

Muskellunge spawning habitat in Big Mantrap Lake

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MN DNR Fisheries - Park Rapids



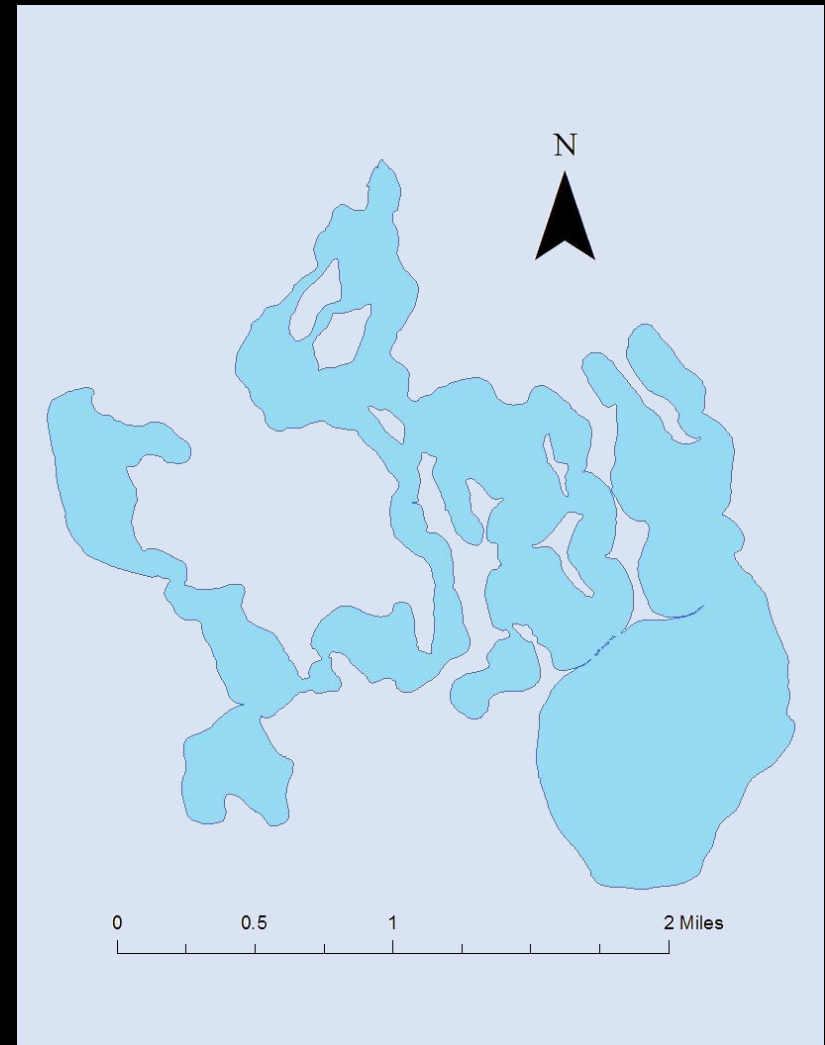


Introduction

- Stocking Muskellunge fingerlings
 - Shoepac, Wisconsin, Leech
- Contribution of stocked fish
 - Fin clip and wire tag
 - 2010 and 2013 assessment
- Advancement of technology

