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Exciting News

Cheryl Gregory, Administrator
NC Plant Conservation Program

The State Property Office received all funds from the NC Dept of Agriculture yesterday for the purchase of McIntosh Bays Preserve in Scotland County. The check along with the closing instructions to the closing attorney was sent over today 2/15/19! This establishes a brand new preserve into the PCP system, it's 26th!

This was a collaborative effort with other partners pledging money for acquisition including the Wildlife Resources Commission, The Nature Conservancy and The NC Herpetological Society. In 2015, PCP applied for a CWMTF grant and a USFWS Recovery Land Acquisition grant (for matching funds) to acquire McIntosh Bays as a Preserve. WRC, TNC and the Herp Society funds helped us meet our match goals for the CWMTF grant. We developed an MOU last month with WRC as a collaborative partner. The shared common interest at this site is the protection of rare species. For PCP, it was the recovery of Canby's dropwort. For WRC and the Herp Society, their interests lie in the permanent protection of imperiled animal species known to occur in the ephemeral ponds at this site (Eastern tiger salamander, Maybee's salamander, ornate chorus frog, southern chorus frog). With a common goal in mind, we will continue to work together to come up with a successful management plan for protecting both plant and animal species at this site.

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More on McIntosh Bays Preserve...

LOCATION: Two contiguous tracts located along U.S. Highway 401, Spring Hill Township, Scotland County

AREA: Tract 1 - ±130 acres
Tract 2 - ±87.99 acres

ACQUISITION: The property proposed for acquisition is for the establishment of a new NCDA&CS plant conservation preserve in McIntosh Bay, Scotland County. Acquisition of this property is critical to protect and enhance populations of imperiled and rare plant species and rare species of amphibians. Funding for this acquisition is provided by a grant from the Clean Water Management Trust Fund, a US Fish & Wildlife grant and partner donations. This item was reported to the Joint Legislative Commission on Governmental Operations. Notifications of acquisitions were made to the County and/or Municipality in accordance with G.S.§146-22. This Plant Preserve Addition was approved by Council of State on July 10, 2018.

The McIntosh Bays natural area has been partially protected by current the landowner, The Nature Conservancy (TNC). As mentioned, PCP has already secured funding to create a new PCP Preserve (named McIntosh Bays) and will close on the 218-ac land acquisition from TNC in early 2019.

LAND USE HISTORY: The bay has changed dramatically since observations in the 1980s and 1990s of open vegetation, standing water in wet seasons, and numerous rare plants. As of a November 2016 site inventory, most of the bay interior had dense loblolly pine. Large pines were harvested here within the last 20 years by TNC, but the effect had been surprisingly short-lived. Dense young pines and sweetgum, most 2-3" dbh but many larger, filled the space. The young forest had dense pine litter and almost no herb layer. The outer edge of the bay itself had a distinct zone visible on aerial photos. It was more dominated by hardwoods, particularly red maple and sweetgum, though loblolly pine was abundant. In the middle, around where the 3 tracts join, was an area where pines are less dense and pond cypress more abundant. This bay was dry, and showed no sign of standing water except in the artificial holes. The dominance of *Andropogon*, when earlier descriptions had indicated *Leersia hexandra*, suggests significant drying. There is no obvious cause of extreme hydrological alteration. There is a ditch along highway 401, but it is not designed to remove large amounts of water. There are no substantial ditches in either bay. It is likely that the heavy tree cover in Cypress Bay is transpiring more water than an open pond cypress stand would, though the heavy herbaceous cover must also have transpired a substantial amount.

Oxypolis canbyi, Nora Murdock, USFWS

Of particular interest at this site is Canby's dropwort (*Oxypolis canbyi*), a coastal plain wetland species which is extirpated in North Carolina, with the only known population in the state last observed in 2004 here at the McIntosh Bays, a nationally significant natural area in Scotland County. The dense tree cover, heavily litter, and dryness in this bay likely makes the habitat unsuitable for this species, but its ability to seed bank may mean viable seeds are still present. PCP along with TNC have taken steps to manage for more suitable conditions, to see if this and other rare species might still be present (see below "Land Management" section).

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McIntosh Bays Preserve….

