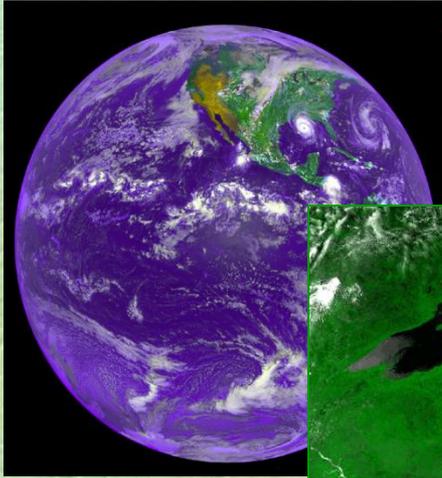
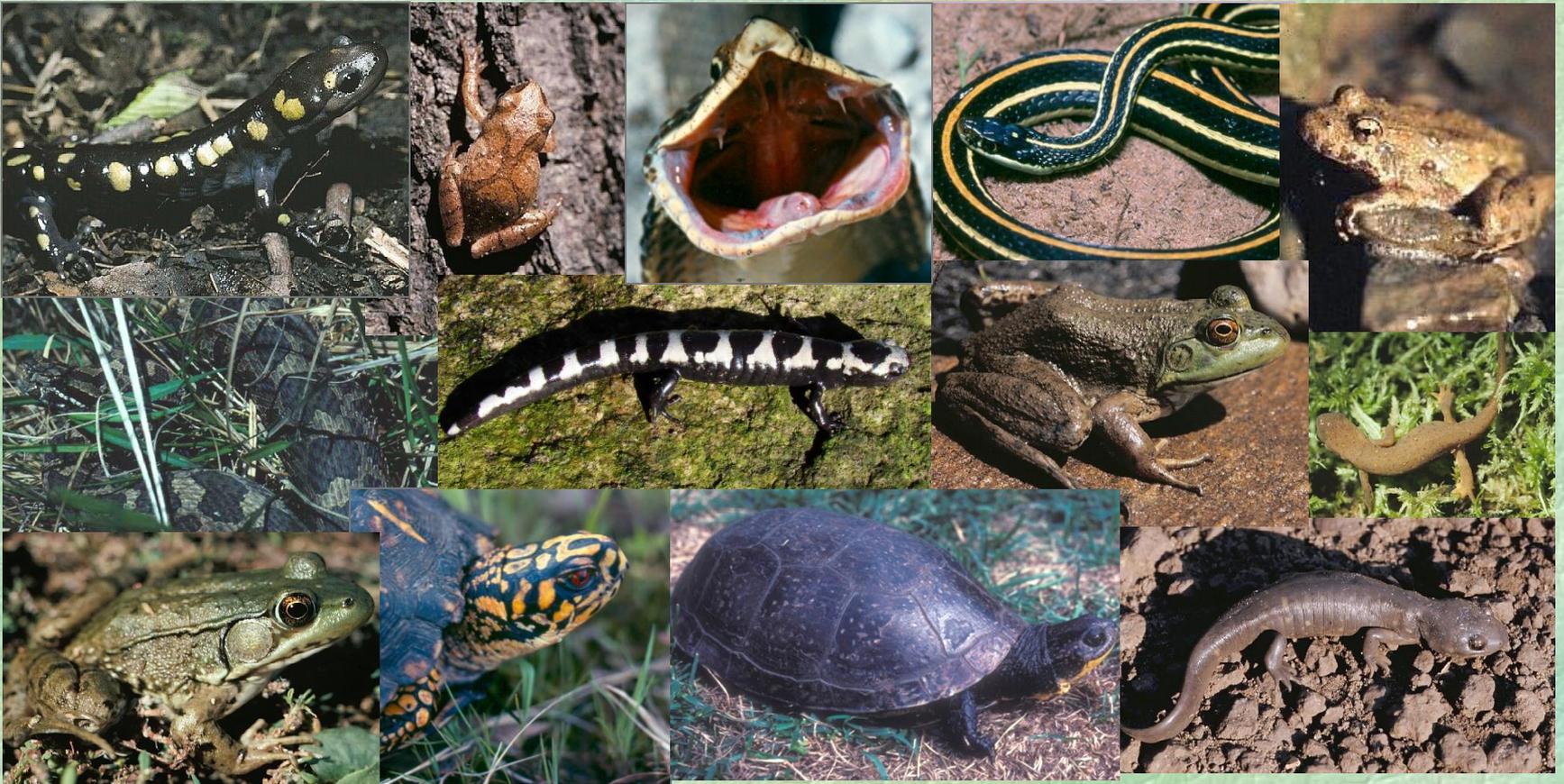


Industrial Strength Herpetology in a Post-Industrial Landscape



Alan Resetar
Field Museum

Why are the Calumet Region, the Indiana Dunes and the resident herpetofauna significant?



