Though snow currently blankets the ground, lengthening days promise another amphibian migration is not too far off and before we know it, Spring Peeper calls will fill the night air in Pennsylvania's wetlands. I trust that many of you are passing snow-bound days studying the quad and block maps on the PARS website in eager anticipation of your first 2016 surveys. A few hearty volunteers have already been surveying for stream salamanders, many of which can be found where streams are still accessible in winter months.

Looking forward to a new herp season myself, I have also been reflecting on the great progress the PARS project has enjoyed to date, due to the efforts of our wonderful volunteers. Since the launch of the project in June 2013, volunteers have submitted nearly 40,000 records, the majority of which have vouchers. For some perspective, the first Pennsylvania herp atlas project logged approximately 43,000 records during its entire seven-year run; PARS is only beginning its fourth year, with seven more years of data collection ahead! More importantly, many of our volunteers have honed into the grid approach, and we are making great progress toward reaching our quad and block goals; this will help ensure thorough survey coverage of the state.

Related to volunteerism, another welcomed aspect of PARS is the development of relationships with academic institutions. Currently, seven faculty members, representing three different Pennsylvania universities, and universities in Delaware, New Jersey, and New York, are integrally involved with the PARS project. Their involvement includes acting as Regional or County Coordinators, Verification Committee members or both. Additionally, they have encouraged many of their students to get involved with PARS, helping to nurture an expanded interest in herpetology among the scientific community of the future.

An expanded role of PARS in academic partnering will soon commence. 2016 will see the launch of an important research project, facilitated by Dr. Kurt Regester of Clarion University, who will study the distribution of Batrachochytrium dendrobatidis in Pennsylvania. Commonly referred to as Chytrid fungus, this disease has decimated amphibian populations in many parts of the world. It is currently known to exist in Pennsylvania, but little is known about the extent of its distribution here. The study will utilize interested PARS volunteers to help collect field samples from American Bullfrogs and Red-spotted Newts, two common amphibian species throughout Pennsylvania.

This partnership highlights an important role of the PARS project, which is to aid herpetological research and other projects with the goal of protecting our native herpetofauna. The massive database being compiled by the volunteers of the PARS project will serve as an invaluable resource for many future projects, and as a potent tool for the conservation of Pennsylvania's amphibian and reptile populations for many years to come.

Marlin Corn
PARS Statewide Coordinator
Many PARS volunteers are eagerly pursuing the quad/block goals of the project! Refer to the maps below to see how much progress has been made in the past year. Of the 874 quads in Pennsylvania, only 55 with no records remain. A year ago we still had 159 quads with no records, and only 24 quads with goal status completed. Currently, goal status has been attained in 60 quads, and numerous others are on the cusp of meeting the goal of 25 species. In a one-year period, the number of quads reaching goal status has essentially doubled. If we can repeat the doubling effect each year, we should have no problem reaching our goal for all quads by the end of the project in 2023. Obviously, this will be no small feat, but we continue to be amazed by what our volunteers are capable of! Additionally, numerous new County Coordinators have been recruited during the past year, and these folks have great initiative in pursuing the quad/block goals in their respective territories.

You might have noticed that some quads were shown to have reached their goals in the 2015 map, but lost this status in the second map. This change is a reflection of the verification process. These graphics are ‘snapshots’ of received records, of which some may not have passed through verification yet. In most cases, the change is the result of the number dropping below the goal by one; meaning it will take only one additional verified species to bring most of these quads back to goal status.

The block map gives a much more accurate picture of just how much of Pennsylvania has actually been surveyed; the current block map status can be viewed on the PARS website (click on the green ‘Blocks’ tab above the county map on the home page). Much of this land is privately owned, presenting one of the more difficult challenges to volunteer surveyors. However, we have every confidence our volunteers can rise to the challenge. While we will never gain access to every land parcel in the state, many of the block goals can be met through other means, such as diligent road cruising efforts. If you are looking for guidance on locations to survey, contact either your County Coordinator (if there is one for your county) or your Regional Coordinator. Coordinator contact information is listed on the last page of this newsletter.

The current quad status (snapshot January 16, 2016) is reflected in the map on the right, as compared to the status a year ago (snapshot January 7, 2015), shown in the map on the left.
NEW COORDINATOR RECRUITS

Please welcome Kelly Murman as our new coordinator for Luzerne County, and Cheryl Nolan for Lackawanna County. While we have a quickly growing team of County Coordinators, many counties are still without a leader. If you would like to be a County Coordinator please contact Marlin Corn: Marlin Corn: mcorn@machac.org. The contact information for all county and regional coordinators can be found on the last page of this newsletter.

SECOND ANNUAL PARS MEMBERSHIP MEETING PLANNED

The second Annual PARS Membership Meeting is scheduled for March 19, 2016 and will be held in the Elk Country Visitor Center in Elk County. Featured speakers will include Dr. Kurt Regester from Clarion University, Dr. Thomas LaDuke from East Stroudsburg University, and Bog Turtle researcher Lori Erb, from The Mid-Atlantic Center for Herpetology and Conservation.

MARCH 19TH, 2016

PARS Pennsylvania Amphibian & Reptile Survey

ANNUAL MEETING

MEMBERS LOGIN TO RSVP

PARS volunteer Ret Turner conducted a PARS introductory program at Jarrett Nature Center in Montgomery County this past autumn. The presentation was well received and followed by a Herp Walk, exposing some youngsters to their very first PA herp encounters.

DONATE WITH PayPal >
## MARK YOUR CALENDAR!

