

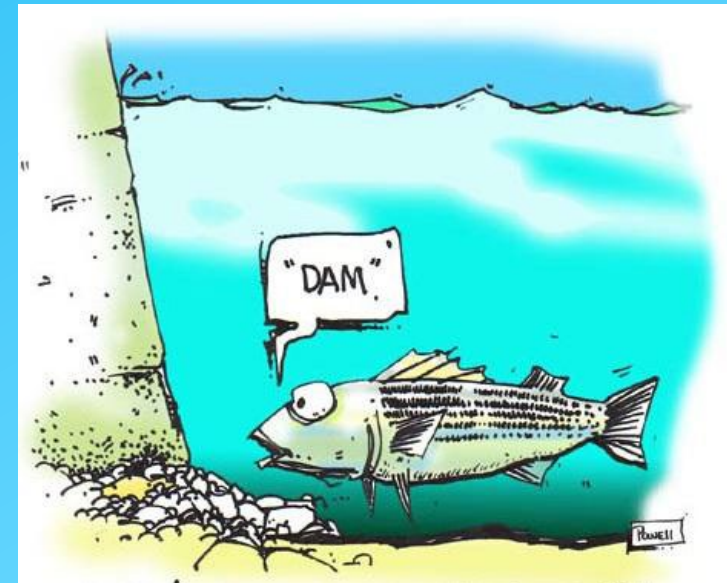
# Wilmington Dam Removal

City Board Meeting 9/9/21

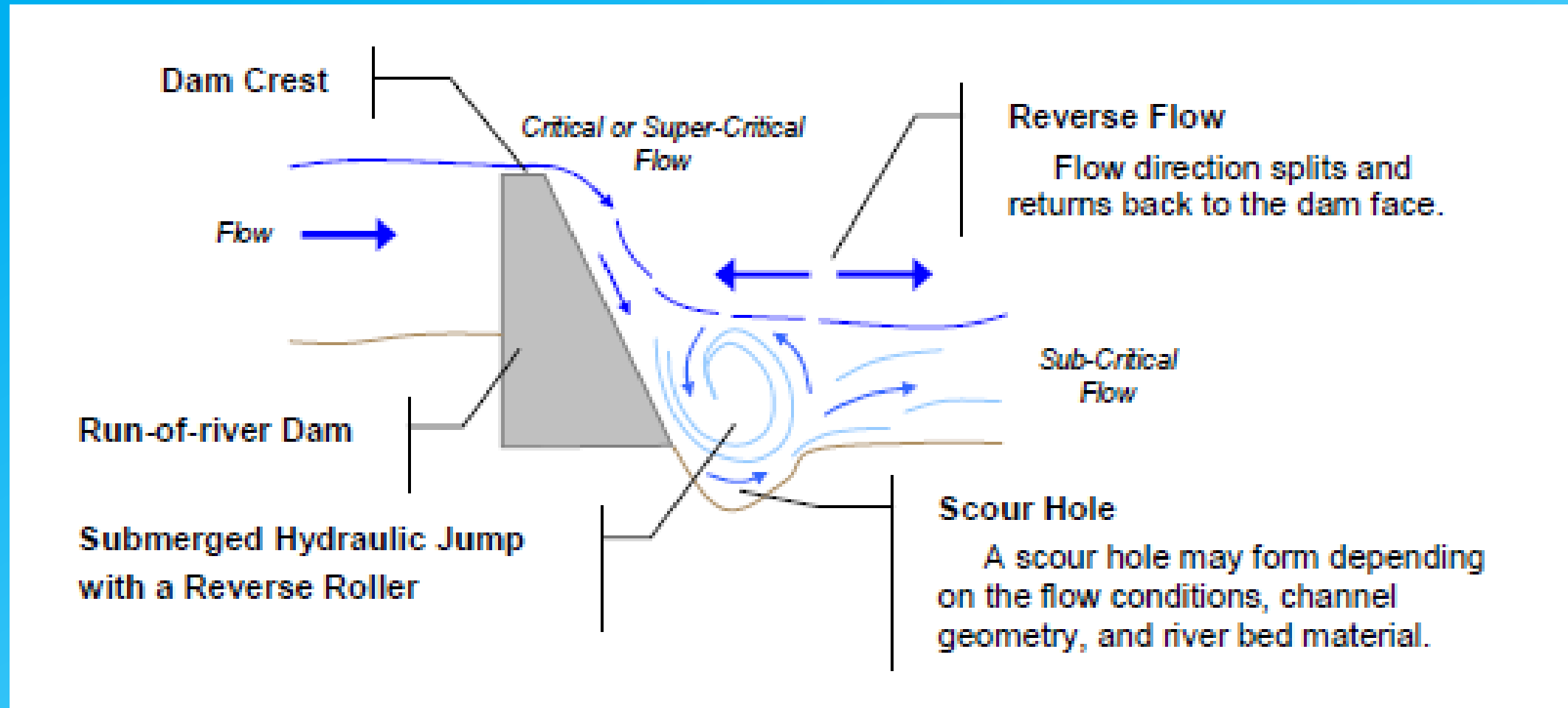


# Purpose of the Presentation

- Why Dam Removal?
  - Public Safety
  - Water Quality / Aquatic Habitat
  - Fish passage
  - Improved Recreation
  - Economic Benefits
- Steps Moving Forward



# Public Safety – Submerged Hydraulic Roller



# Public Safety

- Risk of life loss due to hydraulic roller below each dam
  - Watercraft going over the dam
  - Fishermen getting too close from downstream
  - Falling in at the abutments
- Reduce risk of emergency responders or good Samaritans to put themselves in harms way





# Recreation Goals

- Enhance the recreational usage for watercraft
- Enhance recreational fishing opportunities
- Create a safe, natural area for the public to enjoy



# Economic Benefits

- No Structure Maintenance Costs
- No Sediment Removal
- Less Downstream Erosion Repair Costs
- Emergency Response Costs
- Liability Lawsuits / Insurance

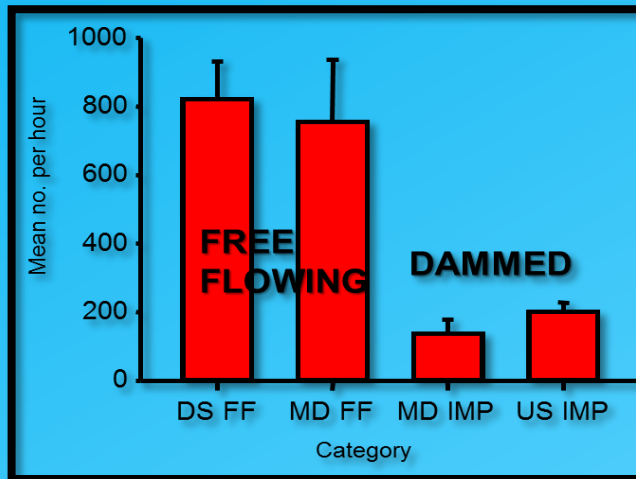
# Ecosystem Impacts

- Dams have negative impacts on aquatic ecosystems; a primary factor in the loss of fish and mussel species diversity in North America
- There are few things that have such a fundamental impact on rivers, with approximately 90,000 dams on rivers in the U.S. ([Americanrivers.org](http://Americanrivers.org))
- Dams block movements of fish and mussels, impacting life history functions, like spawning, foraging, and overwintering
- Prevent re-colonization after droughts, floods, or human induced extirpations resulting from water quality and/or habitat degradation
- Inundate natural habitat; covering riffles and causing deposition of sediment in the pooled area upstream
- Pooled areas often have poor water quality due to excessive algal growth in the slow moving water, leading to wide swings in dissolved oxygen
- 1,605 dams have been removed in the US improving habitat and water quality, and reconnecting isolated stream and river segments

The problems with dams include local effects in the pooled area immediately upstream of a dam and system-wide effects resulting from blockage of fish movements

## Local Effects

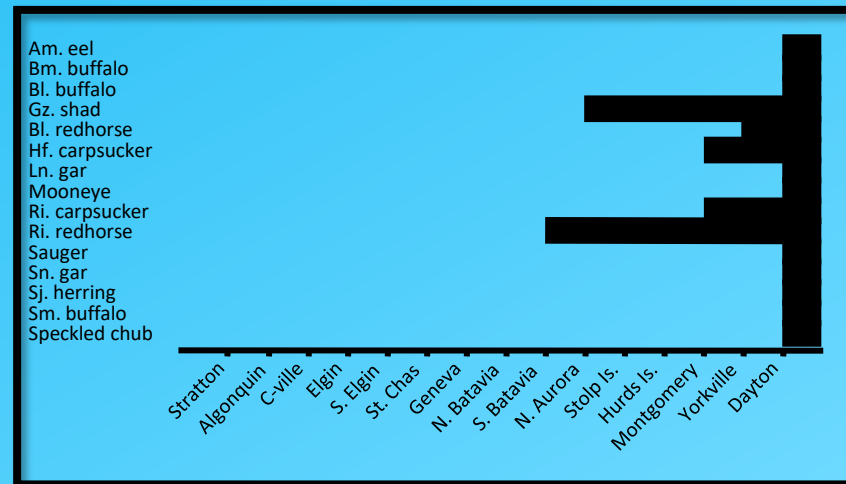
- Degrades habitat, sediment covers rocks, riffles, natural pools
- Degrades water quality by excessive algal growth and sediment decay
- Reduces aquatic insects – primary food for fish
- Eliminates mussel community



Average number of fish collected by electrofishing in free flowing area downstream vs. upstream impounded area for 15 dams on the Fox River.

