

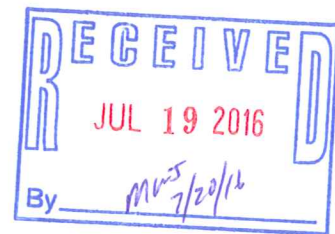


Carnelian-Marine-St. Croix Watershed District

Scandia Plaza II + 21150 Ozark Avenue + P.O. Box 188 + Scandia, MN 55073 + Tel 651.433.2150

July 14, 2016

Lessard-Sams Outdoor Heritage Council
Attn: Mark Johnson, Executive Director
100 Rev. Dr. Martin Luther King Jr. Blvd.
State Office Building, Room 95
St. Paul, MN 55155



Dear Lessard-Sams Outdoor Heritage Council,

Carnelian-Marine-St. Croix Watershed District enthusiastically supports the proposal by Washington County to place easements upon property in the Carnelian Creek Corridor, more specifically those properties now owned by the Manitou Fund, Warner Nature Center and the Wilder Foundation.

Potential development to these properties has been a concern for the District since a merger with another Water Management Organization brought them into our jurisdiction in 2007. Since 2008 the District has discussed the eventual disposition of the properties and has worked with Washington County to insure that they had a high priority for their land preservation efforts.

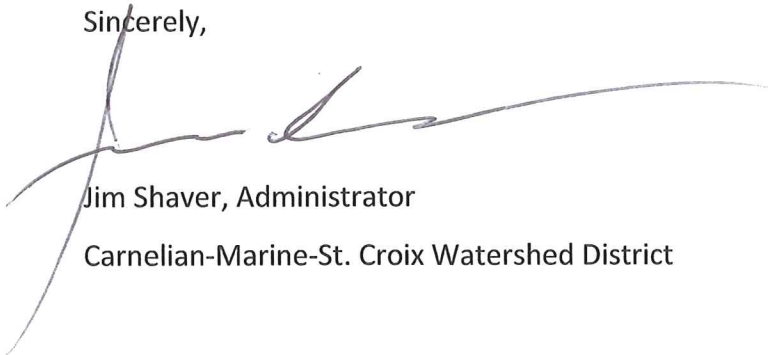
We consider Mays, Clear, and Terrapin Lakes to be benchmark shallow lakes for our area and their high water quality, diverse plant communities, and pristine habitat deserve extraordinary preservation efforts. Our recent assessment of the macrophyte community within these lakes demonstrates how little impact they have had from

outside development. I attach a memo from our Engineering firm summarizing their recent findings.

At our meeting on July 13, the Managers of Carnelian-Marine-St. Croix Watershed District voted unanimously to support Washington County's proposal to the Lessard-Sams Outdoor Heritage Council for funding to facilitate the purchase of conservation easements to help protect these valuable water resources in our area.

Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Jim Shaver', written over a horizontal line.

Jim Shaver, Administrator
Carnelian-Marine-St. Croix Watershed District

enc.

Project Name | Terrapin, Mays and Clear Lakes Diagnostic Study **Date** | 7-11-2016
To / Contact info | CMSCWD Board of Managers
Cc / Contact info | Jim Shaver, District Administrator
From / Contact info | Meghan Funke, PhD, Joe Pallardy, Mike Majeski, Carl Almer
Regarding | Project Update: 2016 Aquatic Plant Survey Results

A point-intercept aquatic plant survey was completed in June of 2016 on Mays, Terrapin, and Clear Lake as part of the 2016 diagnostic study for these three lakes. The point-intercept method is considered the standard protocol for sampling by the MnDNR because it offers a methodology that is quantitative (e.g., frequency of occurrence), repeatable (can be used to track trends in aquatic plant communities over time), and georeferenced (can be used to compare plant communities within different areas of a lake). From this data, a Floristic Quality Index (FQI) was calculated that measures the diversity and health of the aquatic plant community.

The FQI calculation is based on both the quantity of species observed (species richness) as well as the quality of each individual species. Every aquatic plant in the state of Minnesota has been assigned a coefficient of conservatism value (c-value) ranging from 0 to 10. The c-value of all aquatic plants sampled from a lake is used to determine the FQI for a given lake. Species with a c-value of 0 include species like curly-leaf pondweed (*Potamogeton crispus*) because this species is non-native and indicative of a highly disturbed environment. In comparison, a species like Oakes pondweed (*Potamogeton oakesainus*) has a c-value of 10 because this species is extremely rare and only found in undisturbed, pristine settings.

