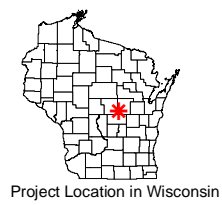


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 920.338.8860  
 www.onterra-eco.com

Sources:  
 Roads and Hydro: WDNR  
 Map Date: November 3, 2015  
 Filename: WaupacaChain\_Location.mxd

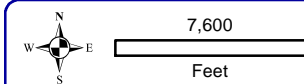
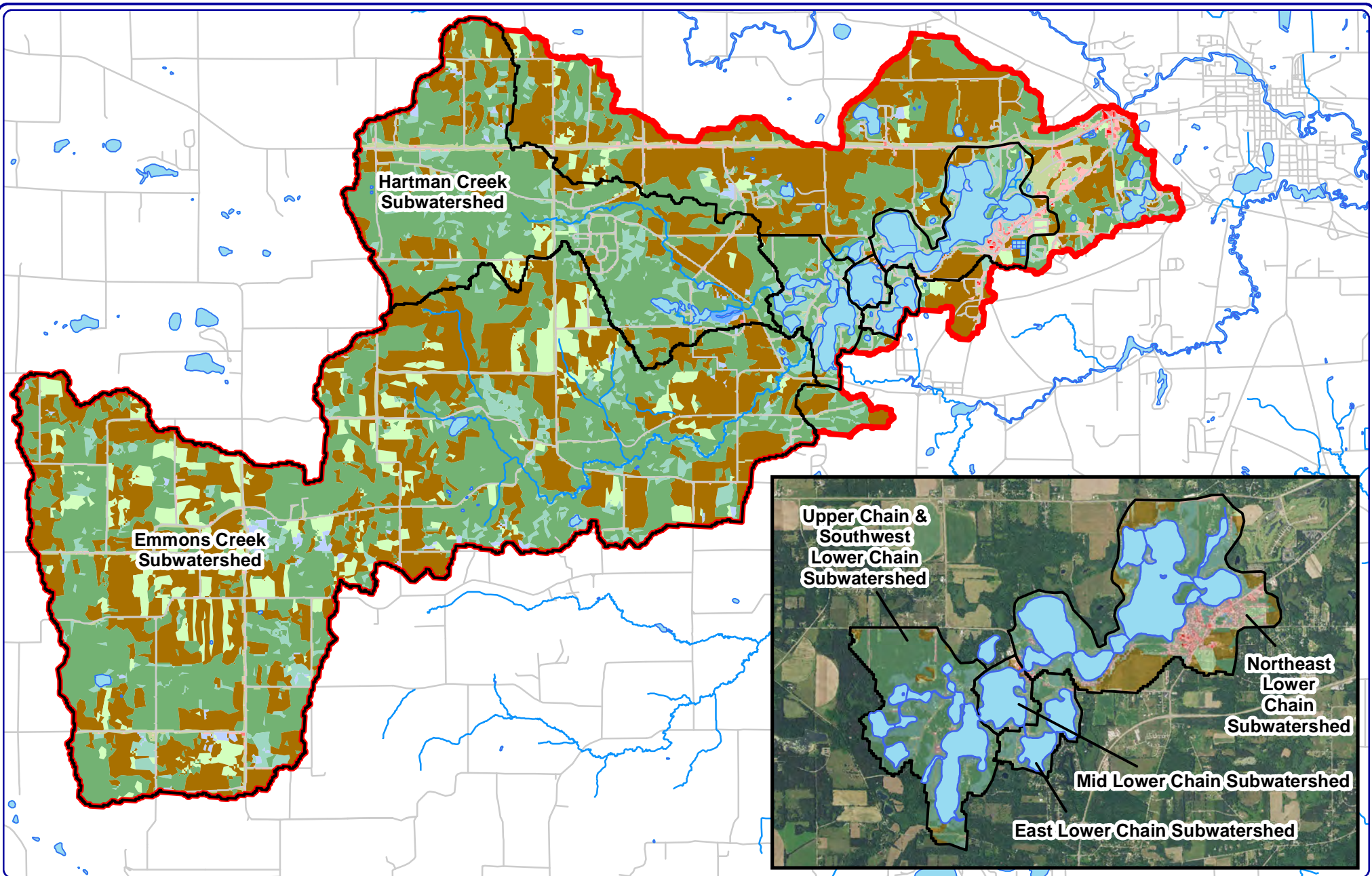


**Legend**

- Waupaca Chain ~ 839 acres  
*WDNR Definition*
- WDNR Managed Lands
- Boat Landing
- Carry-In Access
- Water Quality Sampling Location
- Point-Intercept Survey Locations

Map 1  
 Waupaca Chain O' Lakes  
 Waupaca County, Wisconsin  
**Project Location  
 & Lake Boundaries**





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Sources:  
 Hydro & Roads: WDNR  
 Bathymetry: WDNR, Onterra digitized  
 Orthophotography: NAIP 2015  
 Land Cover: NLCD 2011  
 Watershed Boundaries: Onterra, 2016  
 Map Date: March 1, 2017  
 Filename: WaupacaChain\_Entire-WS.mxd



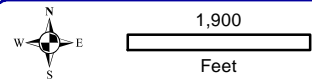
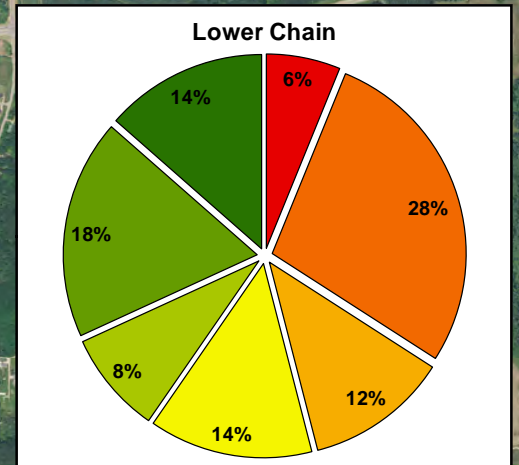
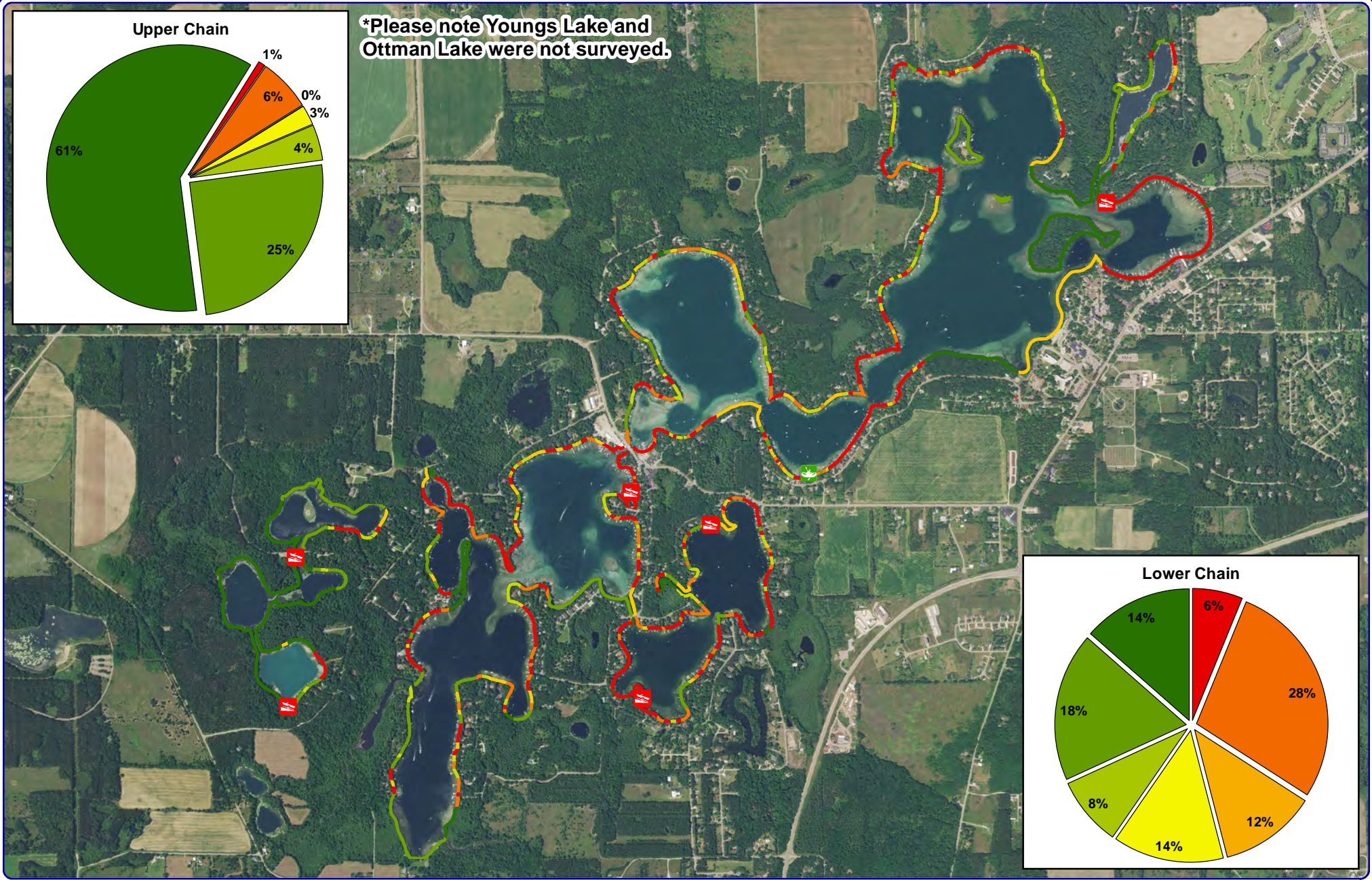
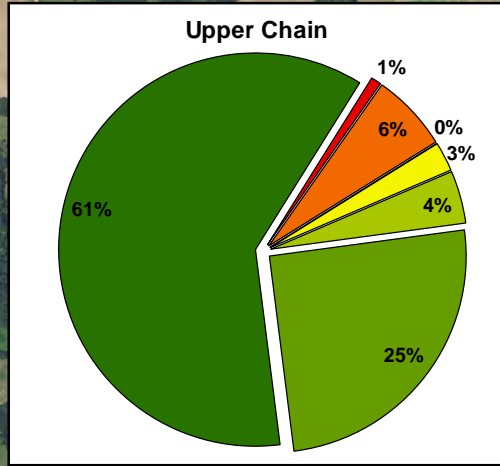
Legend			
Land Cover Types			
	Forest		Pasture/Grass
	Forested Wetlands		Row Crops
	Wetlands		Rural Residential
	Open Water		Medium Density Urban
	Rural Open Space		High Density Urban
	Waupaca Chain Watershed Boundary		Waupaca Chain Modeled Subwatersheds
	River/Stream		