Indiana Dunes National Lakeshore



Credit: NPS, ESRI

Fragmented

3 counties

24 mi²

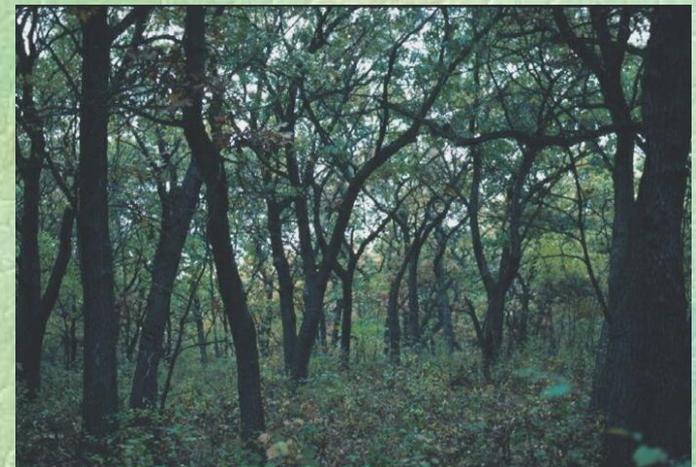
A laboratory of glacial processes

✂ Effects of Pleistocene glaciation

Topographic and soil
diversity

✂ Postglacial climatic fluctuations

Immigration of biota



Novel topographic and geologic features

- ✘ Calumet Lake Plain
- ✘ Tolleston Strandplain
- ✘ High coastal sand dunes
- ✘ The Calumet Rivers
- ✘ Continental divide
Mississippi & Great
Lakes watersheds
- ✘ Variety of soil types