### Scheduled Herp-Blitz Field Trips:

<table>
<thead>
<tr>
<th>Date</th>
<th>County</th>
<th>Location及Details</th>
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</thead>
<tbody>
<tr>
<td>May 20-21</td>
<td>Berks County</td>
<td>Hopewell Furnace and French Creek Bioblitz @ Hopewell Furnace National Historic Park and French Creek State Park</td>
</tr>
<tr>
<td>April 30</td>
<td>Bedford County</td>
<td>For details, contact: Marlin Corn: <a href="mailto:mcorn@machac.org">mcorn@machac.org</a></td>
</tr>
<tr>
<td>May 19-20</td>
<td>Bucks County</td>
<td>Quakertown Swamp Bioblitz</td>
</tr>
<tr>
<td>May 21</td>
<td>Erie County</td>
<td>For details, contact: Mark Lethaby: <a href="mailto:nw@paherpsurvey.org">nw@paherpsurvey.org</a></td>
</tr>
<tr>
<td>June 4</td>
<td>Washington County</td>
<td>For details, contact: Marlin Corn: <a href="mailto:mcorn@machac.org">mcorn@machac.org</a></td>
</tr>
<tr>
<td>June 11-12</td>
<td>Columbia County</td>
<td>Ricketts Glen Herp-blitz - 9 A.M. each day Meet at park office: 695 State Route 487, Benton, PA 17814</td>
</tr>
<tr>
<td>June 23-25</td>
<td>Tioga County</td>
<td>Middle Ridge of the Asaph Wild Area</td>
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### PARS Informative Presentations & Volunteer Workshops:

<table>
<thead>
<tr>
<th>Date</th>
<th>County</th>
<th>Event Details</th>
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<tbody>
<tr>
<td>Feb. 27</td>
<td>Indiana County</td>
<td>Our Hidden Diversity: Indiana County’s Amphibians Blue Spruce Park Lodge 1128 Blue Spruce Rd., Indiana, PA 15701 For details, contact: Ed Patterson: <a href="mailto:sw@paherpsurvey.org">sw@paherpsurvey.org</a></td>
</tr>
<tr>
<td>March 19</td>
<td>Elk County</td>
<td>PARS 2nd Annual Membership Meeting Elk Country Visitor Center, Benezette, PA Members Login to PARS to RSVP</td>
</tr>
<tr>
<td>April 17</td>
<td>Berks County</td>
<td>PARS Introductory Presentation Hawk Mountain Sanctuary 1700 Hawk Mountain Rd., Kempton, PA 19529 For details, contact: Kyle Loucks: <a href="mailto:se@paherpsurvey.org">se@paherpsurvey.org</a></td>
</tr>
<tr>
<td>April 23</td>
<td>Crawford County</td>
<td>Frogs &amp; Salamanders: Presentation and nocturnal field outing. Erie National Wildlife Refuge Visitor Center 11296 Wood Duck Lane, Guys Mills, PA 16327 Contact the refuge for more info and to register: 814-789-3585, <a href="mailto:erie@fws.gov">erie@fws.gov</a></td>
</tr>
<tr>
<td>April 23</td>
<td>Bucks County</td>
<td>Herp Talk &amp; Walk Silver Lake Nature Center 1306 Bath Rd., Bristol, PA 19007 Registration required: 215-785-1177</td>
</tr>
<tr>
<td>July 11</td>
<td>Delaware County</td>
<td>Herp Talk &amp; Walk Glen Providence Park 423 W. State St., Media, PA 19063 For details, contact: Kyle Loucks: <a href="mailto:se@paherpsurvey.org">se@paherpsurvey.org</a></td>
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</table>

**More to be scheduled – stay tuned for details!**

*Find current events at [http://paherpsurvey.org/news/events](http://paherpsurvey.org/news/events)*

*or on Facebook at [http://facebook.com/paherpsurvey](http://facebook.com/paherpsurvey)*
You may have noticed a new species added to the entry fields of the PARS website last year. A research project has confirmed that populations of frogs in the Mid-Atlantic region of the U.S., formerly identified as Southern Leopard Frogs (*Lithobates sphenopehalus*), are, in fact, a previously un-described species. This includes several populations in the southeastern region of Pennsylvania. Referenced as the ‘Cryptic Leopard Frog’ during the study, the species was formally named the Atlantic Coast Leopard Frog (*L. kauffeldi*) in late 2014. This species differs morphologically from *L. sphenopehalus* in several ways, including larger vocal sacs; darker femoral reticulum (markings on thighs); and a tympanic spot, which is either absent or duller and less defined than the bright, white spot characteristic of *L. sphenopehalus*. The vocalizations are distinctly different as well, more closely resembling the calls of Wood Frogs (*L. sylvaticus*), but sometimes including a long, drawn-out groan, typical of other leopard frog species. The question now is whether *L. sphenopehalus* exists at all in Pennsylvania; all populations previously reported as Southern Leopard Frogs appear to be *L. kauffeldi*.

The Pennsylvania Fish & Boat commission and The Mid-Atlantic Center for Herpetology and Conservation played an integral role in the study, enlisting a number of PARS volunteers to assist in searching for previously undetected populations, reconfirming known populations, and obtaining photographic and audio vouchers. Thanks are in order to the following volunteers for their assistance: David Fitzpatrick, Kyle Loucks, Bob Ferguson, Stephen Staedtler, Darnell Brister, Shaun Hicks, Calum Devaney, Amy Ruhe and Joann Corn.

The research leading to the recognition of this species was conducted by Jeremy Feinberg, et. al. If you are interested in reading the paper in which the species was formally described, here is the link: [http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0108213](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0108213)
Wildlife enthusiasts, sportsmen, and people who simply enjoy exploring the natural world are increasingly aware that wildlife diseases pose a threat to many game and non-game species in North America. For example, a fungus associated with White Nose Syndrome in bats is the primary cause of rapid population declines and widespread local extinctions. Similar pathogens associated with disease in wild amphibians have received less public attention and concern, despite well-documented cases of the sudden loss of populations and entire species on nearly all continents.

