



# West Virginia Wildlife

*Spring 2008*

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## Rewarding Careers in Natural Resources

I distinctly remember sitting in a freshman college class called "Introduction to Natural Resources Management" in 1972, being informed that only 20 percent of graduates with a degree in natural resources would end up getting a job in our chosen field of endeavor. Not exactly the words one wants to hear as you start your career training! About 10 years later, looking at the friends I had kept in touch with, I realized that figure was a little low but the percent was still below 40.

Many of the baby boomers who flooded the natural resources job market in the late 1960s and 1970s are now approaching retirement age. In West Virginia, numerous biologists and conservation officers have retired in the past 10 years and we expect many more to retire in the next decade. We've lost a lot of institutional knowledge gained during careers that spanned 30 to 40 years. When it comes to replacing those experienced workers, we're finding a dearth of interested and qualified workers.

Careers in natural resources provide exciting and challenging work experiences. If you could sit around a campfire with fish and wildlife personnel, you would be amazed at their tales of adventure in the woods and waters of West Virginia. No matter how many wild animals you catch, each one presents a different situation, and takes a slightly different approach. Natural resource careers are also rewarding. Whether developing a management plan to protect an endangered species or catching an illegal hunter, you know that you are helping to ensure that future generations will be able to enjoy the state's wonderful wildlife. The fact that most of the recent retirees have worked so many years is a testament to the allure of working for a state natural resources agency.

If you have an interest in working as a wildlife biologist or manager, fisheries biologist, conservation officer, or wildlife technician, contact the West Virginia Division of Personnel at [www.wv.gov](http://www.wv.gov) or (304) 558-3950. They can talk with you about the opportunities available in the natural resources field as well as the educational and experience requirements for those positions. You may also want to talk to local DNR employees, and just maybe they'll tell you a story about the one which (or who!) didn't get away.

*Art Shomo*  
Art Shomo  
Editor



Killdeer faking injured wing.

David Fattaleh

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# Muddling with Mudbugs



## West Virginia's burrowing crayfishes

By Zachary J. Loughman

It's 11 p.m., and I'm staring into a roadside ditch just outside Terra Alta, West Virginia. As I slowly amble down the road, neck bent sharply, the beam of my headlamp illuminates a myriad of creatures. Movement to the left of my beam causes a quick, instinctual call to action. I crouch down to investigate further, only to find a mountain dusky salamander staring back at me. Normally this find would cause a bit of excitement, but tonight I'm after a more elusive species.

The ditch is littered with holes and mounds of mud, which indicates to me the animal I'm seeking definitely lives here. As my headlamp beam lights up the ditch, I investigate each hole with specific intent. Suddenly, from the depths of a hole, a flame orange animal is stirring. This is what I'm looking for, and I deliberately crouch again to investigate further. Up from the bowels of the hole climbs an inch-long upland burrowing crayfish. Nested in its chelae (claws) is a round ball of fresh mud the size of a pea, which it releases at the entrance of its burrow after its climb.

Before the crayfish heads back down the hole, I quickly pin the crayfish and extract it from the burrow. In a futile attempt at scaring me off, the crayfish raises its chelae and gurgles water trapped inside its cephalothorax (the fused head and middle section of the body). Every capture is as exciting as the first it seems, and after a moment of admiration, I sit down on the road, grab my calipers, and collect data for the next five minutes. After data collection, the crayfish is released back into its burrow, and I continue down the ditch.

The above scene is part of my research project supported by the West Virginia Division of Natural Resources Wildlife Diversity Program to better understand crayfish populations within the Mountain State. In the late 1980s, Ray Jezerinac led an effort to document West Virginia's crayfish fauna (also supported by the DNR Wildlife Resources Section). This project ultimately resulted in the publication of *Crayfishes of West Virginia*.

West Virginia's landscape has changed greatly in some parts of the state since the 1980s, and the ultimate impact of these alterations on crayfishes is unknown. Also, since the printing of that publication, new genetic techniques have arisen that aid in the description of new species. To better understand their current taxonomy and what factors have impacted crayfishes since the 1980s, a second statewide crayfish census was started in the summer of 2007. I am working with Stuart Welsh, who works with the U.S. Geological Survey Cooperative Fish and Wildlife Research Unit at West Virginia University, to complete the study over the next four years. While stream forms of crayfish are easily studied, and a wealth of information can be gleaned from these aquatic populations over a short time, burrowing species present an all together different problem. This has everything to do with their unique natural history.

*Chimney of the digger crayfish.  
Inset photo - Digger crayfish with eggs.*

Zachary J. Loughman



Zachary J. Loughman

Chimney of upland burrowing crayfish.

Horton Hobbs Jr., the father of American astacology (the study of freshwater crayfish), classified North American crayfishes behaviorally as tertiary, secondary and primary burrowers based on a species propensity to burrow. Tertiary burrowers make shallow depressions under cobbles and boulders in streams and do not exhibit complex burrowing behaviors. West Virginia's members of the crayfish genus *Orconectes* are all tertiary burrowers, and are frequently encountered under rocks in large rivers and streams.

Secondary burrowers construct somewhat complex burrows, and often inhabit situations that experience predictable stream drawdown during summer months. As surface waters retreat underground, secondary burrowers construct burrows that remain inundated by the available water table. Secondary burrower's burrows tend to be relatively simplistic and direct, leading straight to the water table. In some instance, these burrows can be quite deep, but the majority range between 20 to 39 inches deep.

Primary burrowers exhibit extreme levels of burrowing behavior, and are dependent on the maintenance and construction of their burrows for

various aspects of their life history. When biologists speak of burrowing crayfishes, this is the behavioral group they are talking about. Often there is a vertical mud structure surrounding the burrow entrance called a chimney. Crayfish build these chimneys with mud they bring to the surface while cleaning their burrow. Crayfish are the only animals that make these structures, so if you have chimneys in your yard, you have burrowing crayfish as well.

Burrows usually have multiple entrances which meet under ground, creating a central tunnel that leads to an enlarged resting chamber. Resting chamber depth appears to be correlated to mean annual water table depth. This structure is normally inundated with ground water. Resting chamber depth can range from as shallow as 18 inches to almost six feet underground!

Within the resting chamber, crayfish mate, stockpile vegetation and construct additional tunnels. Female crayfish carry eggs underneath their abdomens, and primary burrowing crayfish often sequester themselves in their burrows during this time. Two to four weeks after hatching, neonates (newborn crayfish) enter their mother's resting chamber and tunnels, staying there for an unknown period of time. Upland burrowing crayfish neonates in Terra Alta were present for an entire summer from May through September within the confines of their mother's burrow, indicating that females do not necessarily rush off their young.