Lobelia boykinii, USFWS

LAND MANAGEMENT: In January 2018, PCP was awarded another USFWS grant to fund site prep and augmentation/reintroduction efforts at this site to restore or reintroduce *O. canbyi*.

As the current landowner, TNC initiated much needed restoration/rehabilitation at the site in late 2016-early 2017 (i.e. removing invaded loblolly pine trees from the pond cypress savanna and planting long leaf pine in the uplands surrounding two Carolina bays). Boykin's lobelia (*Lobelia boykinii*), an at-risk species currently under review by USFWS, is also known to occur in this site and is expected to also benefit from active land management.

~

PCP will develop a management plan at this site and reinitiate annual monitoring for *O. canbyi*, hoping to see it reemerge in response to already ongoing land restoration activities. However, since this species was last seen >10 years ago, PCP proposed initiating reintroduction planning in the event that the species does not naturally return within five years. In consultation with April Punsalan, species lead for USFWS, PCP has identified 2-3 target donor populations in South Carolina, and will consult with USFWS to determine the best site(s) to collect seeds to propagate for reintroduction if that becomes necessary. PCP will monitor for Canby's dropwort at McIntosh Bays for five years; if this species does reemerge naturally, then propagated individuals would be returned to their parent population. PCP has a strong partnership with the NC Botanical Garden and intends to collaborate with them for the seed collection, propagation, and out planting stages of this proposed work, as well as to collect seed for long term storage in an effort to safeguard this species suffering from rapid declines in South Carolina and elsewhere in its range.

PCP's objective with this restoration and reintroduction project outlined above is to facilitate recovery of listed species by seeing them returned to North Carolina in permanently protected and actively managed preserves. PCP will develop a controlled propagation and reintroduction plan for each species that will meet state and federal requirements https://www.fws.gov/endangered/laws-policies/policy-controlled-propagation.html. All proposed collections will strictly adhere to the best practices and guidelines set forth by the Center for Plant Conservation as well as all necessary state and federal permits and other procedures.

Immediate management goals:

Plan prescribed burn of the Tunstall's bay portion. Installing bladed/plowed fire breaks across or through Carolina bay features is not a viable option for PCP's objectives as PCP does not intend to disturb the site hydrology. Instead, we will work with NCFS to remove tree stumps from the property boundary that cuts across Big Cypress Meadow and have NCFS disc that as a fire break. Line discing will occur after the stumps are removed to avoid damage to equipment. Timber stand improvements (hack and squirt) in Cypress meadow is currently ongoing, lopping and treating hardwood resprouts in the vicinity of last-observed *O. canbyi* location (volunteer efforts are much appreciated with this task!) Monitor for *O. canbyi* reemergence for 5 years, hoping to see it reemerge in response to ongoing land restoration activities. Initiate reintroduction planning in the event that the species does not naturally return within five years. Develop a site management plan with input from WRC on imperiled animal species.

Cheryl Gregory

President's Message

Alvin's message for the membership:

"Stand your ground and work hard to protect the natural resources we all depend on for our health and enjoyment!"

Alvin has continued the tradition of FoPC presidents modeling the many ways that we can all contribute to the conservation of North Carolina's imperiled plant species. He has focused his attention on mentoring Mamie Colburn (our Volunteer Coordinator), getting the cottage at Eastwood Preserve renovated and rented to the Marcus family, and working with Laura Fogo on a USFWS grant in which NCPCP is participating. Routine duties have included participating in volunteer workdays on preserves as he can, welcoming three new board members (Owen Carson, David Campbell, and Cindy Lincoln), and conducting regular board meetings.

Worldwide decline of the entomofauna: A review of its drivers

FranciscoSánchez-Bayo, Kris A.G.Wyckhuys. *Biological Conservation*, Vol. 232, April 2019, Pages 8-27

Full article: https://doi.org/10.1016/j.biocon.2019.01.020Get rights and content

Highlights

•Over 40% of insect species are threatened with extinction.

•Lepidoptera, Hymenoptera and dung beetles are the taxa most affected.

•Four aquatic taxa are imperiled and have already lost a large proportion of species.

•Habitat loss by conversion to intensive agriculture is the main driver of the declines.