## System-wide Effects

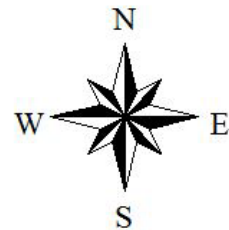
- Fragments river affecting fish distribution
- Barrier to spawning, foraging movements
- Isolates critical habitats: tributaries, and overwintering, and nursery areas
- Prevents re-colonization of areas impacted by floods, droughts and water pollution



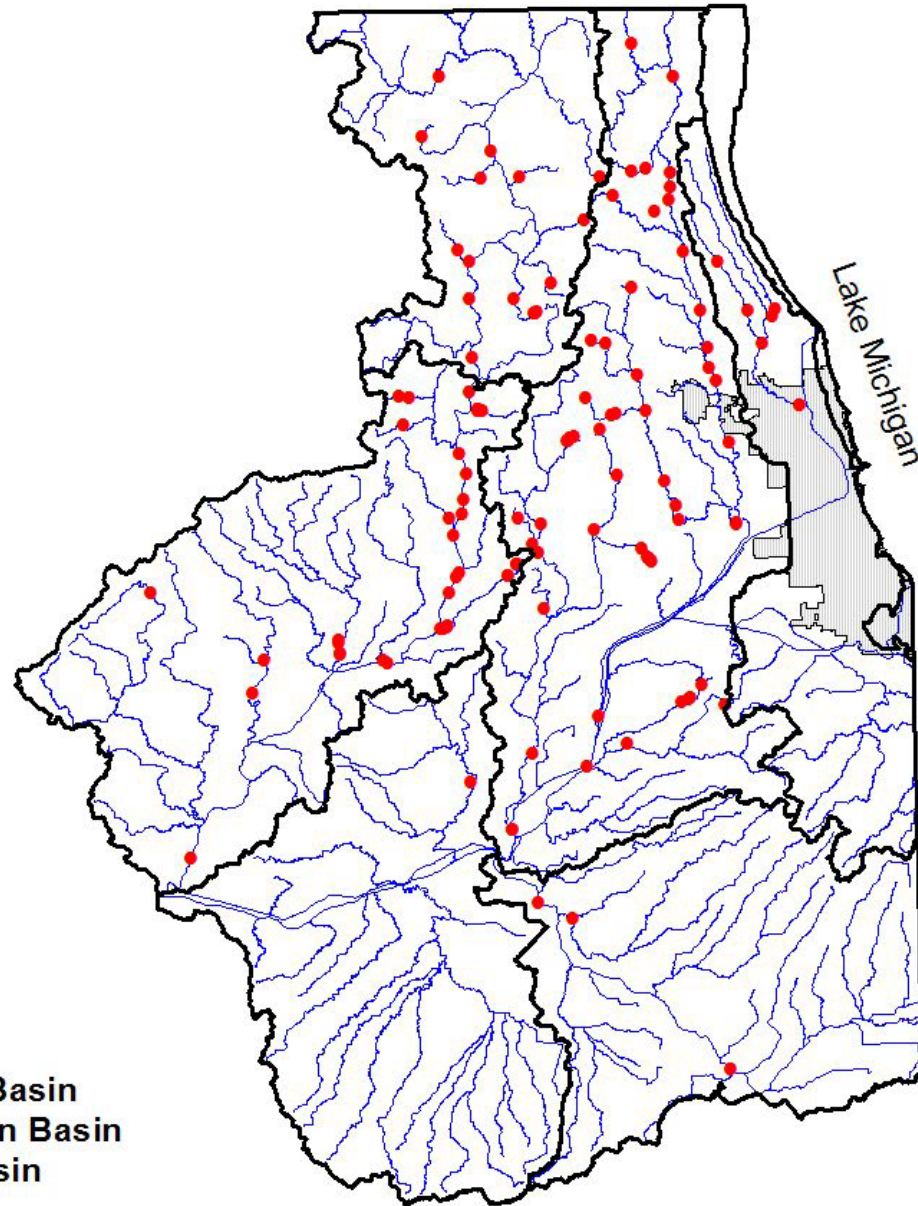
Fish species whose distribution is affected by Fox River Dams. Bars represent furthest upstream extent left from downstream of the Dayton Dam (five miles upstream of Illinois River).



