IN OUR OWN BACKYARD

The Great Lakes Stream Crossing Inventory

Oneida County, Wisconsin July-October 2020

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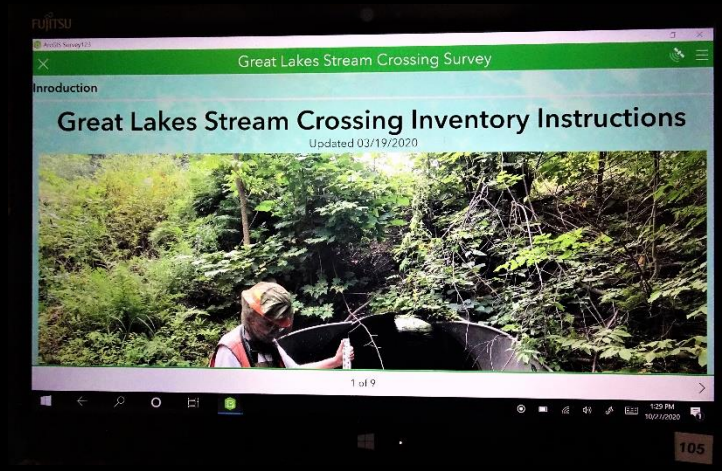
Oneida County Land and Water Conservation
Rhinelander, Wisconsin

This protocol was developed, reviewed, and tested by the following organizations:

Michigan DNR, U.S. Forest Service, Trout Unlimited, Wisconsin DNR, U.S. Fish & Wildlife Service, Huron Pines, Conservation Resource Alliance, Michigan Technological University, and road commissions.

Funding for development and testing was provided by the U.S. Forest Service, U.S. Fish & Wildlife Service, and The Nature Conservancy.

The original version (5/6/2011) was updated 8/26/2020.



Why do it?

-Prevent/minimize environmental damage

-Reduce public safety issues

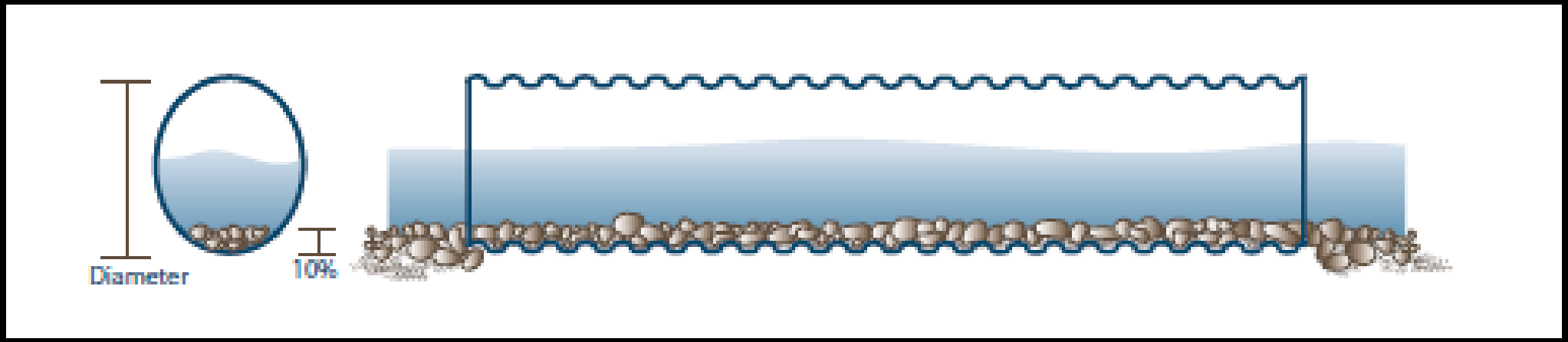
-Prioritize culverts in the project area

-Provide information to responsible parties so they can build more resilient and environmentally friendly stream crossings

-Provide future cost-sharing opportunities for replacing/repairing high priority culverts.

The Ideal Crossing…mimics the natural stream as much as possible

- ❑ **allows water and debris to flow downstream unimpeded**
- ❑ **allows aquatic organisms to move up and downstream as their lifecycles require**
- ❑ **allows high volumes of water to move after heavy rainfall events**

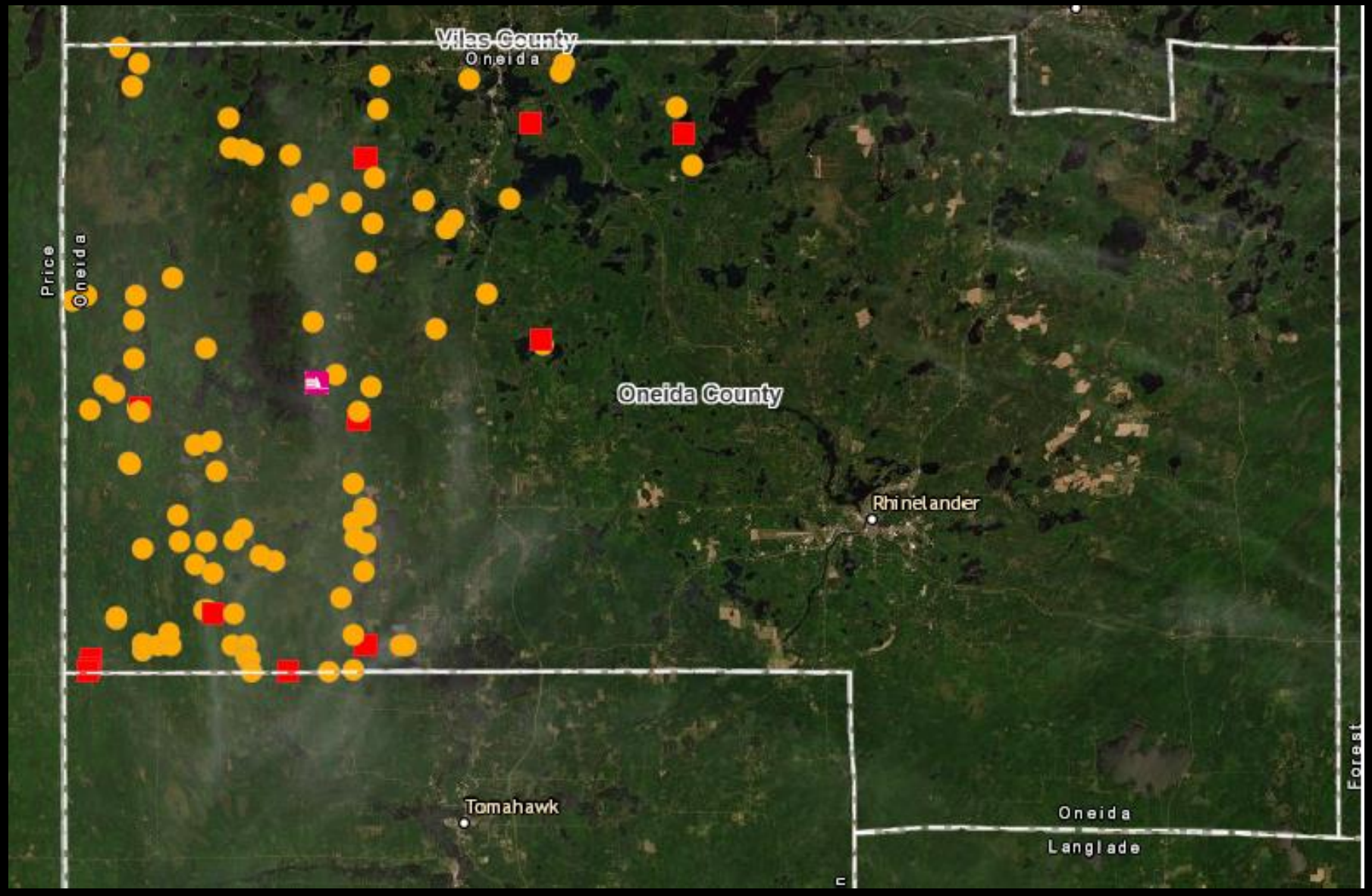


How was it done?

Locate crossings using DNR Surface Water viewer
https://dnr.wisconsin.gov/topic/SurfaceWater/swdv

Surveyed sites from
July 10-October 6, 2020

Location of Surveyed Crossings-Oneida County, Wisconsin

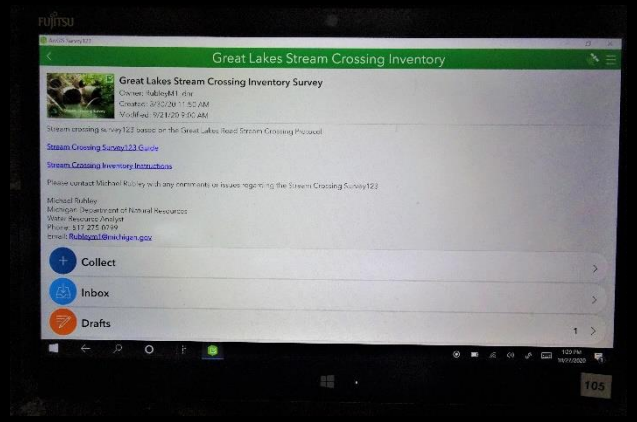


Towns

Hazelhurst (n=7)
Lake Tomahawk (n=2)
Little Rice (n=32)
Lynne (n=35)
Minocqua (n=26)
Woodruff (n=5)

Survey consists of:

- Photographs of site- upstream and downstream
- Variety of measurements
  - Stream flow velocity
  - Water depth
  - Bank and roadway slope
  - Structural measurements/condition assessment
  - Buried depth of structure
  - Visible erosion
  - Other stream condition measurements



Partially-blocked Structure

Hazelhurst 4- Kaubashine Creek at Balsam Park Boulevard

Erosion around Structure

Hazelhurst 5-McCormick Creek at County Hwy Y

Minocqua 8-Unnamed Creek at BoDiLac Road

Erosion due to run-off

Little Rice 22-Bear Creek at County Hwy Y

Hazelhurst 1-Rocky Run Creek at S Blue Lake Road

Buried depth below standard, no riprap

Hazelhurst 6-Kaubashine Creek at Cedar Falls Road

Perched Structure

Condition Issues

Minocqua Thoroughfare, County Hwy J, Woodruff

Not a Barrier

Lynne 27- Thunder Creek at North Turcott Road

Bridge needing repairs

Little Rice 31- Johnson Creek at Old Hwy 8

Minocqua 13-Unnamed Creek at Camp Nine Road

-Erosion Issues

-Buried Depth
Below Standard

-Structure
Undersized

Flowage Issues- Multiple Beaver Dams

Lynne 4-Unnamed Creek at Ruth Road

Beaver Dam Causing Flowage Issues

Erosion around culvert

Structure undersized

Lynne 4-Unnamed Creek at Ruth Road

Little Rice 19-unnamed creek at McCord Road

Passability Issues

-Perched structures

-Structures undersized

Undersized Structures

Lynne 18-Little Somo River at Indian Village Rd

Non-native Species-
Chinese Mystery Snails

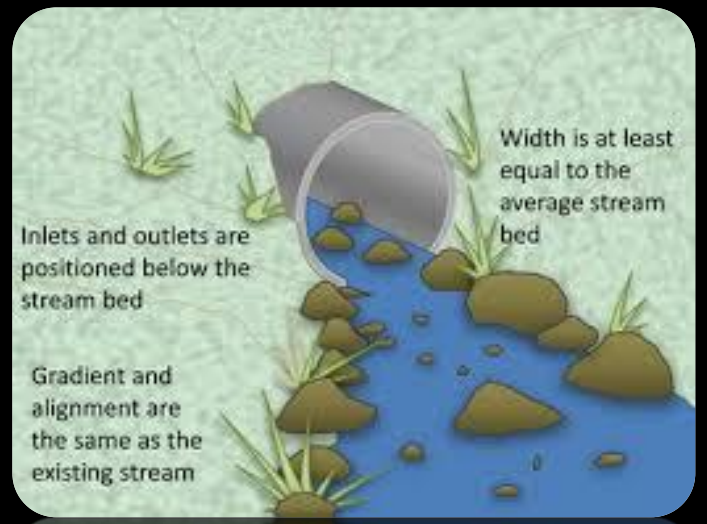
Lake Nokomis, Town of Little Rice

Non-native Species
Common Tansy
Tanacetum vulgare

Crossings were assessed based on 3 factors:

- Barrier to fish/aquatic organism/wildlife passage = Passability
- Structural integrity/condition of structure
- Soil erosion estimate

Passability



Are fish and other aquatic organisms able to cross a roadway stream intersection?