•Agro-chemical pollutants, invasive species and climate change are additional causes.

Friends of Plant Conservation, Inc. is recognized by the Internal Revenue Service as a 501(c)3) tax exempt organization and is maintains a Charitable Solicitation License with the North Carolina Secretary of State.

Mailing address:
Friends of Plant Conservation
c/o NCDA&CS, NC Plant Conservation Program
1060 Mail Service Center
Raleigh, North Carolina 27699-1060

Mamie Colburn, Volunteer Coordinator

Mamie has become a dedicated, and invaluable, asset to the Friends of Plant Conservation and the NC Plant Conservation Program. She has worked to develop partnerships with land conservation organizations and other related agencies. Many of those are now assisting with various workdays, so if you volunteer you will have an opportunity to meet and to learn many new things about Plant Conservation Preserves.

Mamie and Lesley Starke (PCP Plant Ecologist) have put together a great line-up of volunteer opportunities through June (see the following page). Watch the website and the May newsletter for dates for July, August, September, and October.

Give a little time and work with some great people and plants!

For updates on Mamie's activities and and Warkday/Walk opportunities, check the FoPC website:

https://www.ncplantfriends.org/fieldtrips.html

SUPPORT MAMIE !

If you would like to contribute to the Volunteer Coordinator fund to keep Mamie working with us beyond the first 20 months, please send a check to:

Friends of Plant Conservation
c/o NCDA&CS NC Plant Conservation Program
1060 Mail Service Center
Raleigh, NC 27699-1060

*Put **Vol. Coordinator on the reference line**.*

Contributions are appreciated and are tax deductible..

A **Caraway** critter...let's watch for him while we are there on March 1st.

***Xerophyllum asphodeloides* at Cedar Mountain Bog**

2019 Preserve Workday/Walk Schedule

March 1 Caraway Preserve - McDowell County Pulling English Ivy
What: Join us to help hand pull and cut English Ivy around Shortia galacifolia, Oconee bells rare plant habitat. The French Broad River Garden Club will be on hand with us. Perhaps we'll see some Trilliums starting to come through the soil.
Where: Caraway Preserve in McDowell County
When: 10:30 am Friday March 1
Email: mamie.fopcvolunteers@gmail.com to sign up! Thank you.

March 19 - Mountain Bog near Cashiers, NC
What: We'll be exploring a bog with a wet meadow and thick brush to look for additional rare plants. We will use loppers to cut back some areas of brush on our exploration and to give the rare plants additional light. Expect to see amazing species growing in this mountain bog. Highlands Biological Foundation staff will be joining us.
Where: Mountain bog near Cashiers NC
When: 10 am Tuesday March 19th
RSVP: email mamie.fopcvolunteers@gmail.com to sign up! Thank you.

April 16 - Bat Fork Bog in Henderson County - Joint workday with Conserving Carolina
What: Last fall contractors removed a good deal of invasives - we need to return and follow up on their work as the leftoever plants emerge for the spring. We'll be cutting and pulling invasives to help get the site ready for rare plant reintroduction. You will see the results of a few hours of work. It's a great time to see mountain spring ephemerals too! Conserving Carolina will be joining us with volunteers and their stewardship team as well. Many hands make for light work.
Where: Bat Fork Bog in Henderson County
When: 10 am Tuesday April 16th
RSVP: email mamie.fopcvolunteers@gmail.com to sign up! Thank you.

May 21 - Ochlawaha Bog in Henderson County - Joint workday with the Bog Learning Network
What: TBA **Where:** TBA **When:** TBA
RSVP: email mamie.fopcvolunteers@gmail.com to sign up! Thank you.

June 6th - Bat Fork Bog in Henderson County - Creating deer exclosures for lilies
What: Help us protect rare lilies by creating metal exclosure rings around the flowers to keep deer from browsing them. We may also complete some site prep for the reintroduction of rare plants and as always --- fight back the invasives!
Where: Bat Fork Bog in Henderson County
When: 10 am June 6th
RSVP: email mamie@fopcvolunteers@gmail.com to sign up! Thank you.

