

Acknowledgements

- Rita Lee, IDNR; Program Comm.



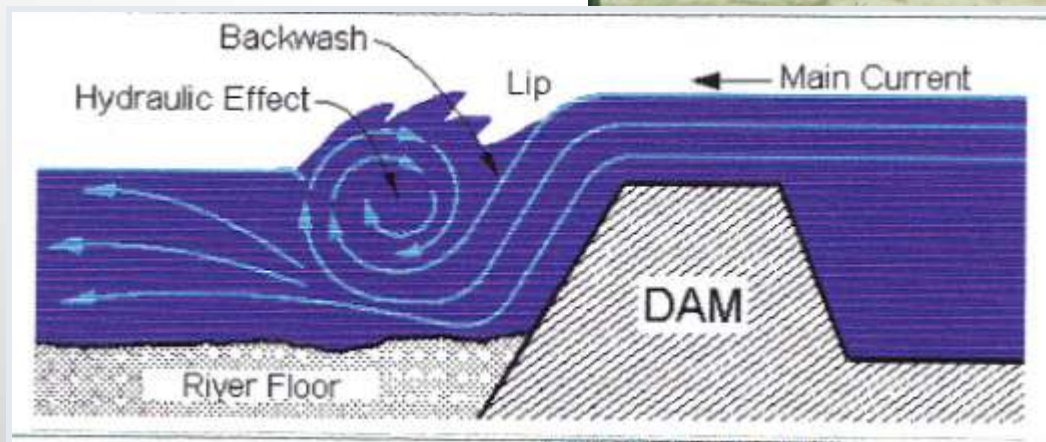
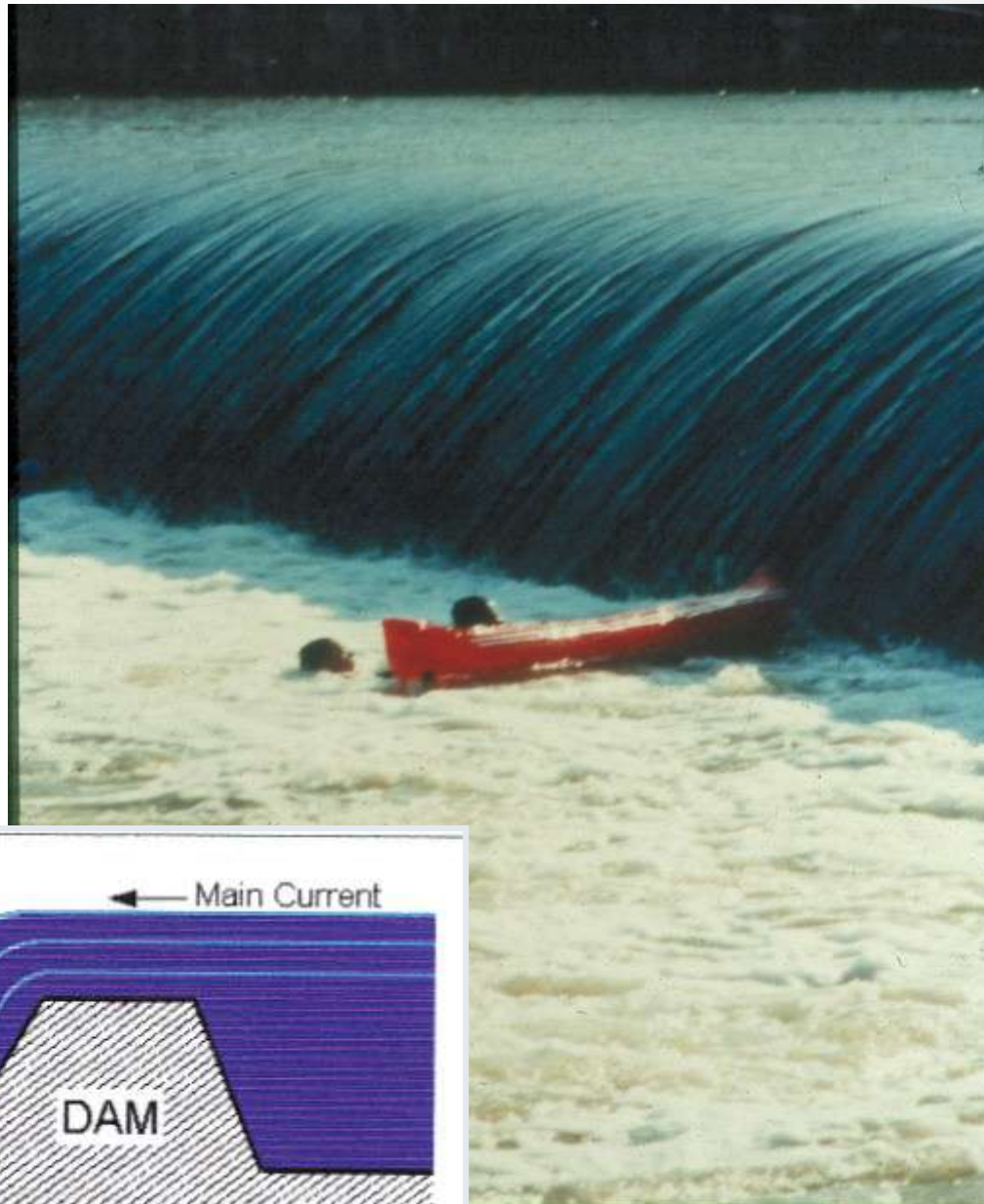
- Fish Monitoring and Evaluations



- Project Funding



DAM SAFETY



Dam Partners

IDNR Office of Water Resources

YWCA

Kane County Dept. Environment

Kane County FPD

City of Aurora

Village of Riverside

Yorkville Sanitary District /PD

Oswegoland Park Dist.

Elgin Park Dist.

