



THE EAGLE'S EYE



THE NEWSLETTER FOR ST. MARKS NATIONAL WILDLIFE REFUGE FALL/WINTER 2013

Manager's Report

Terry Peacock, Refuge Manager

The U.S. Fish and Wildlife Service is taking a hard look at how to cope with the reality of sequestration and continuing budget cuts in the next two years. The Service took small cuts in Fiscal years 2011 and 2012, but in 2013 we experienced an 8.5% reduction. Based on our most optimistic estimates in the current political climate, we are planning for another 5% cut in 2014 and another cut of unknown magnitude in 2015. The regional chiefs of the National Wildlife Refuge System met recently and made a few recommendations on how they think we should deal with the anticipated future budget cuts. Some of these include taking larger cuts to the Regional and Washington Offices, reducing visitor services available, and possibly putting some refuges in caretaker status.

The Southeast Region (4), our Region, is compiling a workforce plan to determine what the new Region 4 National Wildlife Refuge System will look like if the expected budget cuts happen. This plan carefully considers keeping our priority firmly grounded in the resource. We are first and foremost the U.S. Fish and Wildlife Service and our refuges must be managed for wildlife.

What does this mean for St. Marks National Wildlife Refuge? We are looking closely at everything we do and asking is it a priority activity or does it support a priority activity? We must make sure our habitat management is accomplished. At the time of writing this report, we cannot know what our new workforce will look like until we see the national and regional plans; we will make every effort to do the best we can with what we have. We may have to ask that our visitors suffer the loss of some of our public use programs. Our public use areas may not look as well kept as they have in

the past, our Visitor Center may not be open on holidays, and we will have to restrict access to printed brochures. We will be looking to volunteers to help keep public use programs active while our staff concentrates on resource priorities. We will try to keep you posted on changes as the plans develop.

This would be a great time to join our support group, the St. Marks Refuge Association. They are carefully tracking the budget process and supporting the refuge in every way possible including providing funding to cover budget short falls.

On a positive note, the maintenance staff worked all summer on the Headquarters Pond Observation Tower and Trail to make it accessible to all visitors. Some of the improvements were funded with a grant from the entrance fee program. I hope you take the time to come out to the refuge and check out the new trail. 

Editor's Note: The National Wildlife Refuge Association stated recently that "The National Wildlife Refuge System, the world's largest system of lands and waters dedicated to wildlife conservation, suffers from chronic under-funding, operating at half of what it truly needs to fully function. Sequestration made a bad situation worse, cutting FY 13 funding to only \$454 billion for ...561 refuges and over 150 million acres." To learn more, go to <http://www.refugeassociation.org>.



Photo: Mark Alexander Trainor

COMING UP - See Calendar for Details!

Coastal Cleanup **September 21** Public Lands Day **September 28** The Big Sit **October 13**
National Wildlife Refuge Week **October 13-19** Monarch Butterfly Festival **October 26**

Junior Ranger Camp

Lori Nicholson, Environmental Education Specialist

We held our second year of Junior Refuge Ranger Camp this past summer. Thanks to money raised by the St. Marks Refuge Association at the 2013 Wildlife Heritage and Outdoors Festival's Silent Auction, we were able to offer three camps at no cost to



Photo: Alexandria Davis

Savvy Scientists seine for saltwater creatures near the lighthouse.

with nature boosts attentiveness, promotes recovery from mental fatigue, and enhances mental focus. Let's get healthy – outdoors – at St. Marks NWR! (*Get Outdoors, Florida Governance Plan, 2009*)



"THE MARSH, TO HIM WHO ENTERS IT IN A RECEPTIVE MOOD, HOLDS, BESIDES MOSQUITOES AND STAGNATION, MELODY, THE MYSTERY OF UNKNOWN WATERS, AND THE SWEETNESS OF NATURE UNDISTURBED BY MAN."