June DATE TBD - MacIntosh Bays - Herpetological survey - DATE WILL BE ANNOUNCED SOON
What: Join Alvin Brasswell, president of Friends of Plant Conservation, to survey for salamanders and other amphibians and reptiles. We will also be looking for the presence of invasive fish. We may have some plant work to do as well - the day is still in planning phases.
Where: MacIntosh Bays (Sandhills region of NC)
When: TBD
RSVP: email mamie.fopcvolunteers@gmail.com to sign up! Thank you.

ADDITIONAL DATES TO BE ADDED LATER.

Sign up early as group size is limited according to the site.

Meeting times will generally be at 10:00 a.m. -- a specific time will be sent on registration, along with other details for each trip **REGISTER EARLY AS SPACE IS LIMITED.** Directions and other details will be emailed about a week before the event. Please also leave a telephone/cell number so we can reach you.
PLEASE NOTE: Dates may need to be adjusted depending on weather and bloom times. We will advise you as best **we can.**

TO REGISTER: Send an email to Volunteer Coordinator Mamie Colburn
mamie.fopcvolunteers@gmail.com

Attractiveness of Cultivars of Native Plant Species to Wildlife

Carrie DeJaco

Associate Professor of Biology and Environmental Sciences,
Pfeiffer University, Misenheimer, NC and FoPC Board Member

Echinacea 'Tomato Soup'

Consumer interest in native plants for use in landscaping has increased in recent decades. The horticultural industry has responded to this interest by producing cultivars of some of the native species most commonly used in landscaping. Last year, for example, I found 6 different cultivars of *Phlox subulata* offered for sale at a nearby nursery and garden center. This may be seen as a promising trend, as it results in increased purchasing of native plants by homeowners and landscapers and, thus, an increase in native plants across the human-dominated landscape.

When horticulturists select cultivars to propagate, they do so largely based on the appearance of the plant (such as larger, more brightly colored flowers; longer bloom times; more dense, compact branching; or leaf color), although they do also consider the plant's susceptibility to disease and pests. When a "superior" specimen is identified, that specimen is named and then cloned over and over, shared amongst nurserymen and, eventually, the cloned copies of that one individual organism are distributed to nurseries and garden centers across the country.

How do the characteristics of the plants selected for propagation by horticulturists compare to those preferred by wildlife? If wildlife do not agree with the horticulturalists' choices and avoid those plants, is the use of those plants in the landscape any different, ecologically, from the use of non-native plants? There has been little research so far in this area. A few studies have come out in recent years by researchers at the Mount Cuba Center (MCC) and the University of Delaware (UD), home to Dr. Doug Tallamy, now famous for his break-through book, Bringing Nature Home, which has inspired numerous non-scientists to ponder the possibility that the plants in their home landscaping have the potential to provide sustenance for wildlife in a world where wild lands are being rapidly destroyed. One Master's thesis has come out of the University of Georgia and one dissertation from the University of Vermont.

Keith Nevison's Master's thesis research at the UD and MCC focused on insect visitation to various species of *Phlox*, but for only *P. paniculata* did he collect enough data to analyze. For that species, of the 6 cultivars he studied along with the wild type, 'Jeana' and 'Dick Weaver' attracted more pollinators than the wild species, but there were no other differences found.

In Vermont, Annie White's dissertation research compared one cultivar of each of several species with the wild type and found marked differences in insect preferences; in almost every case, at least one group of pollinators had a preference and preferred the wild type—*Achillea millefolium, Agastache foeniculum, Asclepias tuberosa, Baptisia australis, Helenium autumnale, Monarda fistulosa, Penstemon digitalis, Rudbeckia fulgida, Symphiotrichum novae-angliae*). If she had compared more cultivars, as did Nevison, she may have discovered some cultivars that are equally or more attractive to the pollinators.

Coreopsis'Tequila Sunrise'

Coreopsis grandiflora

Joseph Poythress III at the University of Georgia (Athens) found more insects on *Coreopsis grandiflora* than on its 'Tequila Sunrise' cultivar but fewer insects on *Oenothera fruticosa* than on its 'Cold Crick' cultivar. He did note that the overall appearances of *O. fruticosa* and its cultivar were quite similar while *C. grandiflora* and its cultivar were distinctly different from one another.

