



Water Quality Data for the Des Plaines River Watershed Plan

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August 17, 2017



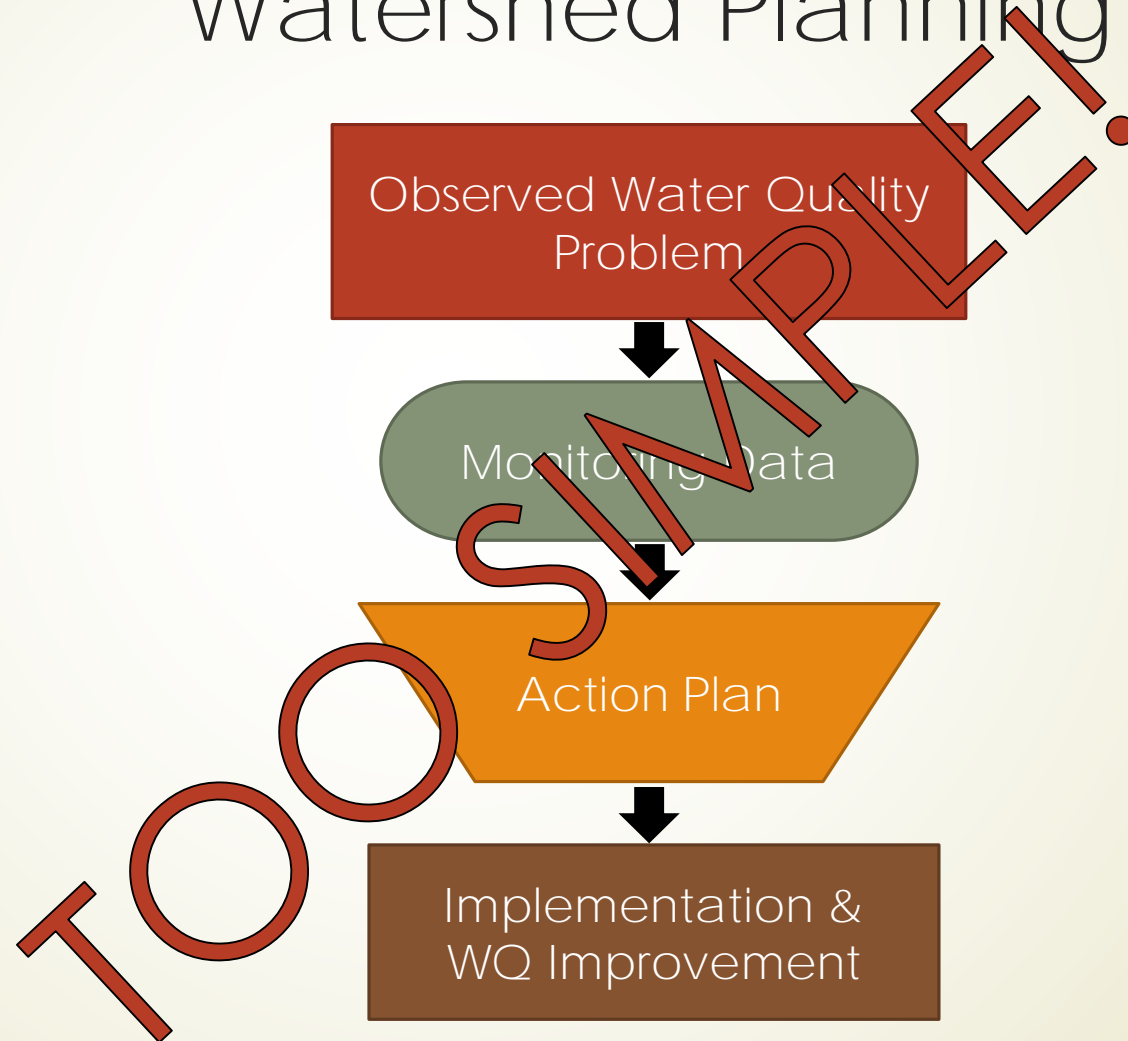
STORMWATER MANAGEMENT COMMISSION



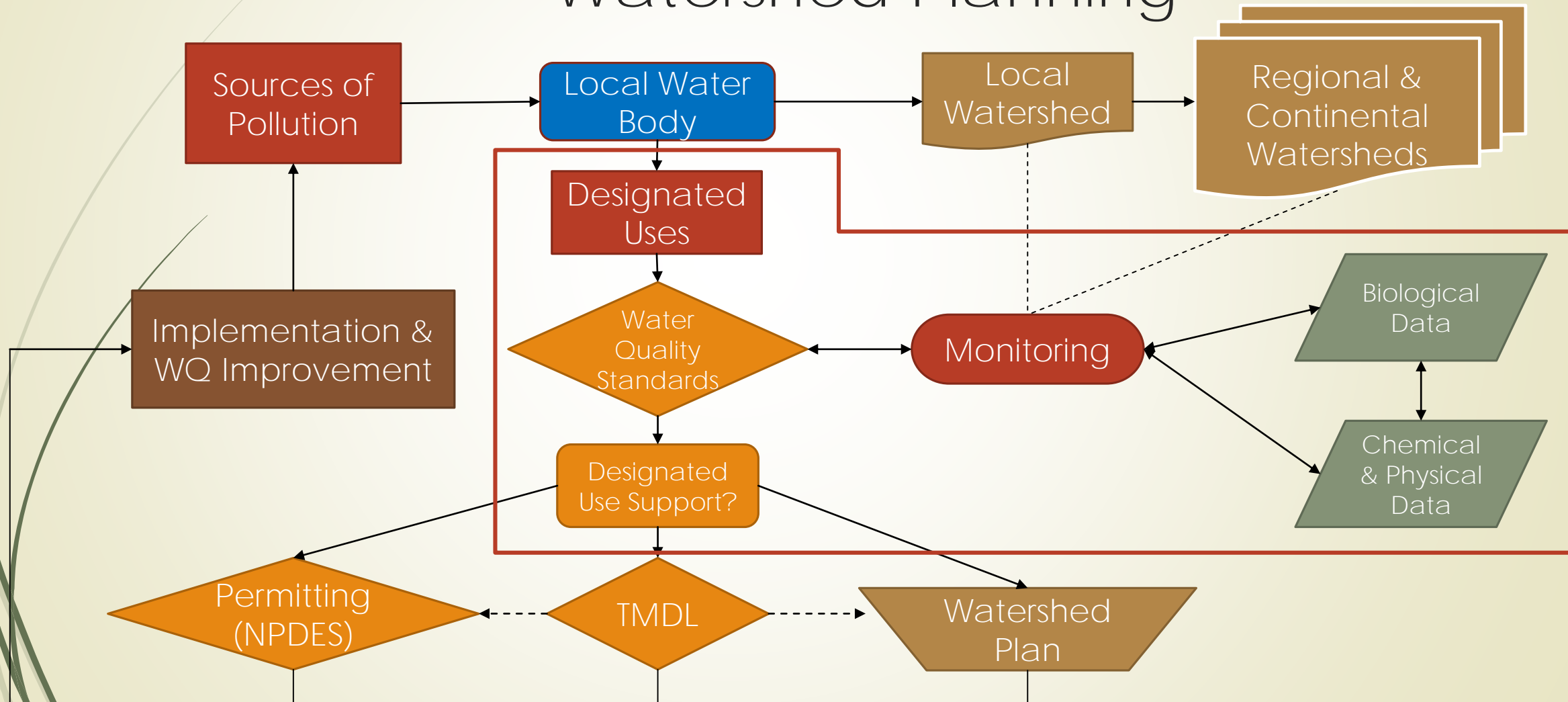
INTRODUCTION

- ▶ Water Quality Data, Assessments, & Watershed Planning
 - ▶ Focus today on Des Plaines River & tributary streams
 - ▶ Past & Current Water Quality Assessments
 - ▶ Past Water Chemistry Data
 - ▶ Past Biological Monitoring Data
- 