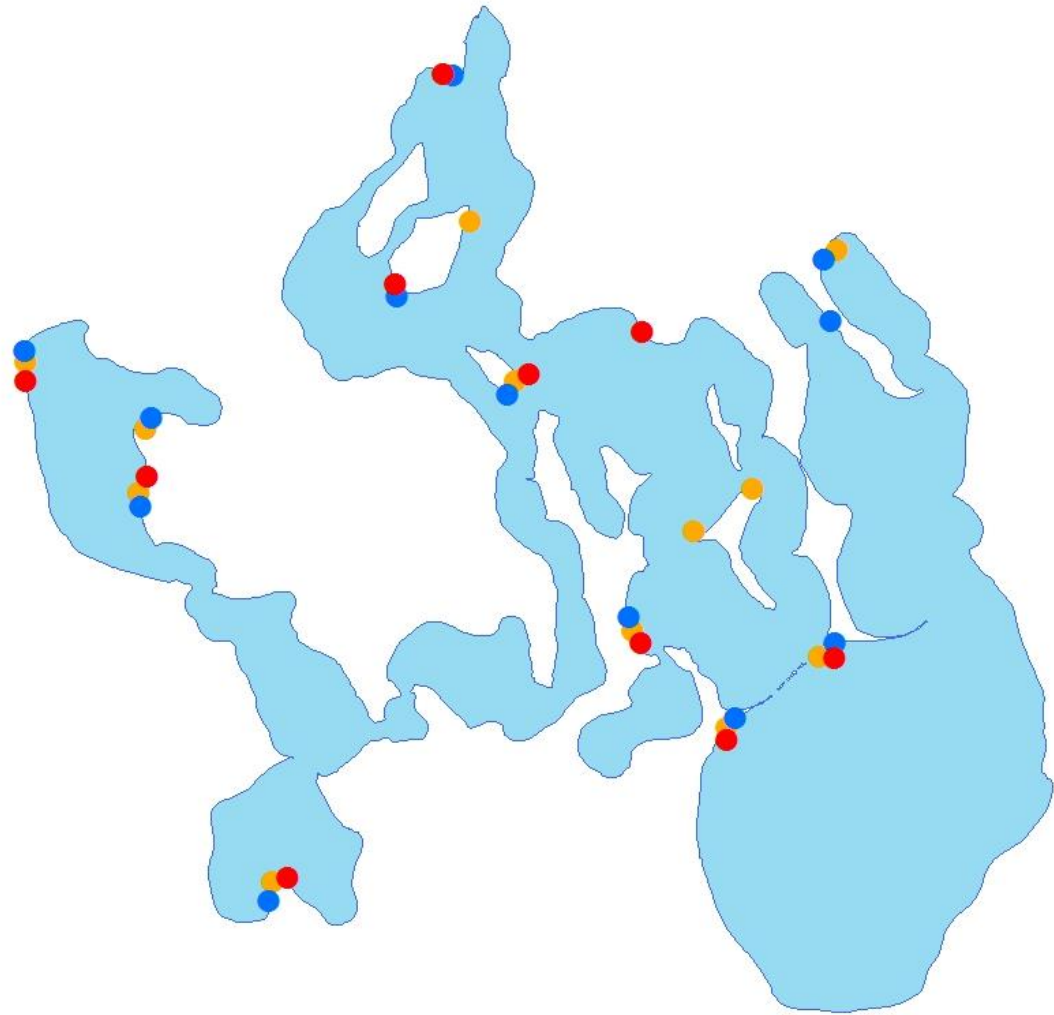
Study area

- Big Mantrap
 - 1,617.69 acres
 - 26.30 miles of shoreline



Methods

- 10 nets – 2015 ●
- 12 nets – 2016 ●
- 12 nets – 2017 ●






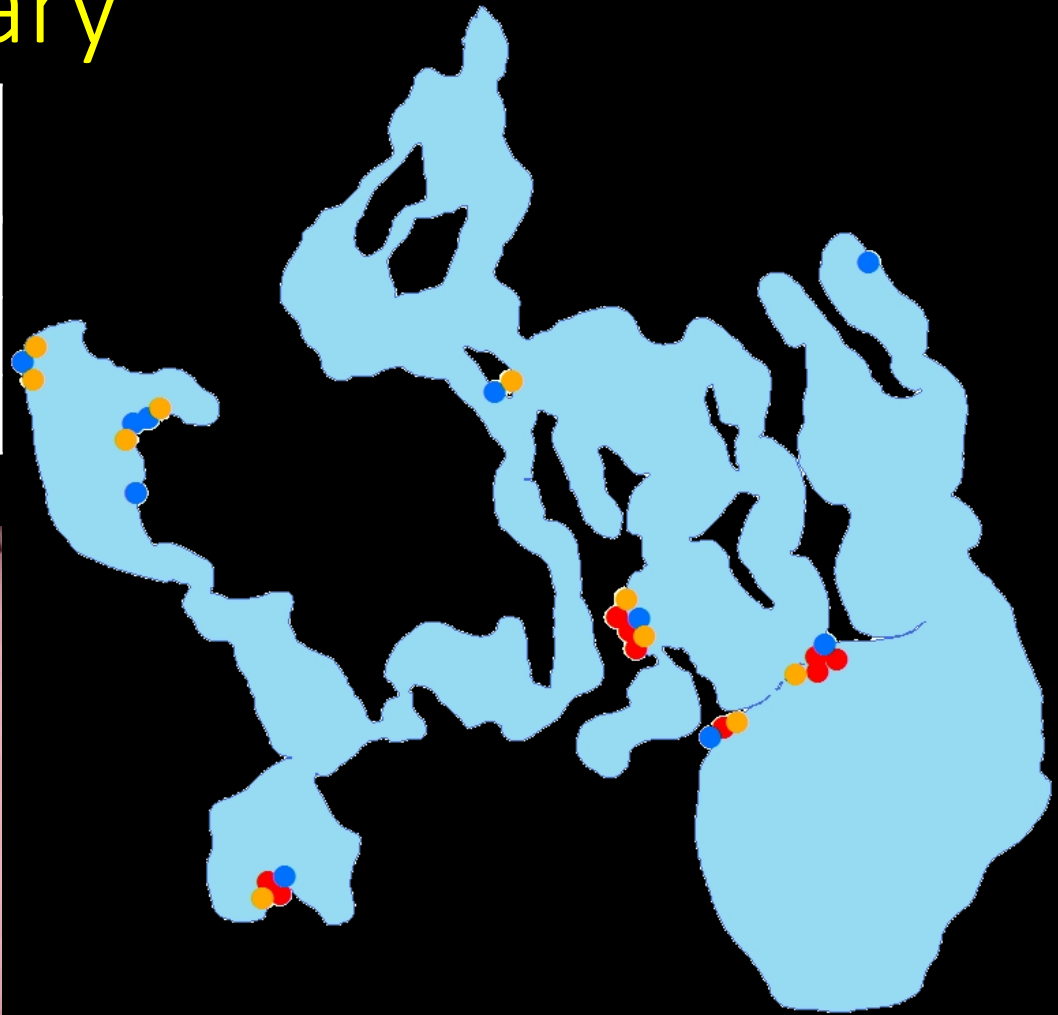
Methods

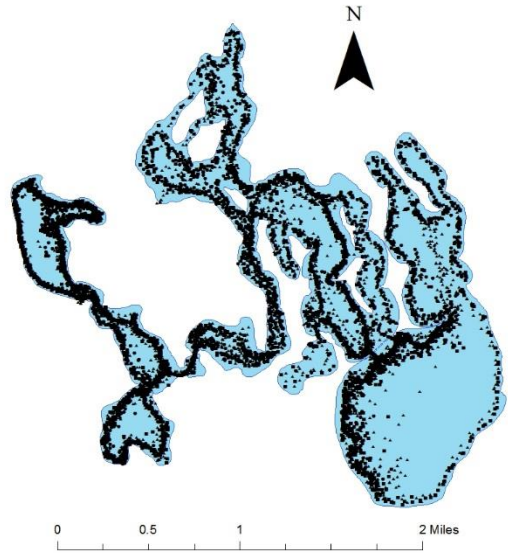
- 40 (2015), 45 (2016), 48(2017)
- 10 female Muskellunge
- DNA analysis of scales
- PIT tag and radio transmitter