Map 2  
 Waupaca Chain O' Lakes  
 Waupaca County, Wisconsin  
**Watershed Boundaries  
 & Land Cover Types**





**\*Please note Youngs Lake and Ottman Lake were not surveyed.**

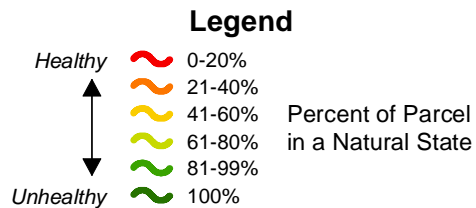


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Sources:  
 Hydro and Roads: WDNR  
 Shoreland Survey: Waupaca County LWCD, 2014  
 Orthophotography: NAIP 2015  
 Map Date: March 16, 2017  
 Filename: WaupacaChain\_ShorelandCondition\_2014.mxd



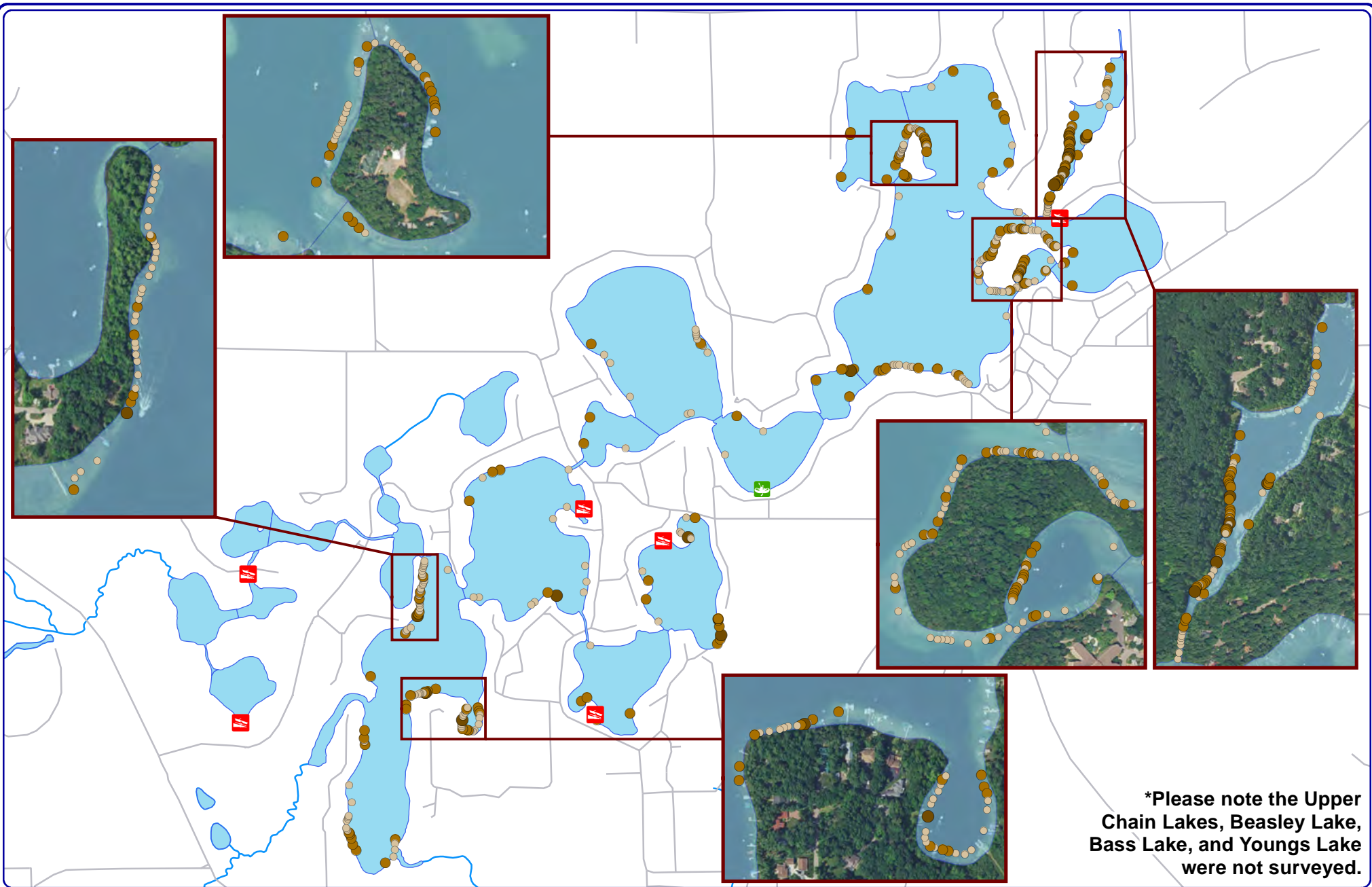
Project Location in Wisconsin



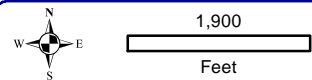
**Map 3**  
 Waupaca Chain O' Lakes  
 Waupaca County, Wisconsin  
**2014 Waupaca County LWCD  
 Shoreland Condition Survey Results**







**\*Please note the Upper Chain Lakes, Beasley Lake, Bass Lake, and Youngs Lake were not surveyed.**



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Sources:  
 Hydro and Roads: WDNR  
 CWH Survey: Waupaca County LWCD, 2014  
 Orthophotography: NAIP, 2015  
 Map Date: March 16, 2017  
 Filename: WaupacaChain\_CWH\_2016.mxd