Hoffman Dam River Rats

City of Plano

Cook County FPD

The Conservation Foundation

DuPage Salt Creek Work Group

DuPage County Stormwater

DuPage County FPD

Kane County FPD

Kendall County DOT

Lake County FPD

Judson College

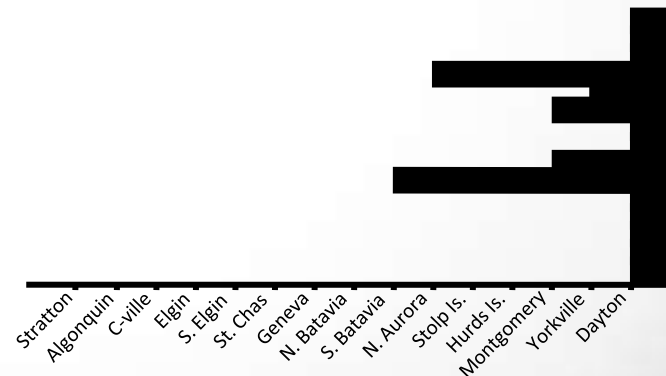
Will County

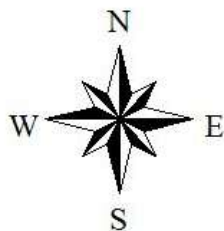
Vernon Hills Golf Course

Fox River Study Group

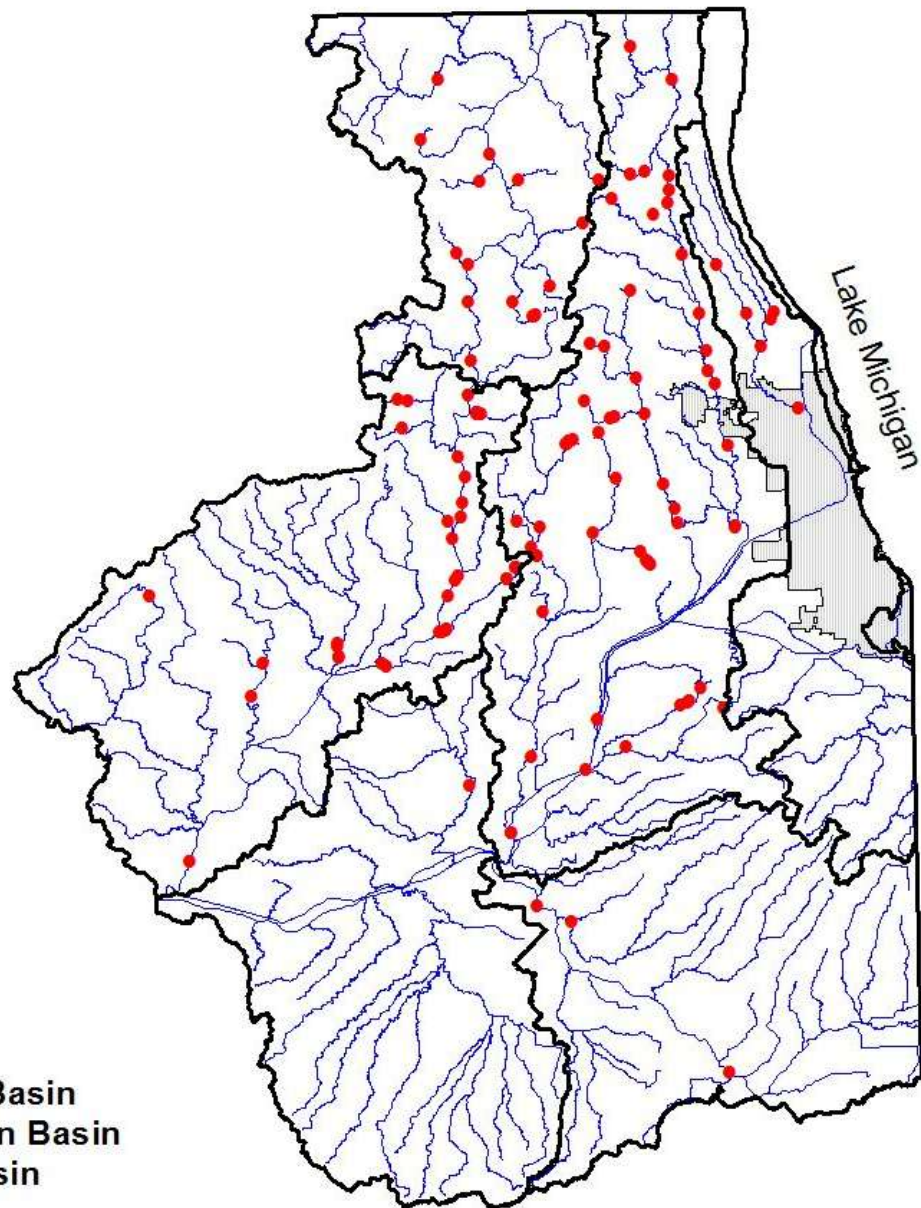
Friends of the Fox River







-  Major Watersheds
-  Dams - Des Plaines Basin
-  Dams - Lake Michigan Basin
-  Dams - Fox River Basin
-  Streams
-  Chicago Municiple Boundry



20 0 20 Miles



Reconnecting NE Illinois Waterways: Review of Dam Removal Projects and Benefits to Fish and River Ecosystems.



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Dam Projects

Legend

-  Dams Removed
-  Fish Passage Projects
-  Region 2 Streams
-  Removed in 2018
-  In Study for Removal


Lake Michigan

- 30 projects completed
- 26 removals
- 4 fish passage
- 500 Miles re-connected
- 2 scheduled for 2018
- 5 in study phase

Dam Evaluations

Watershed Condition

Legend

 Dams Studied

YWCA
Urban LC: **Moderate**
DS IBI: **37-49**

Creek Bend
Urban LC: **Moderate**
DS IBI: **45-48**

Urban LC: **Low**
DS IBI: **56-59**

Seavey Creek
Urban LC: **High**
DS IBI: **31-39**

Hofmann
Urban LC: **High**
DS IBI: **26-36**

IBI = Index of Biotic Integrity
Range = 0 to 60



20 mi

Dam Details

Dam	Stream	Watershed Area (mi. ²)	Year compl.	Hgt (ft.)	Wth (ft.)	Dam Condit.	Cost
YWCA (2)	Brewster Creek	18	2006	8	50	poor	\$400,000
Golf Course	Seavey Creek	11	2009	4	45	poor	\$60,000
Creek Bend	Ferson Creek	54	2010	4	60	fair	\$85,000
Hofmann	Des Plaines River	480	2012	12	259	good	\$2,500,000
River Road	Blackberry Creek	73	2013	12	75	fair	\$900,000

BREWSTER CREEK Before



BREWSTER CREEK After



Brewster Creek



YWCA Dam - 2004



DeSanto's Dam - 2006



Brewster Creek

New channel in former lake bed in 2004 - 4 months post removal



New channel in former lake bed in 2008 - 4 years post removal



Hofmann Dam Removal



River Road Dam Removal





Fox River

5/23/2013

W. Seimonauk St

Geno Farm Rd

West St

W Center St

River Rd



1998

Imagery Date: 5/23/2013

41°38'47.42" N 88°27'08.40" W elev 584 ft

Go



River Rd

Fish Evaluation Methods

PRE-PROJECT

Sampling Sites: ○


POST-PROJECT

“System-wide” effects

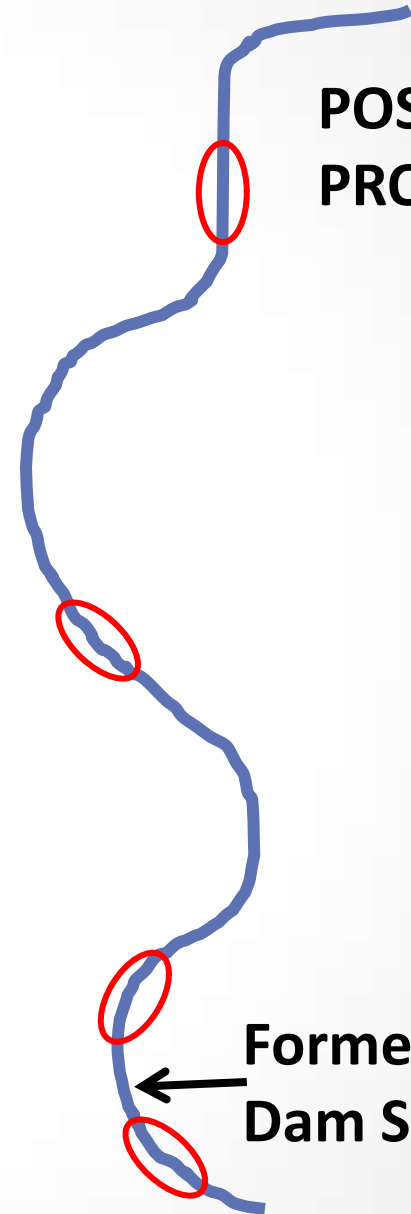
- Species distribution
- Habitat reconnection
 - Spawning runs
 - Seasonal migration

“Localized” effects

- Dam pool
- Downstream impacts

Dam Pool → 
← **Dam**

← **Former Dam Site**



Dam Fish Sampling

Dam	Stream	Year remvd	No. years in study	Pre Samples	Post Samples
YWCA	Brewster Creek	2006	7	2	5
Golf Course	Seavey Creek	2009	1	1	1
Creek Bend	Ferson Creek	2010	4	1	2
Hofmann	Des Plaines River	2012	14	6	3
River Road	Blackberry Creek	2013	3	1	2

Fish Evaluation Methods

Criteria:

- Fish species richness
- Catch Per Unit Effort (CPUE)
- Index of Biotic Integrity (IBI)

Analysis

- T-test
- Non-parametric
Multidimensional Scaling
(NMDS): Presence/Absence
- ANOVA w/ Tukey's HSD



