



## Patoka River National Wildlife Refuge and Management Area Scenic Auto Tour – Western Section

Personal GPS units may be used to find points and may vary slightly by placement. Mileage starting from the Refuge office (at 0.0 miles) is also listed for those that do not have GPS units.

Hunting and fishing regulations are in accordance with State regulations, subject to some conditions. Please refer to the Patoka River National Wildlife Refuge and Management Area Hunting and Fishing Regulations; which can be obtained from the headquarters located at 510 ½ W. Morton St., Oakland City, IN 47660. Trapping furbearers are prohibited on all Patoka River NWR&MA lands. Portions of the Refuge do not have boundary signs posted. **Please respect private property and always ask for permission before entering private property.** This auto tour route follows State Road 57 and county roads, which mainly consist of gravel and can be curvy. Some roads may be missing public road signs and some locations have 1 lane bridges so care must be taken when crossing bridge. **Some roads, such as 850E by Oatsville, may be flooded for a period of time during certain times of the year and will be closed to traffic.** Be aware of oncoming traffic and traffic behind you, and pull over to a safe place to view the area if you desire to explore. Please do not litter, help keep Patoka River NWR&MA a beautiful place for yourself and others. Enjoy the route!

### **Facts about the Patoka River National Wildlife Refuge**

Established in 1994 as Indiana's second national wildlife refuge, the refuge currently contains 6,149 acres. Its proposed boundary stretches for 20 miles as the crow flies in an east-west direction along the lower third reach of the 162-mile long Patoka River. When completed, the refuge will cover 22,472 acres including 7,000 acres of rare bottomland forested wetlands. The Patoka River NWR is recognized as an Important Bird Area by the National Audubon Society, and is home to 380 species of wildlife.

#### **Refuge Office starting point: 0.0 miles**

##### **1. South Fork Parking Lot Trail: 2.2 miles [UTM Zone 16, 0471876 e 4244590n]**

Ditching of the South Fork of the Patoka River was completed in 1914 using a steam driven dredge boat. The 17-mile long dredge ditch created was called Shy Ditch. It was dug to drain the land for farming. Strip mining in the headwaters in South Pike County started in the 1920's. Acid mine water runoff killed all biological life in the river for more than 50 years. Reclamation of many of the offensive sources of acid mine drainage started in the 1980's. Over \$17 million invested by the Indiana Abandoned Mine Land Program in the past 20 years has allowed the South Fork to recover sufficiently to now support fish and other aquatic forms of life. The levee can be seen when walking along the trail. In some places, the spoil bank levee is only 10 feet wide and it prevents Snakey Point Marsh from flowing out into the South Fork. The only time the marsh is able to receive new nutrients, water, and fish from the South Fork is when it floods. A bald eagle nest has been discovered along the South Fork and has successfully fledged 8 eagles since 2002, with 2 eaglets in 2008.

##### **2a. Snakey Point Marsh: 2.7 miles [Zone 16, 0472309e 4244928n]**

Snakey Point is open to the public for hunting, fishing, and bird watching. Snakey Point Marsh was actively farmed from the early 1900's up until the 1930's. The Snakey Point name was first used in the 1850's. Naturalist John T. Hanover was bitten while capturing a venomous snake presumed to be a water moccasin. This occurred near a high bank on the north end of the marsh near what is now known as the Indiana Southern Railroad. No venomous snakes are now known to occur in Snakey Point Marsh. Midland water snakes, rat snakes, black racers, or the threatened copperbelly water snake may be found around the marsh and all are non-venomous.

In the early 1850's, Col. James W. Cockrum operated an Underground Railroad way station in his barn cellar in Oakland City for runaway slaves coming out of Kentucky. Col. William Cockrum, James' son, wrote about their experiences: "If slave hunters showed up, the slaves were moved from harm and safely hidden in the thick brush and tall grass [cattails] in what was then known as the Big Pond, about two miles east of Oakland City." The "Big Pond" refers to Snakey Point Marsh.