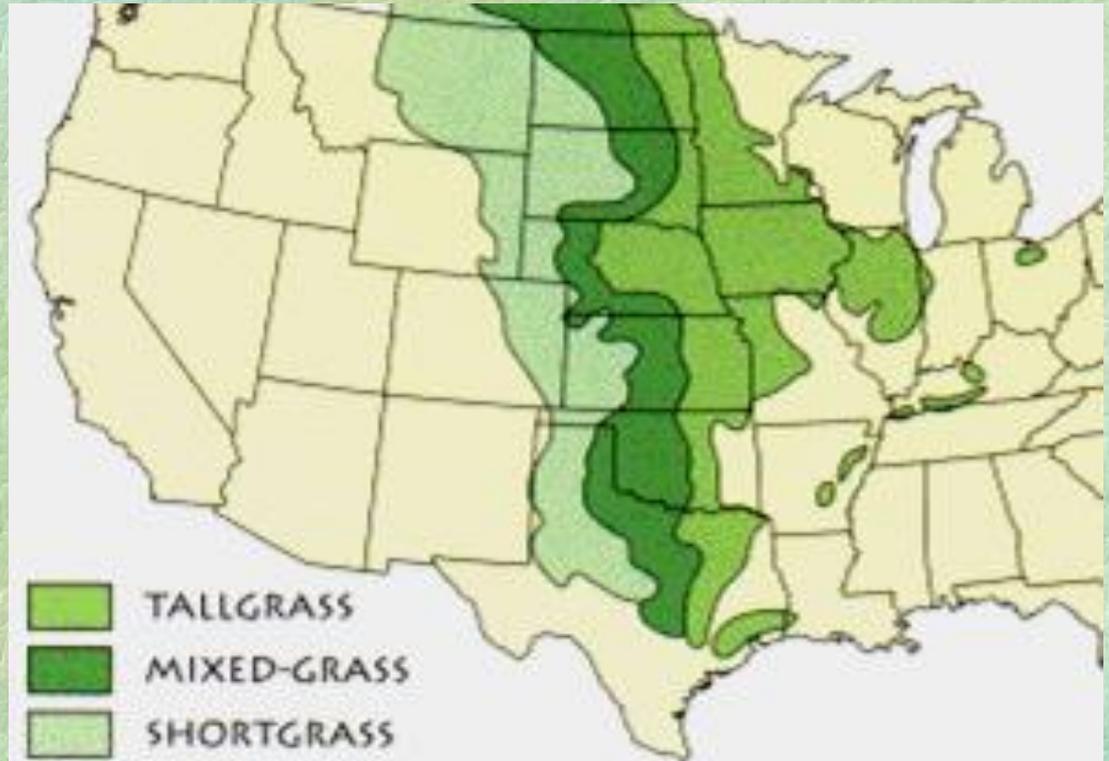


Parallel beach ridges (strandplain)
in Gary/Hammond area

Ecotone between two North American biomes

✂ Eastern deciduous forest

✂ Tallgrass prairie



Credit: McDaniel College

Diverse community types

Wetland

Vernal

Lake

River

Sedge meadow

Marsh

Panne

Bog

Fen



Lakeshore

Beach

Open dune

Mature dune

Diverse community types

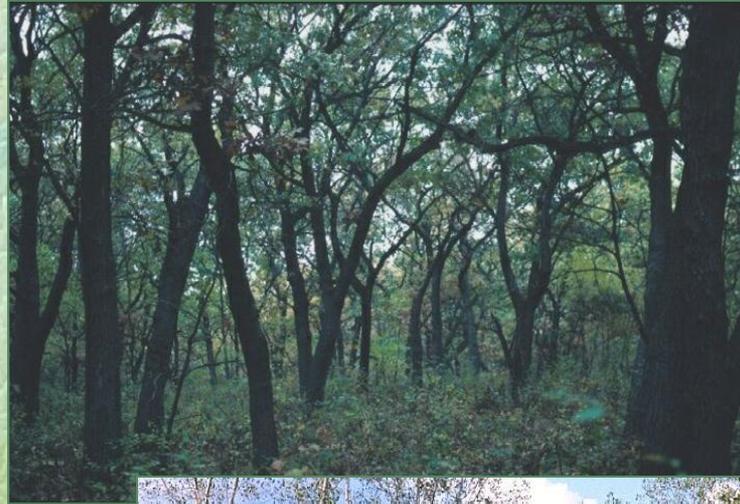
Terrestrial

Oak savanna

Anthropogenic

Prairie

Forest



The herpetofauna of INDU and Calumet

✂ 48 species

19 amphibians

11 frogs and toads

8 salamanders

29 reptiles

17 snakes

9 turtles

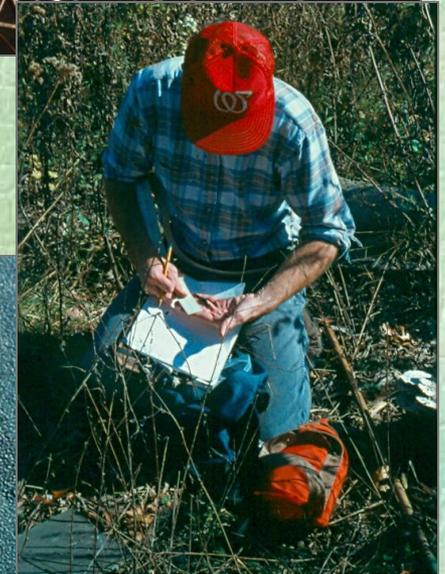
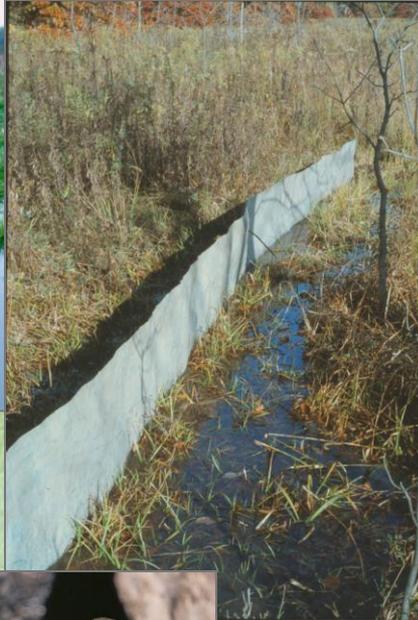
3 lizards