During the previous two decades, biologists have identified and documented the negative effects of a chytrid fungus (*Batrachochytrium dendrobatidis*) on frogs and salamanders. Declines have been documented in many habitats and within most amphibian groups. Several widely distributed and abundant species are often infected, though not unhealthy, and serve as “reservoirs” for the pathogen. For example, infected American Bullfrogs appear to be healthy but sustain the pathogen in the environment and likely spread it to highly susceptible species. More recently, biologists are investigating the effects of two additional pathogens. A different amphibian fungus (*Batrachochytrium salamandrivorans*) has recently decimated the Dutch Fire Salamander in the Netherlands, and a viral pathogen (*Ranavirus*) is ongoing concern. Although international efforts to monitor the amphibian pet trade are improving, biologists are increasingly concerned about the spread of the “new” fungus outside of Europe.

Different opinions on specific aspects of disease ecology exist. However, the overwhelming majority of biologists agree that pathogens represent a serious threat to global amphibian diversity. Even ten years ago, leading international researchers attending an Amphibian Conservation Summit in 2005 concluded that the amphibian fungal disease was “the worst infectious disease ever recorded among vertebrates in terms of the number of species impacted, and its propensity to drive them to extinction.”

Beginning in spring 2016, Clarion University Biology Department faculty and The Mid-Atlantic Center for Herpetology and Conservation will collaborate in a study to investigate the statewide distribution of three amphibian pathogens. The goals of the project are to (1) engage PARS volunteers and promote their essential role as citizen scientists, (2) document the distribution of amphibian pathogens throughout our state, and (3) distribute reports to assist wildlife managers and policy makers in conservation efforts.

“We need your help! PARS members are needed to collect two non-lethal samples from approximately 750 Eastern Red-spotted Newts (*Notophthalmus v. viridescens*). Your participation is the essential component needed for us to succeed. Your contribution to the first citizen science study of these diseases will make a difference for the herps we care about!”

-- Marlin Corn, PARS Statewide Coordinator

Thirty participants will be trained, supplied with sampling kits, and while herping in the field, collect a skin swab sample and a very small tail sample from adult newts. The statewide effort will assess twelve unique ecological regions. Depending on location, each PARS participant will collect samples from 20 to 30 newts throughout the spring, summer, and fall of 2016. Participants will need to take a photo of each salamander, submit the typical information for a PARS record, and follow the decontamination protocol described on our website. Mr. Marlin Corn and Dr. Kurt Regester will coordinate volunteer recruitment and training, and Dr. Helen Hampikian will conduct laboratory tests. The study is supported by a grant from the Pennsylvania State System of Higher Education, facilities at Clarion University and the Barnes Center for Biotechnology Development, and a generous donation from an anonymous PARS member.

For additional information or to pre-register for a short training session at the annual PARS meeting on March 19th, please contact Kurt (kregester@clarion.edu) or Marlin (mcorn@machac.org) at your earliest convenience. We are excited about the project and the active role of PARS members in important research. A few extra minutes of your time while herping will provide valuable information that directly supports science-based decisions in statewide conservation!
Summary of vouchered records received from October 2015 through December 2015:

Please note that these numbers represent the number of blocks, not actual numbers of specimens.

Records not submitted by the end of the month may not be included.

Records listed here might not have yet passed through the verification process.

**Salamanders**
- Eastern Hellbender: 3
- Common Mudpuppy: 1
- Jefferson Salamander: 1
- Spotted Salamander: 23
- Marbled Salamander: 5
- Green Salamander: 2
- Northern Dusky Salamander: 96
- Seal Salamander: 13
- Allegheny Mountain Dusky Salamander: 87
- Northern Two-lined Salamander: 124
- Long-tailed Salamander: 6
- Northern Spring Salamander: 70
- Four-toed Salamander: 11
- Red-spotted Newt: 34
- Eastern Red-backed Salamander: 309
- Ravine Salamander: 5
- Slimy Salamander: 56
- Valley & Ridge Salamander: 53
- Wehrle’s Salamander: 20
- Northern Red Salamander: 23

**Snakes**
- Northern Black Racer: 7
- Timber Rattlesnake: 7
- Northern Ring-necked Snake: 14
- Eastern Hog-nosed Snake: 4
- Eastern Milksnake: 6
- Northern Watersnake: 10
- Smooth Greensnake: 2
- Eastern Ratsnake: 8
- Queensnake: 1
- Northern Brownsnake: 15
- Northern Red-bellied Snake: 12
- Shorthead Gartersnake: 1
- Eastern Gartersnake: 41
- Common Ribbonsnake: 3

**Frogs**
- Eastern American Toad: 22
- Fowler’s Toad: 1
- Gray Treefrog: 3
- American Bullfrog: 17
- Green Frog: 47
- Pickerel Frog: 21
- Northern Leopard Frog: 3
- Wood Frog: 28
- Spring Peeper: 30

**Turtles**
- Common Snapping Turtle: 12
- Midland Painted Turtle: 1
- Eastern Painted Turtle: 16
- Painted Turtle spp.: 3
- Spotted Turtle: 5
- Wood Turtle: 26
- Northern Map Turtle: 3
- Northern Red-bellied Cooter: 1
- Red-eared Slider*: 8
- Eastern Musk Turtle: 1
- Eastern Box Turtle: 12

*introduced species

**Lizards**
- Common Five-lined Skink: 1
- Eastern Fence Lizard: 1
Identification of Desmognathid Species

In the ‘Name That Herp’ section of previous newsletter issue we featured a dozen photos of salamanders from the genus Desmognathus, and challenged readers to correctly determine the species of each. Since there are only three species of ‘Dusky Salamanders’ (Northern Dusky Salamander, Seal Salamander and Allegheny Mountain Dusky Salamander) known to occur in Pennsylvania, the odds are some of you scored well on this quiz. However, others may shake their heads while comparing the photos wondering “Just what are the defining characteristics for each of these three species?” In fact, the quiz really amounted to little more than a guessing game for many. All three of our dusky salamander species can be highly variable in physical appearance, and sometimes multiple photos highlighting different features of a specimen is needed to accurately identify a specimen from voucher photos. Otherwise it can be impossible for even an expert to positively determine the species of dusky salamander in question.