The average FQI score for Minnesota Lakes in the North Central Hardwood Forest (NCHF) ecoregion is 23.7 ± 8 with a median of 22.5 (Radomski and Perleberg, 2012). Each of the three lakes sampled had FQI scores that were greater than the average for the lakes in the NCHF (Tables 1-3). A separate study of 41 Minnesota lakes across the state surveyed as part of the EPA's National Lakes Assessment Project yielded a maximum FQI score of 30. The FQI score of 32 for Terrapin Lake was higher than all 41 waterbodies, including many pristine waterbodies in Northern Minnesota. The FQI scores are reflective of the high quality, undisturbed nature of the aquatic plant community found in Terrapin, Mays and Clear Lakes. The Minnesota DNR recently conducted a review of plant surveys conducted on 3,254 lakes across the state, two species, White-stem pondweed (*Potamogeton praelongus*) and water marigold (*Bidens beckii*) were identified as good indicators of a highly diverse aquatic plant community. White-stem pondweed was found in all three lakes, with water marigold also found in Terrapin Lake. In at least 90% of the surveys in which these species were detected, there were at least 13 other aquatic plant species detected (Radomski and Perleberg, 2012). Nineteen aquatic plant species were observed in Clear Lake, 24 in Mays, and 35 in Terrapin.

All three lakes had exceptionally high aquatic plant species diversity, distribution, and quality. Based on these findings, all three waterbodies are likely eligible for inclusion in the Minnesota DNR's List of Lakes of Outstanding Biological Significance. Additionally, Terrapin Lake could be used as a reference lake to describe pre-settlement conditions.

Table 2. Aquatic plants sampled in Mays Lake, associated coefficient of conservatism (c-value) and frequency of occurrence.

Common Name	Scientific Name	C-Value	Frequency of Occurrence
Coontail	<i>Ceratophyllum demersum</i>	2	43.5%
American white waterlily	<i>Nymphaea odorata</i>	6	39.1%
Fern-Leaf (Robbins') Pondweed	<i>Potamogeton robbinsii</i>	8	35.7%
Large Leaf Pondweed	<i>Potamogeton amplifolius</i>	7	29.6%
Flatstem Pondweed	<i>Potamogeton zosteriformis</i>	6	28.7%
Common (Northern) water-milfoil	<i>Myriophyllum exalbescens</i>	7	27.0%
Chara (muskgrass)	<i>Chara sp.</i>	7	19.1%
Canada Waterweed	<i>Elodea canadensis</i>	4	18.3%
Water Smartweed	<i>Polygonum amphibium</i>	4	11.3%
Common bladderwort	<i>Utricularia macrorhiza</i>	5	9.6%
White Stem Pondweed	<i>Potamogeton praelongus</i>	7	8.7%
Small (Narrow-leaf) pondweed	<i>Potamogeton pusillus</i>	7	7.8%
Water Celery	<i>Vallisneria americana</i>	6	6.1%
Northern Blue Flag	<i>Iris versicolor</i>	4	6.1%
Yellow Pond Lily	<i>Nuphar lutea ssp. pumila</i>	9	4.3%
Illinois pondweed	<i>Potamogeton illinoensis</i>	6	4.3%
Narrow-Leaf/Hybrid Cattail	<i>Typha angustifolia/ 'Typha X glauca</i>	0	4.3%
Floating Leaf Pondweed	<i>Potamogeton natans</i>	5	2.6%
Softstem Bulrush	<i>Schoenoplectus tabernaemontani</i>	4	2.6%
Unidentified water moss	<i>Drepanocladus spp.</i>	NA	1.7%
Southern naiad	<i>Najas guadalupensis</i>	8	1.7%
Lesser Duckweed	<i>Lemna minor</i>	5	1.7%
Greater duckweed	<i>Spirodela polyrrhiza</i>	5	0.9%
Clasping-Leaf (Richardsons') Pondweed	<i>Potamogeton richardsonii</i>	5	0.9%
Sago Pondweed	<i>Stuckenia pectinatus</i>	3	0.9%
Summary Table	Average C-Value	5.42	
FQI = C*√S	Number of species	24	
C= Mean coefficient of conservatism value	FQI	27	
S= Number of species in sample			