✂ Calumet (49) – 1 additional snake

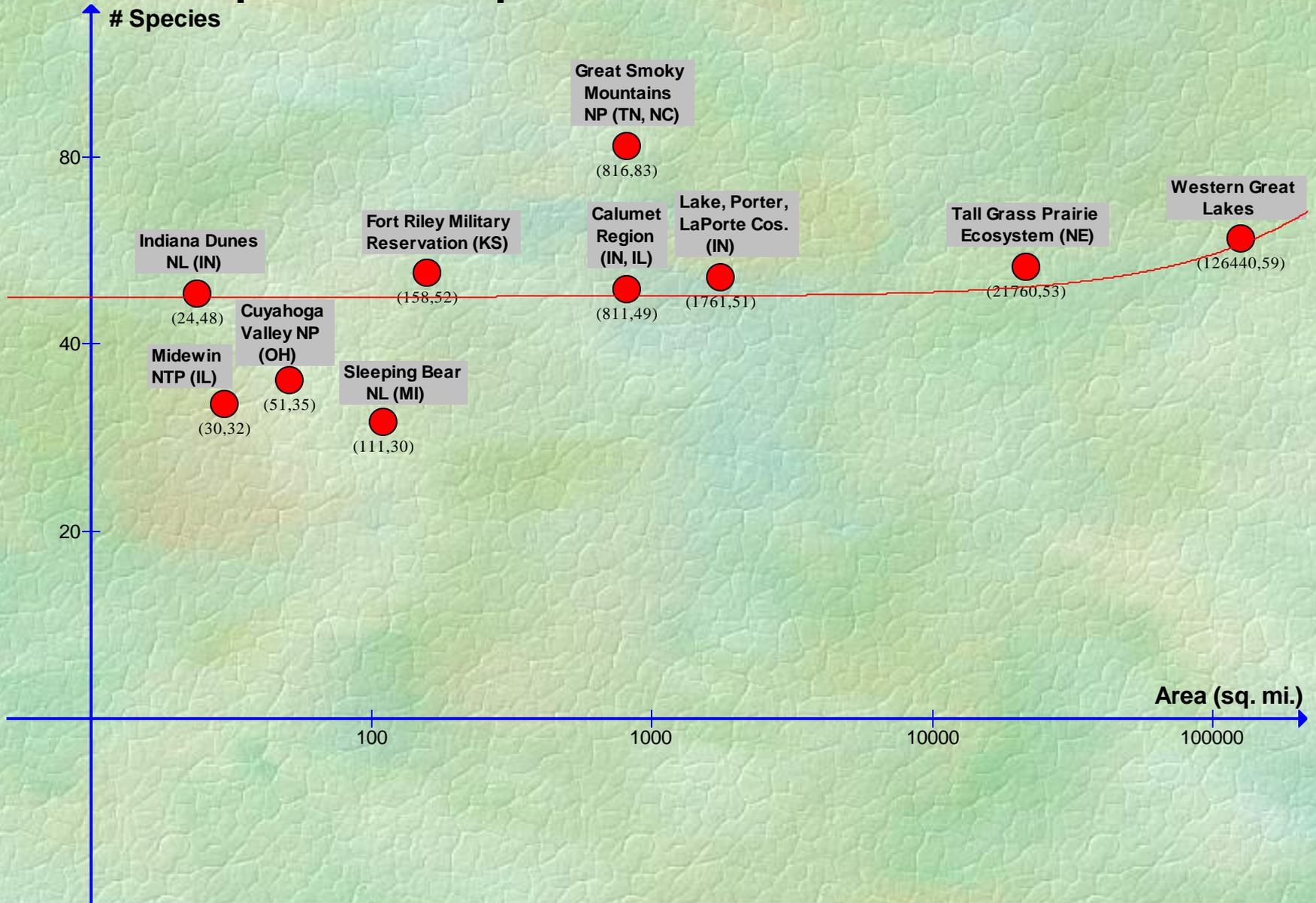
✂ 11 IN endangered (5) & special concern species (6)



Sampling techniques



Herpetofaunal species richness and size of site



Small area/high species richness

59 species/US Great Lakes drainage basin west of Lake Erie (126,440 mi²)

48 species/Indiana Dunes* (24 mi²)

INDU has 81% of the number of species in <1% of the area!!!!

*includes historic occurrences



Credit: US ACE Detroit Office

Herpetofaunal highlights

✂ Regionally rare species

Ringneck snake (*Diadophis punctatus*) and Blanchard's cricket frog (*Acris blanchardi*)



✂ Alternative genotypes

Polyploid salamanders of the *Ambystoma jeffersonianum* complex



✂ Alternative color morphs

Rare melanistic eastern garter snake (*Thamnophis sirtalis*) and eastern hognose snake (*Heterodon platirhinos*)



