Toward a Natural Lake Mendota:

Our Gift to Future Generations

Capital Region Advocacy Network for Environmental Sustainability

CRANES

Lake Mendota Level Recommendations v.2012.03.28

DRAFT

The current draft of this presentation was prepared with the help of many folks.

Additional feedback is encouraged. Please send to:

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The inclusion of information from various experts does not imply their support for the CRANES recommendations.

Madison's Lakes Were Once Prized for Their Beauty and Clarity

"Not a ripple was to be seen on the surface of the lake. It lay gleaming in the sun like a vast resplendent mirror.... I felt as if I was under the influence of some invisible alien power impressing me that this was to be my lifelong home, and thus it has been." ~ Darwin Clarke, June 1837

But it was not just picturesque beauty of the lakes that people noticed; it was the clarity of their water.

[You can] **"see the drifts of white sand far down to the transparent depths** [of Lake Monona]**." ~ Massachusetts reporter, 1853**

Such descriptions routinely appeared in early writings about Madison. It is difficult to exaggerate the importance [many] civic leaders placed on the beauty of the lakes and the clarity of their waters. They were widely viewed as the soul of the city, a reminder that Madison was special and had a high destiny.

Adapted from:
"Our city, our lakes" ~
David Mollenhoff, 19 July 2007
(re-printed in Isthmus Annual Manual 2010-11)

How Natural Lakes Look

Toward a Natural Lake Mendota

PHASE 1: STOPPING THE DAMAGE

No later than MAR 2013, lower the 1979 Lake Order summer targets by 6". Adjust the winter 2013-14 target to equal the new summer minimum target.

PHASE 2: RESTORATION FOR A MORE NATURAL LAKE

By JAN 2014, complete all studies and public participation necessary to begin further lowering the summer targets 2" per year, starting in summer 2014, until the natural level is achieved (~58" total). Annually adjust the Winter target to match the preceding summer's minimum target.

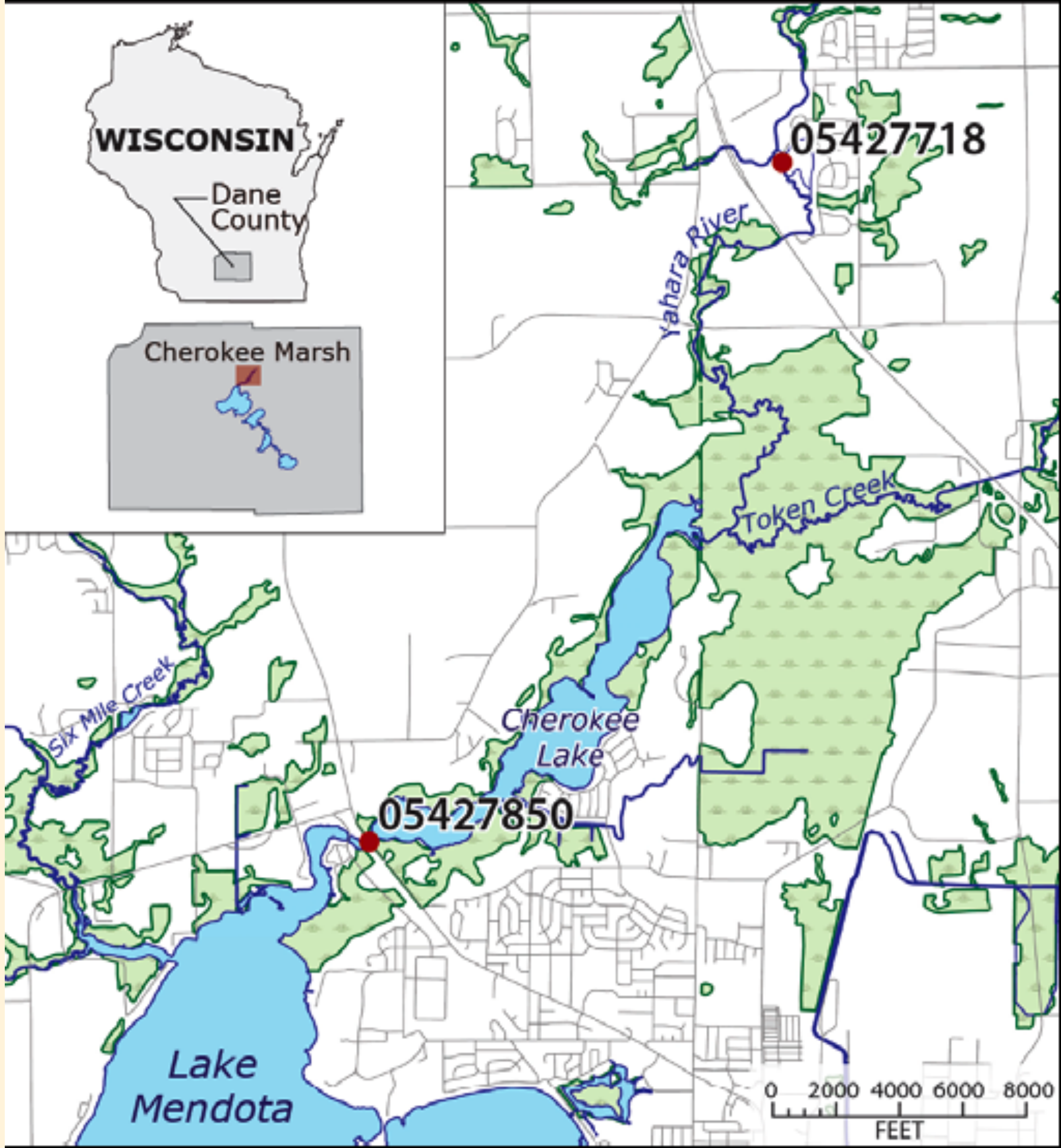
CONCURRENT LAND USE MANAGEMENT

Require that all future development in the Lake Mendota sub-watershed recreates natural hydrological conditions, while also retrofitting existing development insofar as possible toward this standard, to assure that Lake Mendota is not utilized as a detention facility for unnatural stormwater runoff.

ORIENTATION

The upper Yahara River, north Lake Mendota and Cherokee Marsh, present day

 = gage station



Toward a
Natural Lake Mendota

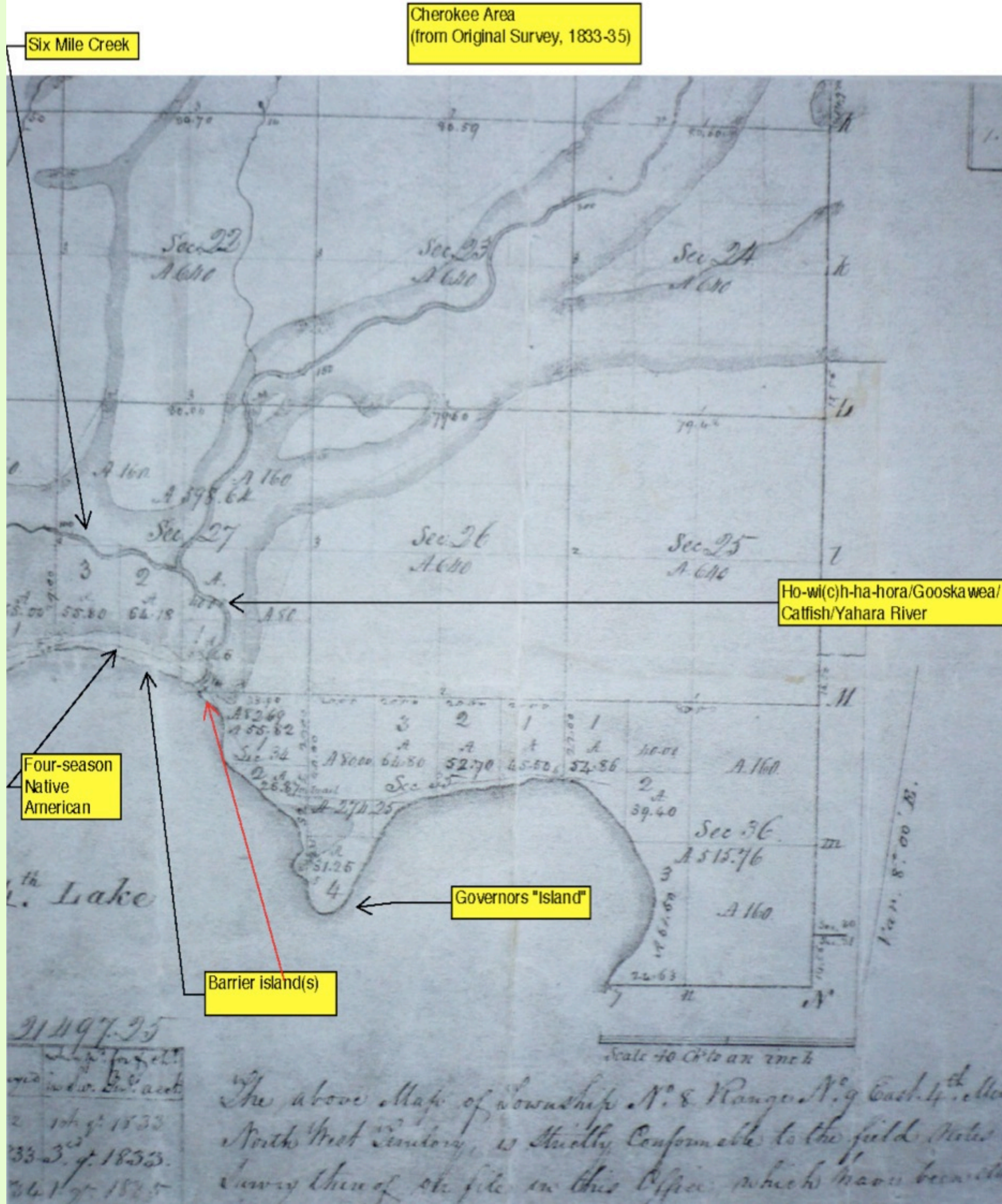
PHASE 1: STOPPING THE DAMAGE

Lower Lake Mendota by 6 inches

Original Survey Map (1833-35)

Six Mile Creek
meets a much narrower
Yahara River*
<u>inside</u> a large marsh.

A four-season Native American trail traversed barrier islands or a land-bridge across the Yahara estuary.



