

Lake Watershed Management Thinking: Space, Scale and Time

-Lessons learned from Urban Ecology –

A broader perspective on lake management

Burney Fischer, Big Mantrap Lake Association

Storyline

Lakes and their surrounding watersheds are social-ecological systems (people & nature interacting). The management of these systems (*spaces*) can be at many *scales* (patches), from a small single lake bay (think neighborhood) to all the lake (water body) to the lake's watershed to multiple lake watersheds. And, it all changes over *time* as humans continue to modify the land. My purpose through a slide series is to demonstrate how watershed thinking is very comparable to how ecologists think of urban ecosystems – neighborhoods > city > metropolitan area.

Background from Urban Ecology

Study of relationships of living organisms with each other and their surroundings in the context of an urban environment

Urban ecosystem dominated by humans & manmade structures

Generally clarified as “social-ecological system” to focus social emphasis

Urban Ecology speaks of Ecology “In”, “Of” and “For” the City

- **“In” the city – study of unique “natural” patches**
- **“Of” the city – connecting/linking the patches**
- **“For” the city – research outcomes lead to protection/restoration,**

- **‘For the City’ reflects an activist approach of ecologists, urban foresters, greening non-profits, etc. to protect/restore the urban ecosystem**

Think how these resonate with lake residents and lake associations

Space – Scale - Time

Space – Watershed > Lakeshore/Lake > Lake > Lakeshore Neighborhood

Scale – Mississippi River Headwaters Watershed > Hubbard

County/HCCOLA > Mantrap Lake Chain (Big Mantrap to Belle Taine) >

Big Mantrap Lake > Local NH/Bay on BML

Time – The lens of today is different than in the past or moving into the future – think development/land use change over time at many scales

From Benfield's "People Habitat: 25 Ways to Think about Greener, Healthier Cities" – chap 1 opening quote, p 1

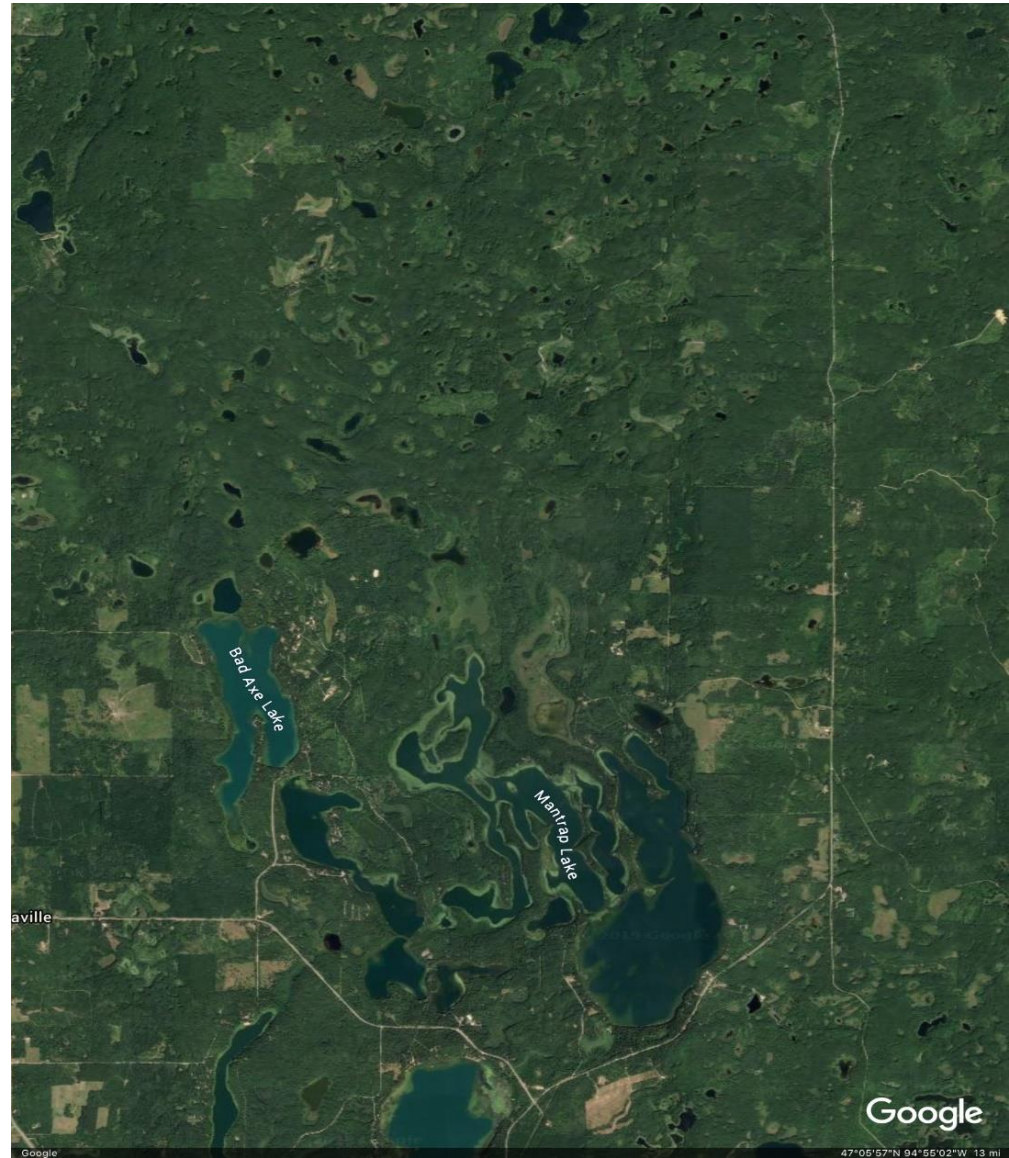
"Allow me to be deliberately provocative: Although this is a book about cities, in some senses "cities" don't matter nearly as much as sometimes suggested. To the environment and the economy, neighborhoods and metropolitan regions matter more."