CHARLES WILLIAM BEEBE, LOG OF THE SUN

Outdoor Report

Ranger David Moody

St. Marks National Wildlife Refuge had a dry start this past spring but this weather soon gushed into gallons of tropical moisture. The mosquitoes were happy, swamps full, and chiggers even attacked my ankles a time or two. Water, the universal solvent, cycles in and out and we must appreciate each drop! It's time to place those rubber boots upside down between the cab and bed of your truck, only pulling them out for rainy cold fronts.

Humans explore the environment more when nature slows down for cooler weather. Birdwatchers and photographers are scouting the marsh and forest fringes with small and large optics; hikers and hunters are lacing up their boots; bicyclists are checking their tire pressure; anglers are baiting their hooks and holding their mouth just right; wildflower rubberneckerers are glassing the ditches and identifying all manner of flowers, butterflies, dragonflies, and other small critters; all coming out to enjoy their National Wildlife Refuge.

Refuge quota hunts will be held in the Wakulla and Panacea Units in November and December. Please check the calendar page for dates. All quota hunter application and permit fees help to financially support the refuge.

Saltwater fishing remains good through the warm fall months and boating and kayaking remain popular. Paddle

along the barrier beach behind the lighthouse for a glimpse of migrating birds and monarch butterflies. Remember, the pools along Lighthouse Road are closed to all boats from October 15 – March 15 to reduce disturbance to migratory waterfowl and shorebirds.



ST. MARKS NATIONAL WILDLIFE REFUGE

PO Box 68

ST. MARKS, FL 32355

850-925-6121

The purpose of The Eagle's Eye newsletter is to share news about St. Marks and encourage people to participate in recreational activities, programs, and events so that they will enjoy and support their refuge.

Graphics and layout design by volunteer and Photo Club member Francie Stoutamire.

Eagle photo on the cover by Nick Baldwin, monarch photo by Lou Kellenberger.

LIKE us, keep up with the latest news about St. Marks, post your pictures and tell us about your refuge visit at

<http://www.stmarksrefuge.org>

<http://www.facebook.com/SMSVNWRS>

<http://www.facebook.com/gotoSt.Marks>

Send comments and suggestions to gail_fishman@fws.gov

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Budgets and Belt Tightening at St. Marks NWR

We hope you will keep supporting us as we carry out our management goals and duties of protecting the plants and animals of St. Marks National Wildlife Refuge while trying to provide the best visitor experience we can on a reduced budget. There are several ways you can help:

- If you know someone who loves to visit the refuge, purchase an annual pass as a gift. The refuge receives 80% of the entrance fee money (from day, senior, and annual pass sales) for Visitor Services. This money pays the rangers who run our environmental education programs, keep the Visitor Center open on weekends and some holidays, and run other special programs.

- Purchase merchandise in the Nature Store run by volunteers so profits support refuge programs.
- Contribute to donation boxes in the Visitor Center or during a special event.
- Join the St. Marks Refuge Association or make a donation to a designated fund such as Visitor Services or the lighthouse. SMRA also has an endowment fund for the future. 

Join in Creating a Legacy for the Refuge - Lou Kellenberger, SMRA Membership chair

We've made great strides since establishing the St. Marks Refuge Association Endowment Fund at the Community Foundation of North Florida in 2012. The fund, which has grown to more than \$20,000 from more than fifty individual contributors, provides a stable revenue source for the future. Also, due to heavy participation from our supporters, several awards earned through the Community Foundation have been added to our fund.

A monetary contribution made directly to one of the association's designated accounts, such as environmental education or biological programs, is used immediately. Endowment funds are invested. After the endowed funds reach a certain level, the interest the earnings can be used for general or specific needs for the refuge. The principal remains in the fund and continues to grow. Recently we received a memorial gift from a long time member. When told that it could be matched in the endowment fund this member thought it an excellent way to help the refuge for many years to come.

Anyone can contribute to the Endowment Fund in any amount or at any time. Gifts may be made in the form of cash, check, credit card, appreciated stock, real estate, retirement plan benefits, charitable trusts, annuities, life insurance, or bequests under a will. Gifts in memory of a loved one are a good way to help create a lasting legacy for the refuge. Please send your contribution marked Endowment, to St. Marks Refuge Association, PO Box 368, St. Marks, FL 32355.

