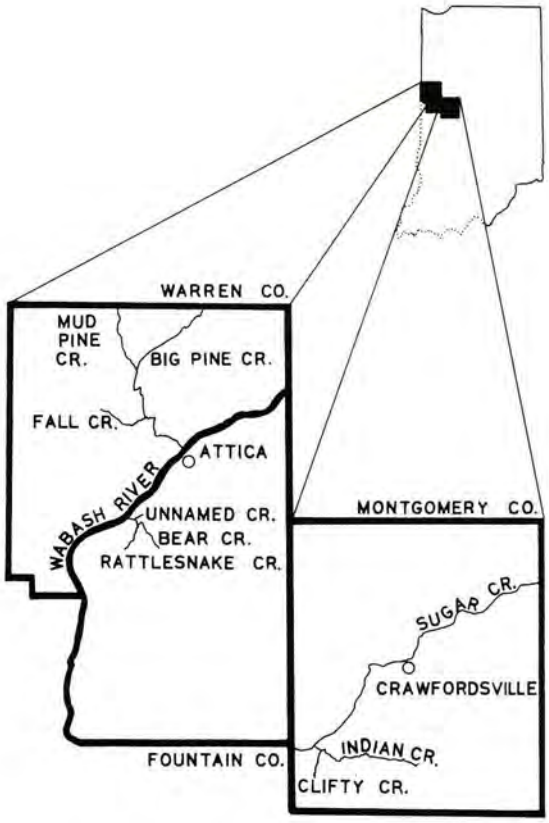
INTRODUCING INDIANA'S

EXCEPTIONAL USE STREAMS

PUBLISHED BY THE INDIANA STATE BOARD OF HEALTH



The preservation of exceptionally clean streams in Indiana has been a major concern of the Indiana State Board of Health and the Indiana Stream Pollution Control Board for many years. Last fall, the Stream Board took the first step in protecting Indiana waterways for the enjoyment of future generations of Hoosiers. Stream Board members unanimously agreed to designate eight of the most picturesque Indiana streams for "exceptional use". The designation allows the streams to continue in their current unpolluted and natural state without being disrupted. The Stream Board action also will allow the addition of other streams to the "exceptional use" list every year.

The initial eight "exceptional use" streams are located on both public and private property. Some of the streams are often used by hiking, swimming, and canoeing enthusiasts every year.

This booklet will familiarize you with the uniqueness of these streams. Each stream is fully described by informative text and colorful photographs. The State Board of Health and the Stream Pollution Control Board hope you will enjoy the booklet and the streams.

T. S. Danielson, Jr., M.D., M.P.H.
Acting State Health Commissioner

INDIANA'S EXCEPTIONAL USE STREAMS

In the fall of 1983, the Indiana Stream Pollution Control Board revised its Water Quality Standards (330 IAC 1-1) to include two new use classifications—Limited Use and Exceptional Use. The "Limited Use" classification is only applied to those waterways of the state which, because of severe habitat limitations, are not capable of supporting aquatic life communities during a significant portion of the year. Streams in this category do not have to meet as stringent water quality standards as do other streams in Indiana, but they must meet certain minimum conditions which prevent them from being health hazards, having odors, being aesthetically unpleasant or being devoid of oxygen.

The streams classified for "Exceptional Use" are those streams which deserve a higher degree of protection than afforded other Indiana streams. Essentially, these streams are preserved in their present natural state and usually have one or more of the following characteristics:

1) The presence of a unique or exceptional habitat or species in the water body.

2) The presence of a rare or endangered species in the water body.

3) The presence of exceptional aesthetic quality in the immediate environs of the water body which is enhanced by the water body.

4) The water body is within the boundaries of or flows through a designated natural area, nature preserve, or a state or national park or a forest.

5) The water body supports an excellent sport fishery.

6) The water body possesses exceptional quality with no historical record of pollution.

7) Intensive recreational use is made of the water body.

At the present time, portions of eight streams have been designated for "Exceptional Use." These eight stream reaches encompass approximately 35 stream miles, most of which have not had this degree of protection before. These stream reaches are:

1) Big Pine Creek in Warren County downstream of the State Road 55 bridge near the town of Pine Village to its confluence with the Wabash River.

2) Mud Pine Creek in Warren County from the bridge on the county road between Brisco and Rainsville to its confluence with Big Pine Creek.

3) Fall Creek in Warren County from a point approximately one-half mile downstream from the U.S. 41 bridge to its confluence with Big Pine Creek.

4) Indian Creek in Montgomery County from the County Road 650 West bridge downstream to its confluence with Sugar Creek.

5) Clifty Creek in Montgomery County within the boundaries of Pine Hills Nature Preserve.