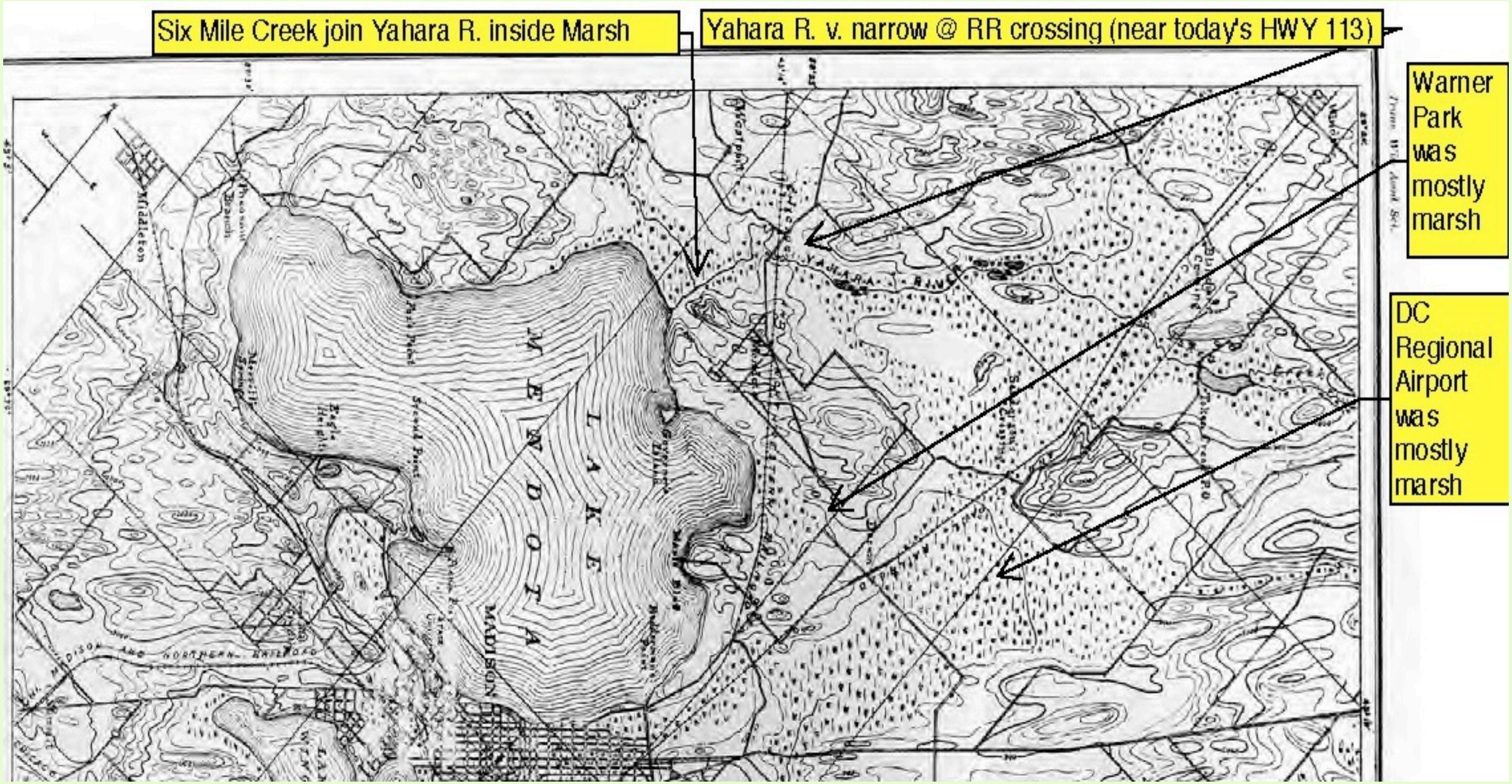
* The Yahara River was formerly named:

Ho-wi(c)h-ha-hora

Gooskawe

Catfish

An 1893 map of flora: Today's isthmus, Warner Park and DC Regional Airport environs were mostly wetlands and marshes, flourishing with diverse biota.



Cheney, L.S. and R.H. True. 1893. On the flora of Madison and vicinity, a preliminary paper on the flora of Dane County, Wisconsin. Trans. Wis. Acad. Sci., Arts and Lett. 9:45-135. ~ Courtesy R. Lathrop, UW, who surmises that the depiction of Lake Mendota's northern shore likely was based on maps from the 1830s survey.

In the 1840s, it was proposed that a dam be built on the Yahara River's outlet at the south end of Lake Mendota, to power a mill.

- Construction of the dam was resisted by many residents.
- Some lakeshore property owners threatened a "takings" lawsuit, because private lands would be drowned when the lake level rose.
- However, powerful dam proponents, including Gov. Farwell, were able to get State of WI legislation passed that pre-empted property rights.

The lake and its admirers lost the battle.

In 1849, Farwell Dam was built, near the Yahara River's outlet, in the area that is now Tenney Park. The 4-story Madison Mills was owned by Gov. Farwell

PHOTO CREDIT: 1890, from WI State Historical Society

Because of the governor’s mill, Lake Mendota suddenly in 1849, became a

VERY LARGE,

UNNATURAL,

MILLPOND.

(in addition to being used
as a sewage facility and garbage dump,
like all the other Yahara lakes).

The mill that was created by Farwell Dam created a head that powered then Wisconsin Governor Leonard Farwell's "Mendota Mills."

In contrast, construction of the earliest and largest of the milldams, the Farwell Dam at the outlet of Lake Mendota, ranks among the larger human changes to the watershed. Begun in early 1849 by future Governor Leonard Farwell, the dam raised the level of Lake Mendota 3.5 feet to power the grist mills, lathes and saws of Farwell's "Madison Mills" on the present site of Tenney Park. A thriving business for many years, the wood and earth dam washed out in 1866, but was rebuilt only to have the mill burn twice over by 1894. The once marshy slough between the lakes was dredged and straightened in 1849 as well. The dam was eventually rebuilt with locks to allow navigation to Lake Monona. The dam has clearly been a major influence on Lake Mendota wetlands and water quality to this day.

In raising the pool, certain areas of deep-water aquatics were undoubtedly lost, especially as water quality and light penetration declined over the years. Shallow aquatics probably shifted location, while near shore emergents would have been inundated. The lake flooded over the bar in the north bay, fetch increased and the extensive wetlands between the bar and the Yahara River inlet were exposed to destructive wave action. The higher water also floated emergent stands, which became susceptible to calving and loss from the increased wave action, and later, from the increased flood flows as the watershed was ditched and cultivated.

By the turn of the century, calving had apparently removed a large area of emergent wetland in the north bay, resulting in Sixmile Creek emptying directly into the lake, rather than through its former outlet into the Yahara River. Although much of the emergent loss within the lake itself was accomplished by 1900, Cherokee Marsh and the Upper Yahara River have seen steady losses this century, including as recently as 1993, when record precipitation caused large chunks of emergents to break free and float across the lake to rest against the University of Wisconsin shoreline.

Lake Mendota Priority Watershed Groundwater and Wetlands Report (WDNR, 2000)

Early spillway at Tenney Park (date unknown)

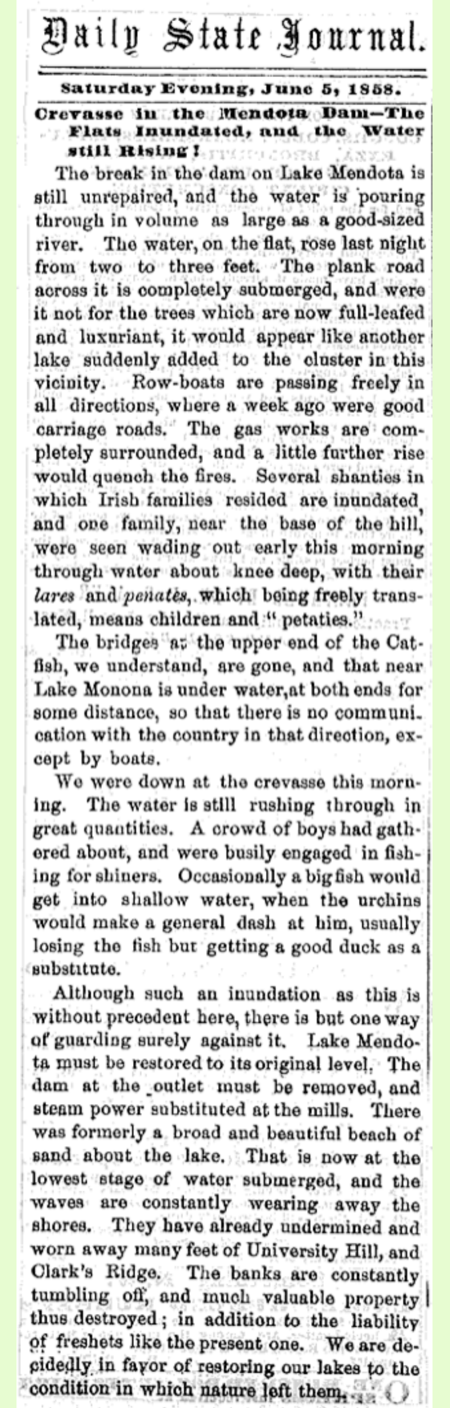
Photo: Wisconsin Historical Society

A 5 June 1858 break in the dam elicited a summary of damage done by the unnaturally high levels, including the loss of several bridges.

Those included erosion of land on the banks of the lake, and the loss of a former "broad and beautiful beach of sand about the lake."

The writer editorialized:
"Lake Mendota must be restored to its former level. …
We are decidedly in favor of restoring our lakes to the condition in which nature left them."

Clipping: Wisconsin Historical Society



Daily State Journal.

Saturday Evening, June 5, 1858.

Crevasse in the Mendota Dam—The Flats Inundated, and the Water still Rising!

The break in the dam on Lake Mendota is still unrepaired, and the water is pouring through in volume as large as a good-sized river. The water, on the flat, rose last night from two to three feet. The plank road across it is completely submerged, and were it not for the trees which are now full-leafed and luxuriant, it would appear like another lake suddenly added to the cluster in this vicinity. Row-boats are passing freely in all directions, where a week ago were good carriage roads. The gas works are completely surrounded, and a little further rise would quench the fires. Several shanties in which Irish families resided are inundated, and one family, near the base of the hill, were seen wading out early this morning through water about knee deep, with their *lares* and *penates*, which being freely translated, means children and " petaties."