Limiting factors

- ✓ Water depth (at least 6 inches)
- ✓ Water flow velocity (less than 3 feet/second)
- ✓ Presence of a natural substrate/sediment
- ✓ Structure length (less than 30 feet)

Structural Condition

- New structure/no deficiencies
- Not new, but no noticeable corrosion
- Good Condition, superficial corrosion
- Moderate deterioration from corrosion or abrasion
- Moderate to major deterioration (less than 5% of structure)
- Major deterioration from corrosion or abrasion (5-10%)
- Major deterioration from corrosion or abrasion (10-50%)
- Severe deterioration from corrosion or abrasion (more than 50%)

Impacts of EROSION

- Fish feeding
- Oxygen levels
- Abrasion causes damage
- Fills in spawning areas
- Smothers aquatic plants
- Increases water temperature

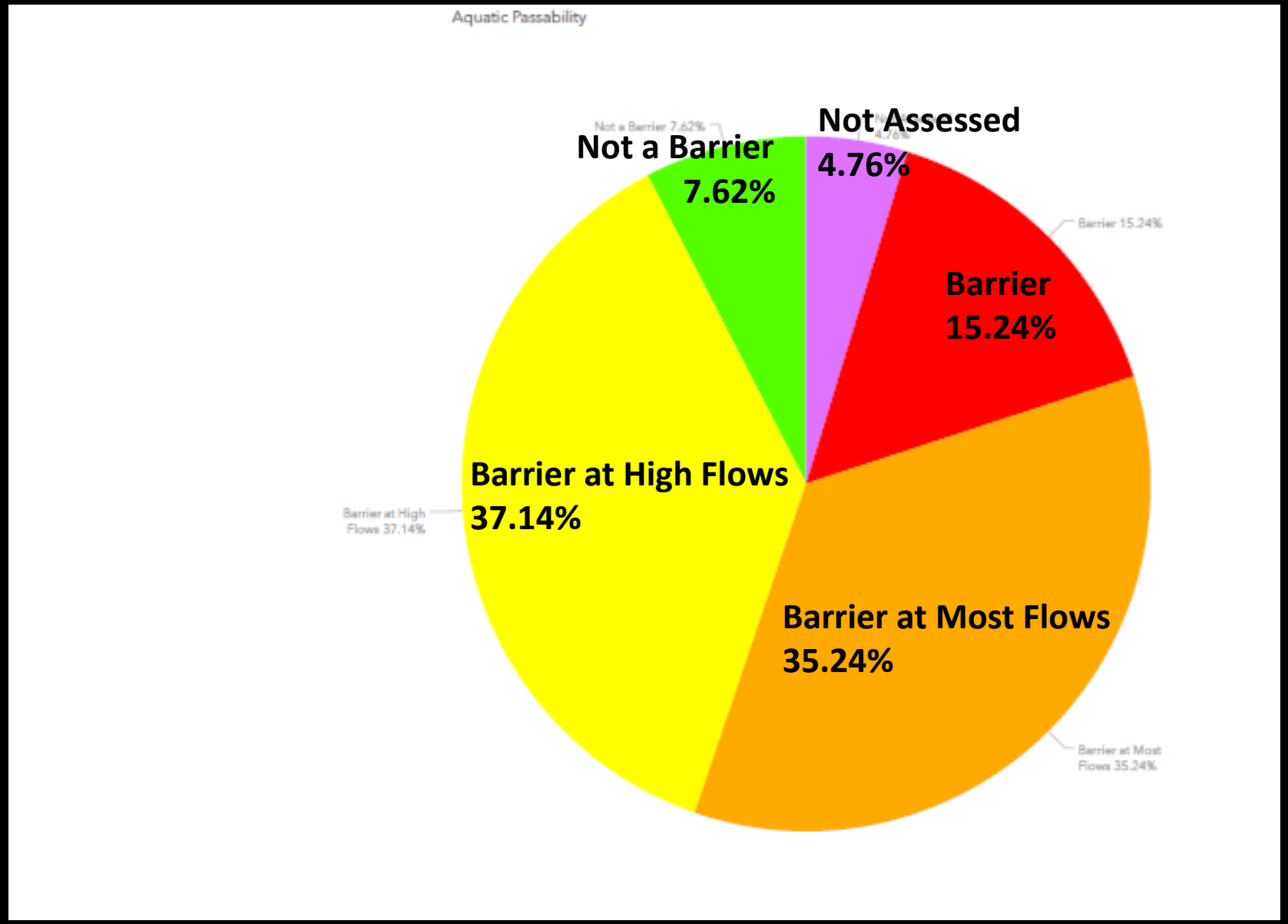
-Where erosion was occurring, measurements to evaluate extent were made.

-Erosion was calculated using the U. S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Universal Soil Loss Equation (USLE)

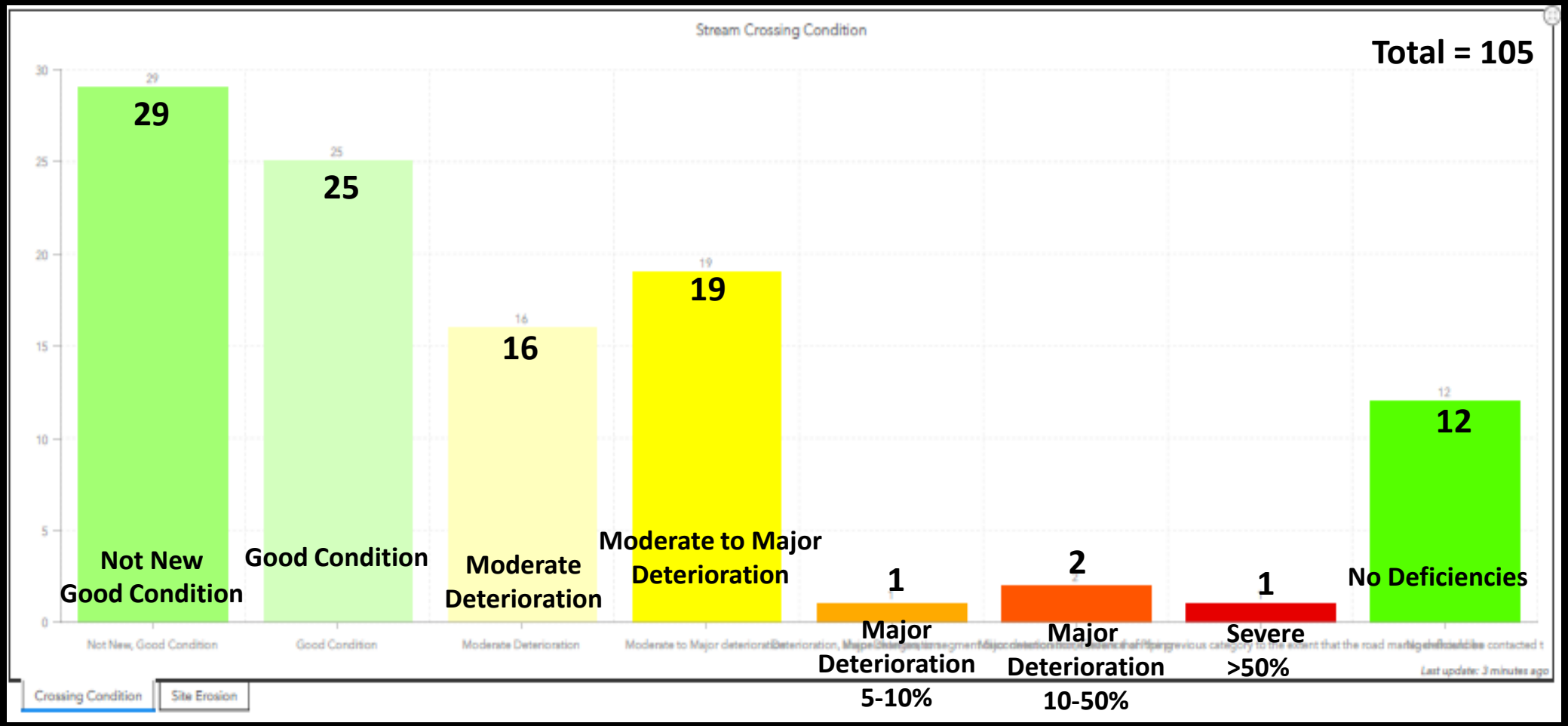
SURVEY RESULTS

- ALL SITES
- RESULTS BY TOWN
  - Lynne
  - Hazelhurst
  - Little Rice
  - Woodruff
  - Minocqua
  - Lake Tomahawk
- PRIORITY SITES

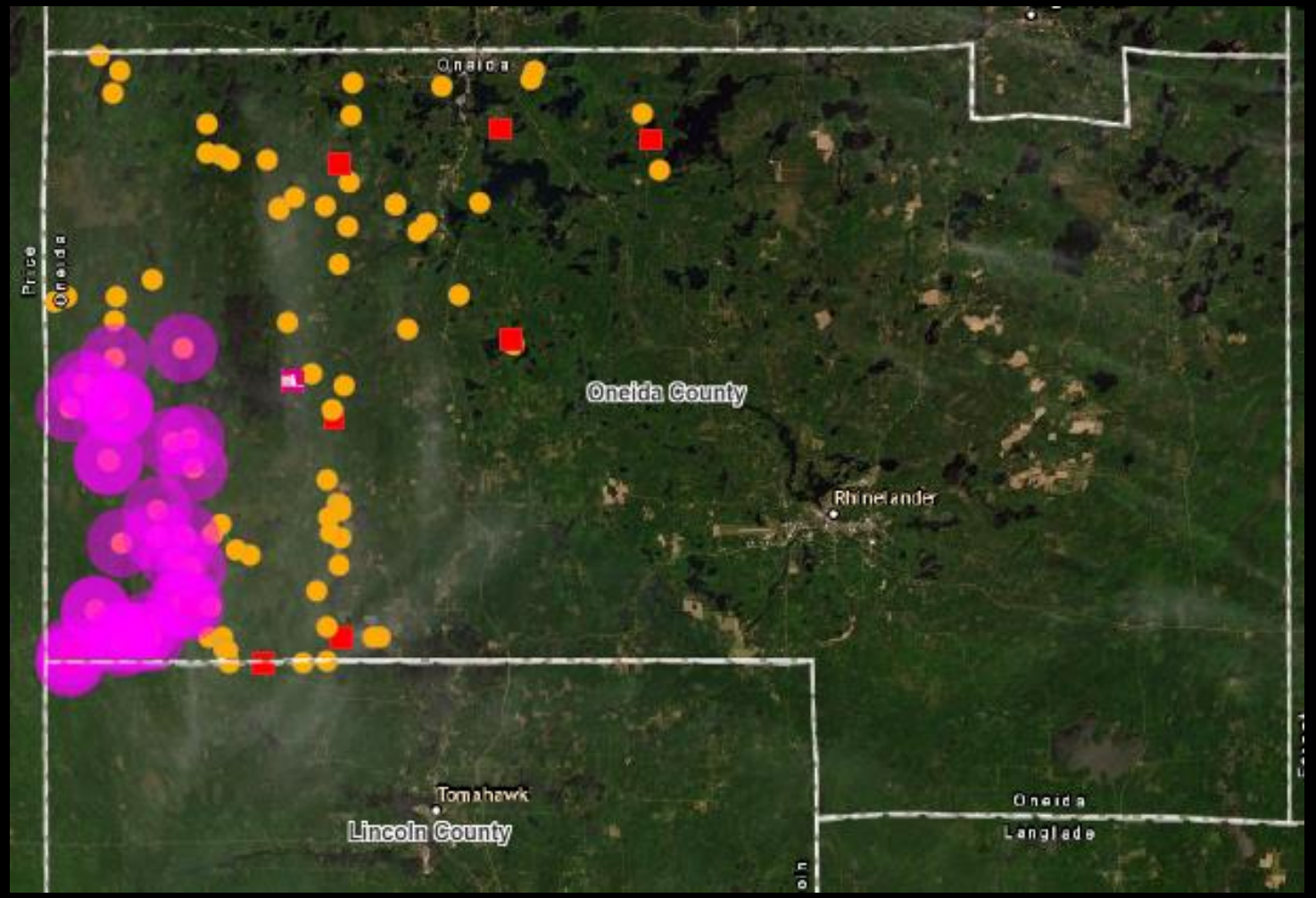
Passability- All Sites (n=105)