## **2b. Hugh Boyd Fishing Pier & Wildlife Observation Deck**

The Hugh Boyd Fishing Pier & Wildlife Observation Deck was constructed by Refuge volunteers to provide fishing opportunities to catch largemouth bass, bluegill, and crappie from the marsh and to view wildlife. The pier can be accessed by circular trail from the Boyd parking lot. The Boyd family lived on the hill, just ¼ mile east of Snakey Point Marsh. Hugh Boyd and his wife were ardent supporters of the proposed Patoka River National Wildlife Refuge. Their 160 acres, which included the south end of the marsh, was the first large tract of land purchased in 1996 with funding received from a North American Waterfowl Management Plan grant. No hunting is allowed on this 5 acre trail area.

## **2c. Maxey Birding Trail**

Just south of the Boyd parking lot is the ½ mile long Maxey Birding Trail. This trail leads past Maxey Marsh. A favorite trail for birders, this is a great place to see migrating woodcock in the spring and fall, along with wood ducks on the marsh. Both Snakey Point Marsh and Maxey Marsh support cattails, American lotus, coontail, buttonbush, smartweeds, and arrowheads which provide vital habitat and food for many species. Bald eagles, great blue herons, great egrets, waterfowl, rails, muskrats, beaver, otter, turtles, frogs, and snakes frequent the marsh.

## **3. Peabody Energy's Columbia Mine Reclaimed Site: 3.3 miles [Zone 16, 0473074e 4245207n]**

Peabody Energy's Columbia Mine tract is over 1,000 acres and lies adjacent to 3 miles of existing refuge boundary. Coal mining occurred through the 1990's with reclamation completed by 2002. This tract offers a tremendous diversity of fish and wildlife habitat. Along with over 300 acres of natural marsh and bottomland forest habitat there are 11 freshwater lakes, early successional field habitats, native grass plantings, and replanted upland forests. This is a favorite area for migrating short-eared owls and Northern harrier hawks looking for hunting opportunities. It is home to many species with some notables being bobwhite quail, wild turkey, white-tailed deer, the rare Henslow's sparrow, grasshopper sparrow, blue grosbeak, mink, otter, coyote, red-tailed hawk, bald eagle, threatened copperbelly water snake, and the federally endangered Indiana bat.

## **4. McClure Monument – Parking pull-over: 6.2 miles [Zone 16, 0475686e 4247012n]**

There is a small parking lot pull-over to the left as you head North on Meridian Line Rd. There is a small trail that leads to a monument that was erected in honor of Elizabeth and Nolan McClure. Patient private landowners like Mr. and Mrs. McClure make land acquisition possible for Patoka River NWR. For 20 years, Mr. and Mrs. McClure held onto the 1,163 acre property and refused all other offers until the Refuge was established. With funding in short supply, they agreed to sell the land for less than the appraised value. This was the first use of funds appropriated from the Land and Water Conservation Fund. This tract is a valuable piece of upland forest habitat, which links the main corridor along the Patoka River, in conjunction with Pike State Forest property to the north. Upland forest trees include species such as red, white, and black oaks, hickory, walnut, yellow poplar, cherry, beech, and blackgum.

## **5. Gray Woods Marsh – Bottomland Hardwood Forest/Forested Wetland: 6.5 miles [Zone 16, 0475706e 4247423n]**

A small trail leading to Gray Woods Marsh can be seen off to the left. The marsh was farmed in the past. Natural flooding from the Patoka River restored the farmland back to its pre-European setting. All over the Patoka River bottoms are bottomland hardwood forests; seasonally flooded forested wetlands that have trees that can withstand water-logged soils for part of the year. Trees include black willow, sweetgum, river birch, silver maple, cottonwood, sycamore, pin oak, Shumard oak, swamp chestnut oak, overcup oak, swamp white oak, green ash, and red maple. Forested wetlands along the Patoka River corridor are prime habitat for the prothonotary warbler (aka golden swamp warbler), which breeds in tree cavities and sometimes uses vacant downy woodpecker holes. The prothonotary warbler is a small striking yellow-orange bird with an olive back and blue-grey wings. The warbler, as well as many other species, is vulnerable to habitat destruction. Patoka River NWR is designated an Important Bird Area because the Refuge provides the bottomland forest habitat for the prothonotary warbler and other neotropical songbirds that use the corridors to migrate to their breeding grounds and overwintering sites in Central and South America.