The bridges at the upper end of the Catfish, we understand, are gone, and that near Lake Monona is under water,at both ends for some distance, so that there is no communication with the country in that direction, except by boats.

We were down at the crevasse this morning. The water is still rushing through in great quantities. A crowd of boys had gathered about, and were busily engaged in fishing for shiners. Occasionally a big fish would get into shallow water, when the urchins would make a general dash at him, usually losing the fish but getting a good duck as a substitute.

Although such an inundation as this is without precedent here, there is but one way of guarding surely against it. Lake Mendota must be restored to its original level. The dam at the outlet must be removed, and steam power substituted at the mills. There was formerly a broad and beautiful beach of sand about the lake. That is now at the lowest stage of water submerged, and the waves are constantly wearing away the shores. They have already undermined and worn away many feet of University Hill, and Clark's Ridge. The banks are constantly tumbling off, and much valuable property thus destroyed; in addition to the liability of freshets like the present one. We are decidedly in favor of restoring our lakes to the condition in which nature left them.

By the early 1860s, when a young John Muir paddled north to Cherokee Marsh from the UW campus, the Yahara estuary’s marsh, barrier islands, and Native American trail had all been drowned.

(as illustrated on this 1900 hydrological map)

By 1894, the dam had washed out on a few occasions and Farwell Mill had burned twice. This 1895 photo is identified as "the Old Mill Site."

Photo: WI Historical Society

Yahara Waterways Water Trail Guide

“Additional dams placed at Tenney Park over the past 150 years kept water levels high, as do today’s locks that facilitate recreational boat traffic. Today’s lake level is a minimum of 5.5 feet above what nature intended, and might be as much as seven to eight feet higher according to a 1900 hydrographic map produced by the Wisconsin Geological and Natural History Survey.”

Publisher: Dane County Environmental Council (2007)

Boaters in Tenney Park Locks, 1906

Photo: Wisconsin Historical Society

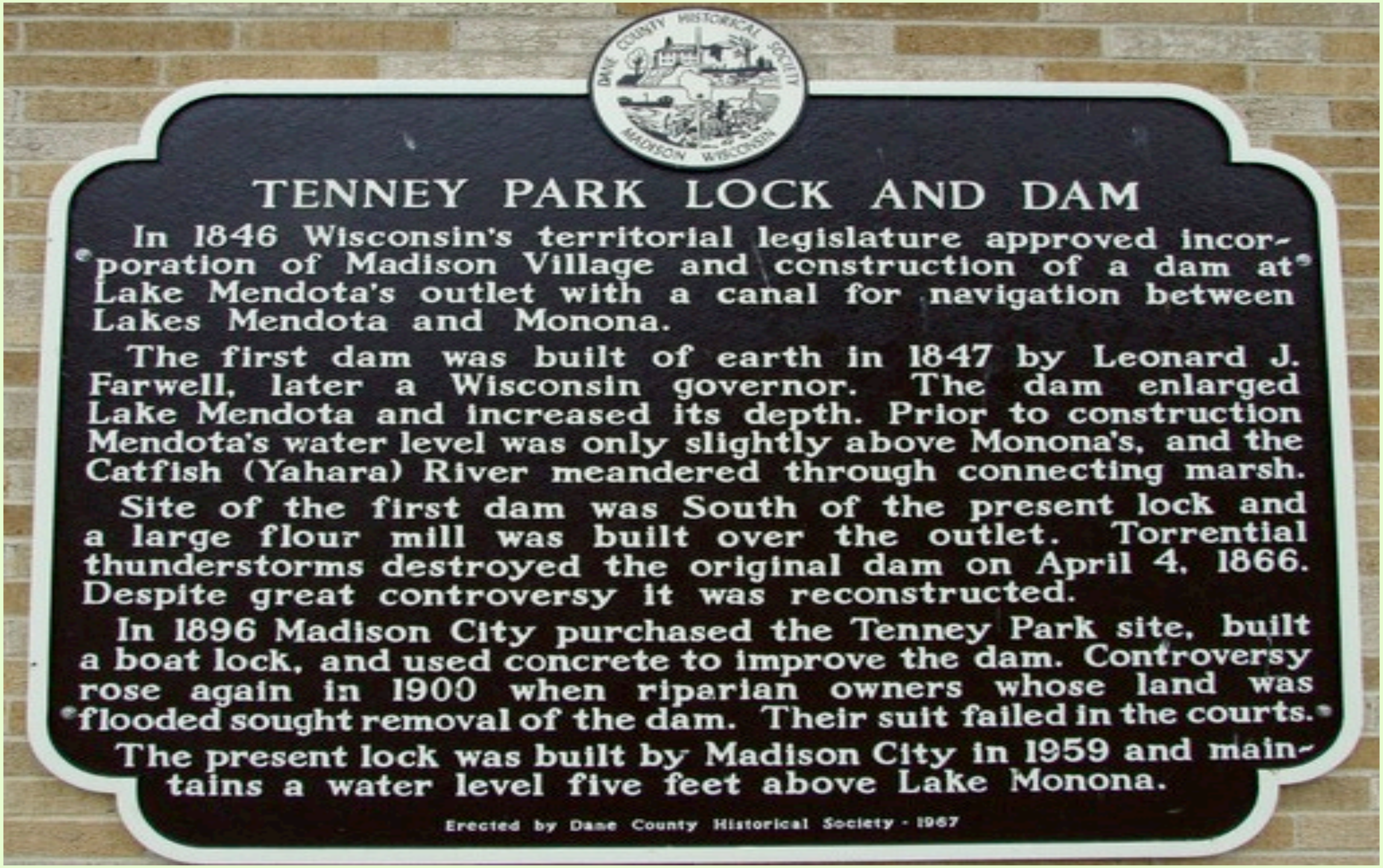
The Mill Race at Tenney Park, 1910

Photo: Wisconsin Historical Society

Locks and spillway at Tenney Park, 1909

Postcard: Wisconsin Historical Society

In the 20th century, the dam was again raised, despite flooding and renewed civic opposition. The current lock was built in 1959 and "maintains a water level five feet above Lake Mendota" according to this Dane County Historical Society plaque, 1967)



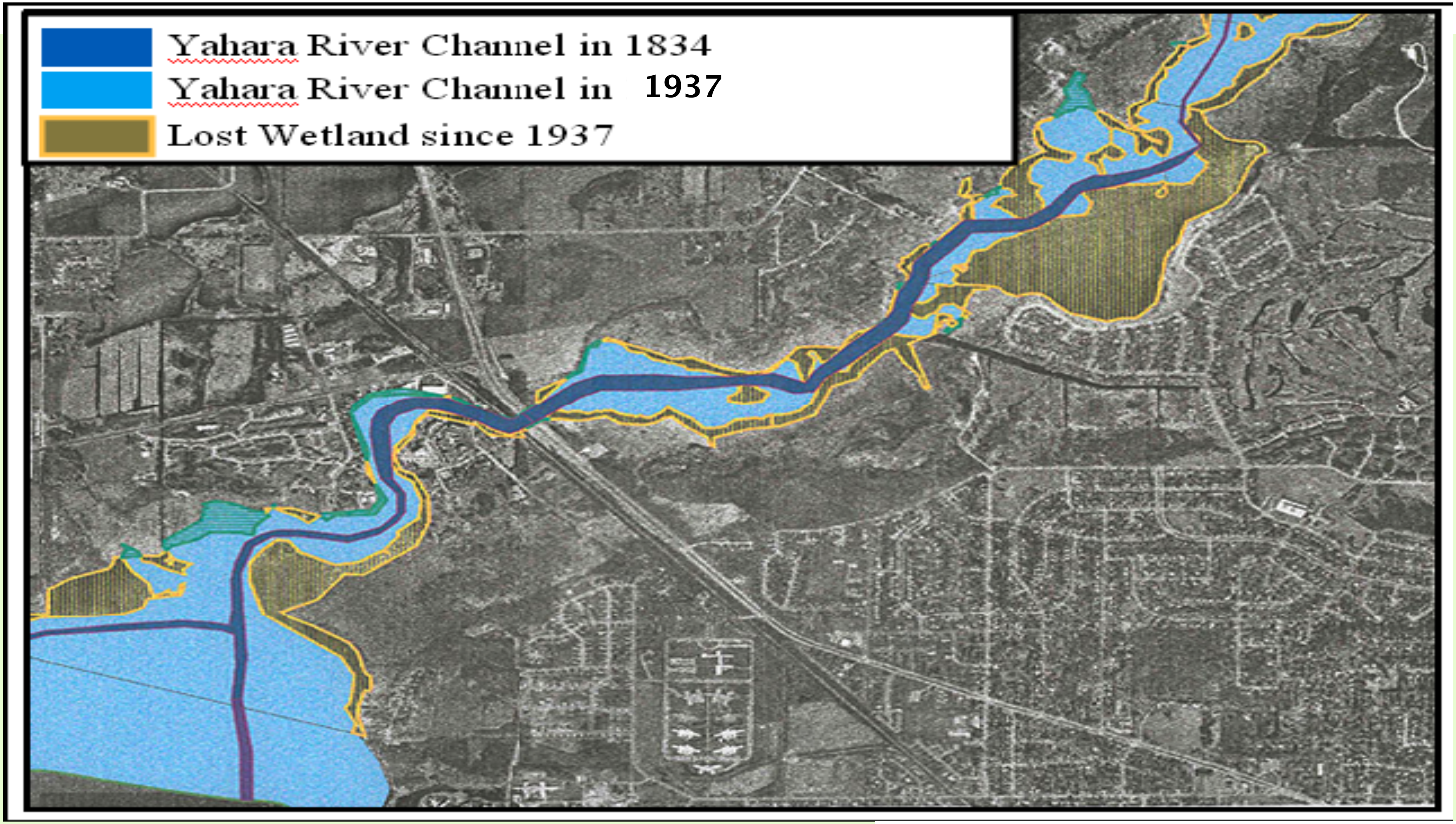
Ever since the first dam was built in 1849, high water has caused damage to lake shore properties and civic infrastructure.

It still does today.

High Water Damage, 1653 Sherman Ave, 27 APR 1950
Photo: Wisconsin Historical Society

Unnaturally high lake levels, as well as dredging of what is now called "Cherokee Lake," have contributed to marsh loss indicated by the light blue and brown areas of this map, about a square mile of high quality marsh.