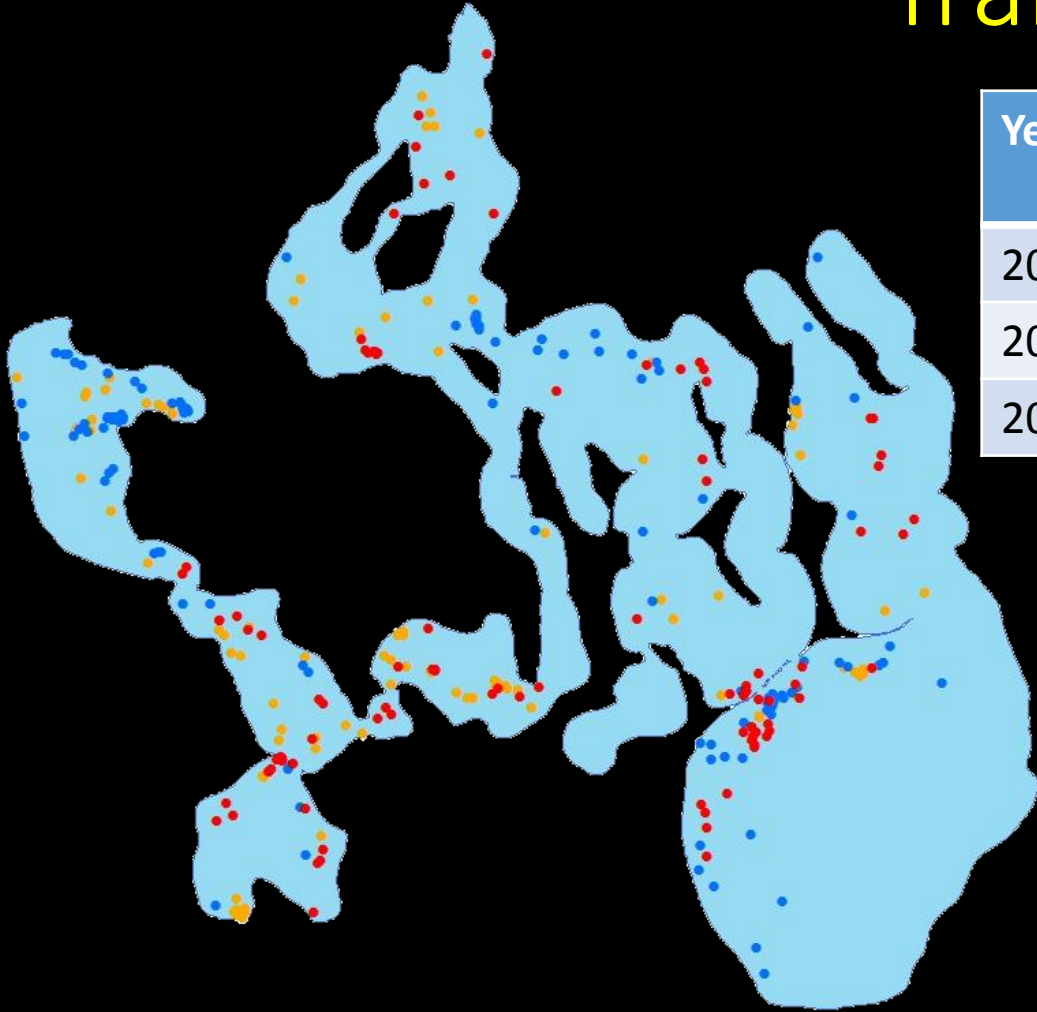
Tagged summary

Year	Tagged - Western	Tagged - Eastern
2015 	3	7
2016 	5	5
2017 	5	5





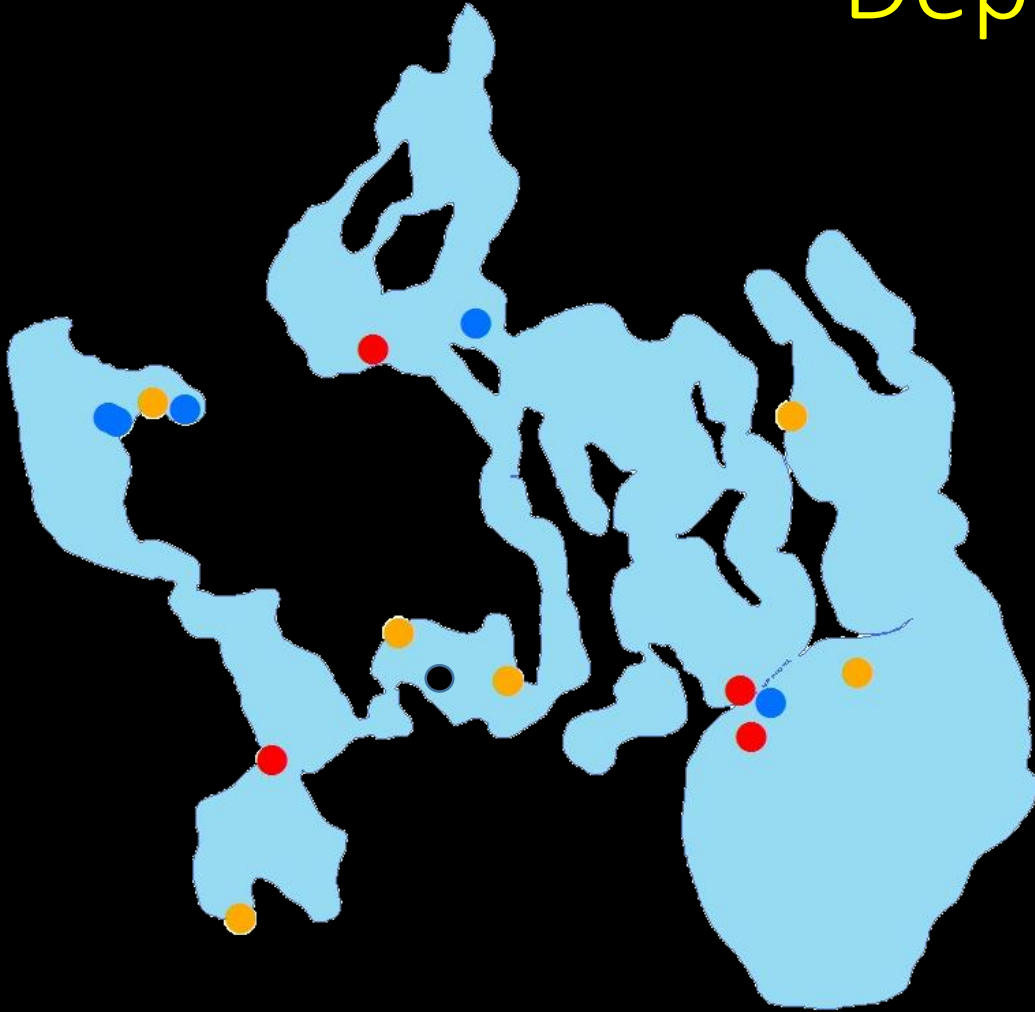
Transmitter locations



Year	Per trip	Number of trips	Found all ten
2015 ●	6.8	14	1*
2016 ●	7.8	16	5
2017 ●	8.6	11	4



