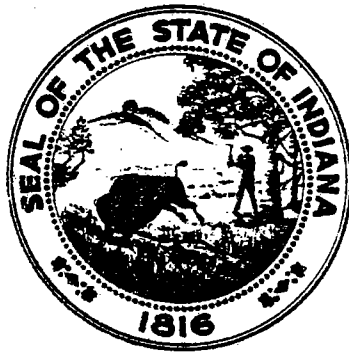


MIGRATION OF NORTHERN PIKE INTO TRIBUTARIES
OF AN INDIANA WATERSHED

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Migration of Northern Pike in Tributaries of an Indiana Watershed

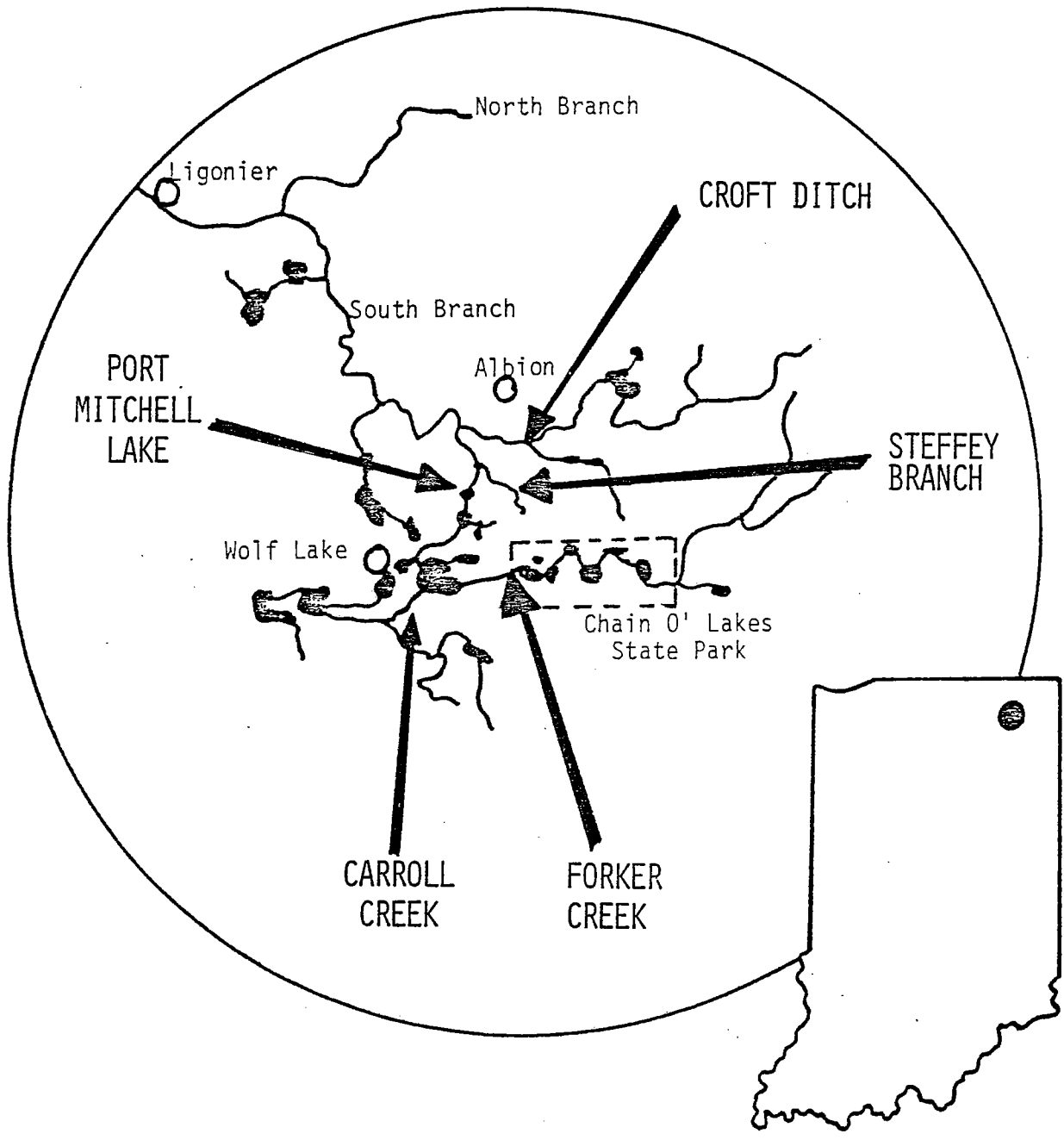
Introduction

For over a century, projects designed to improve agricultural drainage have been implemented throughout Northeast Indiana. These projects, involving channelization of stream beds, creation of tributary ditches, and placement of sub-surface tile drains, have reduced the size of natural lakes and wetlands. Little information is available on the effects of drainage alterations on northern pike in Indiana.