Project Location in Wisconsin

**Legend**

- No branches
- A few branches
- Tree trunk has a full crown

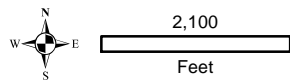
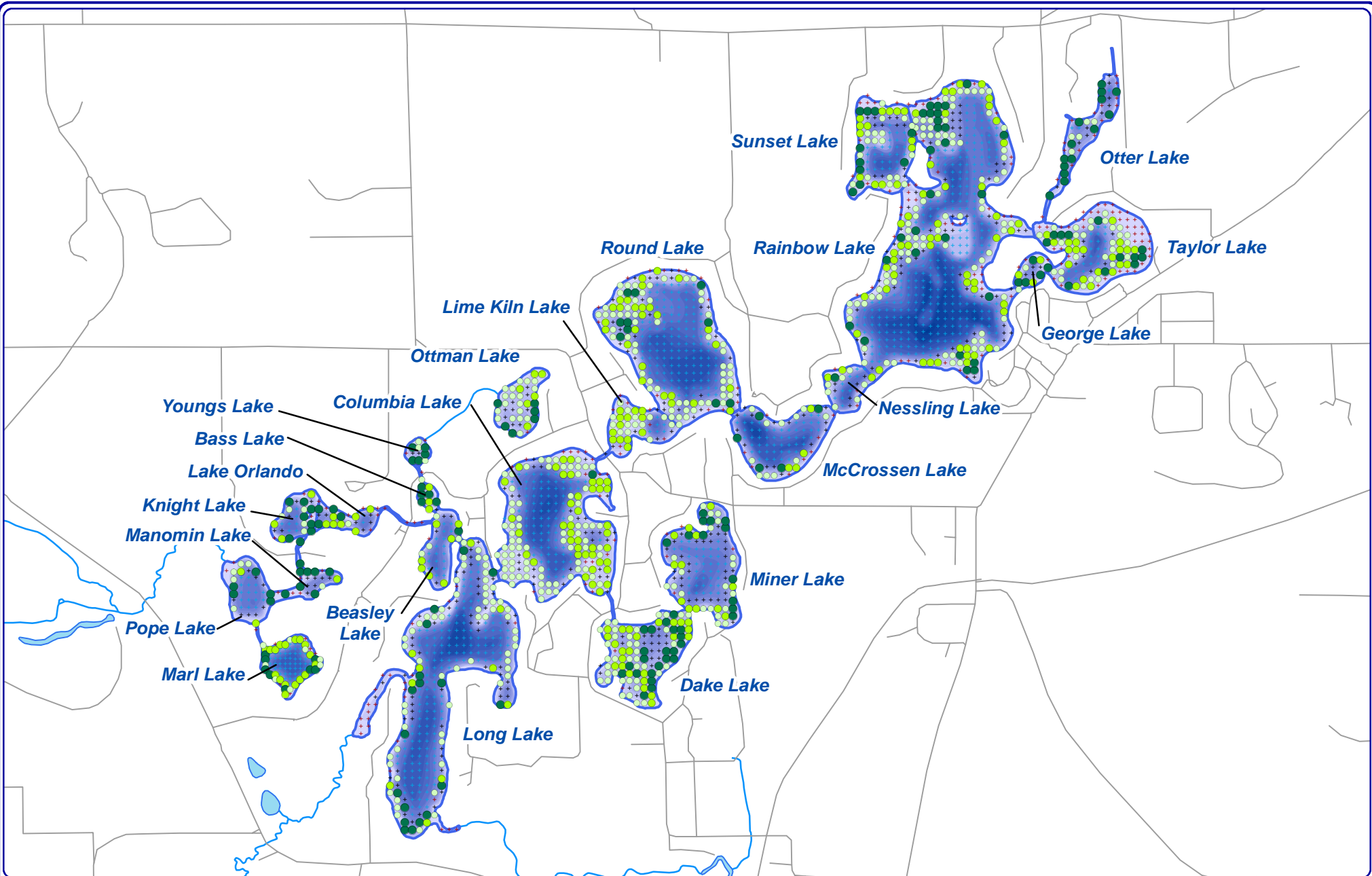
**Map 4**

**Waupaca Chain O' Lakes**  
 Waupaca County, Wisconsin

**2016 Waupaca County LWCD  
 Coarse Woody Habitat Survey Results**







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Sources:  
 Data: Hydro & Bathymetry: WDNR  
 Aquatic Plants: Onterra, 2016  
 Orthophotography: NAIP, 2015  
 Map Date: November 28, 2016  
 Filename: WaupacaChain\_TRFPI\_2016.mxd



Project Location in Wisconsin

**Legend**

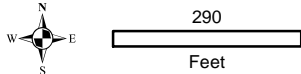
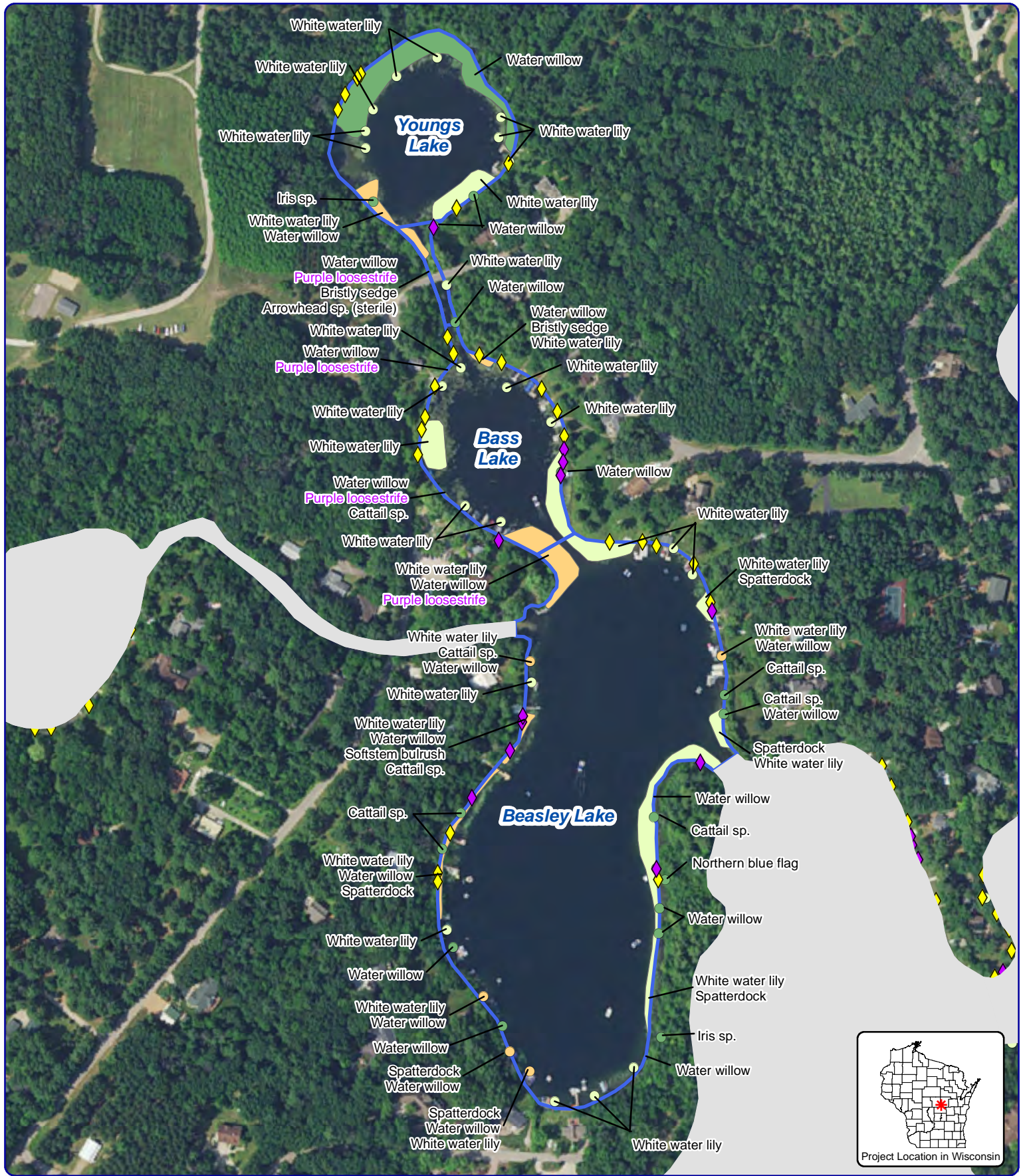
**2016 Point-Intercept Survey**

- Total Rake Fullness = 1
- Total Rake Fullness = 2
- Total Rake Fullness = 3
- No Vegetation
- Non-navigable
- Greater than max depth of plants

Map 5  
 Waupaca Chain of Lakes  
 Waupaca County, Wisconsin  
**2016 Point-Intercept Survey:  
 Vegetation Distribution**







