

4.0 Watershed Inventory III: Watershed Inventory Summary

The following is a summary of important findings, relationships, and trends that historic and current water quality and habitat/biology data is showing. The findings are organized by major cause/indicator of stakeholder concerns.

Nutrients

Nutrients (ortho-phosphates and nitrates) are identified as a major pollutant of concern in the Upper Iroquois Watershed, and are included on the stakeholders list of concerns. All four HUC 10 subwatersheds listed as impaired on the 2010 IDEMs 303(d) list include nutrients as a source of impairment.

Table 56 Subwatershed Ranking according to IDEM's 303(d) 2010 List shows which subwatershed has the most impairments in 2010 and the greatest increase in miles of stream impairment. Carpenter_Denton Creeks and Curtis-Hunter Creeks are the most impacted watersheds.

Table 56 Subwatershed Ranking according to IDEM's 303(d) 2010 List

Subwatershed Ranking Based on IDEM 303(d) List 2010						
HUC 10 Subwatershed	Status	2010 Parameter	*Number of Impairments	% of Stream Miles Impaired	**Rank	Notes
Carpenter_Denton	Impaired	Chloride, Nutrients, IBC, DO	4	47%	4	
Upper Ir_Ryan	Impaired	Nutrients, DO	2	29%	2	
Oliver Creek	No impairments	N/A	0	0%	0	
Mont_Spitlers	Impaired	Nutrients, IBC, DO	3	91%	3	IBC 90% of miles
Curtis_Hunter	Impaired	Chloride, Nutrients, IBC, DO	4	62%	4	
*Not counting PCBs,Mercury, e.coli						
**High number = most impacted						
Percent Change in 303d Listing: 2008 to 2010						
UIWI Name	Acres	Total Waterway Miles	2010 Miles of Impairment	2008 Miles of Impairment	% Change 2008 -2010	Rank
Carpenter_Denton	92,875	147	68.5	66	4%	2
Upper Ir_Ryan Ditch	86,768	139	40.8	28.5	43%	3
Oliver Ditch	52,685	117	0	0	0%	1
Mont_Spitlers	81,048	106	96	53	81%	4
Curtis_Hunter	103,490	153	95	29.5	222%	5

UIWI Water Sampling Summary May 2011 to April 2013

UIWI water quality monitoring data also shows excessive orthophosphate and nitrate levels within the watershed; specifically in the Carpenter-Denton and Curtis-Hunter Creek subwatersheds.

Orthophosphate

A target level of a 0.005 mg/L maximum has been set for the Upper Iroquois Watershed in order to protect aquatic life. The Carpenter-Denton sub watershed exceeded the target for orthophosphate 78% of the time. Curtis-Hunter creek sub watershed exceeded the target 100% of the time. A current theory of why this is

occurring so often is because of the nature of the soils and groundwater hydrology occurring in the Curtis headwaters area. Further investigation is needed.

Nitrates

The target levels for nitrates were set based on protecting groundwater (10ppm drinking water standard), mid-term goal of <5ppm and warm water fisheries (1.5 ppm). 25% of sites exceeded the 10ppm target (sites J19, J2, NC, ND, NA, J22, and NH). The Carpenter_Denton Creek watershed exceeded the 5ppm target, 13% of the time, and the 1.5ppm target 19% of the time.

The target level of 1.5ppm across the whole watershed was exceeded 36% of the time during 2 years of sampling.

A total of 20 nitrate exceedances for the Carpenter-Denton sub watershed, and 39 exceedances for the Curtis-Hunter creek sub watershed were observed above the 1.5 ppm target range. With these numbers targeting efforts to reduce nitrate loss from agricultural and urban sources will show that greatest impact in these areas.

E.coli

E.coli is another important parameter for water quality in the Upper Iroquois Watershed, and high E.coli levels are included on the stakeholders list of concerns. The 2008 303(d) list includes E.coli as impaired for four sub watersheds. E.coli continues to be a concern within the watershed given that current water quality monitoring indicates 6 occurrences or 20% of samples, where sample sites within the Carpenter-Denton sub watershed exceeded the target level of less than 235 cfu per 100 ml sample for safe bodily contact. Curtis-Hunter creek sub watershed exceeded the target level 5 times or 11% of the time throughout the water quality monitoring time frame of May 2011-April 2013

Dissolved Oxygen

Dissolved Oxygen (DO) is also a parameter of concern for the Upper Iroquois Watershed. All four HUC 10 subwatersheds on the 303(d) list include DO as a parameter to water quality. Water quality monitoring also shows excessive DO levels within the watershed, specifically Carpenter-Denton and Curtis-Hunter creek subwatersheds. Carpenter-Denton exceeded the target level of less than 100% a total of 75% of the time and Curtis-Hunter creek a total of 50% of the time.