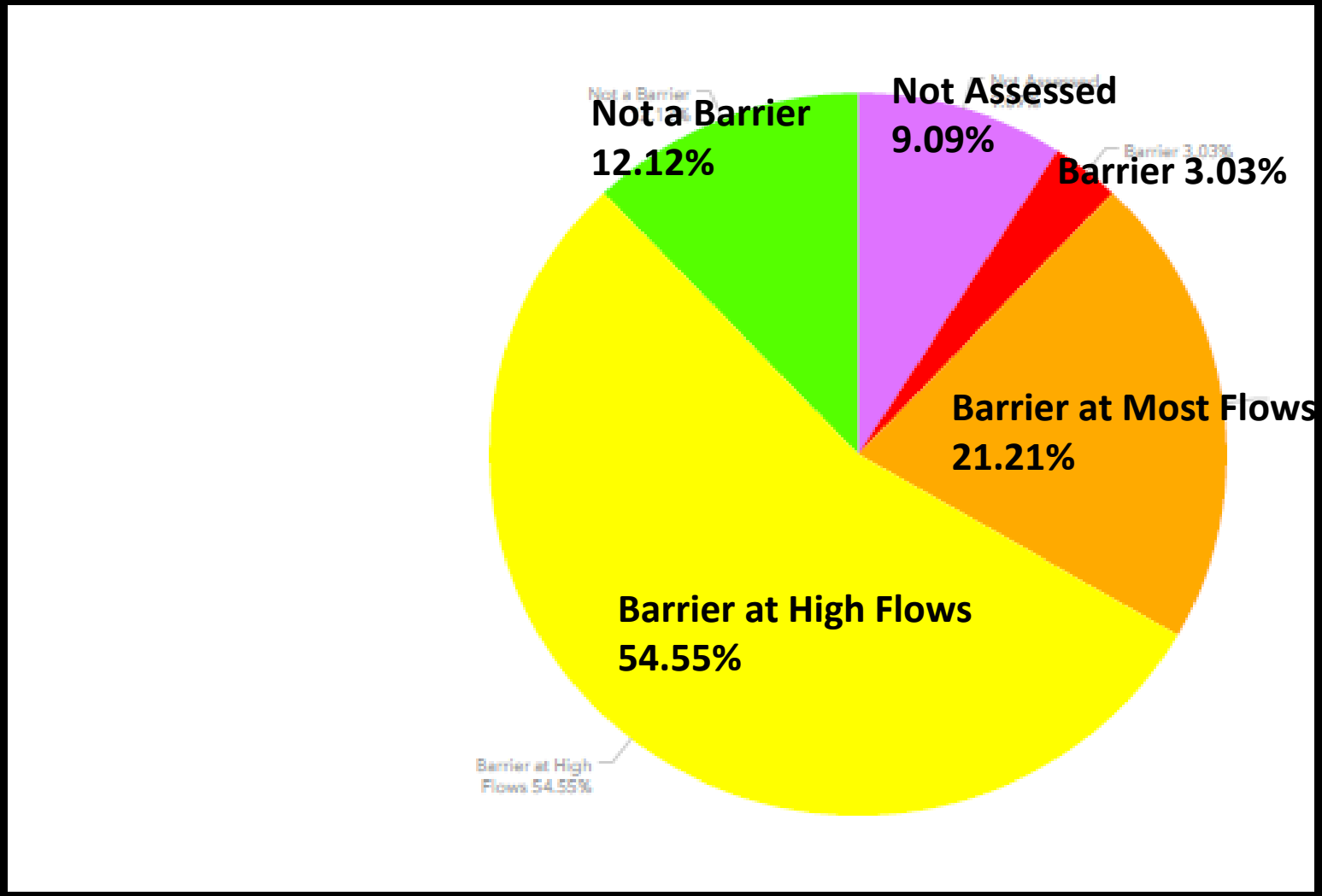
Structural Condition-All Crossings



Sites Surveyed-Town of Lynne (n=33)

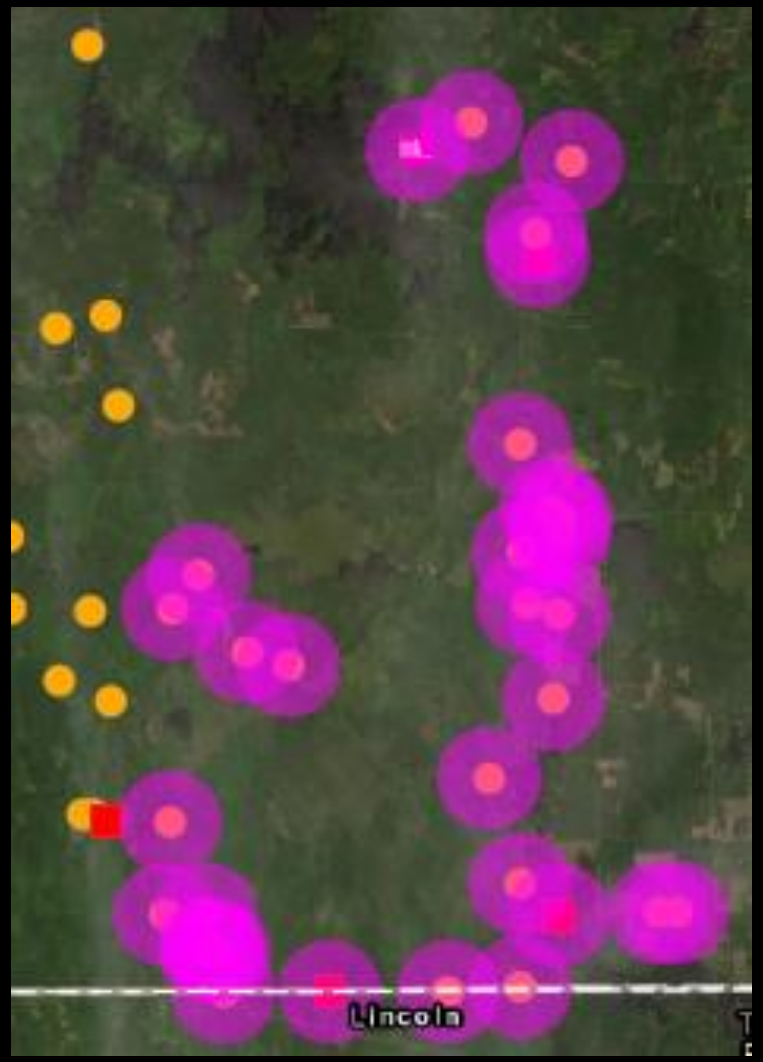


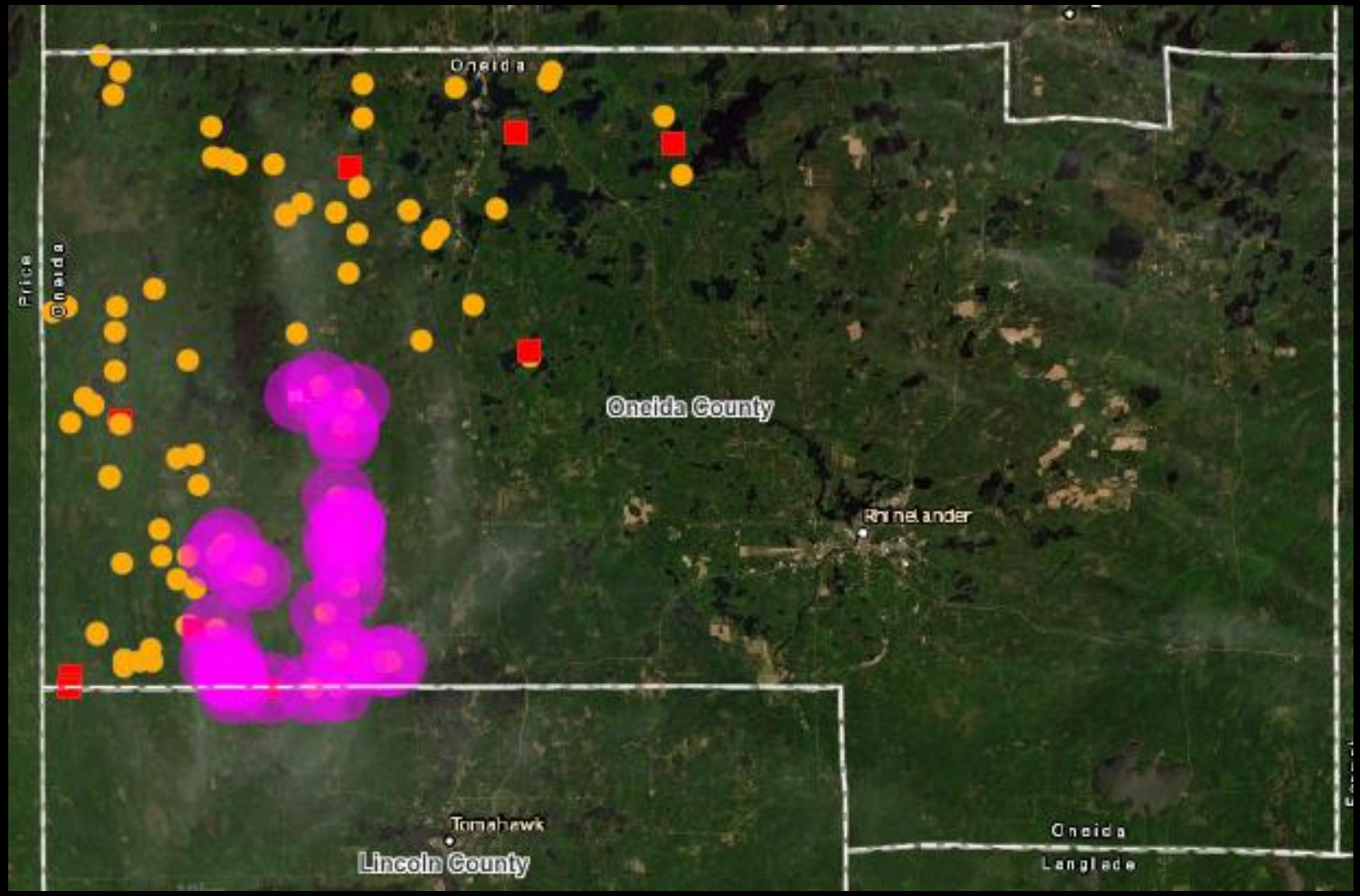
Passability-Town of Lynne



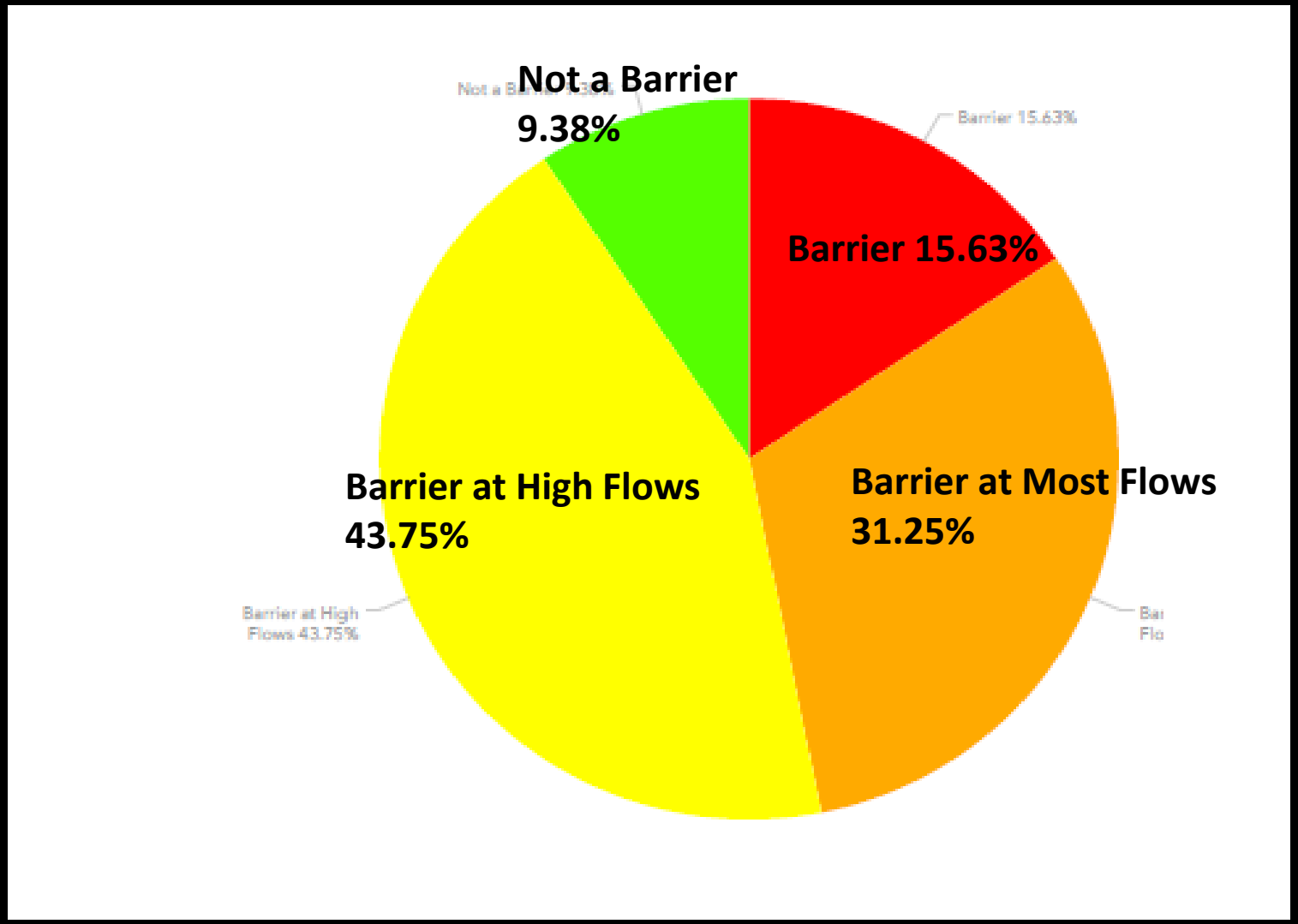
Structural Condition-Town of Lynne

Sites Surveyed-Town of Little Rice (n=32)

