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## **Conserving Biodiversity Through Public Awareness: A Brochure For Clarks River National Wildlife Refuge**

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### **Introduction**

Clarks River National Wildlife Refuge is located in Marshall, McCracken and Graves counties in western Kentucky. It is the only National Wildlife Refuge located solely within the bounds of Kentucky. Clarks River National Wildlife Refuge was actually established in July of 1997 under the Emergency Wetland Resources Act of 1986 but the Kentucky Department of Fish and Wildlife Resources has been fighting for its protection since 1991. Because of the refuge's location, it has great potential to teach the general public about ecological interactions between wildlife and their environment and human impacts on these interactions through habitat loss and over-harvest of resources. In order to conserve biodiversity, we must first teach the public about the natural resources, including wildlife and habitat, we have that are worth saving.

Because Clarks River National Wildlife Refuge was recently established, much of the general information about the refuge that should be readily available to the public isn't available yet. For this project, I worked with Becky Foust from the USFWS to design a general brochure for the Clarks River National Wildlife Refuge that will be accessible to the public. I included a variety of information about the refuge including history, location, habitat, management strategies, observable wildlife, activities at the refuge and refuge regulations. By providing the public with this information, I hope to get them more involved in wildlife activities, including conserving habitat and biodiversity. I hope to expand the public's current views of nature and show them other local causes that are worthy of our time and money.

Clarks River is one of the few remaining rivers that has not been damned or channelized. Because of this, localized flooding occurs throughout the refuge creating a wide array of habitats, including some of the more valuable habitats like

bottomland hardwood forests and wetland complexes. Both bottomland hardwood forests and wetland complexes are fast in decline because of recent habitat destruction. The Mississippi Alluvial Valley is located on either side of the lower Mississippi River. According to Bureau of Land Management, 80 % of bottomland hardwood forests have been destroyed in the Mississippi Alluvial Valley and most of the remaining bottomland hardwood forests are found in fragments. Preservation of remaining bottomland hardwood forests and wetland complexes is imperative in the race to conserve biodiversity because of the incredible diversity these habitats can support. The general public must be involved in this preservation for it to be effective, but they must first learn where these habitats are located and what they have to offer.

The Clarks River National Wildlife Refuge brochure I created is broken into twelve sections based on different aspects of the refuge. Each section contains pertinent information in an effort to educate the public, and possibly get them more involved in refuge activities. The first section of the brochure contains general information about the National Wildlife Refuge System, including the purpose and management of this system. There are actually refuges located throughout the entire world, so the public can get involved in wildlife and conservation related activities no matter where they are located.

The next section contains a brief introduction to the Clarks River National Wildlife Refuge, including the location and present size of the refuge. This section also describes the two cities the refuge is located between. There is actually a picture of the home office of the refuge in Benton, Kentucky in this section.

Also included in the brochure is a section with background about the Clarks River National Wildlife Refuge, including a more in depth description of the refuge and a brief history about the establishment. This section goes into more detail about the Clarks River and the impact the

river and topography have on the environment and habitats. The subject of flooding throughout the refuge is also introduced in this section, which is very important in the creation of bottomland hardwood forests and wetland complexes. A brief history of the establishment of the refuge is included in this section. Unfortunately, information about previous landowners could not be obtained or printed in the brochure without proper permission.

The next section of the brochure includes information about the refuge habitat. This section is very important in terms of educating the public about habitat destruction and wise use of the resources we have that are left. Bottomland hardwood forests are described in great detail, including information about seasonal flooding, benefits they provide and species composition. By describing the benefits provided by bottomland hardwood forests and wetland complexes, including the prevention of soil erosion, protection of water quality and creation of a wide array of wildlife niches, I hope to show the public why these habitats are so important and possibly get them involved in local efforts to save and protect these areas.