Table 57 WQ Targets Exceedances by HUC 10

Parameter	Target Level	Oliver Ditch	Carpenter Denton	Upper Iroquois Ryan Ditch	Curtis Hunter Creek	Montgomery Spitlers Creeks	Total Number of Times Exceeding Target Level
Sites		J15	J22, J34, J33, J19	J28, J1, J2, J4, J30	NH, J26, J37, NF, NE, ND	NB, NA, NC	
Temperature °C	Monthly Standard	1	2	0	1	2	6
DO %	<100	16	52	47	57	28	200
pH	<9	9	27	32	39	19	126
Turbidity (NTU)	<10.4 (US EPA)	14	33	53	75	39	214
Orthophosphate (mg/L)	<0.005	15	39	60	83	34	231
Nitrate (mg/L)	>1.5	3	20	18	39	10	90
	< 5.0	2	16	23	23	11	75
E.coli (cfu/100mL)	<235	1	6	9	5	0	21
	< 410	0	4	2	3	2	11
	<576	1	4	3	15	11	34
Total Number of Exceeds by HUC 10		62	203	247	340	156	1008

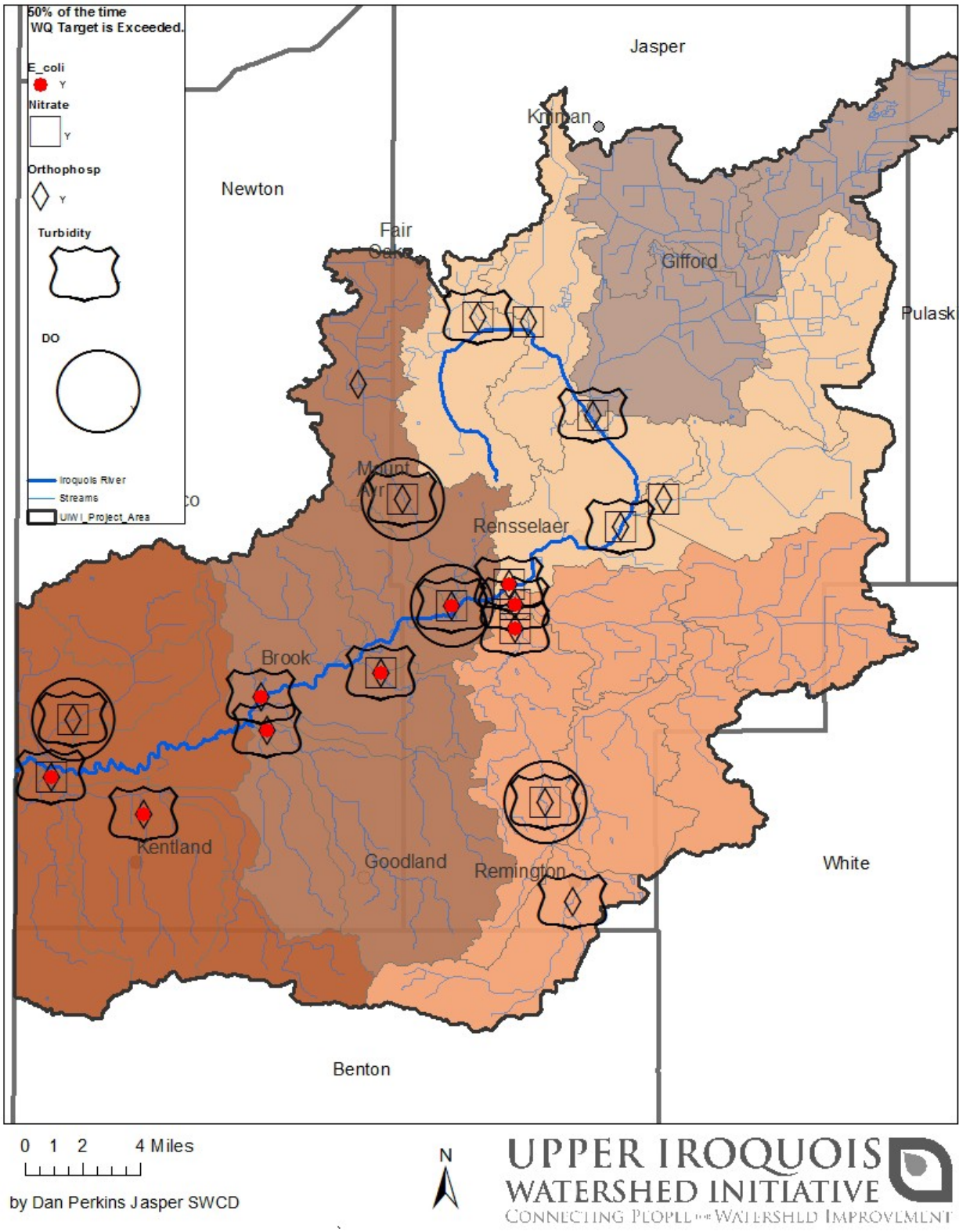
Table 58 % of Samples Exceeding WQ Target by HUC 10