***Rewritten by Fischer for Lakes:* Although we talk about individual lakes, in some sense "lakes" don't matter nearly as much as sometimes suggested. To the environment and the economy, lakeshore neighborhoods and larger lake watersheds (HCCOLA) matter more.**

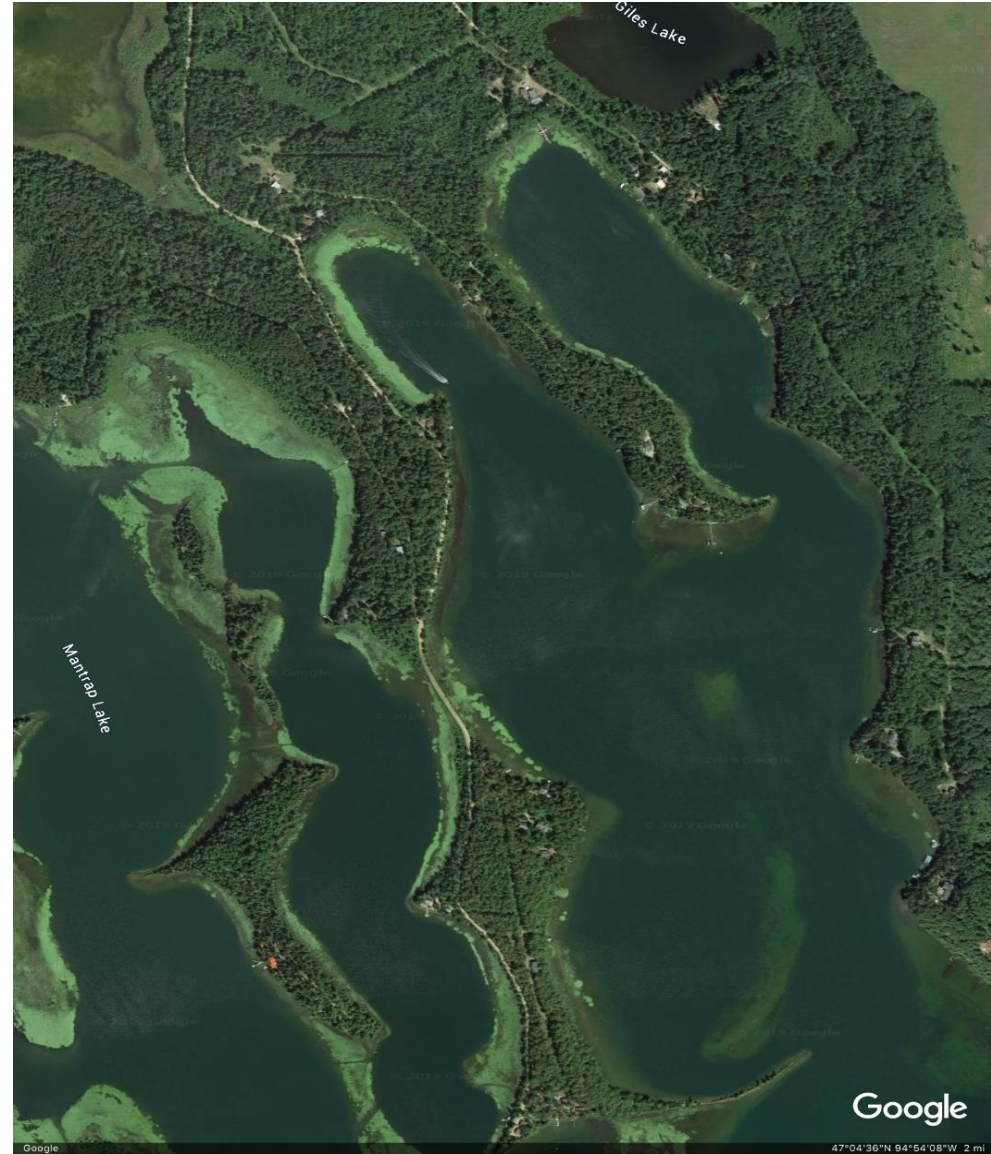
BML
watershed,
within the
Mantrap
Watershed
(BML-Belle
Taine),
within the
Mississippi
Headwaters
Watershed