Also included in the brochure is a section on wildlife management techniques practiced by the US Fish and Wildlife Service at Clarks River National Wildlife Refuge. With this section, I hope to break any misnomers the public might have about the purpose of the refuge and possibly decrease any resentment that might exist within the public because of the establishment of the refuge. I describe in detail the different management techniques that are used for the different types of wildlife that live on the refuge. These techniques include water control structures and levees used to create suitable habitat for waterfowl populations, participation in the Monitoring Avian Productivity and Survivorship Program, which tracks and monitors population trends in neotropical song bird populations throughout the United States, the maintenance of native warm season grass habitat for certain neotropical songbirds and participation in cooperative farming program with local farmers. I also hope to interest the public enough that they help to participate in some of these management programs, and thus also participate in the protection of biodiversity and bottomland

hardwood forest and wetland habitats. Because of the abundance of the public, they must be included in all management strategies if any of those strategies are to be effective.

The next section in the brochure describes the different wildlife that can be found at the Clarks River National Wildlife Refuge and the season that they most frequently occupy the refuge. This section is very important in showing the public what wildlife the refuge has that are worth our time and money. This section also has great potential to teach the public about interactions between species. The refuge resident section is divided into three subsections based on what type of management strategies are employed. Migratory waterfowl and migratory songbirds each have their own management techniques and thus have their own sections. All other wildlife share the same management techniques and thus are lumped into one section. Each subsection also describes a generalized migration pattern of the wildlife being described, which is important in showing why the preservation of refuge habitat is so important. The migratory songbird subsection talks about three warbler species that are very rare and protected that are expected to be found at Clarks River National Wildlife Refuge, which is also very important in showing the public why the preservation of refuge habitat is so important. The other wildlife subsection describes much of the other wildlife that can be found on the refuge, including some of the larger species that are easily visible, some of the more inconspicuous species that can also be seen and many of the different tree species scattered throughout the refuge. Inserted throughout this section are pictures of wildlife that can be found throughout the refuge and different scenic views of the refuge, which will hopefully attract the public to the refuge.

The next section of the brochure is entitled Enjoy The Refuge. This section describes many of the different uses of the Clarks River National Wildlife Refuge that are available to the public. By including the different uses of the refuge, I hope to attract the public to the refuge, and make them want to become more involved in refuge activities. If the public is more involved in refuge activities, they wouldn't oppose the establishment of the refuge and the continued acquisition of more private lands. This section is also divided into subsections based on the different uses,

including fishing, hunting and wildlife observation and photography. The fishing and hunting subsections describe the different types of fish and game species that can be found throughout the refuge. Anyone interested in fishing or hunting is encouraged to pick up a Clarks River National Wildlife Refuge Hunting and Fishing Brochure. The wildlife observation and photography subsection describes some of the regulations of the refuge, including where the public is allowed and the types of traffic allowed on the refuge.

Perhaps one of the most important sections of this brochure is the Wildlife Viewing Tips section. This section gives many tips that will help the public be successful in observing wildlife and some common courtesy tips, such as teaching your children to be quiet, that will help other wildlife observes to be successful. Much of the public would like to observe wildlife and be close to nature but get frustrated when they aren't successful. In order for the public to help in the race for biodiversity, they need to want to be involved, and, hopefully, observing wildlife in their natural habitats will develop that desire to be involved. This section should help the public be more successful in observing wildlife in their natural habitats.

The next section is very important in the protection of wildlife and valuable habitats, such as bottomland hardwood forests and wetland complexes, found at Clarks River National Wildlife Refuge. This section describes different refuge regulations and rules at refuge. This section is very important in establishing limitations that will ensure the protection of wildlife and valuable habitats found at the refuge. There are many different aspects to these limitations, including ATV use, spotlighting, removal of objects from the refuge and interactions with the wildlife at the refuge. The public must know and follow these rules and regulations if wildlife and valuable habitats on the Clarks River National Wildlife Refuge are to be protected.

A small section that includes directions to the Clarks River National Wildlife Refuge is also incorporated in this brochure. This section also includes the hours that the main office in Benton, Kentucky is open. There is also a phone number for anyone who needs to reach a refuge official,

possibly to ask questions about how they can get more involved in refuge activities!