Parameter	Target Level	Exceeding Target Level % of Samples					Watershed Wide Times Exceeding Target Level
		Oliver Ditch	Carpenter Denton	Upper Iroquois Ryan Ditch	Curtis Hunter Creek	Montgomery Spitlers Creeks	
		Sites	J15	J22, J34, J33, J19	J28, J1, J2, J4, J30	NH, J26, J37, NF, NE, ND	
Temperature °C	Monthly Standard	5%	3%	0%	1%	4%	6
DO %	<100	76%	75%	51%	50%	53%	200
pH	<9	43%	39%	34%	34%	36%	126
Turbidity (NTU)	<10.4 (US EPA)	67%	48%	57%	65%	74%	214
Orthophosphate (mg/L)	<0.005	100%	78%	100%	100%	100%	231
Nitrate (mg/L)	>1.5	19%	39%	29%	46%	29%	90
	< 5.0	13%	31%	37%	27%	32%	75
E.coli (cfu/100mL)	<235	13%	20%	23%	11%	0%	21
	< 410	0%	13%	5%	7%	11%	11
	<576	13%	13%	8%	33%	58%	34
Total % samples that Exceed target by HUC 10		50%	50%	46%	51%	52%	50%

Table 59 WQ Targets by Site % of Time Exceed WQ Target

% of Samples Exceeding WQ Target by Site							
Site	Temperature	DO %	pH	Turbidity	Orthopho	Nitrate >1.5ppm	ecoli >235
J1	0%	38%	24%	48%	93%	56%	20%
J15	5%	76%	43%	67%	100%	75%	25%
J19	5%	81%	52%	57%	100%	71%	45%
J2	0%	69%	38%	44%	100%	78%	0%
J22	0%	72%	44%	50%	100%	36%	29%
J26	0%	60%	100%	100%	100%	58%	25%
J28	0%	67%	48%	62%	100%	71%	30%
J30	0%	53%	24%	59%	100%	55%	83%
J33	8%	77%	15%	69%	100%	50%	50%
J34	0%	71%	35%	71%	100%	57%	67%
J37	6%	75%	106%	106%	170%	56%	50%
J4	0%	0%	35%	76%	100%	75%	43%
NA	5%	45%	35%	90%	100%	64%	100%
NB	7%	50%	50%	57%	100%	57%	33%
NC	0%	63%	26%	68%	100%	46%	50%
ND	0%	0%	39%	78%	100%	36%	75%
NE	0%	0%	32%	79%	100%	47%	67%
NF	0%	15%	30%	90%	100%	59%	86%
NH	0%	0%	29%	48%	100%	39%	11%

Figure 85 Water Quality 50% and more of samples exceed target levels.



Habitat and Macro invertebrates Rating

Along with basic chemical monitoring, habitat quality and biological communities have been sampled as part of the UIWI water quality monitoring. It should be noted that "Citizen" level scoring was done to get a rough baseline.

Table 60 Citizen Macro invertebrates Impaired Biological Index (CMIBI) Summary by HUC 10

Citizen MIBI									
Sample Site	Rating 2011	2011 Quality Score	Rating 2013	2013 Quality Score	10 HUC_Subwatershed	2011 Average 10 HUC	2013 Average 10 HUC	2011 Overall Score	2013 Overall Score
J1	15	Fair	12	Fair	Upper Iroquois-Ryan Creek	15.25	14.25	Fair	Fair
J28	10	Poor	15	Fair	Upper Iroquois-Ryan Creek				
J2	19	Good	16	Fair	Upper Iroquois-Ryan Creek				
J4	17	Good	14	Fair	Upper Iroquois-Ryan Creek				
J30	n	n	n		Upper Iroquois-Ryan Creek				
NC	11	Fair	2	Poor	Montgomery-Spitlers Creeks	5.33	10.67	Poor	Fair
NA	1	Poor	4	Poor	Montgomery-Spitlers Creeks				
NB	4	Poor	26	Excellent	Montgomery-Spitlers Creeks				
J37	16	Fair	14	Poor	Curtis-Hunter Creeks	15.67	14.50	Fair	Fair
J26	19	Good	21	Good	Curtis-Hunter Creeks				
NH	13	Fair	22	Good	Curtis-Hunter Creeks				
NF	12	Fair	10	Poor	Curtis-Hunter Creeks				
NE	20	Good	11	Fair	Curtis-Hunter Creeks				
ND	14	Fair	9	Poor	Curtis-Hunter Creeks				
J22	15	Fair	2	Poor	Carpenter-Denton Creeks	16.00	7.25	Fair	Poor
J33	11	Fair	1	Poor	Carpenter-Denton Creeks				
J34	26	Excellent	16	Fair	Carpenter-Denton Creeks				
J19	12	Fair	10	Poor	Carpenter-Denton Creeks				
J15	16	Fair	21	Good	Oliver Ditch	16.00	21.00	Fair	Good
Watershed Average	14	Fair							
Scale	Quality	Scale	Quality						
10 or less	Poor	11-16	Fair						
17-22	Good	23 >	Excellent						