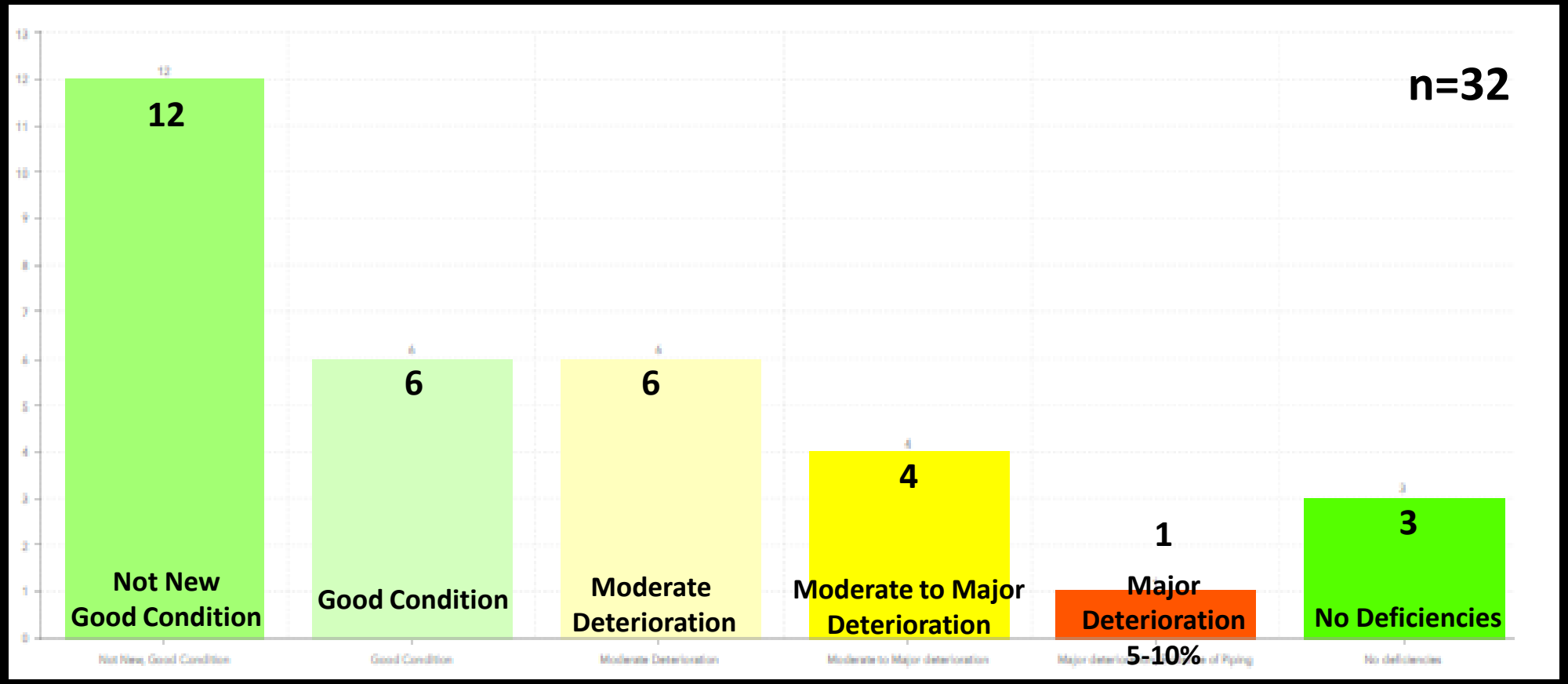




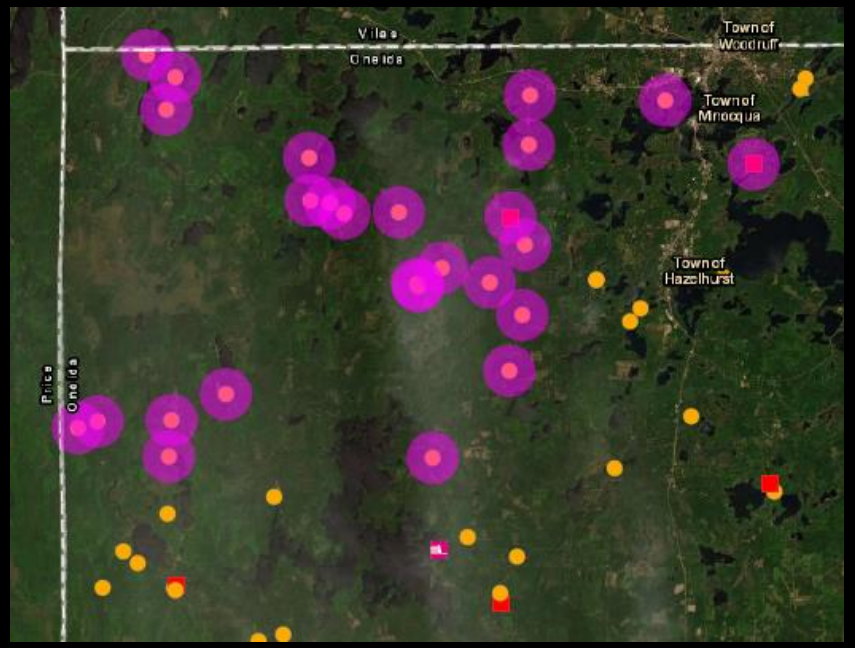
Passability-Town of Little Rice

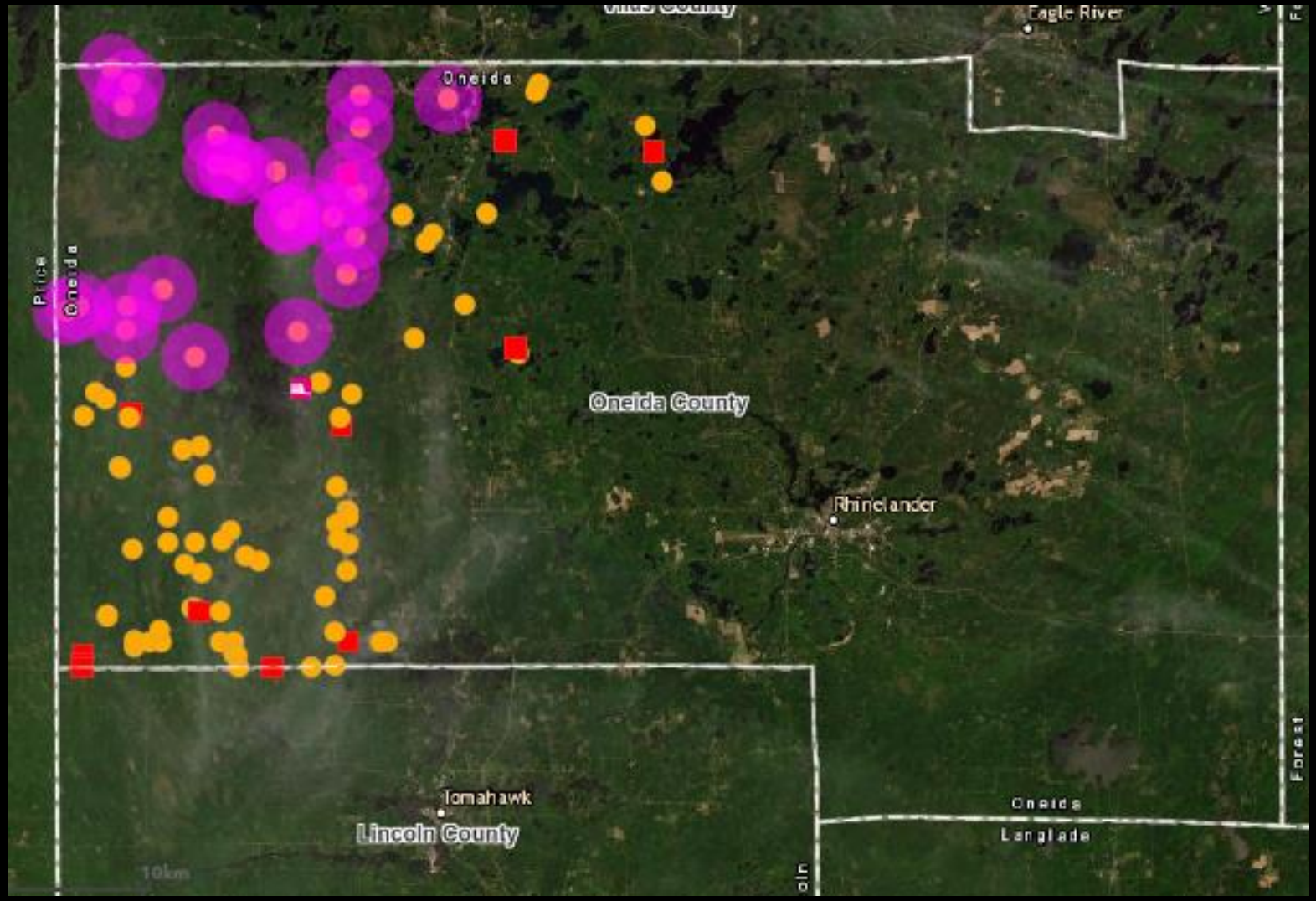


Structural Condition-Town of Little Rice

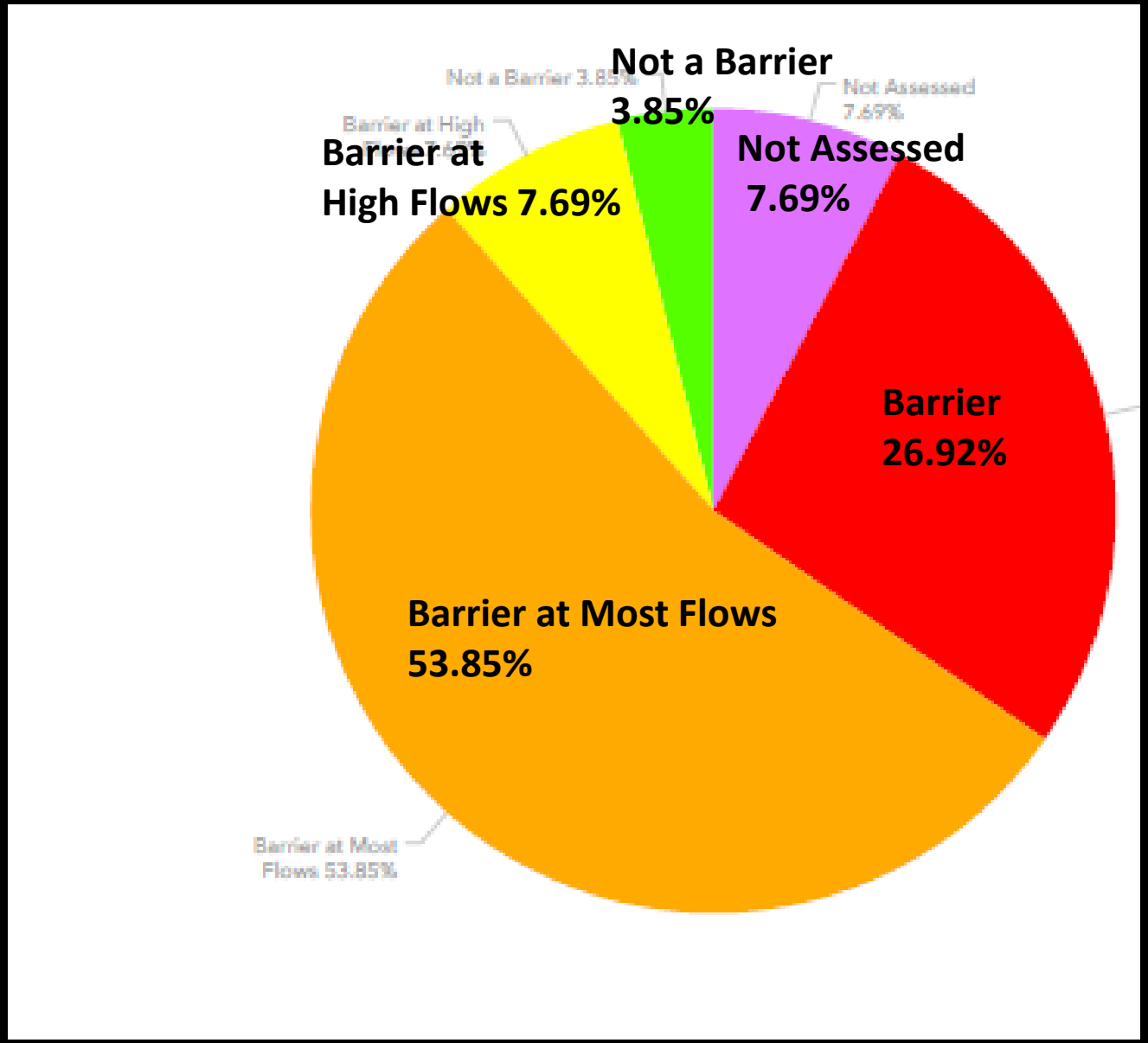


Sites Surveyed-
Town of Minocqua (n=26)