**6. Pike State Forest – Indiana Department of Natural Resources (IN DNR) Forestry Division: 6.7 miles [Zone 16 0475704e 4247781n]**

Adjacent to Patoka River NWR, Pike State Forest consists of 3,889 acres, which is interspersed through the hilly uplands down to the low bottomlands of the Patoka River. The Pike State Forest and Patoka River NWR share similar goals in habitat protection, land conservation, and public use (i.e., fishing, hunting, photography, and bird watching). Eventually, the Pike State Forest property within the approved refuge acquisition boundary will become a part of the Refuge.

**7. Houchin’s Ditch: 7.1 miles [Zone 16, 0475668e 4248343n]**

There is a pull-off after bridge. In 1921, after 5 years of local opposition and court hearings, a local group of citizens started a drainage project known as Houchin’s Ditch. Newspaper accounts stated their intent was to drain 100,000 acres of forested wetlands for farming. After obtaining taking authority by court order, the group set to work dredging a straight ditch 17 miles long, cutting through 36 miles of natural river meanders. After 3 years of steam-powered dredging from floating barges, the ditch was completed from Winslow to just west of Wheeling. At a cost to local landowners of \$580,000, the effort failed to reduce flooding on most of the bottomland intended for farming. They had failed to realize that flooding of the broad flat floodplain of the lower Patoka River was largely controlled by floodwater levels in the Wabash River. The dredged soil deposited on both sides of the ditch bank formed levees which trapped overflowing floodwaters every winter and spring. This created large areas of extended seasonal flooding which transformed valuable bottomland forests into shrub-scrub swamps. The upper Patoka River from Pikeville, in the east, to Winslow remains natural, with no dredging.

**8. Cut-off Oxbow: 7.4 miles [Zone 16, 0475693e 4248959n]**

This is an example of a disconnected oxbow, which has been separated from the Patoka River due to the channelization of Houchin’s Ditch. Trees characteristic of the bottomland hardwood forest dominate here as well as buttonbush, arrowhead, cattail, rose mallow, lizard tail, and water plantain. Buttonbushes are small shrubs that thrive in or around the edges of wetlands, shallow ponds, and old river oxbows. The Buttonbush has tiny white flowers clustered into globes, which bloom late in the summer and smells sweet and the seeds are popular with ducks. Upland forests and buttonbushes have also been discovered to be an important habitat requirement for the federally threatened copperbelly water snake, which frequent the Patoka River bottoms. It uses the shrubs for basking in the sun and hunting prey. The copperbelly water snake is distinguished by a dark brown to black body with a red or orange belly. They are not venomous and feed on frogs, crayfish, and small fish. Copperbelly water snakes are declining because of wetlands being drained for agriculture or surface mining and upland forests are cut for timber or cleared for agriculture and development. Forested wetlands, rivers, and oxbows are important habitat for muskrats, beavers, gray foxes, mink, otters, wood ducks, belted kingfishers, green herons, yellow-crowned night herons, red-headed woodpeckers, and prothonotary warblers, to name a few.

**9. Unreclaimed Mine Land/Hedges Highwall – parking lot pull-over: 7.8 miles [Zone 16, 0475739e 4249569n]**

Note: There is a small parking lot to the right, as you reach the top of the hill on Meridian Line Rd. Visitors can walk around the trail. The highwall mentioned in this excerpt will not be easily visible since this area is a safer pull-off location for exploring. The highwall is north/northeast of the trail.

Refuge land to the east of Meridian Line Road was strip mined in the 1940’s prior to reclamation laws requiring restoration. When a mining company made their last pass with the big stripping buckets, the rock and soil that had been removed to reach the coal seam was cast to the side forming row after row of long steep hills of barren rock. The last long trench made by the steam shovels had the side cast rock on one side of the mine cut and a jagged rock-edged straight up and down highwall on the opposite side where the shovels had made the last cut down to the coal. That is the source of the name reference used by miners as the “last-cut pit.” All old abandoned mine lands have numerous last-cut pits where the mining stopped next to natural land contours. Some of these pit bottoms stay dry but many fill with water from the bottom to close to the top of the highwall.