Water Quality Assessment, Data & Watershed Planning



Water Quality Assessment, Data & Watershed Planning



Water Quality Assessments & Monitoring Data

IL Integrated Report every other year

Streams assessed every 5 years

DPR basin cycle: 2003, 2008, 2013

Primary Contact

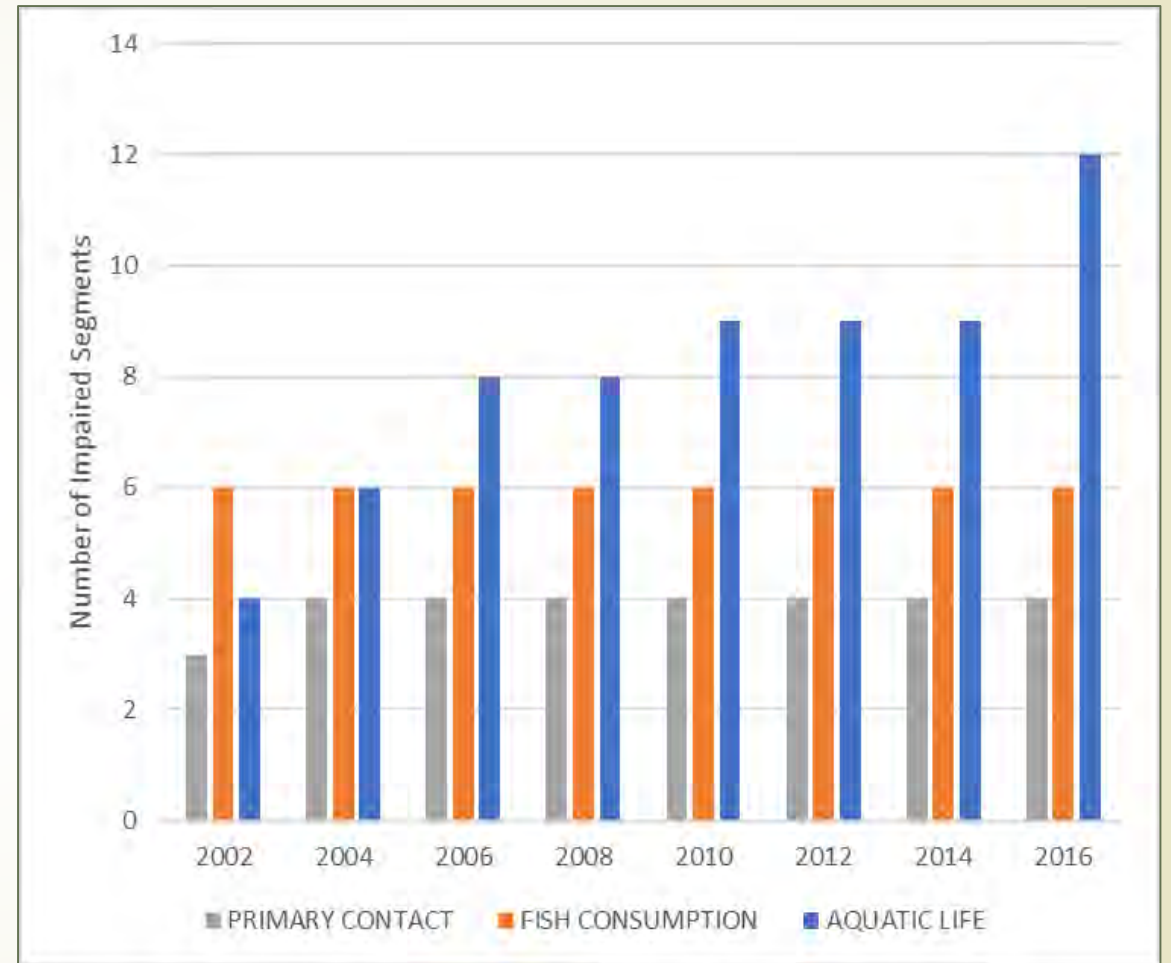
- 2002: 3 DPR segments assessed/impaired
- 2004-16: Buffalo Cr. & 3 DPR segments assessed & impaired

Fish Consumption

- 2002-16: 6 DPR segments assessed & impaired

Aquatic Life

- 2002: 4 impaired of 11 assessed
- 2016: 12 impaired of 13 assessed



Primary Contact

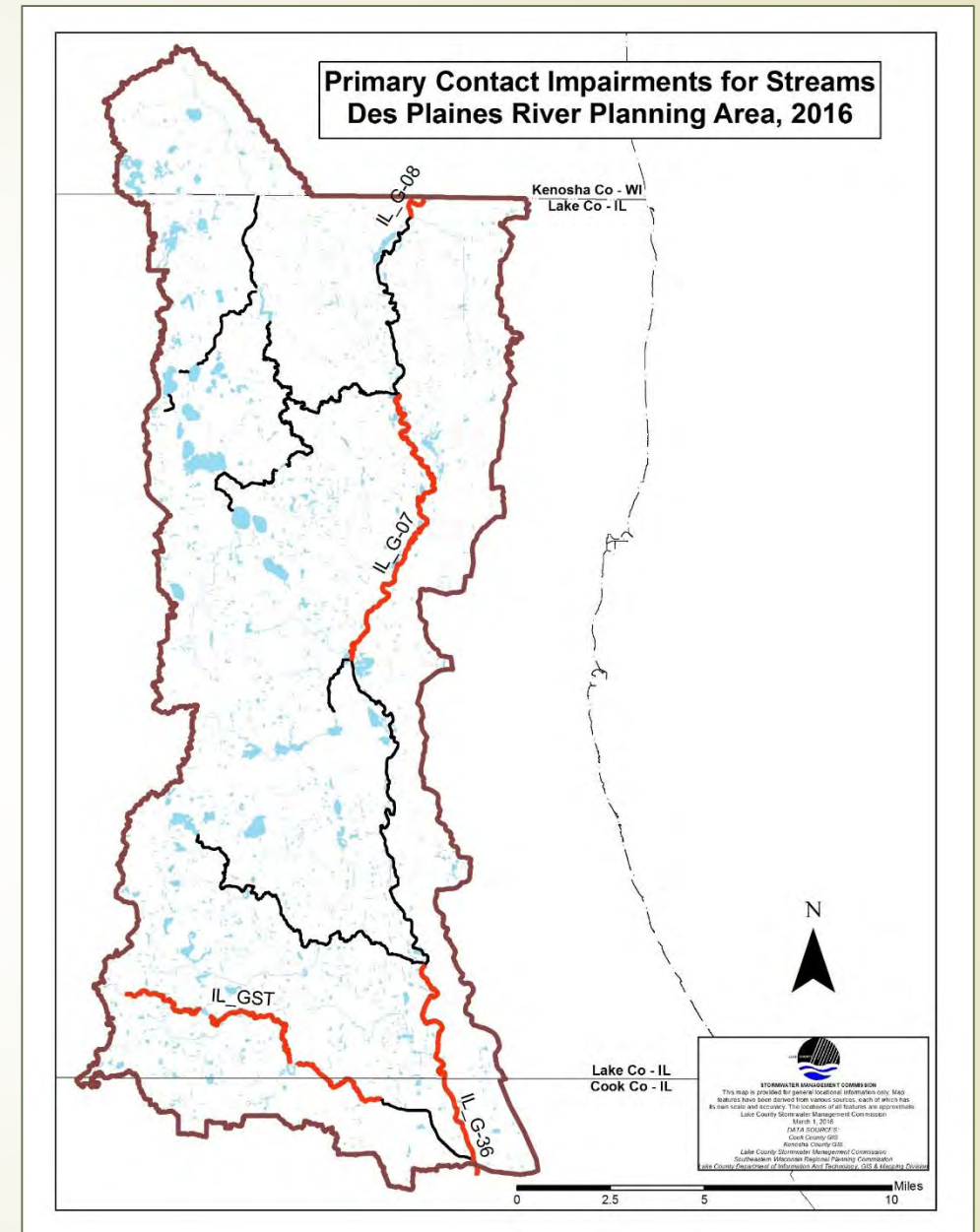
Impairment based on fecal coliform standard:

- Geometric mean of 5 samples taken within 30-day period from May-Oct ≤ 200 CFU/100ml nor shall >10% of samples during any 30-day period exceed 400 CFU/ml
- *May also use last 5 YEARS of data*

Only “protected waters” assessed:

- Presently support or have the physical characteristics to support primary contact
- *AND/OR*
- Flow through or adjacent to parks or residential areas