A major alteration project within the Elkhart River, South Branch is being considered by the Noble County Drainage Board. This project could affect northern pike distribution and abundance in the watershed by resulting in loss, alteration, or inaccessibility of pike spawning areas.

This study was conducted to determine the importance of three tributaries as migration routes to potential pike spawning sites and assess impacts of drainage alterations on pike reproduction.

FIGURE 1. Map of the Elkhart River, South Branch Watershed.



Study Site and Methods

The Elkhart River, South Branch drains a large portion of Noble County (Figure 1). Forty-six lakes comprising 1,390 acres, the Mallard Roost Wetland, and Chain O' Lakes State Park are located in the watershed.

Major tributaries to the South Branch include Carroll Creek (outlet from Bear Lake), Croft Ditch (outlet from Skinner Lake), Forker Creek (outlet from Chain O' Lakes State Park), and Steffey Branch (outlet from Schauweker Lake). Carroll Creek and Forker Creek flow into Muncie Lake while the Steffey Branch and Croft Ditch enter the South Branch downstream from Port Mitchell Lake. Each tributary has adequate flow to accommodate migrating pike during spring.

Alterations are proposed along each tributary and within the mainstem between Williams and Bartley Lakes. Most of the proposed work on the Croft System lies upstream from Skinner Lake and is a part of a separate project. Therefore, Croft Ditch was not included in this study.

Native northern pike are present from Muncie Lake to Port Mitchell Lake. Pike are abundant in Port Mitchell and Bartley Lakes but are rare in Williams and Muncie Lakes. Native pike are absent upstream from Muncie Lake. During fall 1979, pike fingerlings were stocked in Miller Lake (Chain O' Lakes) and Bear Lake.

Winged trap nets were set and checked periodically from March 24 to April 21, 1980 at the mouth of Steffey Branch and the outlet of Chain O' Lakes Park in Forker Creek. A barrier was placed at the Forker Creek site to funnel migrating pike into the trap net. Although the trap net in Steffey Branch did not completely block the channel during high water, it was thought most pike would follow the wings into the trap net. Trap nets consisted of a frame (3' x 5') with attached hoops and one inch mesh netting.

A dragline was operating along Carroll Creek near Highway 33 when the project began so the trap net was placed upstream on the Merry Lea Environmental Center property from March 24 until March 28. On March 31, the trap net was moved to the Highway 33 site. By April 3, it became impossible to continue trapping at this site because of debris coming down the channel so sampling on Carroll Creek was terminated.

Each time the trap nets were checked, all species were identified and recorded. Water temperature of the tributaries was also monitored.

Results

No native northern pike were collected at any site during the project. One stocked yearling pike (fin-clipped) was captured at Forker Creek on March 26. Nine additional species were collected at Forker Creek while ten species were taken at Steffey Branch and two species at Carroll Creek (Table 1).