Radiating in all directions from the walls of the resting chamber are ancillary tunnels. It is theorized that crayfish use these tunnels to gain access to resources, hunt earthworms, feed on root tips, and expand their burrow complexes. Though the number and placement of these additional tunnels vary both on an individual and species level, one tunnel usually is always present. This tunnel leads from the floor of the resting chamber deep into the earth. The purpose of this tunnel is to follow the water table during drought conditions, always ensuring the crayfish has access to groundwater for respiration (crayfish breathe through gills). Including this tunnel, primary

burrower burrows can be quite deep, with several documented greater than eight feet in depth. Pretty impressive, given that they're constructed by organisms only one- to two-inches long! Several animal species, ranging from leopard frogs to jumping mice, use these burrows, making burrowing crayfish a keystone species in the habitats they occupy.

Burrowing crayfish in West Virginia are separated into two distinct groupings determined by the state's geographic characteristics. Lower elevations associated with the Appalachian Plateau, specifically the Ohio River Floodplain, harbor a greater diversity of crayfish. Burrowing crayfishes found in the Plateau include little brown mudbugs, digger crayfish, upland burrowing crayfish and blue crayfish. High elevation wetlands and forests above 2,500 feet in the Allegheny Mountains are home to the second distinct burrowing crayfish fauna in West Virginia, and consist of upland burrowing crayfish and blue crayfish. Species found in the Allegheny Mountains can also be found in the Appalachian Plateau, though high elevation populations do show structural differences from plateau populations.

The Ohio River Floodplain is home to the little brown mudbug (*Cambarus thomai*) and the digger crayfish (*Fallicambarus fodiens*). Little brown mudbugs are common throughout the Floodplain, reaching their highest densities in mature bottomland forests. Wildlife



Zachary J. Loughman

Little brown mudbug.

management areas like Green Bottom and McClintic have thriving little brown mudbug populations. Little brown mudbugs actually aren't little, and in fact are our largest burrowing species, reaching seven inches in length. Coloration ranges from drab browns to brilliant blues and greens for this powerful species.

Digger crayfish are rare in West Virginia, and are the most imperiled burrowing crayfish in the state. Interestingly, West Virginia's populations of digger crayfish are isolated from core populations across Central North America. Intensive survey efforts were recently undertaken to find digger crayfish populations. Prior to this survey, two populations were known in West Virginia. Although more than 80 potential sites were surveyed, researchers discovered only two new populations. Digger crayfish in West Virginia are likely prehistoric Marietta River relicts, left over from the Teays River system from which Teays Valley gets its name. This helps to explain why digger crayfish populations are limited within the state. The natural history of this animal in West Virginia is relatively unknown. Discovering ecological data on this species, as well as finding additional populations, are major objectives of the current West Virginia crayfish survey.

Upland burrowing crayfish (*Cambarus dubius*) are found both in the Appalachian Plateau and the Allegheny Mountains. This species is polymorphic, with three distinct color phases in West Virginia. Populations in the Teays River Valley and lower elevations in the Guyandotte, Coal and Kanawha river basins are blue. High elevation Appalachian Plateau upland burrowing crayfish populations in southern West Virginia are orange and black, and are sometimes referred to as the "halloween morph." Allegheny



Zachary J. Loughman

Upland burrowing crayfish.



Blue crayfish

Zachary J. Loughman

Burrowing crayfishes are unique, important members of West Virginia's natural communities. The burrowing activities of these colorful animals create structures used by more than 400 animal species. In addition, their burrowing activity aids in maintaining healthy ecosystems by transferring nutrients between the topsoil and subsoil. Through increased efforts by the DNR Wildlife Resources Section, conservation plans for burrowing crayfishes will be created and implemented so

future generations can experience the thrill of finding a brilliant blue crayfish in the Mountain State.

*Zachary J. Loughman is Natural History Research Specialist for West Liberty State College, where he teaches biology and environmental courses, and researches crayfish conservation issues and ecology.*

Mountain populations above 2,300 feet are all bright orange. This dynamic color scheme makes this species West Virginia's most variable crayfish species.

Over the past three years, I have conducted intensive studies on the natural history of this species at Terra Alta, West Virginia. Focus areas of this research include feeding ecology, life history, behavior and activity patterns, all aspects of burrowing crayfish biology that have received very little attention by astacologists. Results from these studies are changing biologists' ideas on the behavioral ecology and ecological role burrowing crayfish play in Appalachian ecosystems.

The final burrowing crayfish found within West Virginia is the blue crayfish (*Cambarus monongalensis*). Many tourists and West Virginians have encountered this species while hiking through Cranberry Glades or Dolly Sods. Two populations inhabit our mountains and hills; one in the Appalachian Plateau and one in the Allegheny Mountains. Several biologists have suggested that these populations be treated as subspecies, or even distinct species. One objective of the current study is to decide exactly how this species should be classified.

Both the blue crayfish and upland burrowing crayfish exist in specialized forest habitats called seeps. Seeps are wet areas where the aquifer (water-bearing rock formation) is fractured, resulting in the water table making contact with the earth's surface. In habitats like this, up to 11 burrows occur for every square meter of seep. This can result in seeps the size of your living room having as many as 275 burrow portals! In disturbed environments, like yards, burrowing crayfish can still be present, though burrow portal densities are drastically reduced.



## You can help this effort!

You can aid biologists in understanding burrowing crayfish distribution across West Virginia! If you have chimneys or burrows in your yard or on your property, have seen the crayfishes pictured in this article, and want to get involved in the survey, email [WestVirginiaCrayfish@gmail.com](mailto:WestVirginiaCrayfish@gmail.com) or contact **Zac Loughman** at **304-336-8923** to share your discoveries. If you stumble upon a burrowing crayfish, please take a picture of the animal and record information on your location and email it to the above address. This information can be added to our growing crayfish distribution database, and ultimately is invaluable in understanding burrowing crayfish distributions across West Virginia.

## Field Trip

# Yankauer Nature Preserve



Bluff overlooking the Potomac River



Northern parula warbler

**Viewing Information:** White-tailed deer, pileated woodpeckers, hairy woodpeckers, wild turkeys and box turtles occur year-round. The mixed habitat makes the area ideal for birding. In March great horned owls nest in the preserve's large oaks. Many species of warblers nest here, including the prairie warbler. Look for them in May and June in the cedar thickets and in open areas. Also in May and June, look for scarlet tanagers in the hardwoods. Waterfowl can be seen along the Potomac during their spring migration. Barred owls can often be heard year-round. Hike the South Trail in spring and early summer for wood thrushes and yellow-billed cuckoos. Mid-April to early May is a great time to see many species of wildflowers in bloom, including twin leaf, Dutchmen's breeches, bloodroot and jack-in-the-pulpit.

**Description:** The 107-acre Yankauer Nature Preserve lies along the banks of the Potomac River and was donated to The Nature Conservancy of West Virginia in 1967 by Dr. and Mrs. Alfred Yankauer. The property is owned by the Conservancy but is managed by the Potomac Valley Audubon Society. It is a blend of oak forests surrounded by glades of red cedar and dense thickets of fast-growing shrubs and trees. As you move into the center of the property you find a more mature forest of large oaks and maples growing amid limestone outcrops and sinkholes. The eastern edge of the property is a bluff overlooking the Potomac River. Much of the land is former farmland which is gradually returning to its natural forested state, making it an interesting and informative natural laboratory. Situated in the fastest growing area of the state, Yankauer constitutes an important community resource that is becoming more unique and irreplaceable each year.

