

Salamander News

No. 8

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www.yearofthesalamander.org

The “I” of Salamander Conservation

by Brandon M. Ruhe, President, The Mid-Atlantic Center for Herpetology and Conservation



“I?” You, yes, I’m looking at you, are critical to salamander conservation! Eastern Newt eft, *Notophthalmus viridescens*, © Noah Charney, Year of the Salamander Photo Contest.

As the months of 2014 roll by (too quickly for some of us), each wonderful edition of the *Salamander News* is unified not only by the overarching subject, our beloved salamanders, but by the importance placed upon the role of the general public as stakeholders and stewards in salamander conservation. Whether it is the construction of artificial habitats, supporting funding sources for researchers, or helping pool-breeding salamanders across

the road on migration nights, it is apparent that lasting conservation measures are only attainable through a well-informed and engaged constituency. Unfortunately, there are too many projects, too many important areas to protect, and too few resources available for the relatively small number of researchers and conservationists to get even a tiny fraction of the work done that effective protection of salamanders requires. And in times of financial uncertainty for government and private funding for these projects, the resources are scarcer than ever. But born through these trials is a new and collaborative approach to amphibian and reptile conservation. A surprising number of folks, from all walks of life, identify as amateur naturalists and nature-enthusiasts. For these people, a passive role of moral or financial support for conservation is not enough; they are looking for the opportunity to get their boots and hands muddy in the field with professional biologists and conservationists. These naturalists have swelled the ranks of field herpetology the world over, creating a modern army of **Citizen Scientists**, a term coined two-score ago, but not widely used until the past decade. And to be honest, the idea of general public involvement in

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I = inventory
I = iPhone
I = individuals everywhere



www.machac.org

Brandon M. Ruhe, Photo by
 Amy R. Croushore

sponsored by **PARC - Partners in Amphibian and Reptile Conservation**



Get Your August Photo Contest Calendar - Free!

Even common species like the **Eastern Red-backed Salamander**, *Plethodon cinereus* can be uncommonly fascinating. To grab your own calendar-size version of this month's winner by **Megan Winzeler** and see our newtly runners-up, go to <http://www.parcplace.org/images/stories/YOSal/YoSalCalendarAugust.pdf>.

Call for Photos for the 2014 Year of the Salamander Calendar Photo Contest

We are seeking close-up, digital photos of salamanders, preferably in their natural habitats or within an educational or conservation context. One winner will be selected each month to be the featured photo as part of the Year of the Salamander online calendar. Runner-up photos will also be included in the calendar. In addition, all submitted images will be considered for use in the Year of the Salamander monthly newsletter and website as well as other Year of the Salamander-related conservation, outreach, and educational efforts. Give us your best shot! For more information and for entry details, please visit <http://www.parcplace.org/images/stories/YOSal/YOSphotocontest.pdf>.

Year of the Salamander Podcasts Coming Soon!

Podcasts will soon be posted on the Year of the Salamander webpage (www.yearofthesalamander.org). Check the site for details in August.

Get your Year of the Salamander 2014 Gear!

Go online to the PARCStore (<http://www.cafepress.com/parcstore>).

Ready to gear up for Year of the Salamander? We've got you covered!

At the Café Press PARCStore, you can find just about any style of t-shirt, sweatshirt, or hoodie, for men, women, or children. But don't stop there - you'll find a messenger bag, field bag, aluminum water bottle, even a beach towel (in case you want to join the salamanders crawling out of that primeval sea).



And take a look at the beautiful **Year of the Salamander Wall Calendar**, full of fantastic salamander photos for every month of your year!

Proceeds from sales go to the Year of the Salamander Conservation grant, managed by Amphibian and Reptile Conservancy, a not-for-profit organization that helps support PARC activities, such as public education, publications, and research.



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Year of the Salamander Collaborating Partners

The Year of the Salamander Planning Team is pleased to welcome the following organizations to our growing list of collaborating partners:

Chopsticks For Salamanders

www.chopsticksforsalamanders.org

Chopsticks for Salamanders (CFS) is a non-profit organization that provides funding for salamander research, education and conservation. The organization is supported by three founding American Association of Zoo Keepers (AAZK) chapters: the Bronx Zoo, the National Zoo and the Maryland Zoo in Baltimore. CFS mission has three significant goals: to disseminate information about the production of disposable chopsticks; to increase awareness about salamander diversity in the United States; and to raise money for salamander conservation, education and research.



The Wandering Herpetologist

www.wanderingherpetologist.com

The Wandering Herpetologist is dedicated to providing news, facts, and educational information about amphibians and reptiles. TWH believes in conservation through education. Our goal is to dispel misplaced fears and myths about amphibians and reptiles and to encourage people to learn more about these fascinating organisms.

The Black Mudpuppy

www.blackmudpuppy.com

The Black Mudpuppy is a web-based comic book about the adventures of an Aztec god trapped in the body of a paedomorphic salamander. Drawn by life-long herpetology enthusiast Ethan Kocak, the comic has been featured on Scientific American and Wired Science's websites. Despite that, it's not nearly as educational as it sounds. In any case, it's a fun, snarky comic about obscure perennibranchiate amphibians.



The HERP Project

<http://theherpproject.uncg.edu>

Herpetology Education in Rural Places and Spaces (The HERP Project, funded by NSF ISE Grant # DRL-1114588) consists of four threads (Celebrations, Cyberhub, Herpetology Research Experiences, and Studies) to support educational, conservation and field ecology experiences related to herpetology. The HERP Project's goals include:

- Igniting a passion for NC's reptiles and amphibians,
- Developing a sense of place and a connection to the local environment,
- Engaging people in conservation and field ecology experiences, and
- Promoting the public's participation in scientific research



Where The Wolves Once Roamed

www.wolvesonceroamed.com

With the rise of civilization and especially industrialized society, the earth and its other inhabitants have faced many threats. An increase in the use of natural resources for human use has decreased the amount of resources available for other species. Species are going extinct at a shocking rate as pollution, poaching, and encroachment take their toll. The purpose of this blog is to let the public and students learn about wildlife biology and conservation. Whether you're thinking about pursuing wildlife biology as a career or are just curious about the field, hopefully this blog will answer questions and open eyes.