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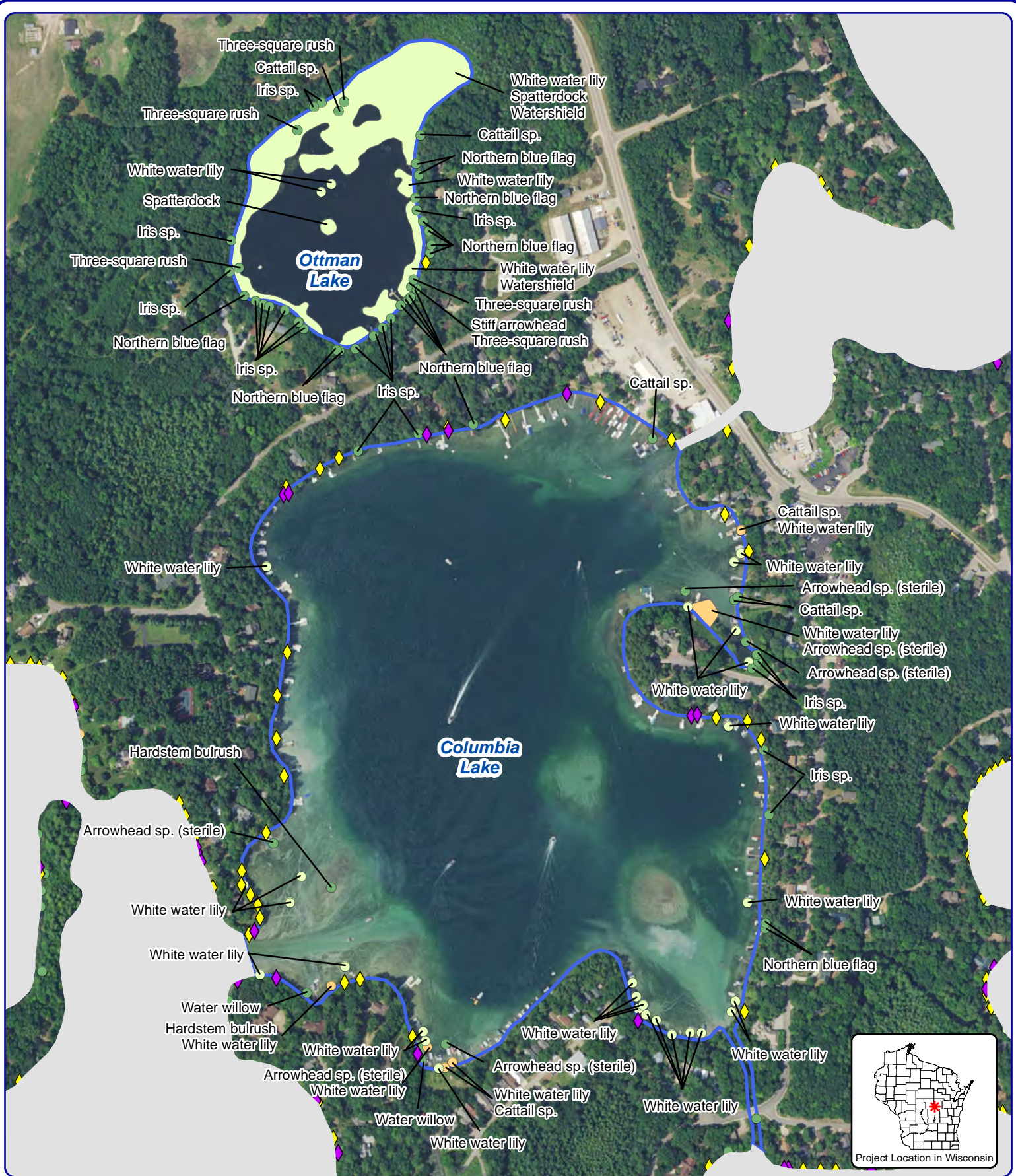
Sources:  
 Roads and Hyrdo: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 8, 2016  
 Filename: Beasley-Youngs\_Comm\_2016.mxd

Legend		
<b>Exotic Plant Communities</b>	<b>Small Plant Communities</b>	<b>Large Plant Communities</b>
◆ Purple loosestrife	● Emergent	● Emergent
◆ Pale yellow iris	● Floating-leaf	● Floating-leaf
	● Mixed Floating-leaf & Emergent	● Mixed Floating-leaf & Emergent

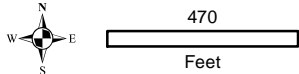
**Map 6**  
 Beasley, Bass & Youngs Lakes  
 Waupaca County, Wisconsin  
 2016 Emergent & Floating-Leaf Aquatic Plant Communities







Project Location in Wisconsin



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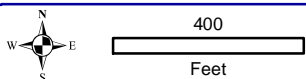
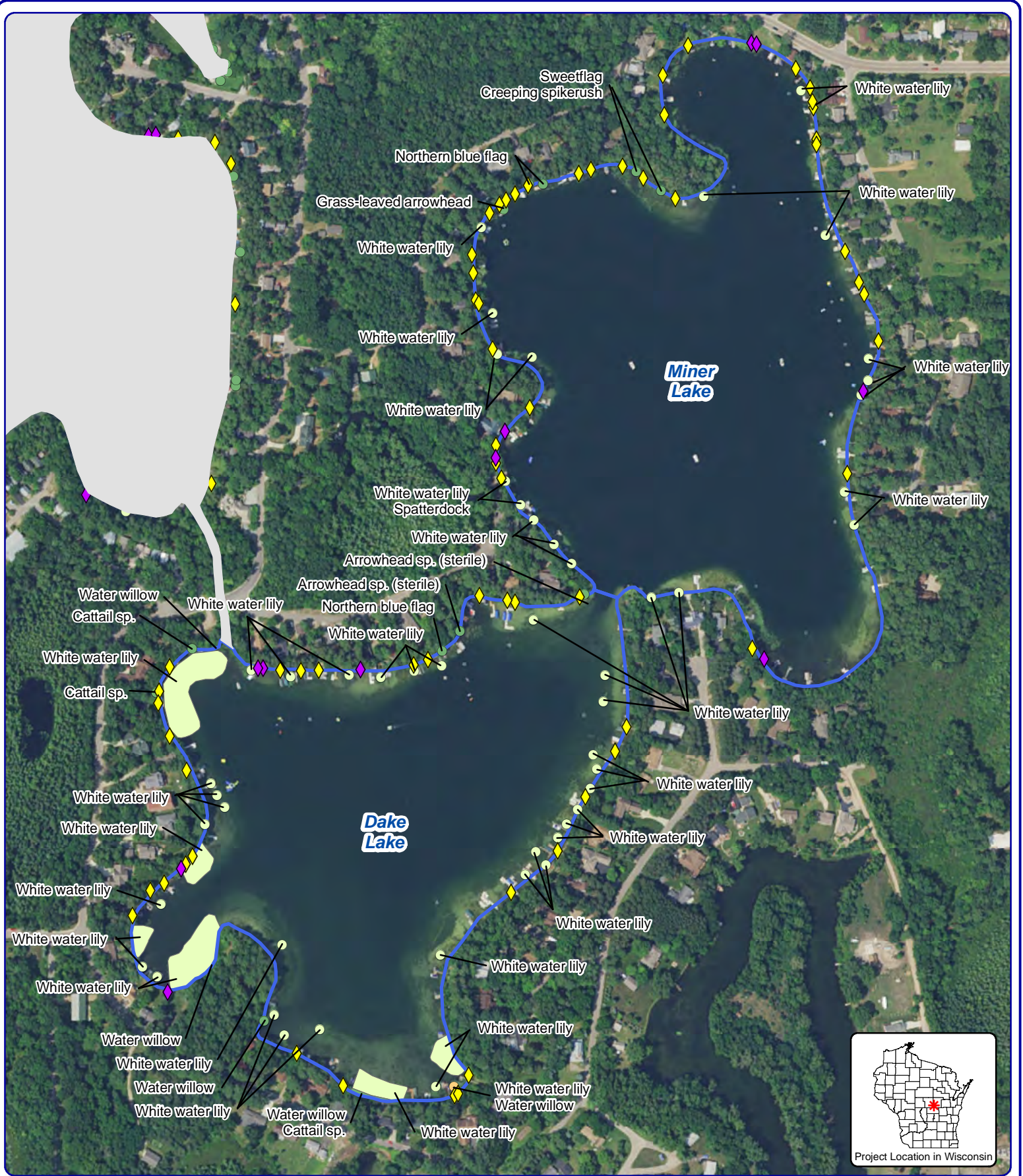
Sources:  
 Roads and Hyrdo: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 28, 2016  
 Filename: Columbia-Ottman\_Comm\_2016.mxd

Legend		
<b>Exotic Plant Communities</b>	<b>Small Plant Communities</b>	<b>Large Plant Communities</b>
◆ Purple loosestrife	● Emergent	✕ Emergent
◆ Pale yellow iris	● Floating-leaf	✕ Floating-leaf
	● Mixed Floating-leaf & Emergent	✕ Mixed Floating-leaf & Emergent

**Map 7**  
**Columbia & Ottman Lakes**  
 Waupaca County, Wisconsin  
**2016 Emergent & Floating-Leaf Aquatic Plant Communities**