The public is welcome to visit the preserve during daylight hours. Three well-marked trails, totaling about two miles, take the visitor through a variety of habitat types. The Kingfisher Trail, South Trail, and Dan Fisher Trail all loop, and you can walk a large circle across the property. A short 1/5 mile trail, the Cedar Loop, is a nice option for those who want a short stroll through a cedar glade. A trail brochure is available and the Kingfisher Trail includes interpretive signs.

**Directions:** From the 4-way stop (routes 45 and 480) in Shepherdstown, drive east towards Sharpsburg. Go about .25 mile and turn left onto Shepherd Grade Road. Travel 1.7 miles and bear left at the "Y" intersection onto Scrabble Road. Stay on Scrabble Road for 4 miles (Note: Scrabble Road turns left at 1.9 miles). Turn right onto Rt. 5/4, Whiting's Neck Road. The Yankauer Preserve is .5 mile on the right.

Photos provided by Will Hershberger/NatureImagesandSounds.com

# Fishing 'Tails'

This is not a tale about wild fishing adventures, or the big one that got away after a 45-minute battle. Rather, it is about some prime fishing opportunities available to anglers in the Mountain State. Scattered throughout West Virginia are several fishing hotspots known as tailwaters. Tailwaters are relatively short stream sections located below dams of any size. Although tailwaters below navigational dams on the Ohio, Kanawha and Monongahela rivers also provide exceptional fishing opportunities, this article addresses only the 10 tailwater areas in West Virginia located below U.S. Army Corps of Engineers (COE) flood control impoundments.

Why are these areas such great places to fish? Fish tend to concentrate in tailwaters because the turbulence of water passing over or through dams increases dissolved oxygen and because the fast currents usually carry more prey species past the waiting fish. Large water fluctuations sometimes flush lake-dwelling fish through dams into the tailwaters. This may amount to a tremendous number of fish, particularly during major winter storms when lake levels are lowest. Finally, dams are barriers to upstream migration, leaving many fish congregated below them.

Tailwaters offer varied fishing opportunities, from strictly coolwater species at Summersville and Jennings Randolph dams, to only warmwater fish at Bluestone and Beech Fork dams. The others provide anglers a combination of both. The newer dams have been constructed with multi-level releases so water can be drawn from various lake depths and mixed to improve water quality and temperatures in the tailwaters that more closely match stream conditions that occurred prior to impoundment. Seasonally these tailwaters provide good coldwater and warmwater fisheries.

The following descriptions will familiarize you with tailwater fishing opportunities below West Virginia's COE flood control dams. It is hoped this information will improve your fishing success and lead to more enjoyable outings.



Burnsville tailwater is accessible by concrete anglers' path. (left side of photo)

**Beech Fork Dam** tailwater is located on Beech Fork of Twelvepole Creek in Wayne County, 2-1/2 miles east of Lavalette on county Route 13. This tailwater is relatively small, and the banks are riprapped from the dam downstream to a small, concrete weir that forms a pool. Below the weir the tailwater reverts back to a natural stream setting. Hybrid striped bass and saugeye are the species most sought by anglers. Largemouth and spotted bass, carp, crappie, bluegill, catfish and tiger musky also live in the tailwaters. Jigs, minnows and nightcrawlers are the most popular game fish baits, while carp are usually taken with dough balls. Wildlife Resources Section (WRS) personnel stock trout in the tailwater once each month from February through May. Parking, restrooms, a picnic shelter and dusk-to-dawn lighting are adjacent to the tailwater area. A paved path and a fishing pier provide handicapped access. Anglers can call (304) 525-5092 to obtain tailwater conditions.

**Bluestone Dam** tailwater is located on the New River near Hinton in Summers County, approximately 15 miles south of I-64 on state Route 20. Flows are released through Bluestone Dam into a short stilling basin and then into New River. Fishing in the stilling basin from a concrete wall that extends across the river below the dam is popular for channel and flathead catfish and carp. Fishing below the dam is excellent for smallmouth and rock bass. Hybrid striped bass and



New handicapped accessible pier juts out over Bluestone tailwater.

David Fattaleh

an occasional musky are also caught in the tailwater. Fishing is best when the dam is discharging from only one to three gates. Parking and lighting are present below the dam on both sides of the river. A new handicapped accessible pier is located on the west side of the river just below the stilling basin. Anglers can call (304) 466-0156 to obtain information on tailwater conditions.

**Burnsville Dam** tailwater is located on the Little Kanawha River in Braxton County, three miles east of Burnsville on county Route 5/11 (use Exit 79 from I-79). Two pools, approximately 1,350 feet long, are formed by a weir at the lower end and are separated by

a causeway. The tailwater pools are riprapped so wading is not practical, but a concrete anglers' path extends from the dam to a point halfway along the lower pool. Public fishing access extends approximately 800 feet below the weir.

DNR Wildlife Resources personnel stock trout once in February and every two weeks from March through May. Walleye fishing is good in this tailwater, especially downstream of the weir during the spring and fall. Crappie, bluegill, bass and catfish provide plenty of action for anglers, and musky are also occasionally caught. Fishing success is highest when flows are below

100 cubic feet per second (cfs). Parking, restrooms, a picnic shelter, a children's playground and dusk-to-dawn lighting are located adjacent to the tailwater area. Handicapped access is provided by the concrete anglers' path along the upper pool. Anglers can phone (304) 853-2398 to obtain daily tailwater conditions.

**East Lynn Dam** tailwater is located on the East Fork of Twelvepole Creek in Wayne County, 10 miles south of Wayne on state Route 37. This is a relatively small tailwater, and the banks are ripped from the dam downstream for approximately 900 feet, where it returns to a natural stream setting.

WRS personnel stock trout in the tailwater once each month from February through May. Anglers eagerly seek saugeye and hybrid striped bass in the tailwater. Chicken liver is the most effective bait for hybrids. Channel catfish are also occasionally caught. Visitors will find parking and restrooms near the tailwater area, and picnic shelters and a children's playground are adjacent to the dam. There is no handicap access available for the tailwater. Anglers can phone (304) 849-9861 for tailwater conditions.

**Jennings Randolph Dam** tailwater is located on the North Branch of the Potomac River in Mineral County. The North Branch forms the boundary between West Virginia and Maryland. Presently, the closest access to the dam tailwater is at Barnum, West Virginia. Barnum is approximately 1-1/4 miles below Jennings Randolph Dam and is reached from county Route 46/2 off of state Route 46, midway between Piedmont and Elk Garden. The Corps of Engineers prohibits public access on its property in the tailwater area for the first 1/2 mile downstream from the dam.