We are still recruiting partners! If you are interested in contributing to the Year of the Salamander efforts, please send an email to yearofthesalamander@gmail.com with a brief description of your organization and its efforts. Our full list of partners can be found at <http://www.parcplace.org/news-a-events/2014-year-of-the-salamander/68-uncategorised/281-year-of-the-salamander-partners.html>

The I of Salamander Conservation, cont. from p. 1

biology and natural history is not actually new; rather it is the reinvigoration of endeavors considered quite en vogue during the Age of Enlightenment. Recently, the inventory and monitoring of salamanders have been greatly aided by citizen scientists in no small part by the availability of technologies only dreamed of a few decades ago. A simple smartphone can contain many of the tools of field work that were individually carried by researchers, or not even available: mapping programs, quick and inexpensive photography, flashlights, and of course, phone and email. So the “I” of salamander conservation, in this case is inventory, but is also symbolic of other pieces in salamander conservation, the iPhone™ one uses in the field, and you, the reader. Repeat after me, whether a professional biologist or neophyte naturalist, “I am important to salamander conservation.”



Water pollution and overcollection for bait threaten some populations of Black-bellied Salamanders (*Desmognathus quadramaculatus*) in the southern Appalachians.

This edition of the *Salamander News* highlights several projects driven by citizen scientists in the Mid-Atlantic Region of the United States of America. These projects are near and dear to me for various reasons, not the least of which is that I was involved in the creation of and administer one of the highlighted projects. Please forgive my regionalism and keep in mind that wonderful citizen science projects occur around the world, led by a diverse and dedicated group of individuals. I hope these examples resonate as beacons of success and positivity that salamanders and amphibian and reptile conservation in general, desperately need. Seek them out wherever they are and lend a hand. But keep in mind there are some basic rules and pieces of advice that must be followed:

1. Be sure to contact project personnel before diving head-first into a project. This will allow you to get a feel for the project and whether it is something commensurate with your interests and experience.
2. Don't be offended if researchers give you a trial period. One of the fears many workers have is that research sites will be hunted by poachers, particularly when species are present that have value in the illegal wildlife trade.
3. Always follow the rules and regulations of the area that you are in. In certain areas, special permissions or permits may be required. For instance, many public parks may have rules prohibiting habitat disturbances, the pursuit of wildlife, or even leaving trails.
4. As featured in the June edition of the *Salamander News*, the spread of pathogens is a growing problem for amphibians and other aquatic life. Decontamination of gear and clothing is very important, even if it is the simple washing of clothes and dipping of boot soles into bleach solution or some other disinfectant. If you move between drainage basins, states, or countries in your travels, decontamination is particularly important. See NEPARC's disinfection protocol at: http://www.northeastparc.org/products/pdfs/NEPARC_Pub_2014-02_Disinfection_Protocol.pdf for more information and guidance on decontamination protocols.
5. If you are involved in a project that allows autonomy in the field, be careful to minimize habitat disturbances (e.g., return rolled logs to the position found, carefully inspect but don't destroy a rock crevice or rip bark from a tree) and impacts on salamanders. Avoid handling salamanders if possible, unless directed to do so (and permitted if necessary). This minimizes injury and stress for the salamanders. While many species seem harmless enough, some can exude quite toxic secretions; also, chemicals on your hands, such as sunscreen, lotions, or insect repellents, can be harmful to salamanders and are easily absorbed by their skin. And never collect salamanders for pets!
6. Situational awareness is critical. Salamander habitats can be dangerous for myriad reasons, including slip-and-fall, drowning hazards, toxic plants, and stinging/biting animals.
7. Have fun and revel in your contributions toward the understanding and conservation of salamanders!

Maryland Amphibian and Reptile Atlas (MARA)

An interview with Heather Cunningham, Ph.D., Statewide Coordinator, Maryland Amphibian and Reptile Atlas

The Maryland Amphibian & Reptile Atlas (MARA) is a five-year citizen science project sponsored by the Maryland Department of Natural Resources and the Natural History Society of Maryland. The project is sponsored by the It was officially launched in January 2010 and ends December 2014. The goal of the project is to document the current distribution of Maryland's amphibian and reptile species. Wildly successful, MARA was one of the first atlas projects to successfully meld hand-held technologies with field biology. Heather Cunningham, Statewide Coordinator of MARA, was interviewed about this project and the role that citizen scientists play in her work.

What is your background, and why herps?

Heather Cunningham: I am from Tuscaloosa, Alabama. I am currently the Statewide Coordinator of the Maryland Amphibian and Reptile Atlas.

I completed my doctorate at the University of Alabama where my research focused on range dynamics of the Northern Slimy Salamander (*Plethodon glutinosus*) and Mississippi Slimy Salamander (*P. mississippi*). Specifically, I studied the impacts of species interactions and environmental conditions on range limits. Additionally, I have always been active in educational outreach programs that raise public awareness about amphibians and reptiles, their importance in ecosystems, and the serious conservation threats they are facing. In general, I find amphibians and reptiles fascinating—the diversity of species, their life history and ecology, etc. However, I am partial to salamanders! Salamanders are just fascinating animals!



Can you give us some background about MARA?

The most recent set of comprehensive maps for Maryland herpetofauna were compiled in 1975 so the MARA is very timely! Since those maps were published in 1975, changes to land use, land management practices, animal disease distribution, water pollution abatement practices, and climate have potentially altered habitat suitability and population fitness of Maryland's herpetofauna. Surveying the entire state, requires significant volunteer assistance and provides an opportunity to recruit and train novice participants, and thereby raise general ecological literacy by increasing awareness, skills, understanding, and knowledge of the natural world.

Why is Citizen Science important?