4 segments assessed & impaired



Fish Consumption

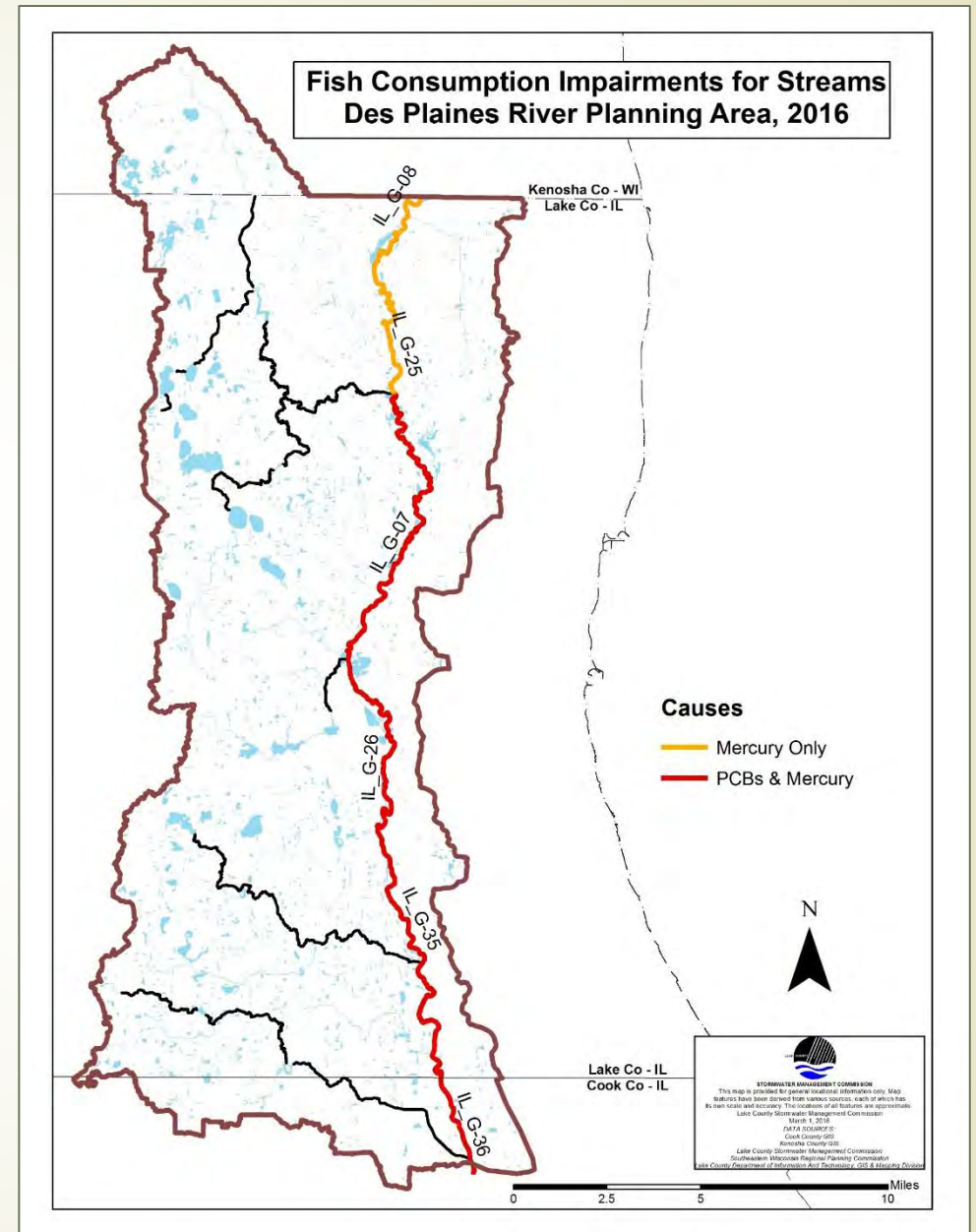
Impairment based on Human Protection Values for Mercury & PCBs

Species sampled

- Common Carp (PCBs)
- Channel Catfish (Hg)
- Largemouth Bass (Hg & PCBs)
- Bluegill
- Pumpkinseed

Listing based on most recent 2 sample years

Sample Dates:1985-2011



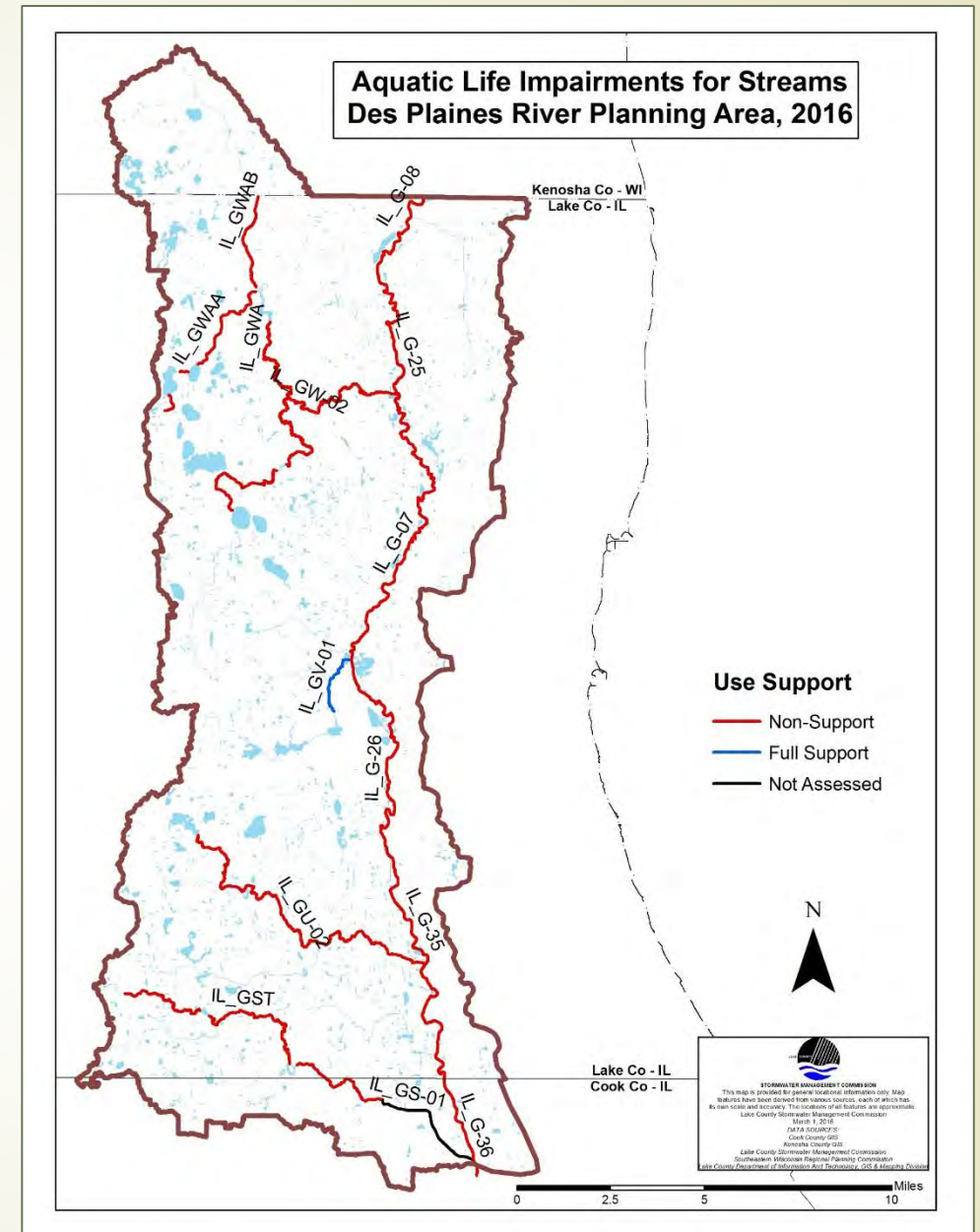
Aquatic Life

Impairment based on Fish and Macroinvertebrate monitoring data

Causes based on:

- WQ standards (e.g., Chloride >500mg/L)
- Observed degradation (e.g., loss of riparian vegetation, dams, channelization, etc...)
- Previously-used non-standard-based criteria for listed segments (e.g., Total Phosphorus >0.61mg/L; Arsenic >18mg/kg in sediment)

12 segments impaired, 13 assessed



Aquatic Life

Causes of Impairment

Cause	DPR units	Trib. units	Total units
Flow Alterations	1	3	4
Sedimentation	1	3	4
Changes in Depth/Velocity	0	2	2
Alterations in Riparian Vegetation	1	1	2
Unknown Cause	2	0	2
Aquatic Algae	1	0	1

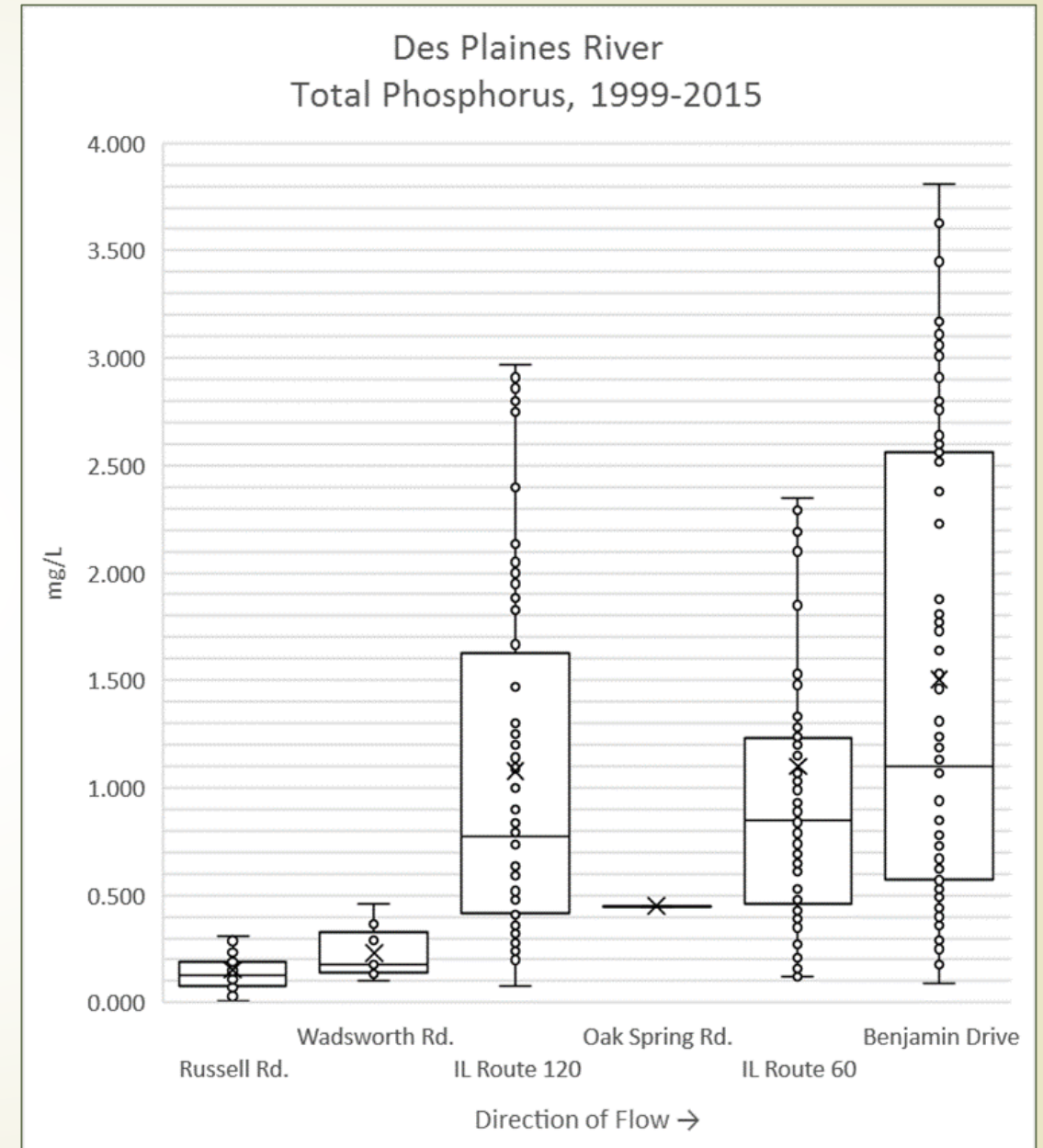
Cause	DPR units	Trib. units	Total units
Phosphorus*	3	3	6
Arsenic*	2	3	5
Dissolved Oxygen	2	3	5
Total Suspended Solids*	2	1	3
Chloride	1	1	2
Manganese*	0	2	2
pH	0	1	1

Total Phosphorus Des Plaines River Mainstem

No numeric standard for streams in IL

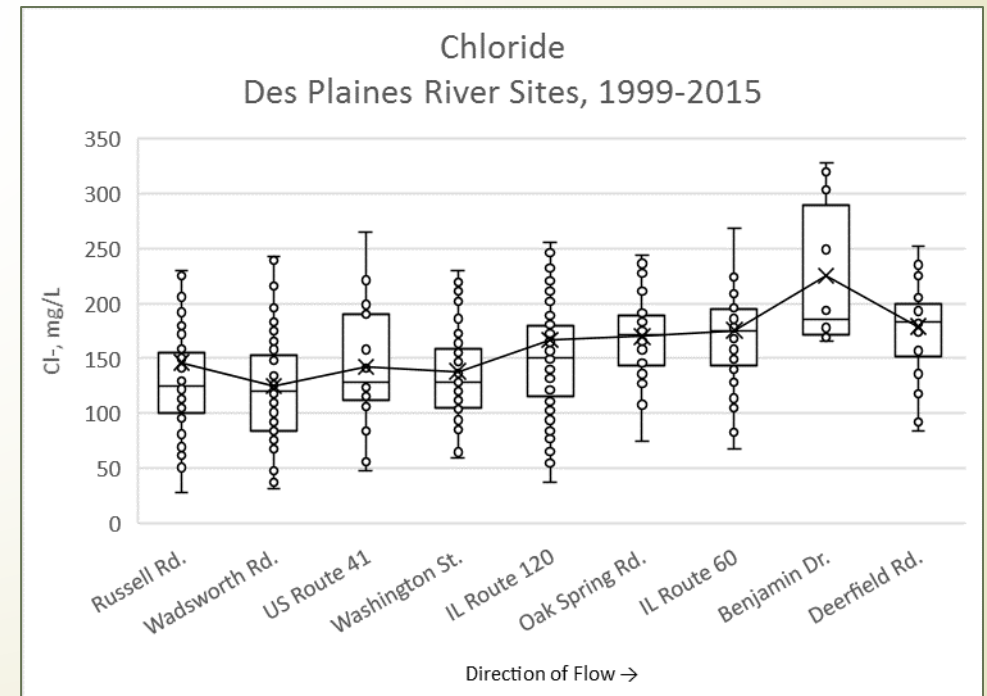
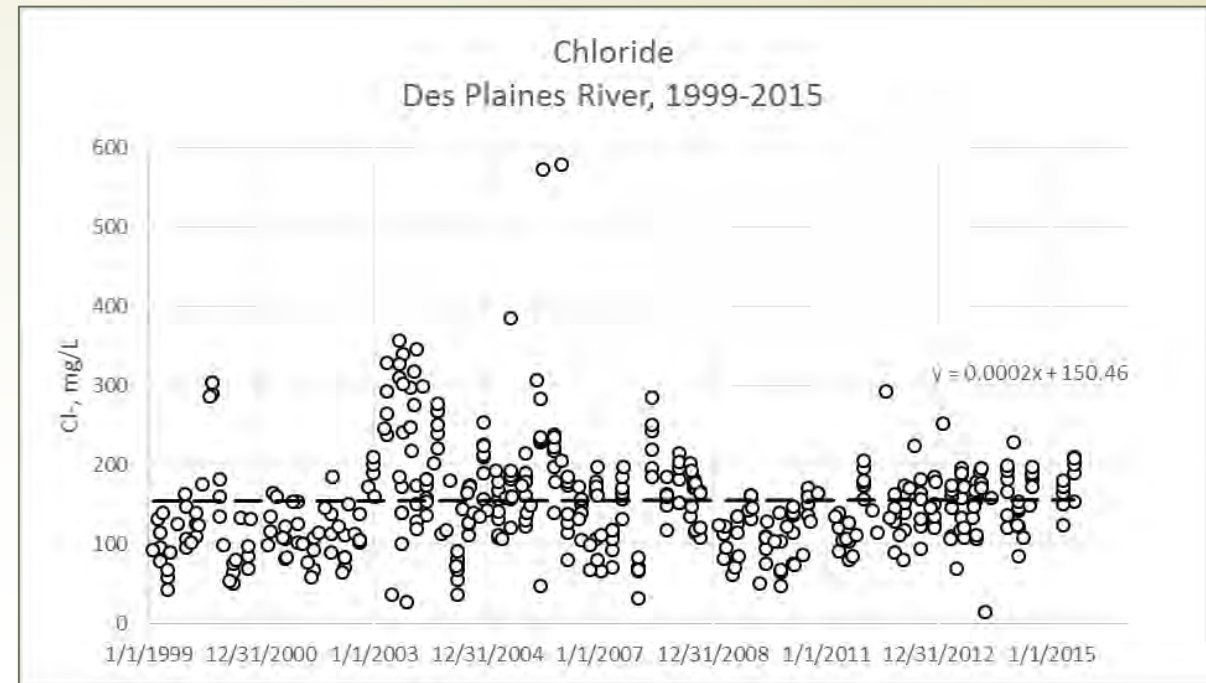
- >0.61 mg/L: non-standard-based criterion for aquatic life 2010 & earlier
- >0.143 mg/L: USEPA National Rivers & Streams Assessment (2008-09) regional threshold for “Poor” condition
- <0.0886 mg/L: USEPA National Rivers & Streams Assessment regional threshold for “Good” condition
- >0.05 mg/L: IL standard for lakes