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 920.338.8860  
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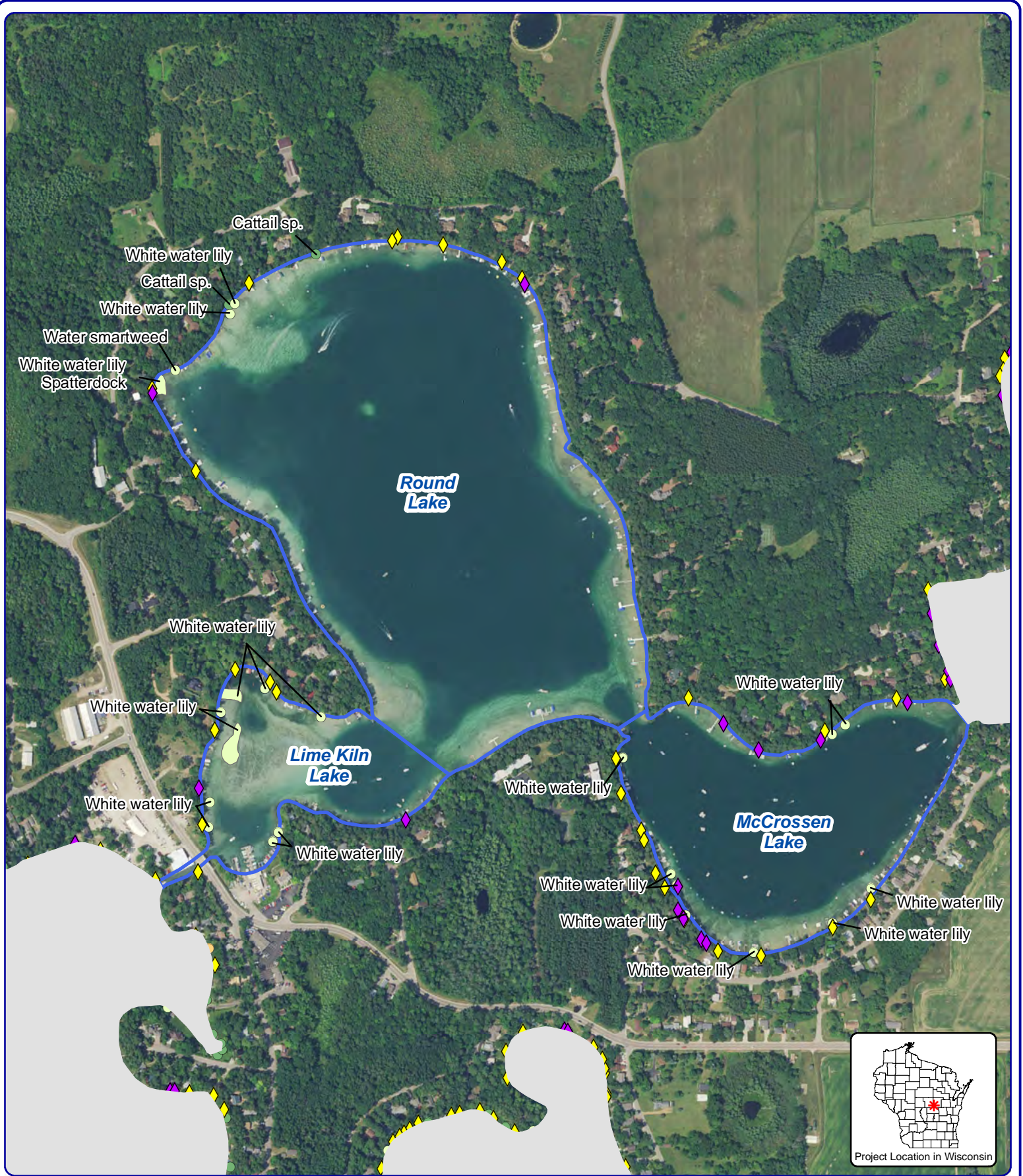
Sources:  
 Roads and Hyrdo: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 28, 2016  
 Filename: Dake-Miner\_Comm\_2016.mxd

Legend		
<b>Exotic Plant Communities</b>	<b>Small Plant Communities</b>	<b>Large Plant Communities</b>
Purple loosestrife	Emergent	Emergent
Pale yellow iris	Floating-leaf	Floating-leaf
	Mixed Floating-leaf & Emergent	Mixed Floating-leaf & Emergent

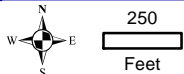
**Map 8**  
 Dake & Miner Lakes  
 Waupaca County, Wisconsin  
 2016 Emergent & Floating-Leaf  
 Aquatic Plant Communities







Project Location in Wisconsin



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 920.338.8860  
 www.onterra-eco.com

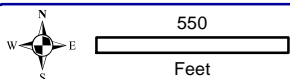
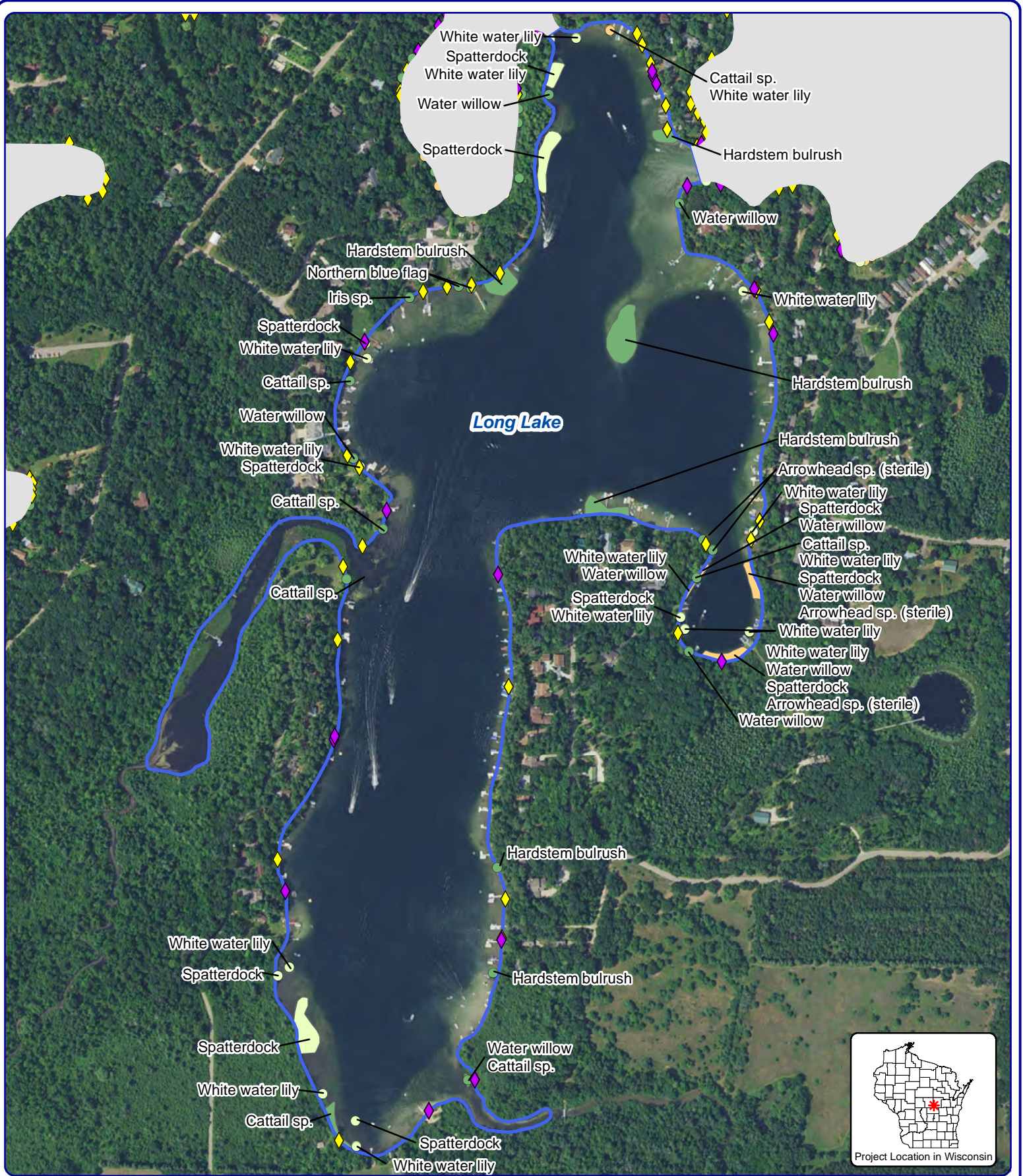
Sources:  
 Roads and Hyrdo: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 28, 2016  
 Filename: Lime Kiln-McCrossen\_Comm\_2016.mxd

Legend		
Exotic Plant Communities	Small Plant Communities	Large Plant Communities
Purple loosestrife	Emergent	Emergent
Pale yellow iris	Floating-leaf	Floating-leaf
	Mixed Floating-leaf & Emergent	Mixed Floating-leaf & Emergent

**Map 9**  
 Lime Kiln, Round, &  
 McCrossen Lakes  
 Waupaca County, Wisconsin  
**2016 Emergent & Floating-Leaf  
 Aquatic Plant Communities**