It is recommended that a pre-implementation phase be completed to acquire a full bio monitoring assessment (macroinvertebrates, fish, and habitat) for the following reasons:

1. Animals are exposed continuously to water, so they integrate effects over time (not just a snapshot like most chemical monitoring)
2. Community responses can diagnose particular water quality problems (low oxygen, excessive nutrients, toxins, etc.)

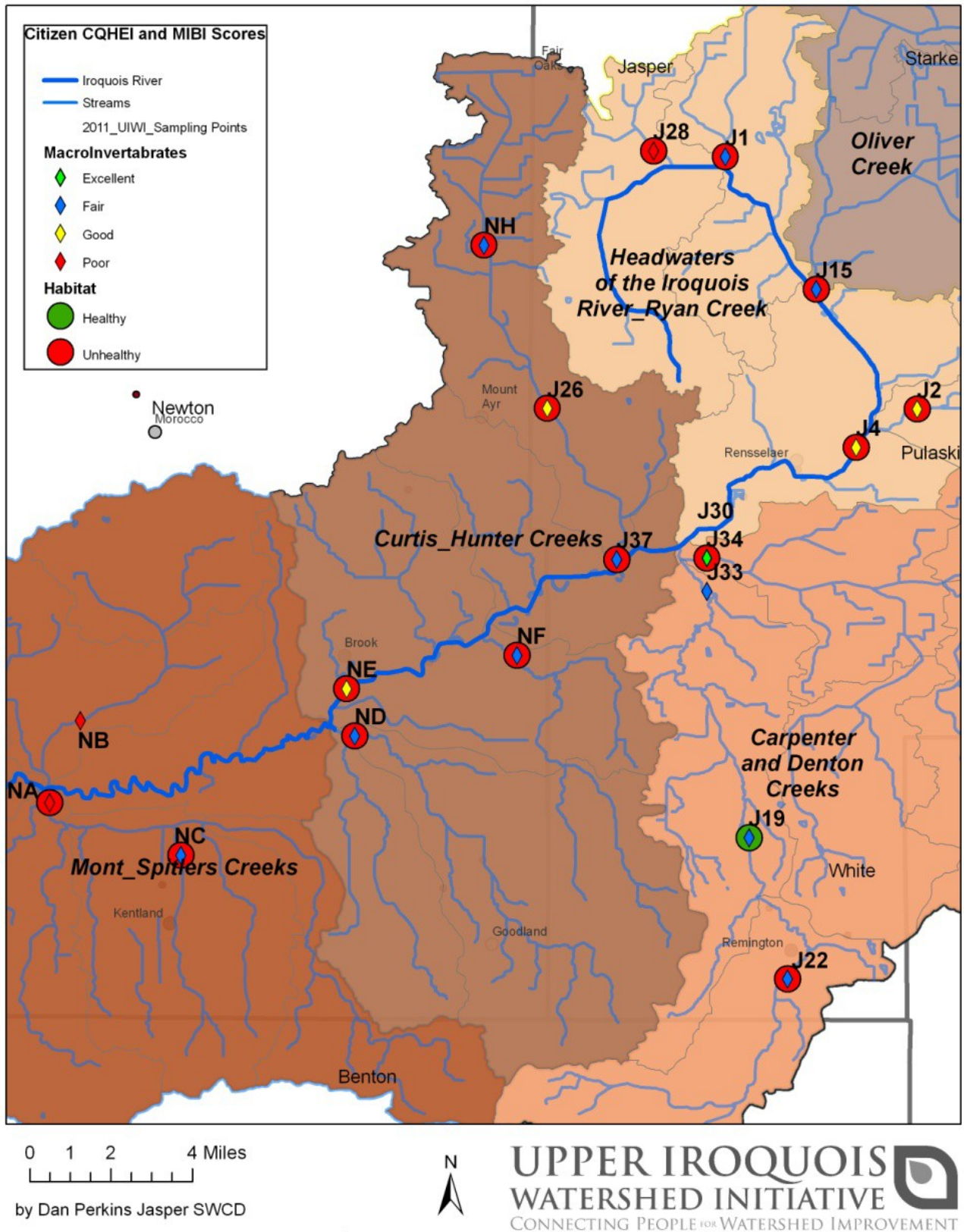
Table 61 Citizen Habitat Evaluation Index Summary by HUC 10