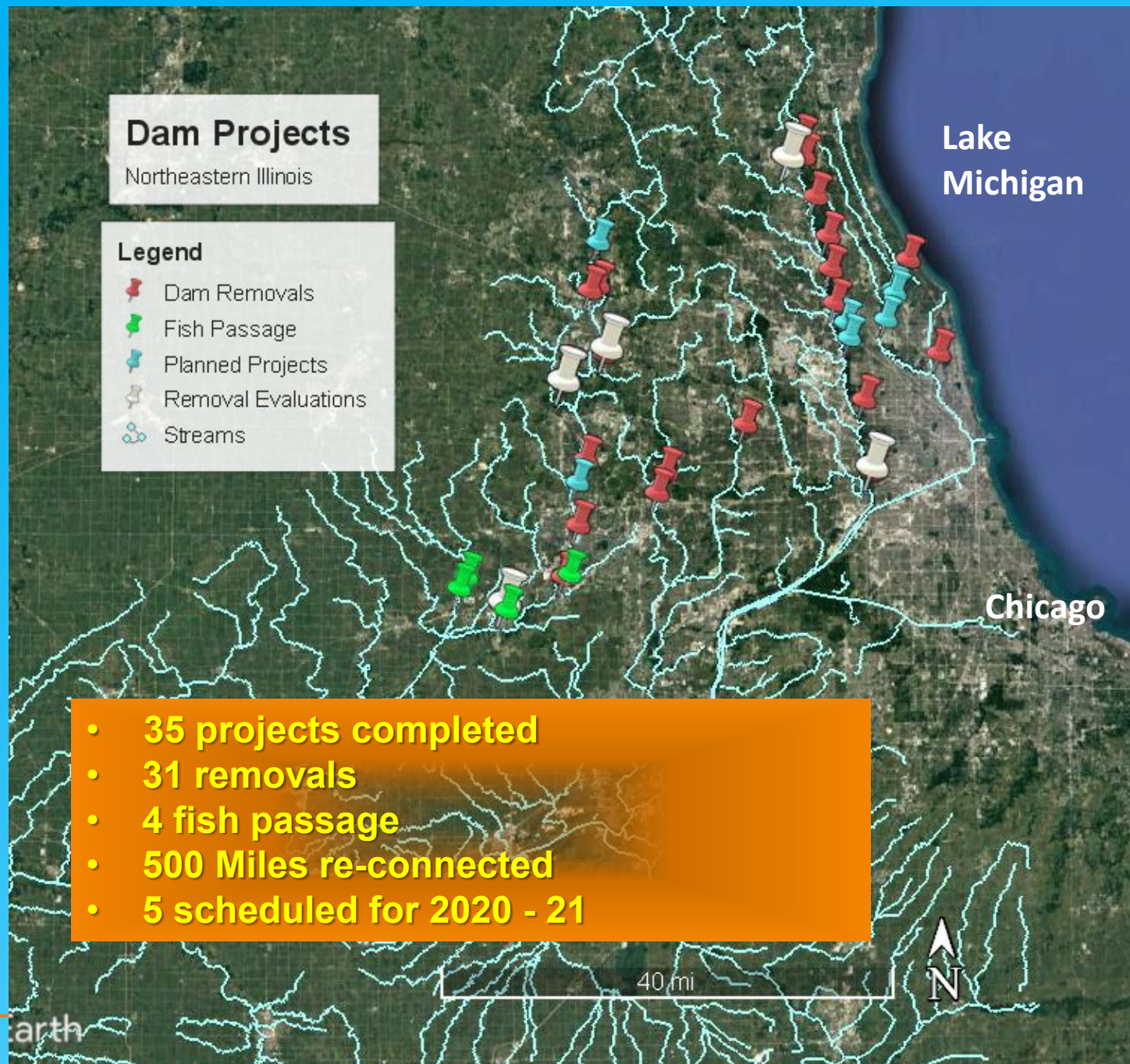
# NE Illinois Dams



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







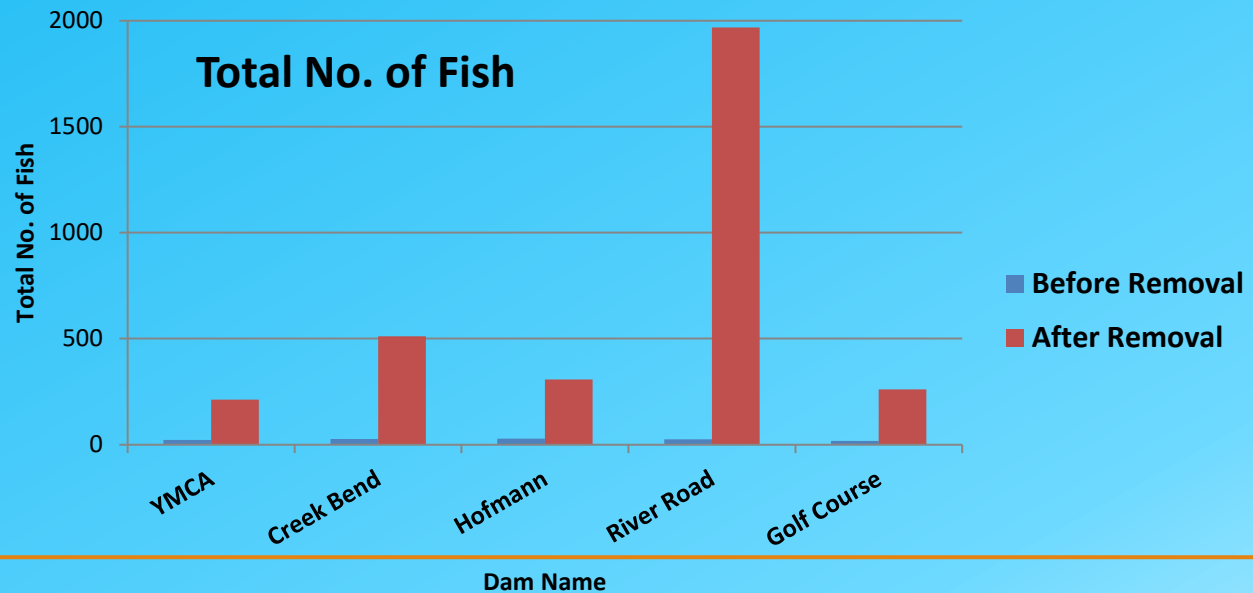
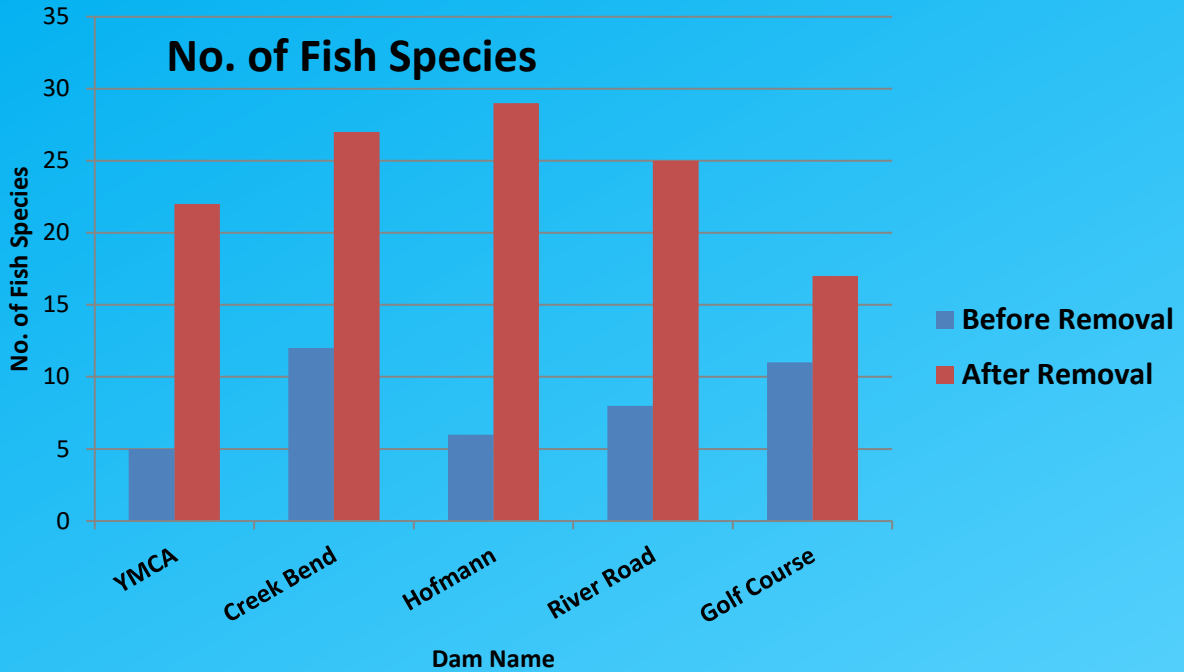
- **35 projects completed**
- **31 removals**
- **4 fish passage**
- **500 Miles re-connected**
- **5 scheduled for 2020 - 21**



## IDNR Fisheries Studies

Five NE IL Dam Projects;  
Change in Upstream Area

- Species ↑ 3X
- Abundance ↑ 6-fold
- IBI ↑ 40%

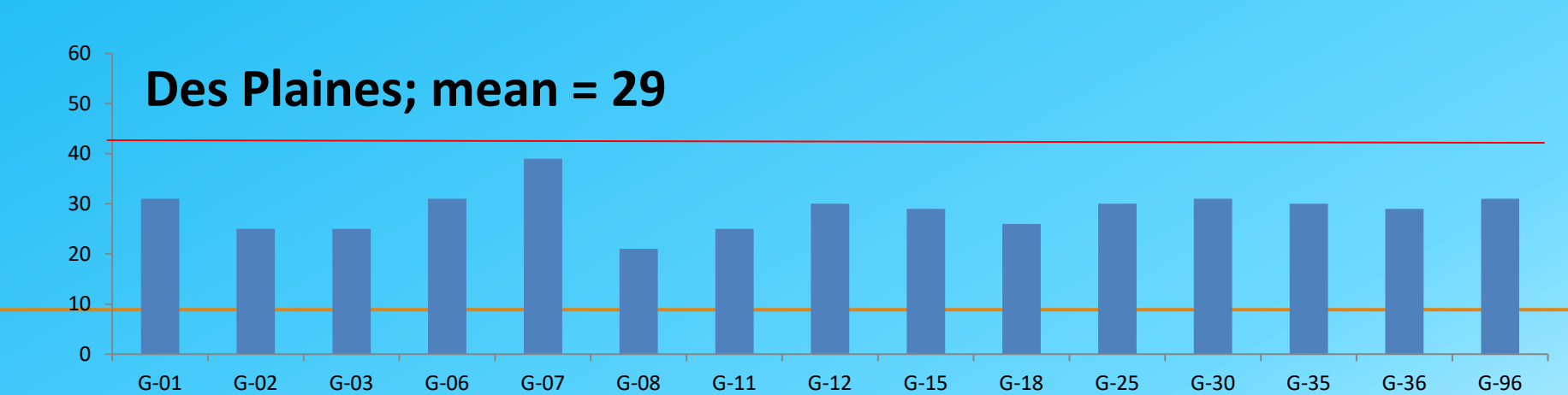
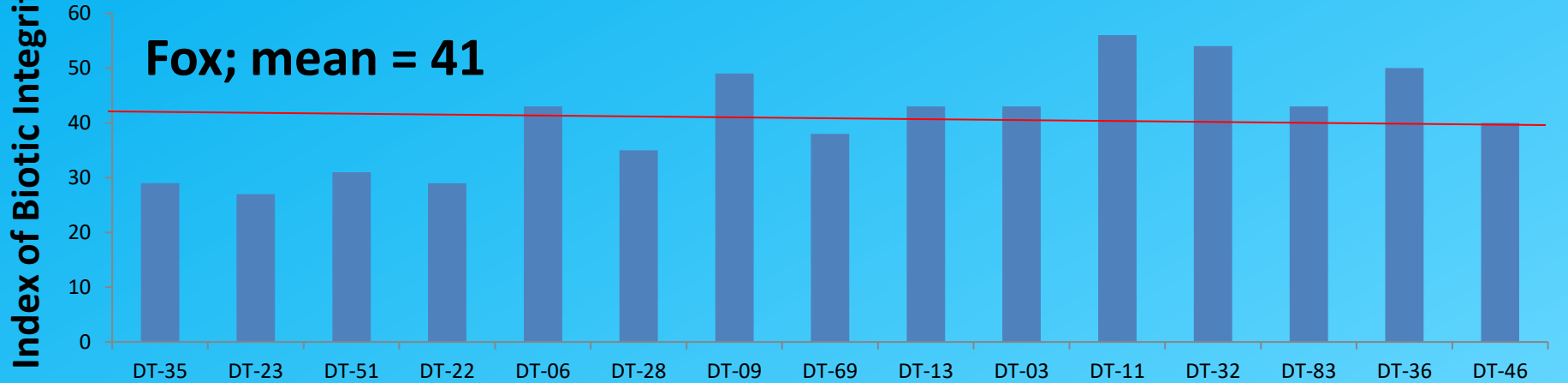
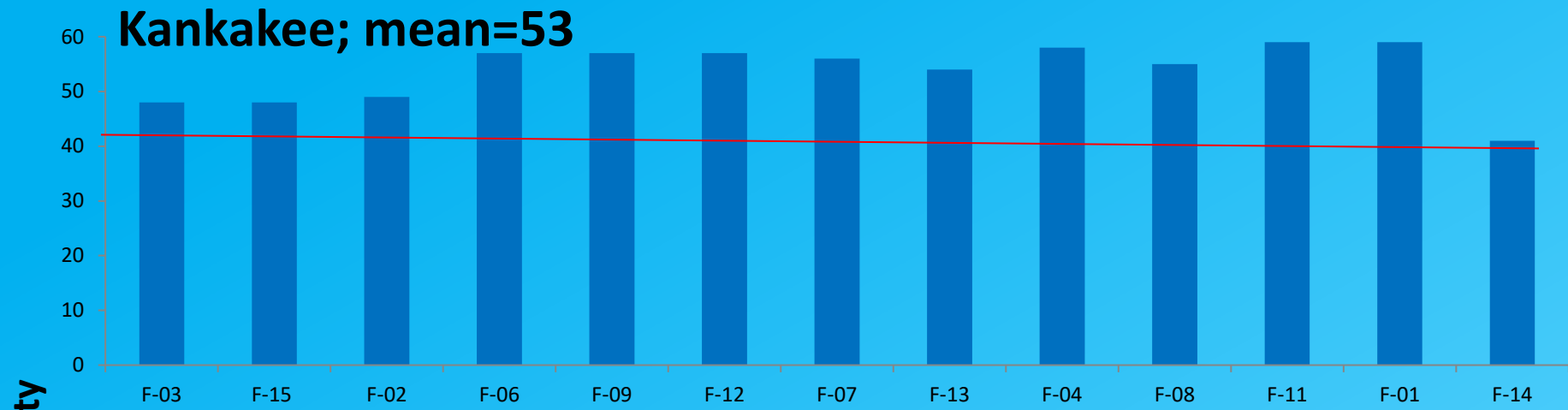