6) Bear Creek in Fountain County from the bridge on County Road 450 North to its confluence with the Wabash River.

7) Rattlesnake Creek in Fountain County from the bridge on County Road 450 North to its confluence with Bear Creek.

8) The small tributary to Bear Creek in Fountain County within the Portland Arch Nature Preserve which has formed the small natural bridge called Portland Arch.

Big Pine Creek, Fall Creek and Mud Pine Creek

The longest stream reach to be classified for "Exceptional Use" is the portion of Big Pine Creek from the town of Pine Village to the Wabash River. State Representative James Jontz and David Dreyer of the Indiana Conservation Council prepared a detailed report on this section of Big Pine Creek and its tributaries in 1973. At that time, there was a proposal to build a reservoir which would have flooded most of this section. Much of the following description of this stream as well as that of Fall Creek and Mud Pine Creek was taken from this report and a book written by Alton Lindsay, Damian Schmeltz and Stanley Nichols published in 1969, entitled "Natural Areas in Indiana and their Preservation."

Big Pine Creek was formed at the end of the last glaciation about 10,000 to 12,000 years ago. It is a relatively undisturbed stream located about 20 miles west of Lafayette. In its upper reaches in White and Benton Counties, it drains flat, fertile farmland. In Warren County, however, the valley becomes deeper, narrower and more pronounced, the stream gradient becomes much steeper and there are colorful sandstone cliffs and outcrops in many locations. In this area, the land adjoining the stream is mostly forested.

Scenic Aspects to Area

A number of individual landforms add to the interest and scenic aspects of the area. Table Rock is located in Mud Pine Creek about one-half mile above its confluence with Big Pine Creek. This erosional remnant of Pennsylvanian sandstone is about six to seven feet high, 20 feet wide and 75 feet long. On the top of Table Rock is a pothole two feet deep and ten feet in diameter, formed when the stream bed was level with the top of the rock.

View from "Lovers Leap" on Big Pine Creek in Warren County.

A high bluff overlooking Big Pine Creek known as "Lovers Leap" is another interesting land form. This feature is located downstream of the confluence of Fall Creek. The top of this bluff is about 120 feet above the stream, and the view westward from that point encompasses an extremely scenic portion of the broad floodplain of Big Pine Creek. Lovers Leap is of interest geologically because the eroded hillside exposes three distinct layers of glacial till. Lovers Leap can be reached by a hiking trail off the county road north from Mudlavia Springs near Kramer.

Steep Gradient

Big Pine Creek is unusual in the Midwest because of its steep gradient. This gradient averages eight feet per mile in the section designated for "Exceptional Use" and increases to 33 feet per mile in the area of Rocky Ford.

A small waterfall on Big Pine Creek in Warren County.

Throughout the "Exceptional Use" segment the stream consists of long, quiet, deep pools interspersed with fast flowing, more shallow riffles. The channel bottom is a mixture of sand and gravel, pebbles, cobble and large boulders which tends to remain clear of sediment despite the increased agricultural development of the area in the last century.

The flora along Big Pine Creek and its tributaries is diverse and often unique. Native white pines are found in the area, and these are rare in Indiana except for the northern-most tier of counties. These trees are *relicts* (a persistent relic of flora or fauna once plentiful in earlier times) from the cooler, moister times found in Indiana after the retreat of the last glacier. As the climate in Indiana turned warmer and drier over the years, these trees were only able to survive in the cool, well drained, moist microclimates provided by the steep bluffs. Other species associated with the White Pine *relict* communities which are found along Big Pine Creek are red cedar and bush honeysuckle. Also, excellent habitat is provided for the lower groups of plants—the mosses, liverworts and ferns. Some of these lower plant species are quite rare, being found only in a few other localities in the state or, for that matter, the world. A number of rare or uncommon higher plants are also found in the area. The Kentucky coffee tree and the yellow birch are two rare trees reportedly found there, and an outcrop prairie, rich in prairie species, is present on the banks of Big Pine Creek near Rocky Ford. Lewis Stannard of the Illinois Natural History Survey noted that this prairie is "very unusual in this part of the Midwest."

Finest Habitats

A report by the Bureau of Sport Fishery and Wildlife (BSFW) of the U.S. Department of the Interior states that the Big Pine Creek watershed contains "some of the finest fish and wildlife habitat... remaining in Indiana." At least 57 species of fish have been recorded from Big Pine Creek and its major tributaries, and these streams are considered some of the best remaining smallmouth bass fishing streams in Indiana. Two resident species which are considered rare and/or endangered in the Midwest by the BSFW and the Illinois Natural History Survey are the bigeye chub and the bluebreast darter. The Illinois Natural History Survey states that the assemblage of species found in these streams are

indicative of clean, clear, gravel-bottomed streams, and Big Pine Creek is a stream only minimally or not at all affected by man's activities.