These highwall pits are considered very dangerous to unwary people and livestock. Because of a long history of accidents or the potential for future accidents at highwall pits, these areas are a high priority to be reclaimed with Abandoned Mine Land (AML) funds. Reclamation of the nearly 2 mile long highwall known as Hedges Highwall will be completed in 2009 and 2010. The deep pit bottom waters will be replaced with a series of shallow water wetlands. The steep slopes will be graded off to a safe angle of repose. These side slopes will then be planted to grasses and hardwood trees to restore the natural productivity of the land. The Hedges Highwall is the only abandoned mine land highwall within the boundaries of the Patoka River NWR. The Refuge is a cooperating partner and will plant 6,000 trees on 12 acres on the newly shaped side slopes.

**10a. Historic Site: Wabash/Erie Canal: 13.3 miles [Zone 16, 0470306e 4247888n]**

The canal berm can be seen just off the road to your right as you cross the bridge. It is set back in the woods. In 1831, the Indiana Legislature approved construction of the Wabash and Erie Canal to connect the Great Lakes with the Ohio River. Groundbreaking began in 1832 in Fort Wayne. This was the start of a 459-mile long canal; the longest ever built in the United States. The canal crossed the Patoka River near the town of Dongola and provided the first major impact on the Patoka River floodplain. Its built-up earthen channel stretches across the Patoka bottoms and crossed the river on a wooden aqueduct. The earthen dikes created a canal 30 feet wide, 6 feet deep, and provided a towpath for mules pulling canal boats through the channel. The canal reached Evansville in 1852 with the first boat arriving on September 22, 1853. The canal was quickly replaced by more efficient railroads and finally abandoned in 1873. While short-lived, it had a tremendous positive impact on settlement in Indiana.

**10b. Historic Site: The Underground Railroad**

From 1850 after the federal Fugitive Slave Act was passed until 1861, an estimated 1,000 runaway slaves escaped from Kentucky and passed through the Oakland City area on their way to freedom in Canada. After crossing the Ohio River to Evansville, just east of the Little Pigeon Creek, the slaves were directed along a route to Oakland City, often following the Wabash and Erie Canal towpath. Col. James W. Cockrum had a large threshing barn with a big barn cellar for storing fruits and vegetables. It also made a secure place to shelter runaways. This barn was located in what is now the center of Oakland City. The danger involved in helping runaway slaves was great with prison, fines, and death, all real possibilities for those willing to take the risk to help their fellow human beings. When the coast was clear from slave hunters and in the dark of the night, the hidden slaves crossed the Patoka River on the Dongola covered bridge or at Martin's Ford several miles east near what is now the Line Road Bridge in Pike County. From there the runaways were hidden in Dr. John Posey's coal bank near Petersburg, until being ferried across the White River in skiffs or on the canal aqueduct. After crossing the White River, the runaway slaves were regarded as "nine-tenths free."

The Dongola iron bridge replaced the covered bridge in 1876 over the original channel of the old Patoka River. As you drive across these densely forested bottomlands, think about the emotions of the runaway slaves, the bounty-driven slave hunters, and the few anti-slavery locals risking their lives to help secure freedom for others. Imagine these groups of people gathering on numerous occasions for over a decade prior to the Civil War, near this very location, mostly in the dark of night in a grand struggle which, when finally resolved after much heartache and bloodshed, strengthened the cause of freedom for all in America.

