

# Lake Sarah

Aquatic Plant Management Update

April 23, 2018



Eric Fieldseth

# Outline

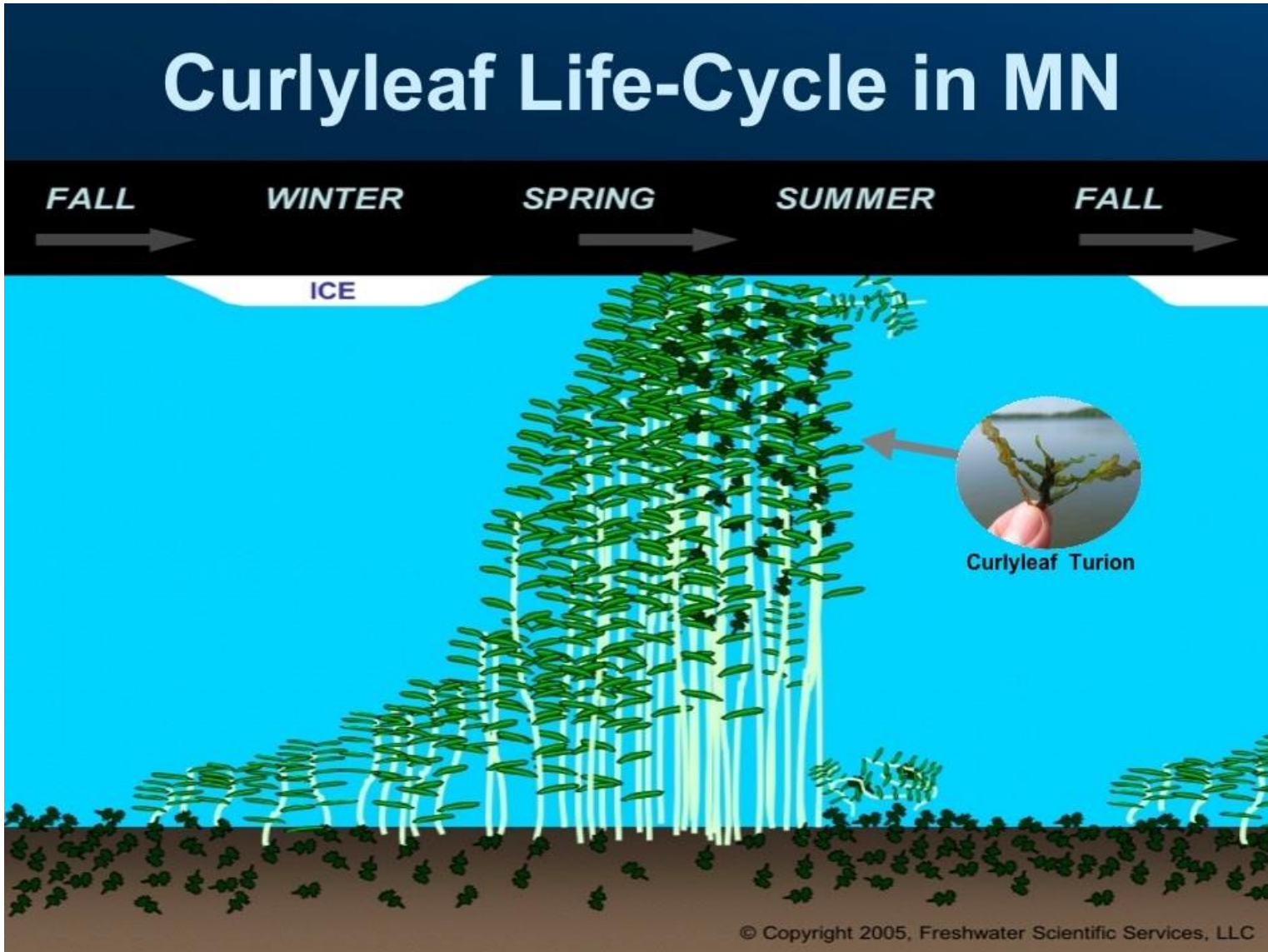
- **Curlyleaf Pondweed (CLP)**
  - Why we manage it
  - How its managed & management goals
  - Results (2013 – 2017)
  - 2018 and beyond
  
- **Eurasian Watermilfoil (EWM)**
  - Why we manage it
  - Management Goals
  - How we manage it

# CLP – Why we manage it

1. CLP displaces native aquatic plants and reduces native plant diversity
2. CLP interferes with recreational use of lake
3. CLP contributes to reductions in water quality through early plant senescence and early algal blooms