West Virginia WRS personnel stock trout once each month from February through May in a 1-1/4-mile section at Barnum. Fishing for other species is unproductive because of the constant coldwater releases from the lake. Anglers must abide by Maryland Department of Natural Resources regulations while fishing on the North Branch. Maryland DNR personnel manage two sections of the North Branch under catch-and-release regulations. The first section is located between the tailwater area one-half mile downstream of



Angler access at Blue Hole below Jennings Randolph Dam

the dam and extends 3/4 mile downstream to Barnum. The second catch-and-release area begins at the lower end of the stocked section at an area known as Blue Hole, and extends four miles downstream to Piney Swamp Run. Anglers must fish with artificial lures only in these two catch-and-release areas.

Jennings Randolph Dam lacks a warning system so wading anglers should be alert for rapid flow increases. Flow increases are usually made before daylight to help prevent anglers from becoming stranded on the opposite sides of the river. Anglers can call the hotline number (304) 355-2890 to obtain tailwater conditions, and a three-day projection of the tailwater flow is posted on the Jennings Randolph website at [www.nab.usace.army.mil/recreation/jenran/recinfo.htm](http://www.nab.usace.army.mil/recreation/jenran/recinfo.htm). Parking is available along the stocked stream section and West Virginia or Maryland residents may fish with a valid fishing license from either state.

**R. D. Bailey Dam** tailwater is located on the Guyandotte River in Mingo County, approximately one mile from Justice off of U.S. Route 52. The tailwater is relatively small, consisting of a 400-foot-long pool extending from the dam downstream to a weir. A small vehicle bridge spans the weir, and the Guyandotte River soon reverts to the natural stream channel. The banks are ripped along the pool and below it for several hundred feet. Concrete paths provide fishing access along the ripped shoreline.

WRS personnel stock trout once in February, every two weeks from March through May, and twice



The Gauley River below Summersville Dam provides year-round trout fishing.

in October. Hybrid striped bass fishing is excellent, particularly in the spring and fall. Channel catfish and other game fish also provide some good action for anglers. Walleye are occasionally caught in some of the deep pools below the ripped section. Parking, portable toilets and dusk-to-dawn lighting are adjacent to the tailwater. There is no handicap access available at the tailwater. Anglers can phone (304) 664-9587 for tailwater conditions.

**Stonewall Jackson Dam** tailwater is located on the West Fork River in Lewis County, 1/2 mile east of I-79 (Exit 96) on county Route 30. This tailwater is a 1-3/4-mile-long pool extending from the Stonewall Jackson Dam to a low-level water supply dam near Weston. Both sides of the pool are ripped for approximately 800 feet below the dam.

WRS personnel stock trout once in February and every two weeks from March through May. Anglers catch bass, yellow perch, crappie, bluegill and catfish in the tailwater throughout the year and occasionally land a musky. A grouted concrete pathway is located along one side of the rip-rapped section. Parking, restrooms, dusk-to-dawn lighting and a handicapped accessible fishing

pier are located immediately below Stonewall Jackson Dam. A little farther downstream is another public access area with parking, a slide for launching small boats (electric motors only), and a graveled path, 300 feet of which is paved and suitable for handicapped access. Anglers can call (304) 269-7463 for tailwater conditions.

**Summersville Dam** tailwater is located on the Gauley River in Nicholas County, seven miles south of Summersville via state Route 129 off of U.S. Route 19. The water release from Summersville Lake into the Gauley River rarely exceeds 70 degrees and makes this section of river, downstream to its confluence with the Meadow River, a year-round trout fishery.

WRS personnel stock trout once in February, every two weeks from March through May, and twice in October. Additionally, trout are stocked each October and June by helicopter farther downstream in the canyon to create a unique remote fishery. Trout are the mainstay of this tailwater fishery because of the coldwater releases. Flows less than 750 cfs are best for successful fishing. Parking, restrooms and a campground are available adjacent to the tailwater. Access for anglers is limited to the area immediately

below the dam, the path across the dam to the opposite shore, and a gravel road leading down to an old U.S. Geological Survey station. Anglers can call 304-872-5809 to obtain tailwater conditions.

**Sutton Dam** tailwater is located on the Elk River in Braxton County, three miles east of I-79 (Exit 62), just upstream of Sutton. The tailwater is rip-rapped from the dam downstream for approximately 1,000 feet; otherwise, the habitat is natural with no manmade pools. WRS personnel stock trout once in February, every two weeks from March through May, and twice in October. Anglers catch bass, catfish and walleye in the tailwater. Legendary-sized muskies also can be found here. The best tailwater fishing is from the dam downstream to the county Route 19/40 bridge in Sutton. Flow releases less than 500 cfs provide the best success.

A new 362-foot concrete fishing access, with handicapped accessibility is available along the shore. This provides excellent shore fishing opportunities. Parking, restrooms, a picnic shelter, a modern children's playground and dusk-to-dawn lighting are provided adjacent to the tailwater area. Anglers can call (304) 765-2705 to obtain information on tailwater conditions.

**Tygart Dam** tailwater is located on the Tygart River in Taylor County, two miles south of Grafton. Anglers can access either side of the tailwaters by county routes 42 (west side) and 44 (east side). The dam releases water into a large stilling basin, and both shorelines of the tailwater are riprapped for approximately 1,000 feet. This is a large tailwater, and boats are frequently used by anglers to more effectively fish the abundant cover. Water released from the dam comes from deep in the lake and subsequently provides cool tailwater temperatures.

WRS personnel stock trout once each month from February through May, and twice in October. Large numbers of Tygart Lake walleyes pass through the dam into the tailwater during high flows from November through May, and anglers catch the majority of these fish by late June. Some walleyes remain in the tailwater year-round, while the larger fish generally move quickly downstream in search of deeper water. Jigs, minnows and nightcrawlers are the preferred baits of most anglers. Fishing is generally best for trout with only one or two gates operating, while walleye fishing is good with up to three gates open. Parking, restrooms, picnic shelters, camping, dusk-to-dawn lighting and a concrete boat ramp are available at the Grafton City Park on the east side of the tailwater. The launching access is steep and large boats (16 feet or longer) may have difficulty



*A new handicapped accessible pier provides access to the Sutton Dam tailwater.*

using the ramp. There is no developed handicapped access at the Tygart tailwater. Anglers can call (304) 265-5953 to obtain information on tailwater conditions.

The DNR Wildlife Resources Section provides weekly updated information on fishing conditions around the state which includes fishing prospects for many of the tailwaters. It is posted on the DNR website each Wednesday at [www.wvdnr.gov](http://www.wvdnr.gov); click on Weekly Fishing Report under the Fishing heading. The report is also sent to the state newspapers and is often printed in the daily papers on Thursday.

Tailwaters can provide year-round fishing opportunities because, even during the coldest winters, these areas remain free of ice. Anglers should be very cautious when fishing during cold weather, however, since water spray may freeze on the riprap and make footing treacherous.