Emily Baisden, at UD and MCC, studied insect herbivory on shrub and tree species and their common cultivars. She found that insects preferred the straight species over cultivars with red/purple leaves but, interestingly, that the insects liked the cultivars with variegated leaves, those with disease resistance, and those with increased fruit yield more than the straight species.

Overall, it seems that, while there may be a trend for insects to prefer the straight species to cultivars, there are certainly some cultivars that are attractive enough to insect pollinators and herbivores that, when used in landscaping, they could definitely be providing for the food web. When it comes to flowers, the closer the plant and flower structure of the cultivar are to the wild type, the more attractive they tend to be to insect pollinators. In the studies by both Nevison and White, the cultivars that attracted the most pollinators were the ones that had flower colors similar to that of the straight species. Cultivars with taller, denser flowering stalks are sometimes more attractive to pollinators than the straight species, as long as the flower shape and color do not differ significantly from the species. Herbivorous insects are happy to take part in feeding on cultivars with increased productivity due to disease resistance or increased fruit production. They don't like un-naturally colored leaves (I don't blame them!), although if the leaves appear half-dead (as variegated ones do to me), they're happy to help those plants in their demise.

Other than their contribution to the food web, another aspect to consider when selecting native plants and/or their cultivars for use in landscaping is the genetic variation they bring to the landscape. Because the cultivars are, by definition, clones, their genetic contribution is limited. Use of the wild type ensures that genetic diversity of the species enables adaptation to local and changing environmental conditions. This is especially important these days, when natural habitats are being altered and destroyed at alarming rates. If everyone in the neighborhood or, for that matter, in the region, plants the same cultivars of native species (because those are the ones commercially propagated), the genetic diversity of the species is limited. Additionally, when we purchase cultivars that have been developed in greenhouses or in parts of the country with climates different from our own, we risk coming home with plants that are not well-adapted to our environment. Plants that performed well in Delaware or Vermont may not do well with the extended warmth of our North Carolina summers.

Another consideration regarding cultivars is that some are sterile. This sterility may come from lack or inviability of pollen or ovules, sometimes intentionally bred into the plants to prohibit unauthorized propagation. While this sterility would be welcomed in non-native plants to decrease the chance of their becoming invasive, sterile cultivars of native species are, in essence, "stealing" pollinator activity from nearby wild species that are relying on pollinators to deliver pollen to and from other nearby plants. With the marked decrease in pollinating insects in today's world due to habitat depletion and our massive use of insecticides, that pollinating action is at a premium. When the pollinators visit plants that are not contributing to the spread of pollen among native plants, the time they spend pollinating our native plants is lessened.

Carrie deJaco….

Straight species are rarely available at box store garden centers, although they are frequently available from small, independent nurseries. When I do see native plants for sale, I almost always bring at least a few home to show my consumer support for their offering native plants (to be honest, I just can't help myself, and my pocketbook may be saved only by the fact that I have a very small car!). When multiple cultivars are offered, I try to select those that look closest to the wild type rather than crazy colors (like those weird, brick-red *Echinacea purpurea*!). Sometimes I will purchase one of each of the cultivars available to try to encourage cross-breeding, and therefore genetic variability, in my own yard.

If you're interested in learning more details about what I've summarized here, you can find the referenced papers online. You can also learn more about various cultivars of native species studied at MCC on their website (https://mtcubacenter.org/research/trial-garden/).

Oenothera fruticosa

Oenothera fruticose 'Cold crick'

(a clumping form that rarely sets seed)

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White, A.S. 2016. From nursery to nature: evaluating native herbaceous flowering plants versus native cultivars for pollinator habitat restoration. Ph.D. dissertation, Univ. of Vermont.

Bombus affinis

Catch a Shooting Star

Crystal Cockman

During these cold winter months, I like to flip through my albums of pictures I have taken of spring wildflowers and think about warmer temperatures soon to come. Fortunately my job allows me to spend quite a bit of time outside, and I have been blessed to see and photograph a lot of interesting and beautiful plants.