**"Sister
Watersheds"**

Wadable: Electric Seine



Non-Wadable : Boat EF

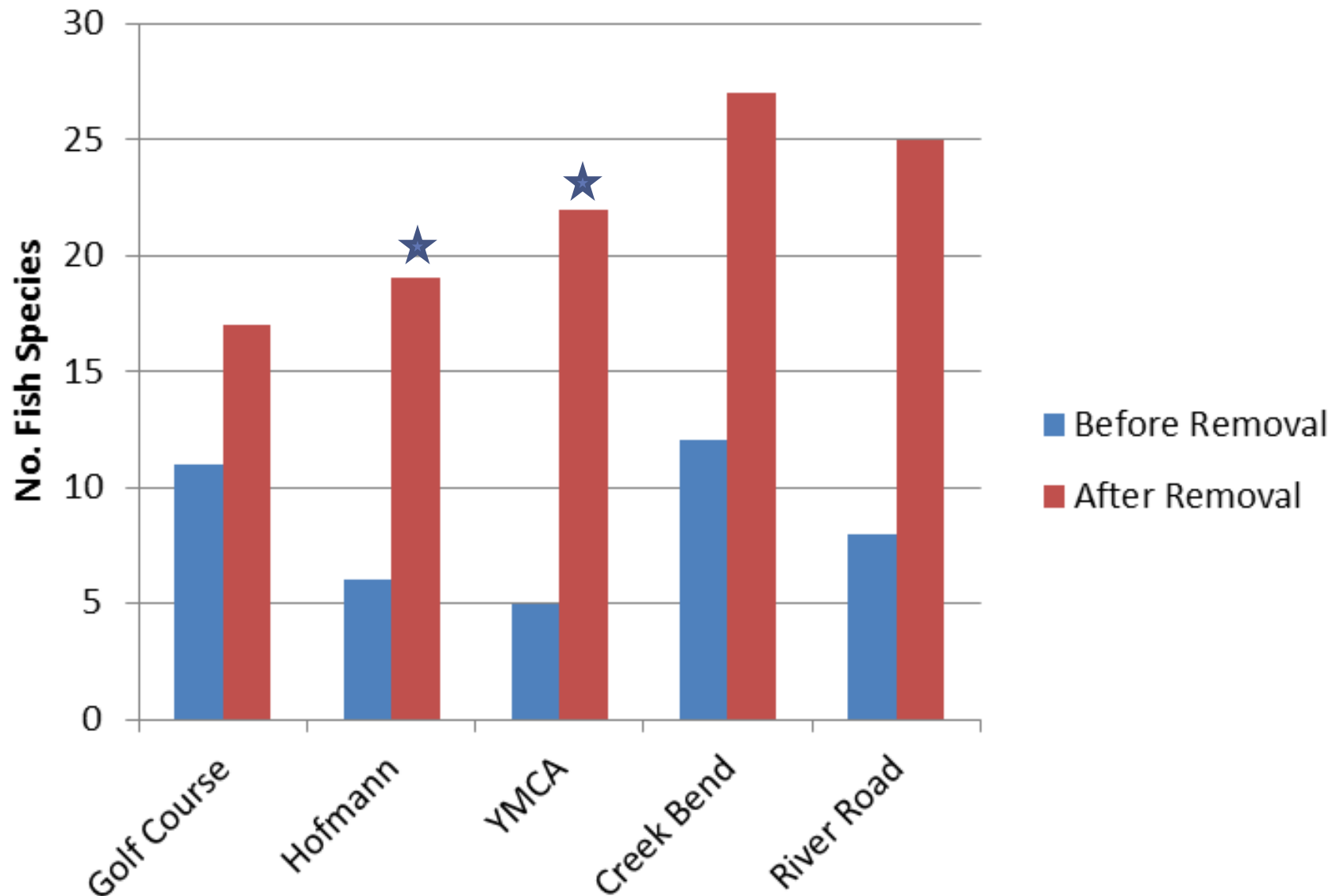


Index of Biotic Integrity – IBI

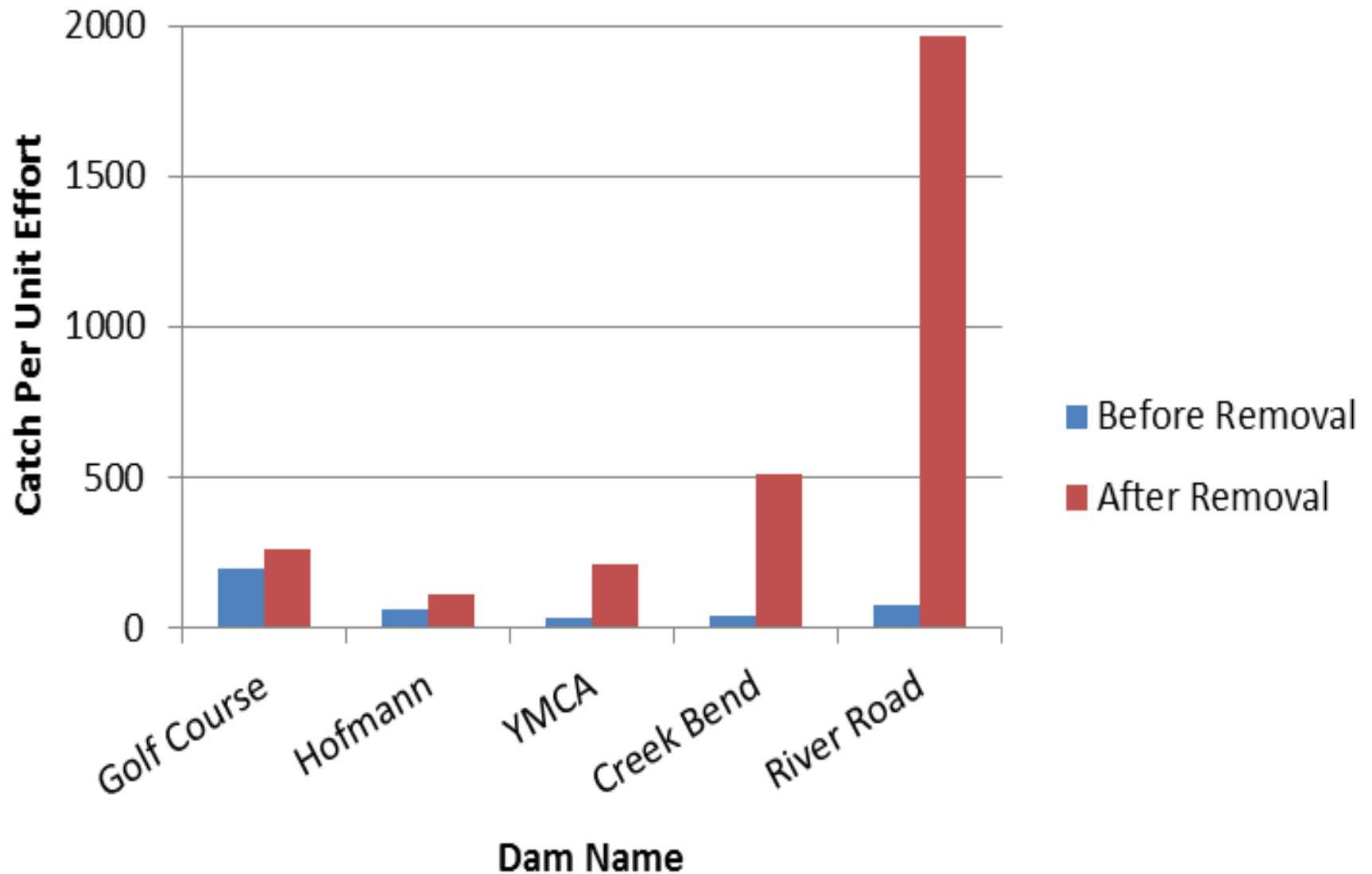
METRIC	SCORE
No. native fish species	0-6
No. sucker species	0-6
No. sunfish species	0-6
No. intolerant species	0-6
No. minnow species	0-6
No. benthic invertivore species	0-6
Prop. specialist benthic invertivores	0-6
Prop. generalist feeders	0-6
Prop. coarse mineral spawners	0-6
Prop. tolerant species	0-6
total	0-60

Difference of >10 = biologically meaningful change (Smogor 2005)