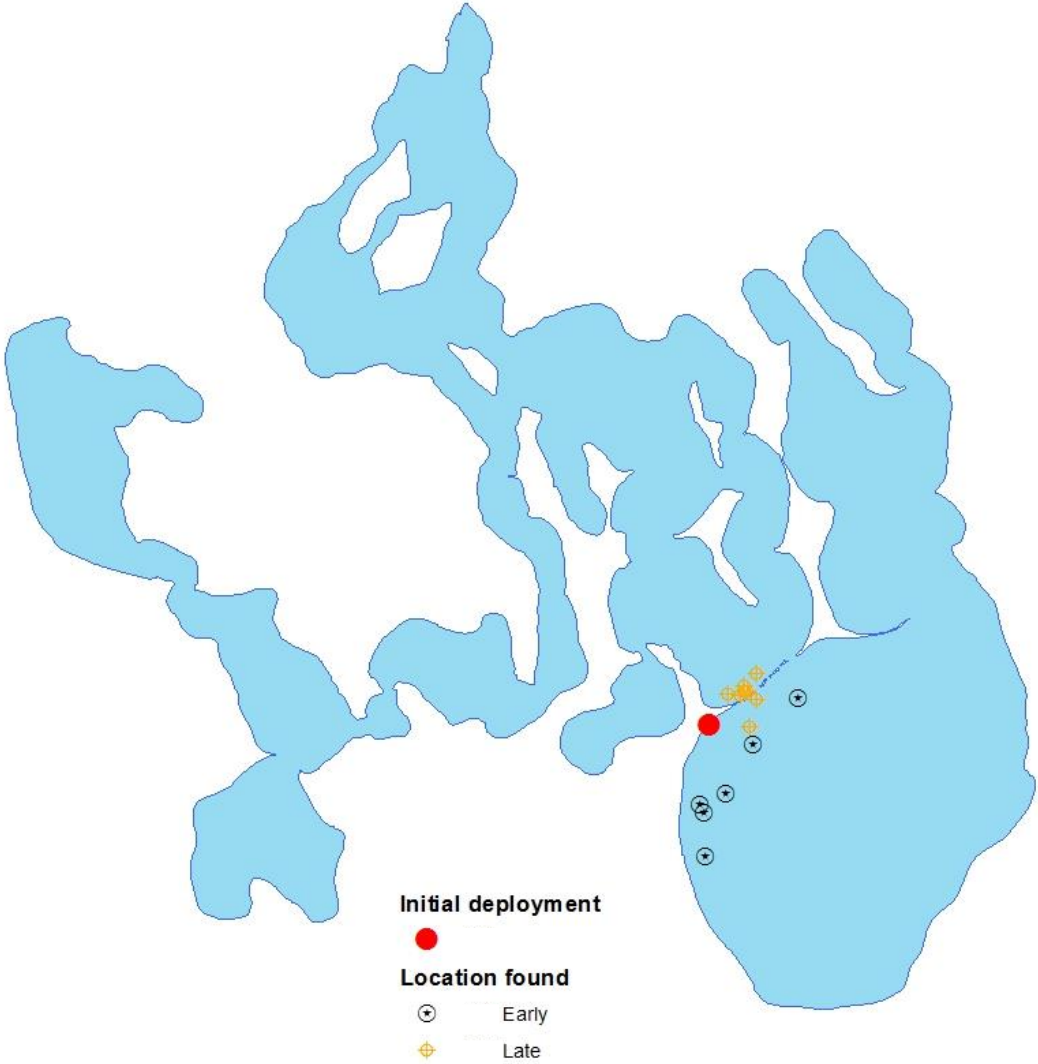
Deposited summary



Year	Deposited	Still implanted (May 30)
2015 ●	4(1)	5
2016 ●	5	5
2017 ●	6	4

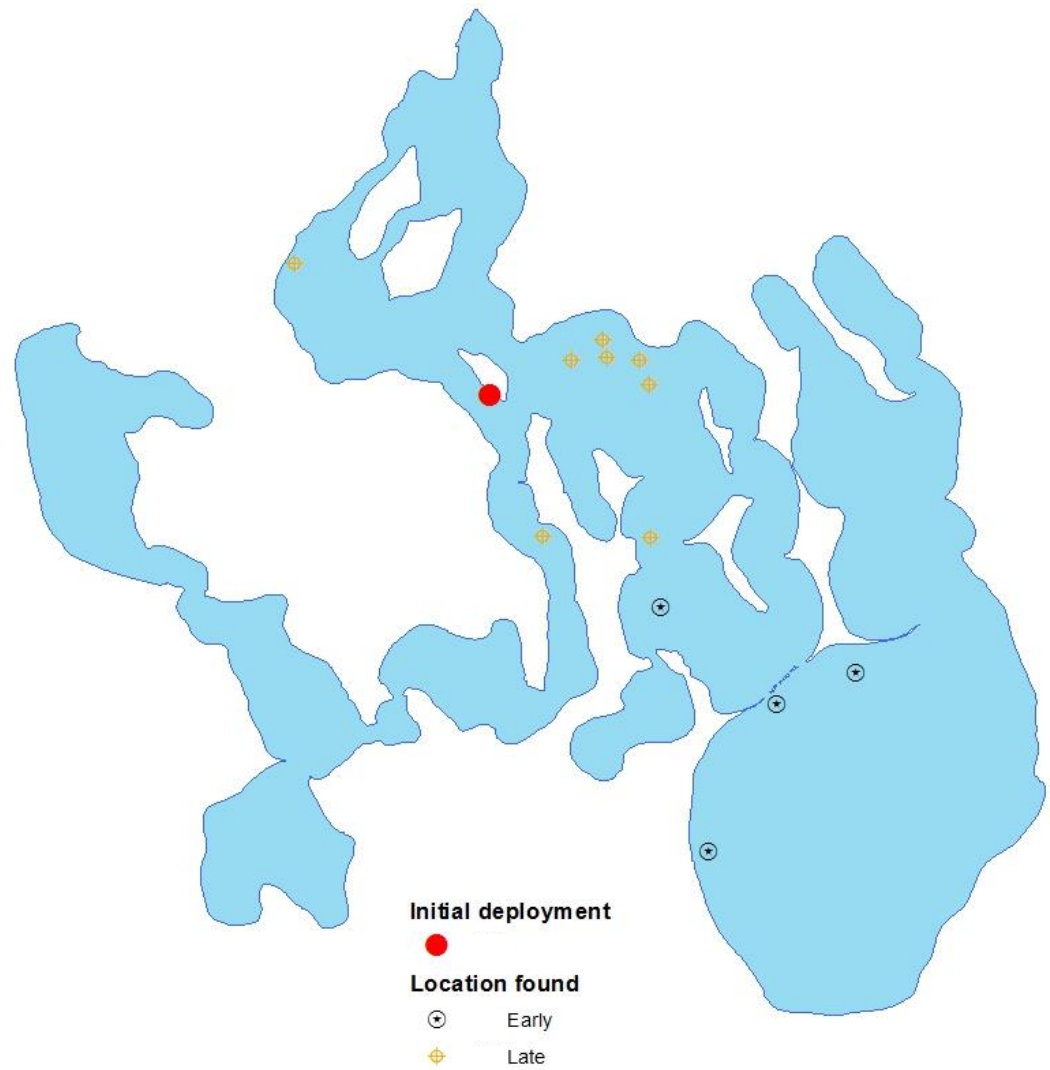
Distance traveled

- Home range
 - 7 of 30 females



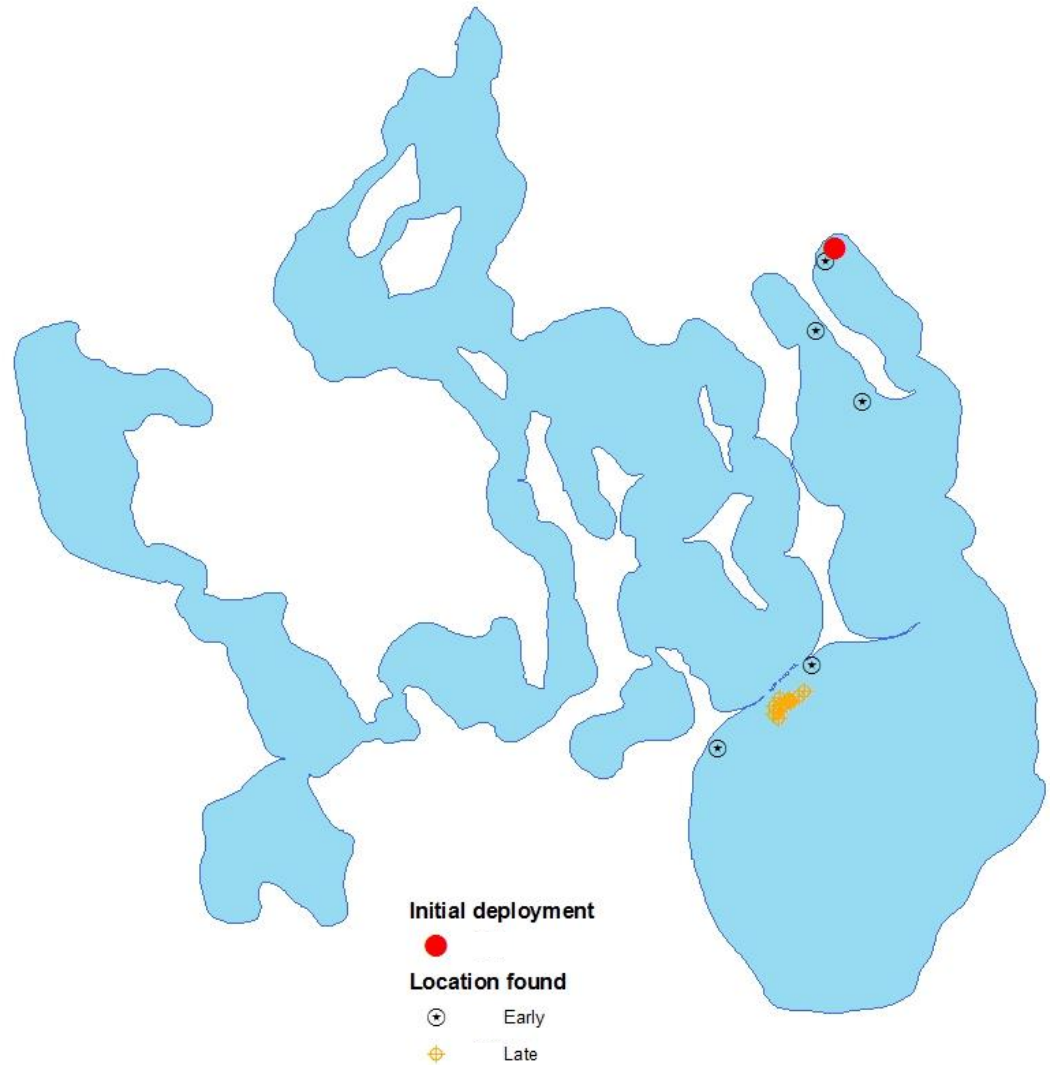
Distance traveled

- Movement within a single basin
 - 13 of 30 females