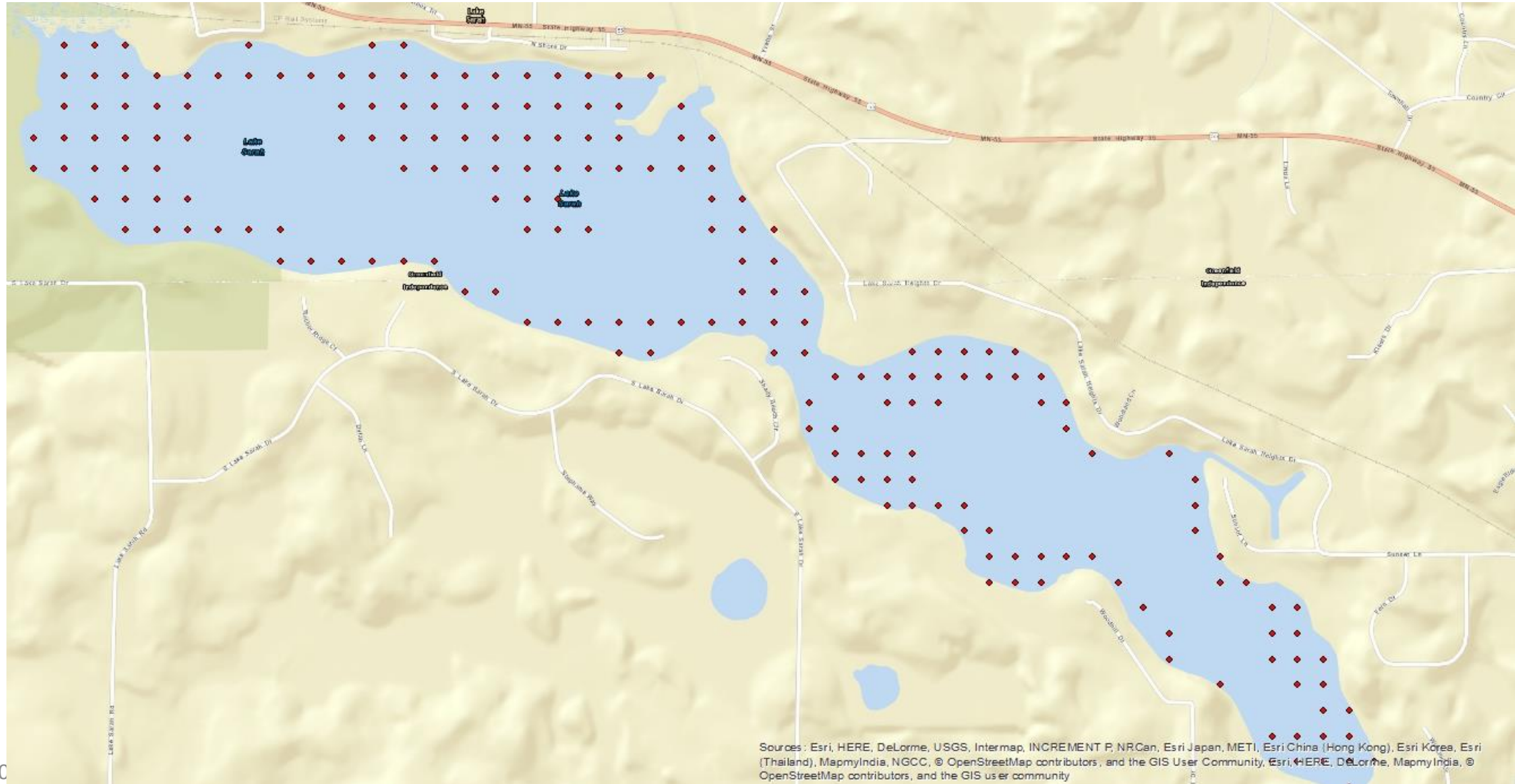


# CLP – How we manage it?





# CLP – How we manage it?

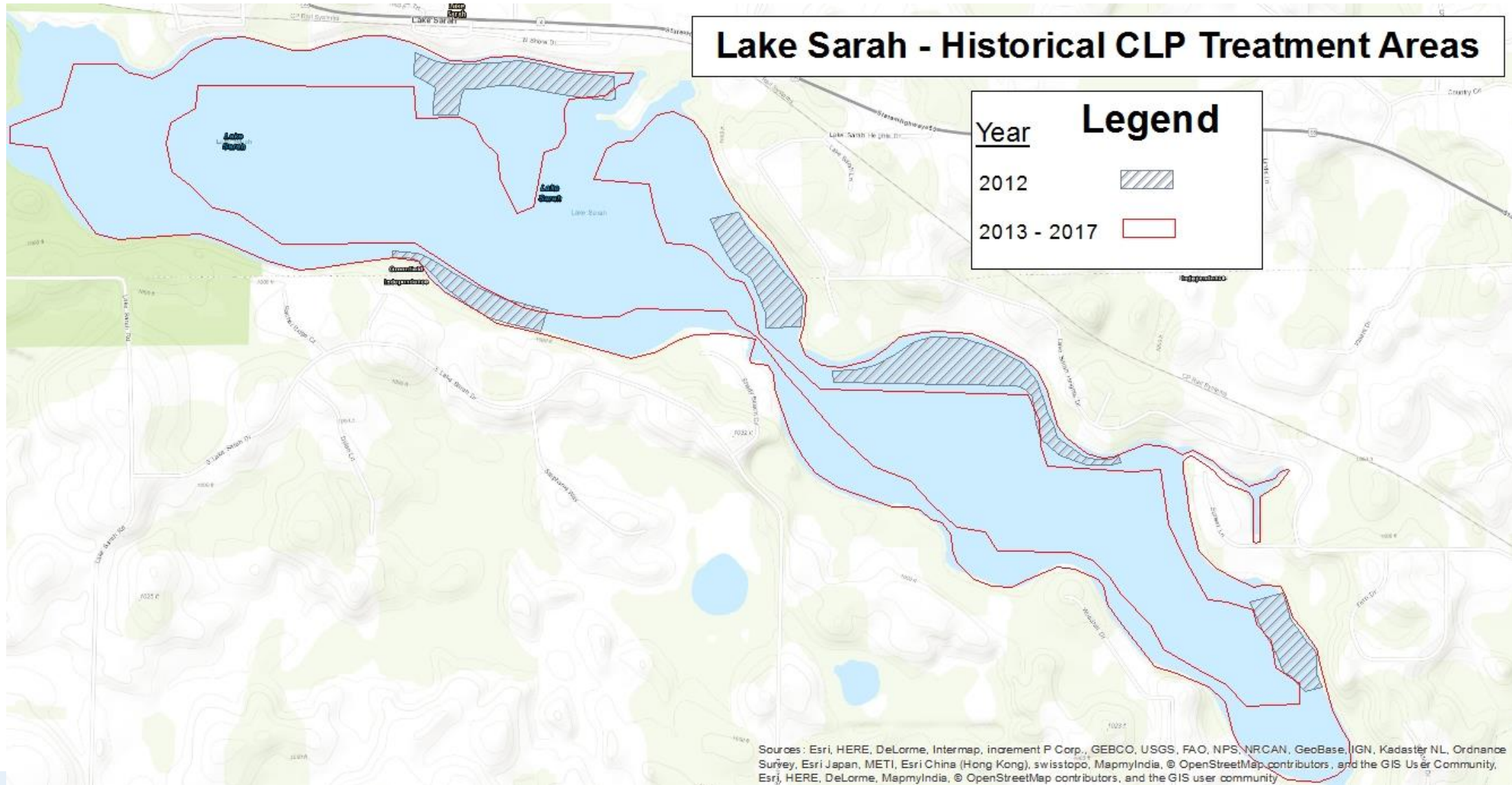


# CLP – How we manage it?

## Whole Lake Treatment (2013 – 2017)

- 260 acres of littoral zone treated
- Treat large enough area that chemical mixes entire water column at a low rate known to control CLP
- Aquathol K is used. EPA approved label for aquatic plant control, widely used for CLP control nationwide.
- Dissipates quickly – need 12 to 24 hours of contact time
- Not toxic to fish and other aquatic organisms at label rates
- No restrictions on label for swimming

# CLP Treatment (2013 – 2017)



# CLP – Management Goals

## LAKE VEGETATION MANAGEMENT PLAN (LVMP)

- 1. Increase native plant abundance and diversity**
  - a. Native plant frequency and species richness shall be maintained or increase
  - b. Native plant subsequent treatment of native plants for access shall be limited
- 2. Control CLP to reduce interference with recreational lake use**
  - a. Reduction in frequency of occurrence of CLP
- 3. Maintain or increase water clarity**
  - a. Secchi depth shall be maintained or increase



# CLP – Results (2013 – 2017)

## 1. Increase native plant abundance and diversity

### *Lake Sarah East Basin*

Treatment Date	CLP* Acres Treated	PI Survey Date	Max Depth of Growth in feet [95%] <sup>†</sup>	% Points w/ Native Submersed Taxa	Mean Native Submersed Taxa/ Point	# Submersed Native Taxa	AVG Secchi Depth [m]
-	-	6/9/2011	12	54	0.7	6	
4/29/2012	23	6/7/2012	10	64	0.9	5	
5/15/2013	95.5	6/6/2013	8	58	0.7	4	
5/17/2014	95.5	6/20/2017	9	58	0.7	6	
5/2/2015	95.5	6/10/2015	9	63	0.8	6	
5/6/2016	95.5	6/7/2016	8	64	0.7	6	
5/5/2017	95.5	6/1/2017	10	78	1	8	