Citizen science is a great way to engage the public in the scientific process while simultaneously raising public awareness about the importance and threats to biodiversity. Citizen science provides an opportunity for people to become involved in the long-term protection and conservation of biodiversity and the environment. In many instances, citizen science may be the only practical way to achieve the geographic reach required to document ecological patterns and address ecological questions at scales relevant to species range shifts, broad-scale population trends, and impacts of environmental processes like landscape and climate change. In our case, the MARA provides an opportunity for citizens to actively learn about native diversity while collecting valuable distributional data that the Natural History Society of Maryland and the Maryland Department of Natural Resources will use for the conservation and protection of Maryland's amphibians and reptiles. As a citizen science project it has the added benefit of educating



Ambystoma tigrinum, Somewhere in Maryland, photo by Kyle Loucks, MARA volunteer.

citizens about native amphibian and reptile diversity and its ecological benefits—an important step in creating an informed society that actively participates in the long-term conservation of Maryland's nature heritage.

Has MARA been a success?

Yes! Support of the MARA project has been exceptional. We have a tremendous group of dedicated volunteers who have put forth an extraordinary effort for this project. To date, over 30,000 records have been submitted from across the state. Distributional data collected during the Atlas period have not been exclusive to common species. Volunteers have collected data on a number of rare species and

species of conservation concern in Maryland. Some salamander examples include, Eastern Tiger Salamander, Green Salamander, Eastern Hellbender, Wehrle's Salamander. The MARA is yielding a better understanding of distribution of native herpetofauna in Maryland. Many new localities and county records have been recorded for many species in the state. Additionally, MARA is providing insights into the presence of non-native species within the state.

How many participants have joined MARA? How many records have been recorded?

To date, more than 500 people have participated (submitted data and/or provided land access) in the project. We have a good mix of amateurs and professionals. Over 30,000 records have been submitted to the Atlas. Approximately, 16,800 of those records have been accompanied by photos and/or recordings. We have received 83 sightings of non-native species in the state.

Is MARA important for salamander conservation?

Yes, through the MARA project we are gaining a better understanding of the distribution patterns of Maryland's salamander species. An important aim for the project is for the data collected to inform conservation strategies for the long-term conservation and protection of Maryland's amphibians and reptiles. Current distributional data is valuable for developing these strategies. Additionally, the MARA will serve as a baseline against which distributional changes can be compared. This will be important in assessing the distributional response of species to factors such as climate change.

What are the most interesting salamander finds for MARA?

Eastern Tiger Salamander—State Endangered : Green Salamander—State Endangered
 Eastern Hellbender—State Endangered : Wehrle's Salamander—listed as "In Need of Conservation" in the state.
 We also had a Northwestern Salamander that hitched a ride to Calvert County on a Christmas Tree!

(Author's Note: the Northwestern Salamander, *Ambystoma gracile*, is native to the northwest coast of North America, the nearest populations a distance of some 2,500 mi or >4,000 km from Calvert County)

What is your opinion about the future for salamanders in Maryland and beyond?

Salamanders, like all amphibians, face serious threats in the US (and the world)—habitat loss, pollution, climate change, invasive species etc. In Maryland, salamanders face some of these same issues. However, I am optimistic about their future in the US and in Maryland. There are a lot of people working very hard to ensure their long-term survival and conservation. In Maryland, there is protection for non-tidal wetlands, efforts to improve stream quality, and protection of riparian habitat. There is also a lot of outreach being conducted to raise public awareness about the plight of these animals and their importance to healthy environment.

How can folks get involved and in contact with you and MARA.

We still need help! For more information people can contact me, hcunningham@marylandnature.org, visit our website <http://marylandnature.org/mara/>, or find us on Facebook, <https://www.facebook.com/MDHerpAtlas>. We have a video on YouTube that describes the project and how folks can get involved,

https://www.youtube.com/watch?v=_zgqCGPUduQ&feature=youtu.be.



Wehrle's Salamander, *Plethodon wehrlei*, Washington County, MD, photo by Ed Thompson.

BioBlitzes

by Thomas C. LaDuke, Ph.D., Department of Biological Sciences, East Stroudsburg University, East Stroudsburg, PA

If we have learned anything about wildlife in the last few decades, we have certainly learned two important facts: 1) that all ecosystems are dynamic, changing systems that respond to disturbance in often-unpredictable ways, and 2) that there aren't enough professional biologists in all the world to keep track of how ecosystems are changing today all over the world. Each such system contains myriad species of plants, fungi, and animals that interact in intricate ways. Many important and valuable studies are certainly done by professional biologists, but funding and human resources are becoming more and more limited, and even if they weren't, we would still only be able to study a small number of animal and plant species and their habitats. As a college professor and herpetologist, I have been especially troubled by the twin issues of declining amphibian species and amphibian deformities in the wild, and have often wished that we could be more proactive in identifying changes in amphibian abundance and distribution as they occur in the wild.

It is precisely for these reasons that many scientists and agencies have become interested in projects that involve citizen science, the linking of knowledgeable non-professionals and hobbyists with professional scientists who have projects that can be accomplished by large numbers of people contributing small amounts of data to a communal pool under the guidance of those scientists. Information that was formerly inaccessible. This kind of study, linking interested citizens with professional biologists, is becoming much more popular and is beginning to provide useful information about amphibians and reptiles, including salamanders. A recent example of this type of study is the BioBlitz, in which expert biologists of many types contribute their expertise and guidance while knowledgeable hobbyists and non-professionals contribute their hands and effort to locate, photograph, and in some cases capture or sample as many species as possible from a given plot of land in a 24-hour period. These kinds of studies provide information about species associations in very limited geographic regions during a brief moment in time. Some have claimed that this kind of information is of limited value because a one-day sample will rarely give a comprehensive list of the species present in the region, and for many groups of organisms, we already know what should be present in the area. However, the amount of information that can result from a well-planned and well-executed BioBlitz is truly vast, and goes far beyond attempting to provide better resolution for range maps. Most importantly, it provides us with current information on the status of many species in the region. Rather than reacting to species declines years or even decades after it is too late to implement meaningful conservation measures, a BioBlitz can help to identify potential problems much sooner, and hopefully allow proactive conservation studies to be undertaken in a meaningful time-frame. Furthermore, for many specific regions and groups of organisms, a BioBlitz provides the only information about what species occur at a given site. Of course, this information becomes much more valuable if there are previous records of what has been seen or collected at the site.