Citizen Habitat Evaluation index (CQHEI)							
Site	2011 Rating	2011 Average Rating	2011 Quality Score	HUC 10 Subwatershed	2013 Rating	2013 Average Rating	2013 Quality Score
J15	44	44	Unhealthy	Oliver Ditch	44	44	Unhealthy
J1	39	31.5	Unhealthy	Upper Iroquois-Ryan Creek	72	51	Unhealthy
J30				Upper Iroquois-Ryan Creek	71		
J28	12		Unhealthy	Upper Iroquois-Ryan Creek	24		
J2	21		Unhealthy	Upper Iroquois-Ryan Creek	30		
J4	54		Unhealthy	Upper Iroquois-Ryan Creek	60		
J33		50.3	Unhealthy	Carpenter-Denton Creeks	46	68	Healthy
J34	48		Unhealthy	Carpenter-Denton Creeks	73		
J19	63		Healthy	Carpenter-Denton Creeks	85		
J22	40		Unhealthy	Carpenter-Denton Creeks			
J37	47	32.33	Unhealthy	Curtis-Hunter Creeks	61	48	Unhealthy
J26	28		Unhealthy	Curtis-Hunter Creeks	60		
NH	41		Unhealthy	Curtis-Hunter Creeks	37		
NF	29		Unhealthy	Curtis-Hunter Creeks	35		
NE	15		Unhealthy	Curtis-Hunter Creeks	56		
ND	34	24	Unhealthy	Montgomery-Spitlers Creeks	53	51	Unhealthy
NC	8		Unhealthy	Montgomery-Spitlers Creeks	58		
NA	40		Unhealthy	Montgomery-Spitlers Creeks	41		
NB				Montgomery-Spitlers Creeks			
HUC 8	Watershed Ave	36.4	Unhealthy				
Citizen Habitat Evaluation Index CQHEI		100>	High Quality Stream				
		> 60	Generally Healthy				
		< 60	Unhealthy				

Sub watersheds which had more than one sampling location within their boundaries took the average score among all sampling site and were scored following either the Citizen MIBI or the Citizen Qualitative Habitat Evaluation index (CQHEI). All sub watersheds scored Fair with the Citizen MIBI except the Montgomery-Strole Creeks sub watershed, which scored Poor, and based on the 2010 303(d) list of impairments that had this area significantly impaired for IBI this shouldn't be a surprise.

Based off of the CQHEI and CMIBI, site J19 within the Carpenter-Denton Creeks sub watershed scored a Healthy rating of 63. However, all other sites within the sub watershed scored unhealthy with ratings in the forties. Habitat and biological measurements directly relate to the stakeholders concern of protecting and creating healthy fish habitat, in that biological monitoring is based on the fact that different species react to pollution in different ways and that benthic macro invertebrates are continuous indicators of environmental quality.

Figure 86 Habitat and Macro invertebrates Scores



4.1 Analysis of Stakeholder Concerns

Following the characterization and inventory of the Upper Iroquois Watershed, stakeholder concerns were analyzed, see Table 62 Analysis of Stakeholders Concerns. As part of this analysis, each concern was evaluated to determine if there was data to support it, if so what evidence is currently available, can the concern be quantified, and is the concern within the scope of this project. These grading variables helped the steering committee decide what to focus on and prioritize the concerns that were gathered during the initial stages of this watershed planning effort. It may appear that the group wants to focus on every concern, but because of the many partnerships in the watershed, the WMP group will play only an advisory or assistance role as needed.

Several of the concerns were chosen not to focus on for several reasons. For example, log jams, since several partnering groups like the IRCD and Friends of the Iroquois have a good handle and mechanisms to deal with this concern. Beaver dams are handled locally by farmers and the county surveyor's office. The fish consumption advisory will not be addressed, largely due to contributing pollutant sources such as methyl mercury and PCB's precipitated from past air pollution from outside the watershed. Perceived poor fishing will also not be targeted as not enough data exists to support this concern.

Table 62 Analysis of Stakeholders Concerns

Concern	Support by data	Evidence	Quantifiable	Outside Scope	Group wants to focus on
Flashiness and flooding of the Iroquois River	Yes	USGS Stream Gage, Local Stories	Yes	No	Yes
Log jams	Yes	IRCD Stream Surveys, Windshield Surveys, Surveyor Reports	Yes	No	No
Beaver dams slowing water	No		No	Yes	No
Too much sediment in water	Yes	Watershed Inventories; WQ monitoring	Yes	No	Yes
Altering of natural hydrology/over ditching	Yes	Desktop Survey, Drainage Miles,	Yes	Yes	No
Lack of drainage in areas	Yes	Local farmers, Surveyor Reports	No	Yes	No
Tile drainage negatively impacts water quality and water flow	Yes	WQ Data-nitrates, USGS Gage	Yes	No	Yes
Decrease in healthy fish habitat within watershed	Yes	WQ Biological Monitoring , CQHEI, CMIBI, Stream Buffer Survey	Yes	No	Yes
Farming right along streams/lack of riparian corridor	Yes	Windshield Survey, Stream Buffer Survey	Yes	No	Yes
Loss of native fish/mussel populations	Yes	Historical fish surveys. Local knowledge	Yes	No	Yes
Fish safe to eat?	Yes	DNR Fish Advisory List	Yes	Yes	No
Fish are unhealthy to eat because of contamination	Yes	Fish Advisory	Yes	Yes	No
Agriculture BMPs should be utilized more	Yes	SI Survey, Tillage Transect, Windshield Survey, WQ Data	Yes	No	Yes
Locals unaware of Ag and Urban BMP options	Yes	SI Survey	Yes	No	Yes
Too many locations where cattle have direct access to watershed streams	Yes	Windshield Survey and WQ Monitoring	Yes	No	Yes