Last year I was able to visit a site in Montgomery County with a remarkable flower – the Eastern shooting star (*Primula meadia*, also known as *Dodecatheon meadia*). They are only known from a few locations in the Uwahrries. A botanist friend of mine had visited this site a number of years ago when these flowers were first spotted, so I was happy to find that they still persisted in this location.

There were a lot fewer plants though than previously found. I asked my friend why this would be, and she told me that small populations usually dwindle over time due to lack of genetic diversity. I asked if they would eventually disappear altogether, and she simply said that was an excellent question. I guess it is hard to know for certain. I surely hope that they are able to hang around.

Shooting stars are in the primrose family and are native to Eastern North America. They are perennial and typically grow to a height of 6-20 inches. Their flowers are nodding, which means they droop down, and the color of the petals can be white (in southern states) or pinkish-purple (in northern states). The ones I saw were white. The petals come down to a point, which is a purplish-red color at the top and then fades into a yellowish-orange color at the tip. They look much like a shooting star.

In North Carolina, eastern shooting star is found in scattered locations in the mountains and Piedmont. According to the natural heritage inventory for Stanly County, its habitat consists of "irregularly inundated, circumneutral streamsides," which are not found in a lot of places, which explains why the are not very common.

Eastern shooting star is only known to occur in one location in Stanly County in the Stanfield area. They are typically found within a Piedmont Mafic Cliff community. In Stanly County, these communities usually occur on rock outcrops and steep slopes on the Rocky River. These areas favor open-canopy woodlands with sun-loving plants. They are comprised of slate bedrock that decomposes slowly into a circumneutral pH soil, and most are south facing. These south facing slopes that receive lots of sun expectedly favor plants that are drought-tolerant. These plants can outcompete other plants in these somewhat harsh living conditions.

Not only are they uncommon in the Piedmont, but also the eastern shooting star is a state threatened species. A threatened species is any species that is likely to become an endangered species within the foreseeable future in all or a large part of its known range. This is largely due to habitat loss, though they are also threatened by poaching. Habitat destruction is probably more of a problem for this plant in states where they occur in more prairie-like habitat, including right-of-ways that are frequently sprayed with herbicides.

I am hopeful that there are more occurrences of shooting star in the area than we know about. If you have seen any nearby, I'd love to hear about it. You can email me at crystal@threeriverslandtrust.org or contact me by phone at 704-647-0302. If not, keep your eye out this spring for this interesting plant. They are another beautiful gem in nature's flower garden.

Photo courtesy Crystal Cockman.

New Smithsonian Study Links Declines in Suburban Backyard Birds to Presence of Non-native Plants

Insect-eating birds that depend on the availability of high-calorie, high-protein cuisine—namely caterpillars and spiders—during the breeding season to feed their young are finding the menu severely lacking in backyards landscaped with even a small proportion of non-native plants, according to a new study from the Smithsonian Conservation Biology Institute. This reduction of food availability has led to a decline in the breeding success and population growth of the Carolina chickadee, the study found.

"Landowners are using nonnative plants in their yards because they're pretty and exotic, they're easy to maintain, and they tend to have fewer pests on them," said Desirée Narango, a graduate student researcher at the Smithsonian Conservation Biology Institute and first author of the study published October 22 in *PNAS*. "But it turns out that a lot of those insects they see as pests are actually critical food resources for our breeding birds. For landowners who want to make a difference, our study shows that a simple change they make in their yards can be profoundly helpful for bird conservation."

The study is the first to directly link the decline of a common resident bird species to the lack of insect prey that results from the use of nonnative plants in landscaping. Narango and colleagues placed nest boxes in more than 160 yards in the Washington, D.C., metropolitan area and collected data from homeowners monitoring the nest boxes weekly for Carolina chickadee nests, eggs and nestlings. In those same yards, they also studied adult and juvenile survival by gathering data from the homeowners on individually marked birds they had resighted.

The researchers found that the only yards that were able to produce enough chickadees to sustain a stable population were those with a plant composition made up of more than 70 percent of native plants. Because more than 90 percent of herbivorous insects will only eat one or a few native plants, the use of these plants in landscaping is essential to ensure breeding birds have enough insect prey to eat. For the same reason, native plants are also likely critical for other resident birds, endangered species and migratory species—and not just in backyards on the East Coast.