The destruction continues to this day, on our watch.



MAP CREDIT: Russ Hefty, City of Madison Parks

This costly devastation persists despite broad support, for protecting our remaining wetlands and the uplands that make them resilient and ecologically sustainable.

…from Dane County citizens, and elected local, county and state officials.

AT RIGHT:

18 May 2009 Proclamation on the occasion of the designation of Cherokee Marsh environs as a Wisconsin Wetlands Gem.

One of 100 such areas statewide so designated by the WI Wetlands Assn.

PROCLAMATION

ON THE OCCASION OF THE DESIGNATION OF CHEROKEE MARSH AS A WETLAND GEM, AND THE LAUNCH BY THE WISCONSIN WETLANDS ASSOCIATION OF ITS STATEWIDE WETLAND GEMS PROGRAM ON 18 MAY 2009 AT CHEROKEE MARSH

With over 4,000 acres, Cherokee Marsh is a significant wetland in the Yahara River watershed.

Cherokee Marsh provides habitat for a rich variety of native wildlife including dragonflies, butterflies, frogs, and birds–such as sandhill cranes, herons, ducks, hawks, and owls–as well as fish, including northern pike, catfish, bluegills, and perch.

Cherokee Marsh sustains large areas of native wetland plants including groundwater-fed fen communities with rare species.

Cherokee Marsh offers a special place for exploration, quiet reflection, and the enjoyment of nature.

Cherokee Marsh serves as a living classroom for educators and naturalists who use the marsh's outstanding diversity to teach students and the public about wetland ecosystems.

Cherokee Marsh improves water quality by discharging cold, clean groundwater into the Yahara River and Lake Mendota.

Cherokee Marsh absorbs rainwater and tempers flood surges, thus helping to protect neighborhoods and lakes.

Cherokee Marsh filters storm-water runoff reducing sediment, nutrients and pollutants that enter the Yahara River and its chain of lakes.

Therefore, recognizing that Cherokee Marsh benefits both our environment and our quality of life, we are dedicated to protecting, preserving, and restoring the beauty, value, and health of Cherokee Marsh and the upper Yahara River watershed.

James Doyle
Governor
State of Wisconsin

Barbara Lawton
Lieutenant Governor
State of Wisconsin

Matt Frank
Secretary
Wisconsin Dept. of Natural Resources

Kathleen Falk
Executive
County of Dane

Kevin Viney
Chairman, Board
Town of Burke

Joe Chase
Mayor
City of Sun Prairie

John Laubmeier
President, Board of Trustees
Village of Waunakee

Thomas G. Wilson
Administrator/Clerk-Treasurer
Town of Westport

David Cieslewicz
Mayor
City of Madison

Jeff Miller
President, Board of Trustees
Village of DeForest

Now, protection of <u>only</u> that which has survived is no longer enough.

Those who would defend the status quo must consider how the many poor decision and compromises of the past now limit our options going forward.

Additionally, climate change related precipitation trends are making the destructive forces faster and bigger.

Restoration of more wetlands is necessary, to replace valuable ecosystem infrastructure.

The WDNR 1979 Lake Orders are also harming Lake Mendota's ecology and water quality.

Lake Mendota's target levels under the Orders have regularly been exceeded since the 1970s.

Why?

- Inherent outcome of the Orders' downstream requirements?
- Bigger boats and larger/more marinas on Lakes Mendota and Monona?
- Precipitation changes related to climate change?

During the1920s, 30s and 40s, Lake Mendota was generally managed near what would have been the low end of the 1979 Lake Orders, had those been in effect.

Lake Mendota Monthly Average Water Levels (feet MSL), 1920-1949

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1920	848.30	848.12	848.60	849.59	849.75	849.85	849.57	849.26	849.22	849.11	849.30	849.18
1921	848.54	848.29	848.32	848.94	849.45	849.79	849.38	849.22	849.68	849.78	849.72	849.89
1922	849.14	848.81	849.71	849.84	849.78	850.15	850.12	849.81	849.52	849.32	849.40	849.35
1923	848.77	848.36	848.86	850.17	849.79	849.43	849.35	849.25	849.41	849.46	849.40	849.42
1924	848.82	848.30	848.55	848.95	849.16	849.27	849.45	850.04	849.67	849.35	849.05	848.93
1925	848.71	848.70	848.73	848.81	848.78	848.79	848.94	848.90	848.87	848.87	848.90	848.88
1926	848.76	848.75	848.99	849.31	849.57	849.43	849.15	848.95	849.07	849.57	849.54	849.27
1927	848.94	849.10	849.25	849.32	849.75	850.23	849.78	849.44	849.40	849.91	849.78	849.73
1928	849.72	849.92	850.23	850.11	849.75	849.77	849.97	849.64	849.48	849.31	849.47	849.52
1929	849.14	848.72	849.55	850.37	850.03	849.78	849.89	849.80	849.37	849.31	849.33	849.20
1930	849.18	849.16	849.31	849.42	849.74	849.78	849.63	849.23	849.08	848.97	848.88	848.96
1931	849.13	848.99	849.05	849.32	849.37	849.37	849.11	848.83	849.00	849.47	849.51	849.76
1932	849.72	849.68	849.69	849.62	849.39	849.31	849.29	849.08	848.91	848.72	848.78	848.80
1933	849.15	849.25	849.43	850.36	850.21	849.86	849.81	849.63	849.46	849.34	849.15	849.14
1934				849.82	849.42	849.21	849.10	848.90	848.76	848.79	849.02	849.52
1935	849.46	849.45	850.16	849.88	849.91	850.04	850.04	849.99	849.67	849.51	849.57	849.68
1936	849.87	849.75	849.95	849.58	849.32	849.25	848.95	848.66	848.95	848.96	849.01	849.00
1937	849.42	850.75	850.65	849.79	849.79	849.71	849.49	849.04	848.92	848.81	848.86	848.88
1938	849.09	850.41	850.37	849.97	850.07	850.07	850.11	849.98	850.61	849.94	849.56	849.38
1939	849.38	849.20	849.33	849.34	849.64	849.89	849.65	849.33	849.08	848.76	848.69	848.73
1940	848.67			849.46	849.77	849.95	849.97	849.90	849.90	849.64	849.64	849.69
1941	849.78	849.46	849.57	849.62	849.56	850.01	849.69	849.31	849.66	850.01	849.78	849.59
1942	849.51	849.18	849.10	849.30	849.56	849.92	849.81	849.63	849.68	849.74	849.77	849.74
1943	849.82	849.54	849.83	849.82	849.58	849.72	849.79	849.44	849.28	849.20	849.21	849.32
1944	849.38	849.53	850.21	849.91	849.72	850.01	849.78	849.35	849.26	849.14	849.27	849.38
1945			849.58	849.46	849.53	849.62	849.34	849.21	849.16	849.19	849.17	849.52
1946	850.13	849.86	850.33	849.80	849.60	849.61	849.52	849.17	849.06	848.97	849.04	849.09
1947			849.67	849.84	849.82	850.20	850.03	849.70	849.60	849.37	849.41	
1948	849.82	849.98	850.81	850.45	850.16	849.83	849.65	849.42	849.13	848.94	848.98	849.14
1949	849.91	850.08	850.44	850.31	849.91	849.82	850.28	849.97	849.52	849.34	849.15	849.08

Summer Range
1.5 to 2.0 ft higher
1.0 to 1.5 ft higher
0.5 to 1.0 ft higher
0 to 0.5 ft higher
Summer Range
0 to 0.5 ft lower
0.5 to 1.0 ft lower
1.0 to 1.5 ft lower

Chart: R Lathrop, MAR 2012

This management pattern mostly continued during the1950s, 60s, and early 70s.

Lake Mendota Monthly Average Water Levels (feet MSL), 1950-1979

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1950	849.41	849.69	850.54	850.66	850.19	850.20	850.57	850.24	849.94	849.84	849.59	
1951	849.89	849.78	849.65	849.60	849.64	849.80	849.85	849.84	849.80	849.95	850.02	849.80
1952	849.61	849.52	850.00	850.01	849.72	849.79	849.79	850.00	849.48	849.12	849.04	
1953	849.82	850.56	850.31	850.04	849.82	850.02	849.81	849.99	849.57	849.30	849.14	849.33
1954		849.45	849.37	849.56	850.05	850.22	850.30	849.83	849.68	850.02		
1955				849.79	849.83	849.82	849.60	849.50	849.05	848.96		
1956	849.27	849.25	849.58	849.88	850.23	849.85	849.71	849.67	849.79	849.49	849.48	849.61
1957	849.72	849.75	849.56	849.77	849.88	849.88	849.59	849.26	849.39	849.19	849.46	849.58
1958	849.51	849.44	849.24	849.36	849.39	849.63	849.41	849.07	848.82	848.80		
1959	848.72	848.80	849.01	851.03	849.93	850.25	850.26	850.61	850.19	850.06	850.10	849.75
1960	850.03	849.51	849.01	849.88	850.45	850.08	850.16	849.86	849.80	849.78		849.18
1961	849.25	849.43	850.43	849.92	849.66	849.90	849.91	849.88	849.92	849.88	850.28	849.97
1962	850.12	849.78	849.80	849.89	849.79	849.79	849.83	849.76	849.69	849.75	849.71	
1963	849.64	849.40	850.11	849.90	849.87	849.94	849.80	849.66	849.56	849.49	849.41	849.55
1964	849.62	849.62	849.60	849.51	849.98	849.87	849.86	849.70	849.59	849.33	849.24	
1965	849.40	849.80	850.20	849.88	849.94	849.75	849.61	849.50	850.09	850.13	849.87	849.84
1966	849.59	850.09	849.62	849.75	849.96	850.03	849.82	849.78	849.75	849.55	849.49	849.85
1967	849.62	849.58	849.60	849.90	849.87	849.99	849.74	849.70	849.58	849.63	850.02	850.10
1968	849.73	849.68	849.49	849.67	849.60	849.80	850.09	850.09	850.10	850.08	850.05	850.03
1969	849.98	849.80	849.79	849.95	849.88	850.06	850.43	850.22	849.62	849.59	849.71	849.72
1970	849.66	849.42	849.56	849.68	849.80	849.76	849.35	849.16	849.38	849.80	849.90	849.90
1971	849.84	849.70	849.50	849.64	849.59	849.46	849.43	849.40	849.40	849.33	849.72	849.90
1972	849.81	849.29	849.63	849.82	849.87	849.45	849.36	849.71	850.16	850.02	849.98	849.58
1973	849.62	849.89	850.65	850.51	850.81	850.53	849.96	849.40	849.39	849.36	848.96	849.18
1974	849.78	849.99	850.35	850.03	849.81	850.01	849.53	849.28	849.11	848.98	848.80	848.55
1975	848.40	848.72	849.51	850.64	850.66	850.55	850.59	849.95	849.36	849.05	849.13	848.78
1976	848.70	848.93	850.30	850.42	850.06	849.60	849.07	848.73	848.61	848.50	848.46	848.53
1977	848.72	849.04	849.79	849.91	849.96	849.84	849.92	850.00	849.82	849.72	849.43	848.75
1978	848.71	848.64	848.67	849.30	849.87	850.22	851.17	850.23	850.10	849.80	849.26	849.11
1979	849.00	848.85	849.22	850.27	850.00	849.91	850.12	850.36	849.90	849.83	849.61	849.14

Summer Range

- 1.5 to 2.0 ft higher
- 1.0 to 1.5 ft higher
- 0.5 to 1.0 ft higher
- 0 to 0.5 ft higher

Summer Range

- 0 to 0.5 ft lower
- 0.5 to 1.0 ft lower
- 1.0 to 1.5 ft lower

Chart: R Lathrop, MAR 2012

Since the later 1970s, Lake Mendota has often been managed above the 1979 Lake Orders targets during summers and, since 2000, with a generally lower Winter level.