**11. Future site of the I-69 Bridge Crossing: 13.9 miles [Zone 16, 0470689 4248766n]**

Many years in the planning, the final apparent route for the north-south 4-lane Interstate Highway 69 lies parallel and directly to the west of CR 1225E. The point chosen to cross the Patoka River floodway is the same area as that chosen in the 1840's for the Wabash and Erie Canal. This is the shortest route extending from high ground on the north side of the river to high ground on the south side. I-69 will cross the Patoka River bottoms on a bridge nearly 1 mile long and 30 feet above the ground. It is estimated to cost between \$45 and \$50 million. The bridge will minimize placement of earthen fill that would constrict the floodway and cause more upstream flooding. This reduces the need for additional

mitigation action. The bridge will also minimize negative impacts to natural habitat and provide a safe passage corridor for fish and wildlife. The bridge will follow in the same direction as the power lines on the hill that is in place today.

**12. Another view of I-69 Bridge Crossing: 14.2 miles [Zone 16, 0470826e 4249198n]**

**13. Active Mine Land Coal Cleaning Site: 19.7 miles [Zone 16, 0464411 4250209n]**

Thousands of acres in Pike and Gibson County were surface mined for coal prior to the passage of the Surface Mining Control and Reclamation Act (SMCRA) of 1977. Many areas have ungraded spoil ridges and last-cut lakes which can provide excellent habitat. However, some spoil ridges and abandoned coal preparation sites contain low grade coal, shale, and sandstone laced with natural pyrites, which can be acidic. Toxic acid rain runoff results from rainfall leaching out high levels of acid-forming substances from magnesium, aluminum, iron, and manganese, and impairs water quality and aquatic life in streams and rivers. Today, as a result of the SMCRA, all water from mining sites must pass through sediment ponds to improve water quality; mined areas are graded back to approximate original contours and covered with topsoil; acidic pyritic bearing rock is buried deep in the mine pit, out of contact with surface water flows and the site is re-vegetated, according to approved reclamation plans. Within the Refuge boundaries, there are ~150 acres of old strip mines. Most of the acid producing abandoned mine lands are located outside of the Refuge but within the same watershed. Most of these have been or are being reclaimed by IN DNR's Abandoned Mine Land Program.

**14. Reclaimed Mine Lands – Grassland Habitat: 20.1 miles [Zone 16, 0464406e 4249399n]**

The designated Wildlife Management Area is the only part of the refuge that is actively mined. Patoka River is the only refuge in the United States where surface coal mining is permitted. Patoka River NWR is authorized at 6,970 acres, and the Management Area (MA), is authorized for the remaining 15,847 acres. The separate designations of the NWR and MA avoid legal conflicts with the Surface Mining Control and Reclamation Act (SMCRA) of 1977. SMCRA prohibits mining within NWRs. Designating the entire area within the boundary as a National Wildlife Refuge would have prohibited surface mining and required compensating land owners for the value of this property right. This area is closed to hunting and fishing until the mine bond is released.

In general, most reclamation plans revert to land use present planted prior to mining. This could be cropland, which would not provide ideal habitat for many wildlife species. The Refuge does not own any of the properties being mined and is not involved in the final reclamation plan decisions. However, some coal companies do plant the mined sites to grassland habitat, which provides excellent nesting opportunities for the declining grassland nesting birds. Some grassland birds include dickcissels, bobolinks, the rare Henslow's sparrow, Eastern meadowlarks, and Savannah sparrows. Other predators depend on grasslands for food like Northern harrier hawks, red-tailed hawks, rough-legged hawks, American kestrels, barn owls, short-eared owls, and great horned owls. Grassland habitat is defined as treeless lands composed of herbaceous vegetation with or without some minor shrubs. Historically, grazing and fire have helped rejuvenate grasslands by increasing plant species diversity, reducing noxious weeds, and eliminating woody vegetation. Grasslands are fast disappearing because of agriculture, development, and the lack of a controlled burning or grazing program to keep woody trees and shrubs in check. Some refuges use goats (Sacramento NWR in CA) or buffalo (Big Stone NWR in MN) for their grazing program!