# CLP – Results (2013 – 2017)

## 1. Increase native plant abundance and diversity

### Lake Sarah West Basin

YEAR	Treatment Date	CLP* Acres Treated	PI Survey Date	Max Depth of Growth in feet [95%] <sup>†</sup>	% Points w/ Native Submersed Taxa	Mean Native Submersed Taxa/ Point	# Submersed Native Taxa	AVG Secchi Depth [m]
2011		-	6/9/2011	13	20	0.2	4	1.5
2012	4/29/2012	26	6/7/2012	13	44	0.5	7	1.5
2013	5/15/2013	164.5	6/6/2013	9	34	0.4	5	1.6
2014	5/17/2014	164.5	6/20/2017	14	48	0.6	5	1.5
2015	5/2/2015	164.5	6/10/2015	10	37	0.5	5	1.9
2016	5/6/2016	164.5	6/7/2016	12	56	1	6	1.9
2017	5/5/2017	164.5	6/1/2017	14	66	0.83	7	1.4

# CLP – Results (2013 – 2017)

## 2. Control CLP to reduce interference with recreational lake use

### a. Reduction in frequency of occurrence of CLP

- Seasonal control is good

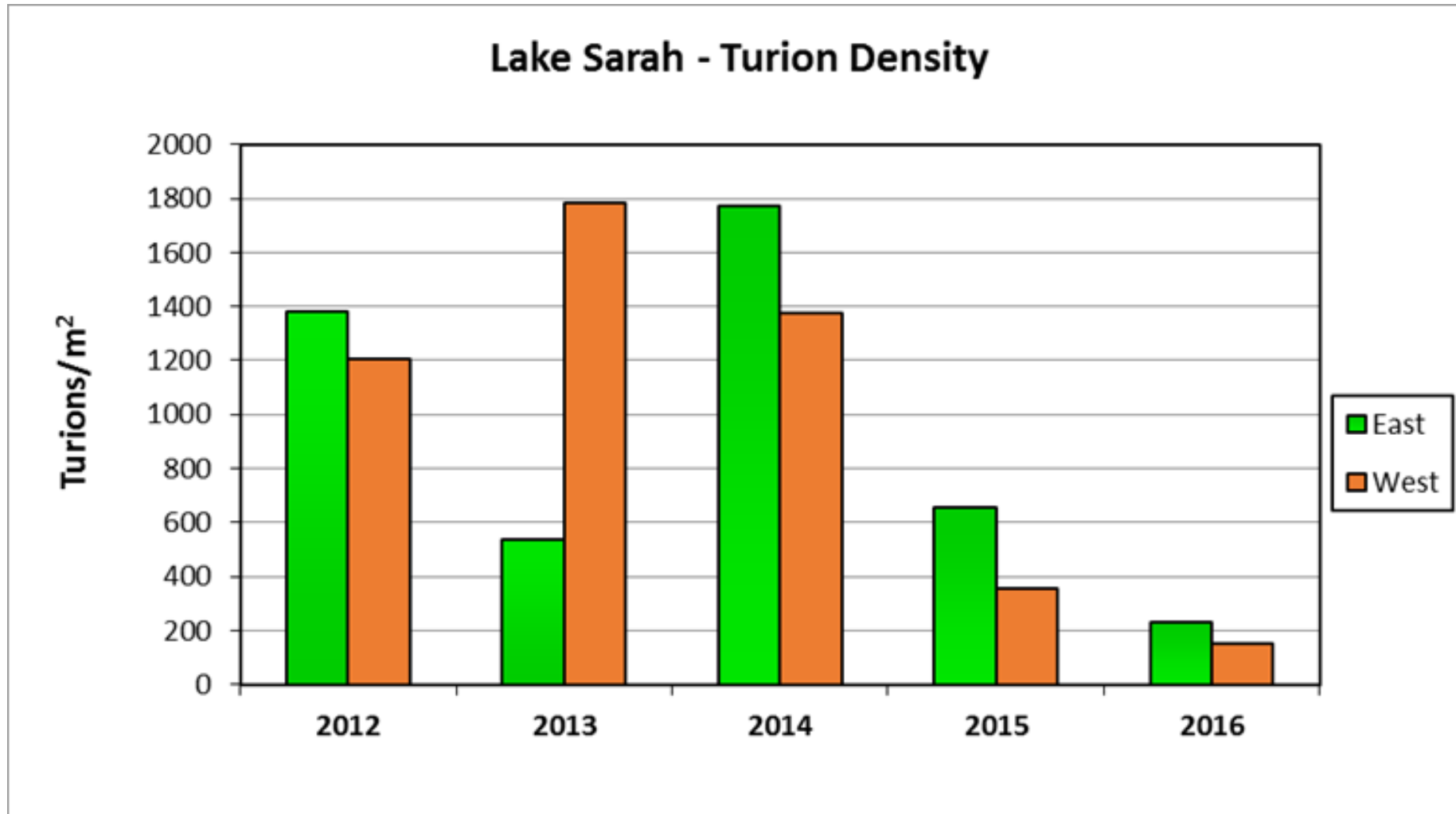
West Basin	2011	2012	2013	2014	2015	2016	2017
Pre-treatment			41	31	47	24	27
Post-treatment	74*	37	24**	0	1	1	16