Rich history of herpetological investigation and publication

✂ First written records

**T. H. Ball. Lake Co. March 14 1858.
Weather record noting “Frogs
appeared.”**

✂ Earliest museum records

MCZ-Harvard - 1897

CAS - 1898

FMNH - 1899

✂ Earliest report by scientist

**Willis Blatchley. 1897. Geology of
Lake and Porter Counties.**

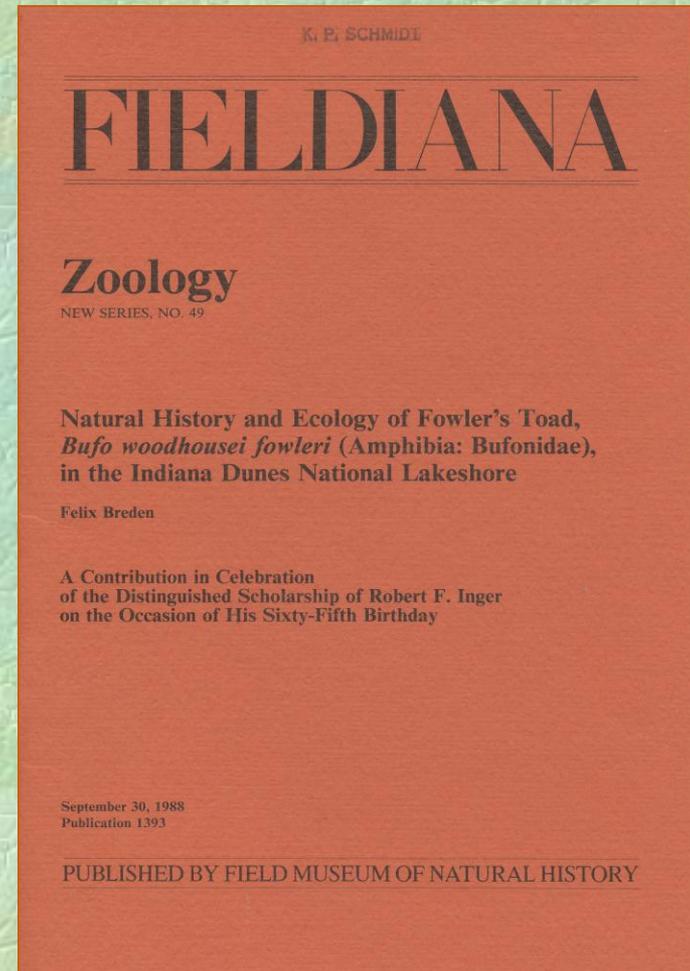
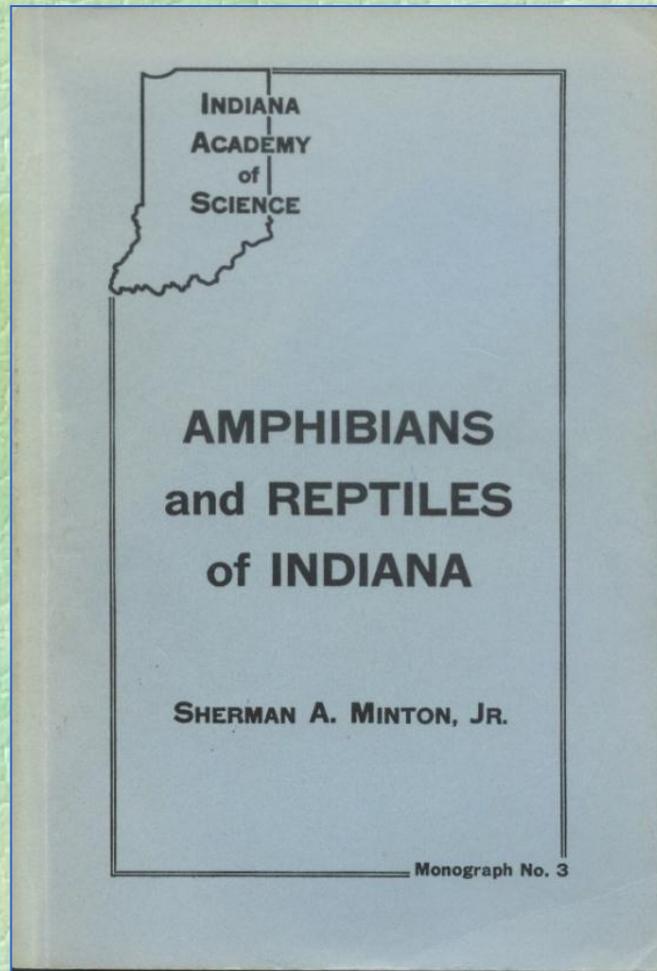


From: Coker. 1991. Pioneer Ecologist. Smithsonian Inst. Press

**Victor Shelford
Indiana Dunes, 1940**

Scientific publications

Over 70 papers



Published historical data

THE GEOGRAPHIC SOCIETY OF CHICAGO
BULLETIN No. 5

ANIMAL COMMUNITIES IN TEMPERATE AMERICA

AS ILLUSTRATED IN THE
CHICAGO REGION

A STUDY IN ANIMAL ECOLOGY

By
VICTOR E. SHELFORD
The University of Illinois



PUBLISHED FOR THE GEOGRAPHIC SOCIETY OF CHICAGO
BY
THE UNIVERSITY OF CHICAGO PRESS
CHICAGO · ILLINOIS

156

POND COMMUNITIES

TABLE XXXIII

DISTRIBUTION OF FISH: PONDS ARRANGED ACCORDING TO ECOLOGICAL AGE
For meaning of numbers and letters see Fig. 84, p. 139.