4.2 Identifying Problems and Causes.

Initial stakeholder concerns (Table 6), the 6 preliminary problem statements were grouped and paired down into 5 problem statements, see Table 63 Stakeholder Concerns to Problem Statements. Within these 5 problem statements, potential causes were documented based on historic and current water quality data, see

Table 64 Identification of Causes of Problems. A cause is defined as an event, agent, or series of actions that produces an effect.

Table 63 Stakeholder Concerns to Problem Statements.

Concerns	Problem
Flashiness and flooding of the Iroquois	The Iroquois River has undesirable high and low levels and flows of water that threaten our towns, agricultural land, and health of the river.
Too much sediment	
Tile drainage negatively impacts water quality and water flow	
Decrease in healthy fish habitat within watershed	The desirable native fish populations in the Iroquois River and surrounding waterways are suspected to be in decline.
Loss of native fish/mussel populations	
Channelization/Ditch cleaning that results in loss of fish habitat = altered hydrology	
Fish are unhealthy to eat because of pollution	
Too much sediment in water	Area streams within the watershed are very cloudy and turbid.
Agriculture BMPs should be utilized more	
Locals unaware of BMP options	
Too many locations where cattle have direct access to watershed streams	
Too much fertilizer entering the water	
Surface and soil erosion contributes to scouring and sloughing of stream banks	
Lack of recreational access to river	Widespread recreational use is prevented.
No trail system in watershed	
High E.coli levels within watershed streams	
Public lacks knowledge about the river and its tributaries' water quality	
Perceived poor fishing	The Iroquois River and its tributaries are listed on IDEM's 303(d) list for "excessive nutrients, E.coli, and IBI."
Septic systems not efficient enough and/or not properly maintained	
Too much nutrients in water	
Surface and soil erosion contributes to scouring and sluffing of stream banks	
CSO's in Rensselaer	

Agriculture BMPs should be utilized more	
Tile drainage negatively impacts water quality and water flow	
Nothing actively growing during non cash crop season to prevent nutrient loss	

Table 64 Identification of Causes of Problems

Problem	Potential Causes
The Iroquois River has undesirable high and low levels and flows of water that threaten our towns, agricultural land, and health of the river.	Increase of tiling and open ditches on agricultural fields has led to increased volume
	Loss of natural riparian habitat and flood zones (reduced flood storage)
	Degraded function and benefit of floodplains (loss of storage capacity and reduced in-stream velocity)
	Increased sedimentation from high velocity flows and channelization causing stream bank erosion
	Log jams
	Lack of education about natural hydrology and effects of channelization
	Lack of unified government strategy about watershed flooding.
The desirable native fish populations in the Iroquois River and surrounding waterways are suspected to be in decline.	Poor habitat/water quality limits the biotic community which is food source for fish
	Dredging and regular ditch cleaning of sediment
	Competing land uses resulting in loss of riparian/diverse fish habitat
Area streams within the watershed are very cloudy and turbid.	Suspended sediments and/or turbidity exceed target values set by this project.
	Livestock access disturb bottom sediments
	soil and wind erosion from agricultural fields and urban construction
	Streambank erosion and slope failures input high levels of sediment
Widespread recreational use is prevented.	Historical view of river just for drainage
	Lack of public access points every 5-10 miles.
	Numerous log jams
	Perceived poor water quality
The Iroquois River and its tributaries are listed on IDEM's 303(d) list for "excessive nutrients, e.coli, and IBC."	Unified source of recreational about region information is not available.
	Nutrient concentrations exceed target values set by this project (nitrate-orthophosphate).
	Lack of nutrient/manure management
	e.coli levels exceed target levels
	Various stream segments are listed as having impaired biological communities
	Lack of Buffer strips along waterways
	Lack of and decline of use of conservation tillage practices
Nothing actively growing during noncash crop season to prevent nutrient loss	
Continual dredging and cleaning of ditches = unstable watercourses	

4.3 Source Identification and Loads: Key Pollutants of Concern

Watershed Inventory, GIS data, and water quality data were used to characterize and calculate loading of potential sources. A source is defined as an activity, material, or structure that results in a cause of nonpoint source pollution.