Mantrap Chain and BML Watersheds

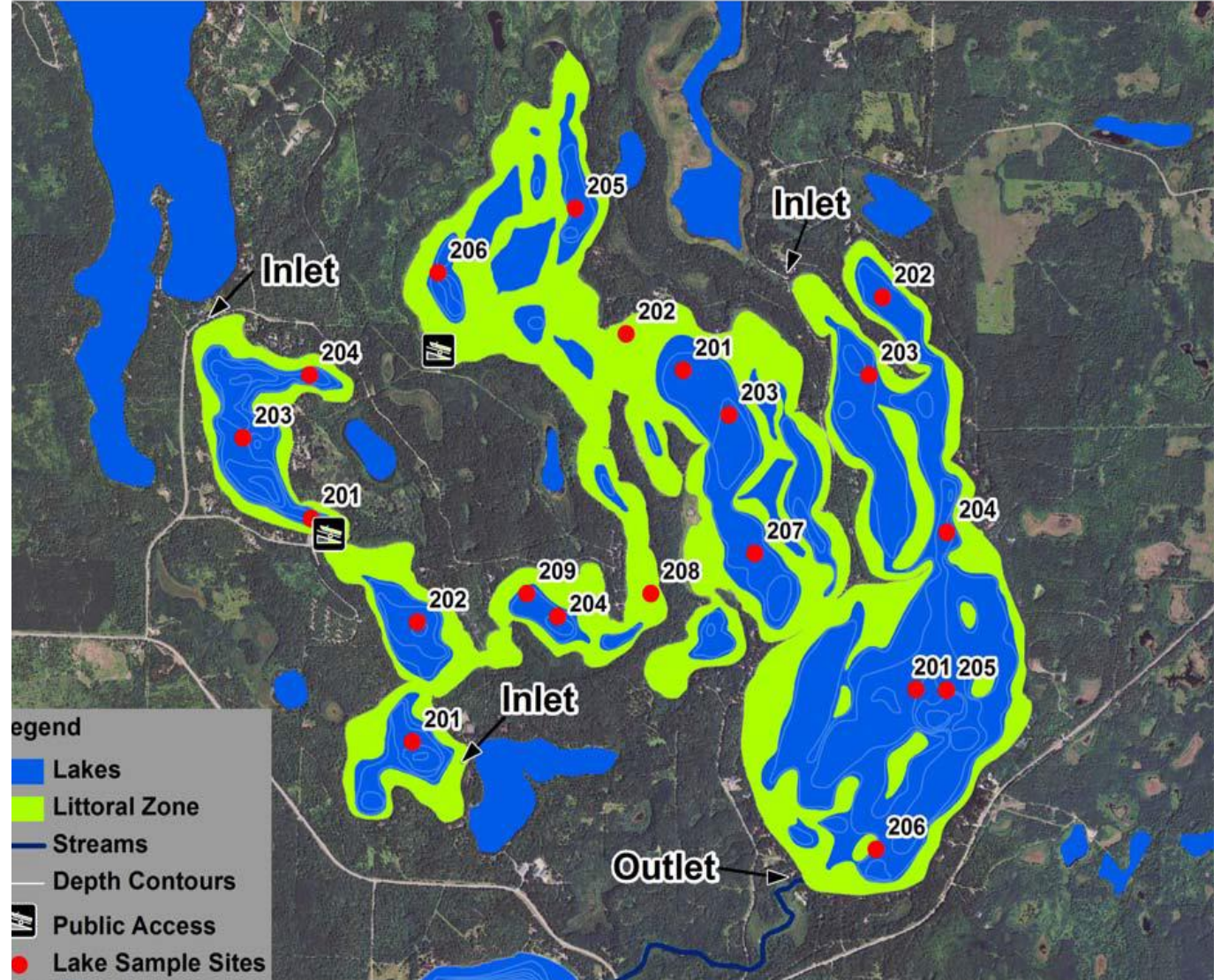


BML Watershed (local) and East Basin



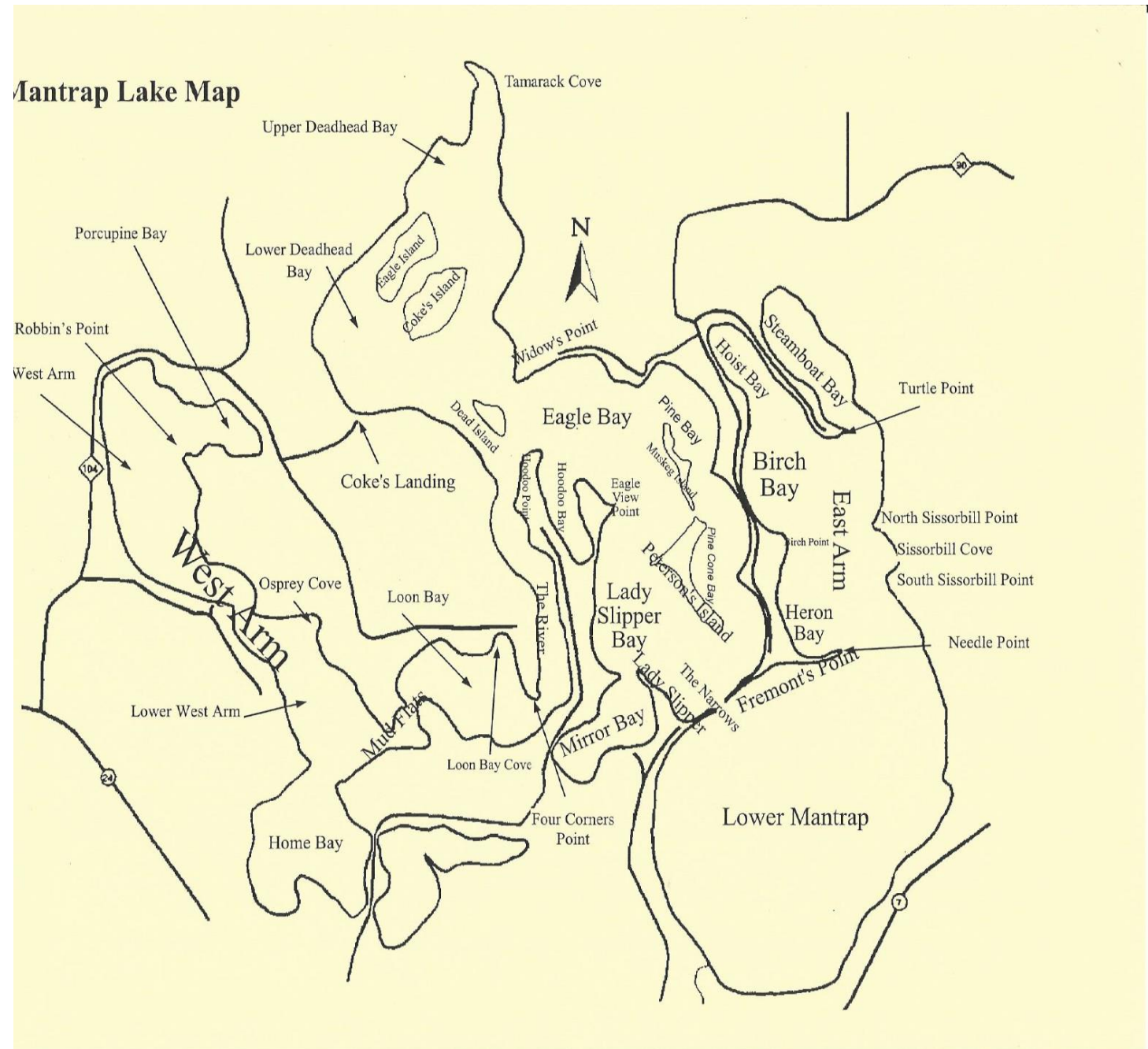
BML – Littoral zones & water depths

Map of Big Mantrap Lake with 2010 aerial imagery and illustrations - lake depth contour lines, sample site locations, inlets and outlets, and public access points. The light green areas in the lake illustrate the littoral zone, where the sunlight can usually reach the lake bottom allowing aquatic plants to grow. (Figure 1, Big Mantrap Lake Report. DNR 2010)