The varied land use patterns and terrain in the area along Big Pine Creek supports a diverse terrestrial fauna. The BSFW reports above average populations of ring-neck pheasant, red fox, fox squirrel, bobwhite quail, whitetail deer, rabbit, raccoon, mink and muskrat in addition to numerous song birds and hawks. Also, BSFW reports the occurrence of badgers in the area, one of only four species of furbearers recognized by the State of Indiana as rare and endangered.

The Rocky Ford section of Big Pine Creek in Warren County. In the spring this becomes a highly rated "whitewater" canoe stream.

Besides the hydrologic, geologic, floral, and faunal components which contribute to the scenic quality of the Big Pine Creek area, there are other factors which are important. The stream itself shows great diversity over a relatively short distance. The upper reaches in White and Benton Counties are rather typical of other prairie streams—relief is slight, banks are low, and agricultural fields adjoin the stream along much of this area. Below Pine Village in Warren County the stream enters an area of highly attractive sandstone walls and cliffs, and the banks are mostly forested. Below Rainsville there is a two mile stretch of steep gradient which contains Rocky Ford, a half mile reach of rocky bottom and steep gradient which can produce whitewater conditions, at least in the spring. The five or six miles below the confluence of Mud Pine Creek may be the most scenic portion of Big Pine Creek. The valley narrows, the walls become steeper, and there is dense vegetation. The high sandstone bluffs and their small coves with ferns and mosses characterize this section.

Broad Floodplain

In the section below Twin Bridges the stream has carved a broad floodplain, with the high bluffs marking the floodplain boundaries set far back from the stream. Finally, for about three miles, the stream enters a steep-walled gorge before reaching the floodplain of the Wabash River. These divisions may be somewhat arbitrary, as these conditions overlap and variety exists within each segment. However, these divisions do show the diversity which exists in Big Pine Creek, and many people believe that diversity contributes greatly to the scenic attractiveness of an area.

Another important feature which contributes to the scenic attractiveness of the Big Pine Creek area is its rural character. Most of the counties along Big Pine Creek are composed of rich, fertile farmland, and agriculture is the main land use. Most towns are small and rural in nature and there is little heavy industry. These counties have a low population density and offensive signs of man's influence on the landscape are few. Within the area designated for "Exceptional Use" the streams (Big Pine Creek, Mud Pine Creek, and Fall Creek) are crossed only eleven times by roads or railroads.

The recreational value of Big Pine Creek is outstanding. Chief among recreational activities practiced at Big Pine Creek are canoeing, hiking, touring and fishing. Other activities include hunting, swimming, "tubing," rafting, photography, nature study, horseback riding, picnicking, etc.

Canoeing Popular

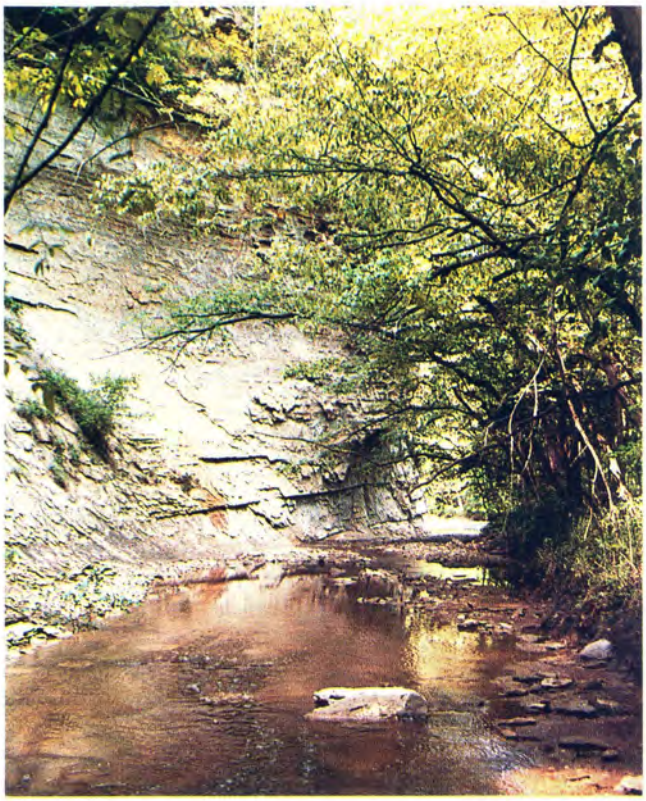
Canoeing is one activity that is particularly pertinent to Big Pine Creek. During the spring, there are several "whitewater" reaches and the Rocky Ford area is classed as Class II to Class III whitewater. Several canoeing clubs in Indiana and other nearby states rate Big Pine Creek very high on the list of Indiana-Illinois streams providing this type of experience.