The genus Desmognathus is easily recognized by several physical traits. All species have prominent gular muscles, making the head appear proportionately larger than most other salamanders of similar size in our region. There is often a light-colored diagonal line running from the posterior corner of each eye to the corner of the mouth; however, this is often absent in older or particularly dark-colored specimens. The hind legs are noticeably stouter than the front legs. Most specimens are between 2.5 and 5 inches, with the tail accounting for roughly one-half the entire length. All dusky salamanders have 13-15 costal grooves. In general, Dusky Salamanders are found along small streams, springs and seeps, usually under stones or logs at the water’s edge.

Knowing ranges of the three dusky salamander species within Pennsylvania may help rule out one or two of the species. The Seal Salamander, D. monticola, has the most restricted range of the three, only being recorded in a handful of counties in the western region of the state. If you are unsure of a dusky salamander you find in the eastern region, you are probably safe in ruling out this species, but keep in mind that PARS volunteers are constantly documenting county records (the first time a particular species is documented in a county) for many herp species.

The three species of dusky salamanders found in Pennsylvania are highly variable in coloration and pattern, making identification tricky without close inspection, especially where ranges overlap. The specimens in the three photos above are Seal Salamander (left), Allegheny Mountain Dusky Salamander (center) and Northern Dusky Salamander (right). Photos: Aaron Semasko, Duane Stafford and Chris Bortz

Field Techniques

...tips for improving field-herping skills
Of the three Pennsylvania dusky salamander species, the easiest to quickly confirm or rule out is the Allegheny Mountain Dusky Salamander, *D. ochrophaeus*. This species is highly variable in color and pattern. It often has a solidly-colored back, ranging in varying shades of gold, red, brown, olive or gray but may also have chevron-shaped blotches aligned centrally down the back. Additionally, there are often, but not always, well-defined, chevron-shaped grooves, which connect with the costal grooves, down the center of the back. However, one trait is consistent with this species; the dorsal surface of the tail is distinctly rounded. The other two dusky species have a keeled dorsal surface. The Allegheny Mountain Dusky Salamander is widely distributed through most western and northern counties in Pennsylvania and is often encountered in upland habitat. If you find a dusky salamander a considerable distance from the closest spring, seep, or stream, there is a good chance it is this species. A specimen exhibiting a reddish or yellowish stripe might be passed off as an Eastern Red-backed Salamander (*Plethodon cinereus*) or Northern Two-lined Salamander (*Eurycea bislineata*) if not given more than a cursory glance.
Seal Salamanders, *D. monticola* are the largest of our three dusky salamanders, with adults often reaching 5 inches in length. Most specimens are boldly patterned dorsally, with a bronze to brownish-gray background color overlain with darker blotches forming patterns of circles or reticulations of browns and grays; but the species is highly variable, and many specimens are drab by comparison. Spots on the tail are usually distinctly evident and bright gold, yellow or orange. The chin is white, and the venter is very light and fairly uniform in color (nearly white in juveniles), but darkens to gray, brown or purple in older adults. Close examination of the toes may reveal they have black tips on this species. These are cornifications which actually serve as ‘claws’ in young specimens, enabling them to hold onto rock surfaces in fast-moving water. These are often, but not always present, and might only be observed on some of the toes. Since the PARS project commenced volunteers have documented Seal Salamanders in Armstrong, Butler, Fayette, Indiana, Somerset and Westmoreland Counties, and historical records exists for Allegheny, Clarion, Franklin, Green and York Counties.

A more typically patterned Seal Salamander is shown in this photo, compared to the specimen shown on the first page of this article. Photo: Nate Nadzdrowic

Seal Salamanders are the largest of our dusky salamander species, and often prey on smaller salamander species. They have been observed perched on rocks during night hours, waiting in ambush for prey. Photo: Ed Patterson

Northern Dusky Salamanders (left photo) typically have darker venters than Seal Salamanders (middle photo). The toes of Seal Salamanders often, but not always, have black tips on one or more of the toes. (above).
Identification of Desmognathid Species

The Northern Dusky Salamander, *D. fuscus*, is by far the most widely distributed of our three *Desmognathus* species, and is found in all of Pennsylvania’s 67 counties. This species is highly variable, with many individuals exhibiting colors and patterns observed in both of the other two Desmognathus species, however patterns often break up and become less distinct in older specimens. First, look at the tail; if it is laterally compressed, or triangular-shaped in cross-section, you can rule out *D. ochrophaeus*. Next, look at the venter; on *D. fuscus* the ventral area will appear moderately to heavily mottled, and less clearly defined from the coloring on the sides, compared to the relatively pale and distinctly demarcated venter of most Seal Salamanders. Check the toes, which will lack the black tips typical of Seal Salamanders. If your specimen has distinct, paired yellowish spots on the back (more typical in young specimens), count the number of pairs distinctly between the front and hind limbs; Northern Dusky Salamanders may have five to eight pairs between the limbs, while Seal Salamanders rarely have more than four pairs.