Lake Mendota Monthly Average Water Levels (feet MSL), 1980-2011

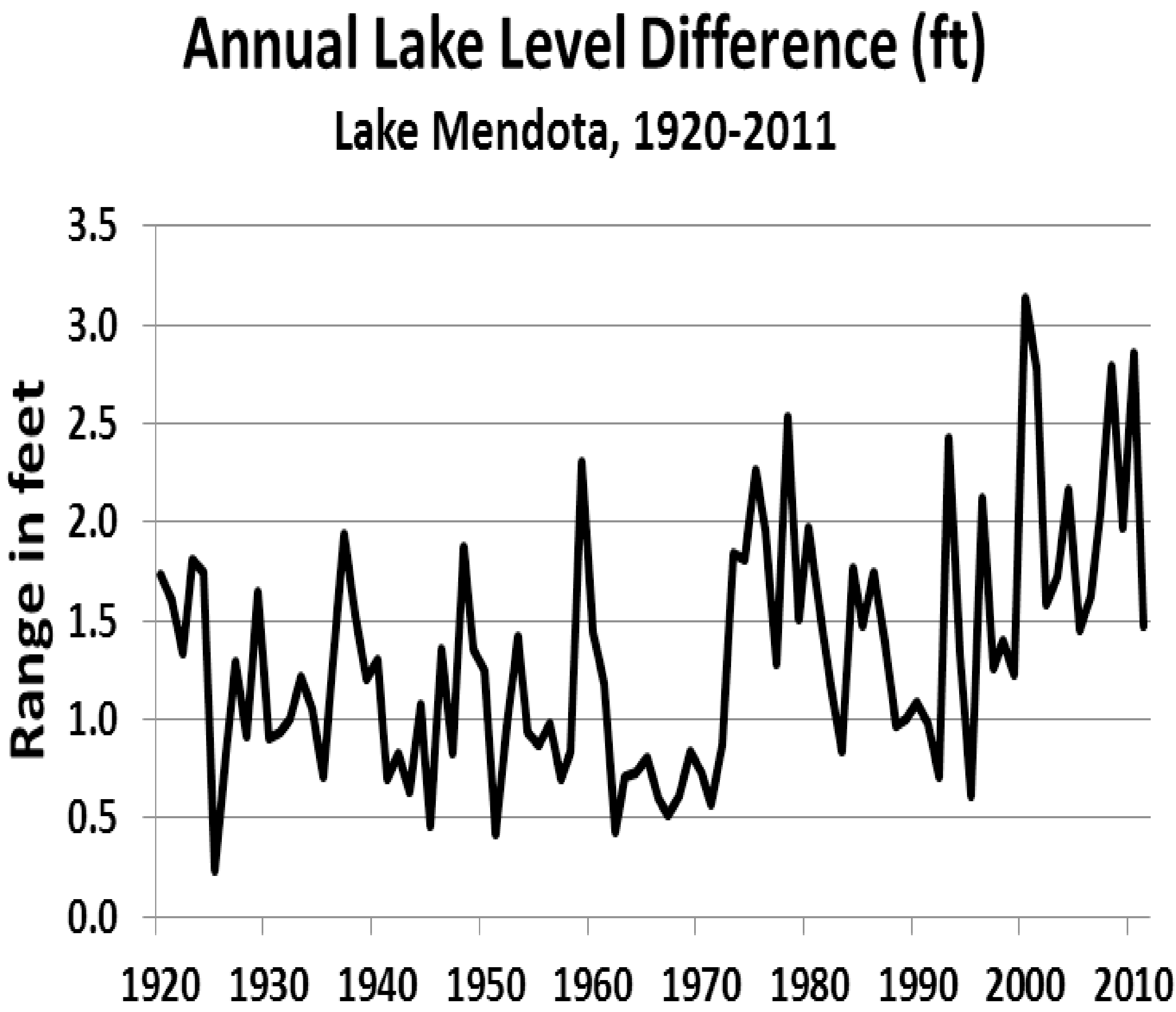
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Summer Range
1980	849.29	849.40	849.38	849.63	849.61	849.90	849.84	850.12	851.07	850.47	849.59	849.10	1.5 to 2.0 ft higher
1981	848.96	848.92	849.36	849.63	849.79	849.97	850.01	849.96	850.48	850.10	849.73	849.38	1.0 to 1.5 ft higher
1982	849.05	848.93	849.32	849.90	849.94	849.97	850.10	849.92	849.80	849.69	849.89	850.03	0.5 to 1.0 ft higher
1983	849.45	849.20	849.53	850.04	849.94	849.86	849.79	849.60	849.81	849.98	849.74	849.64	0 to 0.5 ft higher
1984	849.51	849.51	849.14	849.15	849.99	850.78	850.91	850.31	849.82	849.97	850.49	850.06	Summer Range
1985	849.99	849.47	850.38	850.20	850.01	849.94	850.09	850.25	850.46	850.39	850.94	850.50	0 to 0.5 ft lower
1986	849.47	849.16	849.70	850.09	849.91	849.85	850.05	850.06	850.47	850.91	849.89	849.72	0.5 to 1.0 ft lower
1987	849.08	848.76	849.25	849.89	850.03	849.94	849.84	850.15	849.98	849.69	849.55	849.68	1.0 to 1.5 ft lower
1988	849.42	849.06	849.22	849.94	850.03	849.76	849.68	849.57	849.52	849.65	849.44	849.38	
1989	849.47	849.56	849.93	850.11	850.10	849.96	849.87	850.00	849.95	849.48	849.38	849.10	
1990	849.25	849.42	850.03	850.07	850.29	850.01	850.20	849.94	849.87	849.61	849.50	849.20	
1991	849.27	849.37	850.16	850.25	850.03	850.08	850.09	850.01	849.96	850.07	850.17	849.90	
1992	849.65	849.40	849.68	849.76	849.88	849.67	849.92	849.96	850.11	849.50	849.42	849.78	
1993	849.57	849.25	849.99	851.28	850.67	850.32	851.68	851.48	850.87	850.12	849.47	849.60	
1994	849.62	849.90	850.30	849.78	849.79	849.85	850.33	850.18	850.44	849.90	849.11	849.47	
1995	849.63	849.72	849.60	849.72	850.09	849.85	849.91	850.04	849.69	849.78	849.63	849.48	
1996	849.59	849.94	850.08	850.01	850.19	850.79	851.16	850.57	849.79	849.49	849.40	849.05	
1997	849.19	849.55	850.42	849.83	849.65	849.73	850.18	850.19	849.76	849.51	849.27	849.16	
1998	849.44	849.79	850.23	850.78	850.36	850.41	850.66	850.16	850.09	850.08	849.49	849.38	
1999	849.45	849.37	849.35	849.93	850.51	850.39	850.33	850.16	849.76	849.74	849.48	849.28	
2000	849.23	849.36	849.54	849.91	850.50	852.35	851.52	850.68	850.32	849.89	849.45	849.22	
2001	848.60	848.42	848.91	849.74	849.94	850.37	850.09	851.19	851.19	850.67	849.77	849.65	
2002	848.94	848.97	849.39	849.73	850.02	850.22	849.88	849.86	849.93	849.86	849.15	848.63	
2003	848.40	848.55	848.95	849.65	850.12	849.75	850.00	849.88	849.80	849.53	849.80	849.49	
2004	849.20	848.96	849.70	849.76	850.36	851.13	850.52	850.18	849.76	849.64	849.48	848.97	
2005	848.97	849.69	850.02	850.06	849.84	849.86	849.85	849.87	849.65	849.62	849.27	848.61	
2006	848.68	848.95	849.32	849.84	850.12	850.00	849.86	849.85	850.30	850.25	849.36	848.91	
2007	849.04	849.00	849.52	850.14	849.80	849.84	849.69	850.52	851.02	850.41	849.59	848.97	
2008	849.18	849.40	849.82	850.78	850.51	851.43	851.51	850.81	850.10	849.93	849.42	848.72	
2009	848.52	848.73	850.42	850.49	850.39	850.11	850.03	850.04	850.01	850.10	849.84	848.85	
2010	848.39	848.42	848.89	849.72	850.07	850.28	850.79	851.24	851.05	850.05	849.33	848.60	
2011	848.53	848.61	849.22	850.00	849.93	849.85	849.83	849.84	849.80	849.97	849.91	849.12	

Chart: R Lathrop, MAR 2012

[The chart] shows the difference between the monthly minimum and maximum water levels for each year since 1920.

Coincident with higher water maximum summer levels and much lower winter levels since the early 2000s, the annual fluctuation in water levels has increased quite a bit in recent years compared to prior decades.

In some years [Lake] Mendota did show characteristics of being a reservoir.”



Graph and comments: R. Lathrop, 5 MAR 2012

“… it is pretty obvious that [Lake Mendota] summer levels in general have trended upward over the entire period of record with levels in the early decades being near or below the current summer operating range. From the 1940s through the early 1970s, summer levels were generally within the current operating guidelines.