East Basin	2011	2012	2013	2014	2015	2016	2017
Pre-treatment			31	26	43	30	15
Post-treatment	73*	48	32**	3	0	4	14

\* No treatment 2011

\*\* 06/18/18 dead CLP plants sampled & counted in analysis

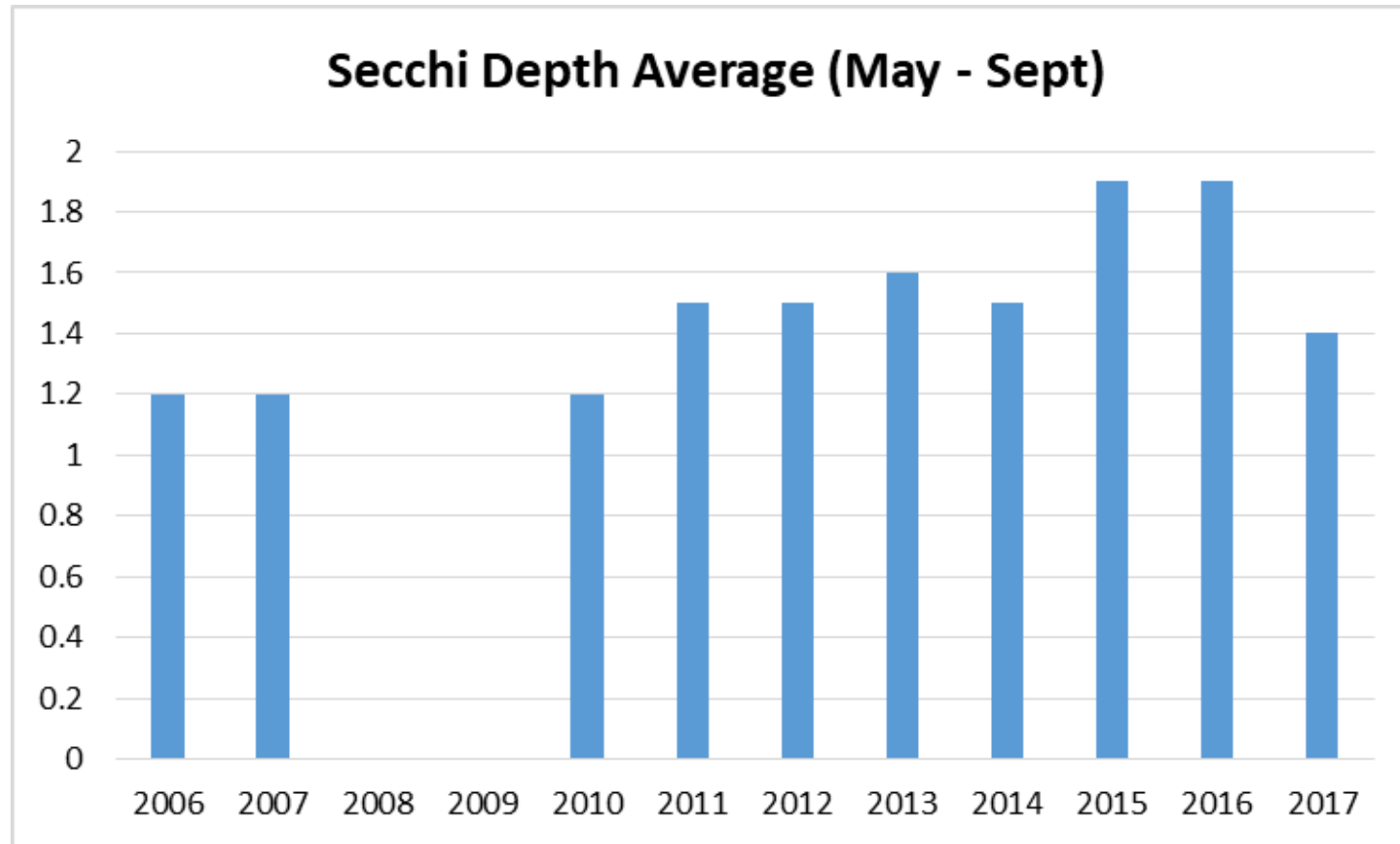
# CLP – Results (2013 – 2017)