Thomas C. LaDuke, Photo by Jill D. Pruetz.



A Long-tailed Salamander, *Eurycea longicauda*, Pennsylvania. Photo by Brandon M. Ruhe.

I have participated in several BioBlitzes in northeastern Pennsylvania and New York and these have been hosted by two separate organizations: The Monroe County Environmental Education Center and another called the Upper Delaware BioBlitz. Both have been very effective at organizing and carrying out these one-day studies at a different site each year. In this way, an impressive record of the species that presently occur in this region is being assembled, year by year. One of the most remarkable things about these events is that they are carried out entirely on a volunteer basis. The amount of scientific expertise that is gathered and brought to bear at these events is truly astounding.

When I stop to think about how much grant money would be required to conduct such a study by paying for the expertise and labor, the numbers run easily into the hundreds of thousands of dollars. Many professional biologists are happy to contribute a day each year to such a project if the appropriate agencies can get permission to access the land and provide any necessary permits.

As a herpetologist, I can see the importance of having real expertise available at a BioBlitz. For some groups, such as salamanders, identification can be difficult even with a key or field guide in hand. Also, many citizen volunteers are able to locate and tally large numbers of the adult forms of more common species, but when one only has a day to perform the study, it is not always possible to find the easy-to-identify adult stages of every species. Thus, the ability to identify the larvae and even the eggs of these species can add a great deal of information to the final roster. Knowing where to look for the less common species can be very important as well. The BioBlitzes that I have participated in have provided remarkably large amounts of information about the areas studied, with total tallies sometimes exceeding 1,000 species. Although we rarely locate and identify all of the species that are expected to occur in a region, we are usually able to provide positive records of occurrence for a majority of the region's amphibians. This is valuable to many biologists and gratifying to participants of all types.

Eastern Red-backed Salamanders, White-tailed Deer, and Citizen Scientists

by Amy R. Ruhe, Natural Resource Manager, Valley Forge National Historical Park & Hopewell Furnace National Historic Site, King of Prussia, Pennsylvania

Valley Forge National Historical Park is a small (5.2 mi² or ±13.5 km²) National Park a mere nine miles (14.5 km) from Philadelphia, the fifth-largest city in the United States of America. The park has remained a refuge for numerous species of amphibians and reptiles that have otherwise disappeared from the surrounding urban landscape. Unfortunately, due to surrounding development, along with lack of natural predators and hunting within the park, an unusually high number of White-tailed Deer (*Odocoileus virginianus*) were found within the park boundaries. The deer density actually reached 240 deer/mi² (±2.6 km²), well-above the natural regional density of 30 deer/mi². The effects on the vegetation in the park were disastrous, with severe over-browsing actually resulting in negative forest regeneration and an almost complete removal of most shrubs and herbaceous plants. Additionally, the deer within the park appeared severely malnourished and stunted. Starting late in 2010, the National Park Service began a deer management program that included the culling of the deer population to more natural levels.

Biologists at Valley Forge developed an Eastern Red-backed Salamander (*Plethodon cinereus*) monitoring program co-located with long-term forest monitoring, including coverboard and transect surveys, to assess changes in the ecosystem as the forests begin to recover. Salamander monitoring began prior to deer management and will be carried out for several decades. Amy R. Ruhe, Natural Resource Manager of Valley Forge National Historical Park was interviewed about this project and the role that citizen scientists play in her work.

Can you tell me a little about yourself?

Amy Ruhe: I am the Natural Resource Manager for the National Park Service (NPS) for both Valley Forge National Historical Park and Hopewell Furnace National Historic Site. As part of my duties, I monitor the natural resources found within our protected landscapes in an attempt to strike a balance between public use, natural resource protection, and the historical goals of these NPS sites.

Why Eastern Red-backed Salamanders?

Eastern Red-backed Salamanders are seemingly ubiquitous denizens of the eastern (U.S.) forests and of incredible importance ecologically, as famously displayed by the work Burton and Likens at Hubbard Brook Experimental



Amy Ruhe in Aruba, Photo by Brandon M. Ruhe.



Eastern Red-backed Salamander, *Plethodon cinereus*, Valley Forge NHP. Photo by Bill Moses, NPS volunteer.

Forest in New Hampshire. They have relatively short lifespans, seemingly quick population regeneration rates, and are relatively easy to find. For our purposes, this is the perfect critter to study as indicators of ecosystem health as related to forest regeneration.

What role do citizen scientists play in your monitoring studies?

A critical one! Park volunteers, from school groups to retirees looking to lend a helping hand. Private citizens can become official volunteers, where they get training, and instruction from park staff and assist us in the field. We have a great group of volunteers and they are really important for getting our projects accomplished.

Have you noticed an increase in your Eastern Red-backed Salamander density?

Not yet, as we are really early in the study. But we are starting to document tree seedlings in unfenced areas, something that hasn't occurred naturally since the 1990s. This is an indication that the forest is beginning to recover, and we expect to see subsequent changes in the salamander populations.

How does someone go about volunteering for a National Park?

Interested people can go to www.volunteer.gov for general information about volunteering at National Parks. Individuals can call volunteer coordinators within each park unit for more information or park specific procedures and requirements. NPS parks are always looking for volunteers, but keep in mind many may not have salamander projects in place.