The last section of the brochure is a wildlife calendar that was compiled with the help of Becky Foust. This section describes different wildlife events that occur at the refuge and the time period within which they occur. This calendar is an easy way to get the public more involved in wildlife activities. If people know when certain activities are happening, they will hopefully be excited to observe those events and visit the refuge specifically so they can observe those events. If they come to observe those events, they will inadvertently experience other wildlife events and hopefully feel a stronger tie to nature, which could possibly increase their participation in the preservation of biodiversity and habitat.

This brochure has two main goals, to educate the public about the purpose and management goals of Clarks River National Wildlife Refuge and to show the public what resources we have that are worth saving. In order for any conservation efforts to be successful, they must include the public. Educating the public is the first step in the race to save biodiversity and curb habitat destruction. If the public sees what a valuable resource they have in Clarks River National Wildlife Refuge, hopefully they will take pride in it and fight to preserve other valuable habitats and biodiversity.

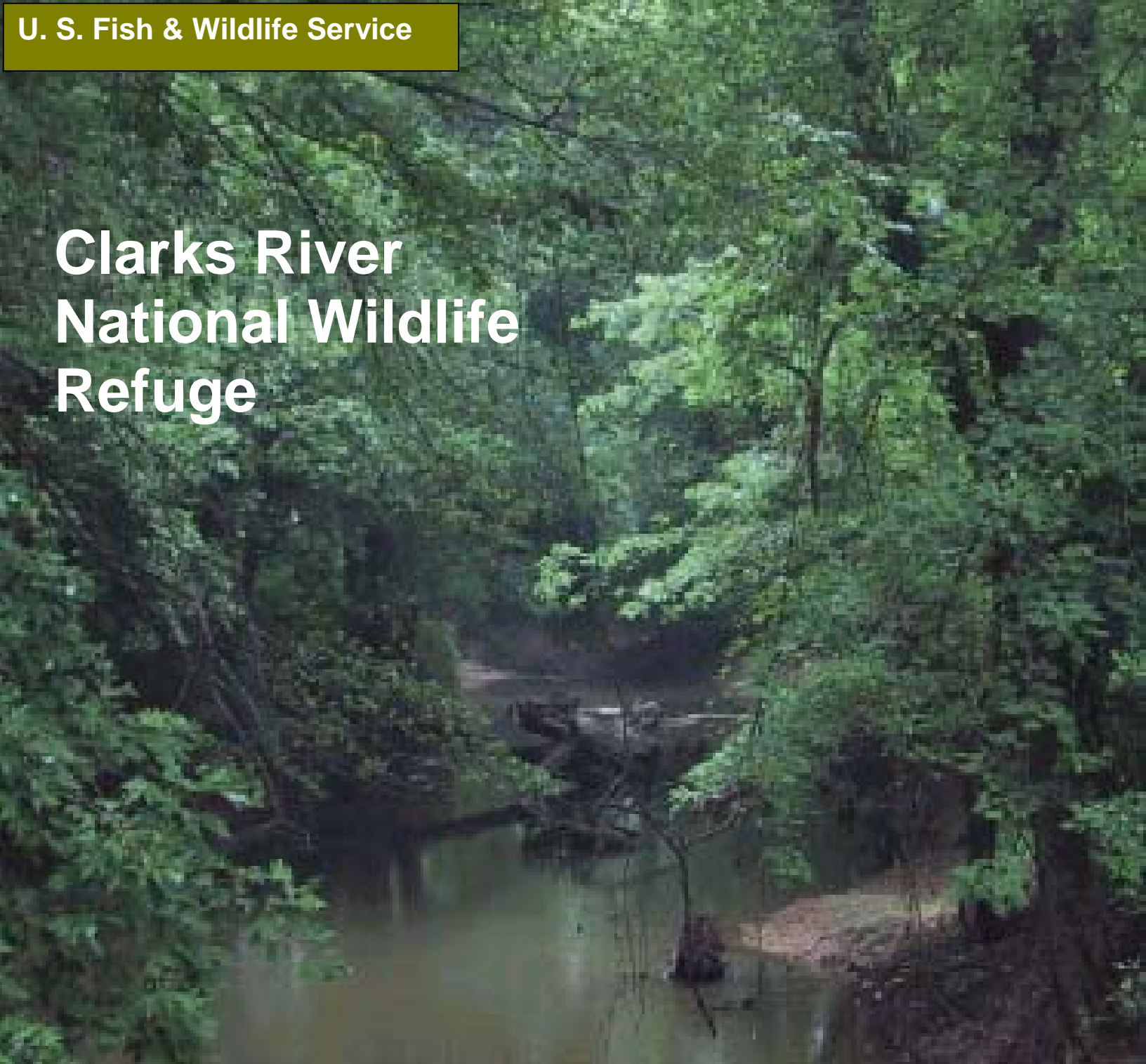
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## Literature Cited