Common Name	Scientific Name	Ponds							
		I	5b 5c	7a 7b	5a	14a	14b	56 58	52
Large-mouthed black bass..	<i>Micropterus salmoides</i> ..	*							
Bluegill	<i>Lepomis pallidus</i>	*							
Blue-spotted sunfish.....	<i>Lepomis cyanellus</i>	*						*	
Pumpkin-seed.....	<i>Eupomotis gibbosus</i>	*							
Warmouth bass.....	<i>Chaenobryttus gulosus</i>	*							
Yellow perch.....	<i>Perca flavescens</i>	*	*						
Chub-sucker.....	<i>Erimyzon sucetta</i>	*	*	*					
Spotted bullhead.....	<i>Ameiurus nebulosus</i>	*	*	*					
Pickereel.....	<i>Esox vermiculatus</i>	*	*	*	*	*		*	
Mud minnow.....	<i>Umbra limi</i>	*	*	*	*	*		*	
Golden shiner.....	<i>Abramis crysoleucas</i>		*	*	*	*			
Yellow bullhead.....	<i>Ameiurus natalis</i>			*					
Black bullhead.....	<i>Ameiurus melas</i>		*	*	*	*		*?	
Dogfish.....	<i>Amia calva (juvenile)</i> ..								*

TABLE XXXIV

HIGHER VERTEBRATES

Name	Pond Numbers				
	I	5c	7a	14b	30 52
<i>Aromochelys odorata</i> Lat.....	*	*			
<i>Rana pipiens</i> Sch.....	*	*	*	*	*
<i>Chrysemys marginata</i> Ag.....	*	*	*	*	*
<i>Graptemys geographicus</i> LeS.....		*			
<i>Diemictylus viridescens</i> Raf.....	*	*	*	*	*
<i>Fiber zibethicus</i> Linn.....	?	?	?	?	?

Report literature/Field notes

Status of the Eastern Massasauga Rattlesnake at Indiana Dunes National Lakeshore

Gary Glowacki and Ralph Grundel
 U.S. Geological Survey
 Great Lakes Science Center
 Lake Michigan Ecological Research Station
 1100 N. Mineral Springs Road
 Porter, IN 46304

January 10, 2005



Great Lakes Network Report
 GLKN/2005/02

USGS
 science for a changing world



Oct. 22, 1935 *My News*

Colony of Blue Racer Snakes Found in Dunes; Field Museum Staff to Keep Check on 'Em

snakes, with relation to age, rate of growth, the distances they travel to and from their place of hibernation, twenty-six of them were marked.

"To mark them we clipped them according to a system comparable to numbers of a combination lock so they will carry scars on certain scales under their tails.

Will Check on Them.

"We shall make expeditions into the region each spring and fall in future years. By checking on scarred snakes we expect to learn much more of their habits than is possible by study of specimens preserved in alcohol."

The blue racer, once common in this middlewest, has suffered near-extinction, Mr. Schmidt said, largely because it is bold and curious.

"The blue racer has the habit of rearing its fore six or eight inches and facing studiously whatever strange may be approaching it. It has never learned not to do this and as a consequence it is frequently caught and decapitated by mowers and resper blades."

As to the garter and brown snakes so many people have seen recently, Mr. Schmidt explained that they are inclined to hibernate upon arrival of the first killing frost.

It is most unusual in the experience of Chicago naturalists to see more than one or two of these handsome active snakes in a day.

"As a means of studying the

the belief that similar hibernation occurs among snakes of the middle west, were mightily pleased then when they discovered last week-end a colony of close to 100 blue racers within an area of less than an acre among the oak-covered dunes.

Sun Selves in 'Open.

"These snakes," Mr. Schmidt said, "were sunning themselves in open places. Many of them had climbed into bushes, where they lay extended on horizontal branches. Tracks in the loose sand showed that they had gone in and out of woodchuck burrows. The average size of the specimens was between four and five feet and all had the glossy fresh appearance of snakes which had recently shed their skins."

"It is most unusual in the experience of Chicago naturalists to see more than one or two of these handsome active snakes in a day.

"As a means of studying the

Field museum herpetologists, in

Mineral Springs Rd.
 Dune Acres
 Police Station

Quaking Bog

Cowles Bog Area

Hibernation Site

Ballets each Wilson Sta.

On a pleasant day in Oct. 1935, I encountered Walter Mecker (Chi. Acad. of Sci.) and Karl Schmidt (Field Mus.), broiling a steak about 1" thick along the trail (it was a road to the Dune Acres golf course then). I was well acquainted with Walter who introduced me to Karl Schmidt. They were devoting the day to observing and scarring ventral scales of blue racers. Blue racers still reside here and should be looked for on warm autumn days.