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 920.338.8860  
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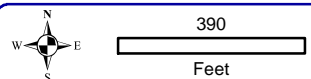
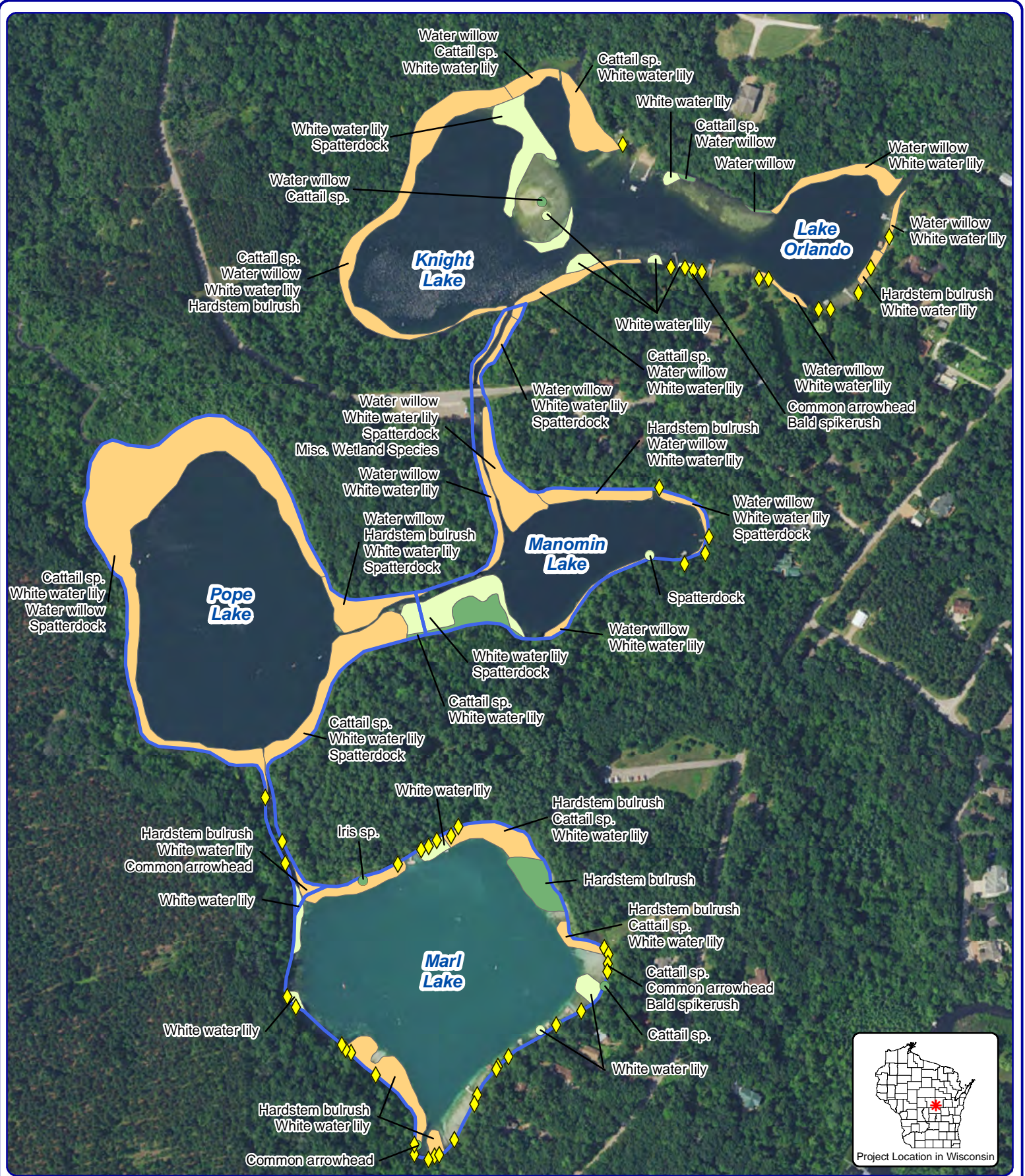
Sources:  
 Roads and Hyrdo: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 8, 2016  
 Filename: Long\_Comm\_2016.mxd

Legend		
<b>Exotic Plant Communities</b>	<b>Small Plant Communities</b>	<b>Large Plant Communities</b>
Purple loosestrife	Emergent	Emergent
Pale yellow iris	Floating-leaf	Floating-leaf
	Mixed Floating-leaf & Emergent	Mixed Floating-leaf & Emergent

**Map 10**  
 Long Lake  
 Waupaca County, Wisconsin  
**2016 Emergent & Floating-Leaf Aquatic Plant Communities**







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Sources:  
 Roads and Hydrd: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 28, 2016  
 Filename: Marl-Orlando\_Comm\_2016.mxd

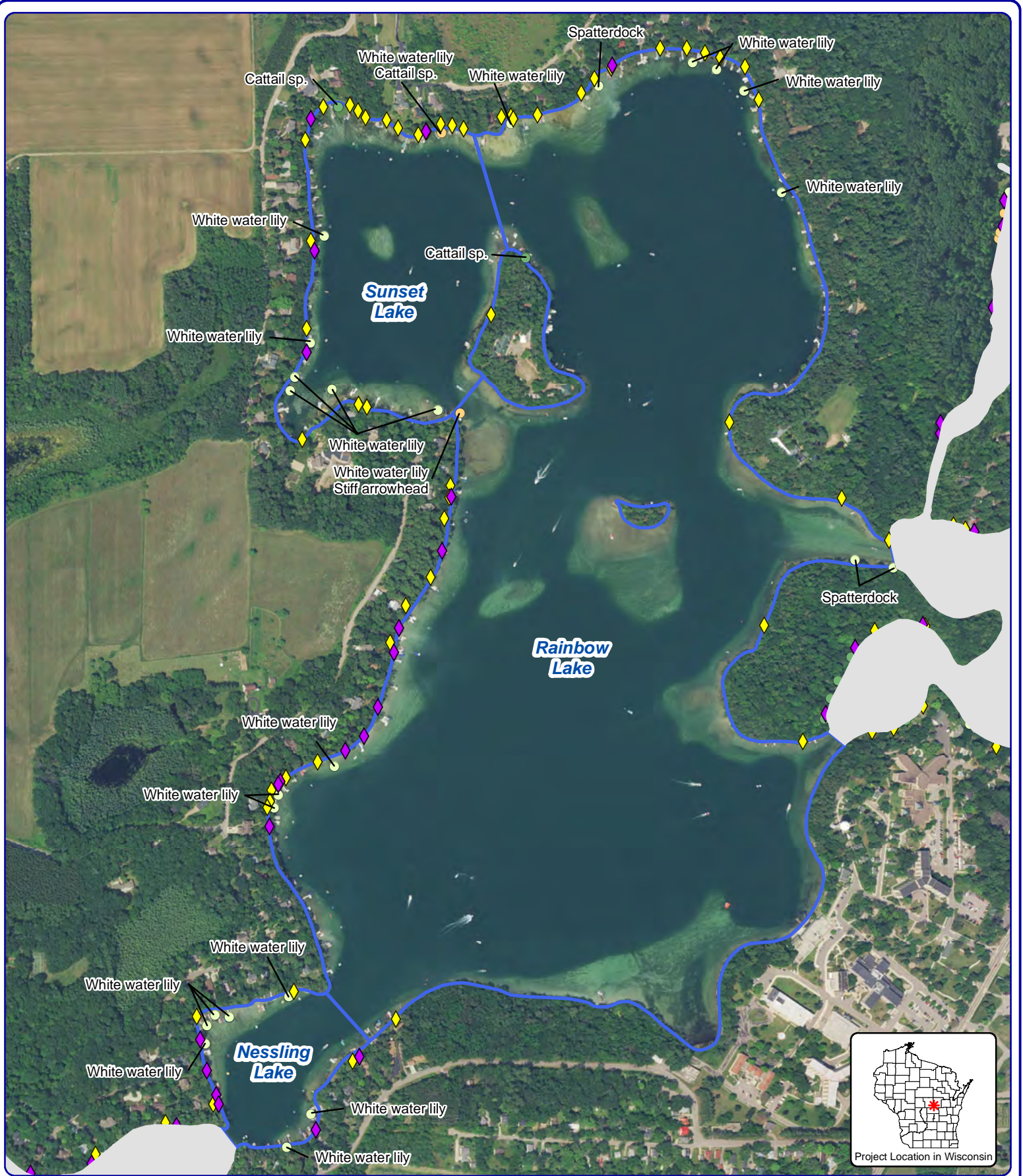
Legend		
<b>Exotic Plant Communities</b>	<b>Small Plant Communities</b>	<b>Large Plant Communities</b>
Purple loosestrife	Emergent	Emergent
Pale yellow iris	Floating-leaf	Floating-leaf
	Mixed Floating-leaf & Emergent	Mixed Floating-leaf & Emergent



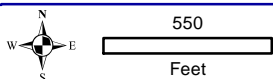
**Map 11**  
 Lake Orlando, Marl, Pope,  
 Manomin, & Knight Lakes  
 Waupaca County, Wisconsin  
**2016 Emergent & Floating-Leaf  
 Aquatic Plant Communities**







Project Location in Wisconsin



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Sources:  
 Roads and Hyrd: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 28, 2016  
 Filename: Nessling-Sunset\_Comm\_2016.mxd

**Legend**

- Exotic Plant Communities**
- Purple loosestrife
  - Pale yellow iris

- Small Plant Communities**
- Emergent
  - Floating-leaf
  - Mixed Floating-leaf & Emergent