Many of West Virginia's tailwaters are also good places for the entire family to enjoy. Whether everyone fishes or not, the great fishing opportunities for those who do, the playgrounds for the children, the picnic sites, and quiet places to relax and reflect all combine for leisurely recreational outings. If you consider yourself strictly a lake or stream angler, take a little time and stop by a tailwater sometime. You may be surprised by what you've been passing up – what other anglers have been enjoying for a long time.

*Compiled by DNR Wildlife Resources Section Fisheries Biologists Mike Shingleton, Kevin Yokum, Mark Scott and Jim Hedrick.*

## Wildlife Diversity Notebook: Killdeer

**Common Name:** Killdeer

**Scientific Name:**  
Charadrius vociferous

**West Virginia Status:** The killdeer is a common spring and fall migrant, a fairly common summer resident which probably nests in every county, and a fairly common winter resident along the lower Ohio Valley and Kanawha Valley areas. It occasionally will winter in other parts of the state where a combination of some open water, usually in the form of boggy springs, and some open grasslands occur.

**Description:** This robin-sized (9-11 inches long) shorebird is easy to identify, with its two black bands separated and bordered by white on the neck, a white patch above the bill, and with a black stripe running from eye to eye. Also has a distinctive white eyestripe behind each eye. Its wings and tail are long. In flight, the rump and upper tail are orange. Both sexes look alike. The killdeer's piercing, repeated "kill-DEE" call is as unique as its appearance. It definitely earns its species name - vociferous!

**Habitat:** Though considered a shore bird, the killdeer readily uses open areas in West Virginia. Such open areas include sandbars, mudflats, pastures, cultivated fields, athletic fields, airports, golf courses, gravel parking lots and graveled roofs. They have been known to provide a learning opportunity for students when they have nested in a school yard.

**Range:** The killdeer is one of the most successful and widespread shorebirds in the Western Hemisphere. They breed in Canada from British Columbia to Newfoundland, southward through the United States to southern Mexico and the Caribbean. Disconnected populations also breed in Costa Rica, coastal Peru, and Northwestern Chile.

They winter from the southern half of the United States south to the northern tip of South America.



**Diet:** It mainly eats earthworms, grasshoppers, beetles and snails. Occasionally will eat small mammals and seeds. Characteristic search method involves running, stopping, waiting, bobbing head and then running again.

**Nesting Requirements:** Though somewhat limited by the state's hilly terrain and forest cover, killdeer take advantage of various types of open areas. The "nest" is simply a scrape in the ground, sometimes with some lining material. It nests in the open with little or no surrounding vegetation. Nests have been found in the middle of gravel roads, on newly turned soil, and along the borders of country roads.



*Clutch of four eggs laid in gravel*

**Life History:** Female lays a clutch of 4 buff-colored eggs with spots. Incubation period is 22-30 days. The young are able to leave the nest as soon as their down dries, and are independent after 20-30 days.

The migrating population in West Virginia begins to concentrate on ponds and lake shores in last August, with several dozen sometimes gathering at one site. These birds typically depart in October.

The killdeer is well known for its broken-wing display. When a predator approaches the nest, the adult drags its wing and hobbles away from its nest, distracting the predator from the young in the exposed nest. When it is a sufficient distance from the nest, the bird "recovers" and flies away, calling loudly. To prevent large hoofed animals from crushing the eggs, the killdeer fluffs up its feathers, displays its tail over its head, and runs at the animal in hopes of making it change its path.

**Threats and Prospects:** The killdeer's fondness for human modified habitats is a double-edged sword. It means that its potential habitat is increasing as a result of human development. On the other hand, it means that it is vulnerable to pesticide poisoning, lawnmowers, and collisions with vehicles and buildings. Some breeding bird surveys suggest populations may be declining in some western states.

*Information compiled by Art Shomo, editor.*



# Cutting Edge Research for Ceruleans

By Petra Bohall Wood

West Virginia's forests are home to a small woodland bird called the cerulean warbler. Its name comes from the sky blue color on the back of the male; the female's back is bluish-green. The cerulean warbler breeds in mature deciduous forests throughout the eastern United States. It typically nests and forages high in the tree canopy; much higher than most other warblers. After the breeding season, this tiny bird, which only weighs 0.3 ounce, makes a long annual trek to spend the winter on the mid-slopes of the Andes Mountains in northern South America.

The Cerulean Warbler is one of the species of highest concern in the eastern United States because of a small total population size and significant declines in numbers throughout its range. Over the last 50 years, scientists estimate that the abundance of this bird has declined about 70 percent on its breeding grounds. Biologists believe several factors contribute to the cerulean warbler's decline, including loss and degradation of forested habitat on the breeding and wintering grounds. The amount of forest in the landscape is important but so is the quality of the forest.

Numerous studies in recent years have attempted to identify actions, particularly habitat management, that would help conserve this species and ensure its existence into the future. In fact, an international meeting of the Cerulean Warbler Technical Group was held in Morgantown, West Virginia in 2006 to begin developing and implementing a cerulean warbler conservation action plan. To find out more about cerulean warblers and conservation efforts for these birds on their breeding and wintering grounds, check out the following Web sites:

- [http://www.fws.gov/Midwest/eco\\_serv/soc/birds/cerw/index.html](http://www.fws.gov/Midwest/eco_serv/soc/birds/cerw/index.html)
- <http://www.srs.fs.usda.gov/egc/>



Male cerulean warbler perching on red bud tree.

Currently, ceruleans are most abundant in the central Appalachian Mountain region. West Virginia is a stronghold for the species. In many parts of the breeding range, cerulean warblers live in forests associated with river valleys, particularly where tall trees emerge above the forest canopy. In mountainous regions like West Virginia, they are much more common on and near the tops of ridges, particularly in areas where oak and hickory trees predominate.

Although cerulean warblers breed in mature deciduous forests, not just any forest will do. They seem to prefer areas where gaps in the tree canopy allow vegetation to grow at many levels above the ground. Although researchers are not certain why gaps are important, they suspect several reasons. The male cerulean often sings from tall canopy trees where his song will carry farther. His territorial defense song would carry further near a gap in the canopy. Another reason may be that canopy breaks allow for growth of long-limbed branches high in the upper canopy where females typically build their nest. Finally, ceruleans feed on insects found on leaves and twigs, and occasionally capture insects in flight similar to a

flycatcher. The vegetation at various levels in canopy gaps may result in more insect prey, making these breaks attractive places to forage.

A recent study completed at the Lewis Wetzel Wildlife Management Area by researchers and students from West Virginia University found that all cerulean warbler territories had small treefall canopy gaps within them. These gaps occur when trees die or fall down from some natural cause. Many of the territories also contained breaks in the canopy from human disturbances such as narrow dirt roads and trails. Some of the ceruleans on this site used a trail as the edge of their territory. A summary of this study can be found online at <https://eidr.wvu.edu/etd/documentdata.eTD?documentid=4596>.