Final Environmental Assessment and Land Protection Plan: Proposed Establishment of Clarks River National Wildlife Refuge (1997). United States Department of Interior, Fish and Wildlife Services Southeast Region.

U. S. Fish & Wildlife Service

# Clarks River National Wildlife Refuge



*Unmatched anywhere in the world, the National Wildlife Refuge System is an extensive network of lands and waters protected and managed especially for wildlife and its habitat. This unique system encompasses over 100 million acres of lands and waters from north of the Arctic Circle in Alaska to the subtropical waters of the Florida Keys and beyond to the Caribbean and South Pacific. The National Wildlife Refuge System is managed by the U. S. Fish and Wildlife Service, which manages and protects over 540 refuges for the benefit of both wildlife and present and future generations of Americans. The lands managed as the Clarks River National Wildlife Refuge are a part of this system.*

- Whitetail buck rutting (late October – mid November)
- November
  - Groundhogs begin hibernating
- December
  - Squirrel breeding begins

## Introduction

Clarks River National Wildlife Refuge is a beautiful bottomland hardwood forest located in western Kentucky. The refuge lies along the east fork of the Clarks River and is seasonal home to over 250 different species of migratory birds. The refuge currently consists of 8,500 acres and is the only refuge located solely within the bounds of the state of Kentucky. The city of Benton, KY can be found near the southeastern end of the refuge, whereas the city of Paducah, KY is situated near the refuge's northwestern boundary.



## Background

The east fork of Clarks River is a comparatively slow-moving river due to the area's low topography and flat floodplains. It is also one of the few rivers in the area that has not been dammed or channelized. Localized flooding for short periods is the norm in this region, as moderate rains frequently cause the streams to flood over their banks. The Clarks River meanders for about 6 miles, from the East and West Fork convergence, until it reaches the Tennessee River.

The U. S. Fish and Wildlife Service's Bottomland Hardwood Preservation Program first identified the present-day Clarks River National Wildlife Refuge as a high priority site for protection in 1978. In 1991, the Kentucky Department of Fish and Wildlife Resources asked the U. S. Fish and Wildlife Service to consider the site for protection as a unit of the National Wildlife Refuge System. The refuge was established in July of 1997 under the Emergency Wetland Resources Act of 1986, with a proposed acquisition of 18,000 acres, and the first tract of land was purchased in August of 1998.

- Eastern meadowlark breeding early – late May
- Blue-gray gnatcatcher nesting early – late May
- Whip-poor-will breeding early May – early June
- Summer tanager breeding mid – late May
- Ruby-throated hummingbird & wood thrush nesting mid May – early June
- Northern bobwhite nesting mid May – mid June
- Kentucky warbler breeding late May – early June
- Scarlet tanager breeding late May – mid June
- Chipmunks and raccoons being born early – mid May
- June
  - Yellow-billed cuckoo breeding early June – early July
  - Peak of wild turkey hatches
  - Bullfrog breeding peaks early – mid June
  - Box turtles hatch
- July
  - American goldfinch breeding late July – mid August
- August
  - Whitetail bucks molt to winter coat (mid – late August)
  - Quail at peak populations
- September
  - Monarch butterflies migrating
  - Whitetail fawns lose spots (early – mid September)
  - Whitetail bucks lose antler velvet (late September – mid October)
  - Teal migrating
- October
  - Increase in waterfowl migration

## Refuge Habitat

The most significant resources of Clarks River NWR are the wetland habitat complexes formed by the river, creeks, beaver ponds and natural ponding in the area. Bottomland hardwood forests are especially valuable in terms of providing wildlife habitat, preventing soil erosion, and protecting water quality. Bottomlands flood anywhere from several inches to several feet seasonally, typically in winter and spring months.