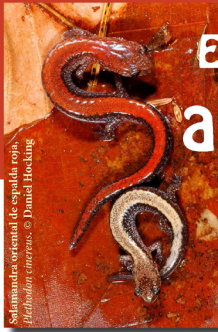
En Español ahora: El Estado de la Salamandra

www.yearofthesalamander.org


The *State of the Salamander* document is now available in Spanish - *El Estado de la Salamandra!* Thanks to members of the Advanced Spanish class at Siena College for their hard work on the translation, and especially to Lisette Balabarca for organizing the effort and editing the results!



©L. Balabarca-Fataccioli



El Estado de la Salamandra



2014 el Año de la Salamandra

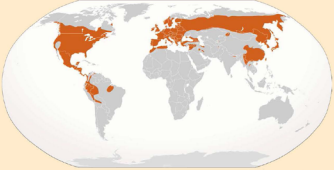
El grupo Para la Conservación de Anfibios y Reptiles (PARC) está celebrando el año 2014 como el **Año de la Salamandra** para alentar la educación, las investigaciones y la conservación de la salamandra. Este es un esfuerzo mundial, reforzado por las acciones de muchas organizaciones e individuos asociados a este proyecto, desde el ámbito público hasta el profesional. Durante el año que viene, PARC y sus colaboradores trabajarán para concientizar a la gente sobre:

- la importancia de las salamandras para la humanidad y dentro de los sistemas naturales;
- las diversas investigaciones dirigidas a una mejor comprensión de las salamandras, de sus funciones en el ecosistema y de las amenazas a su existencia;
- las acciones que se ponen en práctica alrededor del mundo para conservar la población y el ambiente de las salamandras;
- la educación y los esfuerzos para llegar a la población a través de un caleidoscopio de la participación de individuos y grupos.

¿Sabía usted?

- Hay más de 600 especies de salamandras en el mundo.
- La mayoría de las especies de salamandras existe en regiones templadas del Hemisferio Norte.
- Estados Unidos es un lugar clave para las salamandras y tiene más especies que en el resto de los países.
- Casi la mitad de las especies de salamandras en el mundo están bajo amenaza de extinción.
- Las salamandras constituyen un aspecto importante dentro de la cadena alimenticia.
- La pérdida de salamandras puede indicar una mala salud ambiental.


Mapa © de TheEnviron/Maplab/Cytron Map Series. Fuente: Wikipedia



Misión del grupo Para la Conservación de Anfibios y Reptiles (PARC): "Conservar a los anfibios, los reptiles y su hábitat como parte integral de nuestro ecosistema y de nuestra cultura a través de una coordinación proactiva del ámbito público y privado." www.parcplace.org

Para más detalles sobre el Año de la Salamandra, visite nuestra página web: www.yearofthesalamander.org

Hágase socio para celebrar nuestra herencia natural en relación a la salamandra. Para más información sobre cómo ser socio, por favor contáctenos a: yearofthesalamander@gmail.com.



The Spanish translation project was a great opportunity for students in Dr. Lisette Balabarca-Fataccioli's Advanced Spanish class to learn about salamanders. The students were excited to see "live salamanders" at the Year of the Salamander Education Celebration!

Pennsylvania Amphibian and Reptile Survey (PARS)

Marlin D. Corn and Jason Poston, *The Mid-Atlantic Center for Herpetology and Conservation, Oley, Pennsylvania*



Marlin Corn. Photo: Brandon M. Ruhe.

The Pennsylvania Amphibian and Reptile Survey (PARS) is an important state-sponsored amphibian and reptile atlas project launched in 2013. PARS will determine the distribution and status of all amphibians and reptiles throughout Pennsylvania, building upon previous atlas efforts and combining modern technology with an army of citizen scientists. The project is a joint venture between the PA Fish & Boat Commission (PFBC) and The Mid-Atlantic Center for Herpetology and Conservation (MACHAC), funded by the PFBC (via the US Fish & Wildlife Service's State Wildlife Grants Program), the PA Department of Conservation and Natural Resources (Wildlife Resources Conservation Program), and MACHAC. PARS, similar to the MARA project, is the point where the general public, regulatory agencies, and researchers meet collaboratively with the goal of amphibian and reptile conservation. Technological improvements on traditional atlas methods include a voucher system and verification process, social networking capabilities (a Facebook for herpers), and smartphone apps for uploading data while in the field. Marlin Corn and Jason Poston of The Mid-Atlantic Center for Herpetology and Conservation were interviewed about this project and the role citizen scientists play in their work.

Tell us a little about yourselves.

Corn: I was born in Florida in the mid-1950s and have many vivid childhood memories of the great herpetological diversity of this state. One of the houses we lived in was adjacent to a wooded area in which I spent many hours playing, and I recall observing wonderful species such as Broad-headed Skinks, Eastern Kingsnakes, Indigo Snakes, Pygmy Rattlesnakes and Florida Box Turtles on a near-daily basis. These experiences made a great impression upon me and led to an intense interest in herpetology at a very early age. I am now the statewide coordinator of the PARS project for The Mid-Atlantic Center for Herpetology and Conservation.

Poston: I am originally from South Carolina, and now reside in the Pittsburgh area of Pennsylvania. I am the Database Administrator, Web Developer, and a Field Tech for The Mid-Atlantic Center for Herpetology and Conservation. Reptiles and amphibians have fascinated me since I was a kid. I think growing up in the Southeastern United States and having parents who encouraged learning about wildlife and showing me that all things should be appreciated and have a purpose helped in motivating me to learn all that I could about the world around me. Herps were the most interesting to me in those times.



Northern Dusky Salamander, *Desmognathus fuscus*, Pennsylvania. Photo by Brandon M. Ruhe.

Citizen science, why is it important?

Corn: Citizen science is incredibly important to large-scale research projects such as a state-wide atlas. It assists scientists with an incredible man-power resource needed to attain the goals which otherwise would not be possible. Citizen science also helps raise awareness of science-related issues among the general public because of the positive publicity it generates. It helps foster public awareness of important issues and a public buy-in to support responsible stewardship of the planet; it helps connect people to the natural world. It also creates wonderful opportunities, educational and otherwise, for students, teachers and average citizens.