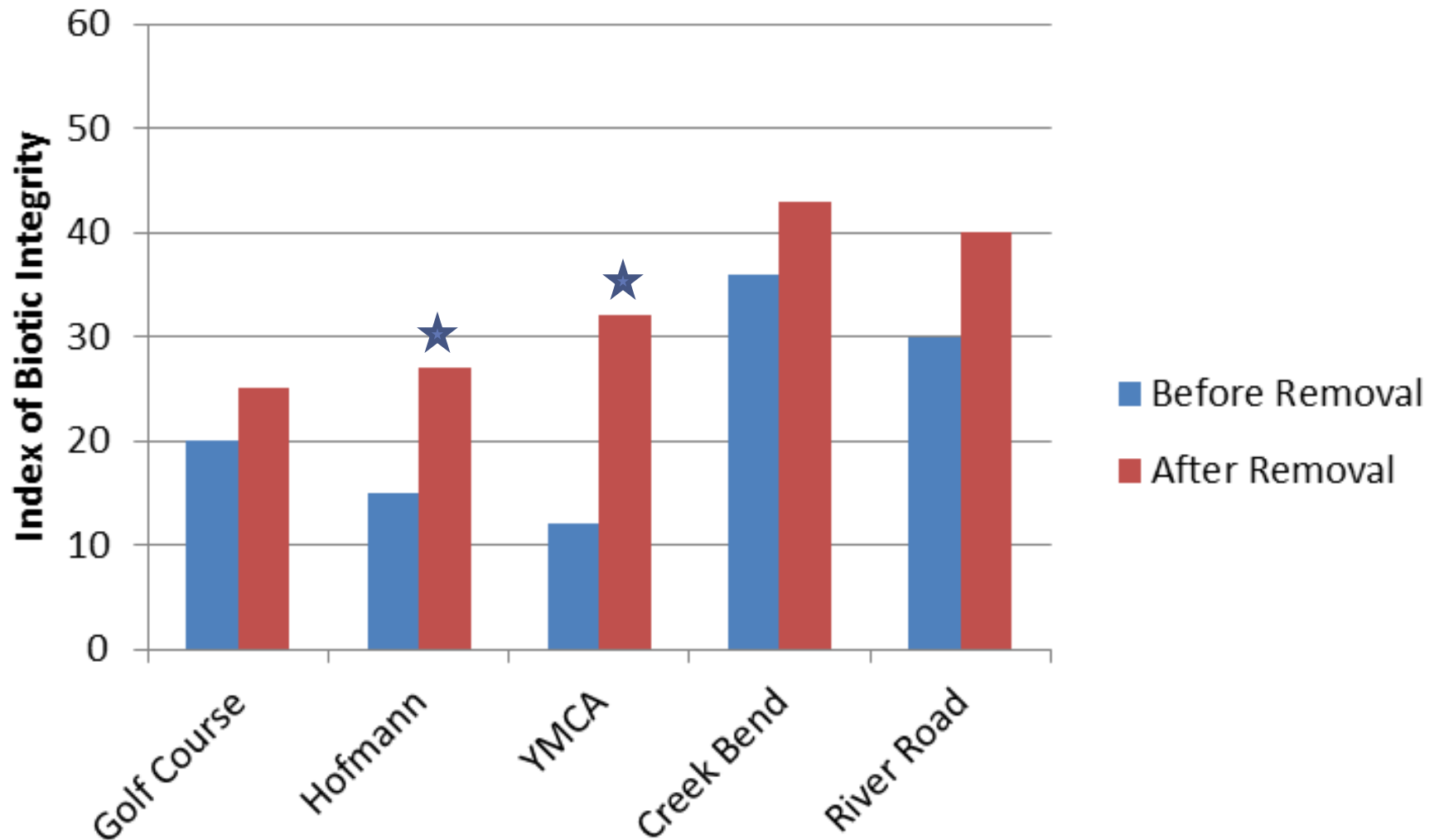
Species Richness in Dam Pool Area Before and After Removal