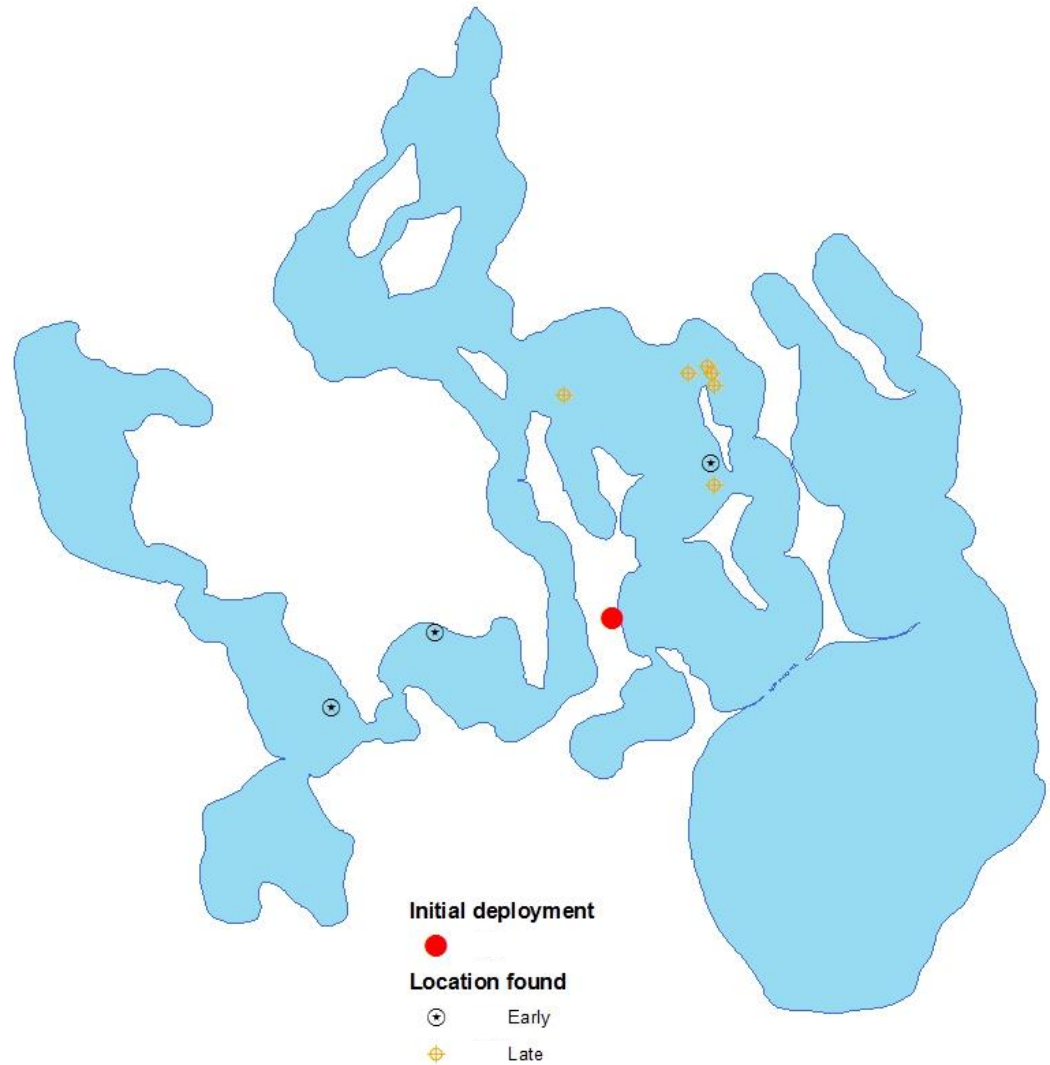
Distance traveled

- Movement within a single basin
 - 13 of 30 females



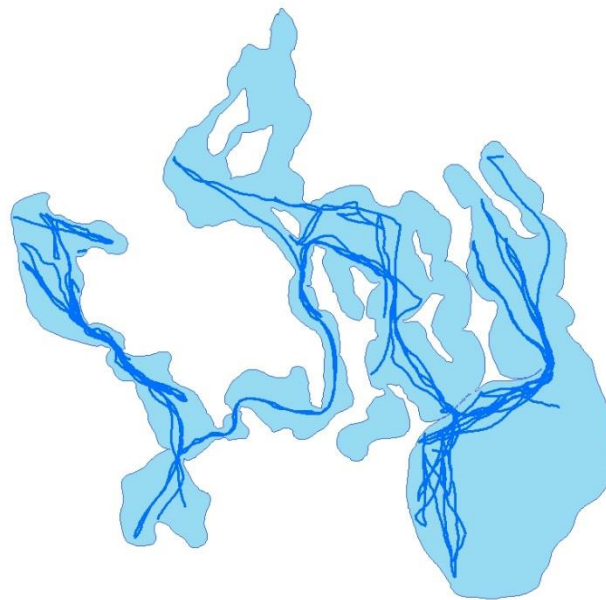
Distance traveled

- Unlimited boundaries
 - 6 of 30 females



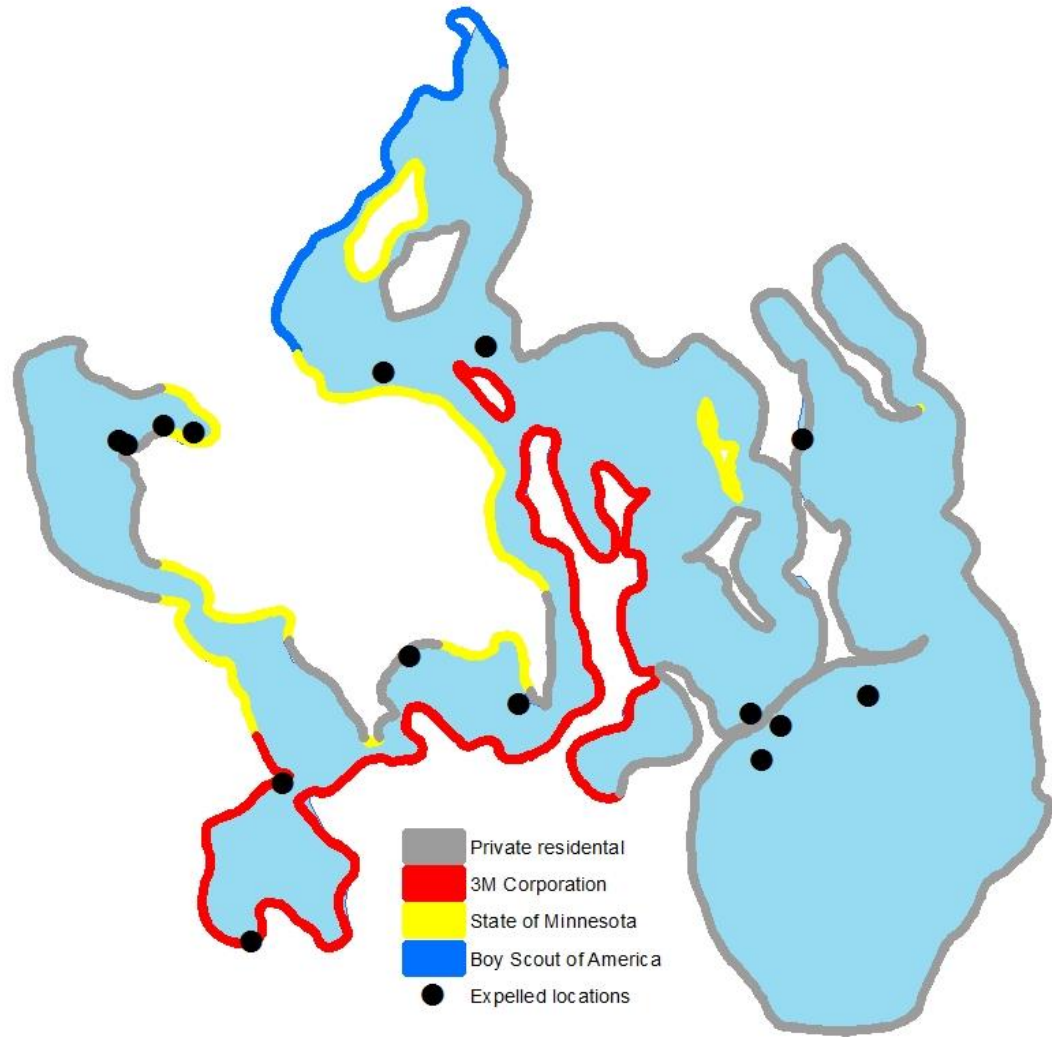
Distances (meters)

2015		2016		2017
301 – 2,679	Average	70 – 1,772	Average	79 – 1,489