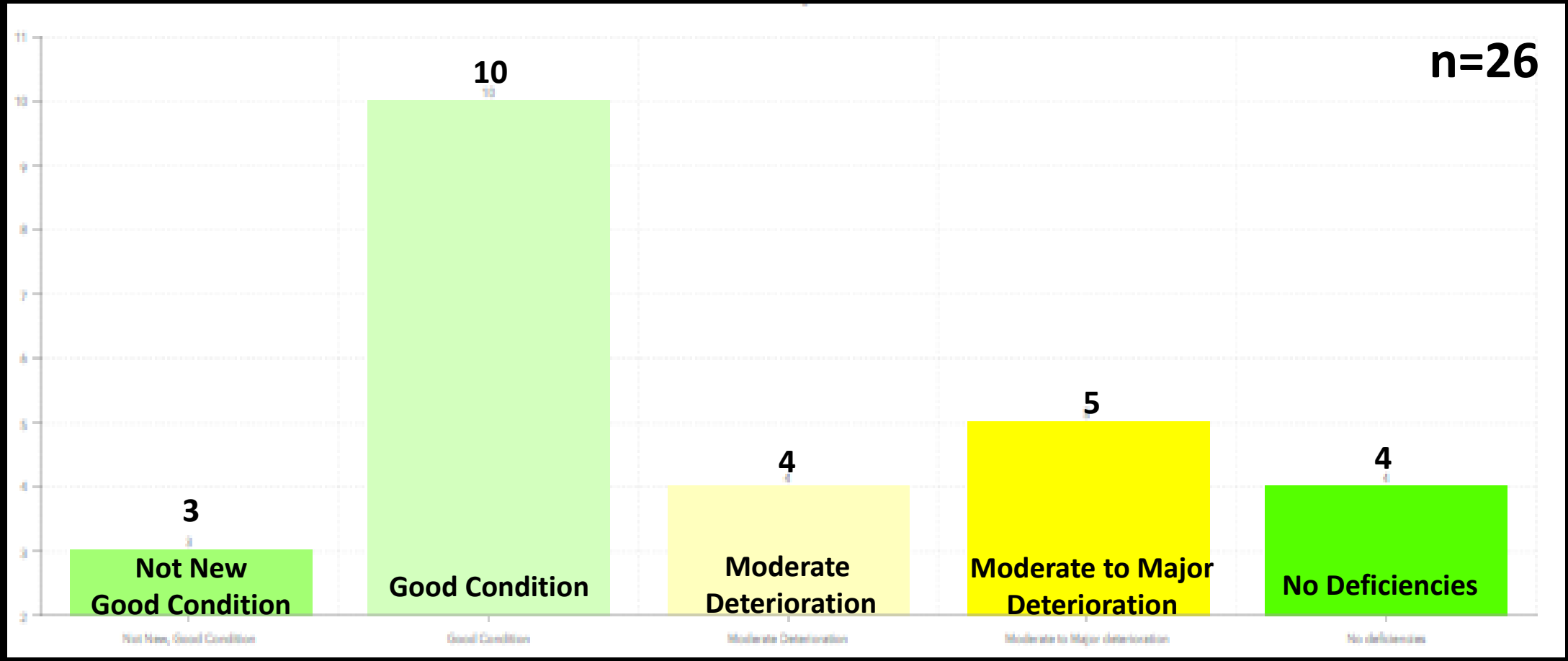




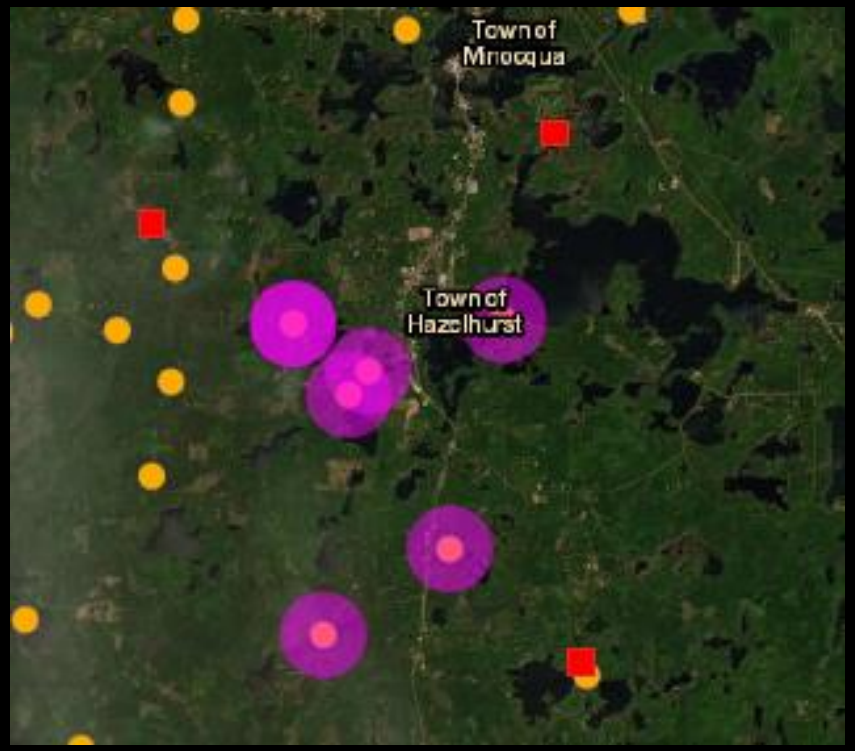
Passability- Town of Minocqua

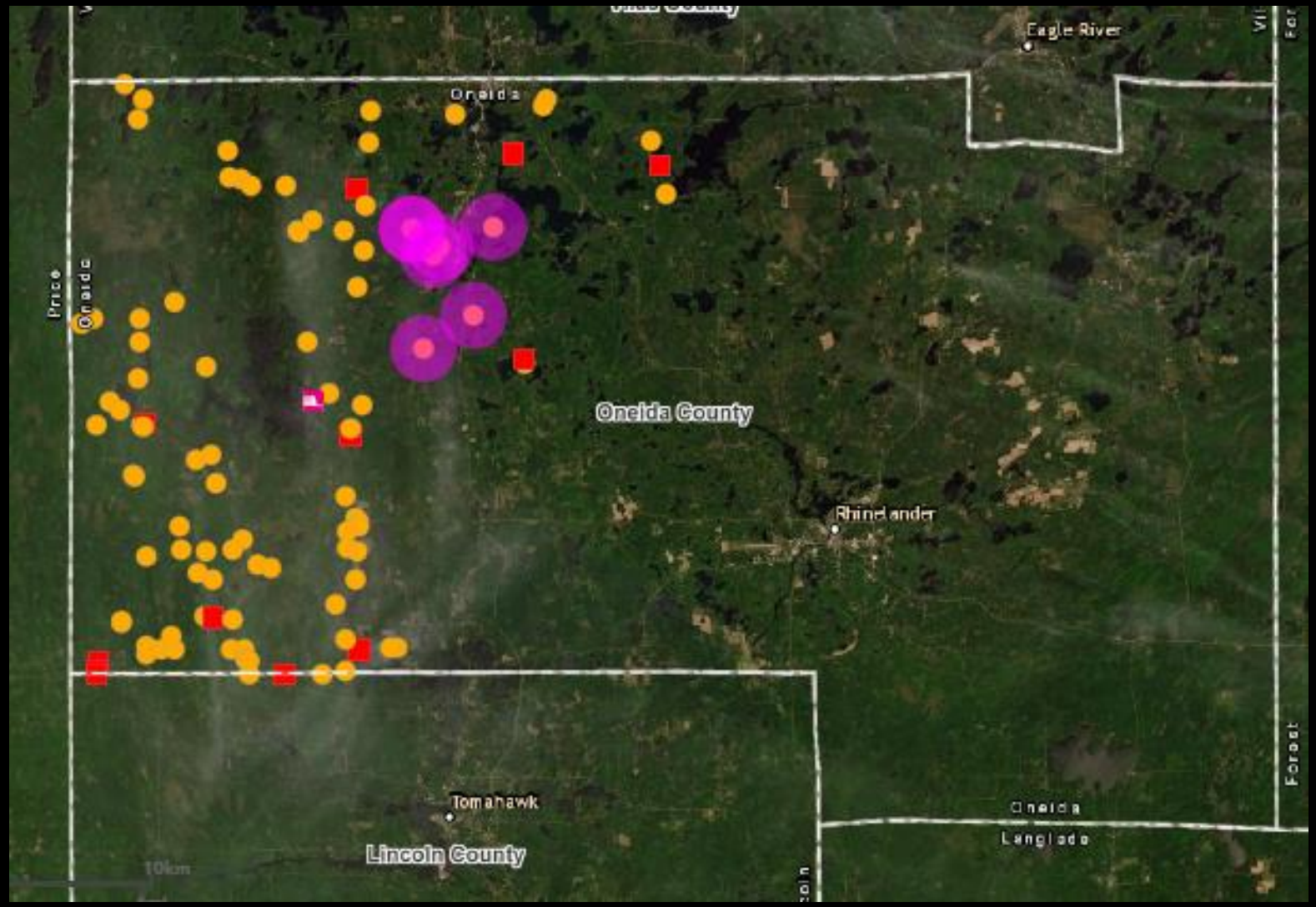


Structural Condition-Town of Minocqua

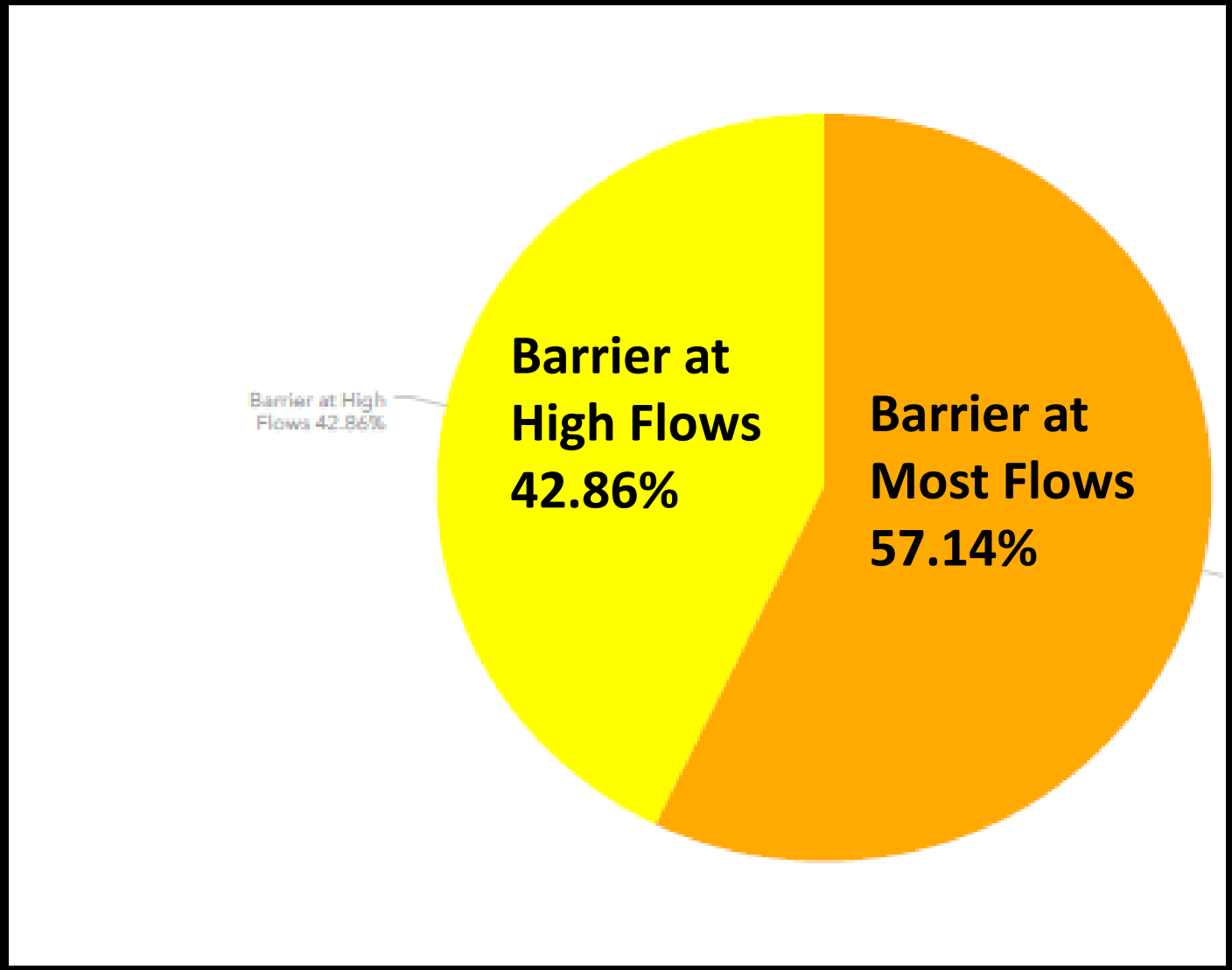


Sites Surveyed- Town of Hazelhurst (n=7)