Several other studies in the eastern United States have provided anecdotal evidence that creating some canopy breaks in a closed canopy forest improves the habitat quality and increases use by these birds. This suggests that harvesting timber might be a useful tool for forest management to benefit cerulean warblers. However, limited detailed information is currently available about how ceruleans respond to the many different forest management practices found in eastern deciduous forests. We know that some gaps in the canopy are beneficial but we do not know how many are too many.

Consequently, biologists began a forest management experiment on seven different study areas in West Virginia, Ohio, Kentucky and Tennessee with the objective of identifying forest management approaches that are compatible with cerulean warbler conservation. The West Virginia study areas include the Lewis Wetzel Wildlife Management Area in Wetzel County, private lands in Wyoming County, and part of the Monongahela National Forest in Randolph County. Each study area includes four plots, each approximately 50 acres in size, of mature deciduous forest.

The research teams collected data during the 2005 and 2006 breeding seasons on all of the study plots before any timber harvesting occurred. They collected data on abundance of cerulean warblers as well as all other bird species that occur on the plots by conducting point counts. This allows them to document changes in the bird community over time. Researchers map territories to determine the density of cerulean territories on each plot.

Biologists know that just because a bird is present in an area does not mean that the habitat is of high enough quality for a bird to build a nest or to



Aerial photo showing moderate timber cutting in middle and uncut buffers at each end.

successfully hatch its young. So researchers find and monitor nests of ceruleans on each plot to quantify nesting success. This is not an easy task because they nest so high in the canopy. Additionally, researchers capture males and mark them with colored leg bands so that they can determine if individuals move away from the timber harvests and if they return to the study area in subsequent



Male cerulean warbler with leg band.

Greg George

years. This gives them an estimate of annual survival rates for these birds. All of these measures provide baseline data (before timber harvest) that can be compared to the post-harvest data.

The research group identified three types of sound timber harvesting methods that commonly occur in the Central Appalachians as the focal harvest treatments for our study. They also selected these harvests so that they could compare heavy, moderate and light canopy disturbance. The three harvest types consisted of: a heavy even-age cut with approximately 20 square feet of residual basal area (BA) per acre, a shelterwood cut with approximately 55 square feet of residual BA per acre (moderate disturbance), and a single-tree selection cut with approximately 75–80 square feet residual BA per acre. The residual basal area is a measure of the number of mature canopy trees that are left on the plot after the timber harvest is complete. One plot on each



Heavy harvest plot at Lewis Wetzel Wildlife Management Area

site remained unharvested to serve as a reference plot. Harvests were implemented on the center 25 acres of each treatment plot between August 15, 2006 and April 1, 2007. The remaining 25 acres were left as uncut buffers on each plot. The aerial photo of the moderate harvest shows the trees remaining in the harvest and the uncut buffer at each end of the sampling plot.

During the 2007 and 2008 breeding seasons, the research teams at each study area are collecting data on how cerulean warblers respond to each harvest. They will address a variety of questions with these data. For example, do ceruleans continue to forage and nest in each of these harvests or do they move to the uncut buffer? If they do nest in one of the harvest treatments, are they as successful at producing offspring as nests in uncut forests? Which of the harvests has greater cerulean abundance and nesting success? For ceruleans nesting in the uncut buffer, does nesting success differ if the adjacent harvest is heavy or light? What is the survival rate of ceruleans using each harvest treatment compared to the uncut buffers or the uncut reference area? Answers to these types of questions will allow managers to plan timber harvests in a way that minimizes negative effects on ceruleans and maximizes positive effects.

This study is a tremendous cooperative effort by researchers, biologists, and wildlife and forest managers. It includes students from four universities, personnel from four state natural resource agencies, two national forests (US Forest Service), and the U.S. Fish and Wildlife Service, timber industry staff, and representatives from the National Council for Air and Stream Improvement and the National Fish and Wildlife Foundation. This study hopes to identify ways that wildlife managers can use forest management to improve breeding habitat for the cerulean warbler.

Petra Bohall Wood is a wildlife biologist and adjunct professor at WVU with the U.S. Geological Survey Cooperative Fish and Wildlife Research Unit in Morgantown. She coordinates the cerulean warbler research which is partially funded by grants from the DNR Wildlife Resources Section's Wildlife Diversity Program.

# A Sense of Wonder...

## Mammals in Motion

### Objective

Children learn that mammals move in different ways.

### Method

Children play follow-the-leader by imitating the movements of different mammals.

### Materials

Photos of different mammals or videos of mammals; slips of paper

### Background

Basically all mammals have four "legs." But various mammals have different methods of getting from one place to another using those extremities. Here are descriptions of the different methods of locomotion.

**Walkers:** Most mammals walk and run on all four legs - but different mammals use different parts of their feet when they move. Show the kids a picture of a bear and explain that it walks and runs on "flat" feet (the soles of its feet), just as raccoons, skunks and porcupines do. The word we use to refer to this method of movement is called plantigrade. Humans also walk on the soles of their feet, but we walk upright on only the "rear" legs. Mammals such as wolves, dogs and cats walk on their toes (the pads of their feet). The special term for this method of walking is called digitigrade. Deer, bison, horses and other hoofed mammals actually walk on their toenails! This is referred to as unguligrade movement.

**Jumpers:** Mammals such as kangaroos cover a lot of ground by making long leaps. A kangaroo uses its strong hind legs for jumping, its tail for balance and its weaker forelimbs for holding food.

**Diggers:** Some mammals spend all or most of their lives underground. Point out the broad forelimbs and strong claws of a mole. Like badgers and most other digging mammals, moles use their front limbs for digging through soil.

**Gliders:** Some tree-dwelling mammals get around by gliding. Flying squirrels and a few other mammals have flaps of skin connecting their front and hind legs. As they leap into the air, they spread out their legs and the skin flaps form a furry parachute.

**Fliers:** Bats are the only mammals that can fly. Thin skin connects the long finger bones which make up the bat's wings.

**Swimmers:** Aquatic mammals such as porpoises and whales are specialized for swimming. Their forelimbs have evolved into powerful flippers, which help them steer as they swim. Their hind legs gradually disappeared as they evolved and their flattened tails give them the push that propels them through the water.

This activity is adapted with permission from the Nature Scope activity series called *Amazing Mammals*, produced by the National Wildlife Federation.



Walking like a wolf is difficult for humans.

Art Shomo



Child hops like a rabbit with hind legs moving forward together outside of front legs.

Art Shomo

### Procedure

Begin by asking why mammals need to move (to find food, escape from predators, find a mate). Then use the background information above and appropriate pictures to discuss the different methods of movement. After you talk about each category, have the kids try each method out.

Have them walk on all fours, with their palms and soles flat on the ground to imitate a bear. Ask the kids to walk on their "knuckles" and balls of their feet like a wolf. Then let them try walking with only their fingertips and toes touching the ground like a deer.