Since the early 1990s, many summers had months with levels above the summer operating range and not one summer below the range except for late summer 1988 at the end of a severe 2-year drought when water levels were within an inch of the operating level. Water levels during more recent droughts have all been well into the summer operating range.

Since 1920 there have been some changes in winter water levels in Mendota, too. Winter levels were relatively low (compared to the current summer operating guidelines) in the 1920s-30s. In general from the 1940s through the early 1970s winter water levels in general were not much lower than the current summer level guideline. However, since the mid-1970s winter levels declined again. Since about 2001, the winter drawdown has been more pronounced as evidenced by the orange and red monthly colors.”

R. Lathrop, 5 MAR 2012

Lake Monona would also
be better protected from surface flooding
when Lake Mendota is lowered 6 inches,
based on an analysis of data
from 1980 to the present.

There would be increased storage capacity
for storing precipitation from the
flashier, more intense climate change
related events of the past two decades.

The lake level problems associated with
a severe drought would be
rare and manageable.

"It is apparent from the [following four] tables that there are many occasions when water can be released [from Lake Mendota] prior to big flood events,
reducing the impact of those floods,
<u>if a lower target level was to be adopted."</u>

A concern has been expressed that it will be difficult to manage Lake Mendota at a lowe level, because the water has to be released and it will flood Monona. None of the advocates for lowering Mendota are advocating that it be done without regard for Monona flooding. If lower target levels are established for Mendota, the water can be released at times that will not harm Monona (and provide more storage to protect Monona in the worst events).

To test this hypothesis, I looked at the monthly mean levels for Lakes Mendota and Monona for 1980-2011. Any month where the mean for Mendota was above the minimum, and Monona was below the maximum, was considered a <u>month when more water could be released, shown in green</u>.

Months when Mendota was above maximum are shown in pink. It is apparent from the tables that there are many occasions when water can be released prior to big flood events, reducing the impact of those floods, <u>if a lower target level were adopted.</u>

Methodology flaws: The monthly means are not the best indicator of how lake levels need to be managed on a daily basis, and a more detailed modeling would need to be performed considering all of the necessary factors as events unfold. However, it is encouraging that this preliminary analysis shows a large number of months when more water could be released.

Here are some scenarios of how the lower target levels might play out.

2007 – more discharge in May-July 2007 would have taken the levels of Mendota to the target or slightly below during the 2007 drought. But the gain of 3" or 6" in Mendota storage may have significantly reduced the impact of the August floods.

2008 – more discharge in March may have slightly reduced the impact of flooding that occurred April-August.

2009 – flooding occurred on Mendota March-June and on Monona March-November, sc new targets alone might not have made much difference.

2002, 2003, 2005, 2011 – drier years which experienced levels near the target elevatior so these would have been years that lakes would have been 3-6" lower, depending on the target chosen.

Commentary and, on next two slides, chart analyses:

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USGS 05428000 LAKE MENDOTA AT MADISON, WI

Available data for this site — Time-series: Monthly statistics — GO

Dane County, Wisconsin Hydrologic Unit Code 07090001 Latitude 43°05'42", Longitude 89°22'12" NAD27 Drainage area 233 square miles Contributing drainage area 196.4 square miles Gage datum 840.00 feet above NGVD29	**Output formats** HTML table of all data Tab-separated data Reselect output format

00065, Gage height, feet,

YEAR	Monthly mean in ft (Calculation Period: 1980-01-01 -> 1989-12-31) Period-of-record for statistical calculation restricted by user											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980	9.290	9.402	9.375	9.625		9.900	9.837	10.115	11.074			9.104
1981	8.961	8.920	9.362	9.627	9.785	9.968	10.012	9.964	10.480	10.095	9.725	
1982		8.932	9.320	9.895	9.941	9.971	10.101	9.924	9.801	9.686	9.892	10.027
1983	9.449	9.196	9.528	10.036	9.943	9.860	9.794	9.598	9.812	9.979	9.744	
1984		9.506	9.140	9.147	9.994	10.783	10.905	10.314	9.815	9.965	10.485	10.058
1985		9.465	10.378	10.196	10.014	9.943	10.087	10.250	10.458	10.393	10.937	10.496
1986	9.467	9.164	9.700	10.090	9.912	9.847	10.052	10.064	10.473	10.909	9.887	9.718
1987	9.075	8.761	9.251	9.889	10.031	9.938	9.841	10.153	9.982	9.689	9.550	9.679
1988	9.421	9.060	9.218	9.944	10.030	9.756	9.682	9.570	9.523	9.650	9.435	9.377
1989	9.469	9.560	9.932	10.107	10.097	9.959	9.871	9.995	9.951	9.475	9.378	9.102
Mean of monthly Gage height	9.30	9.20	9.52	9.86	9.97	9.99	10.02	9.99	10.14	9.98	9.89	9.70

** No Incomplete data have been used for statistical calculation

/3/12 USGS Surface Water data for Wisconsin: USGS Surface-Water Monthly Statistics

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USGS 05428000 LAKE MENDOTA AT MADISON, WI

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00065, Gage height, feet,

YEAR	Monthly mean in ft (Calculation Period: 1990-01-01 -> 1999-12-31) Period-of-record for statistical calculation restricted by user											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	9.246	9.415	10.029	10.070	10.285	10.008	10.195	9.944	9.866	9.611	9.503	9.196
1991	9.266	9.369	10.157	10.250	10.034	10.082	10.087	10.014	9.960	10.074	10.174	9.904
1992	9.653	9.396	9.677	9.764	9.878	9.667	9.918	9.957	10.108	9.503	9.418	9.782
1993	9.565	9.253	9.989	11.275	10.666	10.315	11.675	11.481	10.874	10.117	9.471	9.603
1994	9.619	9.897	10.295	9.777	9.788	9.854	10.328	10.181	10.440	9.896	9.110	9.468
1995	9.630	9.722	9.600	9.715	10.090	9.851	9.907	10.035	9.692	9.783	9.629	9.476
1996	9.593	9.935	10.081	10.007	10.190	10.794	11.164	10.574	9.791	9.487	9.400	9.045
1997	9.193	9.546	10.421	9.827	9.648	9.729	10.180	10.193	9.764	9.507	9.274	9.160
1998	9.436	9.788	10.234	10.784	10.363	10.405	10.655	10.164	10.085	10.075	9.493	9.383
1999	9.452	9.372	9.349	9.930	10.510	10.393	10.332	10.155	9.763	9.742	9.477	9.279
Mean of monthly Gage height	9.47	9.57	9.98	10.14	10.15	10.11	10.44	10.27	10.03	9.78	9.49	9.43

** No Incomplete data have been used for statistical calculation

Chart analysis:
S. Widstrand, DRAFT 3 MAR 2012

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USGS 05428000 LAKE MENDOTA AT MADISON, WI

Available data for this site — Time-series: Monthly statistics — GO

Dane County, Wisconsin
Hydrologic Unit Code 07090001
Latitude 43°05'42", Longitude 89°22'12" NAD27
Drainage area 233 square miles
Contributing drainage area 196.4 square miles
Gage datum 840.00 feet above NGVD29

Output formats
- HTML table of all data
- Tab-separated data
- Reselect output format

00065, Gage height, feet,

Monthly mean in ft (Calculation Period: 2000-01-01 -> 2009-12-31)

Period-of-record for statistical calculation restricted by user

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	9.234	9.361	9.540	9.905	10.499	12.349	11.515	10.676	10.317	9.887	9.449	9.216
2001	8.603	8.415	8.911	9.742	9.942	10.373	10.085	11.191	11.190	10.672	9.773	9.651
2002	8.943	8.972	9.386	9.726	10.021	10.218	9.875	9.864	9.930	9.857	9.149	8.631
2003	8.403	8.552	8.946	9.646	10.121	9.752	9.995	9.875	9.804	9.531	9.799	9.485
2004	9.202	8.957	9.699	9.762	10.357	11.126	10.524	10.175	9.762	9.640	9.478	8.971
2005	8.970	9.693	10.019	10.060	9.842	9.857	9.845	9.865	9.647	9.616	9.265	8.610
2006	8.680	8.952	9.315	9.837	10.123	10.001	9.858	9.850	10.303	10.245	9.361	8.905
2007	9.042	8.999	9.524	10.144	9.798	9.841	9.688	10.522	11.020	10.410	9.590	8.969
2008	9.175	9.399	9.815	10.782	10.506	11.426	11.514	10.808	10.100	9.925	9.418	8.721
2009	8.521	8.726	10.419	10.489	10.386	10.105	10.029	10.041	10.008	10.095	9.843	8.849
Mean of monthly Gage height	8.88	9.00	9.56	10.01	10.16	10.50	10.29	10.29	10.21	9.99	9.51	9.00

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Contributing drainage area 196.4 square miles
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Output formats
- HTML table of all data
- Tab-separated data
- Reselect output format

00065, Gage height, feet,

Monthly mean in ft (Calculation Period: 2010-01-01 -> 2010-09-30)

Period-of-record for statistical calculation restricted by user

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	8.393	8.418	8.890	9.715	10.066	10.279	10.792	11.244	11.050			
Mean of monthly Gage height	8.39	8.42	8.89	9.72	10.07	10.28	10.79	11.24	11.05	10.05	9.33	8.60
2011	8.53	8.61	9.22	10.00	9.93	9.85	9.83	9.84	9.80	9.97	9.91	9.12

Chart analysis:
S. Widstrand, DRAFT 3 MAR 2012

"It appears that the average [L Mendota] summer water level has been raised 0.65 feet and shifted the balance from [6% above max and 60% below max] to [33% above max and 7.5% below max]."

USGS monthly levels for Lake Mendota 1920 – 2009

This is an analysis of monthly mean water levels for Lake Mendota, for March-October from 1920-2009, from data on the USGS website.