# STREAM REPORT CARD

## Index of Biotic Integrity - IBI

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





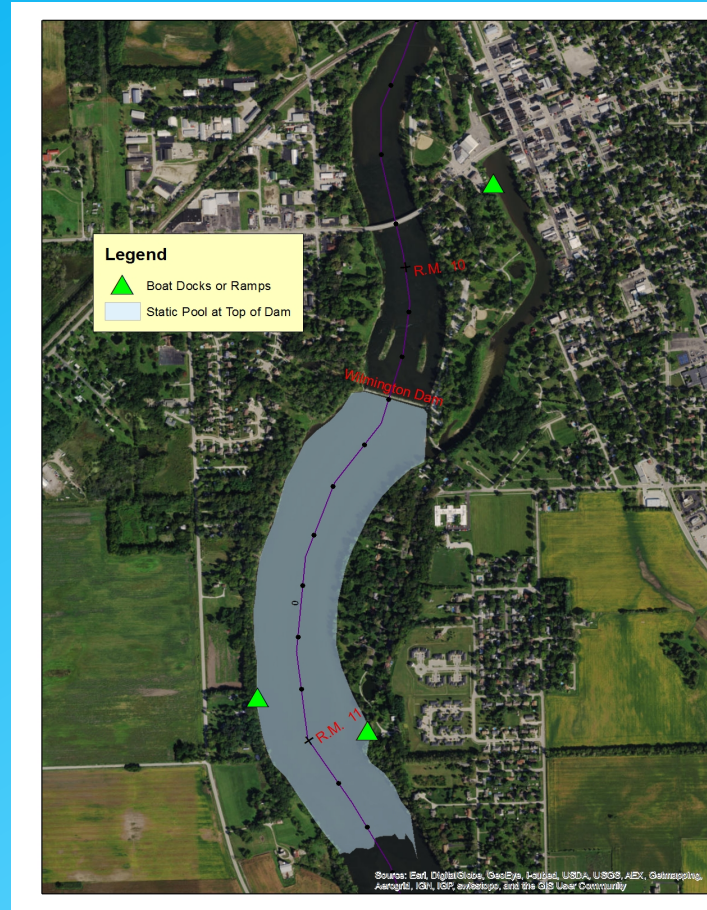
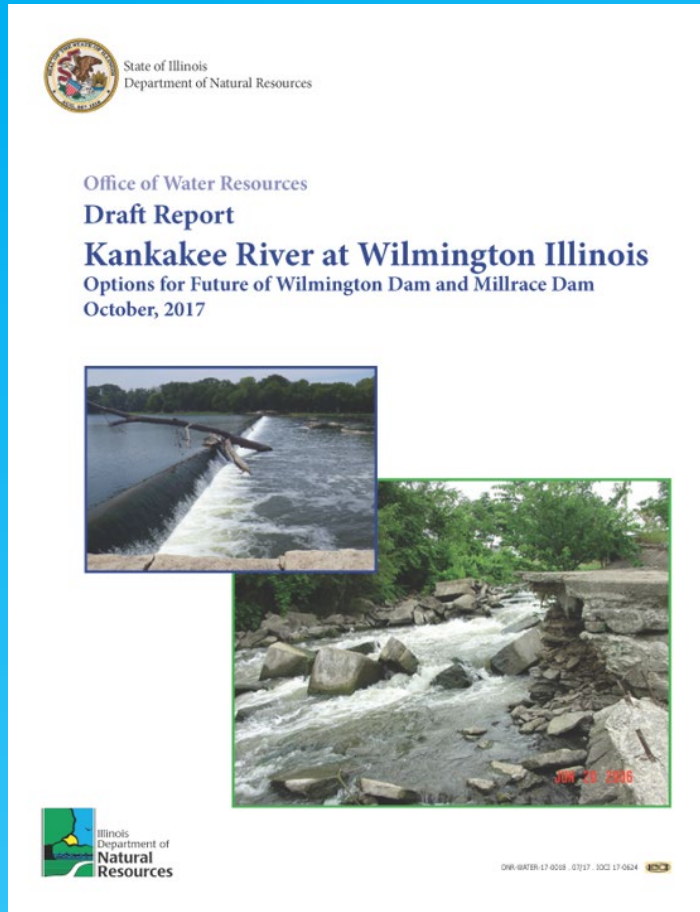


# Kankakee River is a species rich, high quality system, among best in Illinois

- Not sure what the future holds:
  - Global warming
  - Urbanization
  - Changes in water quality
  - Localized fish die offs
  - Sedimentation
- Connection to downstream recruitment source is essential to preserve it for future generations



# IDNR Draft Report



## 3 Alternatives Investigated

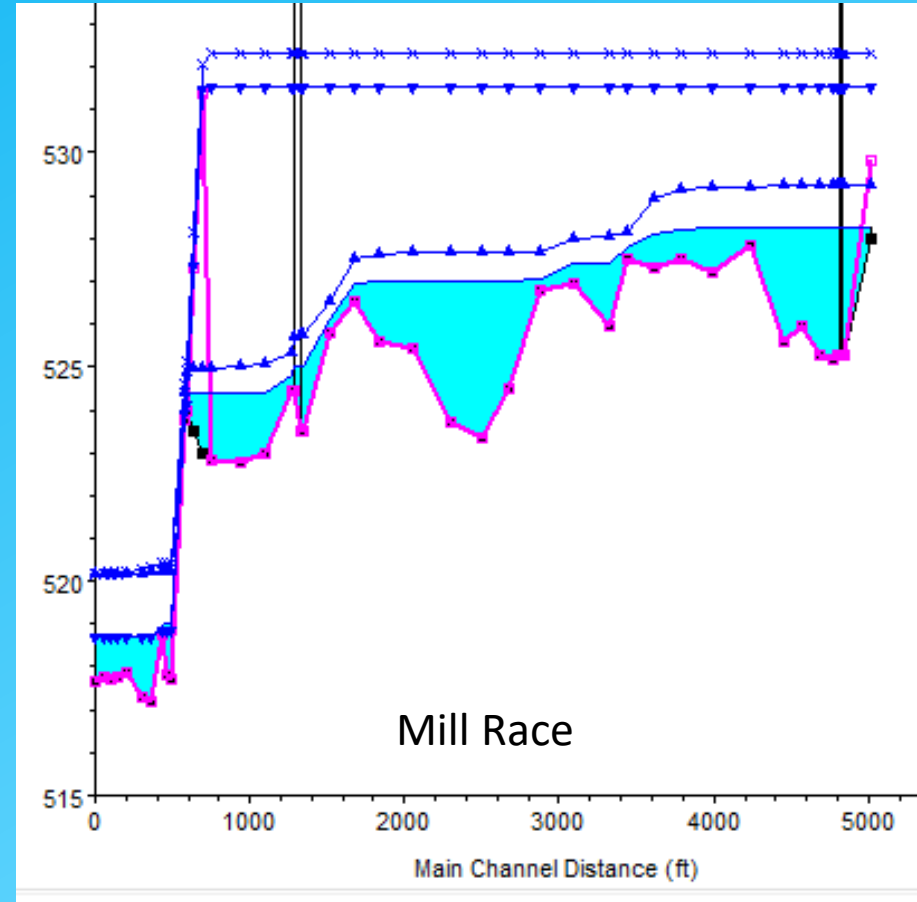
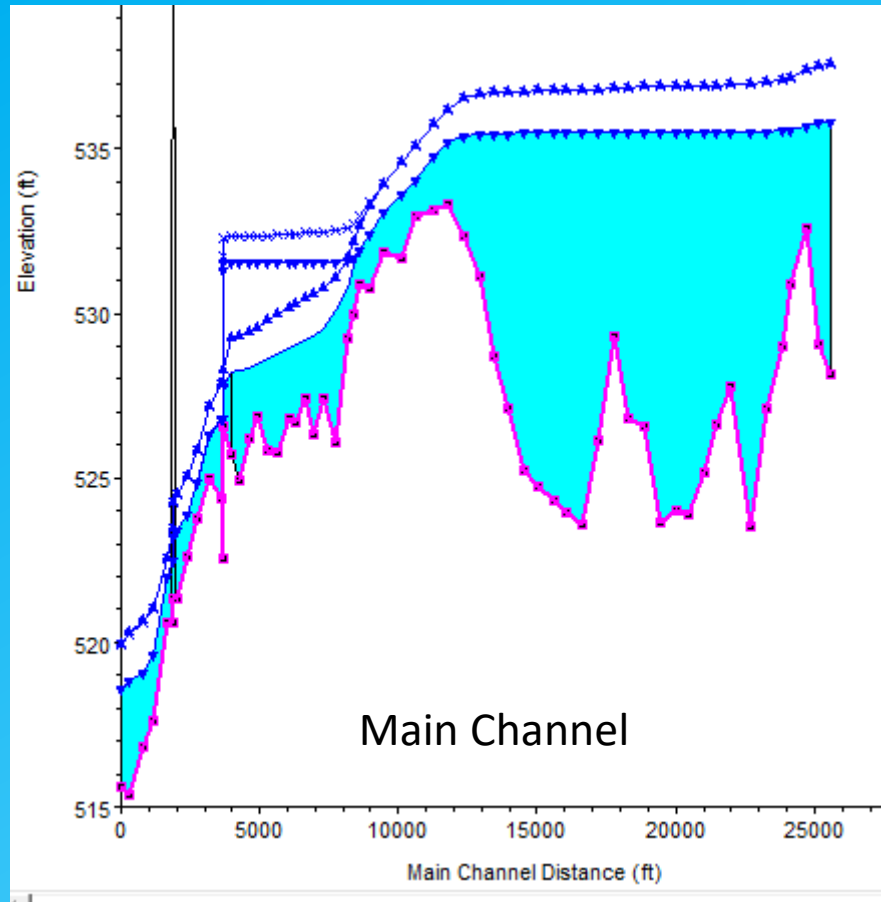
- Full Removal
- Rock Ramp
- Rock Ramp w/ Millrace Riffles