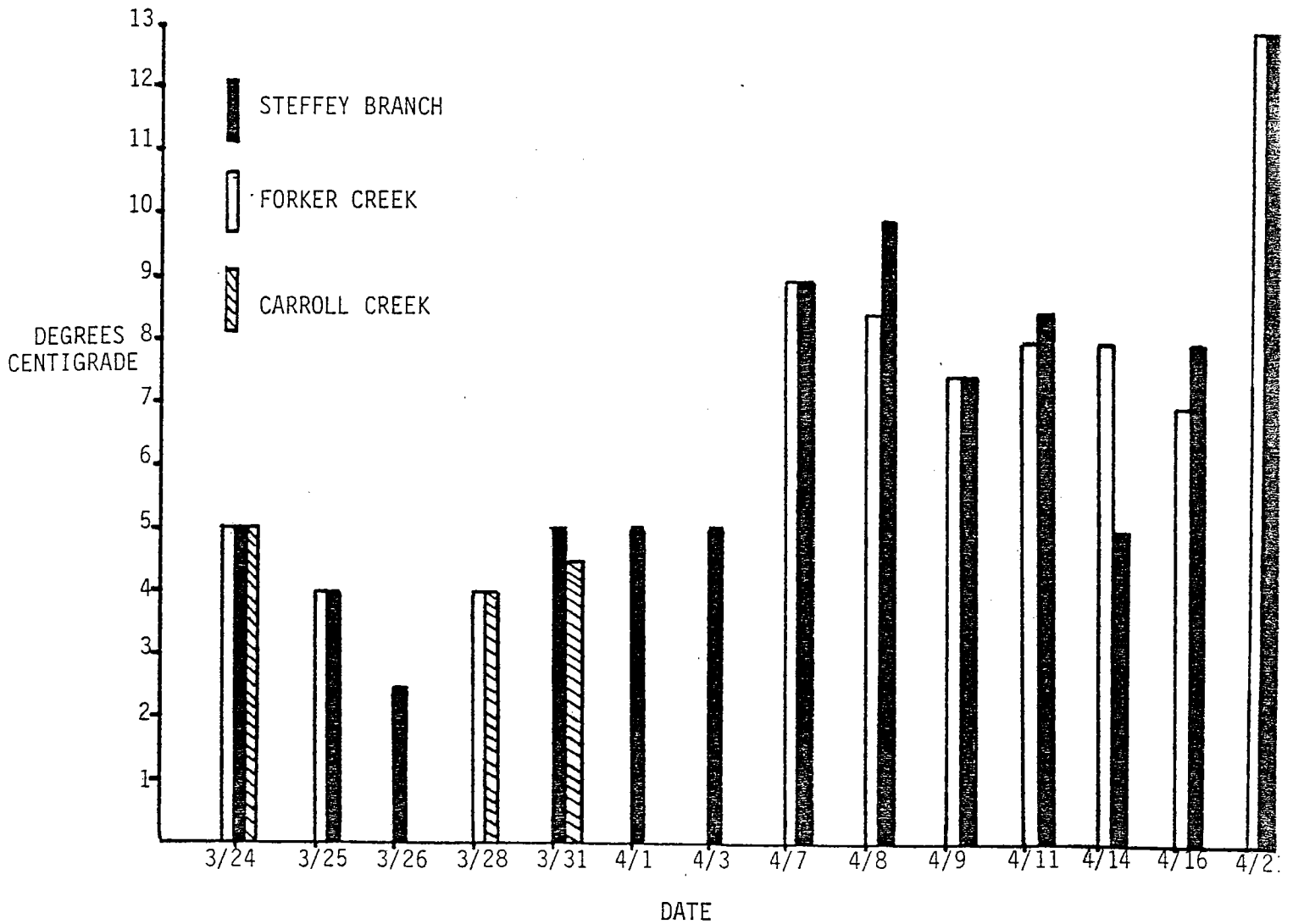
Table 1. Fish species collected by trap nets in three tributaries of the Elkhart River, South Branch during spring, 1980.

SPECIES	FORKER CREEK	STEFFEY BRANCH	CARROLL CREEK
Black crappie	X	X	
Bluegill	X		
Bowfin		X	X
Bullhead	X	X	
Carp	X	X	
Creek chub		X	
Golden shiner		X	
Grass pickerel		X	X
Hogsucker	X		
Lake chubsucker	X	X	
Largemouth bass	X		
Northern pike	X		
Rainbow trout*	X		
Spotted sucker		X	
White sucker	X	X	

* Annually stocked in Sand Lake, Chain O' Lakes State Park.

Water temperatures ranged from $2\frac{1}{2}^{\circ}\text{C}$ in the Steffey Branch on March 26 to 13°C in Forker Creek and the Steffey Branch on April 21 (Figure 2).

Figure 2. Water temperatures of three tributaries of the Elkhart River, South Branch during spring, 1980.



Discussion

Based on results of this study, tributaries of the Elkhart River, South Branch do not serve as pike spawning routes. Most pike reproduction occurs within the Port Mitchell Lake area and adjacent wetlands. It is unlikely natural distribution and abundance of pike in the watershed will increase through migration.

Although the water level control structure at Chain O' Lakes State Park may curtail upstream movement, the number of pike migrants from Muncie Lake is not sufficient to establish a pike fishery in Park lakes.