The St. Marks Refuge Association is a 501(c)(3) nonprofit organization and contributions are tax-deductible.

SMRA President's Message - Betsy Kellenberger

We have an exciting schedule of activities coming up this fall! The refuge will again participate in the Keep Wakulla Beautiful Coastal Cleanup event on September 21. Refuge volunteers and staff will run the check-in table. The association once again provided funding for T-shirts. Join in the trash pick-up to keep our surrounding area beautiful!

On September 28 we celebrate National Public Lands Day with a Pancake Breakfast followed by volunteer service project to remove invasive plants from Plum Orchard Pond right behind the Visitor Center. Plan on wearing old sneakers and old clothes if you want to help because it will be wet and dirty! With the removal of the invasive species more native species will have room to grow and feed the native birds and other wildlife. The breakfast, sponsored by the association, is open to all. Join us to get the fall season kicked off in grand style. There will be news of other volunteer opportunities such as the Monarch Festival in late October!

After years of no change to our membership dues, the association has raised some levels in order to increase our financial support of refuge programs. The membership form reflects the

changes. Members will receive their renewal request letter in the month in which they last paid their dues and it will reflect the new dues levels. Thank you for being a member of the St. Marks Refuge Association and a supporter of the refuge!

Board member and Nature Store manager, Betty Hamilton, attended the Friends Academy at the National Conservation Training Center in West Virginia in August. The week-long Friends Academy, open to 25 participants, cultivates emerging Friends leaders by providing a broader understanding of the Refuge System and increases the effectiveness of Friends. The National Wildlife Refuge System in partnership with the National Fish and Wildlife Foundation paid for all expenses. Congratulations Betty!

Watch for the association's updated website in September. Board member Paul Hamilton has been working on a new platform which will save some money and make it more user-friendly. The latest events will be posted as well as a donations page where contributors can choose different areas of support to help the refuge. Check it out in September www.stmarksrefuge.org and continue to go to our Facebook page St. Marks Refuge Association for news, events and photos.

“A man could be a lover and defender of the wilderness without ever in his lifetime leaving the boundaries of asphalt, powerlines, and right-angled surfaces. We need wilderness whether or not we ever set foot in it. We need a refuge even though we may never need to go there.” Edward Abbey, *Desert Solitaire: A Season in the Wilderness*

St. Marks National Wildlife Refuge

Cassandra Skaggs, Volunteer



CASSIE SKAGGS HOLDS A BUFFLEHEAD DUCK

I developed my love for the outdoors as a child on the banks of the Flint River in southwest Georgia. My sister and I often roamed the bottomlands looking for fragments of arrowheads and fossils in the limestone.

While in high school, I volunteered at a local zoo and studied wildlife at the Warnell School of Forestry and Natural Resources at the University of Georgia. After earning my Bachelor of Science in Forest Resources in 2011, I worked for the Georgia Legislature as a Senate aide to the Natural Resources and the Environment Committee. Then it was on to northwest Minnesota to study bufflehead ducks for my Master of Science in biology through the University of North Dakota. While visiting home in 2012 between field seasons, I read about the whooping cranes arriving at St. Marks NWR.

Needing some outdoor time, I decided to make the nearly three-hour drive to volunteer at St. Marks. I was lucky enough to work on a variety of tasks for three weeks. After another term as a legislative aide, I went to Agassiz NWR in Minnesota to study buffleheads for the summer. One day, I hope to work at a National Wildlife Refuge to carry on wetland ecosystem conservation. 

Faces of Summer, 2013

Jennifer Hinckley, Prescribed Fire Specialist

As summer heated up, St. Marks National Wildlife Refuge grew by three summer interns, Shawn Harrington, Tiffany Lane, and Lauren McCullough. Shawn was funded through the University of Georgia with a grant from the U.S. Fish and Wildlife Service. Tiffany and Lauren were funded through by the SMRA Summer Biological Intern Program.