To represent a jumper, have them hold their arms close to their chests and jump forward.

To imitate a digging animal, have the kids walk on their knees and move their arms in a breast stroke motion to simulate pushing dirt away.

Gliding animals are hard to imitate but have the kids hold their arms straight out to their sides, keeping them steady as they walk.

To represent a bat, have kids flap their arms like wings as they walk around.

It is tough to imitate an aquatic mammal, but have the kids bend forward at the waist so that their upper body is almost parallel to the ground, hold their upper arms against their body, and let their forearms hang down toward the floor, swinging the forearms back and forth like fins.

After practicing all the movements, choose a child to be the leader and have the rest of the group line up behind him or her. Tell the kids to leave an arm's length of distance behind the person in front of them. Now ask the leader to choose one of the mammals you've discussed and then move forward imitating that mammal. The rest of the group should follow in a line, making the same movement. After a short time, tell the mammals to stop and have the leader go to the back of the line. Let the new leader (the next person in line) choose another mammal from the discussion and act it out. Continue until everyone has a chance to lead.

# Nature's Tapestry

Photography by David Fattaleh and Steve Shaluta



*When we try to pick out anything by itself, we find it hitched to everything else in the universe.*

*John Muir*



*Wild bears and birds are by right not the property merely of the people alive today, but the property of unborn generations, whose belongings we have no right to squander.*

*Theodore Roosevelt*

*Joys come from simple and natural things, mists over meadows, sunlight on leaves, the path of the moon over water. Even rain and wind and stormy clouds bring joy, just as knowing animals and flowers and where they live. Such things are where you find them, and belong to the aware and alive. They require little scientific knowledge, but bring in their train an ecological perspective, and a way of looking at the world.*

*Sigurd Olson*

*If you wish your children to think deep thoughts; to know the holiest emotions, take them to the woods and hills, and give them the freedom of the meadows; the hills purify those who walk upon them.*

*Richard Jefferies*



*Indeed the river is a perpetual gala and boasts each month a new ornament.*

*Ralph Waldo Emerson*



*Climb the mountains  
and get their good tidings.  
Nature's peace will flow into  
you like sunshine flows into  
the trees. The winds will  
blow their own freshness into  
you and the storms their  
energy while cares will drop  
off like autumn leaves.*

*John Muir*

*In every walk with nature, one  
receives far more than he seeks.*

*John Muir*



*Come forth into the light. Let Nature be  
your teacher.*

*William Wordsworth*

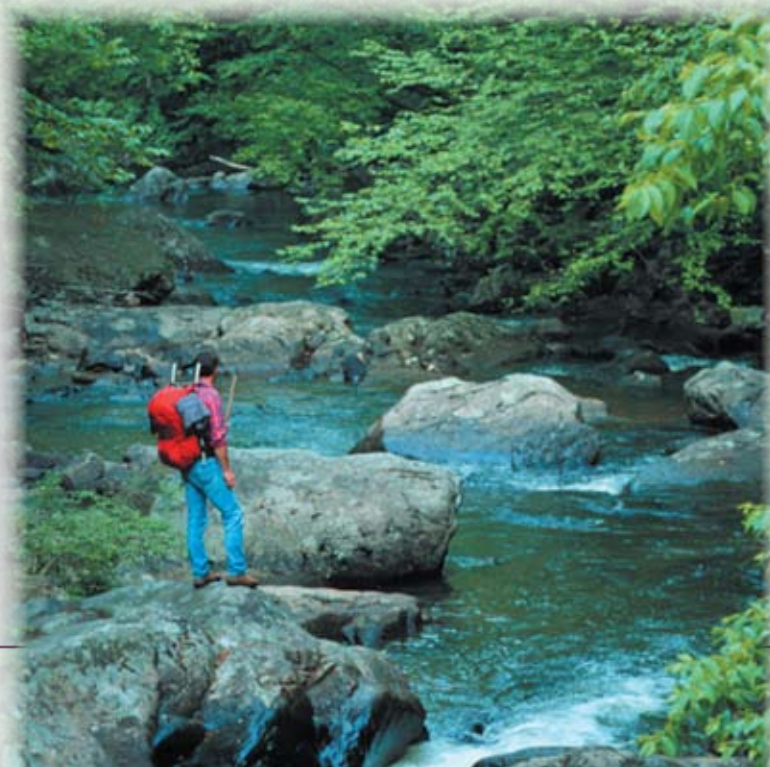
*This Grand Show is eternal. It  
is always sunrise somewhere, the  
dew is never all dried at once, a  
shower is forever falling, vapor  
is ever rising. Eternal sunrise,  
eternal sunset, eternal dawn and  
gloaming, on sea and continents  
and islands, each in its turn, as  
the round earth rolls.*

*John Muir*



*For if one link in nature's chain might  
be lost, another might be lost, until the  
whole of things will vanish by piecemeal.*

*Thomas Jefferson*



*In the woods, too, a man cast  
off his years as the snake  
his slough, and at what  
period soever of life is always  
a child. In the woods is  
perpetual youth.*

*Ralph Waldo Emerson*

## New Wildlife Management Area Dedicated in Logan and Mingo Counties

The DNR Wildlife Resources Section has established a new Wildlife Management Area in Logan and Mingo counties. The Elk Creek WMA consists of 6,004 acres of forested, steep-sided hills owned by Heartwood Forestland Fund II, L.P. The WMA consists of two separate parcels of land, one totally in Logan County. The other tract straddles the Logan/Mingo county line, and is adjacent to the western boundary of R.D. Bailey Lake WMA.

Frank Jezioro, DNR Director, said, "Heartwood Forestland Fund II is to be commended for developing this lease agreement which will assure that the property will be enjoyed by current and future generations of hunters, anglers and trappers." Heartwood leased the property to the DNR for 10 years at no cost.

Logan and Mingo counties are open to archery hunting for deer and several trophy bucks have come from the vicinity of the WMA. The population of black bears is increasing in the area so hunting opportunities for bear are good. Wild turkeys also live on the area, and squirrel and raccoon are the main small game species present. Initial management activities will include installing information and boundary signs and developing road closures where needed.

Access to the Elk Creek WMA is by way of state Route 80, and Elk Creek and Spice Creek roads. Individuals interested in obtaining additional information about the area may contact the DNR Wildlife Resources Section District office at 304-675-0871.

## West Virginia Wildlife Television Segment Wins Emmy

West Virginia Wildlife, a weekly segment seen on WCHS and WVAH television stations, recently won a regional Emmy award. After more than 13 years of working with local television stations, this is the first time the local franchise has won what is arguably the most prestigious award for which the series is eligible. The judging committee looks at many different aspects of journalism and story-telling when choosing who will bring home the familiar statuette. The combination of Brad Rice's videography, the expertise of WRS biologists, and West Virginia's beautiful, diverse wildlife made my job of telling a good story almost effortless.