Catch Per Unit Effort in Dam Pool Area Before and After Removal



Index of Biotic Integrity in Dam Pool Area Before and After Removal

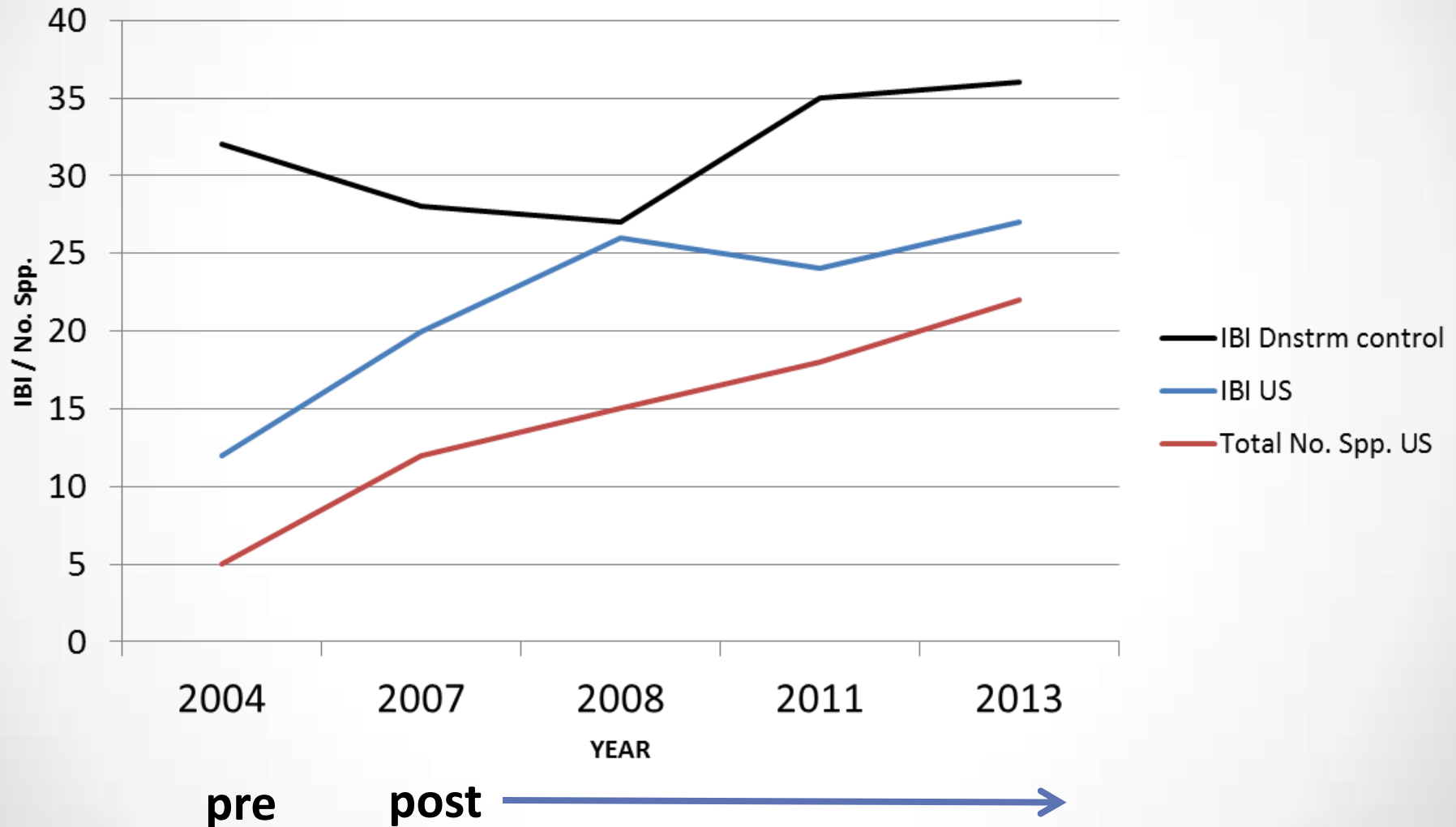


Results for all dams

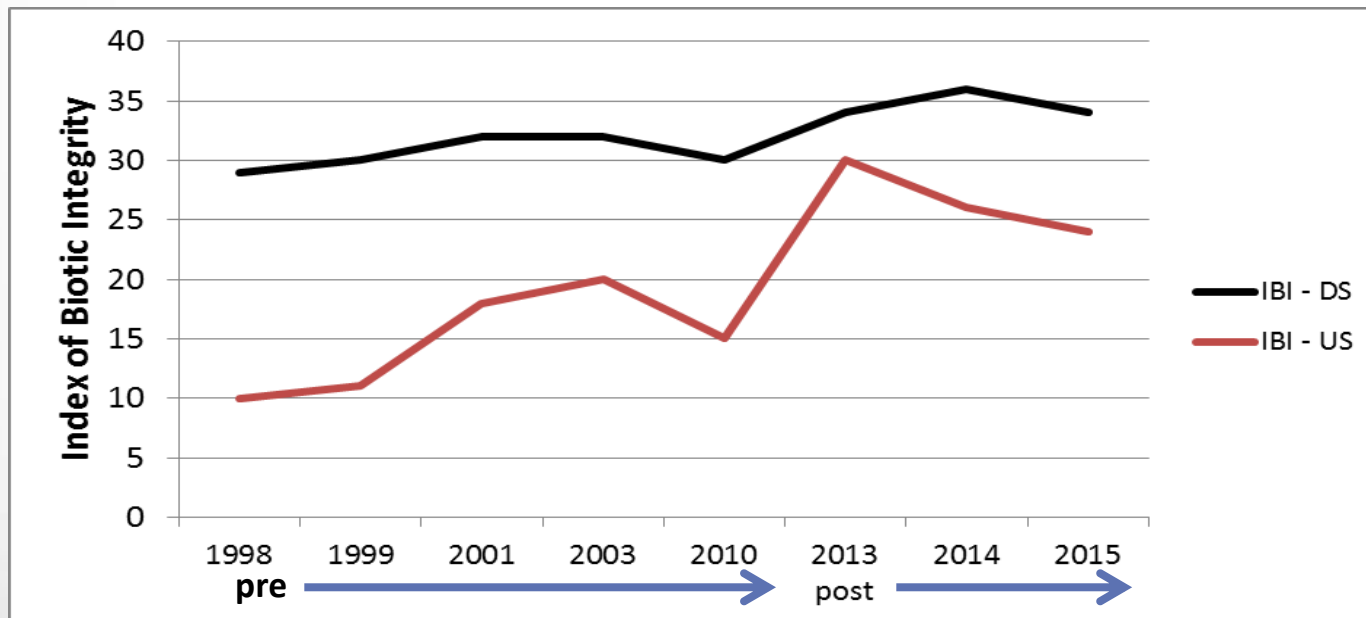
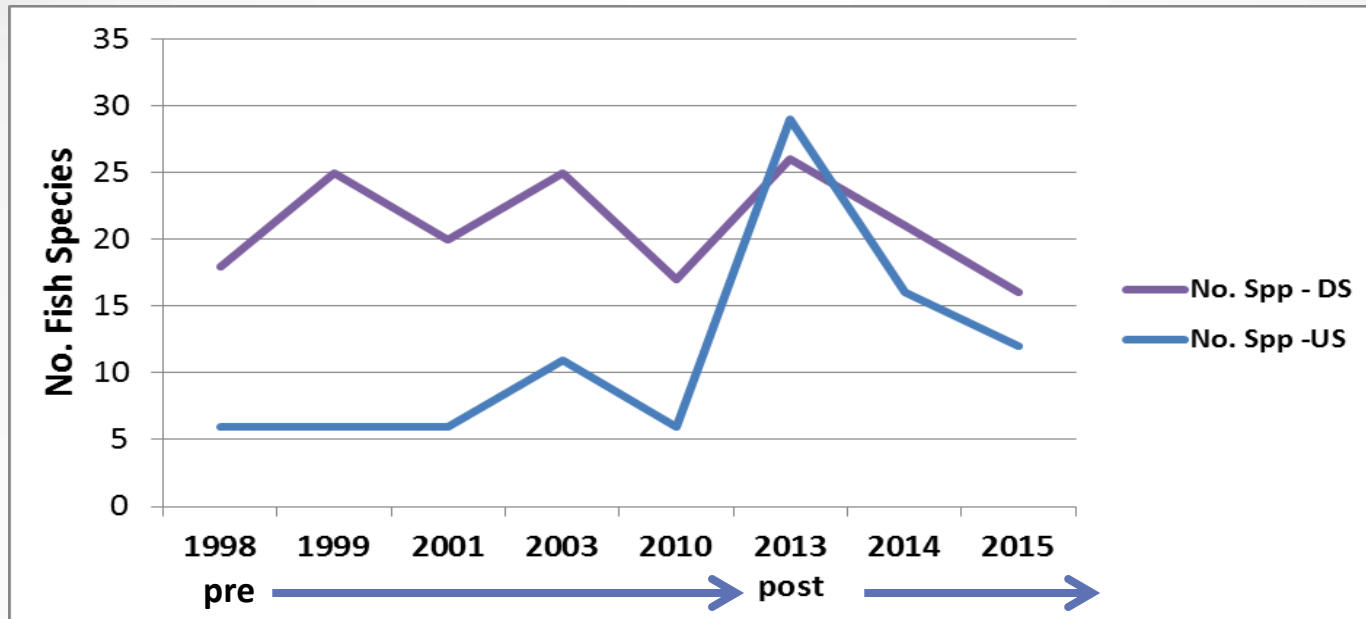
(CPUE = Catch per Unit Effort; IBI= Index of Biotic Integrity)

	No. Fish Species		CPUE		IBI	
Dam	Before	After	Before	After	Before	After
Golf Course	11	17	196	260	20	25
Hofmann	6	19	62	110	15	27
YMCA	5	22	31	213	12	32
Creek Bend	12	27	36	511	36	43
River Road	8	25	74	1967	30	40
mean	8.0	24.0	79.8	612.2	23.3	33.4
T-test	p=0.000175		p=0.100		p=0.0484	