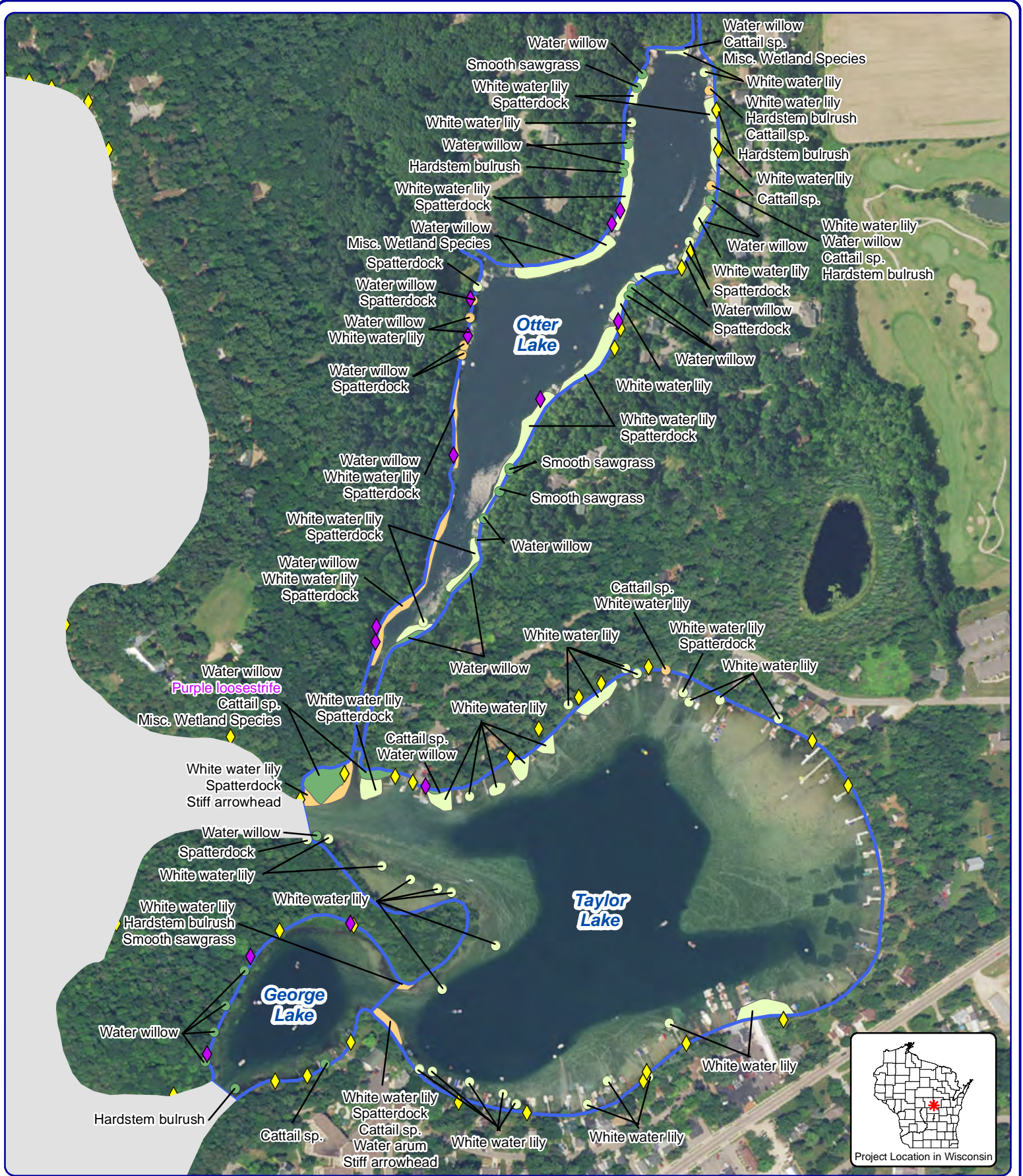
- Large Plant Communities**
- Emergent
  - Floating-leaf
  - Mixed Floating-leaf & Emergent

**Map 12**

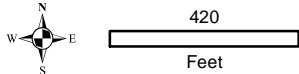
Nessling, Rainbow, &  
 Sunset Lakes  
 Waupaca County, Wisconsin  
**2016 Emergent & Floating-Leaf  
 Aquatic Plant Communities**







Project Location in Wisconsin



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 920.338.8860  
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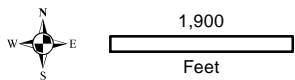
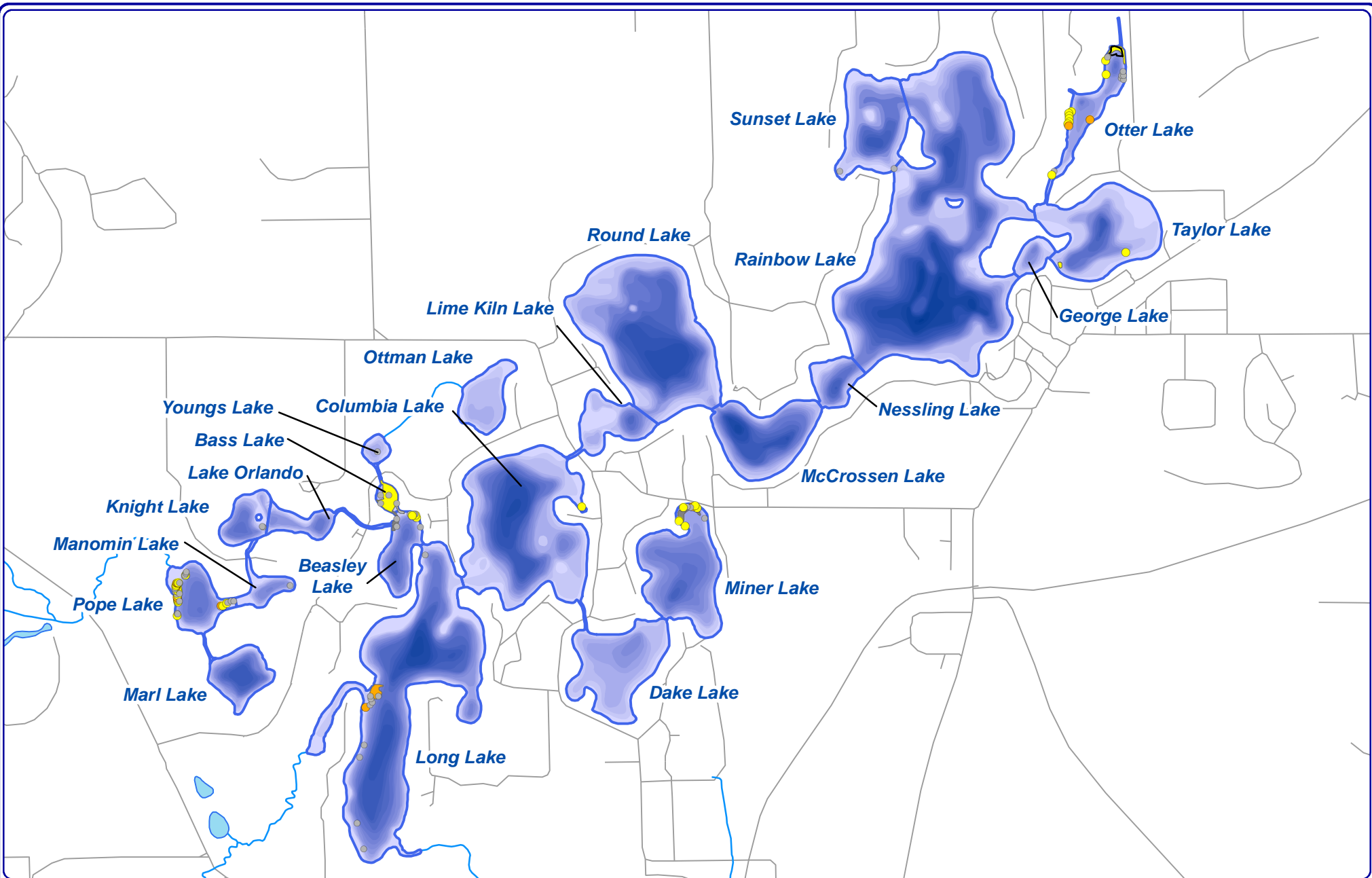
Sources:  
 Roads and Hydr: WDNR  
 Aquatic Plants: Onterra, 2016  
 Map Date: November 28, 2016  
 Filename: George-Otter\_Comm\_2016.mxd

Legend		
<b>Exotic Plant Communities</b>	<b>Small Plant Communities</b>	<b>Large Plant Communities</b>
◆ Purple loosestrife	● Emergent	● Emergent
◆ Pale yellow iris	● Floating-leaf	● Floating-leaf
	● Mixed Floating-leaf & Emergent	● Mixed Floating-leaf & Emergent

**Map 13**  
 Otter, Taylor, &  
 George Lakes  
 Waupaca County, Wisconsin  
**2016 Emergent & Floating-Leaf  
 Aquatic Plant Communities**







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Sources:  
 Roads and Hydro: WDNR  
 Bathymetry: WDNR, Onterra digitized  
 EWM Survey: Onterra, 2016  
 Map Date: June 10, 2016  
 Filename: Map14\_WaupacaChain\_CLP\_ESAIS\_June16.mxd



Project Location in Wisconsin

**Legend**

- |  |                                      |  |                      |
|--|--------------------------------------|--|----------------------|
|  | Highly Scattered                     |  | Single or Few Plants |
|  | Scattered                            |  | Clump of Plants      |
|  | Dominant                             |  | Small Plant Colony   |
|  | Highly Dominant                      |  |                      |
|  | Surface Matted ( <i>None found</i> ) |  |                      |