Shawn attends the School of Forestry and Natural Resources at the University of Georgia. Tiffany Lane and Lauren McCullough study wildlife ecology at the University of Florida.

This is by no means a complete list of their tasks: captured adult red cockaded-woodpeckers; nest peeping; banded chicks; checked fledglings; and identifying and tracking individuals using a scope); applying herbicide on invasive Bahia grass; re-sign-

ing around the bald eagle nests (navigating with a DNRGPS; strenuous hiking through rough and overgrown terrain; and marking boundary trees with signs and paint); conducting a wading bird nest survey on Smith Island that estimated over 1,500 nests from 7 different species; and assisting with the Summer Ranger Camp.

The interns made many visits to St. Vincent NWR



Photo: Jennifer Hinckley

SHAWN HARRINGTON



Photo: Joe Reinman

TIFFANY LANE, LEFT, AND LAUREN MCCULLOUGH, RIGHT SPRAY HERBICIDE

to conduct sea turtle nest surveys (learning to recognize different sea turtle tracks, identifying egg locations, protecting nests with self-releasing cages, daily cage checks, documenting sea turtle nests for adopters); monitor the red wolf semi-captive population using radio telemetry to locate endangered wolves; using night vision goggles to locate and remove sea turtle pests such as wild hogs and raccoons.

They created a species guide about common and endangered species, indicator species, comprehensive descriptions and detailed pictures and sketches for multiple habitats throughout the Florida panhandle and entered hunt data from 1974-2008 in Excel.

Last but not least, they completed firefighter type 2 training: S-130, S-190, L-180, I-100, IS-700, moderate pack test, and a field day and attended prescribed burns that were applied throughout the refuge to manage the land and wildlife. 

World War II & St. Marks National Wildlife Refuge

Gayla Kittendorf, Volunteer

The advent of U.S. entry into World War II brought some changes for St. Marks National Wildlife Refuge.

As early as December 7, 1941, projects for the Civilian Conservation Corps (CCC) camp assigned to the refuge were prioritized with the goal of having the most essential projects finished before the camp was called elsewhere. The CCC camp was closed on June 30, 1942, except for a few men left behind to finish the Mounds spillway. During this time, a small fire crew was organized. After a particularly severe wind storm took out several poles and lines, the fire crew went to work doing the repairs, as well as felling “all dead or weakened trees along the entire telephone system.”

As the war continued, visitors to the refuge decreased due to the rationing of gas and tires, except for a number of “ardent fishermen” who continued to come on weekends. One visitor of note in the fall of 1942 was Vereen M. Bell, author of *Swamp Water*, a novel set in the Okefenokee Swamp. Bell, a Georgia native and a Navy lieutenant during WWII, was killed in action in the Philippines in 1944.

A significant contribution was made by the refuge in support of the war effort. A lookout tower and telephone facilities (both maintained by the refuge), as well as tools and other fire-fighting equipment, were supplied to the Coast Guard for fire, lookout, and coast patrol. The service dock at Port Leon was leased without charge to the Army base at Tallahassee to tie up crash boats. A LeTourneau scraper (earthmover) was loaned to the Army during the construction of Dale Mabry Field flight training center in Tallahassee.

By 1943, projects at the refuge were taking a back seat to maintenance: “*With a very severe labor shortage very little development work has been undertaken during the quarter. A fire crew which was employed in the fall and originally consisting of six men gradually dwindled to a one man crew, the others having quit for higher wages and employment at the Army base at Carrabelle, Florida.*”

For a short period in late summer of 1945, refuge personnel was down to two men—an assistant manager and a clerk-patrolman, making maintenance a great challenge. Even so, an impressive amount of work was accomplished considering the relatively small staff available. Some work was done by staff during off-hours. Two more men arrived that fall, including Refuge Manager Paul Kreager, who served St. Marks for the next eighteen years. 