On Clarks River NWR, the bottomland hardwood forests are composed of overcup oak, bald cypress, and tupelo gum trees. Slightly higher, better drained areas are covered with willow oak, swamp chestnut oak, red oak, sweet gum, sycamore, ash, and elm.



Bottomland forests have been in decline throughout the past century, due to agriculture and urban sprawl. Places like Clarks River NWR have become even more vital to the survival of species that utilize and thrive in these habitats

## Managing for Wildlife

The primary management objectives of the Clarks River NWR are to provide habitat for a natural diversity of wildlife associated with the Clarks River and its floodplain while providing opportunities for wildlife-dependent recreation.



*Water birds* – Levees and water control structures are used on the refuge to impound water on crop fields in

Boats must be removed from the refuge after each day's use.

## Directions

### *Getting There . . .*

From I-24...take exit 25, south on Purchase Parkway. Take exit 43 off the Purchase Parkway, go right (east) on Hwy. 348. Take Hwy 641 north and go 1.2 miles to Refuge Headquarters at 91 U.S. Hwy 641 North. The Refuge is open Monday – Friday from 7:30 a.m. to 4:00 p.m. Telephone number is 270-527-5770.

## Wildlife Calendar

- January
  - Great horned owl breeding mid January – early March
  - Whitetail bucks shed antlers
- February
  - Barred owl nesting late February – late March
  - Wood duck nesting begins late February
  - Chorus frogs start singing and warm rains bring out peepers and spotted salamanders, mid February
- March
  - Killdeer nesting late March – mid May
  - Red-shouldered hawk nesting early March – early April
  - Rabbits begin breeding mid – March
  - Winter wild turkey flocks breaking up late March
- April
  - Northern parula nesting late April – mid May
  - Wild turkey nesting late April – mid May
  - Quail nesting begins
- May



order to provide wintering habitat for migratory waterfowl. Water management typically occurs in late summer to early fall, in preparation for waterfowl migration. This type of management also provides additional habitat for other water birds such as herons, killdeer, and sandpipers.

*Songbirds* – Since 2003, Clarks River NWR has been involved in an important migratory songbird monitoring endeavor, the MAPS (Monitoring Avian Productivity and Survivorship) program. During the



summer breeding season, stations are setup within forested habitats where songbirds are captured by means of a fine gauge mist net, banded with a small numbered leg band, and released. Data such as age, sex, and condition are

recorded for each bird captured to determine their status, movement, and productivity. The results of these monitoring efforts help detect population trends in many species of migratory songbirds, a great number of which are declining.

A portion of the refuge is also managed in native warm season grasses for songbirds associated with grasslands. Native warm season grass habitat, made up of grass species such as big bluestem, little bluestem, and switchgrass, is maintained by prescribed burning or mowing.

*Other Wildlife* – The refuge also participates in a cooperative farming program where farmers plant crops in a share system. In return for using refuge land for agriculture, farmers are required to leave a percentage of



Try sitting quietly in one good location. Let wildlife get used to your presence. Many animals that appear hidden will reappear once they think you are gone. Walk quietly in designated areas, being aware of sounds and smells. Often you will hear more than you will see.

Teach children quiet observation. Other wildlife watchers will appreciate your consideration.

Look for animal signs. Tracks, scat, feathers and nests left behind often tell interesting stories.

### **Refuge Regulations**

Refuge boundary signs define refuge boundaries. “Area closed” signs are erected to minimize disturbance to waterfowl or other wildlife and for public safety.

Searching for and removal of objects of antiquity is prohibited.

Firearms are prohibited on the refuge except during authorized hunting seasons. Firearms must be unloaded and encased when traveling through the refuge.

Disturbing or feeding wildlife and collecting plants is strictly prohibited.

Pets on a leash are permitted. Dogs under verbal control are allowed during refuge squirrel and raccoon hunts.

ATV’s are not allowed.

Bicycling is permitted on established roads during normal public use hours.