3,825	Farthest	6,354	Farthest	3,484
602 – 10,683	Total	70 – 14,884	Total	238 – 10,426



Shoreline ownership

	Expelled locations	% of shoreline
Private residential	10	71
3M Corporation	2	15
State of Minnesota	3	10
Boy Scout of America	0	4



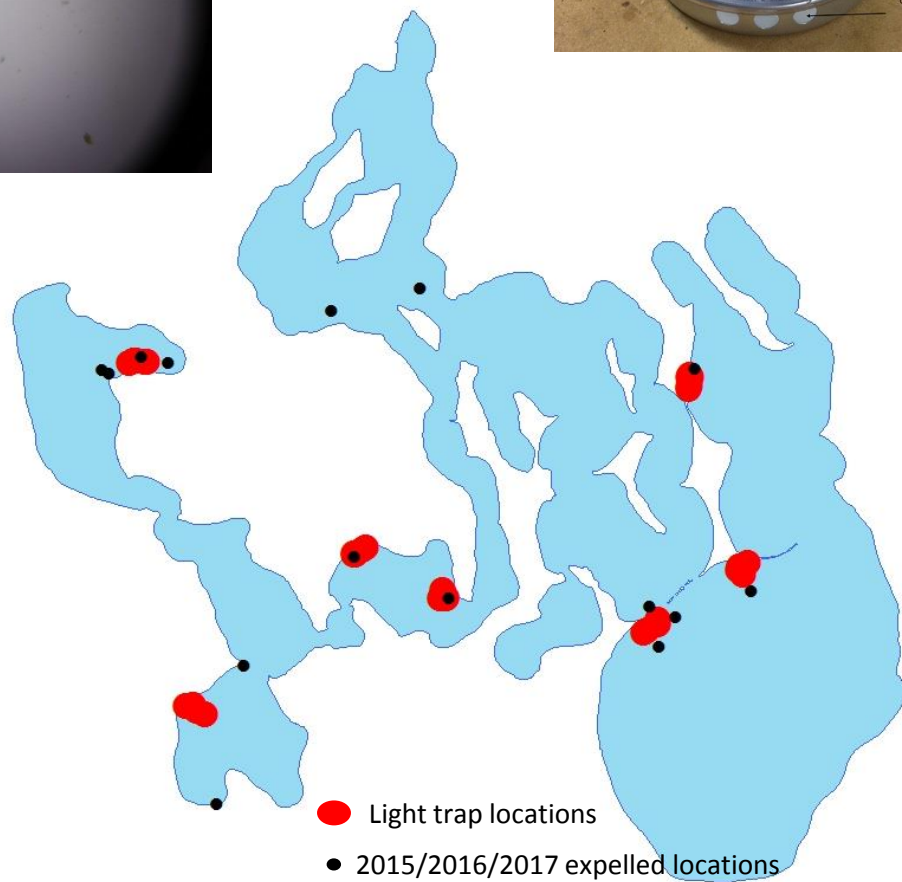
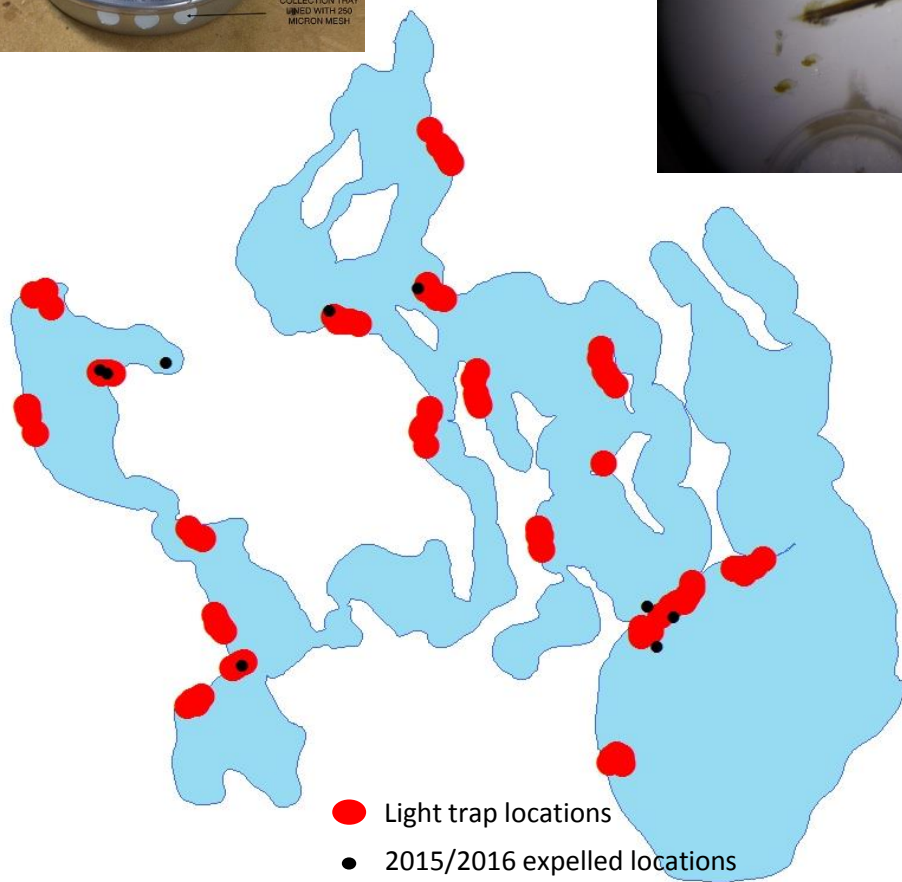
Light traps