“AFTER YEARS OF PREACHING BY AUDUBONITES AND THEIR EQUIVALENT IN OTHER LANDS, THE CULT OF THE USELESS IS COMING TO POWER - USELESS FLOWERS, USELESS BUTTERFLIES, USELESS WARBLERS AND SINGING BIRDS, USELESS HAWKS, USELESS FORESTS, USELESS WILDERNESS: ALL THE USELESS THINGS THAT BY THE VERY USELESSNESS ARE USEFUL . . . REDEEMING AND REFRESHING AND NEEDFUL TO THE HUMAN SPIRIT.”
JAMES FISHER, *THE WORLD OF BIRDS*



Photo: David Moynahan

St. Marks Photo Club

George Burton, Volunteer

Umbrella, anyone? July did feel like a solid month of rain. The aquifer recharged and our area is now filled with flowers – Viva La Florida! If you enjoy what you discover on St. Marks, please consider becoming a volunteer. It will help the refuge and yourself grow!

Last summer was busy. A beautiful May Saturday found the Photo Club at Otter Lake for their Annual Meeting and Picnic. We presented a Certificate of Appreciation to Club President Tom Darragh who embodies what the St. Marks National Wildlife Photo Club is all about. We are fortunate to have him. After a morning photo safari and a delicious lunch grilled by Royce Phillips we voted on and Tom later signed a revised Memorandum of Understanding with the U.S. Fish and Wildlife Service and the St. Marks Refuge Association. This revised agreement allows the Club to continue using our photography toward a common goal of helping St. Marks National Wildlife Refuge.

In June, Diane Flowers enlightened all with techniques for post-processing enhancements of portrait photography...but not before surprising the group with a Photography Quiz and prizes for high scorers! For July, Mike Robertson led a session identifying digital photography file types captured in-camera as well as those available after downloading and editing. In August, Dean and Sally Jue conducted a class on photographing and identifying moths, butterflies, and dragonflies abundant on the refuge. Many thanks to these members for their investments in time and effort to share their wisdom with our club!

Looking forward to drier days, we hope to be back outside enjoying a variety of outings. Tom Darragh will send out e-mails about our events so if you are not on the photo club list, e-mail Tom at thomasd@talstar.com and ask to be added.

PHOTO TIP: When framing your photos, remember that background is a very important (and sometimes overlooked) component of composition. Try to eliminate distractions in the background by re-framing the shot to remove the distractions (if possible) or adjusting the aperture settings to blur the background creating an attractive *bokeh*, the visual quality of the out-of-focus areas of a photograph. 

September to December 2013 Events Calendar

Call the refuge at 850-925-6121 for more information and to make reservations.

Unless otherwise stated, public programs are held in Nature's Classroom adjacent to the Visitor Center.

Tots on Trails and Families in Nature

Tots on Trails meets on the **second Thursday** and the **second Saturday** of each month at 11:00 a.m. Activities for pre-school children last about 45 minutes.

Families in Nature programs engage the whole family on the **fourth Saturday** of each month between 11:00 a.m. and 2:00 p.m. Registration required for these programs.

September 2013

1 – First Sunday – 2:00 p.m. *Monarchs!* Join tagging coordinator David Cook as he shares what we're learning about the vivid orange and black monarch butterflies that migrate through St. Marks in October and November. Find out how you can get involved in projects to tag them, feed them, and look for them during the winter.

2 – Labor Day – *Visitor Center closed due to budget cuts*

7 – Digital Photography Class – 9:00 a.m. Beginning photography with Barney Parker. Limit 15. Registration required.

12 – Tots on Trails – 11:00 a.m. Registration required.

14 – Tots on Trails – 11:00 a.m. Registration required.

21 – Coastal Cleanup – Arrive early to check-in. Pick up trash on Lighthouse Road from 9:00 to 10:30 a.m. Weigh trash between 10:30 and 11:00 a.m. and pick up your T-shirt, sponsored by St. Marks Refuge Association. Bring work gloves, hat, bug spray, and water. Call Ranger David Moody at 850-925-6121 to register ahead of time.