While dusky salamanders can be difficult to identify in the field, they can be even more difficult to identify from photos, which can result in records failing to make it through the verification process. When taking voucher photos of dusky salamanders it is a good idea to get a shot of the venter as well as the dorsum. Try to get a good photo of the tail which will clearly show whether it is round or keeled. If you suspect you have found a Seal Salamander, try to get a good close-up of the toe tips if possible. Submitting multiple photos from different angles of any specimen that may be confused with another species will help ensure that your record will pass verification.

The PARS project welcomes qualified guest writers for this column. If you would like to contribute an article, contact Marlin Corn: mcorn@paherpsurvey.org

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Juvenile specimens of Northern Dusky Salamanders and Seal Salamanders both have dorsal spots. They can be differentiated by counting the pairs of spots between the front and hind limbs; juvenile Seal Salamanders (left photo) have four pairs of spots while juvenile Northern Dusky Salamanders (right photo) may have 5 - 8 pairs of spots on this region of the dorsum.

Photo: Ed Patterson
Photo: Jake Cramer

……tips for improving field-herping skills
Highlights of the 2015 Autumn Season

Frogs
A Fowler's Toad was documented in Pike County, the first PARS record for this species in Pike. Three Northern Leopard Frog observations were made in Northumberland County.

Salamanders
Two Green Salamander documentations were made in Fayette County, one reconfirming the viability of a known site at which they had not been observed for several years. Marbled Salamanders were observed in Bucks, Franklin, and Schuylkill Counties. A Jefferson Salamander was found in Susquehanna County. Three Eastern Hellbenders were found in Venango County. A Common Mudpuppy was found in Erie County. Fifteen Seal Salamander observations were made in Butler, Fayette, and Indiana Counties. The Butler record is the first for this species in this county since 1975. Five observations of Ravine Salamanders were made in Allegheny County.

Turtles
Seven observations of Spotted Turtles were made in Lebanon County. Twenty-six records came in for Wood Turtles from Bedford, Blair, Centre, Lebanon, Monroe, and Schuylkill Counties. Two observations of Northern Red-bellied Cooters were received, one each from Berks and Bucks Counties. Sixteen Eastern Box Turtle records came in from thirteen different counties.

Lizards
A Five-lined Skink was reported from Blair County; only the second observation from this county to date. An Eastern Fence Lizard was found in Beaver County.

Snakes
Seven Timber Rattlesnake observations were received, all presumably from den sites, but no Northern Copperhead records were submitted. Four Eastern Hog-nosed Snakes were submitted from three different counties. Two Smooth Greensnake records from Centre County were submitted, the first vouchered records for this county since the launch of PARS. A Queensnake was observed in Beaver County, and four records for Common Ribbonsnakes were submitted from Clinton, Lebanon, and Monroe counties. The Clinton County specimen appears to be a county record. Observations were submitted for one of Pennsylvania’s rarest serpents, the Eastern Massasauga.
March 6, 2014 - 1:00 p.m.

The thermometer read 22 degrees, and a biting wind blew as I shut off the vehicle at the parking lot for the Ghost Town Trail in Nanty Glo, Cambria County. I was not here to look for salamanders, but instead to collect data from a trail counter located along the trail. Even though it had been an extremely cold winter, the Nanty Glo portion of the trail always receives a fair amount of use from local residents who walk here on a daily basis, regardless of the conditions.

Nanty Glo is a former coal mining town located in northern Cambria County. The town name is derived from its Welsh origins. The translation Nant-y-glo means ‘streams of coal’. Nanty Glo began in the 1890s under the name Glenglade. At its peak, five coal mines operated here; the largest was the Heisley Mine, employing 1,130 workers. By the 1940s Nanty Glo reached a peak population of 6,240. Today, about 2,800 residents live here.

Although I was not here to look for salamanders, once you get hooked on looking for them, you develop an unconscious habit of flipping or turning over rocks. As I entered the trail, I noticed a hillside seep and at its base several larger rocks. I thought, “Who knows, maybe something will turn up?”

Under the first rock a large salamander appeared. I was not sure what it was at first, but I knew that if it moved into the rocky hillside I would never manage to capture it. After a quick grab and some squirming in my fingers, I realized it was a Northern Spring Salamander.

Spring Salamanders (*Gyrinophilus porphyriticus*) are a large, robust species with irregular streaks, spots and maculations on a salmon to yellowish-brown to red body, head and tail. They can reach lengths of nearly eight inches. The tail is flattened from side to side and a line, known as the canthus rostralis, extends from each eye to the tip of its broad snout.

Identifying this one was not difficult; what was difficult was trying to hold it in my frozen hands while it was squirming around. I did not bring any containers with me on this short walk, because finding a salamander on this very cold day seemed unimaginable. But I managed to contain it inside the pocket of my jacket on the short walk back to my car. Once there I placed it into a container and turned on the heater to full blast.

As I took some photos, the salamander began to warm up and became more responsive. Maybe it thought that spring had somehow instantaneously arrived. Salamanders are ectothermic, meaning their body temperatures are controlled by their surroundings.
The PARS Experience

Spring Salamanders generally inhabit cool streams, springs and even caves in Pennsylvania and other parts of Appalachia. They tend to avoid places where fish reside and will come out at night to search for prey, both in the water and on nearby land.

What was most unusual about this one’s habitat was that it was in the middle of a town, far removed from what would be described as anything close to pristine habitat. The runoff that fed this hillside seep came from a nearby borough street that was regularly plowed, cindered and salted during the winter. But here it was nonetheless. How it got here and how it managed to survive under these less than ideal conditions seemed remarkable to me.

From the warmth of my car I took my time admiring this Spring Salamander, while enjoying my own spring respite, and then took it and placed it under the same rock where I had found it.