N. Bergenhall 3-2-1986

Voucher specimens/tissue samples

29 North American institutions



© The Field Museum,



© The Field Museum,

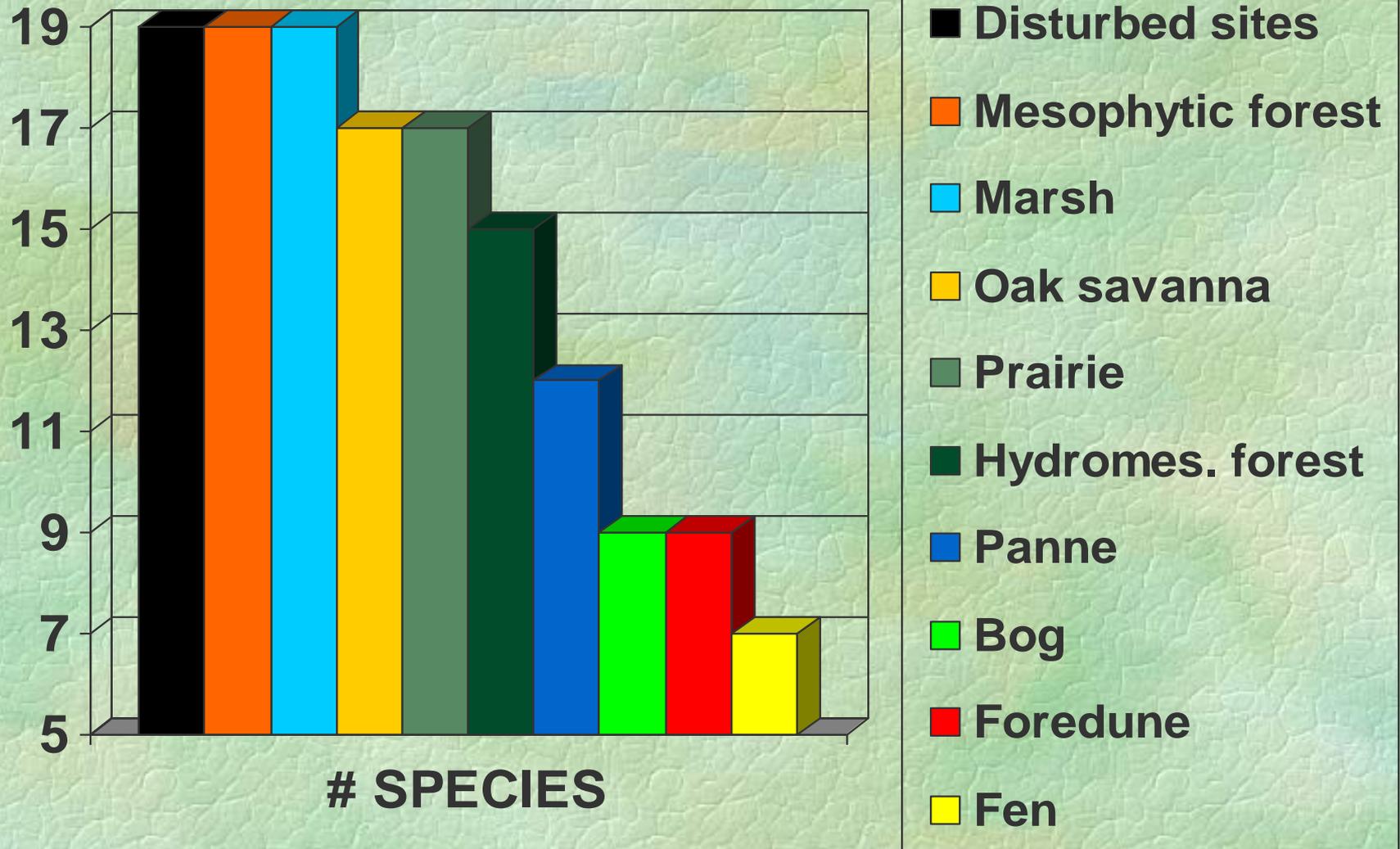
Historical records

	Species	Indiana Dunes	Calumet Region
	Blanchard's cricket frog	1970's	2012
	Smooth green snake	1902	2012
	Pickerel frog	1922	-
	Five-lined skink	pre-1900	-
	Marbled salamander	1960	-