Poston: Citizen science is a great way for projects like PARS to collect data from large areas, in a comparatively short amount of time, so we can have a better understanding of the distribution and range of species though out the state. Modern technology makes it easier for people to document species, since most people have a computer, smartphone or digital camera to use in the field and for transmitting data.

Has PARS been successful thus far?

Corn: The first year of PARS has been overwhelmingly successful: we have recruited over 900 volunteers who have submitted many thousands of observations, and we have compiled a collection of over 100,000 records, including historical observations. Many of the records we have received are of rare species, and have even ‘resurrected’ a species thought to have been extirpated from Pennsylvania. After one year we have already gained a much clearer picture than previously existed of Pennsylvania’s herpetological distribution. With nine years still remaining for PARS, we anticipate this project becoming one of the most successful wildlife atlases ever conducted.

Poston: In the first year of the project we are seeing some great data submitted from our volunteers. We have discovered a new species (Cope’s Gray Treefrog) within the state and rediscovered what was considered an extirpated species (Eastern Smooth Earthsnake), and have recorded many new county records. The PARS project has had over 1,500 participants, this being our regular contributors and also people that send us email submissions. The first year of the project (2013-2014) resulted in 13,400 atlas records from participants and nearly 100,000 historical records from pre-PARS years via volunteers, museums, and regulatory agencies. Close to 90% of our project volunteers are amateurs and >10% are professionals.

Is PARS (and atlases in general) important for salamander conservation?

Corn: Yes, as PARS gives us a better understanding of Pennsylvania’s salamander distributions, we can better develop strategies for the long-term conservation and protection of these animals. Population data collected by PARS will serve as a baseline against which future changes in distribution can be compared. This will be important in assessing the response of species to factors such as climate change (Poston agrees).

What are the most interesting salamander finds for PARS?

Corn: We are seeing good representation of previously under-sampled species such as the Ridge & Valley Salamander and Wehrle’s Salamander.

Poston: The rare species of course! Green Salamander, Blue-Spotted Salamander, and Eastern Hellbender.



PARS Volunteers Photographing Salamanders. Photo by Marlin Corn/The Mid-Atlantic Center for Herpetology and Conservation.



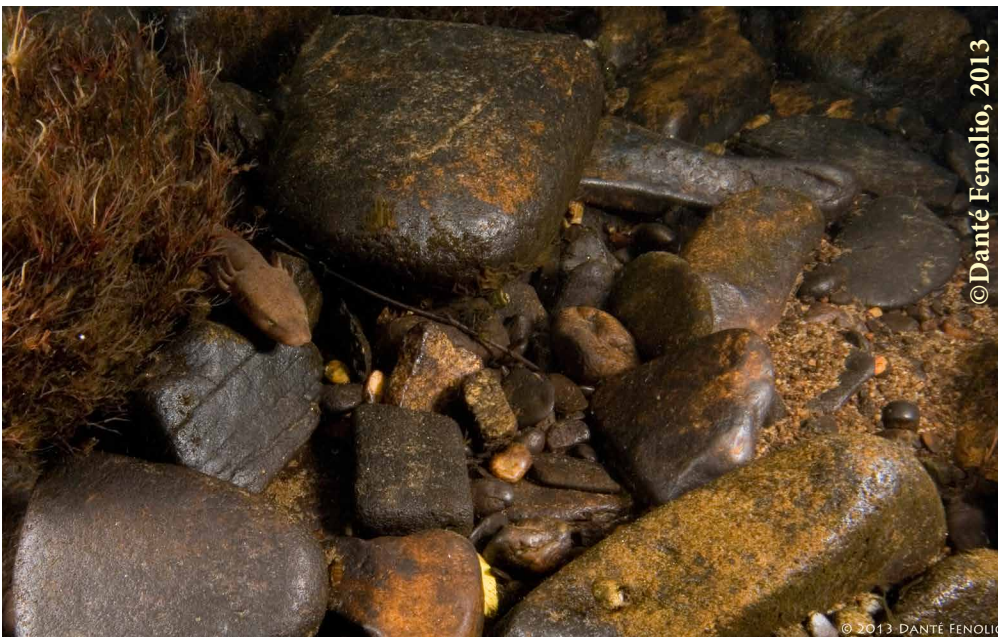
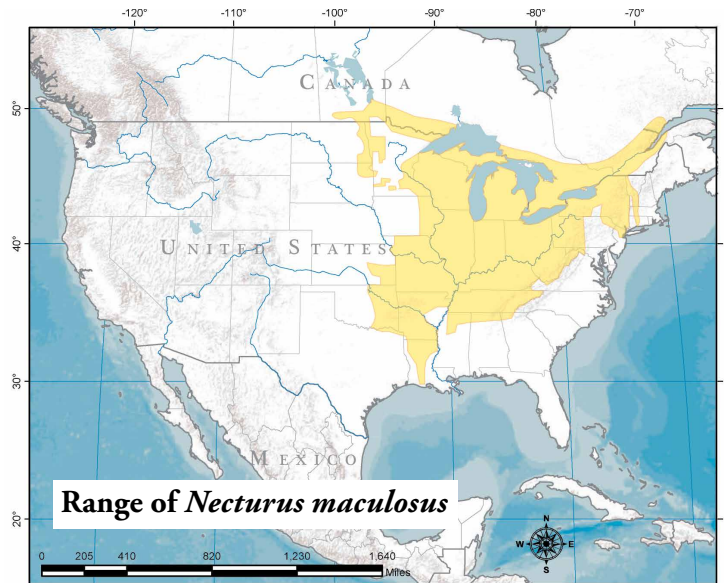
PARS volunteer photographing a Northern Spring Salamander (*Gyrinophilus porphyriticus porphyriticus*) with a smartphone. Field data were also entered and immediately sent to the PARS database via a smartphone app. Photo by Marlin Corn/The Mid-Atlantic Center for Herpetology and Conservation.