# CLP – Results (2013 – 2017)

## 3. Maintain or increase water clarity



Add a footer

# CLP – 2018 & beyond

## 2018

- Early spring survey will determine treatment area
- 2018 could be another whole lake treatment if CLP abundance warrants it
- Other scenario – CLP shows another large reduction – treatments would be then be spot treatments, higher rates needed

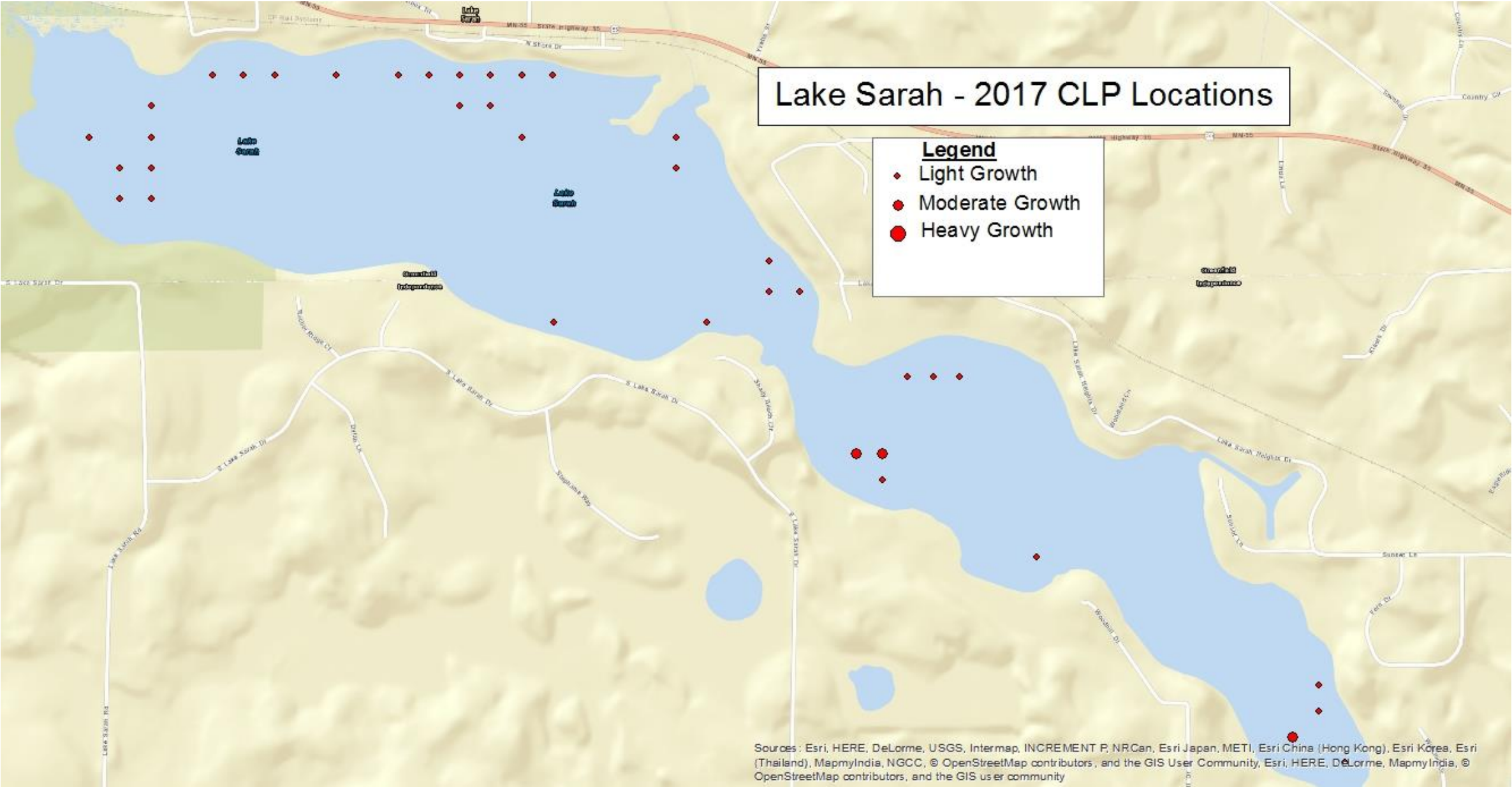
## Beyond 2018

- treatments will likely be spot treatments (not whole lake)
  - More emphasis on treating in calm conditions – good contact time is needed
  - Only larger areas should be treated (> 5 to 10 acres)
  - Higher rates used
  - Goal is continued control of population to small areas

