) eight

were detected during my camera surveys. I also had detections of the only marsupial predator in North America, the Virginia opossum. The only carnivore not detected during surveys was the grey fox.

Over the duration of my camera surveys, I collected 8,698 independent detections of all nine predator species. An independent detection was arbitrarily defined as a lapse of more than 60 minutes between two images of the same species at a site. Raccoon ( $n = 4,432$ ) and red fox ( $n = 3,477$ ) accumulated the majority of detections, and although thought to be common, striped skunks were only detected three times during the preliminary phases of the study. Otters ( $n = 373$ ), opossum ( $n = 170$ ), and coyote ( $n = 106$ ) were not as frequently detected as red fox and raccoon, but were common around im-

poundments. Mink ( $n = 87$ ), black bear ( $n = 46$ ), and long-tailed weasel ( $n = 4$ ) were the least commonly detected predators. Also, 75 images collected from camera surveys documented predation events by red foxes. Of the food items that could be identified in the images ( $n = 44$ ), 66% were mammals (primarily muskrat and other small mammals), 18%, were avian prey (at least three being positively identified as a waterfowl species), 14% were an egg, and 2% were a fish (carp).

In addition to camera surveys, I collected 283 scat samples from five carnivores [otter ( $n = 123$ ), red fox ( $n = 74$ ), raccoon ( $n = 40$ ), mink ( $n = 23$ ), and coyote ( $n = 23$ )]. Each scat sample was analyzed for residual prey remains and frequency of occurrence was determined for all prey items.

(continued on p.9)



## WATERFOWL MIGRATION STUDY UNDERWAY AT GREAT SWAMP NWR

By Sean Knox, Graduate student, Frostburg State University, Frostburg, Maryland



If you find yourself driving through the Refuge, you may notice someone in chest waders or knee boots balancing some combination of binoculars, a spotting scope, buckets, backpacks, and a long metal pole with a net on the end. There also may or may not be a kayak involved. If you do, there's a fair chance it's me. My name is Sean Knox, I'm a graduate student from Frostburg State University, and I feel very lucky to be able to conduct my research here at Great Swamp National Wildlife Refuge. As I write this, it's already June and I'm diving into my first summer field season with research plans that will carry into the fall.

I began my work here back in March, travelling up from Frostburg on weekends to document the spring waterfowl

migration on the Refuge's five impoundments (large pools). This was followed by aquatic invertebrate sampling, a part of my project that hopes to examine current waterfowl food production levels in the impoundments.

One of the main components of my summer field work will involve measuring water depths across each impoundment, the study of which is called bathymetry. By taking water depth measurements throughout each impoundment, including measurements at the surrounding water control structures, my goal is to create a contour depth map of each impoundment that will assist the staff in managing water levels for the many species of waterfowl that rely on this refuge as a stopover site during spring and fall migration. Along with my bathymetry work, I will also begin mapping the various species of wetland vegetation present in each impoundment. This will give the staff an idea of which plant species are currently growing in each impoundment, and will aid me in determining where to do vegetation sampling in the seasons to come.

This work will transition straight into my fall research, which will consist of fall migration surveys and food production

sampling. Beginning this fall, food production sampling will expand to include aquatic invertebrates, moist-soil seeds, tubers, and submerged aquatic vegetation, all of which are important elements of various waterfowl diets. The goal of each of these is to 1) document the migration chronology of waterfowl using the impoundments here at Great Swamp, and 2) to examine current production levels of preferred waterfowl food sources that would be here when the birds pass through during migration. I'll also be conducting another spring/summer/fall season of fieldwork next year; this work, combined with the bathymetric contour maps, will provide two years of data that can be used to assist in future impoundment management decisions.

The refuge staff and Friends group volunteers have been incredibly friendly and welcoming since the moment I arrived; I really can't thank them enough. I also owe a debt of gratitude to my professors and my fellow graduate students for their support, both in the office and in the field. I'm surrounded by an excellent group of people. I'm very excited about the next year and a half of field work, and I'm already eagerly awaiting the start of fall migration.

## CARNIVORES *(continued from page 8)*

Avian prey remains were recognized in 10% of all samples, and 86% of those were in red fox scats. However, the most common prey items found in fox scats were insects (74%) and mammals (66%); avian remains occurred in scats about as often as fruits/seeds (32% and 30%, respectively). Avian remains also occurred in scats of mink (8%), coyote (4%), raccoon (2%) and river otter (1%).

At Great Swamp NWR, the most important predator of birds was red fox. This species was also one of the most commonly detected predators and may occur at relatively high densities on the refuge. Although waterfowl productivity is influenced by several factors, predation has been shown to be a very important determinate affecting survival of nests, ducklings, and breeding females, and predation on duck populations by foxes is positively related to fox density. However, further research should be conducted evaluating the extent of predation by red fox, and more research should be conducted on other waterfowl predators on the refuge, such as raptors or snapping turtles.



A rare photograph taken at Great Swamp NWR of a raccoon and red fox interacting. Red fox and raccoon were the mostly regularly detected predators on or around the wetland impoundments.

## EUROPEAN STARLING—A NON-NATIVE AND INVASIVE BIRD SPECIES

*Story and photos by Leo Hollein*

The Great Swamp National Wildlife Refuge has three avian species introduced from Europe.