How can folks get involved in PARS?

You can email us at info@machac.org or visit us at <http://www.paherpsurvey.org> and <https://www.facebook.com/paherpsurvey>.

Family of the Month: Proteidae

The Mudpuppy (*Necturus maculosus*) is a member of the family Proteidae, which also includes the Waterdogs and the Olm. Mudpuppies occur in a variety of permanently aquatic habitats throughout parts of the eastern United States and Canada. They grow up to 16 inches (41 cm) long. These fully aquatic salamanders are paedomorphs, meaning they reach reproductive maturity while still retaining the appearance of a larval salamander. They have elongated bodies, red, feathery external gills, simple lungs, underdeveloped limbs, and fin-like tails. The name “Mudpuppy” originates from the squeaky, dog-like bark the animals can make.



A Mudpuppy peeks out from its stream-bottom habitat. Photo by Danté Fenolio, Year of the Salamander Photo Contest.

Family: Proteidae

Also known as:	Waterdogs, Mudpuppies, or Olms
Number of Species:	6 species in 2 genera, <i>Necturus</i> (5 species) and <i>Proteus</i> (1 species)
Region / Habitat:	<ul style="list-style-type: none"> - <i>Proteus anguinus</i> salamanders occur east of the Adriatic Sea in south-central Europe, in subterranean freshwater habitats - <i>Necturus</i> salamanders occur in the eastern United States and southeastern Canada
Physical Characteristics:	<ul style="list-style-type: none"> - all species are paedomorphic, meaning they reach reproductive maturity while still retaining the larval morphology such as external gills and a keeled, fin-shaped tail - they have elongated bodies and small, underdeveloped limbs
Behavior / Development	<ul style="list-style-type: none"> - nocturnal - they live and reproduce in water, laying their eggs on stones or plants
Fun Facts:	<p>Many subspecies of <i>Proteus anguinus</i> (Olm) do not have eyes, as they have adapted to living underground in caves.</p> <p>Waterdogs or Mudpuppies got their common names from the squeaky noise they make, though it is not really that much like a bark.</p>

Jewels of the Muck by Dirk J. Stevenson, The Orianne Society

In the eastern United States, gorgeous orange and red salamanders share seepages with odd dragonflies that sport ophidian patterns. From ravine springs in Appalachia to boggy seeps at the base of Coastal Plain sandhills, at sites where you find the various subspecies of those jaw-droppingly beautiful plethodontids—the Spring Salamander (*Gyrinophilus porphyriticus*), Red Salamander (*Pseudotriton ruber*) and Mud Salamander (*Pseudotriton montanus*)—you can almost always expect one-to-several species of Spiketail Dragonflies (Cordulegasteridae, *Cordulegaster* spp.)

Spiketail nymphs, like the larvae of these salamanders, are aquatic and inhabit mucky perennial seepages. Also similar to these spring salamanders, Spiketails have lengthy larval periods of from 2-3 years+ in duration.



Spiketail Dragonflies. On the right is a Say's Spiketail adult and nymph. The nymphs of (*Cordulegaster sayi*), a rare Coastal Plain dragonfly of seepage areas at the base of longleaf pine-wiregrass sandhills, share mucky springs with larvae of the Southern Red Salamander or, sometimes, the Mud Salamander. Photo of adult sayi by Giff Beaton, photo of nymph by Kevin M. Stohlgren



Strong springs feed this muck-lined seepage stream near the 17-Mile River in southern Georgia. **Photo by Dirk Stevenson, The Orianne Society.**

Wait a minute, just what is a perennial mucky seepage?

Perennial seeps are

highly stable environments that maintain some groundwater flow even during severe droughts (the artesian waters of seeps approximate annual average air temperatures, locally). And muck, reddish-brown or sometimes black, is a slurry of partially decomposed organic matter (i.e., not inorganic clay and silt) formed by slow but steady decomposition of hardwood litter. From the origin of spring-fed, muck-riddled seeps, often the size of a bathtub or smaller, flow idyllic brooks and runs often margined with sphagnum moss and liverworts.

they initiate rigorous rigging in their efforts to swim-escape back into the ooze; they are tough to hand-collect. Meanwhile, *Cordulegaster* nymphs, often the only dragonfly larvae present in these habitats, are optimal quarry for us fifty-somethings (when exhumed, they stumble about in an ungainly way, with excruciating slowness, before endeavoring to again bury themselves).

Spiketail larvae live a sit-and-wait, predatory existence—all the while buried shallowly in muck. The larvae will actively kick small particles of debris onto their bodies, rendering them invisible. And considering that they reach 1.5-2 inches in length before transforming, well, you can imagine that it's likely they are predators and/or competitors with *Pseudotriton* and other salamander larvae.

Field encounters with metamorphosed examples of Red and Spring Salamanders will excite the most seasoned of herpetologists. Lifting a stone along a mountain brook to expose a tomato-red *ruber* or shining your headlamp beam to reveal the salmon form of a large "Gyro"

Although I have wrecked numerous manicures doing so, I sure enjoy hand-raking muck for spiketail and salamander larvae. By stirring and turning the top four inches or so of muck deposits, an unseen world comes into view. Small annelids and crayfish, amphipods and mayfly nymphs, and even tiny mollusks are among the primary constituents of these soupy milieus. You will spot the beige *Pseudotriton* larvae as



Southern Red Salamanders often select microhabitats where they are bathed in seepage. **Photo by Dirk Stevenson, The Orianne Society.**

The handsome Midland Mud Salamander (*Pseudotriton montanus diastictus*) often co-occurs with equally gorgeous Tiger Spiketail (*Cordulegaster erronea*). **Photo by Dirk Stevenson, The Oriante Society.**

prowling a streambed at night in search of salamander prey.... They just don't come prettier, folks.