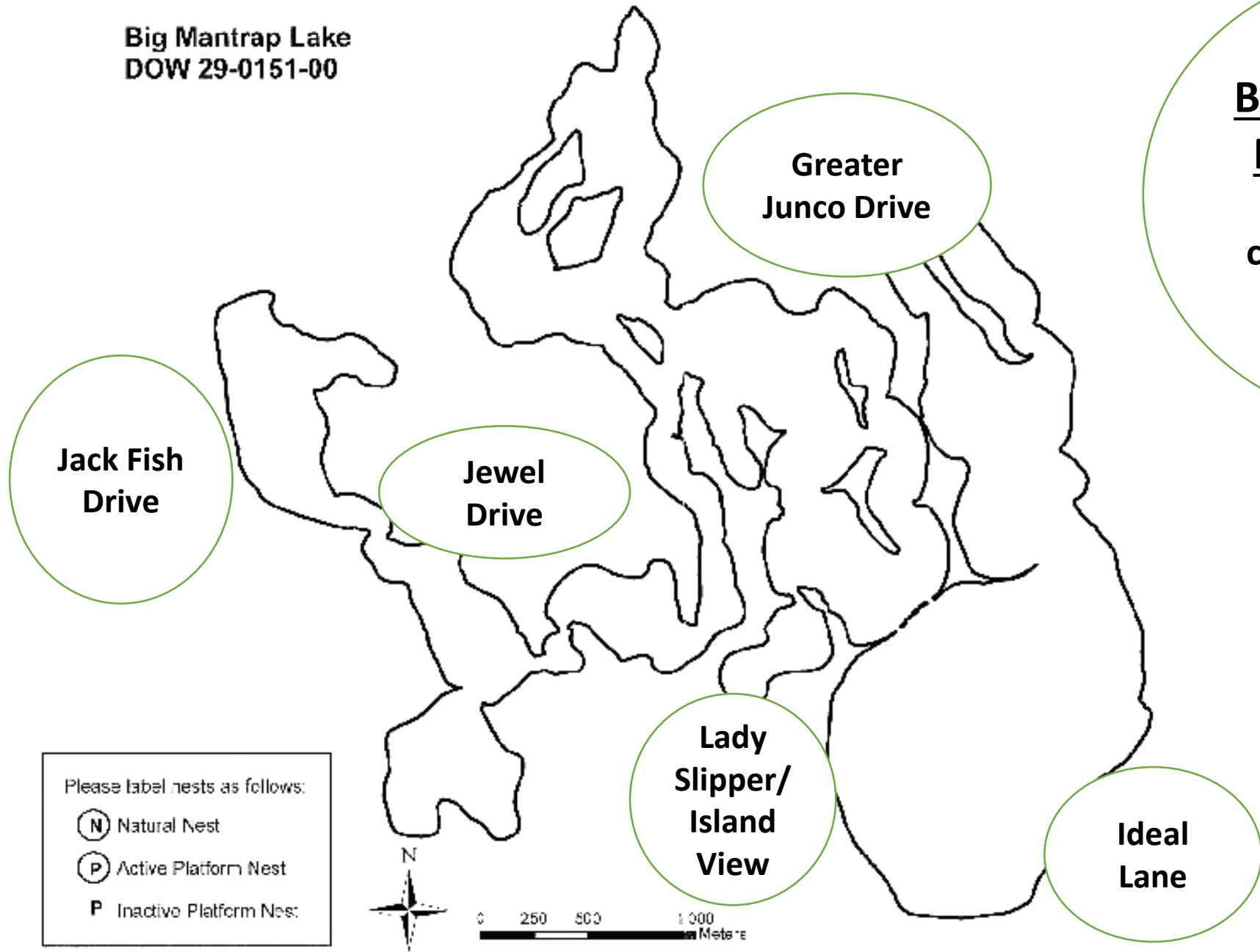


BML Names – Road & Lake Locations

This is how people think of a lake and its human connections. Create for your lake and distribute widely.



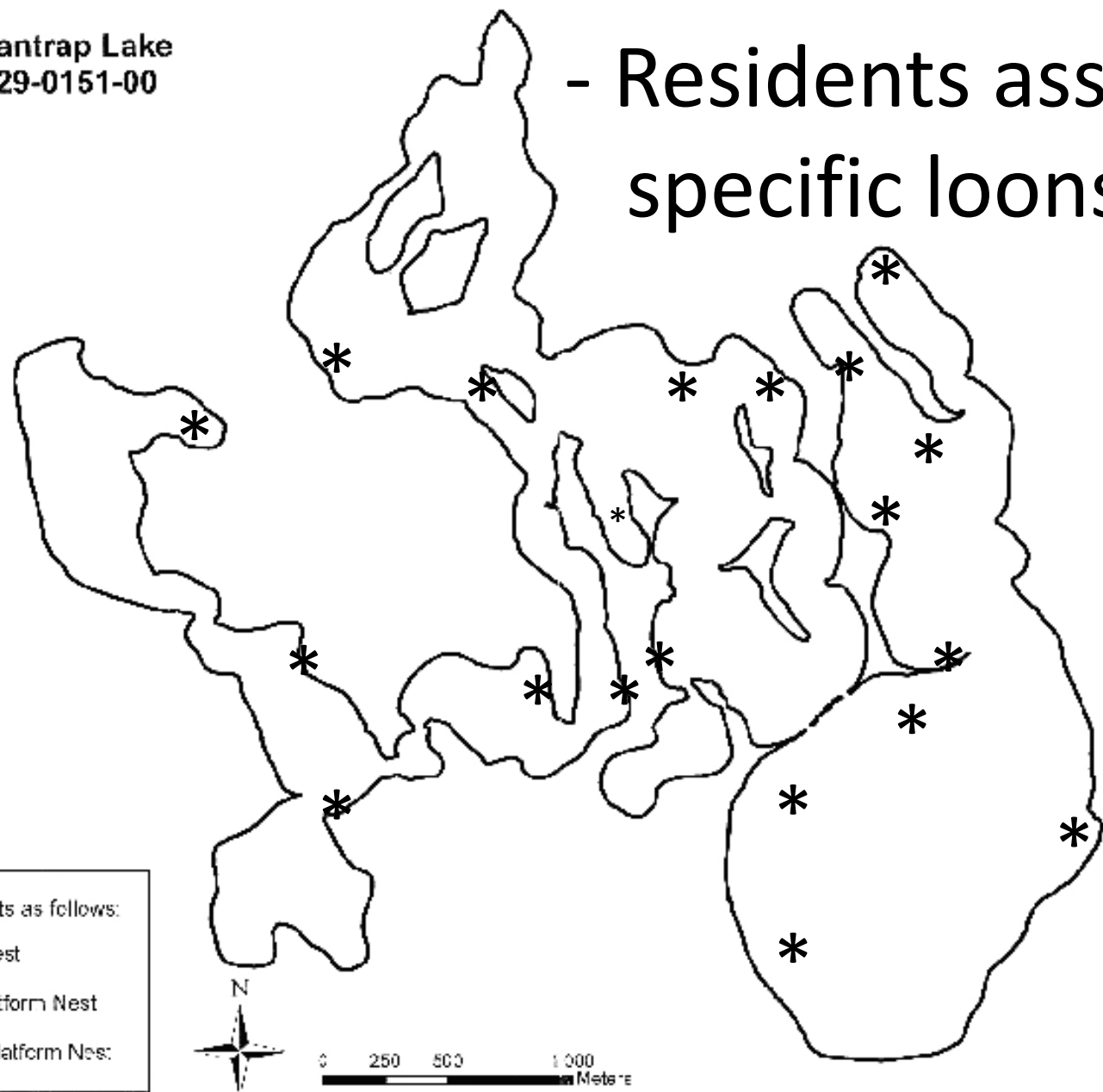
Big Mantrap Lake
DOW 29-0151-00



Big Mantrap Lake
Neighborhoods
Each socially
connected & rather
autonomous

Artificial Loon Nest Locations - Residents associate with specific loons & nests!