Nonpoint pollution sources are varied, yet common throughout almost any watershed. A summary of potential sources identified in the Upper Iroquois River watershed for each of our problems is listed below:

Nutrients (Nitrogen and Phosphorus):

- Conventional cropping practices
- Waste water treatment discharges
- Industrial discharges
- Excess Agricultural and residential fertilizer
- Poor riparian buffers
- Streambank and bed erosion
- Construction activities
- Improperly managed animal waste
- Confined feeding operations
- Human waste (failing septic systems, package plants, inadequately treated wastewater)
- Altered hydrology (ditching and draining, fish passage limitations, altered stream courses)

E. coli:

- Human waste (failing septic systems, CSO, package plants, inadequately treated wastewater)
- Animal waste (livestock in streams, pet waste, poor manure management, domestic and wildlife run-off)

Sediment:

- Conventional cropping practices
- Stream bank and bed erosion
- Poor riparian buffers
- High velocities as a result of increased agricultural tile drainage and urban run-off (impervious surfaces)
- Construction activities
- Livestock access to streams
- Altered hydrology (ditching and draining, fish passage limitations, altered stream courses)
- Flooding

GIS and water quality data were used to evaluate the potential sources within each subwatershed. Appendix 2: Potential Source Summary Data HUC 10 contains tables detailing the data for each potential source and was used to identify the potential sources listed in Table 65 Potential Causes and Sources for each Pollution Problem.

Table 65 Potential Causes and Sources for each Pollution Problem

Problem	Potential Causes	Potential Sources
<p>The Iroquois River has undesirable high and low levels and flows of water that threaten our towns, agricultural land, and health of the river.</p>	<p>Increase of tiling and open ditches on agricultural fields has led to increased volume</p>	<p>Crop land having artificial drainage as % of total drainage miles; Oliver Ditch 230 miles or 65%, Carpenter-Denton 136 miles or 46%, Upper Iroquois-Ryan with 242 miles or 64% drained, Curtis-Hunter with 111 or 42%, and Mont-Strole with 104 miles or 50%.</p>
	<p>Loss of natural riparian habitat and flood zones (reduced flood storage)</p>	<p>Windshield Survey 5 of sites with less than 50% buffer; Oliver 24 sites, Carpenter-Denton 15, Upper Iroquois-Ryan 26, Curtis_Hunter 27, Mont_Strole 14 % riparian buffered within 100 ft of waterway; Oliver Ditch 18%, Carpenter-Denton 20%, Upper Iroquois-Ryan 18%, Curtis-Hunter 20%, and Mont-Strole 20%.</p>
	<p>Loss and degraded function and benefit of wetland/floodplains</p>	<p>% of Total land area in Wetland; Oliver Ditch 6.5%, Carpenter-Denton 1%, Upper Iroquois-Ryan 2.5%, Curtis-Hunter 1.4%, Mont-Strole 0.8% % riparian buffer within 100 ft of waterway; Oliver Ditch 18%, Carpenter-Denton 20%, Upper Iroquois-Ryan 18%, Curtis-Hunter 20%, and Mont-Strole 20%.</p>
	<p>Increased sedimentation and channelization</p>	<p># of Active Erosion Sites- Oliver 1, Carpenter_Denton 3, Upper Ir_Ryan 19, Curtis_Hunter 11, Mont_Strole 14</p>
	<p>Log jams</p>	<p># of Live Stock Access Sites- Oliver 2, Carpenter_Denton 12, Upper Iroquois_Ryan 7, Curtis_Hunter 19, Mont_Strole 8</p>
	<p>Log jams</p>	<p>County Survey Records and IRCD tracking</p>
	<p>Lack of understanding of flooding, hydrology and effects of channelization</p>	<p>% area in wetland less than 2%, outdated view of drainage options , Crop land having artificial drainage as % of total drainage miles; Oliver Ditch 230 miles or 65%, Carpenter-Denton 136 miles or 46%, Upper Iroquois-Ryan with 242 miles or 64% drained, Curtis-Hunter with 111 or 42%, and Mont-Strole with 104 miles or 50%.</p>
	<p>The desirable native fish populations in the Iroquois River and surrounding waterways are suspected to be in decline.</p>	<p>Poor habitat and poor biotic community</p>
<p>Perceived poor fishing</p>		<p>N/A</p>
<p>Competing land uses resulting in loss of riparian/diverse fish habitat</p>		<p># of Poor Rank for Habitat and Biotic communities; Carpenter-Denton 5, Upper Iroquois 5, Curtis-Hunter 5, Mont-Strole 7 Windshield Survey 5 of sites with less than 50% buffer; Oliver 24 sites, Carpenter-Denton 15, Upper Iroquois-Ryan 26, Curtis_Hunter 27, Mont_Strole 14</p>
<p>Habitat scores according to CQHEI rank all sites, but one as unhealthy = lack of quality habitat</p>		<p>Habitat scores according to CQHEI rank all sites, but one as unhealthy = lack of quality habitat</p>