Finding Mud Salamanders can be difficult, and I have often stumbled while hunting the soggy bottoms where they occur. In south Georgia, a good Mud Salamander log is embedded deep in soft, saturated

black soil; you'll see water close to the surface in nearby crayfish burrows. In the Gulf Coastal Plain, *P. montanus* is sometimes found with the massive, blue-eyed Arrowhead Spiketail (*Cordulegaster obliqua*) as well as one of our strangest salamanders, the One-toed Amphiuma (*Amphiuma pholeter*).



The freaks come out at night. A close-up showing pitted sensory organs along the face and body of a One-toed Amphiuma collected by hand from a muck bed in the Ochlockonee River drainage of southern Georgia. **Photo by Todd Pusser.**

This nightcrawler-sized amphiumid is specialized for life in muck; in fact, here's an aquatic eel-like salamander that doesn't even swim. Not described until 1964—and the larvae of this species is still unknown—the type specimen of this charcoal-colored salamander was flushed from its mucky lair by a hurricane event.

What is thought to be the most primitive lineage of the species-rich Family Plethodontidae (the lungless salamanders) comprises three genera: *Gyrinophilus*, *Pseudotriton* and *Stereochilus* (Many-lined Salamander). Inasmuch as two of these genera, totaling three species (*Pseudotriton ruber*, *P. montanus*, and *Stereochilus marginatus*) are widespread in the Coastal Plain of the southeastern U.S., a region with abundant ravine seepage habitats, this fact led herpetologist D. Bruce Means to posit that this region (SE Coastal Plain) may have been the ecological theater in which plethodontids first evolved.



Left: The non-descript and highly aquatic Many-lined Salamander is known to very few other than salamander aficionados. **Photo by Kevin M. Stohlgren.**



Left: A gorgeous adult female "Gyro" (Spring Salamander, *Gyrinophilus porphyriticus*) from the Blue Ridge Mountains of northeast Georgia. **Right:** A Blackchin Red Salamander (*Pseudotriton ruber schencki*) found close to a seepage area in north Georgia. **Photo by Dirk Stevenson, The Oriante Society.**



Siena Celebrates Salamanders

Siena College faculty and undergraduates have been actively involved in various aspects of the Year of the Salamander campaign. These efforts involved independent and collaborative projects that culminated in a public event, the “*Year of the Salamander Education Celebration*,” held on Earth Day 2014. The Year of the Salamander campaign has been a wonderful opportunity to involve undergraduates in independent and small-group work, which has included participating in planning team conference calls, organizing a discussion symposium at a national meeting, soliciting organizations to partner in the campaign, and researching and drafting text and suggesting images for the *State of the Salamander* monograph. Several classes included semester-long projects that focused on the campaign, such as translating the *State of the Salamander* into Spanish (“Advanced Spanish”) (see p. 9 announcement and link) and designing salamander natural history interpretive panels and developing environmental education lesson plans incorporating salamander activities and crafts for grades K-5 (“Environmental Interpretation”).



Siena undergraduate, Saleha Atif, poses by an interpretive panel on red-spotted newts that she and her classmates designed in their Environmental Interpretation class.

Students in several organizations (e.g., Environmental Club, Students for Fair Trade) worked with faculty advisors to lead the publicity and running of the *Year of the Salamander Education Celebration* event, which was attended by college faculty, students, and local school children. The event featured local salamander experts, live salamanders for viewing, chocolate salamander treats, and a variety of salamander crafts. In fall 2014, students will bring the salamander-focused lesson plans they developed to local elementary teachers. The Year of the Salamander campaign has been an ideal framework to engage Siena and the local community, and has provided several experiential learning opportunities for undergraduates.

Right: Devin Rigolino and Kristen Glass tell about their work preparing draft text for the *State of the Salamander* monograph.

By Mary Beth Kolozsvary, Siena College



Marissa, age 5, proudly shows off the Year of the Salamander bag she made at the event.



Herbie the Hellbender, “visiting” from Purdue University, cordially invites Dean Weatherwax to Siena’s 2014 Year of the Salamander Education Celebration.



Dr. Moustakas, Physics professor, and his son (sporting a salamander tattoo!) enjoy the afternoon’s activities.



Jonathan's Fair Trade Dark Chocolate Salamander Bananas

Ingredients:

Bananas
Popsicle Sticks
Fair Trade Dark Chocolate
Candy Eyes
Yellow Icing (from a tube)

Peel the bananas and cut them in half. Put a popsicle stick in each half banana and put them in a freezer. Melt Fair Trade Dark Chocolate in a double-boiler. Take the bananas from the freezer and dip them in the chocolate while it is still warm. Place the candy eyes on them. Once the chocolate hardens a bit, use the yellow icing from the tube to put the spots on. Put them back in the freezer until you are ready to serve them. Delicious!



Nathan, age 7, drew a series of illustrations about what he saw and learned at the event. He sums it up nicely with 2014 Year of the Salamander is ... Awesome!



Some salamander crafts from the celebration.

facebook

Follow all of the Year of the Salamander news and happenings on Facebook (<https://www.facebook.com/YearOfTheSalamander2014>) and Twitter (@YOSal2014).



Upcoming Meetings & Events

2014 Joint Meeting of Ichthyologists and Herpetologists (SSAR/ASIH), July 30 – August 3, Chattanooga, TN. More info at www.dce.k-state.edu/conf/jointmeeting/

Sabino Canyon Lizard Walk, August 9, 8 am, Sabino Canyon Recreation Area, Tucson, AZ. Meet at the visitors' center.

NEPARC annual meeting, August 13 - 15, 2014, Allegany State Park, Salamanca, NY

Stream & Marsh Exploration, September 13, 10 am, Sessions Woods Conservation Education Center, Burlington, CT. Hillary Clifton will introduce you to the creatures of the Sessions Woods streams and beaver marsh, including salamanders. Pre-register at 860-675-8130. See [link](#) for more info.

Great Smoky Mountains Salamander Ball, September 13, Knoxville Zoo, Knoxville, TN. More info at www.dlia.org/newsdlia-events