Use of artificial lights, including vehicle lights, to observe wildlife is prohibited.



their crops for wildlife. This provides a supplement to the natural foods provided on the refuge.

## Refuge Residents

### Migratory Waterfowl

Arriving in early autumn and usually peaking in late December, many species of migratory waterfowl



such as mallards, black ducks, ring-necked ducks, hooded mergansers and common mergansers utilize Clarks River Refuge as winter habitat. An autumn

visit to the refuge can be an extraordinary event revealing both the remarkable species of migratory waterfowl and the beautiful colors of fall leaves!

### Migratory Songbirds

Neotropical songbirds spend approximately 8 months a year wintering in Central and South America and the remaining months on breeding grounds in North America's temperate latitudes.

Over 200 species of neotropical songbirds can be found at Clarks River Refuge. Species such as the imperiled cerulean warbler, the Swainson's warbler and the prothonotary warbler are three of the five

birds on the Service's list of highest priority neotropical migratory bird species dependent on forested wetland, and each is suspected to be found in the Clarks



River Refuge area. Other neotropical songbirds, such as summer and scarlet tanagers, Kentucky warblers, indigo buntings and Acadian flycatchers, utilize the

opossum, crow, red fox, gray fox, bobcat and coyote in designated areas. Hunting of white-tailed deer and turkey is also permitted in certain areas of the refuge.



Hunting of migratory waterfowl is permitted in certain areas of the refuge. In addition, a draw hunt will be held to hunt migratory

waterfowl at the Sharpe-Elva Water Management Unit. More information is available in a separate hunting and fishing regulations brochure from the refuge office.

*Wildlife Observation/Photography* – Wildlife is plentiful throughout the refuge and is easy to observe with careful movements. Vehicles are allowed on designated roads only. Foot traffic is also permitted year around on roads and trails, except for closed areas.



## Wildlife Viewing Tips

Dawn and dusk are the best times to see wildlife

Observe from the sidelines. Leave "abandoned" young animals alone. A parent is probably close by waiting for you to leave. Don't offer snacks, it could disrupt their digestive systems.

Cars make good observation blinds. Drive slowly, stopping to scan places wildlife might hide. Use binoculars or a long lens for a closer look.

refuge for breeding and migration habitat. Because of protected lands like the Clarks River Refuge, the music and beauty of the songbirds has not faded!

### Other Wildlife

Clarks River Refuge is also home to a wide variety of

upland game species, small mammals, reptiles, amphibians and fish. Some of the more commonly seen wildlife includes white tailed



deer, raccoons, beavers and coyotes. A closer look, however, reveals many of the more inconspicuous species of small mammals such as minks, mice, rabbits and squirrels that can be easily overlooked.



A walk through the refuge during spring, summer and fall months can be a delightful experience because of the trees and flowers in bloom. Some of the more common trees include overcup oak trees, swamp chestnut oak trees, willow oak trees, bald cypress trees and sycamore trees. Some of the more colorful and stunning flowering plants include the orange

spotted touch me not, the passion-flower, the partridge pea and the Indian pink.

During the warm summer months, the refuge's wet



areas provide wonderful habitat for many frogs, salamanders and snakes. The calls of different frogs can serve as a different, yet fascinating, new type of music to the ears. Unfortunately,

the summer months also provide wonderful habitat for some of the more annoying insects including ticks, mosquitoes and chiggers, which can be troublesome when not properly prepared. Remember to pack the bug spray to avoid contact with these insects!

### Enjoy the Refuge

Wildlife viewing, fishing, hunting, boating and canoeing are all popular uses of the refuge. Public use areas are open daily during daylight hours, except as modified by seasonal refuge regulations.

*Fishing* – Most of the refuge's waters are open year around for fishing. Some areas are closed seasonally to provide sanctuary for waterfowl and wildlife. In early spring, crappie abound and are easily caught. Later in the season, catfish, bass and



bluegill are more plentiful and provide exciting sport fishing for many. More information is available in a separate hunting and fishing regulations brochure from the refuge office

*Hunting* – Public hunting is currently permitted on approximately 8,000 of the refuge's acres. Upland

# Clarks River National Wildlife Refuge