Concentration increases downstream



Chloride

- Historic trend difficult to identify from raw data, very weakly upward
- Minimum values for all DPR sites appear to increase beginning ca. 2009(?)
- Appears to be a weak upward trend in the downstream direction
- 10% of DPR & 19 % of tributary values exceed chronic threshold of 230 mg/L
- Likely need for additional snowmelt monitoring events on DPR & tributaries

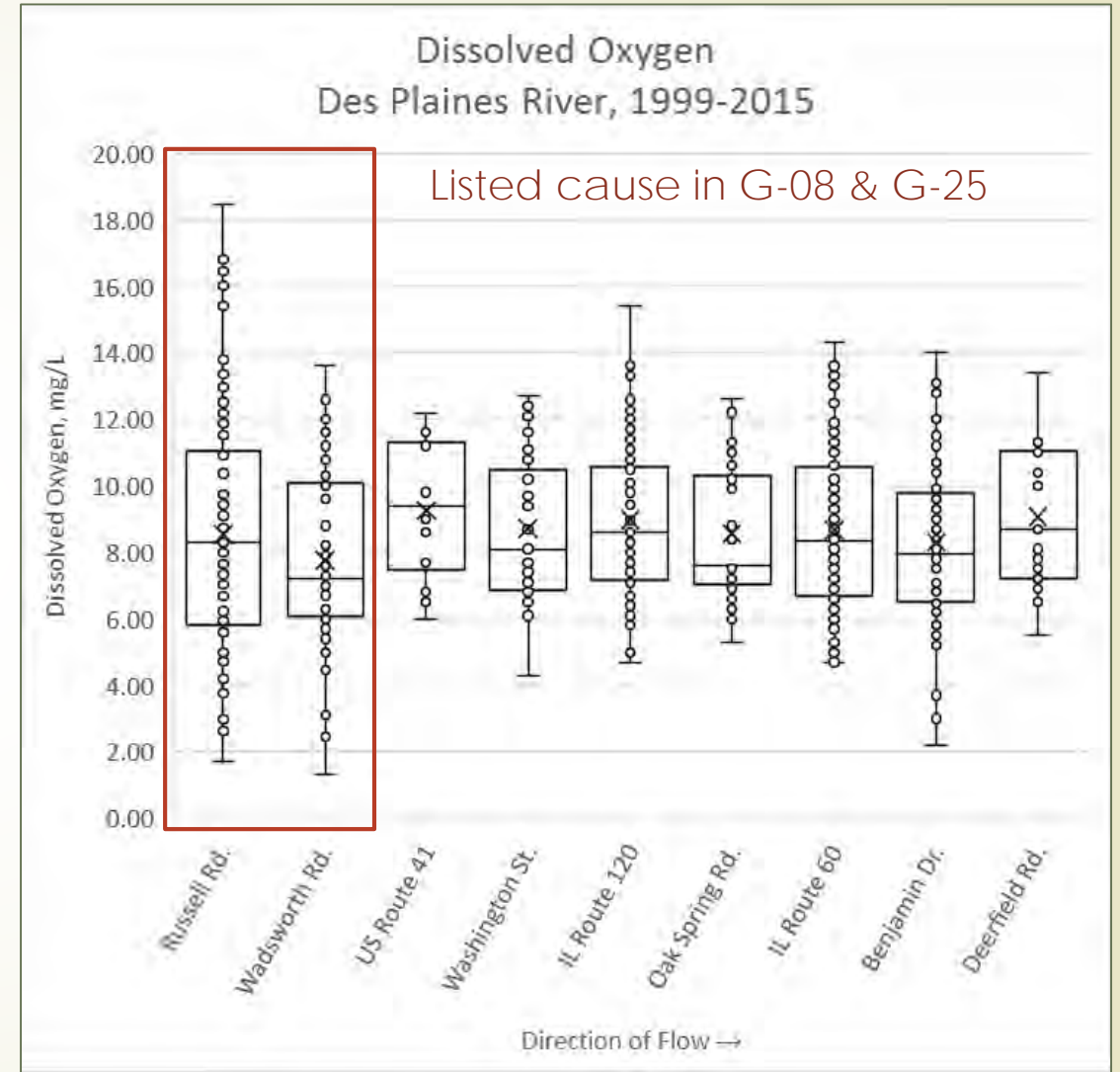
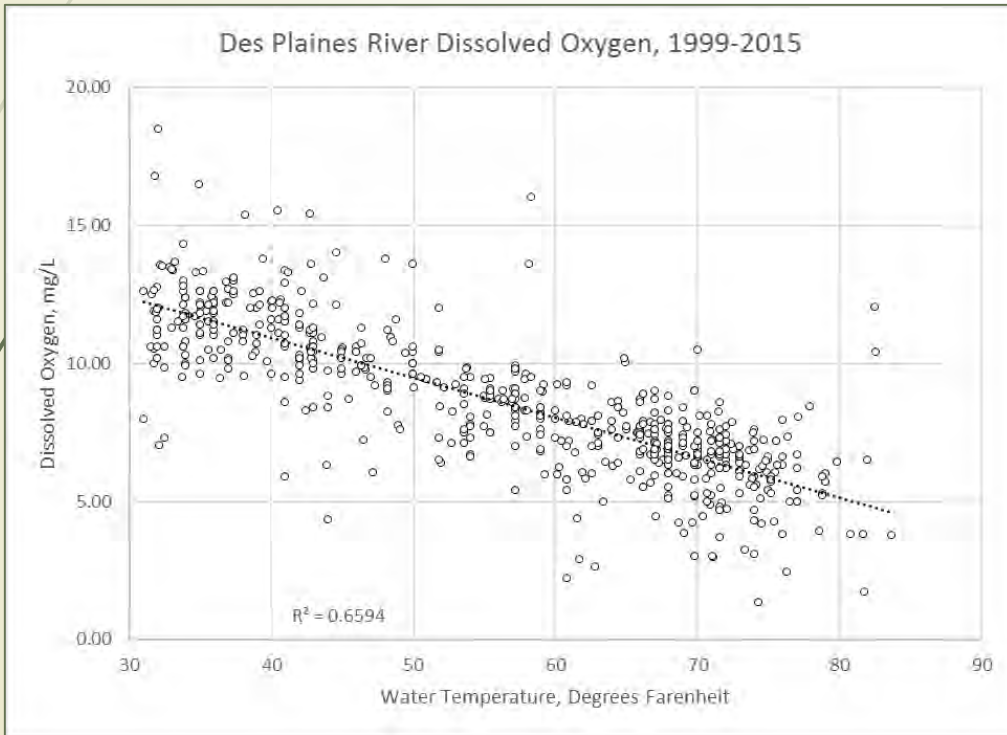