**15. Bottomland Hardwood Forest Restoration: 21.0 miles [Zone 16, 0464398e 4248150n]**

Since refuge establishment, approximately 853 acres of bottomland forest habitat have been replanted all over the Refuge. One of the goals is to restore the riparian corridor along 30 miles of the Patoka River. Bottomland species that are planted include: persimmon, sweetgum, river birch, sycamore, pin oak, Shumard oak, cherrybark oak, bur oak, bald cypress, swamp chestnut oak, overcup oak, swamp white oak, pecan, and butternut, to name a few. Tree planting is typically done in straight rows and volunteer tree species such as cottonwoods and silver maple will fill in the gaps. Over the years, as the trees grow, some will die out earlier than others and eventually leave a checkerboard pattern that will be consistent

with the uneven-aged tree management. Emphasis is placed on hard-masted trees, such as oaks and pecans, to provide a solid base of food and habitat for a plethora of wildlife, as well as the starting block for the next generation of trees.

**16. Oatsville Bridge – this area may be under water at certain times of the year: 21.2 miles [Zone 16, 0464386e 4247733n]**

There is a small pull-off after the bridge crossing. There is a large pump station which provides water to the Francisco Coal Plant located 2 miles to the south. The water washes impurities from the mined coal. The straight dredging of the Patoka River is noticeable here as well. The Lower Patoka River Conservancy District, established in 1972, is responsible for clearing downed trees and debris out of the river channel to keep the flow clear and to decrease flooding in farm fields in the lower 37 miles of the Patoka River. Healthy trees along the bank are normally left to provide shoreline stability and habitat for fish and wildlife.

**17. Partnership with Ducks Unlimited (DU): 23.4 miles [Zone 16, 0462788e 4246627n]**

The point of interest is north on 750E (**road is not marked**) but the road is rough, so pull into the turn-around to view the property to the north. The U. S. Fish & Wildlife Service and Ducks Unlimited (DU) have a long-standing working relationship to preserve and provide wildlife habitat. Duke Energy, which operates the Gibson Power Plant in western Gibson County near Owensville to the west, provided \$100,000 each year for 10 years to DU in exchange for carbon sequestration credit. Reforestation adds to the planet's net carbon storage and helps moderate global warming by slowing the growth of carbon emissions in the atmosphere. Each ton of carbon sequestered is called a carbon credit in the "carbon market." Companies can buy or generate these sequestration credits, which are then sold or traded to offset their own carbon dioxide (CO<sub>2</sub>) emissions.

The funds from Duke Energy allowed DU to purchase land and plant bottomland hardwood trees in exchange for mitigation for coal-fired power plant activity. Duke Energy owns the easement on the property, which protects the trees against logging indefinitely. The Refuge purchased this parcel of land from DU. It is a prime example of a three-way partnership between Patoka River NWR, Ducks Unlimited, and Duke Energy.

**\*\*NOTE:** As you continue to #18, 50N **road is not marked**, turn left onto gravel road by sharp curve (hardtop road is 950E).

**18. Wildlife Food Plot/Cooperative Farming Agreement: 26.6 miles [Zone 16, 0467193 e 4246165n]**

Occasionally, the Refuge will purchase land with plans for long-term management to restore wetland habitats on larger parcels. The property that was purchased might be a smaller portion of the long-term picture so instead of planting the area to trees or letting the fields remain fallow; Patoka River NWR allows cooperative farming on these parcels. Cooperative farming agreements between the local farmers and the Refuge allow the fields to be planted for agriculture but portions of the fields will be left and planted to buckwheat, millet, and/or sorghum in exchange for the opportunity to farm the land. The wildlife food plots provide additional food for wildlife.

**19. Upland Forest Restoration: 27.1 miles [Zone 16, 0467792e 4246158n]**

This small section will be planted to upland tree species in 2009. Tree species that are typically planted include: white, red, and black oak, shagbark hickory, black gum, black cherry, walnut, swamp white oak, swamp chestnut oak, scarlet oak, Shumard oak, chinkapin oak, and tulip tree. Tulip tree is Indiana's official "State Tree." The Wabash/Erie Canal can also be seen by the road to your left as you look north.

**End of Auto Tour on State Rd 57: 28.5 miles.**

**Thank you for touring the western portion of the Patoka River National Wildlife Refuge & Management Area!**