Problem	Potential Causes	Potential Sources
<p>Area streams within the watershed are very cloudy and turbid.</p>	<p>Suspended sediments and/or turbidity exceed target values set by this project.</p>	<p>% riparian buffer within 100 ft of waterway; Oliver Ditch 18%, Carpenter-Denton 20%, Upper Iroquois-Ryan 18%, Curtis-Hunter 20%, and Mont-Strole 20%. Lack of conservation tillage across watershed - no-til corn less than 10%, soybeans less than 60%.</p>
	<p>Livestock stirring stream bed</p>	<p># of Live Stock Access Sites- Oliver 2, Carpenter_Denton 12, Upper Iroquois_Ryan 7, Curtis_Hunter 19, Mont_Strole 8</p>
	<p>Streambank erosion and slope failures input high levels of sediment</p>	<p># of Channelization Sites- Oliver 40, Carpenter_Denton 72, Upper Ir_Ryan 56, Curtis_Hunter 62, Mont_Strole 34</p>
	<p></p>	<p># of Active Erosion Sites- Oliver 1, Carpenter_Denton 3, Upper Ir_Ryan 19, Curtis_Hunter 11, Mont_Strole 14</p>
<p>Widespread recreational use is prevented.</p>	<p>Historical view of river just for drainage</p>	<p>Lack of unified land use and recreational plans</p>
	<p>Lack of public access points every 5-10 miles.</p>	<p>Lack of funding, traditional view of stream as just for drainage, missed opportunity</p>
	<p>Numerous log jams</p>	<p>stream bank sloughing, flashiness, sedimentation</p>
	<p>Perceived poor water quality</p>	<p>Lack of knowledge and education efforts across watershed</p>
	<p>Unified source of recreational about region information is not available.</p>	<p>No central website or information source.</p>

Problem	Potential Causes	Potential Sources
<p>The Iroquois River and its tributaries are listed on IDEM's 303(d) list for "excessive nutrients, e.coli, and IBC."</p>	<p>Nutrient concentrations exceed target values set by this project.</p>	<p>Crop land having artificial drainage as % of total drainage miles; Oliver Ditch 230 miles or 65%, Carpenter-Denton 136 miles or 46%, Upper Iroquois-Ryan with 242 miles or 64% drained, Curtis-Hunter with 111 or 42%, and Mont-Strole with 104 miles or 50%.</p>
		<p>% riparian buffered within 100 ft of waterway; Oliver Ditch 18%, Carpenter-Denton 20%, Upper Iroquois-Ryan 18%, Curtis-Hunter 20%, and Mont-Strole 20%. Windshield Survey 5 of sites with less than 50% buffer; Oliver</p>
		<p>Nitrate Leaching Index Ranking . . .</p>
		<p>9 cso outlets in Rensselaer that open in 1/2 rain event,</p>
	<p>e.col levels exceed target levels</p>	<p>Failing septic systems in unsewered communities, septics tied directly to subsurface tile lines, manure, wildlife, CSO</p>
	<p>Various stream segments are listed as having impaired biological communities</p>	<p>% riparian buffered within 100 ft of waterway; Oliver Ditch 18%, Carpenter-Denton 20%, Upper Iroquois-Ryan 18%, Curtis-Hunter 20%, and Mont-Strole 20%. Windshield Survey 5 of sites with less than 50% buffer; Oliver</p>
	<p></p>	<p># of Poor Rank for Habitat and Biotic communities; Carpenter-Denton 5, Upper Iroquois 5, Curtis-Hunter 5, Mont-Strole 7</p>
	<p>Lack of Buffer strips along waterways</p>	<p>% riparian buffer within 100 ft of waterway; Oliver Ditch 18%, Carpenter-Denton 20%, Upper Iroquois-Ryan 18%, Curtis-Hunter 20%, and Mont-Strole 20%.</p>
		<p>Windshield Survey 5 of sites with less than 50% buffer; Oliver</p>
	<p>Lack of and decline of conservation tillage practices</p>	<p>% loss of no-till corn and soybean acres from 2000-2011; Jasper County 8% corn and 3% soybeans. Newton County 13% corn and 12% soybean acres</p>
<p>Nothing actively growing during non cash crop season to prevent nutrient loss</p>	<p>Lack of cover crop use across watershed: CC Cost Share acres vs total acres in watershed by county,</p>	
<p>Loss of Wetland treatment and function</p>	<p>% of Total land area in Wetland; Oliver Ditch 6.5%, Carpenter-Denton 1%, Upper Iroquois-Ryan 2.5%, Curtis-Hunter 1.4%, Mont-Strole 0.8%</p>	