Dissolved Oxygen Des Plaines River Mainstem

Standard:

5.0 mg/L March-July

3.5 mg/L August-February



Macroinvertebrate Monitoring

Macroinvertebrate Index of Biotic Integrity (mIBI) one criteria for Aquatic Life Use

Full Support: mIBI ≥ 41.8

- Total taxa
- Ephemeroptera taxa
- Coleoptera Taxa
- Intolerant Taxa
- Macroinvertebrate Biotic Index
- Percent individuals as Scrapers
- Percent individuals as Ephemeroptera, Plecoptera or Trichoptera

Most Mainstem sites = Full Support

Tributary sites vary considerably





Fishery Monitoring Data Des Plaines Watershed, 1995-2015

- ▶ Numerous Data Sources

- ▶ IDNR
- ▶ INHS
- ▶ USACE
- ▶ USGS
- ▶ LCFPD
- ▶ NSWRD
- ▶ Local Units of Gov't
- ▶ Contractors

- ▶ At least 45 stations

- ▶ 12 Mainstem
- ▶ 33 Tributary

- ▶ Use in Watershed Planning:

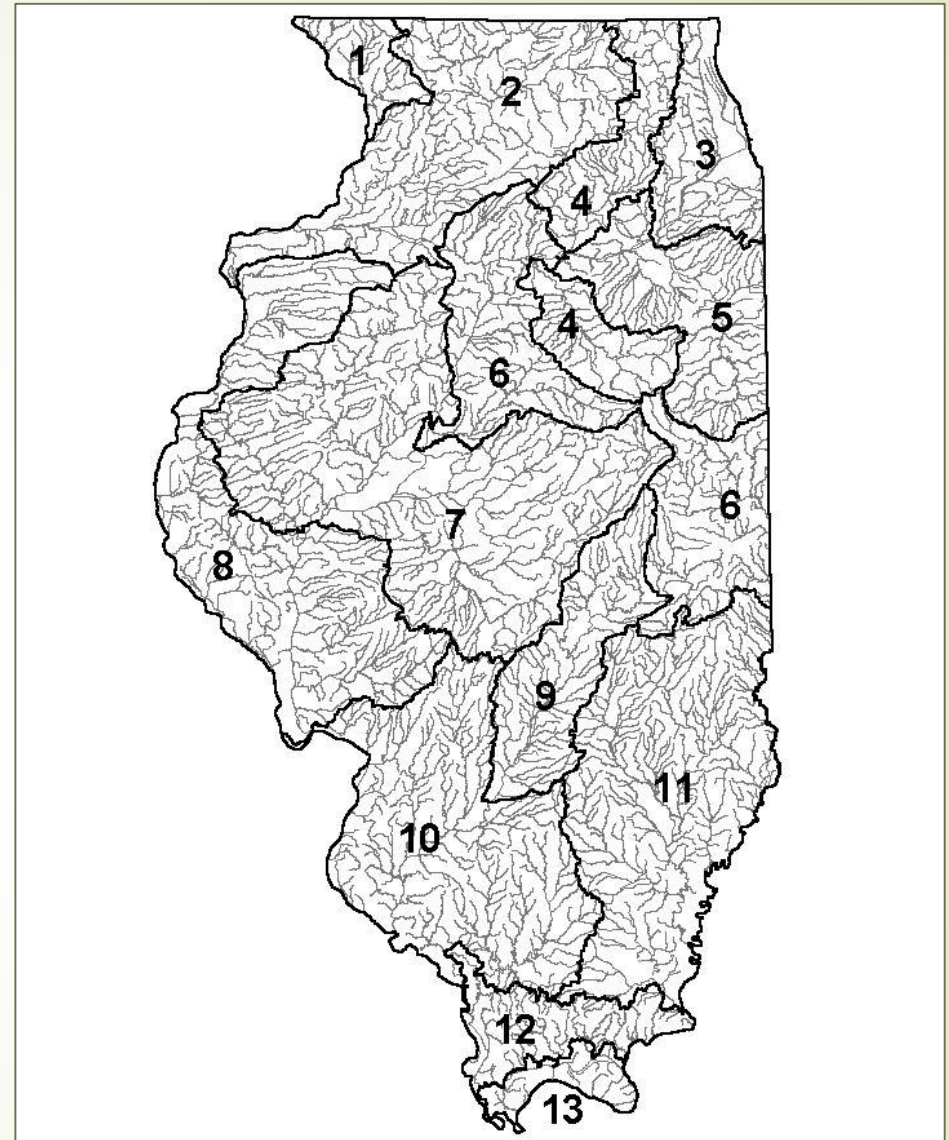
- ▶ Role in WQ impairments (Index of Biotic Integrity-fIBI)
- ▶ General condition of watershed fishery during recent past
- ▶ Assess recent changes & current trends
- ▶ Compare to DRWW data
- ▶ Guide recommendations for watershed projects/restoration

Illinois Fish IBI (fIBI)

Des Plaines Watershed in IBI Region 3

10 fIBI Metrics:

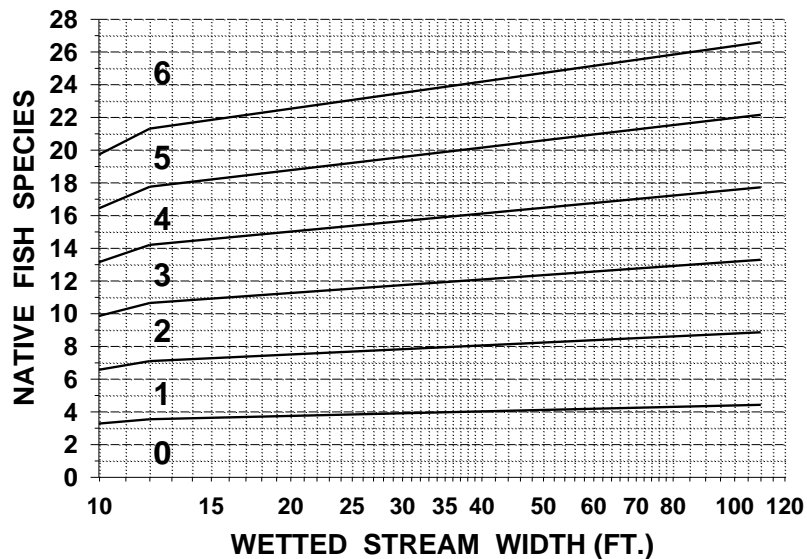
- Native Fish Species
- Native Minnow Species
- Native Sucker Species
- Native Sunfish Species
- Benthic Invertivore Species
- Intolerant Species
- Prop. Specialist Benthic Invertivores
- Prop. Generalist Feeders
- Prop. Lithophilic Spawners
- Prop. Tolerant Species