Big Mantrap Lake
DOW 29-0151-00



Please label nests as follows:

- (N) Natural Nest
- (P) Active Platform Nest
- P Inactive Platform Nest

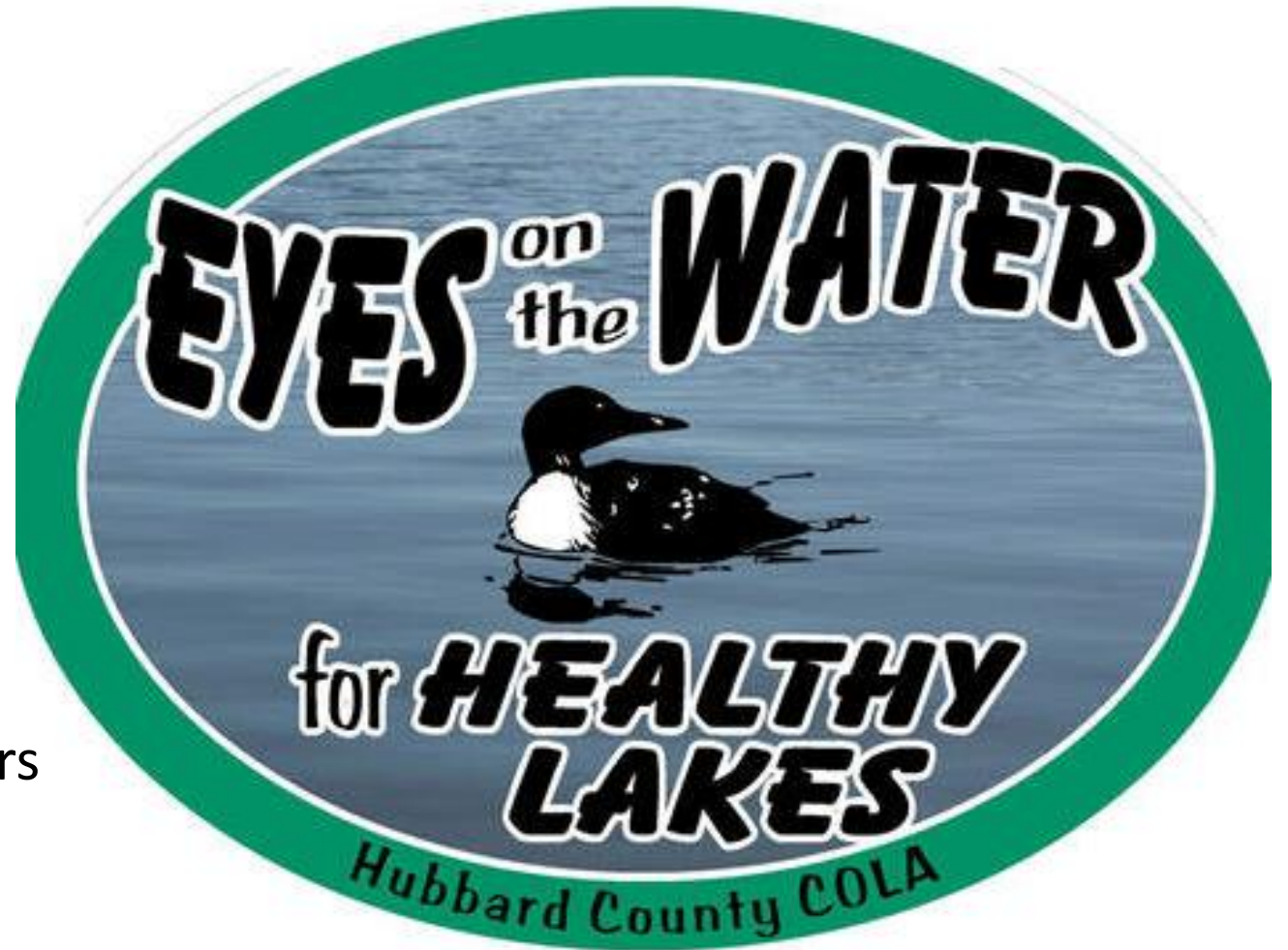
The Current “Lake” Model

BMLA – Mtgs, Newsletter, Social Media (Facebook), etc.

BMLA NH’s – social gatherings,...

“Eye’s on the Water/Shore”

- Water Quality Monitoring
- AIS Monitoring
- Loon Nest Monitoring
- Lake Resident Fisherman, Boaters
- All looking for changes!