YMCA Dam Removal - 2006

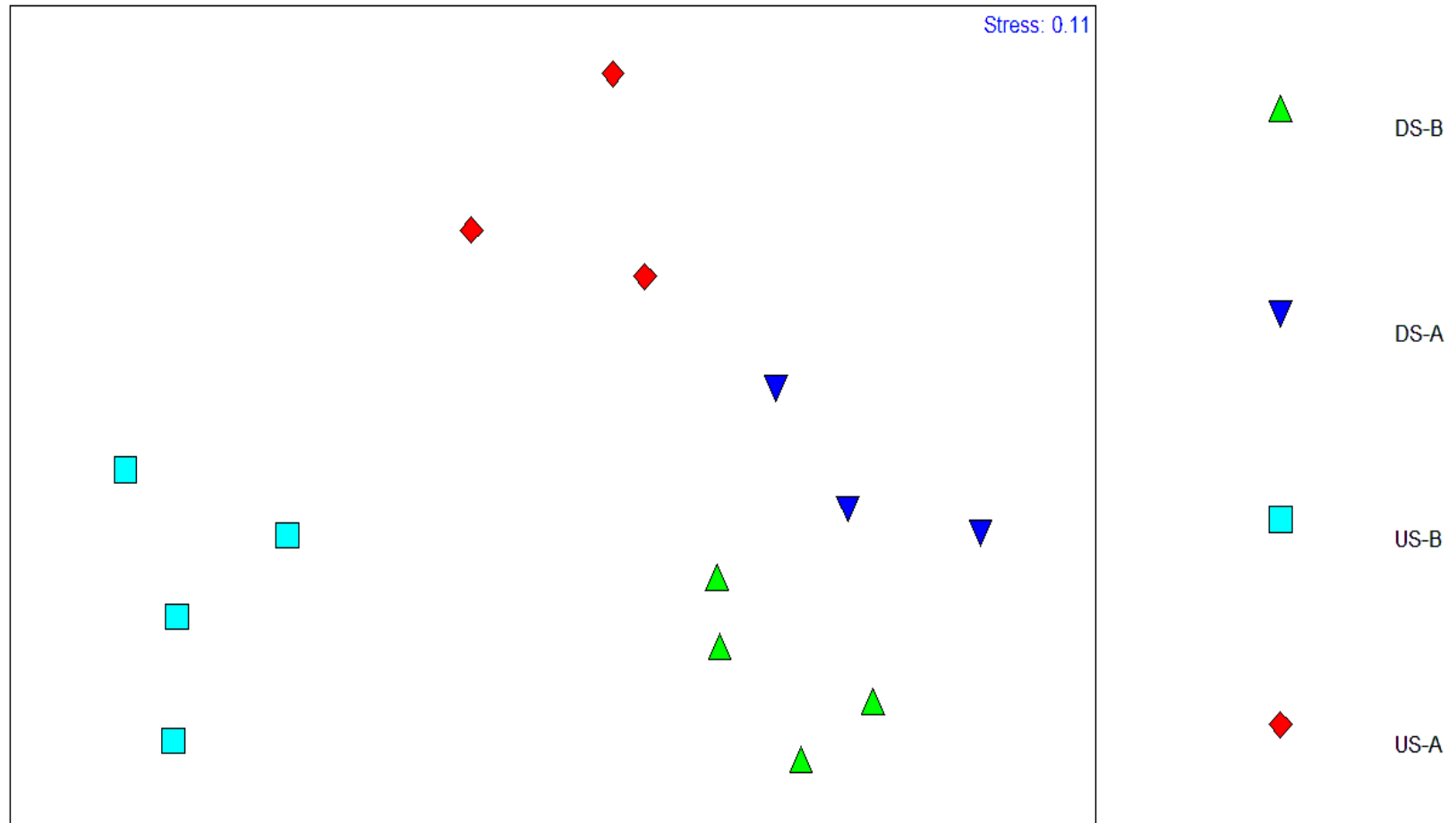


Hofmann Dam Removal - 2012



NMDS for Hofmann Dam samples (Bray's Similarity Presence/Absence)


Downstream Before (DS-B); Downstream After (DS-A)
Upstream Before (US-B); Upstream After (US-A)