The attached pages compare the lake levels to the levels established in the 1979 lake orders, and identifies the following conditions:

Monthly mean is…

Above summer maximum

Above summer midpoint

Below summer minimum

Summary Years	(#months) above max	above mid	below mid	below min	decade mean
1920-1929	1	7	8	65	849.45
1930-1939	2	8	13	56	849.50
1940-1949	5	3	23	48	849.68
1950-1959	5	11	25	38	849.78
1960-1969	3	12	27	38	849.01
1970-1979	13	7	19	41	849.04
1980-1989	16	34	18	12	849.94
1990-1999	33	23	19	4	850.11
2000-2009	30	25	23	2	850.13
1920-1979	**29** **6.1%**	**48** **10.0%**	**115** **24.1%**	**286** **59.8%**	**849.41**
1980-2009	**79** **33.1%**	**82** **34.3%**	**60** **25.1%**	**18** **7.5%**	**850.06**

Data analysis and comments: S. Widstrand; 10 JAN

1979 WDNR Lake Orders
have resulted in a Lake Mendota
that is too often even higher than
the already unnaturally high levels
previously allowed by the
dam and lock at Tenney Park.

2010s?

What would a Lake Mendota look like March through October if it were 6 inches lower than the Summer minimum target of the WDNR 1979 Lake Orders?

Much like it does in the following photos.

Taken on 17 December 2011,
when Lake Mendota was at an elevation of 849.12,
or about 6" below the current Summer minimum.

Warner Park shoreline structure, view south

PHOTO: Jon Becker

Warner Park lagoon outlet, view east

PHOTO: Jon Becker

Warner Park neighboring residential shoreline, view north

PHOTO: Jon Becker

Warner Park, shoreline erosion

from wave/wind action
at high water levels,
stormwater runoff,
grass sod vs. native plants,
etc.

PHOTO: Jon Becker

James Madison Park, view northeast

PHOTO: Jon Becker

James Madison Park, view southwest

PHOTO: Jon Becker

James Madison Park, view southwest

PHOTO: Jon Becker

UW Union Terrace, view northeast

PHOTO: Jon Becker

UW Union Terrace, view northeast

(note: access via waterfront steps to lake is maintained)

PHOTO: Jon Becker

UW Union Terrace, view northeast

(note: plenty of pier access)

PHOTO: Jon Becker

UW Union Terrace, view southwest

PHOTO: Jon Becker

In other words…

… the world will not end

if Lake Mendota summer target levels

are lowered 6 inches.

(and it actually gets that low 10% of the time)

Winter Target Reduction

Q. Why adjust the
winter 2013-14 target to equal
the new summer minimum target?

A: To reduce damage to
habitat and shorelines
from conditions resulting from the
WDNR 1979 Lake Orders.

In the Winter,
under the 1979 Lake Orders
Lake Mendota's level is lowered so much that both flora and fauna
are threatened.

This unnatural drawdown is done only to create flood capacity for the Spring thaw flood risk,
which in turn is caused by the unnaturally high Summer target levels of the 1979 Orders.

PHOTO: Six Mile Creek north of M, water at 848.44,
20 FEB 2012, Si Widstrand

This radical seasonal swing in Lake Mendota's level prevents both submergent or shoreland vegetation from thriving.

PHOTO: Six Mile Creek, looking south from CTH M; 20 FEB 2012; Si Widstrand

The result:
Barren shoreland mudflats in the winter, and barren stream bottoms in the summer.

PHOTO: Six Mile Creek, looking south from CTH M; 20 FEB 2012; Si Widstrand

The extreme drop to the winter minimum undercuts a sizable public investment in shoreland vegetation restoration.

PHOTO: Yahara River, off North Unit of Cherokee Conservation Park (north end of “Cherokee Lake”)

Winter mudflats in the Spring become a barren river bed.

PHOTO: Yahara River, off North Unit of Cherokee Conservation Park (north end of “Cherokee Lake”); 20 FEB 2012; Si Widstrand

What are the benefits of lowering Lake Mendota 6 inches?

The benefits of lowering Lake Mendota 6 inches are very compelling, across several categories:

- ENVIRONMENTAL
- WATER QUALITY
- PUBLIC SAFETY &
  ECONOMIC
- CULTURAL, RECREATION,
  & TOURISM

ENVIRONMENTAL BENEFITS

- ***More and better habitat, by protecting existing wetlands, while also allowing more success in efforts to restore shore area vegetation.***

- ***Healthier, more natural conditions for wildlife, including fish, amphibians, shellfish, and birds or other flying critters.***

Our large investment in shore area restoration will have a better chance for success, giving even greater returns on frugal use of public funds.

PHOTO : Jon Becker

WATER QUALITY BENEFITS

- ***Less sediment runoff***
- ***Reduced shoreline erosion***
- ***Less nutrient pollution***

PUBLIC SAFETY & ECONOMIC BENEFITS

- *Safer beaches for swimming*
- *Increased capacity to handle emergency flooding, with less chance of over-topping Tenney dam, or breaching of adjacent shoreland, which would cause civic/private infrastructure damage and sewer problems*

MORE PUBLIC SAFETY & ECONOMIC BENEFITS

In 2008, Dane County suffered more than $68 million in damages from storm or climate-change related flooding.

In an emergency effort to prevent sanitary sewer backflows and uncontrolled sewage overflows into lakes and streams, over a million gallons of sewage being dumped in a high quality sedge meadow of Cherokee Marsh.

This area of the Marsh is being restored, thanks to a considerable public investment of over $1 million. A promised report on damage caused by the sewage has not yet been delivered.

Many Isthmus residents and businesses were not so fortunate in 2008. Storm sewers backed up, and their basements were damaged by very high groundwater.

After nearly being overtopped by waves in 2000, the earthen dam along Tenney Beach was raised 2 feet. When water levels are high, waves and wind can push water higher on the dam, or back through storm sewers.

This map from a 2009 study shows the potential impacts of the 100-year flood under different scenarios

The dam was recently found structurally sound by engineers, so a breach is unlikely. If breached, there'd be damage near Tenney Park and the Yahara channel, but also further away, due to backflooding.

FLOODING EXTENTS:

Green = w/dam intact   Magenta = w/o dam   Dark blue = w/dam breach

Light blue = Potential storm sewer backflooding w/breach.

This map from a 2009 study shows the potential impacts of the 100-year flood under different scenarios

TOURISM, CULTURAL & RECREATION BENEFITS

$2-3 billion is spent annually within Dane County, second in WI only to Milwaukee County

- ***A more scenic and beautiful lake.***
- ***A more diverse habitat, including increased shoreline vegetation, creating better birding, and other outdoors observational activities.***
- ***A more interesting experience of Lake Mendota for paddlers and nearby hikers alike.***
- ***A more resilient, sustainable fishery.***
- ***Less damage to piers from wind and waves.***


PHOTO CREDIT: Mario Quintana

Concerns?

A 6-inch drop would cause:

- ***No negative impact on civic infrastructure, such as water intakes or stormwater outlets*** (S. Josheff, WDNR) ***or on management of downstream lakes under WDNR 1979 Lake Orders.*** (J. Balousek/K. Connors, Dane County)

- ***No significant impact on shoreline location or appearance, though some areas may benefit from restoration of native plants.***

Concerns?

A 6-inch drop could cause:

- *Localized impact on large boat navigation to harbors or marinas that have always required dredging (businesses may want to dredge again sooner, or to adjust any large boat-related aspects of their business plans).*

- *Localized increases of some invasive plants.*


Cherokee Marsh North Unit
PHOTO CREDIT: Jon Becker

Toward a Natural Lake Mendota

PHASE 2: RESTORATION FOR A MORE NATURAL LAKE

Lower Lake Mendota to its natural level

After lowering Lake Mendota 6 inches,
we can further enhance
our lake for future generations!

How?

By further lowering summer target levels
in 2 inch increments annually
(*with an ecologically correlated winter target level*)
until Lake Mendota's natural level is reached.

Sandhill Cranes in Upper Yahara River, Near Cherokee Marsh North Unit

PHOTO CREDIT: Mario

A natural Lake Mendota would be just a little higher than Lake Monona.

Lowering Lake Mendota 58 inches (total, i.e., including the first drop of 6 inches) would still leave an inch of head at Tenney Park dam.

That may be enough for successful management–
even under the current (1979) WDNR Lake Orders–
downstream, where the other three lakes are already usually managed at natural levels.

J. Balousek/K. Connors, Dane County

Yep, you read that right.

In the summertime, Lake Mendota is still being managed at about 5 feet higher than its natural level, even though there's not been any need to power a mill for quite some time.

This managed level is unnatural and it's killing Lake Mendota's vital shoreline vegetation, marshes, and wetlands.

That's unjustifiable, and undoes restoration efforts.

But we've gotten used to how it looks and functions.

How Lake Mendota target levels would change, 2012–2038, if carefully lowered 2 in/yr.

SUMMER Minimum	SUMMER Midpoint	SUMMER Maximum	YEAR	CHANGE Feet	CHANGE Inches	WINTER Mimimum
849.6	849.9	850.1	1979			849.2
849.1	849.4	849.6	2012	-0.5	-6	
				(0.167 ft/yr)	(0.167 ft/yr)	mmer min. prev year)
848.9	849.2	849.4	2013	-0.7	-8	849.1
848.8	849.0	849.3	2014	-0.8	-10	848.9
848.6	848.9	849.1	2015	-1.0	-12	848.8
848.4	848.7	848.9	2016	-1.2	-14	848.6
848.3	848.5	848.8	2017	-1.3	-16	848.4
848.1	848.4	848.6	2018	-1.5	-18	848.3
847.9	848.2	848.4	2019	-1.7	-20	848.1
847.8	848.0	848.3	2020	-1.8	-22	847.9
847.6	847.9	848.1	2021	-2.0	-24	847.8
847.4	847.7	847.9	2022	-2.2	-26	847.6
847.3	847.5	847.8	2023	-2.3	-28	847.4
847.1	847.4	847.6	2024	-2.5	-30	847.3
846.9	847.2	847.4	2025	-2.7	-32	847.1
846.8	847.0	847.3	2026	-2.8	-34	846.9
846.6	846.9	847.1	2027	-3.0	-36	846.8
846.4	846.7	846.9	2028	-3.2	-38	846.6
846.3	846.5	846.8	2029	-3.3	-40	846.4
846.1	846.4	846.6	2030	-3.5	-42	846.3
845.9	846.2	846.4	2031	-3.7	-44	846.1
845.8	846.0	846.3	2032	-3.8	-46	845.9
845.6	845.9	846.1	2033	-4.0	-48	845.8
845.4	845.7	845.9	2034	-4.2	-50	845.6
845.3	845.5	845.8	2035	-4.3	-52	845.4
845.1	845.4	845.6	2036	-4.5	-54	845.3
844.9	845.2	845.4	2037	-4.7	-56	845.1
844.8	845.0	845.3	2038	-4.8	-58	844.9