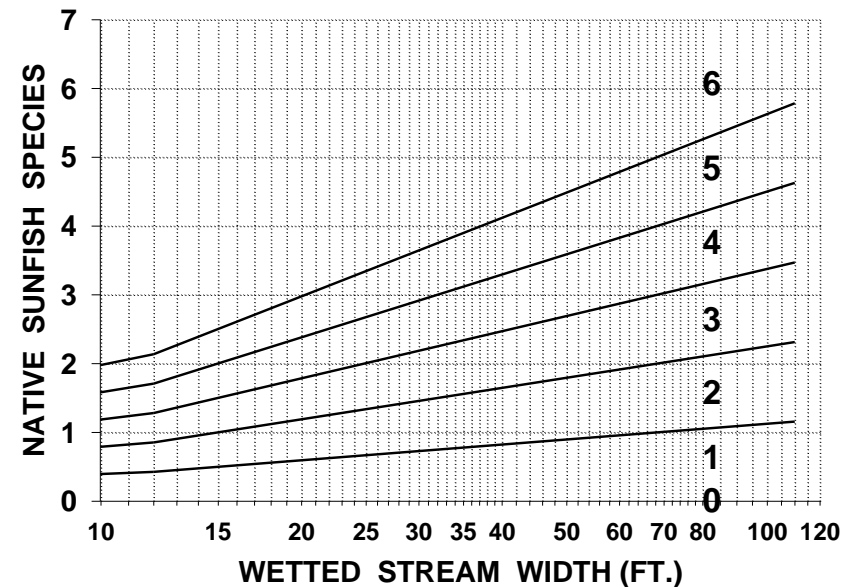
Source: Illinois EPA



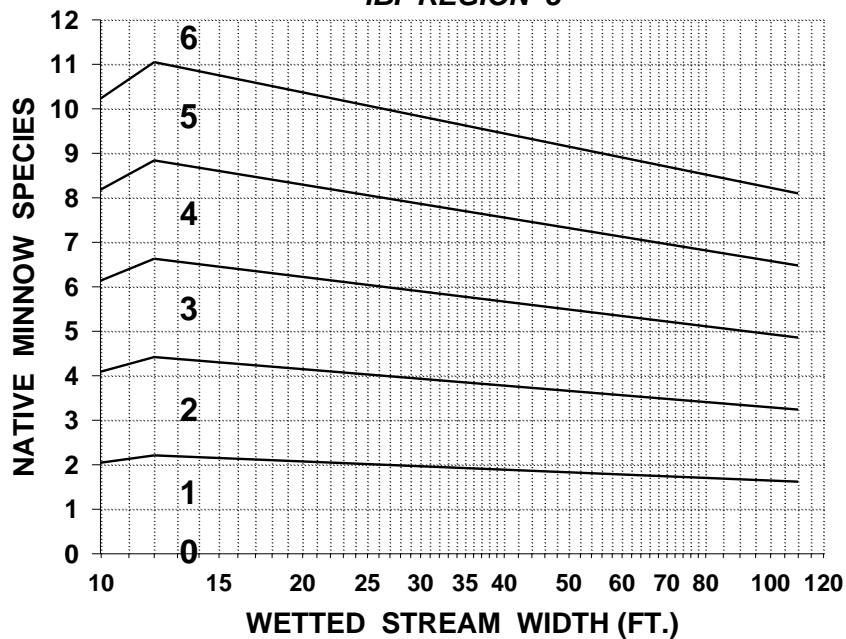
IBI REGION 3



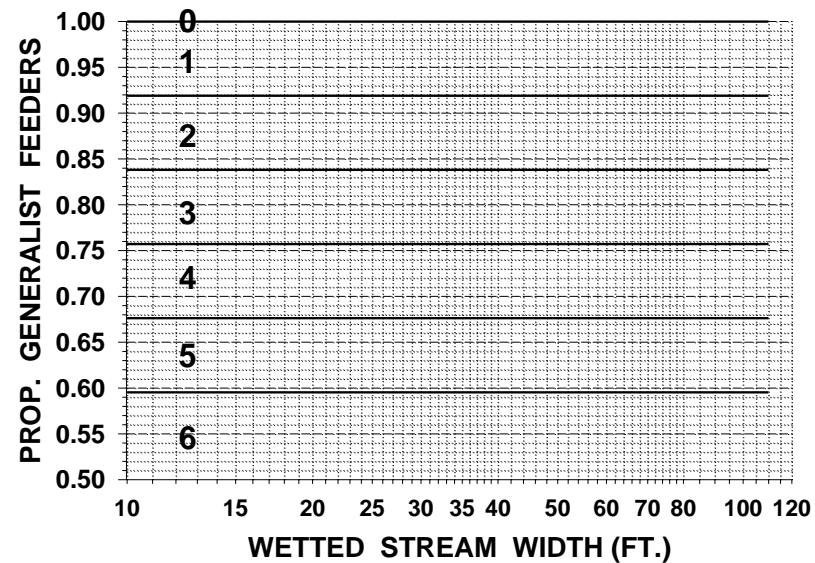
IBI REGION 3



IBI REGION 3



IBI REGION 3



IDNR Des Plaines Basin Fishery Report 1983-2013 Summary

Covers entire DPR basin in IL

Mainstem Fishery:

- 57 Native Fishes in basin (2013)
- 15 only found in lower river (below Riverside)
- % of Tolerant spp. has decreased since 1983
- % of Intolerant spp. increased little

Tributary Fishery:

- 39 Native Fishes (2013)
- 8 species only occurred below Brandon Lock
- Non-hydrologic factors in upper Tribs



Office of Resource Conservation
Division of Fisheries
Area A Streams Program
5931 Fox River Drive
Plano, IL 60548

Status of fish assemblages and sport fishery in the Des Plaines River Watershed and trends over 30 years of Basin Surveys 1983 - 2013



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IDNR Des Plaines Basin Fishery Report

1983-2013 Summary

Stream Quality/Index of Biotic Integrity

Mainstem:

- fIBI increases since 1983
- Remains below “Full Support” threshold at all stations (fIBI \geq 41)

Tributaries:

- No Upper DPR trib fIBI > 40
- QHEI did not correlate with fIBI
- Bull & Indian Cr. fIBI increased substantially since 1983

mIBI suggests water quality could support more diverse assemblages

Table 10. Scores and ratings for 2013 mainstem and tributary stations for Macro-invertebrate Biotic Index (MBI; range 0 - 11, higher scores indicating poorer quality), Macroinvertebrate Index of Biotic Integrity (mIBI; range 0 - 100, higher score indicate better quality) and Fish Index of Biotic Integrity (fIBI; range 0 - 60, higher scores indicating better quality). Aquatic Life Use Ratings: good = Good Resource Quality; fair = Fair Resource Quality; poor = Poor Resource Quality; FS = Fully Supporting, NS = Not Supporting.

Station Code		MBI	Rating	mIBI	Rating	fIBI	Rating
G-25	Des Plaines River	5.0	good/FS	43.7	good/FS	35	fair/NS
G-07	Des Plaines River	4.8	good/FS	54.4	good/FS	39	fair/NS
G-35	Des Plaines River	5.6	good/FS	43.3	good/FS	30	fair/NS
G-15	Des Plaines River	5.7	good/FS	53.0	good/FS	29	fair/NS
G-33	Des Plaines River	5.7	good/FS	40.3	fair/NS	34	fair/NS
G-18	Des Plaines River	8.2	fair/NS	19.2	fair/NS	26	fair/NS
G-02	Des Plaines River	5.3	good/FS	45.9	good/FS	25	fair/NS
G-11	Des Plaines River	5.6	good/FS	49.1	good/FS	25	fair/NS
GW-01	Mill Creek	6.4	fair/NS	39.4	fair/NS	35	fair/NS
GV-01	Bull Creek	6.0	fair/NS	61.0	good/FS	40	fair/NS
GU-06	Indian Creek	6.0	fair/NS	41.7	fair/NS	31	fair/NS