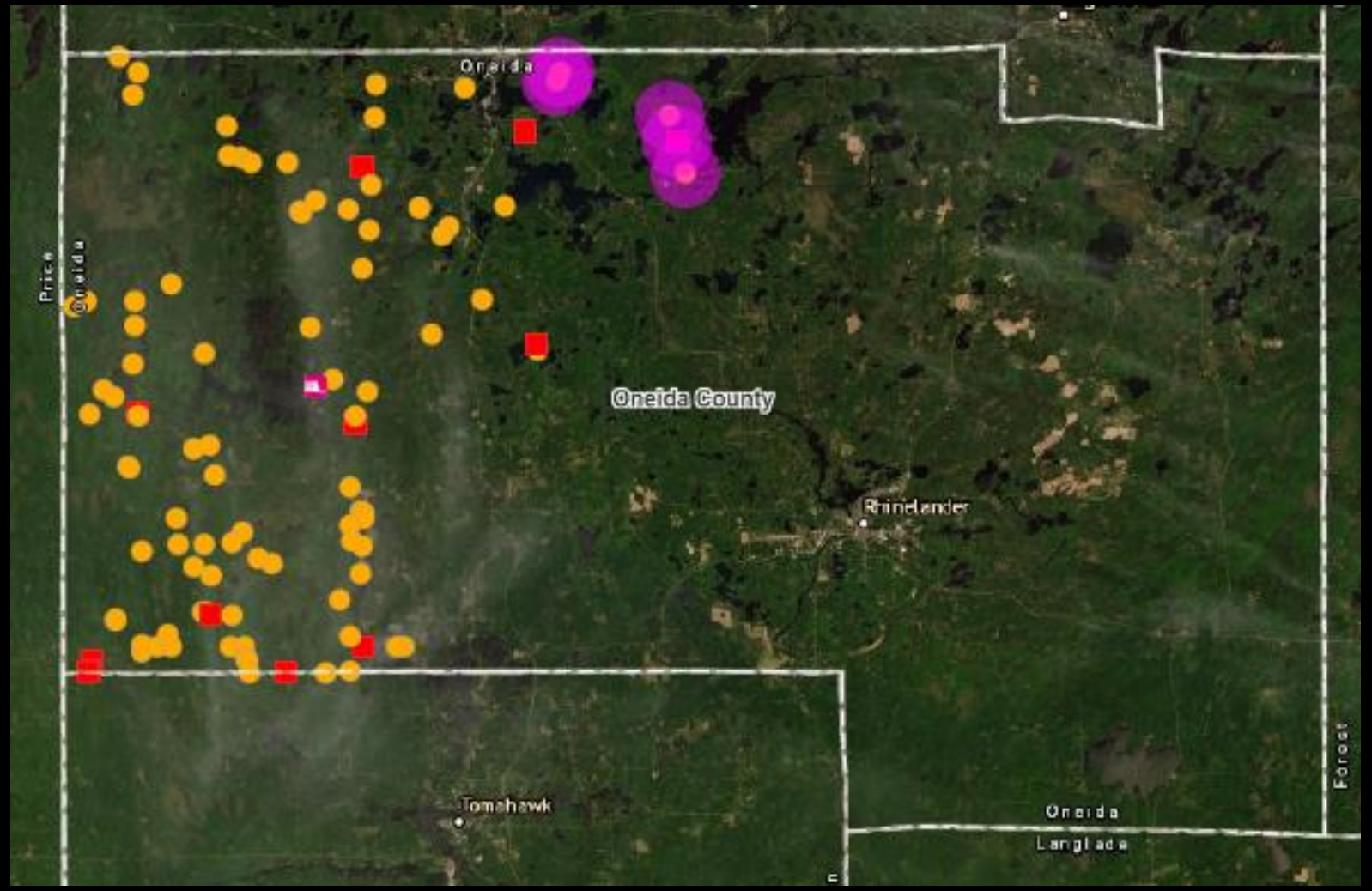


Passability-Town of Hazelhurst

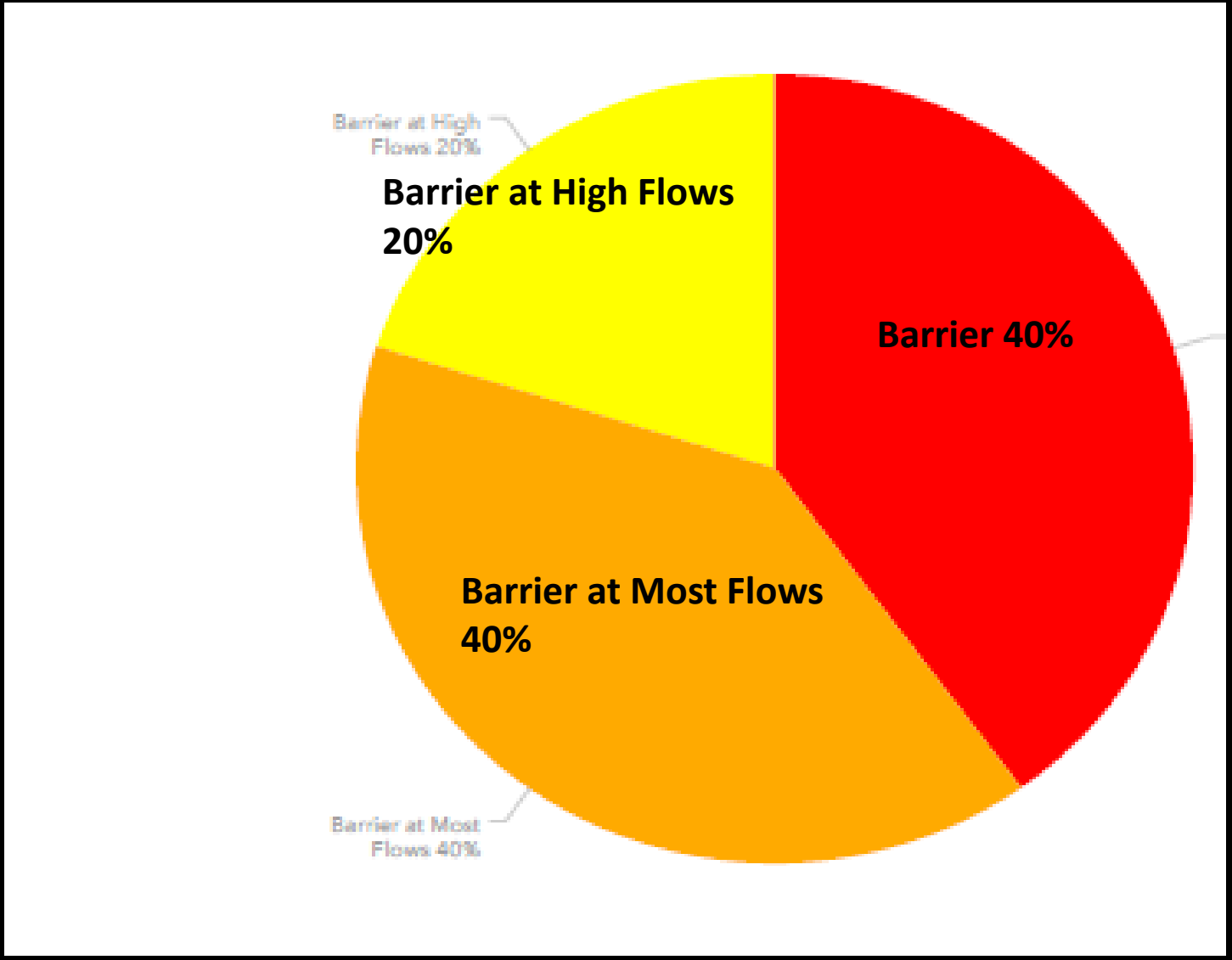


Structural Condition-Town of Hazelhurst

Sites Surveyed- Town of Woodruff (n=5)