"System-wide" Results

Dam Evaluations

Legend

 Dams Studied

Golf Course Dam

YWCA Dam

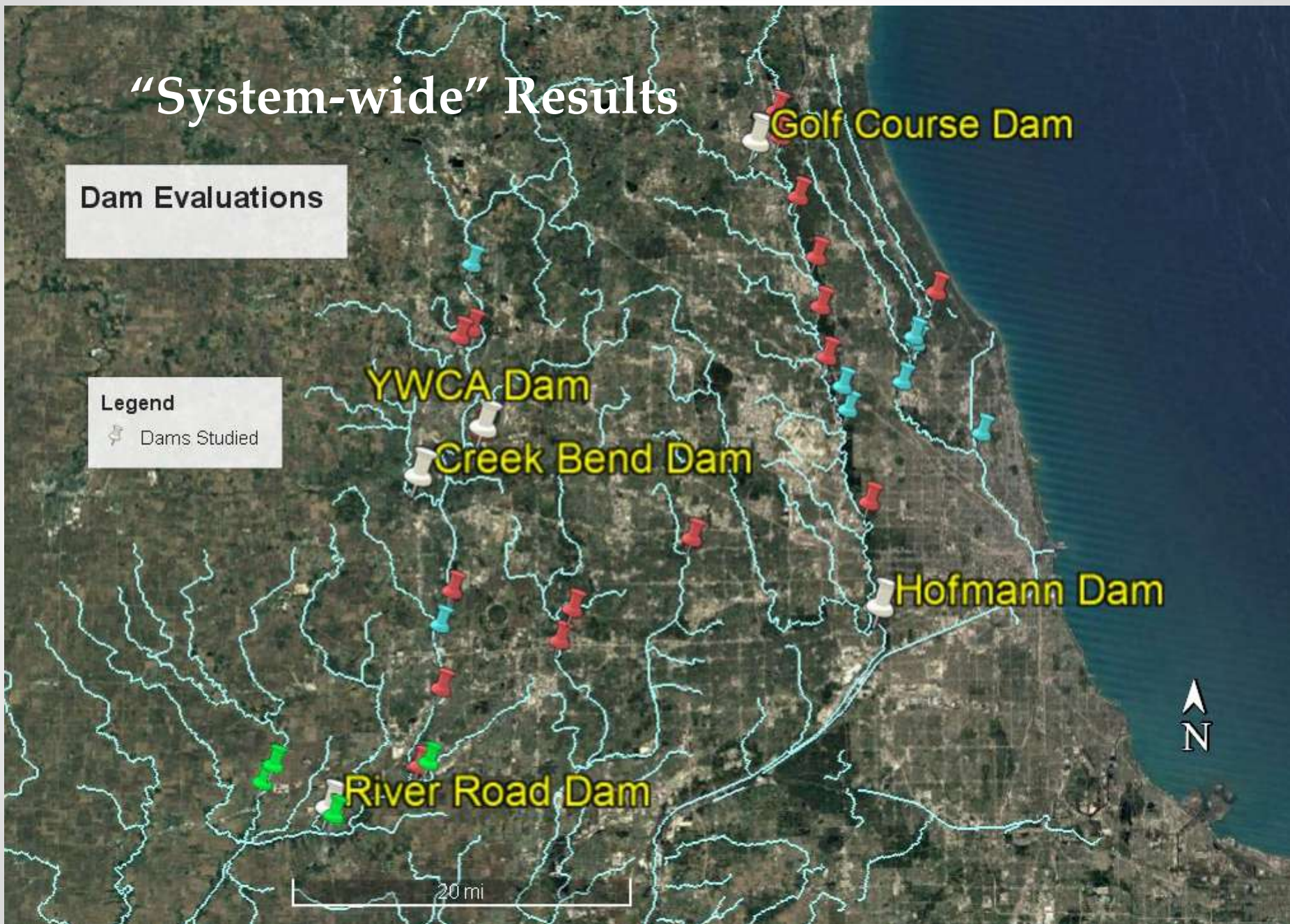
Creek Bend Dam

Hofmann Dam

River Road Dam

20 mi

N





**Riverine species in
Brewster Creek after removal**

Blackberry Creek

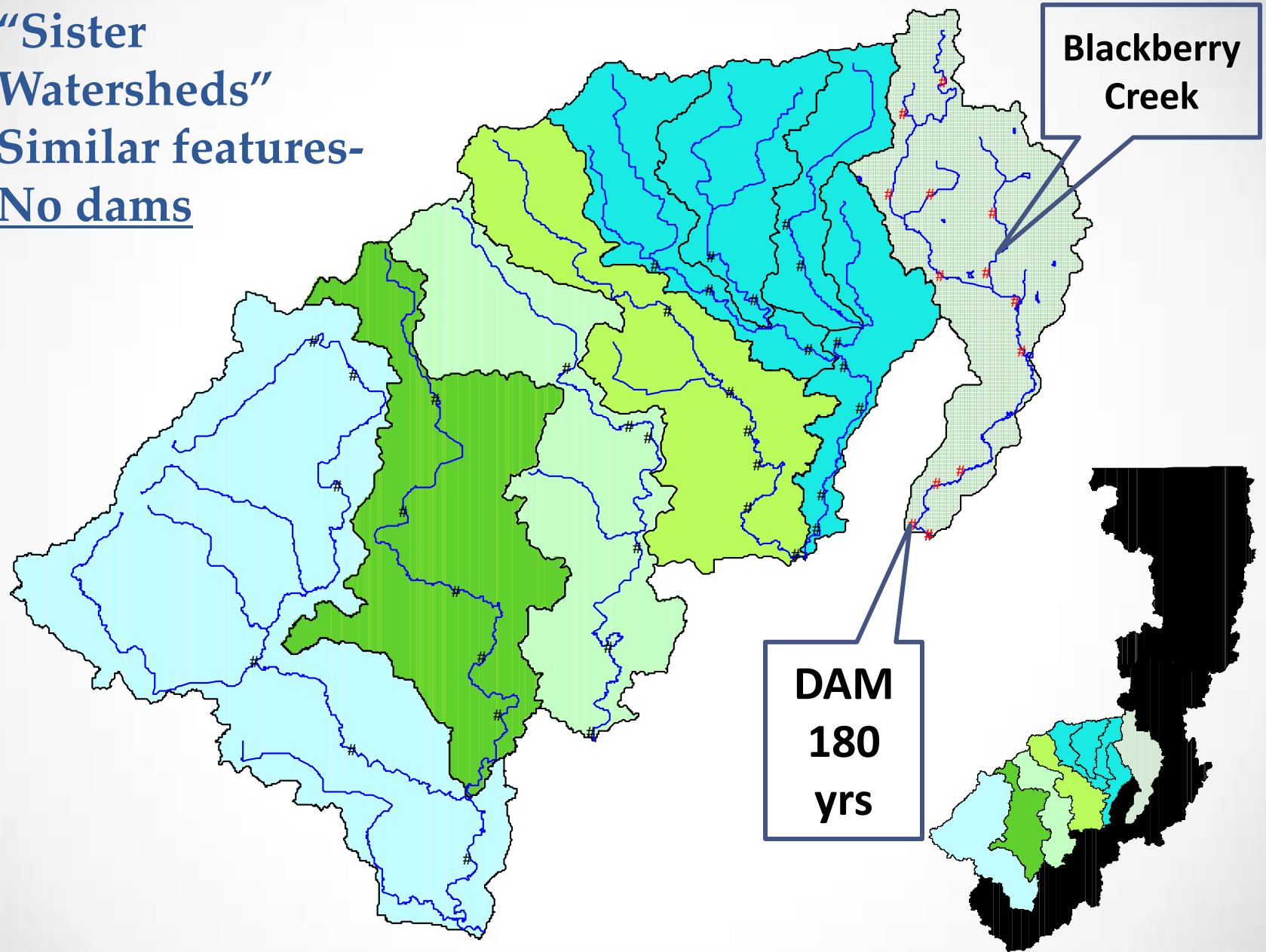
Spring 2013 – 2 weeks post removal

Shorthead Redhorse and Quilback Carpsucker spawning runs





“Sister
Watersheds”
Similar features-
No dams



**PRE – PROJECT : Fish species absent from
Blackberry Creek compared to neighboring,
un-dammed tributaries.**

Species	Blackberry	Big Rock	Somonauk	Indian	Little Indian	Little Rock
Rosyface Shiner	0	X	X	X	X	X
Southern Redbelly Dace	0	X	X	X	X	X
Largescale stoneroller	0	X	X	X	X	X
Shorthead Redhorse	0	X	X	X	X	X
Black Redhorse	0	X	X	X	X	0
Quillback	0	X	X	X	X	X
Banded Darter	0	X	X	X	X	X
Rainbow Darter	0	X	X	X	X	X
Orangethroat Darter	0	X	X	X	X	X
Channel Catfish (1996)	3	10	27	10	5	1
Smallmouth Bass (1996)	4	336	151	18	13	71

PRE-PROJECT: IBI Scores from Blackberry Creek
compared to neighboring, un-dammed tributaries
(ANOVA; $P = 9.65E-05$).

Sampling Site		Blackberry	Big Rock	Little Rock	Indian	Little Indian
DS	1	34	52	52	48	51
	2	34	59	48	53	49
	3	35	56	44	56	44
	4	35	58	45	49	47
US	5	33	57	43	40	35
mean		34.2	56.4	46.6	49.2	45.2
difference		---	+22.2	+12.4	+15	+11
Tukey's HSD		a	b	b	b	b

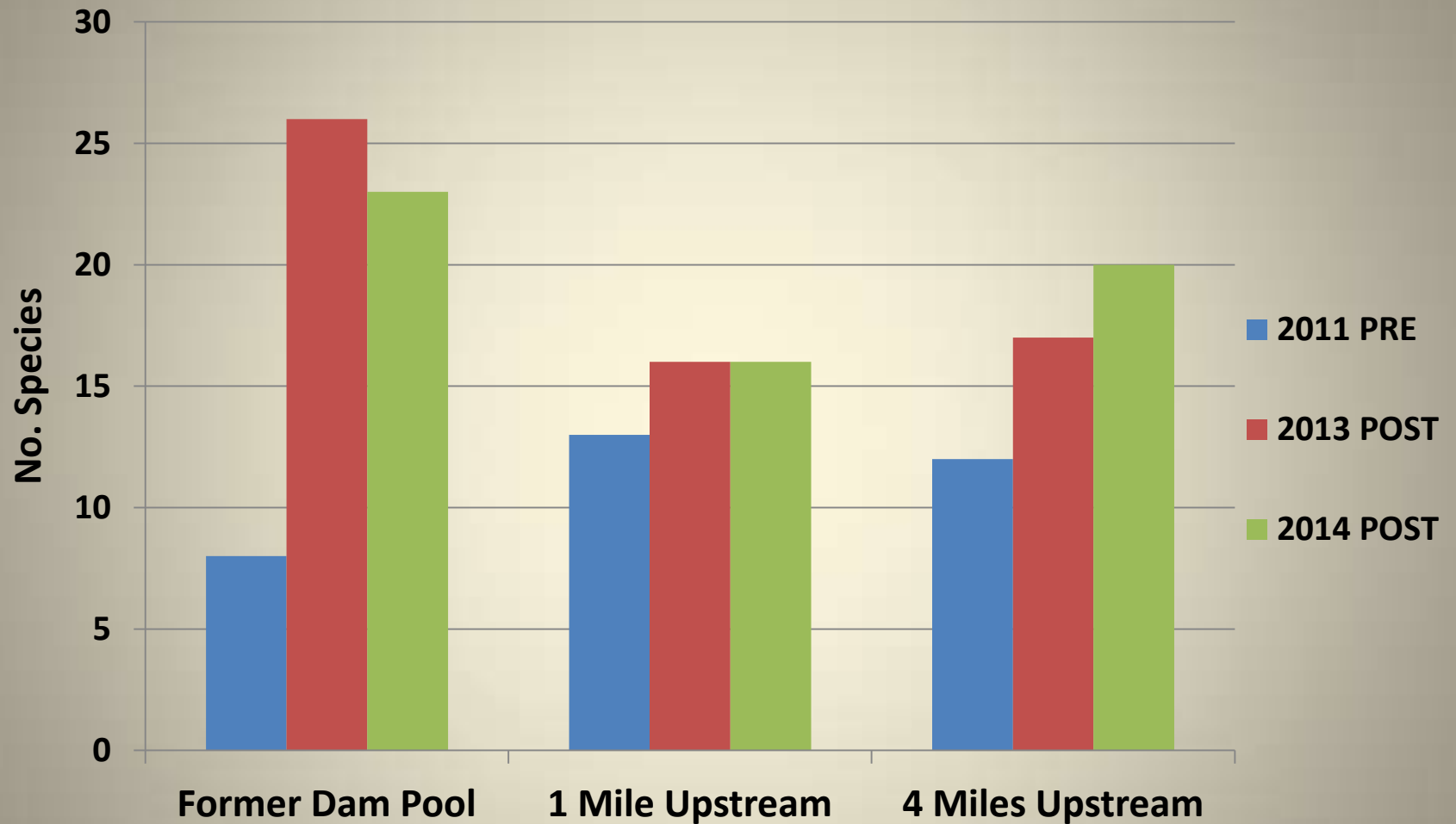
POST PROJECT - Blackberry Creek fish species compared to neighboring un-dammed tributaries