*NOTE: All information is from a draft report and should be considered preliminary due to the limited scope of this study.*



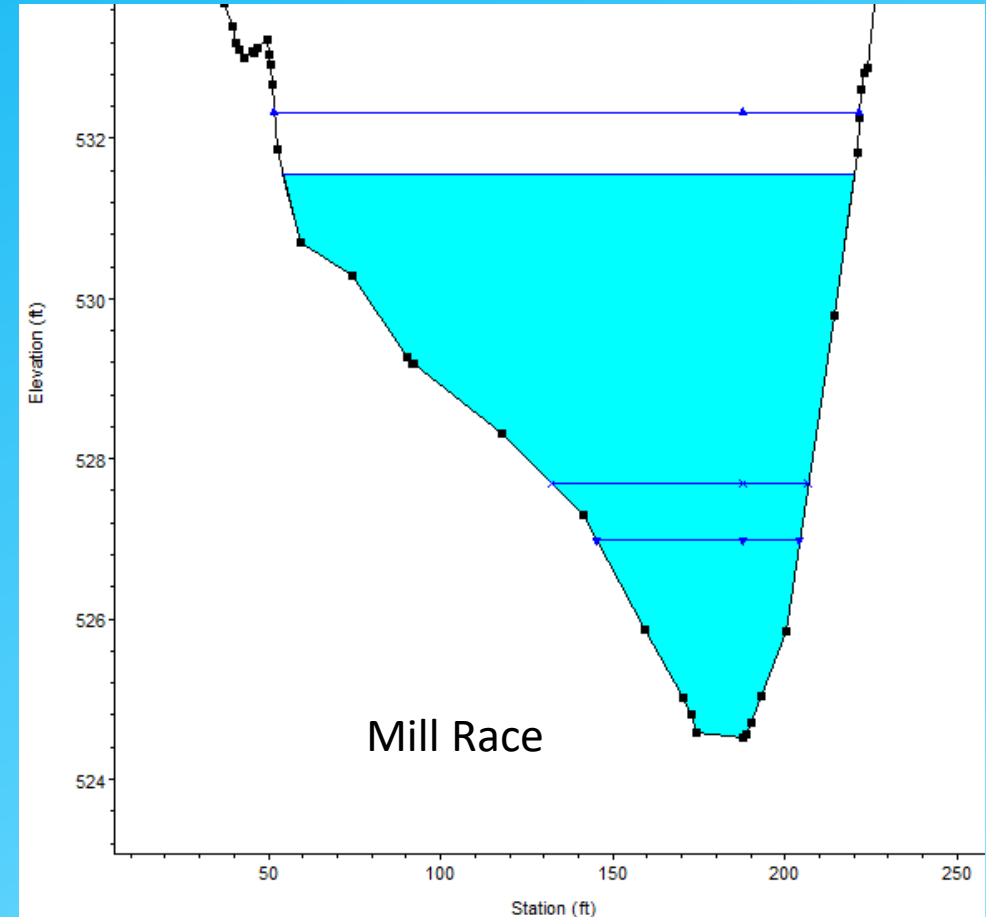
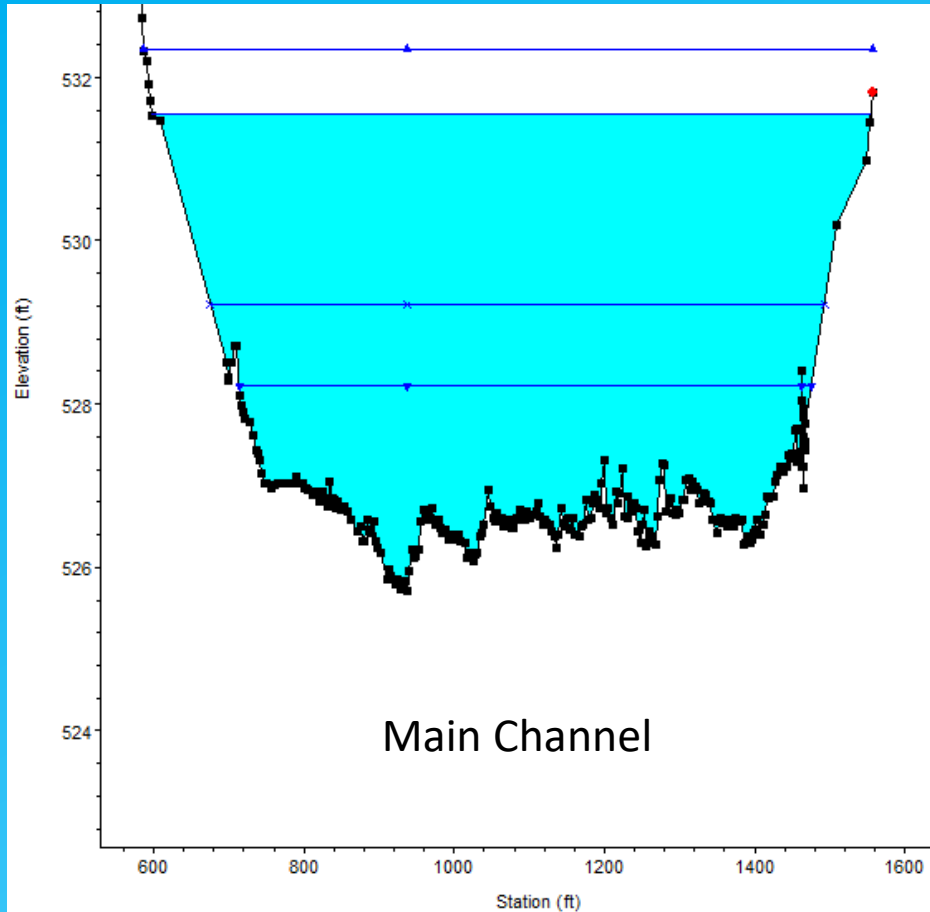
# Full Removal