"These novel, artificial suburban landscapes are found across the country," Narango said. "But a gingko that you plant in D.C. and a gingko that you plant in L.A. are doing the same thing for bird conservation—nothing. By using native plants, we can provide food for not only our common North American species, but we're also providing vital stopover habitat and resources for migratory birds during their perilous journeys."

Because more than 80 percent of land in the contiguous United States is privately managed, conservationists are trying to get a handle on the ways these human-dominated landscapes threaten wildlife—and how they can be managed in a way that can help. The study's authors will continue to guide landowners in their landscaping decisions by next looking at whether some native plant species are disproportionately important for supporting insect prey to breeding birds.

This study was conducted in partnership with the University of Delaware and funded by the National Science Foundation. It relied on data collected by landowners participating in the Smithsonian's Neighborhood Nestwatch program, a citizen-science program that engages communities in monitoring the annual survival and reproductive success of specific bird species.

"Urbanization is one of the primary ways we're losing natural habitat around the world, and it remains essential that we figure out how we minimize our impacts while maximizing the protection of biodiversity," said Pete Marra, director of the Smithsonian Migratory Bird Center and co-author of the paper. "By working together with citizen scientists participating in the Neighborhood Nestwatch program, people actually living within the urban matrix, we have collectively found a solution that's good for birds and also for people.

Resources on native plants can be found online at Audubon's Native Plants Database, National Wildlife Federation's Native Plant Finder and the United States Department of Agriculture's Plant Hardiness Zone Map.

The Smithsonian Conservation Biology Institute plays a leading role in the Smithsonian's global efforts to save wildlife species from extinction and train future generations of conservationists.

Article:
Desirée L. Narango, Douglas W. Tallamy, and Peter P. Marra. Nonnative plants reduce population growth of an insectivorous bird. PNAS November 6, 2018 115 (45) 11549-11554; published ahead of print October 22, 2018 https://doi.org/10.1073/pnas.1809259115

Keeping Up with Global Warming

Recent drought and tree mortality effects on the avian community in southern Sierra Nevada: a glimpse of the future?

L. Jay Roberts, Ryan Burnett, James Tietz, Sam Veloz

Abstract

Birds respond rapidly to changes in both habitat and climate conditions and thus are good indicators of the ecological effects of a changing climate, which may include warmer temperatures, changing habitat conditions, and increased frequency and magnitude of extreme events like drought. We investigated how a widespread tree mortality event concurrent with a severe drought influenced the avian community of the Sierra Nevada mountain range in California. We assessed and compared the separate effects of climate stresses and altered habitat conditions on the avian community and used this information to evaluate the changes that are likely to occur in the near future. We built tree mortality maps from freely available Landsat imagery with Google Earth Engine. We analyzed avian point counts from 2010 to 2016 in the southern Sierra Nevada, to model temperature, water deficit, and tree mortality effects on the abundances of 45 bird species, and then used these models to project abundances into the future based on three climate projections. A large portion of the avian community, 47%, had a positive relationship with temperature increase, compared to 20% that responded negatively. More species (36%) declined with drier conditions than increased (29%). More species declined in response to high tree mortality (36%) than increased (9%). A preponderance of species adapted to colder temperatures (higher elevation) had negative responses to high tree mortality and water deficit, but positive responses to increasing temperature. We projected the highest total bird abundances in the future under the warmest climate scenario that we considered, but habitat modification (e.g., tree mortality) and water deficit could offset the positive influence of temperature for many species. As other studies have shown, climate warming may lead to substantial but idiosyncratic effects on wildlife species that could result in community composition shifts. We conclude that future climate conditions may not have a universally negative effect on biodiversity in the Sierra Nevada, but probable vegetation changes and increased likelihood of extreme events such as drought should be incorporated into climate-smart forest and wildlife management decisions.

Mountain chickadee

Full article:

L. Jay Roberts, Ryan Burnett, James Tietz, Sam Veloz. **Recent drought and tree mortality effects on the avian community in southern Sierra Nevada: a glimpse of the future?** *Ecological Applications*, 2019; e01848
DOI: 10.1002/eap.1848