# Lake Sarah - 2017 CLP Locations

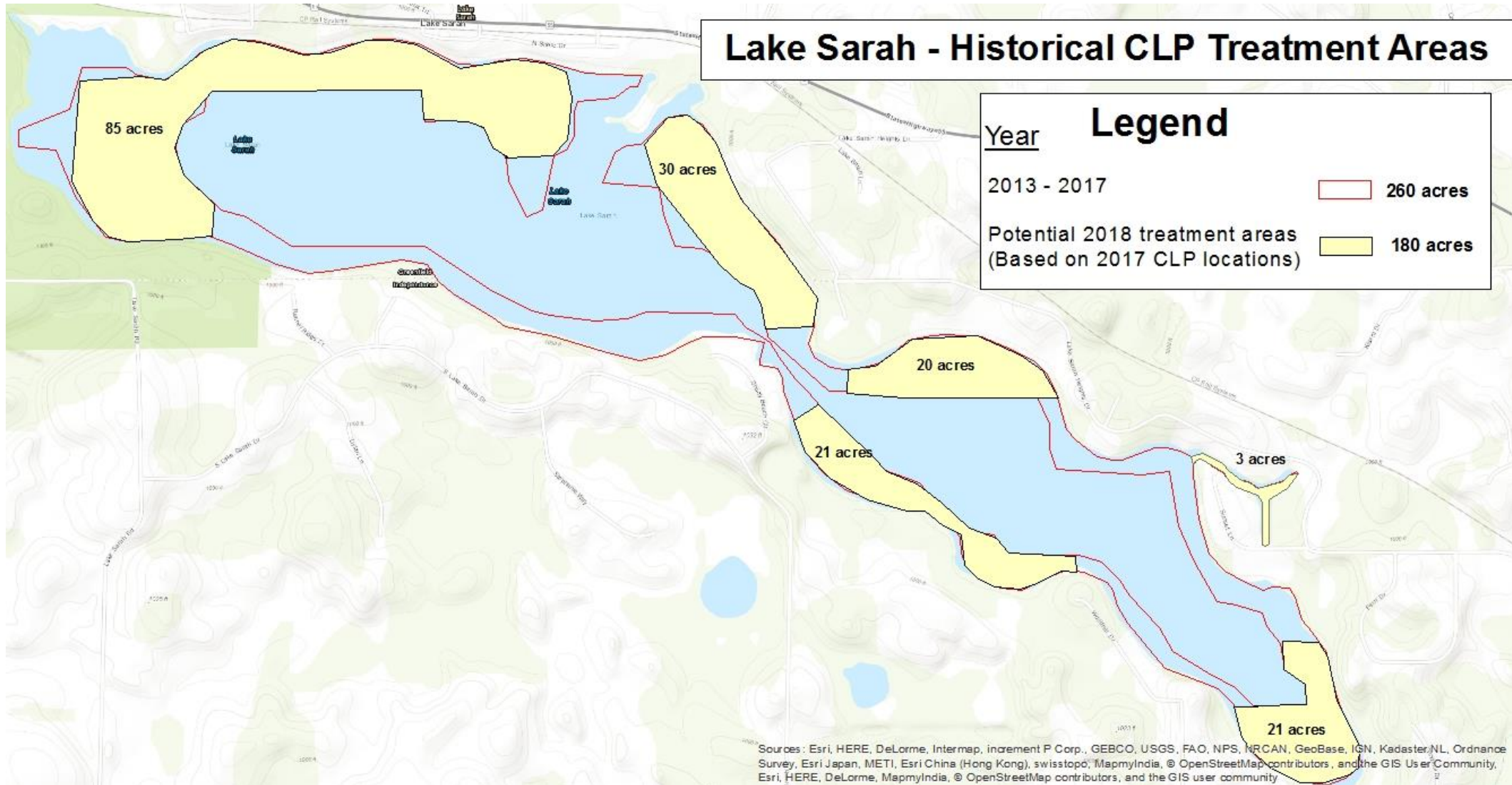
**Legend**

- ◆ Light Growth
- Moderate Growth
- Heavy Growth



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

# Possible scenario





# Eurasian Watermilfoil (EWM)

## Why manage it?

- Can displace native species
- Can interfere with recreation

## Management Goal





- Provide seasonal control on nuisance areas
- Nuisance areas are large mats of EWM at or near the surface