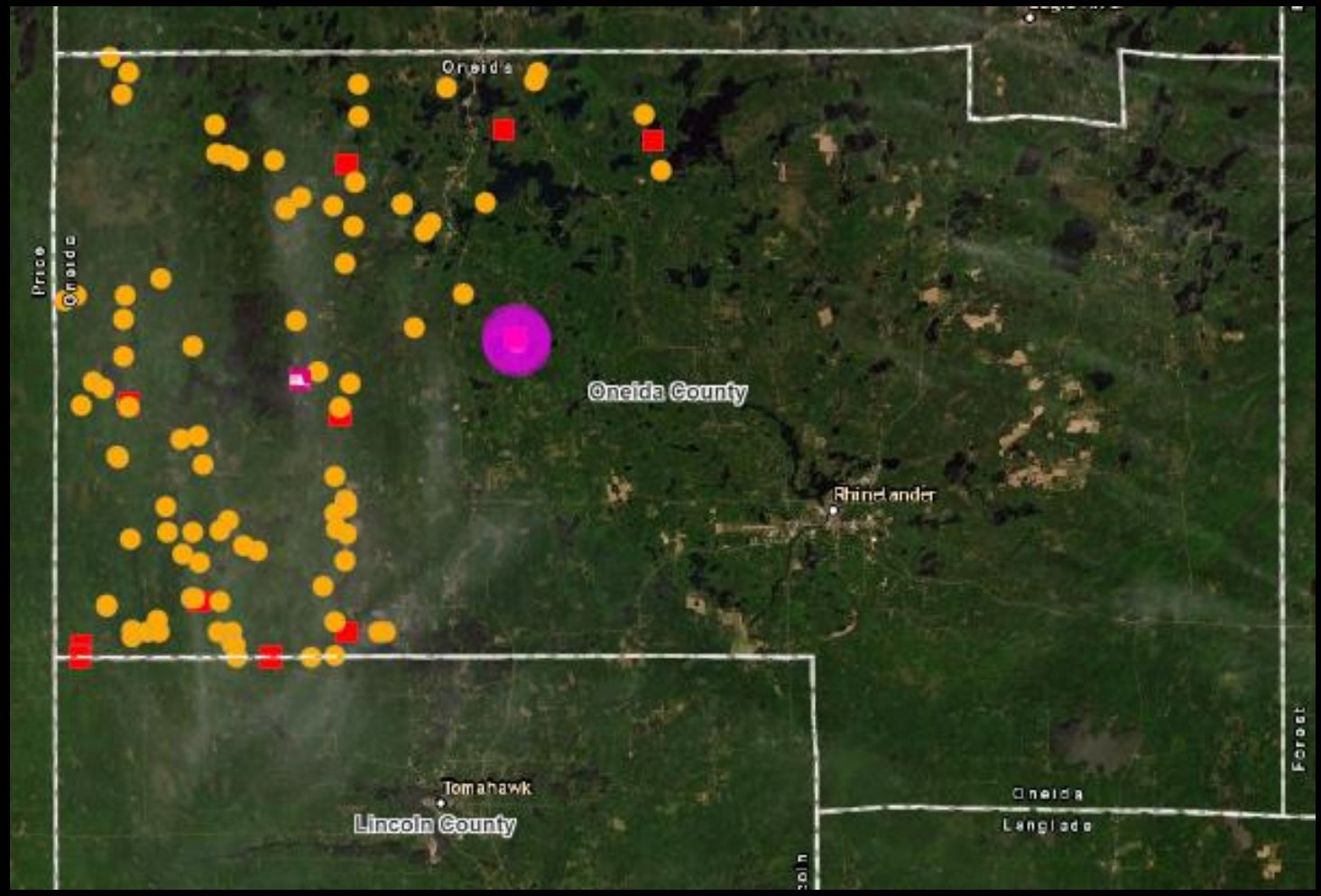


Passability- Town of Woodruff

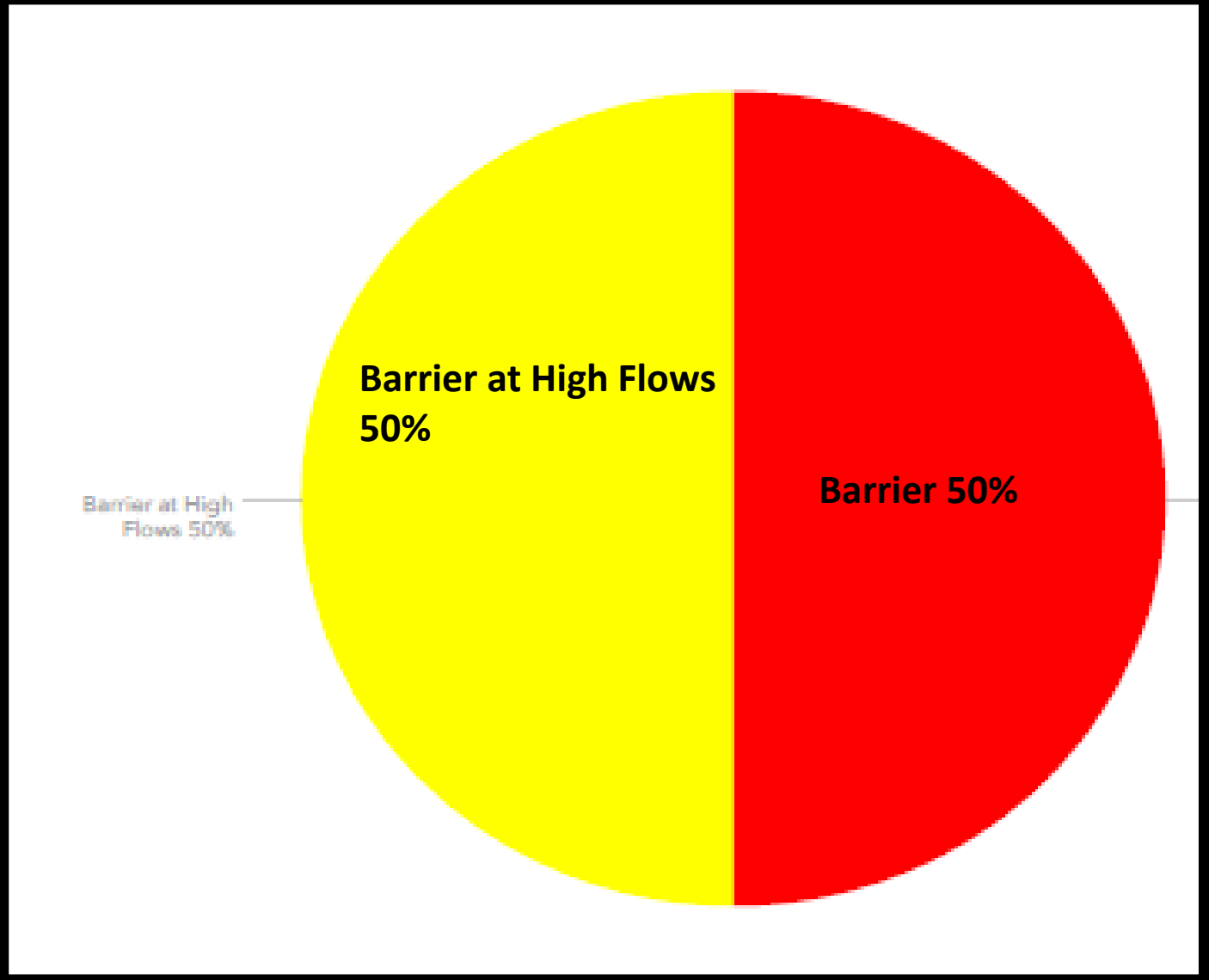


Structural Condition-Town of Woodruff

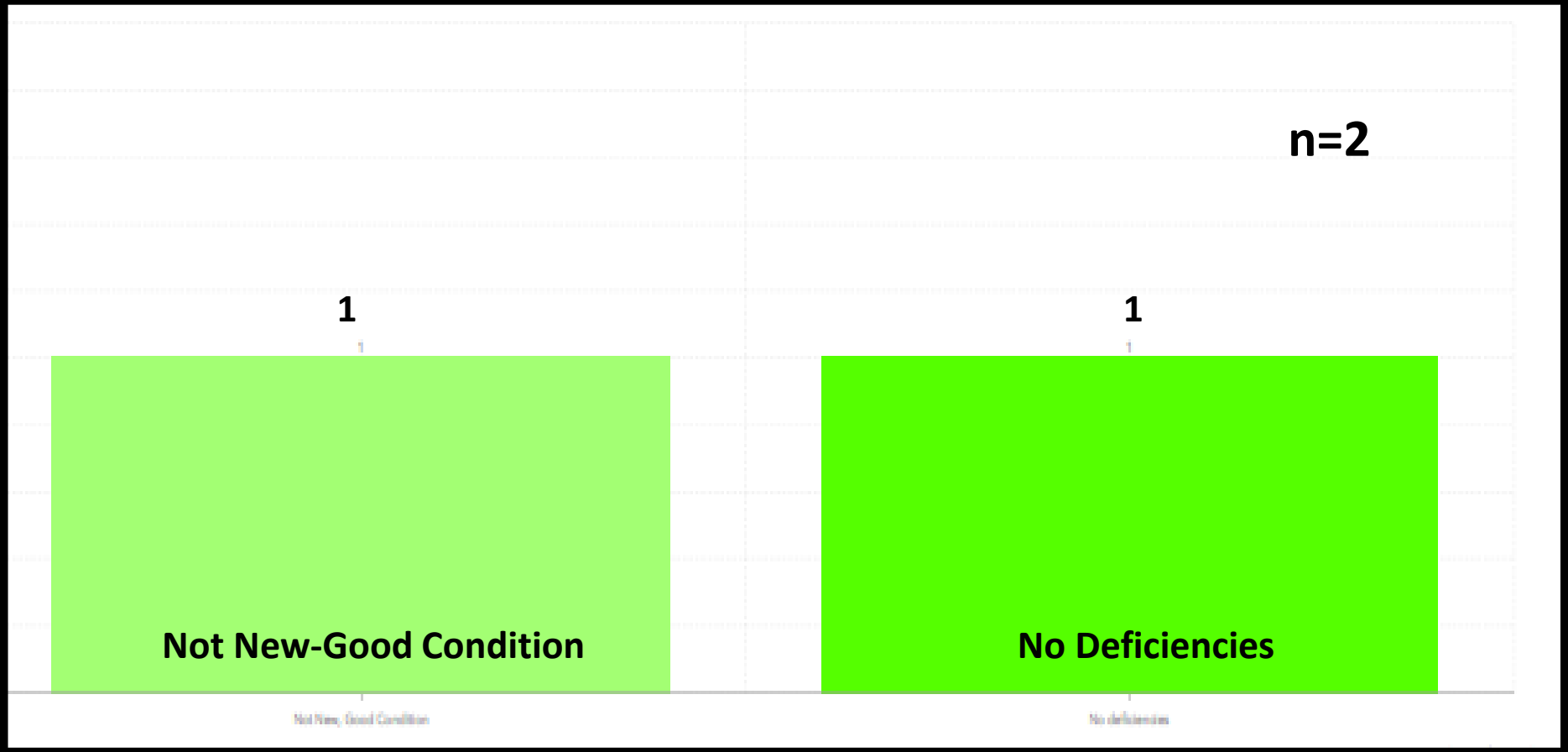
Sites Surveyed-
Town of Lake Tomahawk
(n=2)



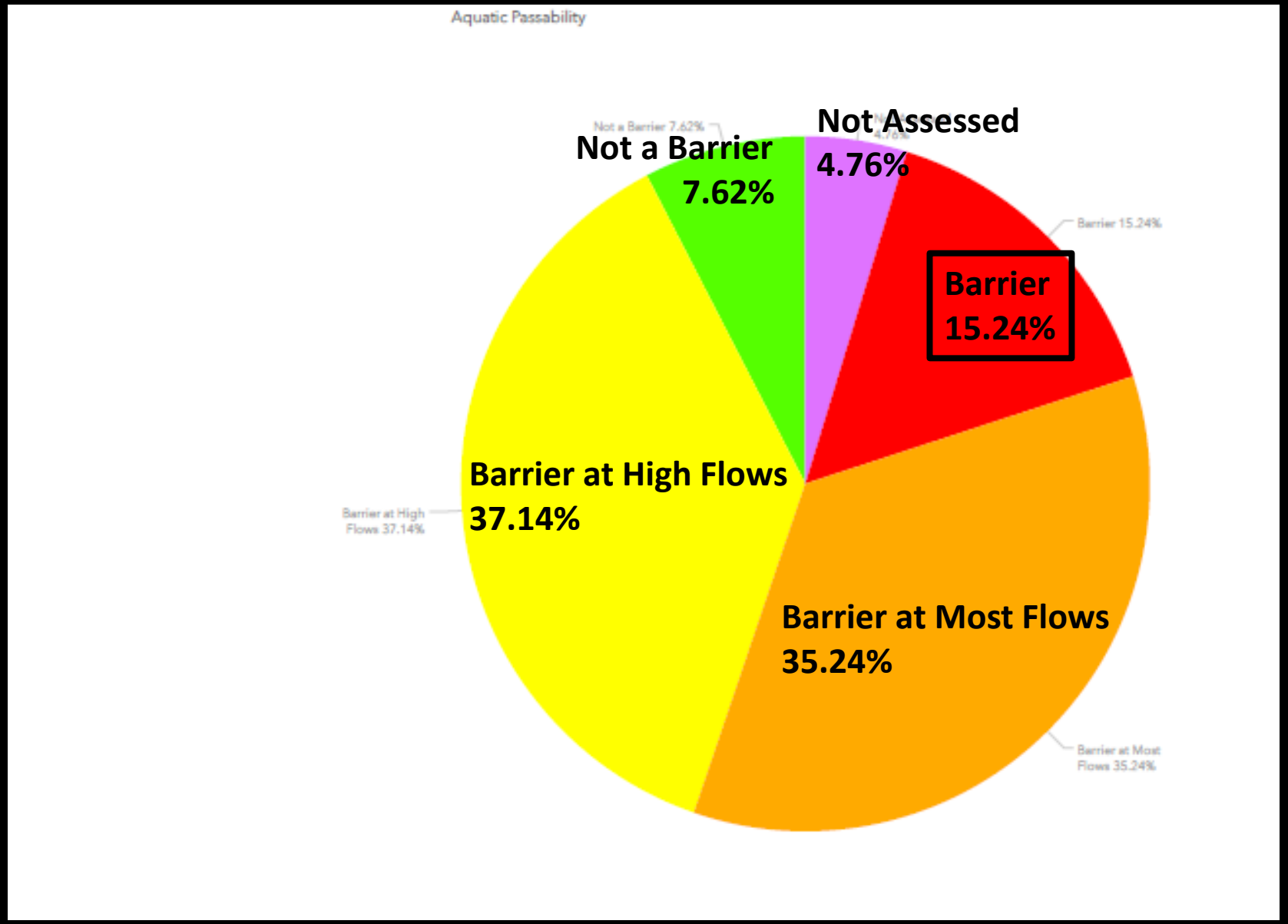
Passability-Lake Tomahawk



Structural Condition- Town of Lake Tomahawk



Passability- All Sites (n=105)