Common Name	Scientific Name	C-Value	Frequency of Occurrence
Pondweed Species	NA	NA	0.4%
Water Marigold	<i>Bidens beckii</i>	8	0.4%
Sago Pondweed	<i>Stuckenia pectinatus</i>	3	0.4%
Summary Table		Average C-Value	5.40
FQI = $C \cdot \sqrt{S}$		Number of species	35
C= Mean coefficient of conservatism value		FQI	32
S= Number of species in sample			

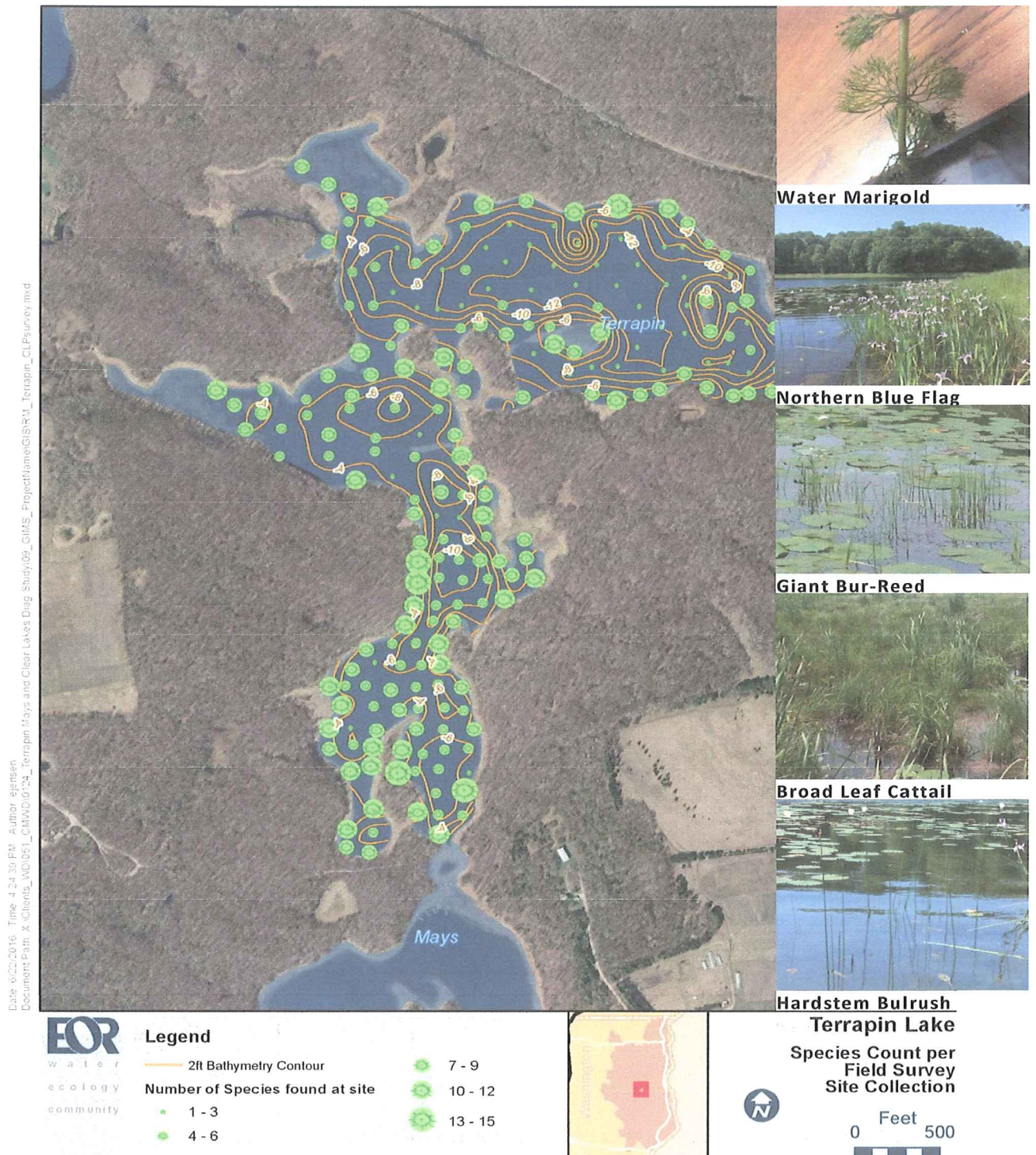


Figure 2. Terrapin Lake Aquatic Plant Species Distribution, June 2016