St. Marks NWR Photo Club – 9:00 a.m. Contact President Tom Darragh at 850-556-3477 or thomasd@talstar.com for information

28 – National Public Lands Day - FEE FREE DAY!

Pancake breakfast from 9:00 – 10:00 a.m. – sponsored by St. Marks Refuge Association for association members, volunteers, and new volunteers. Volunteer Service project – 11:00 a.m. – 1:00 p.m. Bring hat, gloves, and shoes/clothes that might get wet and muddy. Dedication of the accessible trail and observation tower at Headquarters Pond – 1:30 p.m.

Families in Nature – between 11:00 a.m. and 2:00 p.m. – *Freshwater Fun*. Registration required.

October 2013

5 – Digital Photography Class – 9:00 a.m. Limit 15. Registration required.

6 – First Sunday – 2:00 p.m. – *History of Bird Banding*. Currently a Research Associate at Tall Timbers Research Station, Todd Engstrom is an accomplished birder and bird bander. Banding birds requires skill and attention. Information from recovered bands provides vital information on migration patterns, movements of birds, and life histories of different species.

10 – Tots on Trails – 11:00 a.m. Registration required.

12 – The Big Sit! – 8:00 a.m. – 5:00 p.m. – count migrating birds at the lighthouse.

Tots on Trails – 11:00 a.m. Registration required.

13 – 19 – National Wildlife Refuge Week – Entrance fees waived this week so visit your national wildlife refuges often!

14 – Columbus Day – *Visitor Center closed due to budget cuts*

15 – Pools along Lighthouse Road closed to boats until March 15, 2014, to reduce disturbance to migratory birds.

19 – St. Marks NWR Photo Club – 9:00 a.m. Contact President Tom Darragh at 850-556-3477 or thomasd@talstar.com for information.

20 – Magnolia Cemetery walk – 3:00 p.m. led by Ranger Craig Kittendorf. Registration required.

26 – 25th Annual Monarch Butterfly Festival –  10:00 a.m. to 4:00 p.m. Learn to landscape for wildlife by using a variety of native plants in the right place to provide food and cover for insects, birds, reptiles and amphibians, and small mammals. Pollinators need all the urban refuges we can provide. Visit our exhibitors at the Visitor Center Complex, the pollinator gardens at Picnic Pond, and the popular Monarch Tagging station at the lighthouse. The Stone Crab Festival will be held in the City of St. Marks on the same day.

Families in Nature – between 11:00 a.m. and 2:00 p.m. – *Butterflies*. Registration required.

31 – Happy 82nd Birthday St. Marks NWR

November 2013

2 – Digital Photography Class – 9:00 a.m. Limit 15. Registration required.

3 – First Sunday – 2:00 p.m. – Jim Dunbar, *What inundated underwater archaeological sites are telling us about late Pleistocene climate change and its likely impacts on human and large mammal populations in North Florida*.

Daylight Savings Time ends; refuge gates on St. Marks and Otter Lake will close at 7:00 p.m.

9 – Fall Birding and Wildlife Tour with Don Morrow, 9:00 a.m. and 1:00 p.m. Limit 25 per tour. Registration required.

Tots on Trails – 11:00 a.m. Registration required.

9 – 11 – FEE FREE IN HONOR OF OUR VETERANS!

14 – Tots on Trails – 11:00 a.m. Registration required.

16 – St. Marks NWR Photo Club – 9:00 a.m. Contact President Tom Darragh at 850-556-3477 or thomasd@talstar.com for information.

23 – Families in Nature – between 11:00 a.m. and 2:00 p.m. – *Trees*. Registration required.

28 – Thanksgiving – *Visitor Center closed for Holiday*

December 2013

1 – First Sunday – 2:00 p.m. – Don Morrow, *Nightbirds: Part 2, the night shift at St. Marks*. This second installment on nocturnal birds of the refuge will cover the six rail species and two night-herons that may be found here. A listening tour will follow.

