CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 17, 2017

TO: Russ Rasmussen

FROM: Sally Jarosz, Kevin Doyle, Pat Trochlell, Tom Bernthal

SUBJECT: Lake Koshkonong Wetland Sampling 2016-2017

In order to monitor the wetland vegetative condition of Lake Koshkonong, we are using a combination of older vegetation sampling data gathered by Jeff Kraemer of Natural Resources Consulting in 2005, data we gathered during the fall of 2016, and data we gathered during the early summer of 2017 (just before the planned water level increase). We propose to monitor these same wetland communities' conditions during the 10-year monitoring period and compare them to the 2005 Kraemer data and 2016/2017 survey data by calculating weighted mean C-value changes and trends. We will use existing data from the 2005 wetland plant community surveys as our estimate of "before" conditions (i.e., prior to the water level order) because recorded water levels during that period were consistently lower than the new maximum water level. We selected sites from the 2005 data set that are representative of the major wetland plant communities fringing the lake and that we were able to gain landowner access to.

Our primary survey tool for assessing the vegetation in wetlands around Lake Koshkonong is a Timed Meander Survey (DNR, 2016) to calculate Floristic Quality Assessment metrics: weighted Mean C and weighted Floristic Quality Index plus aerial imagery review (if available) of large-stand invasive species spread. Weighting is calculated using percent cover estimates. The result of these surveys will be a Floristic Quality Assessment (FQA), a quantitative tool to measure vegetation diversity and quality. Using the FQA, we will be able to compare various vegetation metrics across wetland location and type. Importantly, this method is roughly compatible with the 2005 assessment, allowing us to track changes in floristic quality dating back to the 2005 baseline.

In the fall of 2016 and summer of 2017, we conducted timed meander surveys in 17 communities (14 of Kraemer's sites and 3 additional sites). Of those 17 sites, we characterized 9 as emergent marsh communities, 5 floodplain forests, 2 sedge meadows (1 very degraded and 1 of good quality), and 1 shrub carr. We were unable to gain access to as many wetland communities as we hoped.

The fall of 2016 and the summer of 2017 seasons were wetter than normal, and we observed standing water in the wetland communities. Many of the wetlands we observed appeared to have already been impacted by high water. Based on our observations of the recent past when water levels were high, we expect that sustained higher water during the growing season may have the most impact on forested communities. Many of the tree species found can tolerate some seasonal flooding, but will not likely tolerate sustained saturated or standing water conditions throughout the entirety of the growing season. This is even further compounded by the impact of emerald ash borer on forested wetlands in Southern Wisconsin. At least 4 of the sedge meadow communities identified by Kraemer in 2005 have since converted to emergent marsh communities. We predict that with increased water levels, the trend of sedge meadows converting to emergent marshes will continue.

Our assessments are intended to measure the impact of the lake levels on surrounding wetlands, assuming the lake levels will be within the range of the water level order. If the lake levels go above or below that range (due to abnormal participation events, years) then our results will be harder to interpret.

A summary of initial results is shown below:

Table 1. Initial 2016-2017 Wetland Condition Sample Results

2005 Kraemer Community Number	2005 Community Type	2016/17 Type	2016/17 Weighted Mean C*	Relative Cover of Non-native Species
1.2	Emergent Marsh	Emergent Marsh	4	6%
1.3	Floodplain Forest	Floodplain Forest	2.9	15%
1.4	Emergent Marsh	Emergent Marsh	4.6	7%
2.3	Floodplain Forest	Floodplain Forest	2.7	33%
2.7	Sedge Meadow	Emergent Marsh	Unable to survey, observed from road	
2.8	Sedge Meadow	Emergent Marsh	Unable to survey, observed from road	
3.3	Emergent Marsh	Emergent Marsh	3.8	29%
3.5	Sedge Meadow	Emergent Marsh	4.4	15%
3.8	Floodplain Forest	Floodplain Forest	1.8	32%
3.12	Emergent Marsh	Emergent Marsh	2.5	29%
3.13	Emergent Marsh	Emergent Marsh	3.7	3%
3.15	Sedge Meadow	Sedge Meadow	5.1	4%
4.2	Sedge Meadow	Shrub Carr	1.4	46%
4.3	Sedge Meadow	Sedge Meadow	1	69%
4.4	Sedge Meadow	Emergent Marsh	5.8	4%
4.7	Emergent Marsh	Emergent Marsh	1.6	67%
New Site #1	Not sampled in 2005	Floodplain Forest	2.2	25%
New Site #2	Not sampled in 2005	Emergent Marsh	4.3	9%
New Site #3	Not sampled in 2005	Floodplain Forest	4	4%

* Weighted mean C values range in value from 0 to 10, with 0 indicating the lowest possible quality community and 10 indicating the highest possible quality community.