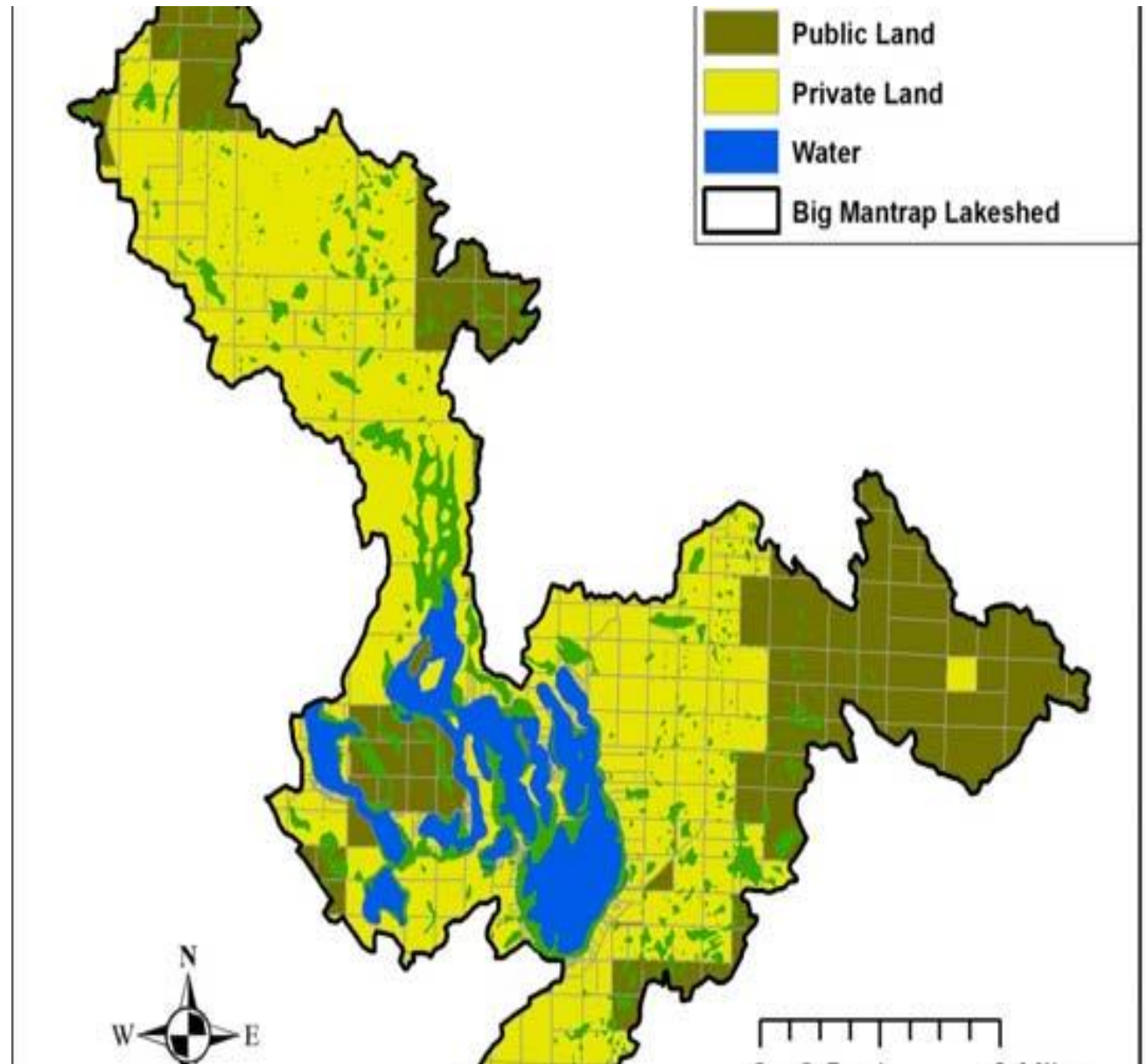


	Location	Nest date	Eggs	Add'l egg	Hatch	date hatch	died	Comments:C indicates Canopy
A/C	Porcupine Bay	5/13/2019	2					
A/C	Campground/Osprey	5/20/2019	2		1 predated			1 predated before 2nd laid (5/23)
A/C	Home Bay	5/13/2019	2					tagged female
B/C	Mud Flats	5/9/2019	2					
A/C	Loon Bay	5/10/2019	2					
B	Dead Island	5/21/2019	2					rushes west end of Island.
Natural	Dead island 2							
A/C len	River	5/11/2019	1	?				
B/C	Vicek	5/9/2019	2					
A/C	Pine Bay	5/26/2019	1	?				
Natural	Mirror Bay	5/15/2019	1		predated			
B/C	HooDoo	5/23/2019	2					2011 tagged male
Natural	Eagle View	5/23/2019	1					
A/C	Ladyslipper East	5/9/2019	2					4 duck eggs
A/C	Junge	5/28	1	?				
A/C	Freemont Point	5/11/2019	2					
B/C	Turtle Point	5/22/2019	1					
A/C	Birch Bay	5/9/2019	1	?				
A/C	Hoist Bay	5/22/2019	1	?				
Log	Steamboat	5/16/2019	2					
Log	Love	5/21/2019	2					
B	Widow Point							
Natural	Narrows	5/13/2019	2					
B/C	Needle Point	5/21/2019	2					
Natural	Lower Deadhead	5/13/2019	1		predated			
Natural	Ladyslipper West	5/15/2019	1		predated			
	Renest	5/28/2019	1					
Total			39		0		0	