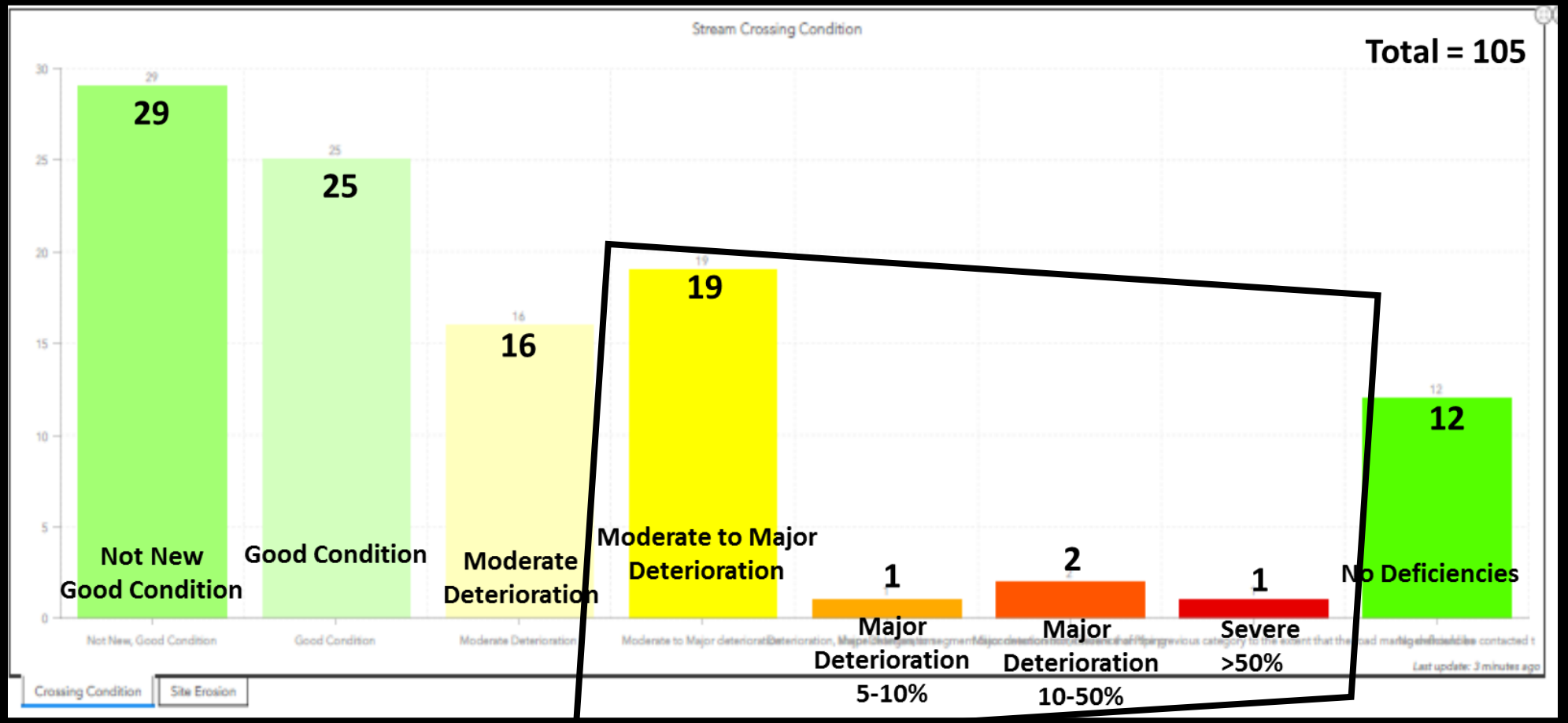


Priority Crossings due to Passability Issues with Contributing Factors

Site ID	Stream Name	Crossing Name	Road	Downstream	Structure	Structure	Bankful	Structure	Water	Lack Substrate	Water	Constriction	Perched	Scour Pool
			Width (ft)	Fill Depth (ft)	Width (ft)	Height (ft)	Width ft	Length>30 ft	Depth<6 in	in structure	Velocity>3 ft/sec	Ratio<0.5		
lake tomahawk 2	Muskie Creek	Lakewood Road	27.6	2.5	10.9	6.9	36	No	No	No	Yes	Yes	No	No
woodruff 1	Minocqua Thoroughfare	County Hwy J	48.5	1.8	4	4	33	No	No	No	Yes	Yes	Yes	No
woodruff 3	Gilmore Creek	County Hwy D	39	11.5	4	4	110	Yes	No	Yes	Yes	Yes	No	No
minocqua 9	Howards Creek	Camp Nine Road	22	2.8	1.4	1.3	9.5	Yes	No	No	Yes	Yes	No	Yes
minocqua 12	Tomahawk River	Blue Lake Road	25	0	41.5	15.5	47.5	No	No	No	Yes	No	No	No
minocqua 13	unnamed creek	Camp Nine Road	20	2.5	2	2	13	No	No	Yes	Yes	Yes	Yes	Yes
minocqua 18	Stone Creek	East Squaw Lake Road	23.5	4.5	5.5	4	32	Yes	No	Yes	Yes	Yes	No	Yes
minocqua 19	unnamed creek	Dam Road	23	1.8	1.1	1.2	6	Yes	Yes	Yes	No	Yes	Yes	Yes
minocqua 25	unnamed creek	Cedar Falls Road	20	4.5	4	4	7	Yes	No	Yes	No	No	Yes	Yes
minocqua14	Tomahawk River	Camp Nine Road	19	4	12	8.5	28	Yes	No	Yes	Yes	Yes	No	Yes
lynne 12	Muskellunge Creek	Muskellunge Road	15.6	0.5	2	2	6.1	Yes	Yes	Yes	No	Yes	Yes	Yes
little rice 16	Little Rice River	Kelly Fire Lane (Bass Lake)	15	2.2	8	3	59.1	Yes	No	Yes	Yes	Yes	No	Yes
little rice 19	unnamed creek	McCord Road	12.8	3	1.5	1.5	3	No	Yes	Yes	No	No	Yes	Yes
little rice 31	Johnson Creek	Old Hwy 8	22	NA	24	5.5	11.4	No	No	No	No	No	No	no data
little rice 32	unnamed creek	Old Hwy 8 (east)	25.8	1.5	2.2	2.2	9.9	Yes	No	No	No	Yes	Yes	Yes

Classified Trout Stream

Structural Condition-All Crossings



Priority Crossings due to Structural Condition Issues

Site ID	Stream	Crossing	Structure Length (ft)	Structure Width (ft)	Structure Height (ft)	Downstream Fill Depth (ft)	% Plugged	% Crushed	Rusted Through	General Condition
hazelhurst 1	Rocky Run Creek	South Blue Lake Road	49.2	4	4	8.1	None or 0%	1% - 20%	No	Moderate to major deterioration
hazelhurst 4	Kaubashine Creek	Balsam Park Boulevard	29	14	3	21.5	1% - 20%	None or 0%	Yes	Moderate to major deterioration
hazelhurst 5	mccormick creek	County Hwy Y	39.6	3	3	2	None or 0%	None or 0%	Yes	Moderate to major deterioration
woodruff 3	Gilmore Creek	County Hwy D	115	4	4	11.5	None or 0%	None or 0%	No	Moderate to major deterioration
minocqua 5	Yukon Creek	Scottsman Lake Road	13	9	3	0	None or 0%	1% - 20%	Yes	Moderate to major deterioration
minocqua 13	unnamed creek	Camp Nine Road	16	20	3.5	0	None or 0%	None or 0%	No	Moderate to major deterioration
minocqua 16	unnamed creek	W Squaw Lake Road	29	2	2	1.2	None or 0%	None or 0%	No	Moderate to major deterioration
minocqua 20	Little Willow Creek	Price County Road	28	3	3	1.1	None or 0%	None or 0%	Yes	Moderate to major deterioration
minocqua 21	Willow River	Price County Road	21.9	15	6	1.1	21% - 40%	61% - 80%	No	Moderate to major deterioration
lynne 1	Meadow Brook	Townhall Road	29.8	4.5	3.1	1	None or 0%	None or 0%	No	Moderate to major deterioration
lynne 2	Meadow Brook	Ahola Road	28	2	2	2.5	None or 0%	None or 0%	No	Moderate to major deterioration
lynne 4 south	unnamed creek	Ruth Road	48	4.5	3	2.1	1% - 20%	None or 0%	No	Major deterioration 10-50%
lynne 8	unnamed creek	Indian Village Road	41.1	4	4	2	1% - 20%	1% - 20%	Yes	Moderate to major deterioration
lynne C	Little Somo Creek	East Village Road	43	4	4	4.6	None or 0%	1% - 20%	No	Moderate to major deterioration
lynne 16	Little Somo River	Work Road	27.4	3	3	1.7	1% - 20%	1% - 20%	No	Severe >50% deterioration
lynne 18	Little Somo River	Indian Village Road	37	2.8	2.8	1	None or 0%	None or 0%	No	Moderate to major deterioration
lynne 20	Swamsauger Creek	Flowage Road	16	2.5	3.5	0.5	1% - 20%	1% - 20%	Yes	Moderate to major deterioration
lynne 24	unnamed creek	Thunder Creek Road	33.5	2.5	2.5	0.8	None or 0%	None or 0%	Yes	Moderate to major deterioration
little rice 10	Clukey Creek	Burrows Lake Road	34.1	3	3	0.8	None or 0%	None or 0%	No	Moderate to major deterioration
little rice 11	Brown Creek	Brown Creek Road	35	3.5	3.5	2	None or 0%	None or 0%	No	Moderate to major deterioration
little rice 16	Little Rice River	Kelly Fire Lane (Bass Lake)	35	3	3	2.2	None or 0%	None or 0%	Yes	Moderate to major deterioration
little rice 26	unnamed creek	McCord Road (north)	23.6	3	3	1.1	None or 0%	None or 0%	No	Moderate to major deterioration
little rice 31	Johnson Creek	Old Hwy 8	24	24	5.5	NA	None or 0%	None or 0%	No	Major deterioration 10-50%

Classified Trout Stream

Priority Crossings due to Estimated Total Erosion

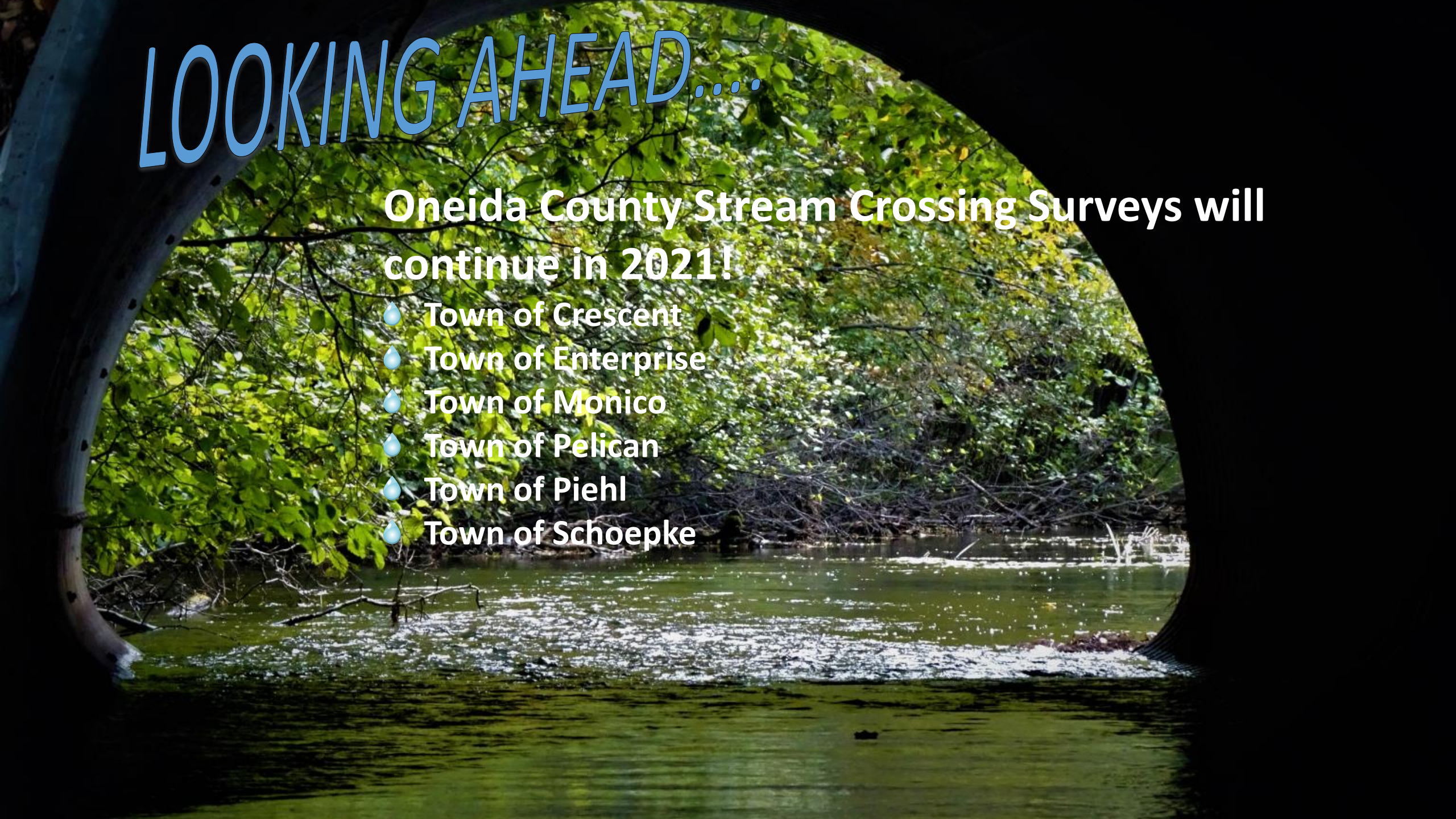
(Exceeding 2 Tons per Year)

Site ID	Stream Name	Crossing Name	Left Approach Erosion Estimate (tons/yr)	Right Approach Erosion Estimate (tons/yr)	Site Erosion Estimate Total
hazelhurst 4	Kaubashine Creek	Balsam Park Boulevard	0.01	0.02	7.75
hazelhurst 1	Rocky Run Creek	South Blue Lake Road	0.11	0.08	3.13
hazelhurst 3	Threemile Creek	Lower Kaubashine Road	1.07	1.75	2.83
woodruff 4	Gilmore Creek	County Hwy E	0.19	0.19	7.44
minocqua 6	unnnamed creek	Bo Di Lac Road	0.08	0.07	11.70
minocqua 20	Little Willow Creek	Price County Road	0.10	0.27	5.07
lynne 18	Little Somo River	Indian Village Road	0.04	0.66	28.30
lynne 10	Hauser Creek	East End Road	0.23	2.68	6.64
lynne 9	Hauser Creek	Indian Village Road	1.87	1.91	3.78
little rice 22	Bear Creek (north)	County Hwy Y	0.07	no data	28.38
little rice 30	unnamed creek	old Hwy 8	0.95	2.26	3.21
little rice 25	unnamed creek	East Village Road	2.40	0.72	3.12
little rice 17	Little Rice River	Kelly Fire Lane (Gobbler Lake)	0.16	0.30	2.14
	Classified Trout Stream				

Summary/Conclusions

Crossings in six of 20 towns (30%) in Oneida County have been surveyed

- The effects of all culverts in a watershed are cumulative
- The optimal goal is to maximize connectivity (minimize environmental impact) on a basin scale while minimizing cost
- Data from on-the-ground surveys, coupled with improved communication between conservation and infrastructure managers is essential



LOOKING AHEAD....

Oneida County Stream Crossing Surveys will continue in 2021!

- Town of Crescent
- Town of Enterprise
- Town of Monico
- Town of Pelican
- Town of Piehl
- Town of Schoepke

All completed survey data may
be viewed at the Michigan DNR HUB site
https://great-lakes-stream-crossing-inventory-michigan.hub.arcgis.com
AND
Oneida County Interactive Land and Water Mapping app
https://www.co.oneida.wi.us/departments/li/land-records-system/

References

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