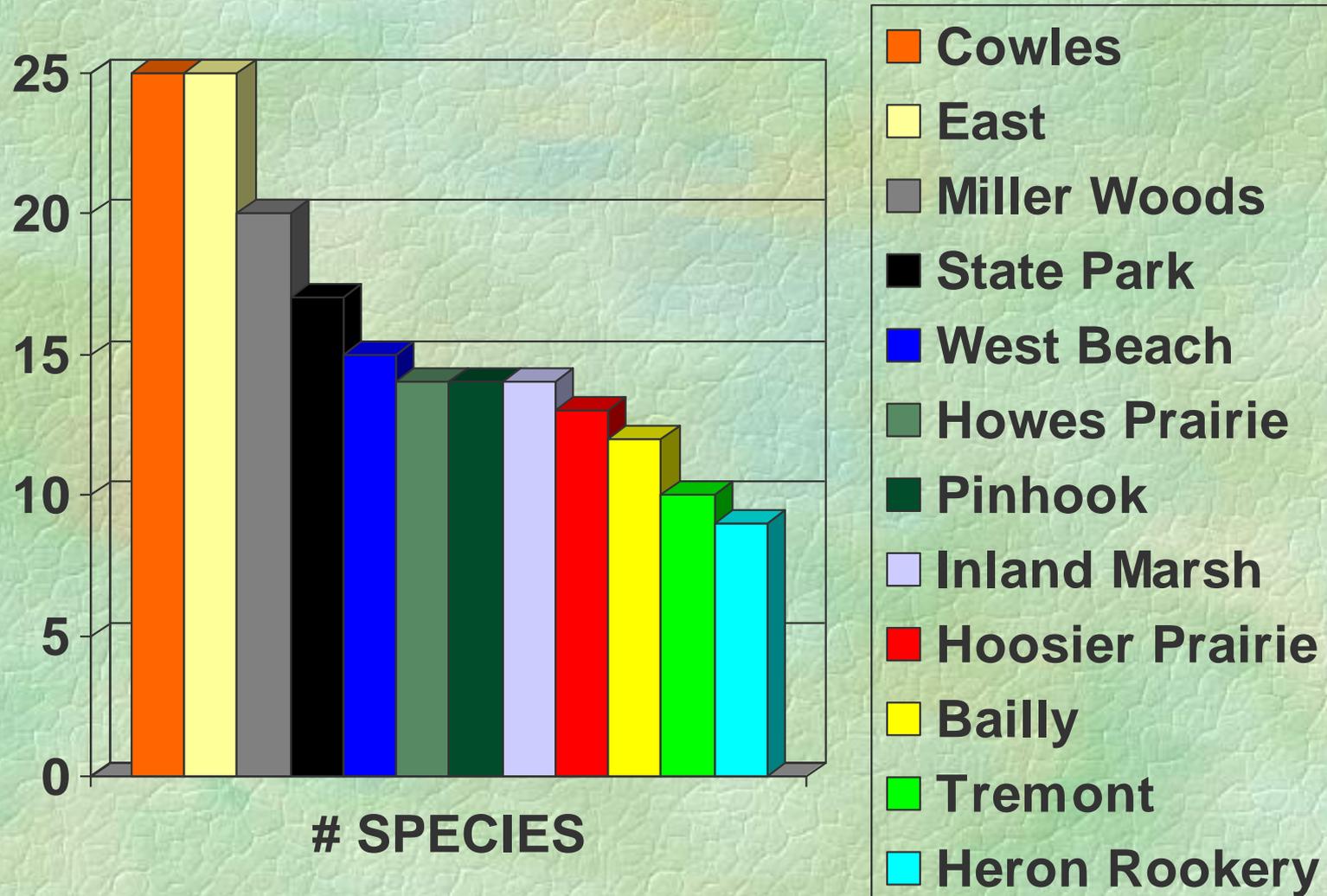
New county records since 1978

Species	Lake	Porter	LaPorte
Northern ribbon snake		x	x
Queen snake	x		x
Redbellied snake	x		
Bullsnake	x	x	
Six-lined racerunner			x
Eastern snapping turtle			x
Eastern box turtle	x		
Northern green frog	x		
Boreal chorus frog		x	
Spotted salamander	x		

Species richness by habitat type (Calumet Region)



Species richness by INDU site



Species abundance over time

Reptiles (IN Dunes)	Museum records	Resetar field work
Species	1930-1939 # specimens	1980-1989 # observations
Spotted turtle	14	20
Eastern massasauga	10	2
Western ribbon snake	4	26
Northern brown snake	4	56

Species abundance over time

Amphibians (IN Dunes)	Museum records	Resetar field work
Species	1930-1939 # specimens	1980-1989 # observations
Blanchard's cricket frog	44	0
Northern leopard frog	27	13
Wood frog	21	139
Four-toed salamander	6	22

Management

- **Promote species and community-based research**
- **Monitor on a regular basis**
- **Maintain early successional habitat**
- **Maintain open-canopied habitat**
- **Maintain egg-laying sites**
- **Manage egg predators**

Thank you!!