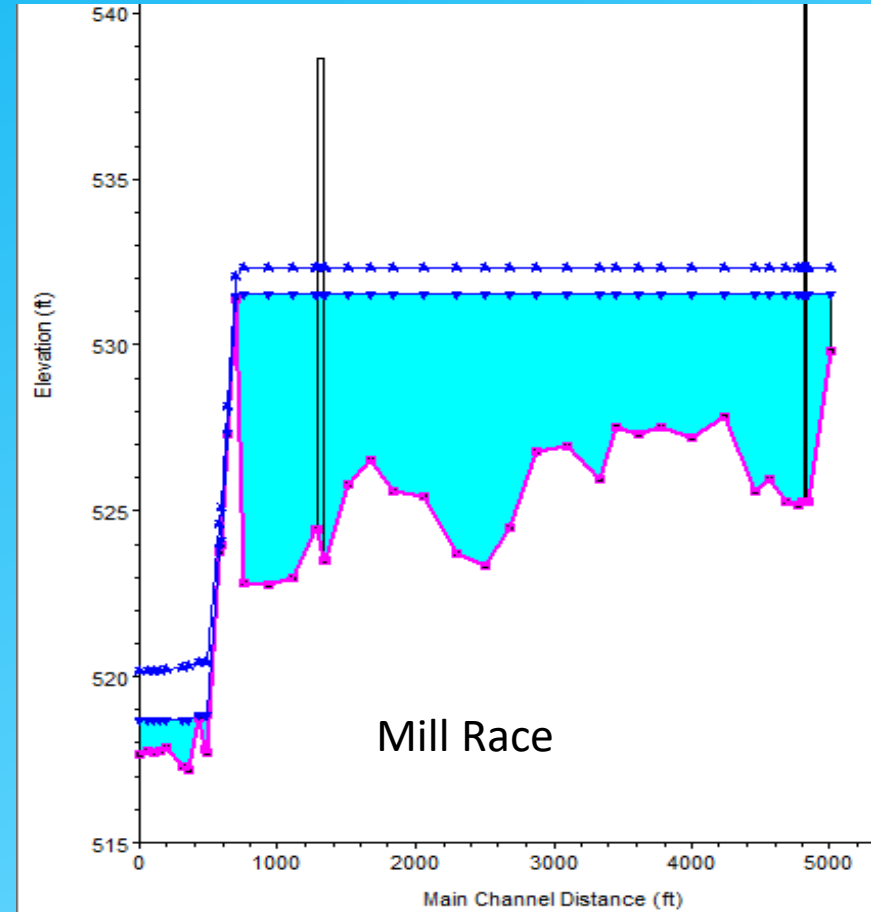
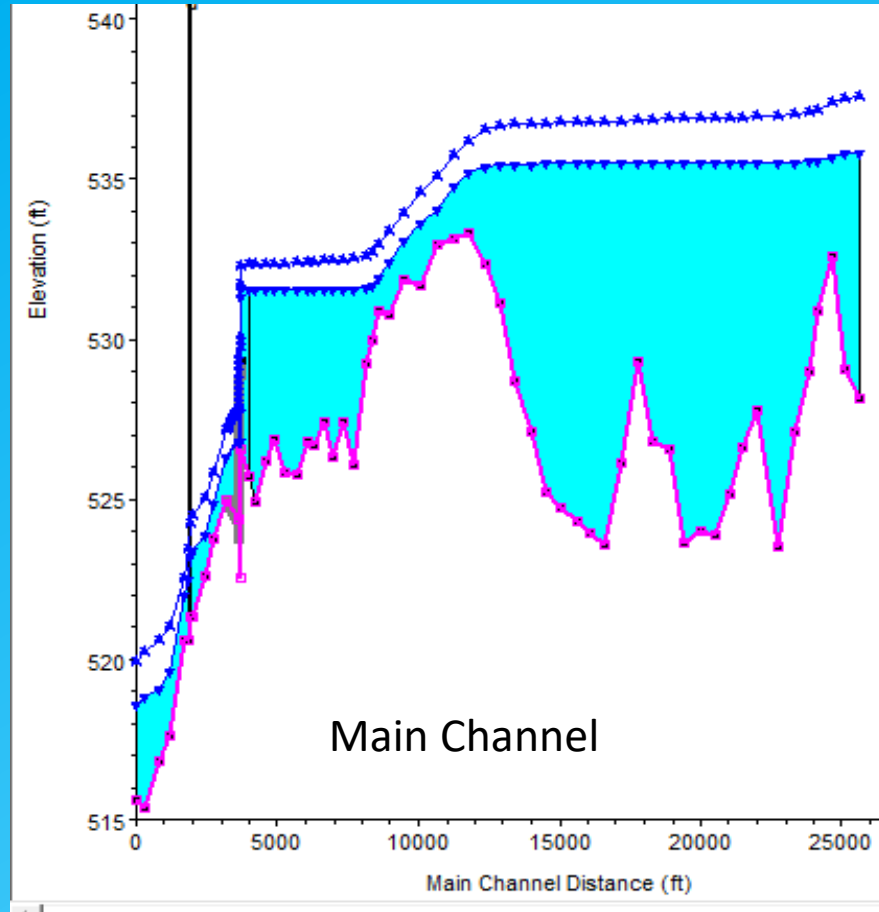
50% and 90% flow profiles



# Full Removal

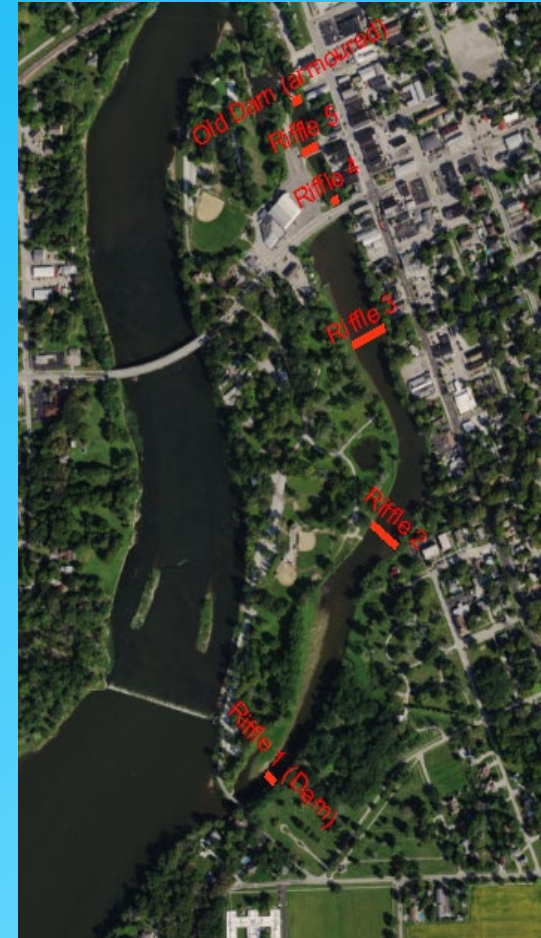
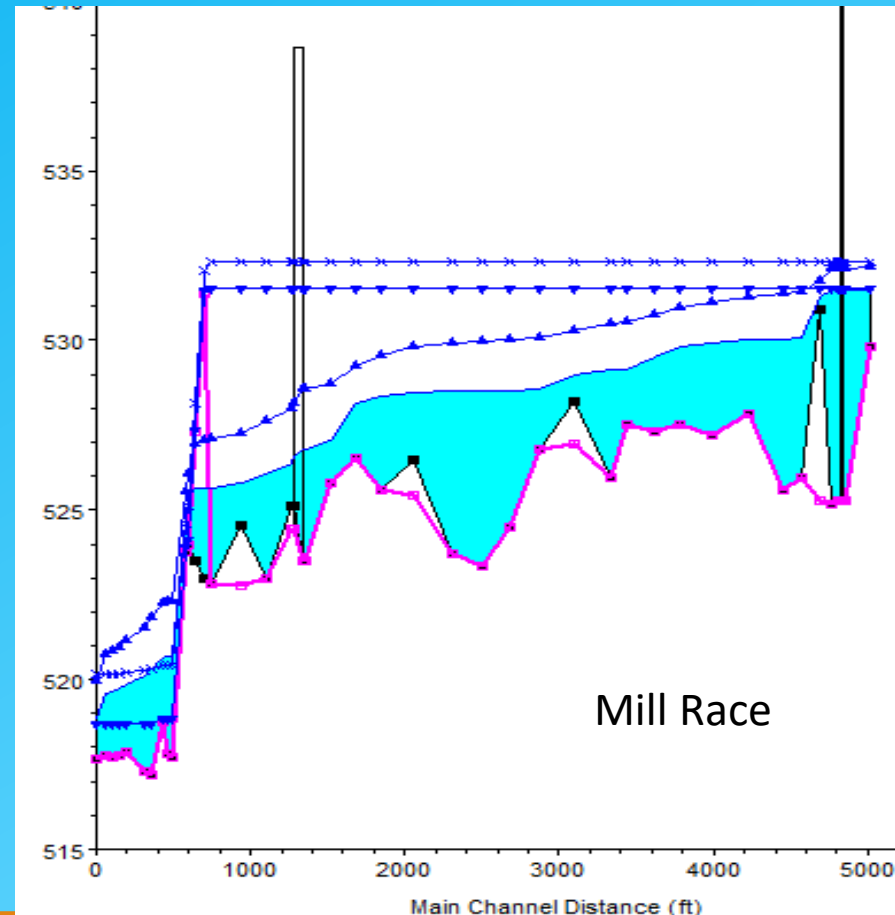
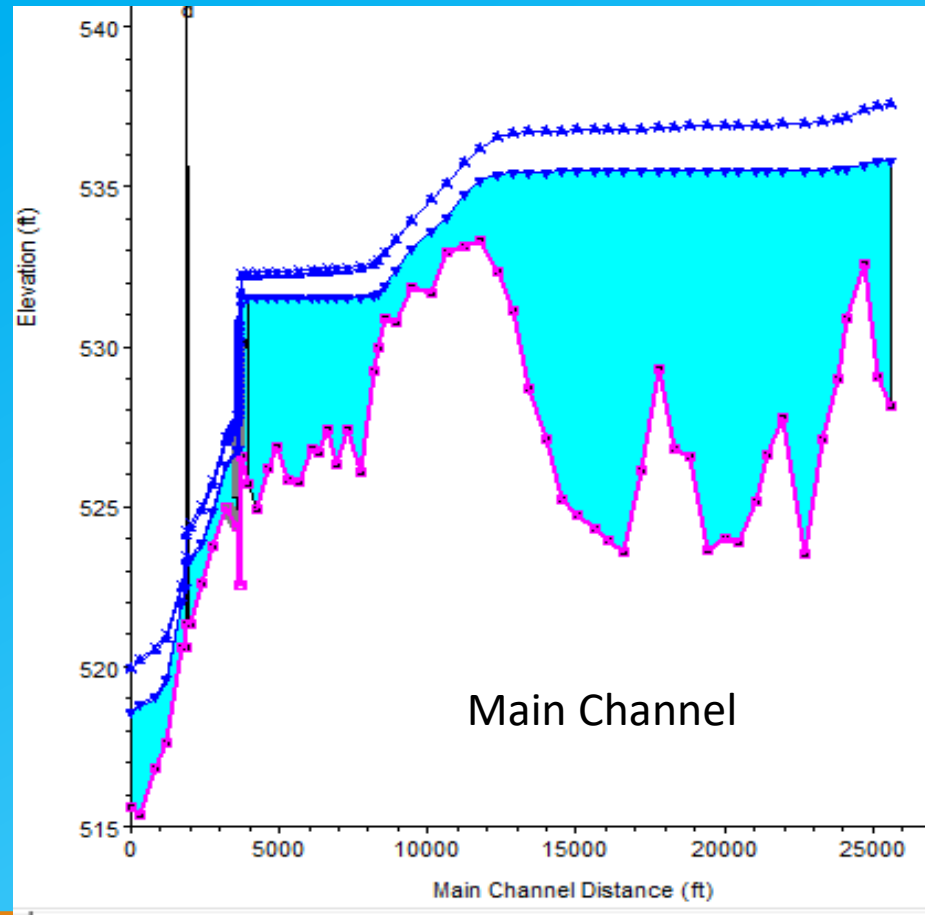