The reach of Fall Creek in Warren County designated for "Exceptional Use" contains the section known as Fall Creek Gorge. Fall Creek here is rather shallow with a slippery, sandstone bottom. Erosion has created a series of depressions called "potholes." Some of these potholes are quite large (20 feet in diameter) and may be two to three feet deep. Although there are large potholes in the wider parts of the stream, Fall Creek Gorge itself is a constricted part of the stream which has a series of these potholes forming a cascade. Upstream of the Gorge, Fall Creek drops over a five foot ledge to form an attractive waterfall. This area of Fall Creek is one on the most scenic and unusual spots in Indiana. Here also are found traces of the *relict* white pine-red cedar community. Mosses, liverworts and ferns also are very abundant.

Fall Creek Gorge on Fall Creek in Warren County. Some of the large "potholes" are visible in the center-right of the picture.

"Fire Pink" (Silene Virginica) blooming along Clifty Creek in Pine Hills Nature Area in Montgomery County.

Indian Creek in Pine Hills Nature Area looking upstream. "Devil's Backbone" is visible in the background.



Clifty Creek in Pine Hills Nature Area looking downstream to its confluence with Indian Creek. "Honeycomb Rock" is on the left.

Indian Creek in Pine Hills Nature Area looking downstream. Clifty Creek joins with Indian Creek at the base of "Honeycomb Rock" in the middle-left of the photo.

Mud Pine Creek is itself a beautiful stream with a rocky bottom and clear water, and fishing reportedly is excellent. Biologists from the State Board of Health, who visited the area for only a short period early in 1983, found eight species of mayflies from five genera living there. This is a diverse mayfly community and indicates high water quality.

The portion of Mud Pine Creek designated for "Exceptional Use" contains the unusual geological formation called "Table Rock" which was discussed earlier. It is located about one-half mile upstream from the confluence with Big Pine Creek.

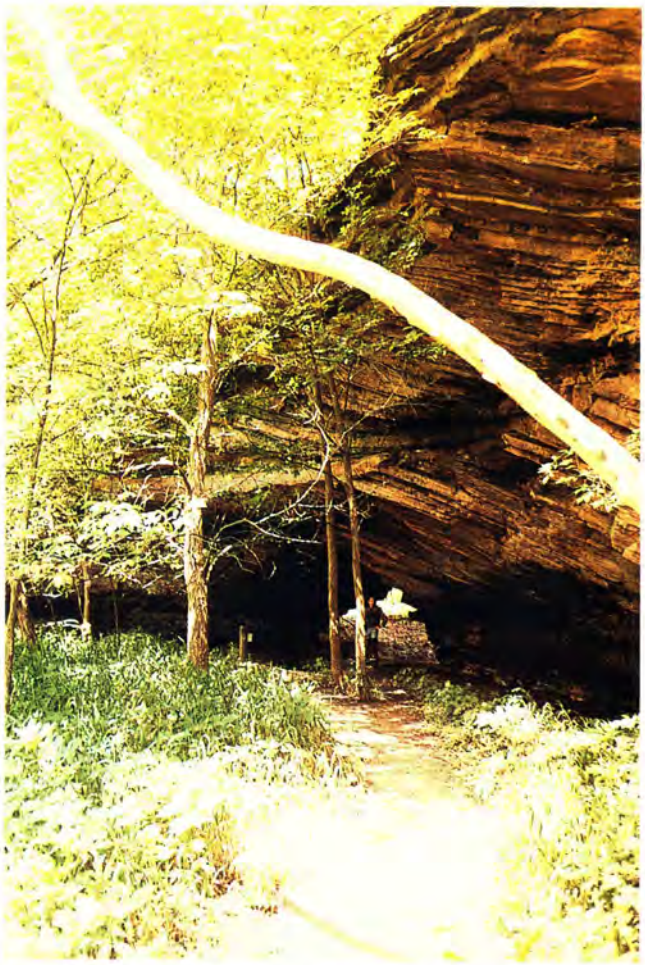
Clifty Creek and Indian Creek

Clifty Creek and Indian Creek in Montgomery County are the two streams in Pine Hills Nature Preserve which have been designated for "Exceptional Use." These two streams have clean, cool water which flows over bedrock and cobble stone bottoms. These two streams have cuts down through the sandstone bedrock more than 100 feet in some places, leaving high ridges or "backbones" enclosed by the streams on three sides. The formations produced by the stream cutting through the rock as it twists and turns are technically called "incised meanders." E. R. Smith in his 1933 report on the features of Pine Hills stated that "these...(backbones)...may be considered the most remarkable examples of incised meanders in the Eastern United States."