Species	Blackberry	Big Rock	Somonauk	Indian	Little Indian	Little Rock
Rosyface Shiner	√	X	X	X	X	X
Southern Redbelly Dace	0	X	X	X	X	X
Largescale stoneroller	√	X	X	X	X	X
Shorthead Redhorse	√	X	X	X	X	X
Black Redhorse	0	X	X	X	X	0
Quillback	√	X	X	X	X	X
Banded Darter	√	X	X	X	X	X
Rainbow Darter	0	X	X	X	X	X
Orangethroat Darter	√	X	X	X	X	X
Channel Catfish*	9 (3)	10	27	10	5	1
Smallmouth Bass*	44 (4)	336	151	18	13	71

*Y-O-Y present four miles upstream

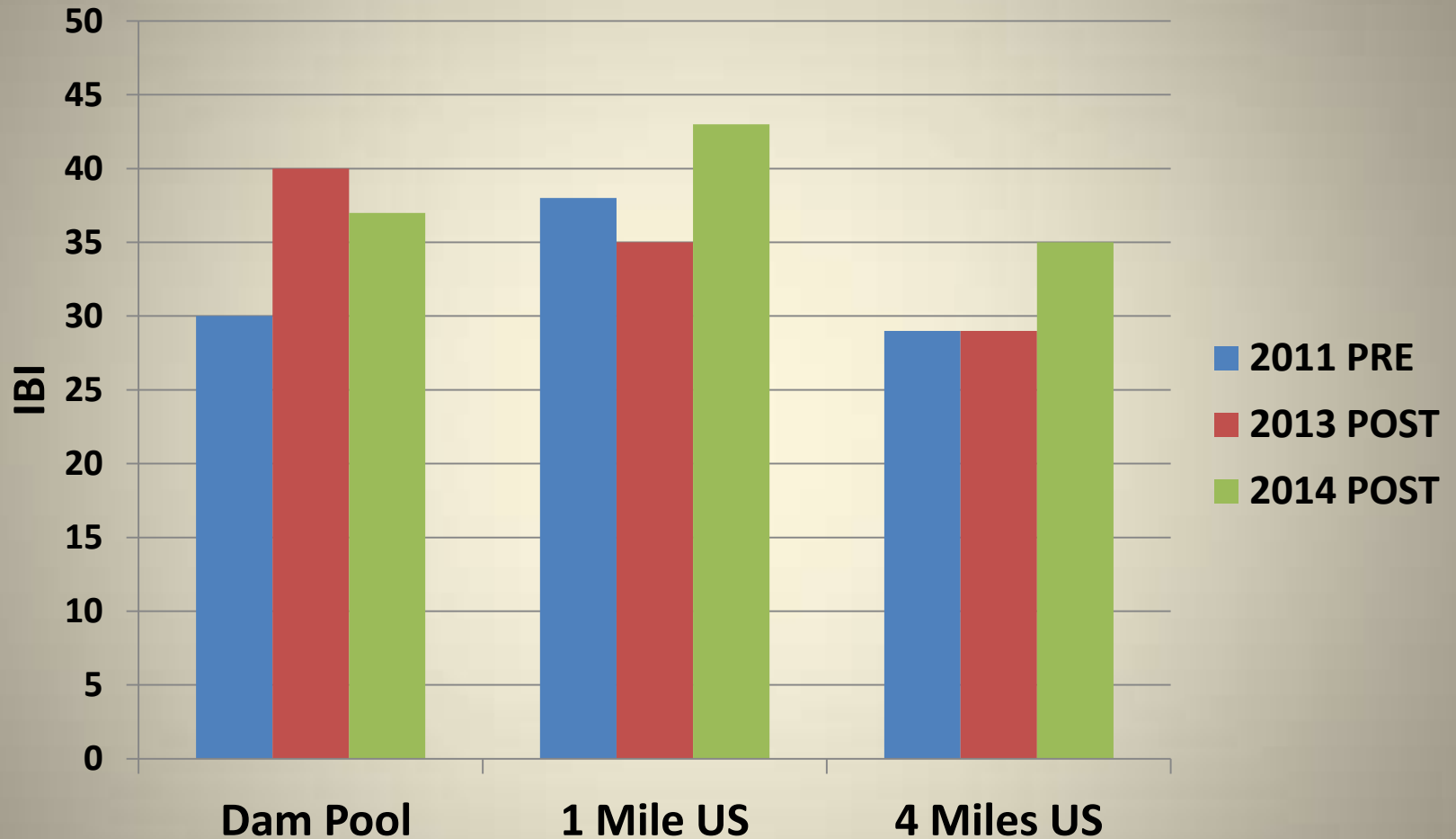
Blackberry Creek Dam Evaluation

No. species pre (2011) vs. post (2013, 2014)



Blackberry Creek Dam Evaluation

Index of Biotic Integrity (IBI) 2011 pre vs. post 2013, 2014



“System-wide” Results



	Brewster Creek	Des Plaines River	Seavey Creek	Ferson Creek	Blackberry Creek
New fish species upstream	11	5	7	3	12
Longnose Gar					X
Golden Shiner	X				
Creek Chub			X		
Hornyhead Chub			X		
Largescale Stoneroller					X
Central Stoneroller	X		X		
Common Shiner	X		X		
Spotfin Shiner	X				
Rosyface Shiner		X			X*
Sand Shiner	X				
Quillback	X				X
Highfin Carpsucker					X
Shorthead Redhorse					X
Channel Catfish	X	X		X	X*
Flathead Catfish	X				X
Yellow Bullhead			X		
Black bBullhead			X		
Stonecat	X				
Slender Madtom					X
Mottled Sculpin				X	X
Yellow Bass		X			
Smallmouth Bass	X	X		X	X*
Logperch		X			
Johnny Darter			X		
Banded Darter	X				X
Orangethroat Darter					X

Fish Passage Projects

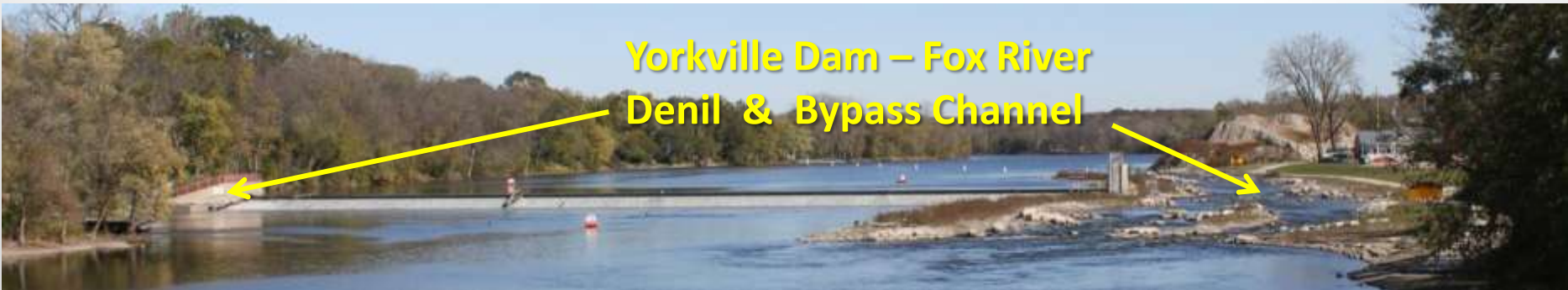
Big Rock Creek Ramp



Big Rock Creek Bypass



**Yorkville Dam – Fox River
Denil & Bypass Channel**



Evaluation of Dam Removals - Summary

- Fish assemblages improved at all dams across a ranges of dam sizes and watershed conditions.
- Repopulation of former dam pool very rapid; reliant on recruitment source – No. fish species increase 3X
- Index of Biotic Integrity increase in former dam pool – statistically and “biologically” significant (>10 points).
- Catch per unit effort increase variable; average increase 7X in former dam pool area
- Tributary spawning runs re-established rapidly, also benefiting mainstem populations
- “Missing” fish species repopulate upstream segments
- Fish passage structures used by variety of species; connection partial; all require rebuild and/or maintenance

Dam Removal: Before



Carp Infestations



water quality, flood storage, sediment control,
reduced odors.



Facing Downstream

OLD DAM
LOCATION