I have been to that location many times since then, in all seasons, and I always flip the same rock hoping my winter find will reappear. It never has; but, even so, I still have warm memories of that trip to Nanty Glo, Pennsylvania. - Ed Patterson
Help Stop the Spread of Invasive Species

Next to habitat loss, many biologists agree the greatest threat to our planet's biodiversity is the degradation of habitat from the spread of invasive species. Invasive species are aggressive, non-native plant and animal species, which have been introduced from other parts of the world. These species become problematic because they spread aggressively when introduced to habitats similar to those of their native countries, without the predators or pathogens which normally keep them in check. This can amount to a nuisance (Asian stinkbugs anyone?), but it often has devastating effects.

Many aggressive, introduced plant species have completely taken over vast tracts of forests, meadows and wetlands throughout the world, creating monocultures and eliminating most other plants, including rare and sensitive species. This impacts not only native plant populations, but also animals, including herps. Invasive wetlands plants negatively alter habitat for rare species such as the Bog Turtle. In much of the Northeast, introduced, non-native earthworms are eating and completely eliminating the humus layer in forests. This layer of detritus, which replenishes nutrients and retains moisture in forest soils, is critical for trees, plants, woodland amphibians and the invertebrates upon which they feed.

Avoid contributing to this problem by cleaning shoe soles and automobile tires before entering natural areas; the seeds of invasive plants are often picked up and transported in soil stuck within the treads of tires and hiking shoes. If using live bait when fishing, never release leftover worms into the environment.

More information on invasive species in Pennsylvania is available from the Department of Conservation and Natural Resources (DCNR) website:
http://www.dcnr.state.pa.us/conservationscience/invasivespecies/index.htm
**PARS LEAGUE OF EXCEPTIONAL HERPERS**

The column dedicated to recognition of noteworthy herping achievements and our wonderful volunteers. Recognitions based on highest number of observations, most significant observations, and other distinguished efforts.

**Significant Finds**

*Congratulations to the volunteers who documented some of Pennsylvania’s rare and difficult-to-find herp species during October, November & December 2015*

Scott Angus: Eastern Fence Lizard, Queensnake  
Rose-Anna Behr: Valley and Ridge Salamander  
Brian Benner: Wehrle's Salamander  
Aaron Bierly: Eastern Hog-nosed Snake  
Stan Boder: Eastern Massasauga  
Chris Bortz: Marbled Salamander, Four-toed Salamander, Valley and Ridge Salamander, Eastern Hog-nosed Snake, Spotted Turtle, Wood Turtle, Eastern Box Turtle  
Andy Brookens: Marbled Salamander  
Jacob Cramer: Eastern Hog-nosed Snake, Eastern Box Turtle  
Anthony Croasdale: Eastern Box Turtle  
Kyle Fawcett: Northern Leopard Frog, Valley and Ridge Salamander  
Brian Hardiman: Four-toed Salamander, Eastern Box Turtle  
Sebastian Harris: Common Ribbonsnake  
Dave Hughes: Timber Rattlesnake  
Brandon Hunsberger: Eastern Hellbender  
Rachel Kester: Four-toed Salamander  
Mark Lethaby: Common Mudpuppy, Four-toed Salamander  
Kyle Loucks: Jefferson Salamander, Northern Red-bellied Cooter, Eastern Box Turtle  
Scott Martin: Valley and Ridge Salamander, Timber Rattlesnake  
Dave McNaughton: Four-toed Salamander, Common Ribbonsnake, Spotted Turtle, Wood Turtle, Eastern Box Turtle  
Hannah Mellor: Ravine Salamander  
Ed Patterson: Seal Salamander, Four-toed Salamander, Wehrle's Salamander, Valley and Ridge Salamander  
Karen Pearce: Eastern Box Turtle  
Rebecca Picone: Common Ribbonsnake  
Gary Pluto: Green Salamander  
Tom Pluto: Four-toed Salamander, Valley and Ridge Salamander, Wood Turtle  
Travis Russell: Valley and Ridge Salamander, Wood Turtle, Eastern Box Turtle  
Stephen Staedtler: Marbled Salamander  
Duane Stafford: Wehrle's Salamander  
Tyler Streets: Wehrle's Salamander  
Andy Weber: Fowler's Toad, Four-toed Salamander, Eastern Hog-nosed Snake, Smooth Greensnake, Wood Turtle  
Nick Wilkes: Five-lined Skink  
Andrew Wolf: Eastern Box Turtle

**Block Masters**

PARS volunteers who currently hold the top ten slots for the most quad-blocks surveyed since the project launch. *January 21, 2016 snapshot.*

Ken Anderson: 340 blocks  
Kyle Loucks: 292 blocks  
Scott Martin: 214 blocks  
Kyle Fawcett: 204 blocks  
Ed Patterson: 170 blocks  
Bob Ferguson: 128 blocks  
Duane Stafford: 126 blocks  
Stephen Staedtler: 125 blocks  
Jay Drasher: 118 blocks  
Brandon Hunsberger: 117 blocks

**The 100 Club**

PARS members who made over 100 documentations during October, November or December of 2015:


**The Fantastic Five**

PARS volunteers who have logged the most records since the launch of the PARS project on June 1, 2013 through December 31, 2015:

Duane Stafford: 2,372 Records  
Ken Anderson: 2,330 Records  
Brandon Hunsberger: 2,025 Records  
Ed Patterson: 1,970 Records  
Bob Ferguson: 1,655 Records
I am not writing about dogs, but if you have ever seen a Northern Spring Salamander, you'll notice they kind of have the complexion of a hot dog. Though their color is no anomaly in the animal kingdom, the species exhibits an interesting life history unique among the Plethodontidae family, which I researched for my Master's thesis.