7 – Digital Photography Class – 9:00 a.m. Limit 15. Registration required.

12 – Tots on Trails – 11:00 a.m. Registration required.

14 – Winter Birding and Wildlife Tour with Don Morrow, 9:00 a.m. and 1:00 p.m. Limit 25 per tour. Registration required.

Tots on Trails – 11:00 a.m. Registration required.

14 – 16 – Wakulla Unit Gun Hunt

14 – 16 – Mobility Impaired Hunt (Panacea Unit)

21 – St. Marks NWR Photo Club – 9:00 a.m. Contact President Tom Darragh at 850-556-3477 or thomasd@talstar.com

for information.

20 – 22 – Panacea Unit Gun Hunt

28 – Families in Nature – between 11:00 a.m. and 2:00 p.m. – *Nature's Gifts*. Registration required.

WHOOPING CRANES! Operation Migration and the whooping cranes will return to St. Marks again this year. Expected arrival will be in November or December. Please check Facebook <https://www.facebook.com/SMSVNWRS> for the latest news.

Wildlife Observations

Fall migration is underway. Look for blue-winged teal and bald eagles appearing in September. Eagle pairs refurbish their nests together. Look for adult eagles sitting on snags throughout the fall and winter. It won't be long before more ducks land in the refuge pools and Apalachee Bay and songbirds pass through the woodlands. As temperatures cool, alligators sun on the banks on warm days.

Along Lighthouse Road and the hiking trails, viceroys, queens, Gulf fritillaries, swallowtails, skippers, sulphurs, and monarchs feed on beggarticks (see article in the summer 2013 issue), goldenrod, dotted horsemint, and saltbush. Wildflowers and butterflies peak in October to early November. Monarchs feed and shelter on coastal shrubbery before continuing their westward migration.

By mid-November wildflowers and butterflies are fewer. Our fall color is subtle. In the swamps cypress trees turn rusty red and maples turn dark red. Sweet gum leaves flash bright yellow. Snakes and other reptiles and amphibians may come on to the asphalt seeking warmth before a chilly evening. Red-shouldered hawks perch on snags and northern harriers skim the marshes looking for prey. November and December are great months for getting out on the levees. 

2014 marks the 50th Anniversary of the Wilderness Act.

A little more than 17,000 acres are designated Wilderness on your refuge. Come explore your trails.

Edaphic Algae in Salt Marshes

Tom Baird, SMRA Board member

Tall grasses of the salt marshes capture a visitor's attention. The vast expanses of marsh grasses inspire poets and artists and are emblematic of St. Marks National Wildlife Refuge. Cordgrass (*Spartina alterniflora*) fringes the banks of tidal creeks and needle rush (*Juncus roemerianus*) dominate the higher less frequently flooded marsh. Yet much goes on in a salt marsh that escapes the casual visitor.

Teeming communities of organisms thrive at the marsh's surface. Many are microscopic plants that use sunshine to transform nutrients brought in by the tides into carbon compounds that support grazers in the marsh and other life forms in the nearby sea. These tiny plants create a dynamic mosaic that nourishes the marsh.

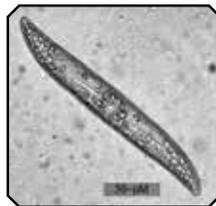
Diatoms, a type of brownish or yellowish algae, live on the marsh's surface mud. In large numbers they can make the mud appear golden brown. These edaphic plants are influenced by the soil rather than climate. Viewed under a microscope, hundreds of active life forms swarm. Because of their stiff glass-like outer capsule made of silica, diatoms are easily distinguished from other microscopic plants. A characteristic size and shape identify each species. While other algae vary in shape, the diatoms appear uniform, gem-like.