2016



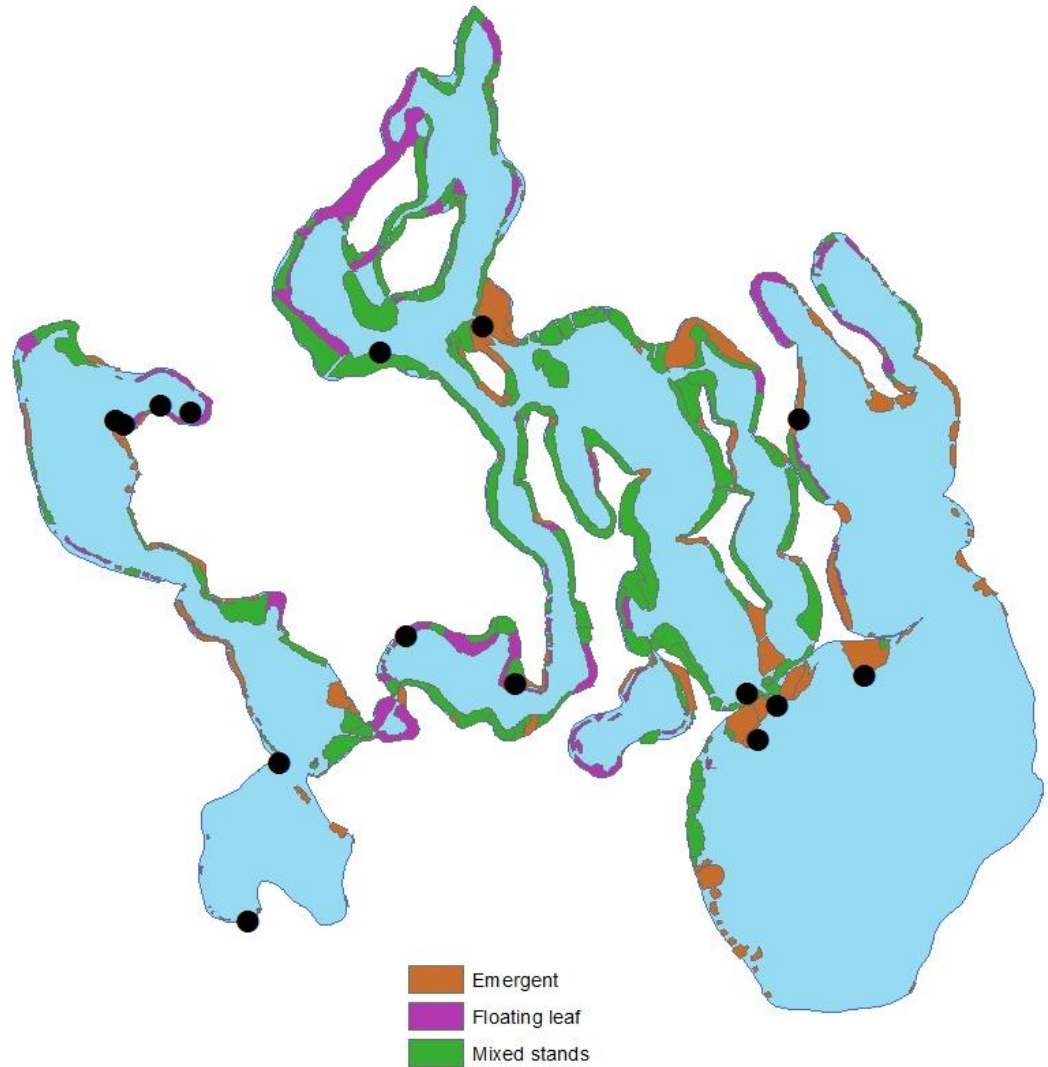
2017



Habitat Assessment

- Emergent

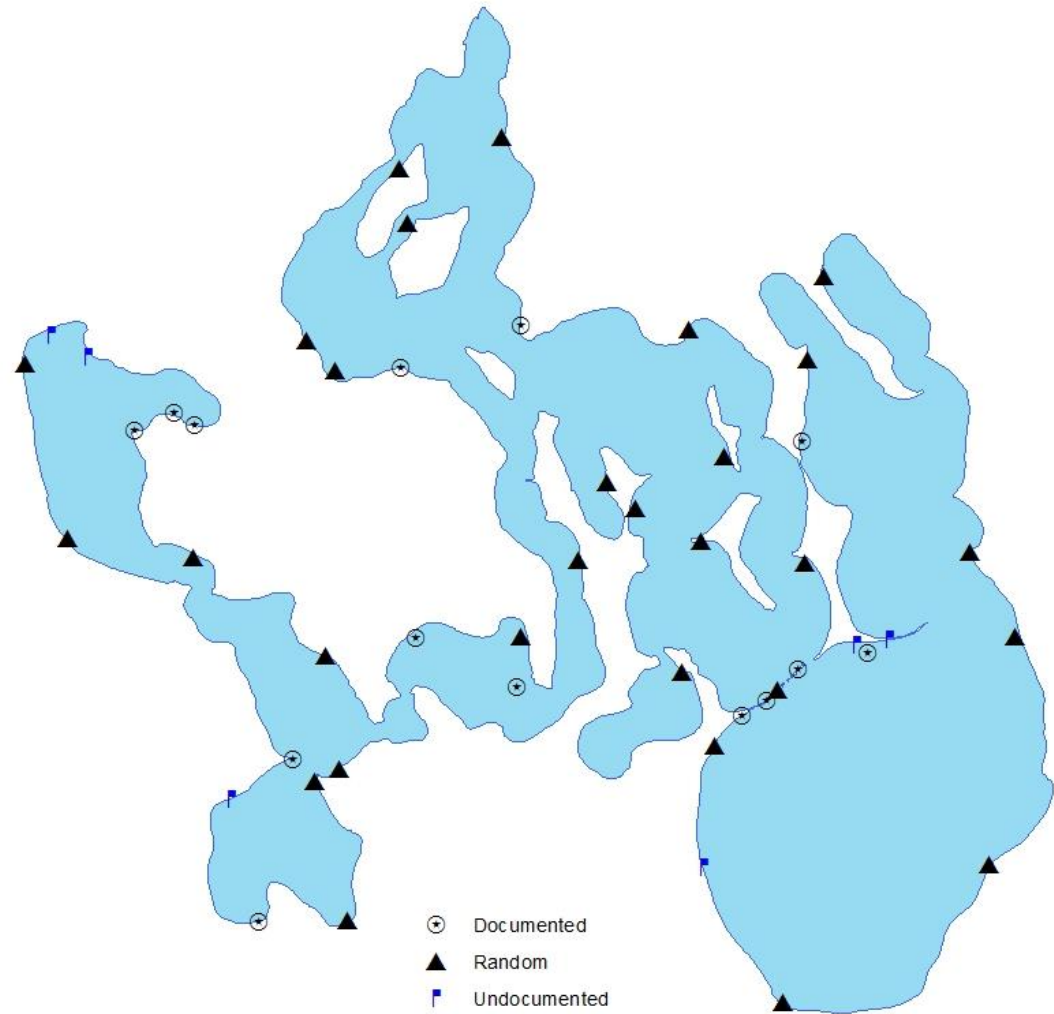
	Expelled locations
Emergent	7
Floating leaf	2
Mixed	4
Nothing	2
Total	15



Habitat Assessment

- Emergent
- Plots

Transect category	Number (Shallow, Middle, Deep)
Documented	14 (Chara, Chara, Coontail)
Random	29 (Chara, Bushy, Coontail)
Undocumented	6 (Chara, Chara, Chara)
Total	49 (Chara, Chara, Coontail)



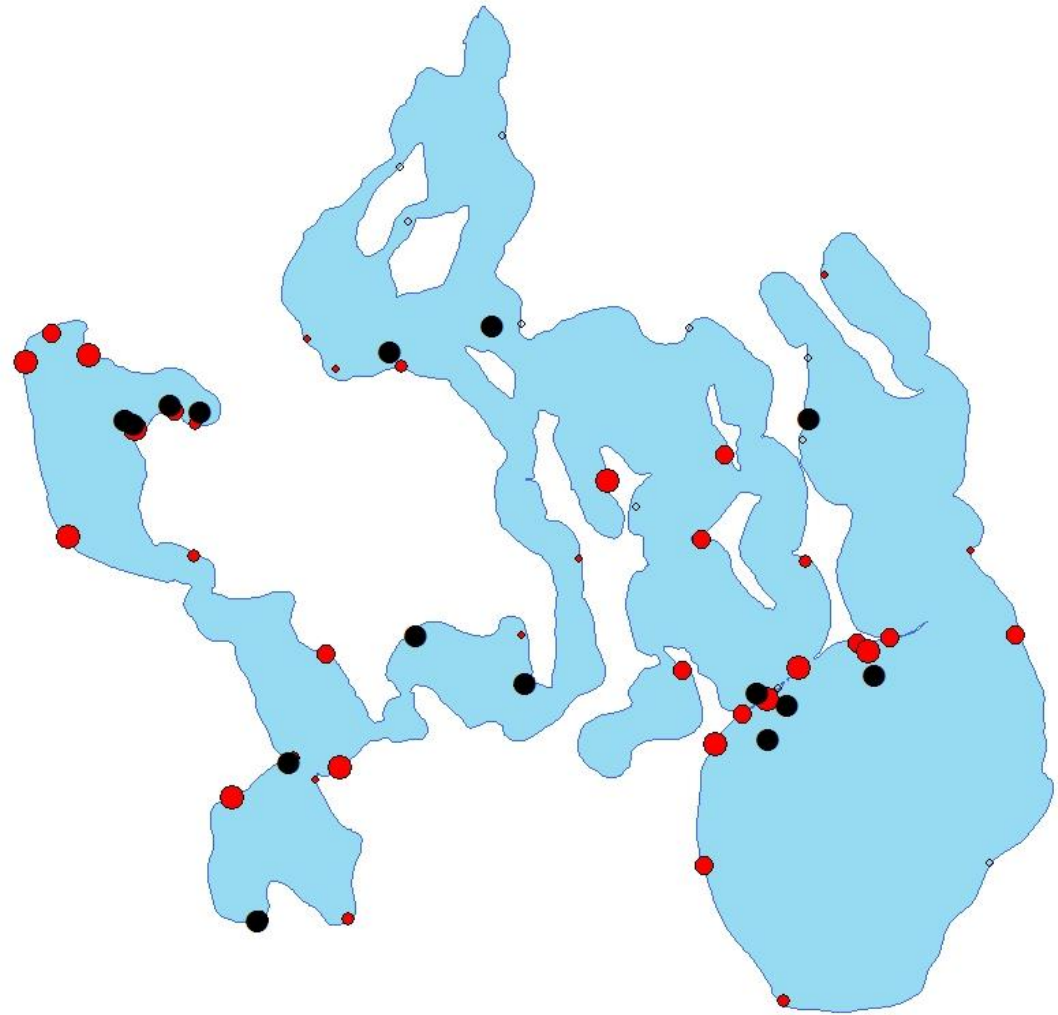
Habitat Assessment

- Emergent
- Plots
- Chara – Fall



Habitat Assessment

- Emergent
- Plots
- Chara – Fall



Rank	Documented (n)	Random (n)	Undocumented (n)
0	2	8	
1	1	7	
2	3	4	
3	4	5	4
4	4	5	2
Total	14	29	6
Avg	2.5	1.7	3.2

DNA makeup

- 30 female Muskellunge (16 expelled)

Year	Leech	Wisconsin x Leech	Shoepack vs Leech	Unknown (poor scales)
2015	6 (4*)	4 (1)		
2016	7 (3)	1 (1)	1 (1)	1
2017	7 (3)	2 (2)		1 (1)

Conclusion

- Successful in implanting transmitters/tracking fish/fish expelling transmitters
- Surprised by movement of Muskellunge during spawning season
- Chara was a dominant plant species but other plants species are present



Acknowledgements

- MN DNR Fisheries - Park Rapids
- MN DNR EWR – Brainerd
- Hugh C. Becker Foundation