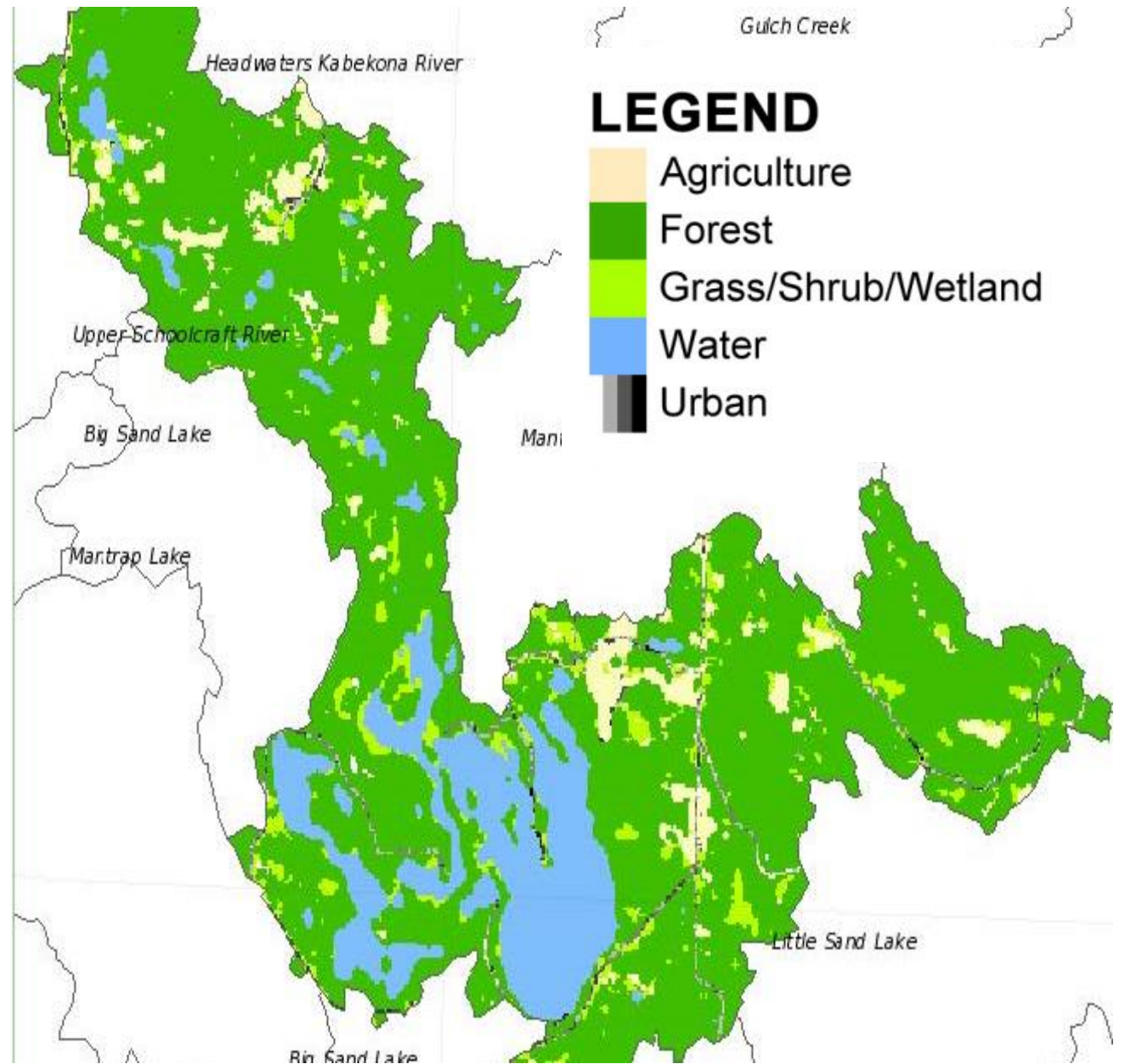
BML Watershed Land Ownership

Mantrap lakeshed with
land ownership, lakes,
wetlands, and rivers
illustrated (Figure 16, Big
Mantrap Lake Report, DNR 2010)



BML Watershed Land Use

Mantrap lakeshed land cover (<http://land.umn.edu>) (Figure 15, Big Mantrap Lake Report, DNR 2010)



Day Dreaming Ways to Influence Watershed Protection,

Eye's on Watershed – next steps

- Land use change – temporary or permanent (+, ~, -'s)
- Human (disturbance vs conversion)
- Natural (fire, blowdowns, drought,...)
- Idea – use drones to monitor change (ex: BML timber blowdown, 2016, **circles**)
- Ownership changes – future land use?
- County GIS sources



Closing Thoughts

- I have presented some ideas to take home and consider
- There are no right or wrong answers, just good questions
- Consider the following – *When's the best time to plant a tree?*
 - 20 years ago
 - Second best time – 10 years ago
 - But, planting today is better than tomorrow!
- Maybe it's time to consider thinking more about watersheds?
- Be glad to discuss further with anyone, anytime!
- Email: bufische@Indiana.edu

Questions?