The most invasive of these species in the refuge is the European starling. The other two are the house sparrow and the mute swan.

While some may migrate, most starlings are year round residents of the refuge. They are one of the most abundant bird species in the refuge and the United States. Groups of starlings are usually present around the Visitor Center.



Starlings are cavity nesters that nest in holes in buildings, nest boxes and natural or previously used woodpecker holes in trees. Starlings compete with cavity nesting native birds for nest sites. They are too large to enter the small 1 ½ inch round entrance holes on bluebird boxes. Starlings have not been observed nesting in any refuge bluebird box in the last 14 years.

However, starlings are the most common nester in the kestrel nest boxes (photo above). On a few occasions starling nests have even been found in wood duck boxes. Starlings cannot out-compete the kestrels for a nest box but will nest in an unused kestrel box. Kestrels do not make nests. Wood chips are placed in their boxes to provide support for their eggs. Starlings make a crude straw nest and do not appreciate the wood chips. They systematically remove all the wood chips before making their own nest.

Sixty starlings were released in Central Park in 1890<sup>(1)</sup>. Some of these birds survived. Their subsequent generations colonized the country from coast to coast in sixty years. This success is attributed to a number of traits. Starlings are generalists in regards to nesting sites, habitat and food. They prefer feeding on insects living in short grass but are opportunistic foragers. They will feed on seeds, fruit and even fungi. Starlings will readily come to suet feeders in the winter. They also raise multiple clutches in a season. After the breeding season is over, they congregate in large flocks that may also contain grackles, red-winged blackbirds and cowbirds. This provides safety and a large group to seek out food. These large flocks are nomadic in the winter as they search for food. Starlings, like American robins, are fond of bathing. Even in the coldest of weather, starlings will wade into a pool of water to clean their feathers.

European starlings have an unusual jaw structure. Most birds have jaw muscles that provide most of the force to snap their beaks closed. European starlings have backwards muscles that facilitate springing open the bill. This enables the starling to insert its beak in thick turf and then open the beak to create space to search for food.

The photo below shows a starling nest with six blue eggs which hatch in about two weeks. As is the case with most cavity nesting passerines, the hatch-



lings take about three weeks to fledge. The empty nest is rank with fecal material. The juvenile starling is brown. It looks much different than its parents and can be confusing to identify. An adult starling is shown at top and both sexes look the same.

In the United States some massive starling winter roosts have been culled. Starling nests in the refuge are prevented from fledging young on an opportunistic basis.

Starlings have also been introduced into New Zealand where they have found a useful niche. Ranchers in New Zealand place nest boxes atop fence posts to attract starlings to control insects in their pastures. A pest in one situation can be a resource in another.

(1) Ehrlich, P.R., Dobkin, D. S., and Wheye D. "The Birder's Handbook", pages 489 and 491.

# FRIENDS OF GREAT SWAMP NATIONAL WILDLIFE REFUGE MEMBERSHIP APPLICATION

The Friends of Great Swamp is an independent, non-profit organization organized in 1999. Our operations and activities are managed by an all-volunteer Board of Directors. As our mission statement indicates, our focus is Refuge-centric — we support the goals, projects, and mission of the Great Swamp National Wildlife Refuge.

To become a member of the Friends of Great Swamp, fill out the information on this form, and mail with your check to:  
Friends of Great Swamp National Wildlife Refuge  
241 Pleasant Plains Road, Basking Ridge, New Jersey 07920

### ANNUAL MEMBERSHIP APPLICATION

- EASTERN BLUEBIRD—\$15-\$49
- PAINTED TURTLE—\$50-\$99
- RIVER OTTER—\$100-\$249
- MONARCH BUTTERFLY—\$250-\$499
- WOOD DUCK—\$500 +
- New Member?

TOTAL ENCLOSED \$ \_\_\_\_\_

You may also join online at [www.friendsofgreatswamp.org](http://www.friendsofgreatswamp.org)

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State, Zip Code \_\_\_\_\_

Phone Number \_\_\_\_\_

E-Mail Address \_\_\_\_\_

Gift Membership From: \_\_\_\_\_

(If this is a gift, please include your full name on the line above so we may notify the recipient)

**We need more Friends ...**

**Become a Friend Today—or,**

**Give a gift membership to a friend.**

**Thank you**



**Memberships help support the projects and programs at Great Swamp National Wildlife Refuge.**

**Membership Benefits**

- The Swamp Scene Newsletter.
- A 10% discount in Friends Nature Shop .
- Notifications of upcoming events.
- Satisfaction in knowing you are helping protect wildlife and wild places while safeguarding a national treasure for future generations.

Gift Memberships will include a coupon redeemable at the Friends Nature Shop for a free Great Swamp pin or Great Swamp patch.

Friends of Great Swamp NWR  
241 Pleasant Plains Road  
Basking Ridge NJ 07920



## **THE SWAMP SCENE JULY 2015**

Friends of Great Swamp National Wildlife Refuge  
Is an independent, volunteer, non-profit organization  
dedicated to

Promoting stewardship of the natural resources of the Refuge,

Inspiring an appreciation of nature through education and outreach,

Engaging in partnership activities that support and enhance the Great Swamp National  
Wildlife Refuge and the National Wildlife Refuge System.