The lack of migrants from Muncie Lake also explains the prior absence of pike in Bear Lake, since spawning habitat appears suitable there. Examination of past drainage patterns and soil types indicates the Bear Lake watershed may have been isolated from the South Branch most of the year or was a distant part of the adjacent Tippecanoe watershed where pike are also absent. Creation of a larger drainage channel between Bear Lake and Muncie Lake did not result in an influx of pike. Apparently, Muncie Lake doesn't have a pike population large enough to function as a nucleus for range expansion. This is supported by gill net catch data (Pearson 1978).

Stocked pike have been found at two other sites in the watershed. One was gill netted at High Lake in July, 1980 (Pearson 1980) and one was caught by a fisherman at Long Lake in May, 1980. This demonstrates the need for a "watershed approach" in pike management. Pike may migrate to undesirable parts of a watershed if a large population is established. At the present time, potential effects of stocked pike on native species as well as stocked fish (trout in Sand Lake and tiger muskies in High Lake) are not likely to be detrimental.

Since northern pike do not use tributaries of the South Branch as spawning routes, drainage alterations within these tributaries will have no major effects on pike reproduction. More rapid drainage of headwaters could

increase normal flooding of wetlands in the Port Mitchell Lake area. However, this probably won't be detrimental to pike reproduction.

Even though the alterations will not curtail pike reproduction, a negative aspect was apparent. Organic debris and silt resulting from instream channelization, as noted along Carroll Creek, increased sediment and turbidity in downstream sections. Construction of settling basins along the tributaries could minimize the problem.

Summary and Recommendations

No native northern pike were collected in trap nets in three tributaries of the Elkhart River, South Branch during the spring spawning season. These tributaries are not serving as routes for pike migrating to potential spawning areas. Therefore, proposed drainage alterations in these tributaries will not be detrimental to natural pike reproduction in the watershed.

Most pike reproduction occurs in the Port Mitchell Lake area and adjacent wetlands. These areas should be left in a natural condition.

In addition, several northern pike management proposals are recommended:

1. Survey the South Branch mainstem with standard fish population techniques to obtain data on pike distribution and abundance.
2. Attempt to collect spawning northern pike in the Port Mitchell Lake area to pinpoint spawning sites and tag pike for estimating exploitation.
3. Continue monitoring current and proposed drainage alteration projects in the watershed.
4. Make a second stocking of northern pike in Miller Lake and Bear Lake in 1980 and conduct follow-up checks of pike survival and reproduction.

Submitted by: Jed Pearson, Fisheries Biologist
Date: October 2, 1980

Approved by: GARY HUDSON
Gary Hudson, Fisheries Supervisor
Date: December 19, 1980

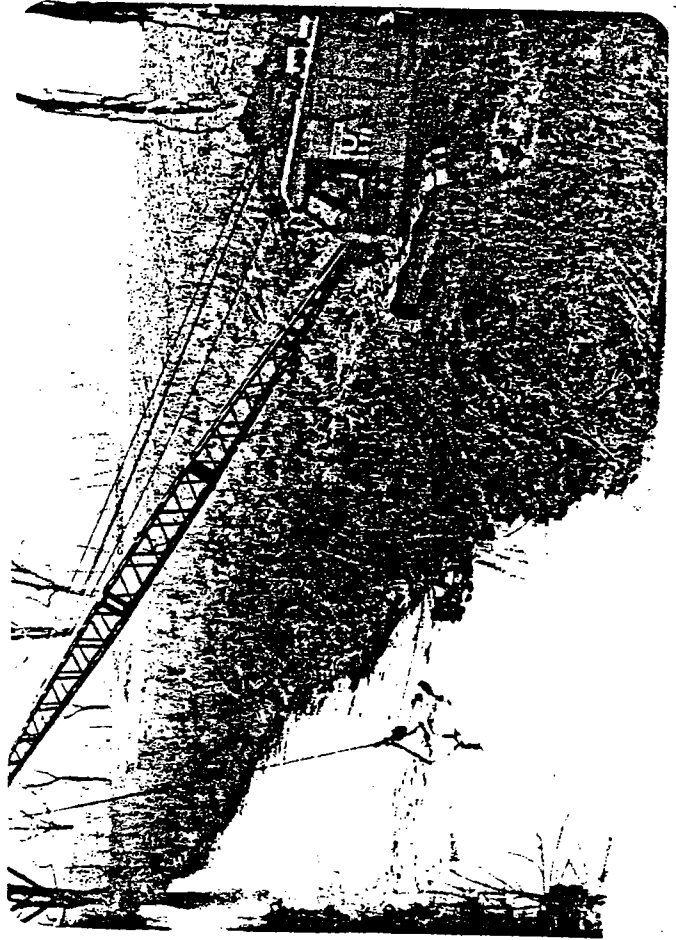
Approved by: William D. James
William D. James, Chief of Fisheries
Date: December 30, 1980