The Northern Spring Salamander (Gyrinophilus p. porphyriticus) ranges in the eastern United States from Alabama to Maine, in an area coinciding with the Appalachian Mountains. They are found statewide in Pennsylvania except for the southeastern corner of the state. As the name implies, they inhabit springs, seeps, and small streams in forested areas. Nearly all amphibians go through a larval stage, and most species have relatively short and consistent larval periods before they metamorphose. The Northern Spring Salamander however, can be like a kid who never wants to move out of his parents' house. In the literature, authors refer to the larval period lasting anywhere from two to seven years.

To help investigate this larval period mystery, I looked at another animal that typically hangs out with (and by this I mean beats up on, and eats) our Spring Salamander friend: the brook trout. Our state fish, the brook trout, requires the same high quality of water as most other stream salamanders, and in small streams they are the top predator. The native variant of this fish (they are also stocked) does not usually get much bigger than ten inches within the small streams that Spring Salamanders inhabit, yet they are voracious predators and are known from other studies to affect the growth and activity of the Northern Spring Salamander negatively.

So my thought (aka. hypothesis) was that these fish beat up on the salamander larvae so badly that they wanted to get the hell out of the stream ASAP (via fast, consistent growth). In the temporary streams and small seeps, where brook trout failed to reach, the larvae were the "top dog" and stayed in the water or metamorphosed as they pleased (inconsistent growth). To figure this out, I caught and euthanized 35 larvae from four streams in western Pennsylvania (two with trout, two without) to determine their age. I used a method with a long, ugly word called skeletochronology. After measuring their body lengths, I cut off their tiny legs and extracted their even tinier femurs and cross sectioned them to see what looks like the rings of a tree. After this long, tedious, and frustrating process, I could count the rings under a microscope.

What I discovered was that the larvae in the streams with trout had consistent growth, but it was slow. The larvae I collected in those streams grew big and grew to an age of six years. The larvae in the fishless streams grew as I expected, which was inconsistently. I did not collect a larva older than three years there, though the sizes of these guys and gals were roughly the same as the older ones in the streams with trout. So was my experiment a success!? Sort of. I had to think a lot about why these Spring Salamander larvae would want to grow up so slowly in such a hostile neighborhood, with brook trout lurking around every corner.
As it turned out, my results made sense. The larvae in the streams with trout may have been so scared to come out and eat their grubby little food items, that they barely came out at all. So these larvae grew up slowly, and did not metamorphose until they grew to nearly the size of an adult. Again, the larvae in the fishless streams showed inconsistent growth, as I expected. The reasons for this are harder to explain, as I looked at only one variable (pH and water temperature were insignificant). The most obvious culprit is something called intraspecific competition. The larvae here are the “top dogs”, and with no bigger species beating them up, they beat up each other. It’s not so easy just to hide under a rock where a fish can’t get you, when your own brethren can find and kill you. So the less competitive salamanders lose their gills and flee the terrifying stream, while the larva that grows up fast and bullies the others doesn’t want to leave. Life is good for him. He wants to stay where he can be the toughest kid on the block and make my data look strange. Or maybe, something just plain sucks about that stream; the rocks are undesirable, or the water is too clear. The jury is still out on those variables, but I’m proud I figured out a little piece of this Plethodontid puzzle.

I still go back to my study streams and flip rocks. When I find a long hot dog colored larva, I tell the little one how lucky it is to have legs and live in such a cool stream. Plethodontid salamanders in general are said to have “complex life histories”. Aside from biting each other’s faces during mating and territorial disputes, they are an ecological “middle man”. Their importance as a predator that eats little bugs which other animals cannot find, and as prey to the others above them, cannot be overly stressed. Next time you find yourself asked: “Who cares about some slimy lizard?” tell the person I care. Actually, just tell them about how important these salamanders are to our environment.

If you’re further interested, or bored and want to read the entire thesis:  http://mds.marshall.edu/etd/730/

Arron Semasko
Dear PARS community, How many times have we been asked: why do you like ___ (snakes, lizards, frogs, bugs, “creepy” things normal people hate)? I never answer this question to the satisfaction of others, because I don’t think there is a good answer. “I just do.”

My name is Aaron Semasko and I was hatched in Latrobe, Pennsylvania. If you’ve never heard of Latrobe, read a bottle of Rolling Rock beer or ask Mr. Rogers, they’ll tell you. I remember the first snake I ever caught. While fishing with my dad at a farm pond, I went exploring after about five minutes of actual fishing. I looked down into a pile of dead, folded over grass on the edge of the pond and saw half the body of a snake. So I reached down and grabbed it of course! The pattern was vividly beige with dark blotches on it, and my first grade hand barely wrapped around its thick body. Still to this day I swear it was a hognose snake, but my grown up realistic mind says it was a water snake since there are no records for hognoses anywhere near this pond. So why didn’t it bite me? I’ll never know now, but I held it up and said “Hey dad look a snake!” He yelled back across the pond at me as if I was holding a stick of dynamite and said “PUT IT DOWN!”

The following years I obsessed over every toad and garter snake I saw during the summer. If only I’d have known about road cruising... My grandparents had a cottage on Laurel Hill near Johnstown, PA that we used for family picnics in the summer. My brothers, cousins, and I built dams and caught salamanders all day in the stream and heavy hemlock woods on the property. My family also had a small camp in Cameron County where I had my first experiences with rattlesnakes and built dams and caught salamanders in hemlock woods.