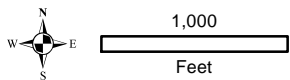
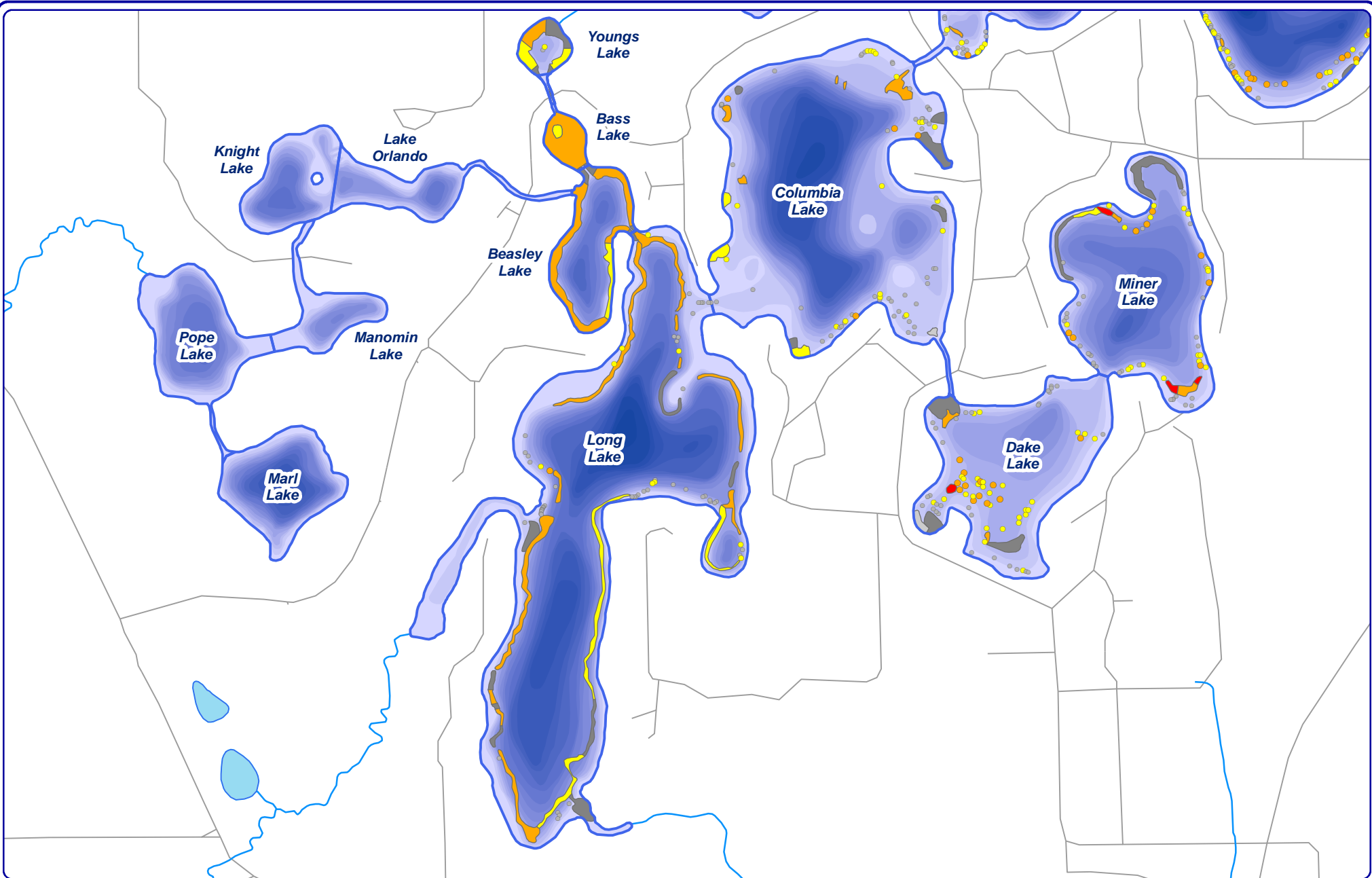
**Map 14**

**Waupaca Chain**  
 Waupaca County, Wisconsin

**June 2016 Curly-leaf  
 Pondweed Locations**







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 www.onterra-eco.com

Sources:  
 Roads and Hydro: WDNR  
 Bathymetry: WDNR, Onterra digitized  
 EWM Survey: Onterra, 2016  
 Map Date: October 5, 2016  
 Filename: Map15\_WaupacaChain\_EWM\_Sept16\_South.mxd



Project Location in Wisconsin

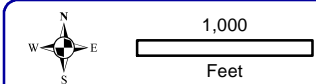
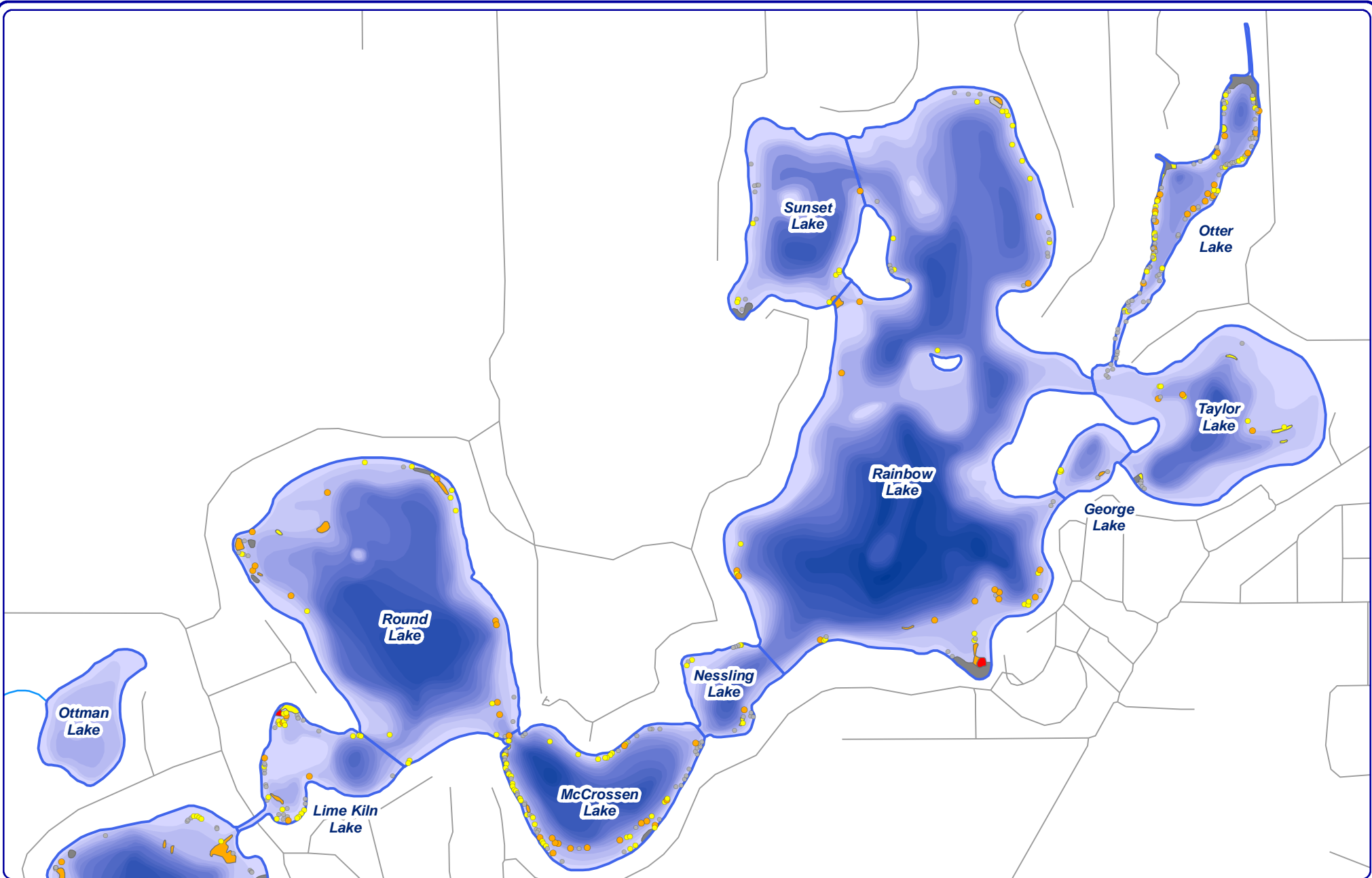
**Legend**

- |  |                  |  |                      |
|--|------------------|--|----------------------|
|  | Highly Scattered |  | Single or Few Plants |
|  | Scattered        |  | Clump of Plants      |
|  | Dominant         |  | Small Plant Colony   |
|  | Highly Dominant  |  |                      |
|  | Surface Matted   |  |                      |

**Map 15**  
**Waupaca Chain - South**  
 Waupaca County, Wisconsin  
**September 2016**  
**EWM Locations**







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 www.onterra-eco.com

Sources:  
 Roads and Hydro: WDNR  
 Bathymetry: WDNR, Onterra digitized  
 EWM Survey: Onterra, 2016  
 Map Date: October 5, 2016  
 Filename: Map16\_WaupacaChain\_EWM\_Sept16\_North.mxd



**Legend**

	Highly Scattered		Single or Few Plants
	Scattered		Clump of Plants
	Dominant		Small Plant Colony
	Highly Dominant		
	Surface Matted		

**Map 16**  
**Waupaca Chain - North**  
 Waupaca County, Wisconsin  
**September 2016**  
**EWM Locations**