The marsh surface is also home to a variety of filamentous algae that often form mats at the water's edge and between the

stalks of marsh grasses. Important in this group are the blue-green algae, so called because they contain chlorophyll and photosynthesize. Structurally they are bacteria, lacking the internal membrane structure of algae. Blue-green bacteria often possess tolerances for extremes of temperature and drying and are often found in the salt flats – slightly elevated patches of bare soil where high salinity is caused by fluctuating tides. Algal mats comprise mainly of the genus *Calothrix* sometimes form. The blue-green bacteria are important not only as producers, but many of the species found in salt marshes are nitrogen fixers. They convert gaseous nitrogen from the atmosphere into a usable form for the higher plants, much like fertilizer.

Edaphic algae and marsh grasses interacting with one another create alternating peaks of production. The algae even out productivity in the marsh by functioning in winter when the marsh grasses die back and sunlight reaches the substrate. The interaction of these two components, sometimes visible in the pink and green colors of the mud, ensures maximum production over the entire marsh surface during the year.

The production of algae is about 25 percent of the production of marsh grasses. This is a significant and often overlooked aspect of marsh ecology. Additionally, algal production occurs when grasses are dormant and may provide more easily assimilated food for marine life than that provided by higher plants. The productivity of our refuge marshes – and thereby Apalachee Bay – is dependent on the health of this fascinating assemblage of microscopic plants gliding at the mud's surface working out of sight to keep our marshes healthy and productive.



a diatom

ST. MARKS NATIONAL WILDLIFE REFUGE

PO Box 68

ST. MARKS, FL 32355

(850) 925-6121

WWW.FWS.GOV/SAINTMARKS

WWW.STMARKSREFUGE.ORG

WWW.FACEBOOK.COM/SMSVNWRS



Evolution of the Pollinator Garden

Ranger Scott Davis

Habitat fragmentation, pesticides, droughts, floods, and ornamental landscaping have pushed many pollinators to dangerously low numbers. Without pollinators, our food crops are at risk. You may not love insects but we all must eat. In 2009 Apalachee Audubon foresaw the need for increasing awareness about the plight of pollinators. Using a grant from the National Wildlife Refuge Association, Audubon volunteers began the first pollinator gardens at Picnic Pond.

The basic bones and philosophy of the garden remain.

On September 29, 2012, Public Lands Day, a group of volunteers descended on the gardens armed with gloves, clippers, and trash bags to remove weeds. In March of 2013, refuge volunteers led by Ranger Scott Davis, began the next phase of the garden's evolution. Using his ecological knowledge, Ranger Davis

has considered soil types, water availability, and other conditions to plan a wildlife garden that will bloom almost year round. Choosing plants that tolerate poor, dry soils, hot sun, as well as occasional flooding and drought, the plants will provide nectar

for many types of pollinators, larval host plants, and food for a variety of small wildlife species. There is no better demonstration of nature's interconnectedness than a native plant garden. Best of all, beyond periodic weeding, the garden should require little care after becoming established.

Pollinators include butterflies, moths, bats, hummingbirds, flies, bees, wasps, beetles and other insects. You can help pollinators by using native plants in your landscape, reducing or avoiding pesticides, and encouraging your neighbors to do the same. The U.S. Fish and Wildlife Service has a web site for pollinator tips <http://www.fws.gov/pollinators/PollinatorPages/YourHelp.html>. Working together, we can create new habitats to increase the numbers of our pollinators. We can't survive without them.

Tiger Swallowtail Photo: Mark Alexander Trainor



Pin Tail Duck Photo: Lou Kellenberger

St. Marks Refuge Association Membership Application

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____
Email _____



Table with 2 columns: Membership Type and Price. Includes Individual (\$25), Family/Couple (\$35), Non-Profit Group (\$50), Supporter (\$60), Contributor (\$100), Lifetime (\$500), Corporation (\$500), and Patron (\$1000).

Please make checks payable to St. Marks Refuge Association. Mail completed form and check to St. Marks Refuge Association, Inc., PO Box 368, St. Marks, Florida 32355. Materials can also be dropped off at the refuge Visitor Center. St. Marks Refuge Association, Inc. is a 501(c)(3) non-profit organization and donations are tax-deductible to the extent allowed by law.