West Virginia Wildlife was judged on five stories submitted by the stations. Two stories dealt with two dedicated science teachers from South Charleston Middle School who came out with us one cold March day to get first-hand

knowledge of bears and their month-old cubs in dens. Brad and I had a chance to meet with the students later and check out their projects. We could tell they really enjoyed hearing the first-hand stories and lessons their teachers brought back with them.

We also included stories on barn owls and using mist nets to catch bats – not something you see every day! We concluded our submission with coverage of Isaac Ryan. Isaac is a brave little boy in a fight for his life against leukemia. The folks from Catch a Dream, a Mississippi-based organization, heard about Isaac and his desire to go fishing. They made it happen and even brought in

a professional bass angler to give him some tips. I'm sure that story touched the hearts of the Emmy judges almost as much as it did ours.

Submitted by  
Patrick McMurtry, WCHS/WVAH TV



From left to right: District Wildlife Biologist Gary Sharp, DNR Commissioner Ken Wilson, and Terry Elkins of American Forest Management, Inc. at area dedication ceremony.

Bob Fala



Steve Shaluda

## Timber Rattlesnake Named Official State Reptile

At a ceremony in the Governor's reception room on April 3, 2008, Governor Joe Manchin III signed a bill designating the timber rattlesnake as the State Reptile. Attending the ceremony were approximately 60 students from Romney Middle School, who initiated the designation as part of a class project in social studies. Also "attending" the ceremony was a live rattlesnake brought in by Jim Fregonara of the DNR Wildlife Resources Section.

The 7th-grade students were studying how bills become law and were assigned to produce a mock piece of legislation. While working on the project, the students decided to follow through and have their mock legislation become law.

After failing to get it passed in 2007, they tried again this year and were successful in rallying support for the measure with the help of their local delegate, Ruth Rowan. Their teacher, Ron Wolford, thought the box turtle would be a good candidate; but the students came up with the timber rattlesnake, and he deferred to their idea.

West Virginia is the first state to have the timber rattlesnake as its state reptile and joins only three other states to designate a snake as such. The timber rattlesnake is one of two poisonous species of snakes in the Mountain State, the other being the copperhead.

## DNR Hosts Annual State Archery in the Schools Tournament

The Division of Natural Resources hosted its third annual West Virginia Archery in the Schools Program State Tournament at Summersville National Guard Armory on Saturday, March 1, 2008. Approximately 30 schools and 500 students from across West Virginia participated in the event.

"Participation in West Virginia Archery in the Schools state tournaments is growing at a phenomenal rate," said Frank Jezioro, DNR Director. "The first year's tournament at Capitol High School had 280 students; the second year's tournament at Braxton County High School had 350 students. The Summersville National Guard facility allowed us to accommodate a much higher number this year."

"We at the DNR are very encouraged about the success of the Archery in the Schools Program," said Jerry Westfall, Program Coordinator with Wildlife Resources Section. "The Program is really geared to generate participation rather than competition. However, we are aware that competition generates a lot of excitement in the program. Keep in mind, this may be the only time in some of these student's lives they will wear school team colors and compete in front of a thousand or more spectators."

"Thanks go to the army of volunteers required to score, register and assist these students. Without the continued support of these volunteers, state tournaments at this level would not be possible. As we continue to expand, we will need more help next year," said Westfall.

For more information on the West Virginia Archery in the Schools Program, visit our Web site at [www.wvdnr.gov/archery](http://www.wvdnr.gov/archery). Click on News/Links to see the top individuals and teams in this year's tournament.



Senior Female Class Winners:  
Second Place - Anna Houben, Ripley High (left)  
First Place - Jana Sims, John Marshall High

DNR photo



Student take aim to win at the State Archery in the Schools Tournament.

DNR photo

## New Fish Species Identified in the Elk River

A West Virginia University professor has discovered a new species of fish in the Elk River near Charleston. Stuart Welsh, assistant professor in the Wildlife and Fisheries Resources Program, named the new species *Crystallaria cincotta*, or diamond darter. His findings were published in *Zootaxa*, an international journal.



The diamond darter was recently identified as a new fish species.

The adult diamond darter is three to five inches long and is translucent, meaning light passes through it. It is a close relative of the crystal darter which lives in the drainage basins of the Mississippi River. The name references the sparkle from reflected light when viewed with lights during nighttime collections. It also fits the analogy of a diamond as a rare crystal.

The population was originally discovered around 1980 but it wasn't until January 2008 that genetic tests and examination of other characteristics identified it as a distinct species. Historical records indicate the species lived in the Green and Cumberland rivers in Kentucky and Muskingum River in Ohio until the early 1900s when it disappeared from those waters.

"Discovering a new species is directly linked to discovering the diversity of life," said Welsh. "If there is one fun and exciting thing about science, then it is the discovery of new things."

The new species was named after Dan Cincotta, a DNR Wildlife Resources Section fisheries biologist, in recognition of his contributions toward management and conservation of the biodiversity of fishes in West Virginia.

## Calendar of Events

### May 30 - June 1

Whistles, Wings, & Wildflowers  
Cass Scenic Railroad State Park  
Variety of birdwatching hikes, wildflower walks, and train rides. Call (304) 456-4300 for more information or go to [www.cassrailroad.com](http://www.cassrailroad.com).

### June

- 7-8 Free Fishing Days  
Statewide  
Fish without a license! Call (304) 558-2771 for more information.
- 7-8 IBO World Qualifier and Big East Challenge Archery Event  
Coopers Rock State Forest  
For more information call (304) 594-1561
- 6-8 2nd Annual Southern Boreal Bird Festival  
Canaan Valley State Park  
Participate in daily walks, workshops and seminars about birds usually found further north in North America. Call (304) 866-4121 for more information.
- 7 Kids Fishing Derby  
Bowden Fish Hatchery  
Call (304) 637-0245 for more information.
- 7 Kids Fishing Derby  
Little Beaver State Park  
Begins at 9 am. Participants receive lunch, t-shirts, and prizes. Call (304) 763-2494 for more information.
- 21 Celebration of Summer  
Cathedral State Park  
Bird and wildflower walks to celebrate the first days of summer. Call (304) 735-3771 for more information.

### July

- 12 Walk Between the Parks  
Canaan Valley Resort State Park  
Naturalist guided hike between Canaan Valley and Blackwater Falls state parks. For more information call (304) 866-4121.
- 26 NWF Women in the Outdoors Field Day  
Kanawha State Forest  
For more information contact Billie Shearer at (304) 558-2771.

### August

- 2 Fishing with a Friend  
North Bend State Park  
Free fishing rodeo. For more information contact Sheriff Ron Barniak (304) 643-2262

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1.800.CALL WVA  
[www.wvstateparks.com](http://www.wvstateparks.com)

Watch [www.wvstateparks.com](http://www.wvstateparks.com) for fishing activities and packages.



Free Fishing Days  
June 7-8, 2008





West Virginia  
Wildlife