Literature Cited

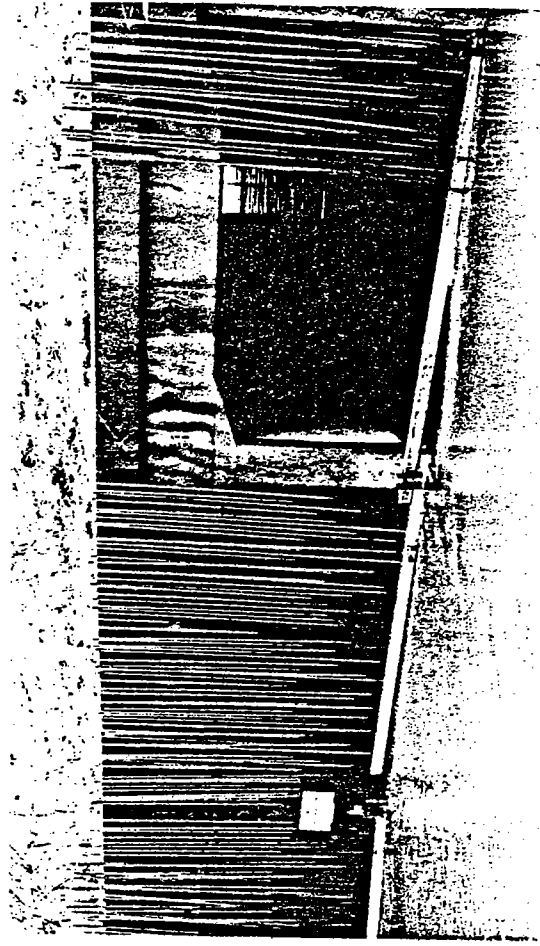
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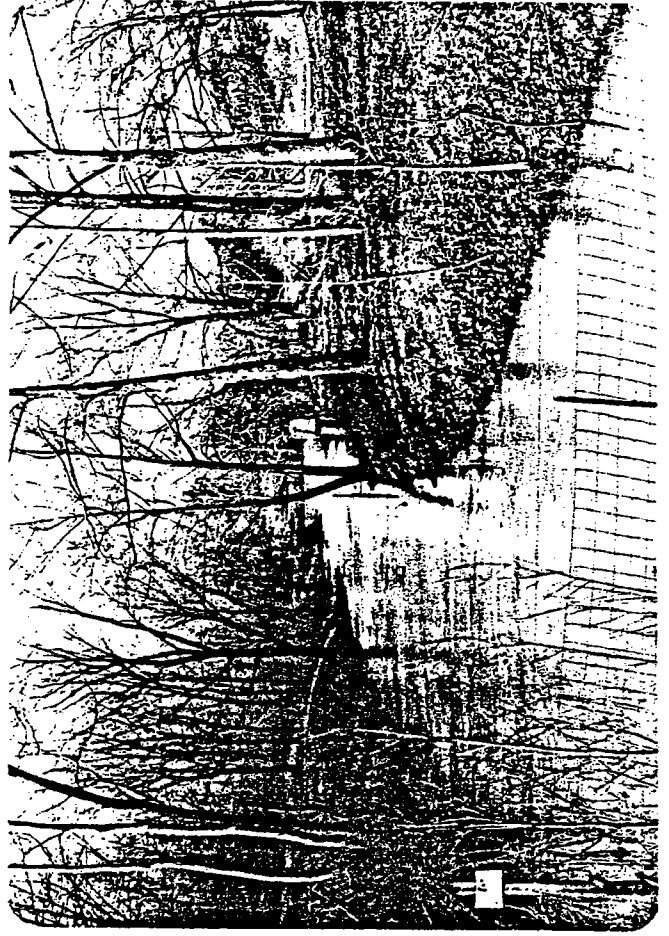
STEFFY BRANCH NEAR TRAPPING SITE



DRAGLINE OPERATING ON CARROLL CREEK



FORKER CREEK BARRIER



DOWNSTREAM VIEW OF FORKER CREEK