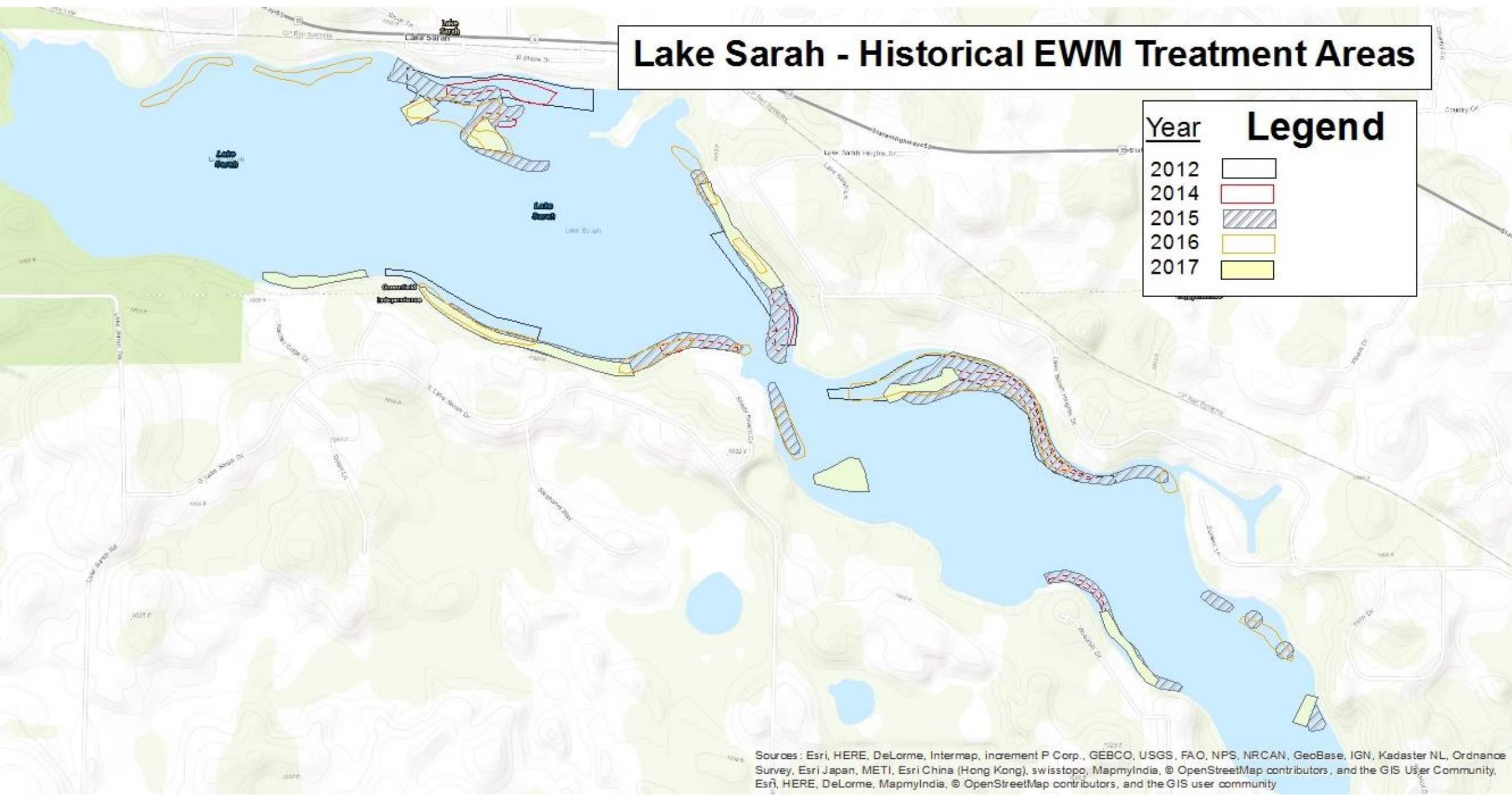
# Eurasian Watermilfoil (EWM)

## How we manage it

- Annual survey to assess EWM
- Few options for treatment product
  - Prior to 2017 – treated with liquid 2,4-D
    - Needs at least 24 hrs contact time – not the best solution for small areas (< 10 acres)
    - Mostly selective for EWM
  - 2017 used diquat – contact herbicide with shorter contact time (~3 hrs)
    - Good solution for small areas
    - Not selective for EWM – can also impact native plants

# Lake Sarah - Historical EWM Treatment Areas

Year	Legend
2012	
2014	
2015	
2016	
2017	



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

# QUESTIONS

Contact Information

Eric Fieldseth, AIS Consulting Services

[efieldseth@gmail.com](mailto:efieldseth@gmail.com)