# Rock Ramp



50% and 90% flow profiles

# Rock Ramp with Riffles

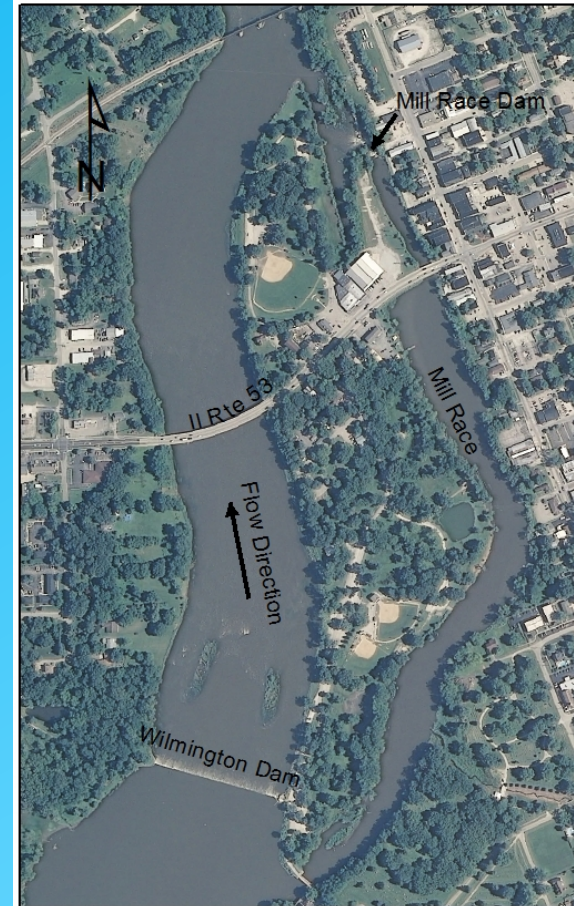


50% and 90% flow profiles

# Flow Comparison

50% Daily Flow	Main Channel	Mill Race
Existing	2806	74
Removal	2843	37
Ramp	2806	74
Ramp w / riffles	2392	488

90% Daily Flow	Main Channel	Mill Race
Existing	840	0.4
Removal	836	3.6
Ramp	840	0.4
Ramp w / riffles	712	128





# OWR Project Participation

- OWR will provide construction cost up to full removal based on the following benefits provided:

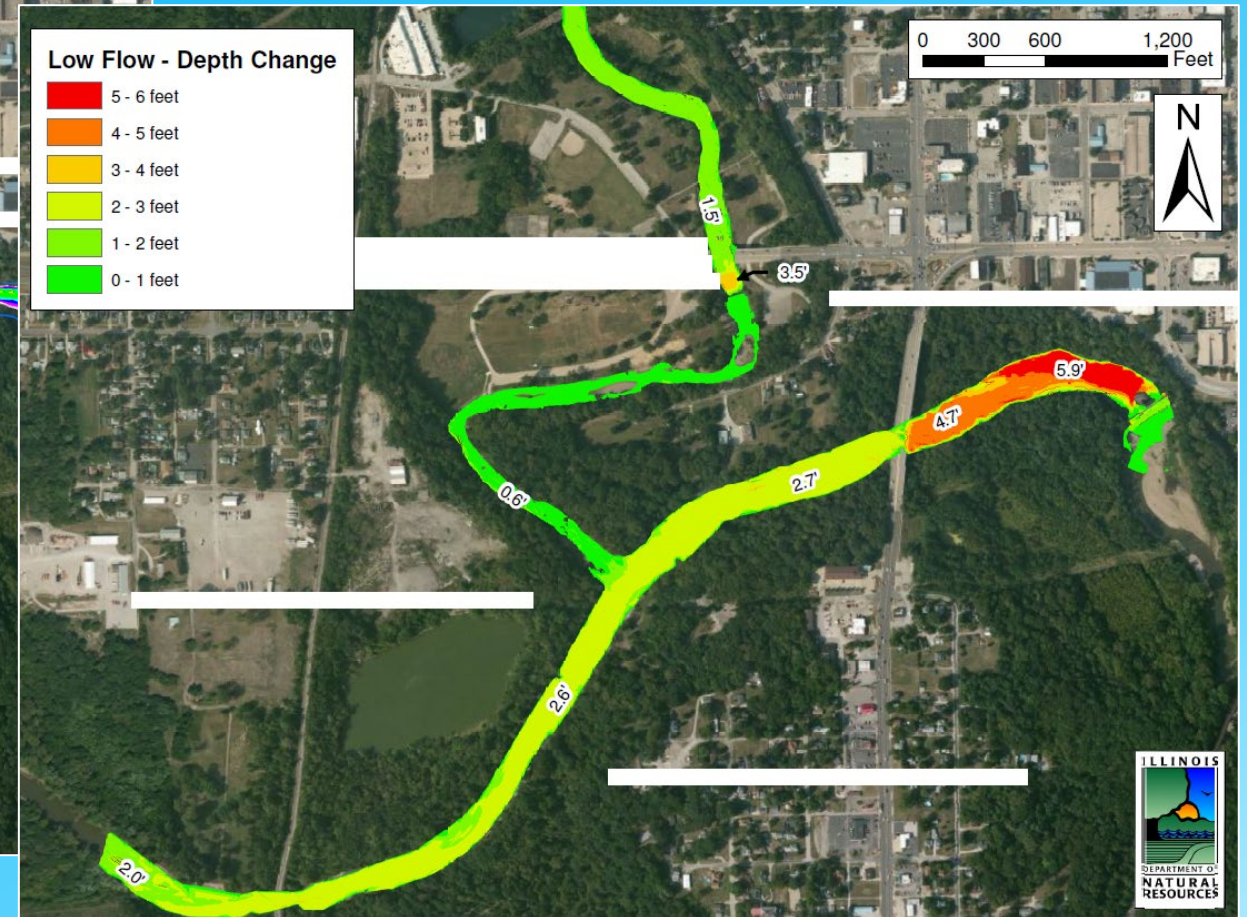
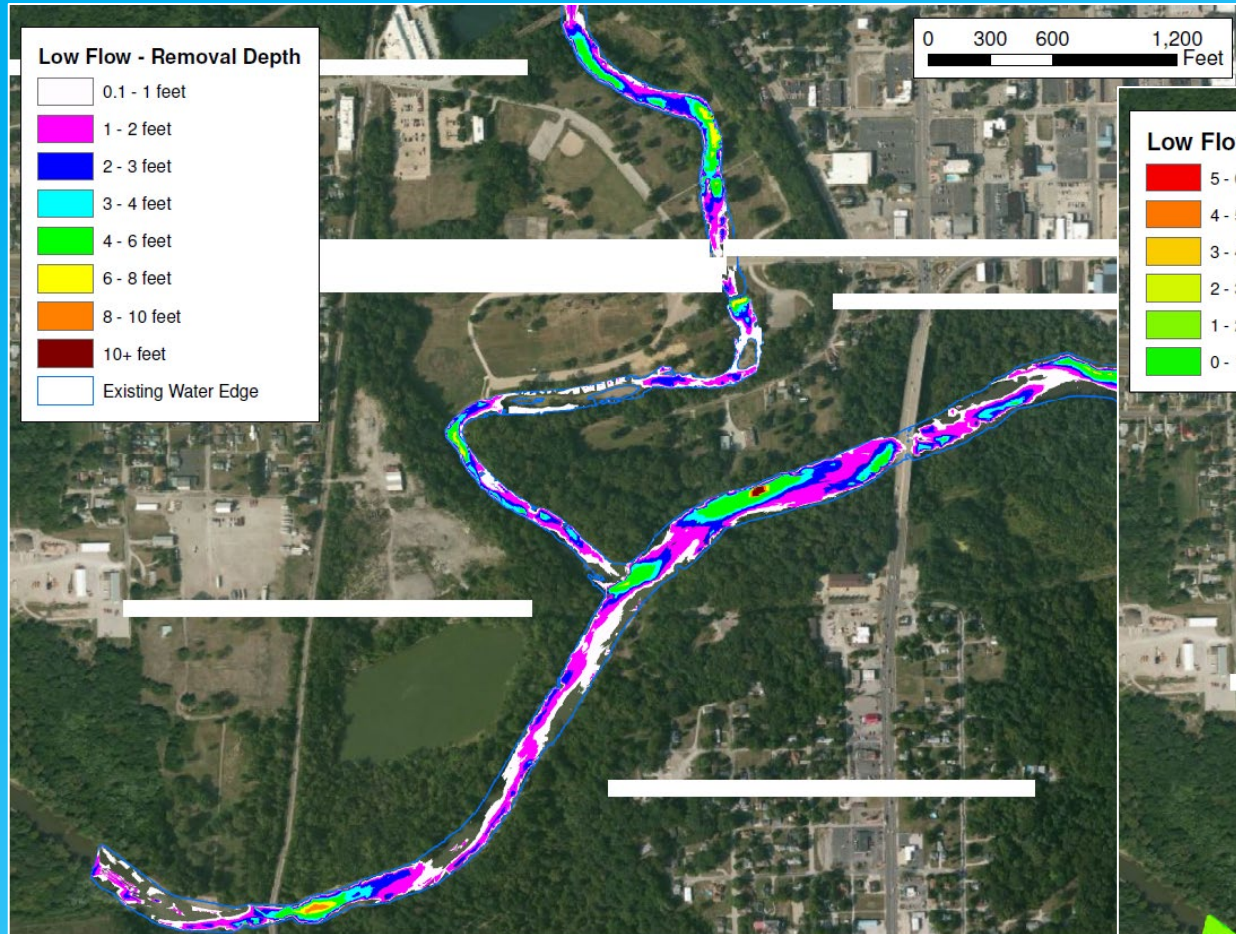
Benefit Provided	% Cost Share
Public Safety Addressed (full dam removal)	60%
Restored Aquatic Habitat / Water Quality	15%
Fish Passage	15%
Non-motorized boat passage	10%