The four major ridges are called Pine Backbone, Turkey Backbone, Mill-cut Backbone and Devil's Backbone. The latter is flat on top and has carvings in the bedrock of passenger pigeons, dates, and a bas-relief of a "devil's face." The top of the backbones are 100 to 120 feet above the stream beds, and the view from these ridges is spectacular. Devil's Backbone has been undercut to a drastic extent by Clifty Creek, and at one point it is said to have come within 1.5 feet of being perforated to form a natural bridge.

Relict Pines, Yew, Hemlock

At Pine Hills may also be found *relict* communities of White Pines, Canada Yew and Hemlock on the cool, moist, well drained hillsides and coves. These areas also abound in mosses and ferns. On the top of Pine Backbone is an original beech maple forest.



Portland Arch in Portland Arch Nature Preserve in Fountain County. The Arch is in the lower middle-right of the picture and was formed by a small tributary to Bear Creek (Arch Creek) cutting a tunnel through the sandstone. The Arch is about eight feet high.

Pine Hills Nature Preserve is truly a spectacular and unique area in Indiana and the Eastern United States. The two streams, Clifty Creek and Indian Creek, are an integral part of this unique area and maintaining them in their natural, unpolluted state is important in enhancing the experience one gets when visiting this area.

Bear Creek and Rattlesnake Creek

Bear Creek Canyon, including Portland Arch, is another extremely scenic and unusual area in Indiana. Located in Fountain County, this Nature Preserve has steep slopes and precipitous cliffs which were formed by Bear Creek cutting down through the sandstone bedrock. Some of the cliffs are 90 feet high.

Bear Creek is a winding, clean, clear stream which at normal stage is less than four feet deep in pools which are interspersed with riffles. A variety of fish and aquatic life are found in and around the stream. Near the downstream end of the canyon, a small tributary (referred to as Arch Creek in the trail guide that is available at the registration site at the entrance to the area) has cut a tunnel through the sandstone to form an arch or natural bridge about eight feet high known as Portland Arch.

The trail guide also mentions that Portland Arch has been a favorite gathering place for people from Indiana and Illinois for many years and formerly was a popular resort area. In the past, a flat-bottomed boat carried passengers from Lafayette to Portland Arch every Sunday, and the Wabash Railroad ran three or four excursions every year. A civic and amusement park was once operated there as well as a Boy Scout Camp. Several log cabins were built there, but they burned in 1917 and were replaced by a pavilion where meals were served and dances were held. A dam, built across Bear Creek, contained a water wheel and dynamo that furnished lights for the park. Only remnants of the dam and a concrete foundation from part of the boy scout camp are still visible today.

At Bear Creek Canyon one can also find a few native white pines on the steep, well drained slopes where the temperatures are cooler. Mosses and ferns are abundant and the rare bush honeysuckle is found here. It is also the only place in the state where the Canada blueberry has been reported.

Rattlesnake Creek, although not directly associated with Portland Arch or Bear Creek Canyon, is a major tributary to Bear Creek and a portion of it does lie within the Portland Arch Nature Preserve. It is a stream about the same size as Bear Creek, and probably has many of the same features, fauna and flora as does Bear

Bear Creek in Portland Arch Nature Preserve in Fountain County. Bear Creek has formed Bear Creek Canyon by cutting down through the sandstone bedrock forming cliffs up to 90 feet high.

A view of Fall Creek downstream from Fall Creek Gorge in Warren County. Fall Creek Gorge is just visible in the background to the right and behind the man in the picture.

Creek. For these reasons it is also designated "Exceptional Use" for a limited distance upstream from its confluence with Bear Creek.

Unique Features

All of the streams designated as "Exceptional Use" are either unique themselves, have unique features, or are an intergral part of a larger area which is itself unique. By designating these streams as "Exceptional Use" waters, they can be maintained in their present, relatively unpolluted state and will contribute to the enjoyment of these areas by many of Indiana's citizens.

Provisions have been made in the revised Water Quality Regulation (330 IAC 1-1) to allow citizens to propose streams or waterways for the "Exceptional Use" classification. Persons interested in doing so should contact the Technical Secretary of the Indiana Stream Pollution Control Board, 1330 West Michigan Street, Indianapolis, Indiana 46206, for more information.

INDIANA STATE BOARD OF HEALTH

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