Source: S. Pescitelli, IDNR

Des Plaines R. Mainstem 1995-2015 Data

12 sites in planning area

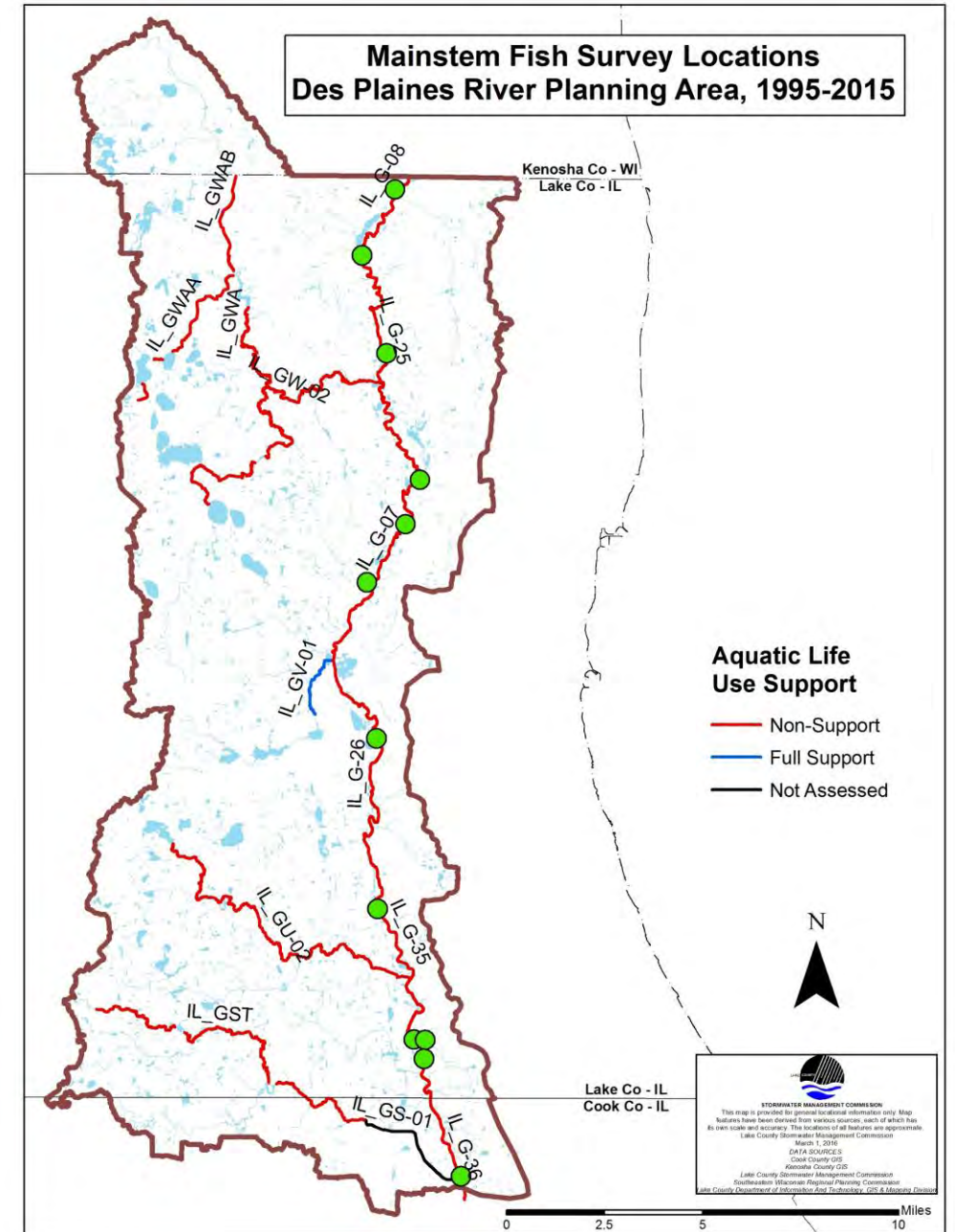
~ 40 Native Species occur

~20 in most surveys (range 11-24)

Average fIBI is 32.1 for planning area

- Lack of: sucker spp., benthic invertivores, intolerant spp., & lithophilic spawners
- Good numbers of sunfish & minnow spp.
- Mainstem dams removed in & below planning area

Bluegill, Blackstripe Topminnow,
Largemouth Bass, Green Sunfish most
common



Tributary Streams 1995-2015 Data

At least 33 sites in planning area

~40 Native Species occur

of Native Species/site variable

Range from 2-25, Average ~10

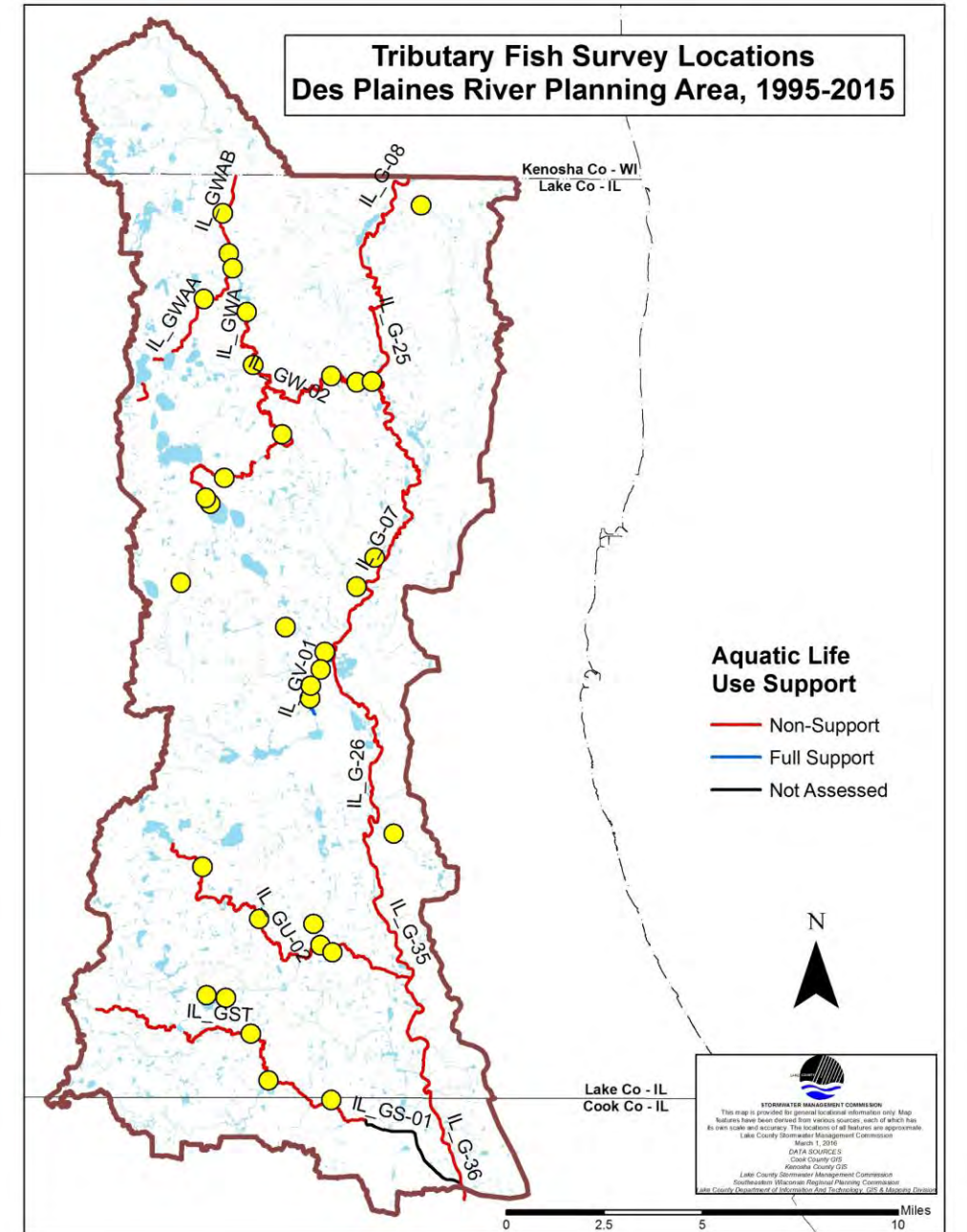
Average fIBI is 23.4 for all tribs

Similar metric profile to DPR

Slawski, et al. (2008): dams, then urban land cover are greatest predictor of fish assemblages in Upper DPR tribs

USACE (2004) suggested Newport Creek has greatest potential for restoration

Upstream sites have lower fIBIs



Common/Uncommon Species

Most Common Fishes:

- Bluegill
- Green Sunfish
- Largemouth Bass
- Blackstripe Topminnow
- Bluntnose Minnow
- White Sucker

Recent "Rare" Occurrences

- Iowa Darter (DPR & Trib)
- Walleye (DPR)



Photo Credits: The Nature Conservancy/Ben Cantrell (bluegill); nanfa.org/Nate Tessler (green sunfish, largemouth bass); nanfa.org/Uland Thomas (blackstrip topminnow); Konrad P. Schmidt (bluntnose minnow, walleye); Lake Co. SMC/Patty Werner (white sucker); Ohio DNR (Iowa darter)

Next Steps

- Compare and contrast DRWW monitoring data
- Determine additional analysis needed for past data
- Formulate recommendations for watershed plan

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