# Preliminary Study

	Complete Removal	Rock Ramp	Rock Ramp w/ Riffles
Total Cost	3.6 Million	4.8 Million	4.9 Million
OWR Participation %	100%	40%*	50%*
OWR Participation \$	\$3.6 Million	\$1.4 Million	\$1.8 Million
City Participation \$	\$0	\$3.4 Million	\$3.1 Million

\* The ramp improves public safety due to the elimination of the submerged Hydraulic Jump. The placement introduces new hazards. Therefore, a full 60% can not be provided based on new hazards.

# Future Resources





# Rock Ramp Concerns

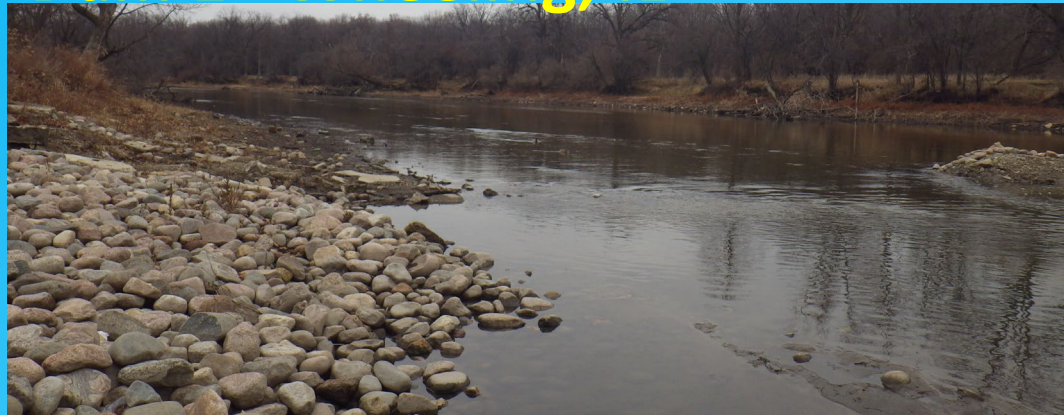




# Dam Removal in Illinois



**Dam 1– Wheeling, IL**



**Hoffman Dam – Des Plaines, IL**

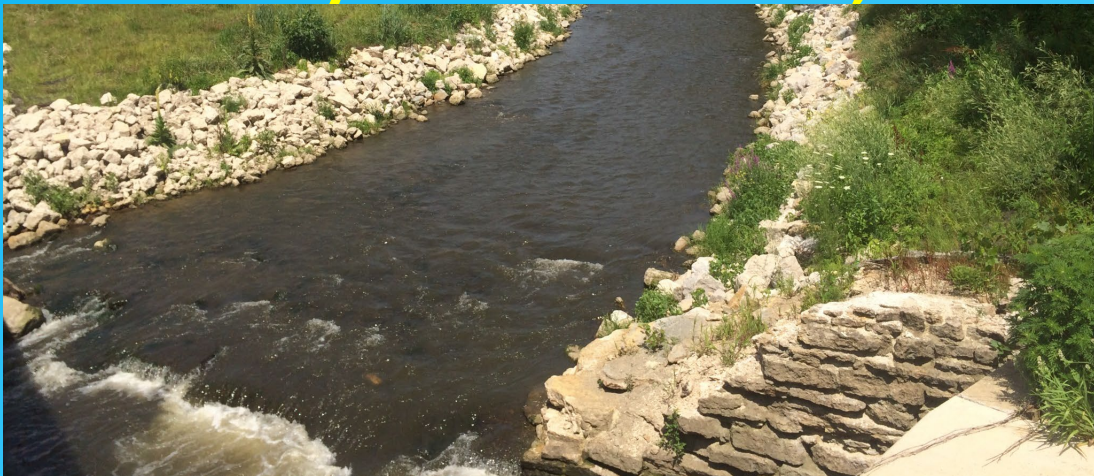




# Dam Removal in Illinois



**Blackberry Dam – Yorkville, IL**



**Vermilion River Dam – Danville, IL**



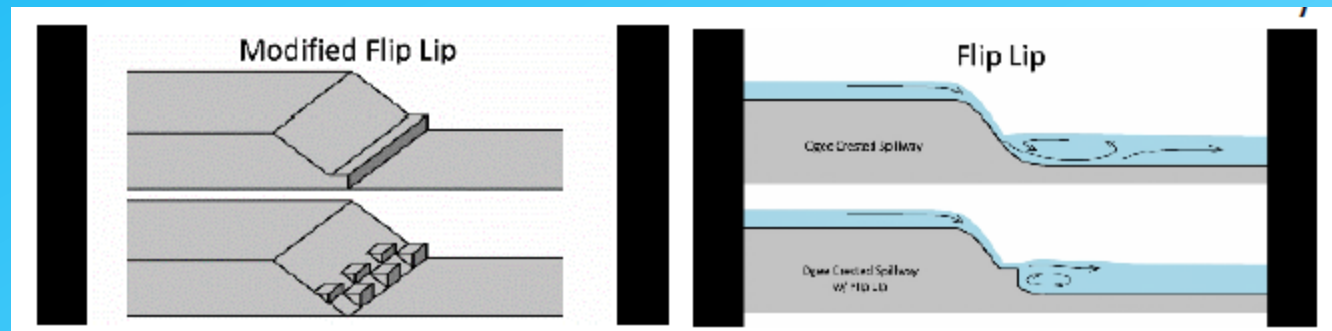
# Known Issues to address

- Left Abutment and privately owned
- Flow through mill race and main channel
- 3 Boat docks



# Submitted Questions page 1

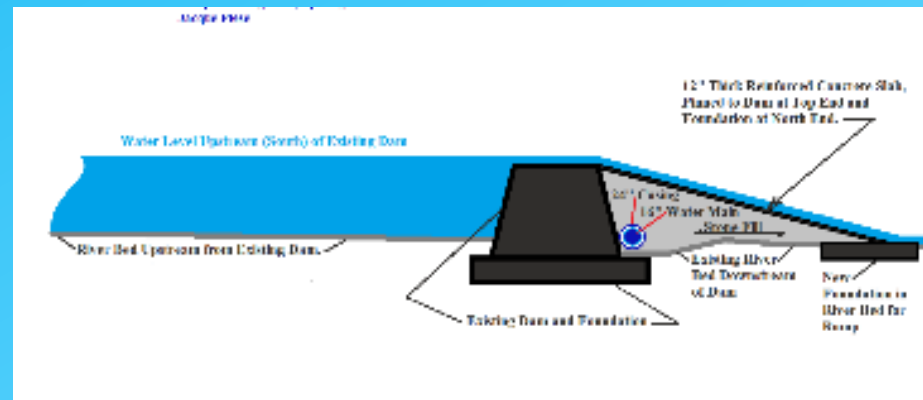
1. If the dam is turned over to the IDNR what type of easement would they need through the South Island Park?
2. Do they have plans to do anything with the Millrace?
3. Have they seen the study and models done by Brigham Young University about modifying low head dams with a "kick flip" that diverts the lower pool surface water away from the dam ?





# Submitted Questions page 2

4. Original drawings showed a railing and signage porridge around the dam area can we go ahead and do that and not remove the dam?
5. If we remove the dam completely what will happen to the Mill race?
6. What will water levels look like south of the dam?
7. What do you think of the following option:



# Submitted Questions page 3

8. Upstream from the dam I read 1.7 miles will be affected can we elaborate on that impact as far as elevation of top of water now to elevation after removal?
9. If both dams were removed would it be possible to remove the millrace dam first to allow the strong flow to move thru to naturally move sediment that the temporary dam has held back? Then after the channel has been cut down again remove the main dam on the Kankakee. After the main dam is removed how much will that drop the flow rate on the millrace side? Not just the flow rate but how narrow will the millrace become? If the millrace becomes narrower will the city be aloud to beautify the new millrace banks with no cost of permits and get the green light to do so with only construction expense?
10. Is the dnr against stair stepping the main dam and removing the millrace dam? Along with stair stepping the dam would this help on public safety and get our insurance in check or is removal the only way to get our insurance provider in check? If our insurance provider claims the only way to get in check with liability is removal maybe we need to check into what insurance provider Yorkville has because their dam is stair stepped.

# Thank you

- Rick Pohlman – IDNR OWR, Division Manager
- Wes Cattoor – IDNR OWR, Section Chief
- Tristan Widloe – IDNR ORC, Stream Specialist