Most of my teenage and college years were a herpetological drought. I became very interested in guitars and music and assumed nobody cared about snakes and there was no future in the topic. I attended the University of Pittsburgh at Johnstown at first as a Pre-Pharmacy major, but became disinterested and unmotivated to have elderly people scream at me on the phone about not receiving their blood pressure medication (little did I know that same medication may have been derived from pit viper venom). I switched my major to Biology – Ecology because I just wanted to work outside / with animals. I worked with neither of these the two years after I graduated and instead cut, bent, and grinded steel.

I needed a serious change and decided on a whim to apply to Marshall University for an M.S. I applied there because it was the closest geographically on a random list of schools for herpetology, and after speaking with my future advisor and mentor Dr. Thomas Pauley, I thought of nowhere else. Once at Marshall, everything came together for me and I realized how much I had been missing with the herp community all those years. Around this time I began submitting records to PARS and coordinating with Jason Poston.

While writing my thesis on the relationship between Spring Salamander larvae growth and brook trout predation, I worked as a research technician on a Timber Rattlesnake telemetry project with Gian Rocco at PSU. Though I love all herps, my favorites have always been venomous snakes (thanks Steve Irwin). I could not have been happier to tromp through endless oceans of mountain laurel and huckleberry through north central PA seeing hundreds of rattlesnakes that summer and the next after graduating.

From the experience I gained on the TR project, a new job presented itself to me as a construction monitor. I monitored the past two years and in turn met a lot of great people to argue with about whether there are more copperheads or rattlesnakes in PA. I’m ecstatic to have a job that allows me handle snakes and educate gas workers who assume every snake wants to kill them.

I feel proud that Pennsylvania has such a great resource in PARS. I find myself scanning over records for hours to satisfy my own interests. I love seeing the outstanding amount of raw data produced by citizens that would ordinarily take years to compile the old fashioned way. The survey is helping create a baseline that will prove worthy for decades to come.

The scent of a hemlock forest and a salamander in my hand still makes me feel like a kid again. Though the hike in may be miserable at times, I cherish each time I’m standing one leg longer than the other on a scorched south facing slope in north central PA in July. These are the spots that flood my mind when I think conservation. There is no part too small in ecology, so the same applies for conserving it. Thanks to the PARS community for all the parts you add!

-Aaron Semasko
Species Spotlight

Spotted Turtle

*Clemmys gutatta*

Range & Habitat: Spotted Turtles have been confirmed by PARS volunteers in 20 Pennsylvania Counties, the majority of which lie in the southeastern region of the state. Historical records exist for numerous other counties, in other regions. Spotted turtles prefer shallow waters and utilize a wide variety of wetlands which may include swamps, bogs, marshes and small ponds. They are known to move between different water bodies in their range through the seasons, to exploit seasonal food sources, and have been observed in vernal pools, feeding on amphibian larvae in early spring. Spotted Turtles are among the first turtles to emerge each year, and are sometimes observed basking on sunny days in February.

Search Strategy: Early spring is the easiest time to observed Spotted Turtles, as they spend the first warm weeks (prior to full leaf-out) basking on objects in the open. Look carefully at exposed logs, buttressed tree roots, and hummocks for cryptically basking Spotted Turtles. Be sure to employ stealth, as these wary critters will dive into the water quickly when they spot encroaching searchers. If you see a specimen dive into the water, search the bottom where it entered, especially under sunken branches and other submerged debris.

The Spotted Turtle is a small, semi-aquatic species, with a maximum shell length usually under 5 inches.
NAME THAT HERP:

Just Juveniles

The following photos are all of hatchling or juvenile turtles. Try your luck at guessing the species identity for each.

A. 
B. 
C. 
D. 
E. 
F.
NAME THAT HERP:
Just Juveniles

G.

H.

I.

J.

K.

L.
NAME THAT HERP:
Just Juveniles
NAME THAT HERP:
Just Juveniles: Answers

A. Common Map Turtle  
Photo: Mark Lethaby

B. Red-eared Slider  
Photo: M. Corn

C. Eastern Box Turtle  
Photo: M. Corn

D. Wood Turtle  
Photo: Andy Weber

E. Bog Turtle  
Photo: M. Corn

F. Eastern Musk Turtle  
Photo: Tom Pluto

G. Spotted Turtle  
Photo: Martin Corn

H. Eastern Mud Turtle  
Photo: Brandon Ruhe

I. Northern Red-bellied Cooter  
Photo: M. Corn

J. Northern Map Turtle  
Photo: Scott Martin

K. Eastern Painted Turtle  
Photo: M. Corn

L. Eastern Box Turtle  
Photo: Jay Drasher

M. Northern Map Turtle  
Photo: Mark Lethaby

N. Wood Turtle  
Photo: Andy Weber

O. Bog Turtle  
Photo: Jay Drasher

P. Northern Red-bellied Cooter  
Photo: M. Corn

Q. Red-eared Slider  
Photo: M. Corn

R. Spotted Turtle  
Photo: David MacNaughton
Preferably Alive

Acris crepitans
A.K.A. Eastern Cricket Frog

Last confirmed sightings in Bucks and Luzerne counties.

Refer to PARS website for counties of historical distribution. Males start calling in April and make a distinctive clicking sound.

Reward: Accolades of the herping community
Contact & Resource Information

Regional Coordinators:
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The PARS Team:
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Recommended Web Sites:
Pennsylvania Amphibian and Reptile Survey (PARS): www.paherpsurvey.org
The Mid-Atlantic Center for Herpetology and Conservation (MACHAC): www.machac.org
Pennsylvania Fish & Boat Commission (PFBC): www.fish.state.pa.us
Society for the Study of Amphibians and Reptiles: www.ssarherps.org
Northeastern Partners in Amphibian and Reptile Conservation: www.northeasparc.org
Maryland Amphibian and Reptile Atlas: www.marylandnaturalist.org