Benefits

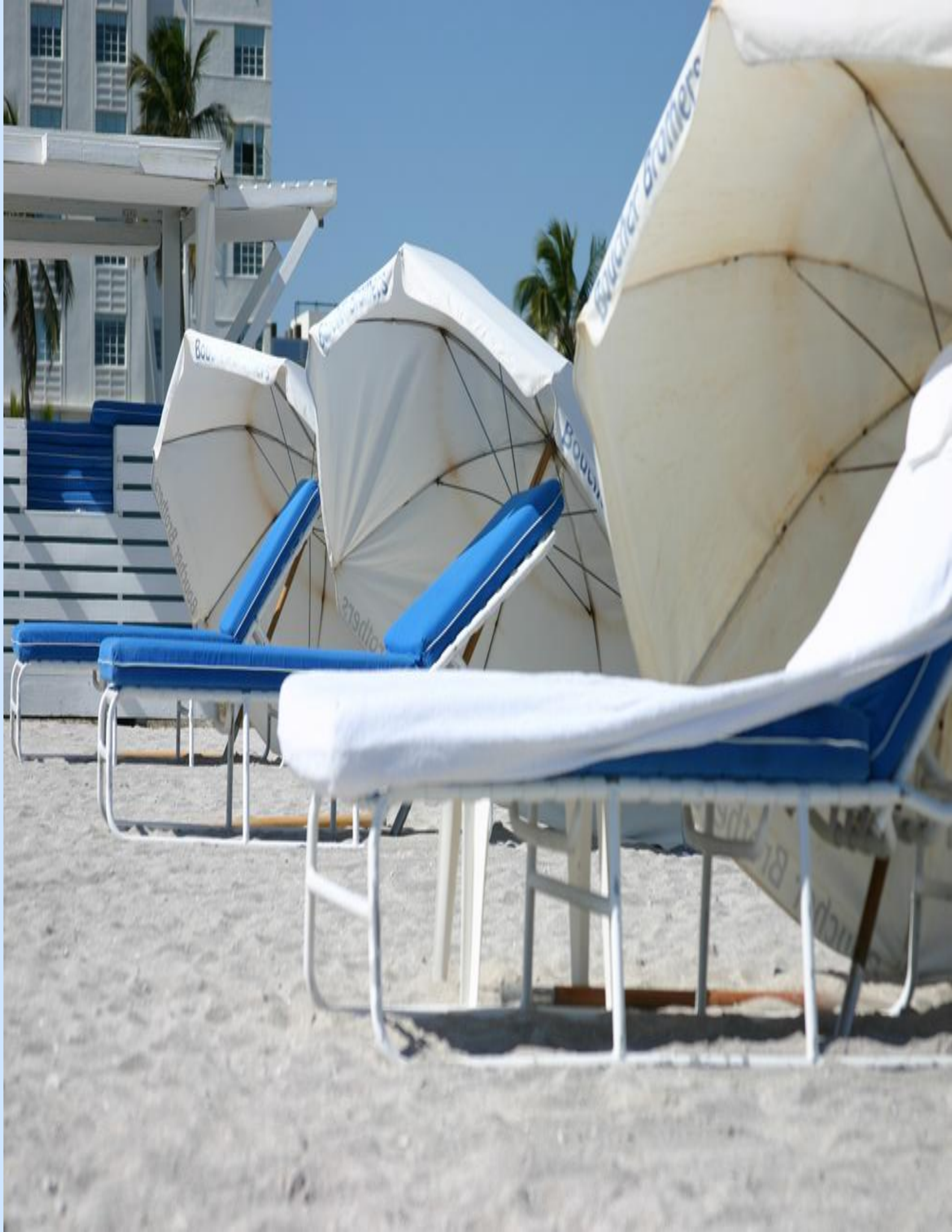
- *All the enormous environmental benefits of restoring at least a square mile of wetlands and native shoreline vegetation.*
- *Reduced damage to civic/private infrastructure.*
- *More diverse recreation opportunities.*
- *Enhanced public safety.*
- *Recovery of drowned Native American mounds, and historically documented white sand beaches.*

Could native shellfish once again become abundant?

(After the Civil War, for several years there was a thriving market for freshwater pearls from the Rock River.

Shellfish found in channel near School Road landing on Yahara River, 5 February 2012 .

Could we enjoy Caribbean quality white sand beaches at Tenney Park?



Should we rebuild Frank Lloyd Wright's Rocky Roost?

CONCERNS?

Actually, there are not very many.

- ***As the natural shoreline re-emerges, invasive plant species will need to be controlled. Research of Lake Michigan's recently lower level indicates that natural fluctuations in lake levels provide a competitive advantage for native plants over invasives.*** (J. Zedler, UW-Madison)

- ***To prevent drying of adjacent wetlands, some artificial ditches may need to be blocked or filled, as the lake's natural hydrology is restored.*** (Q. Carpenter, UW)

- ***The submergent aquatic vegetation will need sufficient time to "migrate" outward, along with the shoreline.***

CONCERNS?

- ***As the normal high water mark changes, continued public interest in the exposed shoreland will need to be secured*.**

Public ownership of the recovered shoreland would secure at least a bit of the profound benefits that would have been ours, if only John Nolen's recommendation to avoid development on the shores of all the Yahara lakes had actually been implemented.

The recovered shoreland could, for example, provide room for public trails and walkways, such as the proposed boardwalk from James Madison Park to the Union Terrace.

OTHER CONCERNS?

- ***The length or height of some piers may need to be adjusted.***
- ***Adjustments may be necessary for boat launches and public access points as levels decline.***
- ***Some harbors or marinas that are oriented to large boat owners may need to transition to a new customer base, over the course of 2-3 decades.***

  Channel dredging may be needed during this transition period, although as the lake is lowered, gravity and water movement will do much of this work, just as it does under present conditions.

These concerns are easily outweighed by the many benefits of a natural Lake Mendota.

It may comfort those who are fearful of change to remember that the lowering can always be paused temporarily, or even reversed, if ecological conditions warrant.

CREDIT: Jon Becker

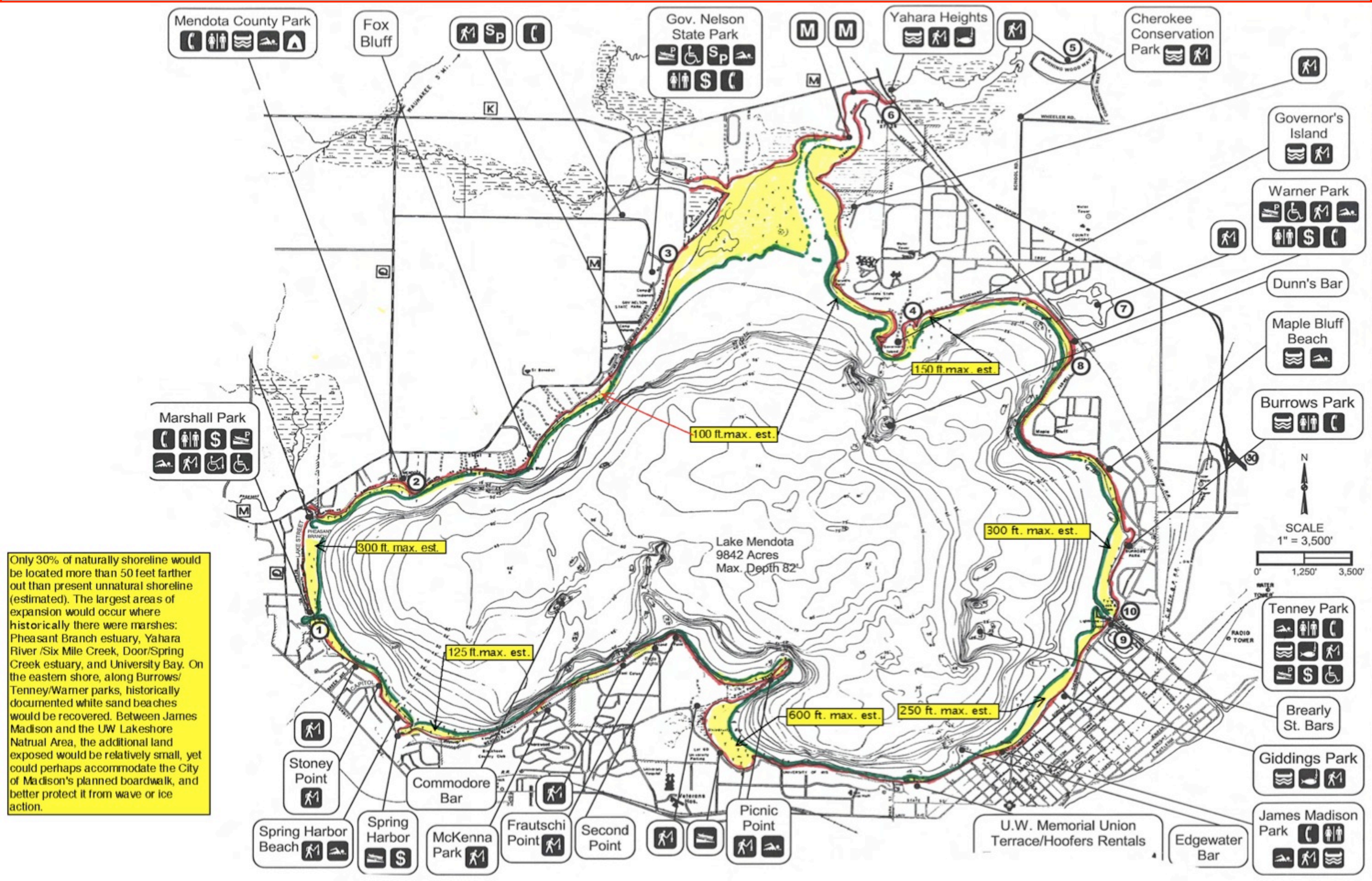
What will a more natural Lake Mendota, ~58 inches lower, look like?

- *Mostly, not much different at all.*
- *White sand beaches may be recovered, including those near Tenney Park.*
- *In a few areas, it may be possible to restore up to 200 feet of marsh or wetlands that have been drowned.*
- *At the northern estuary and near Picnic Point, it will be possible to restore much larger former marshes and wetlands, across areas extending 600 feet or more from the current shoreline.*

Red line = Current shoreline

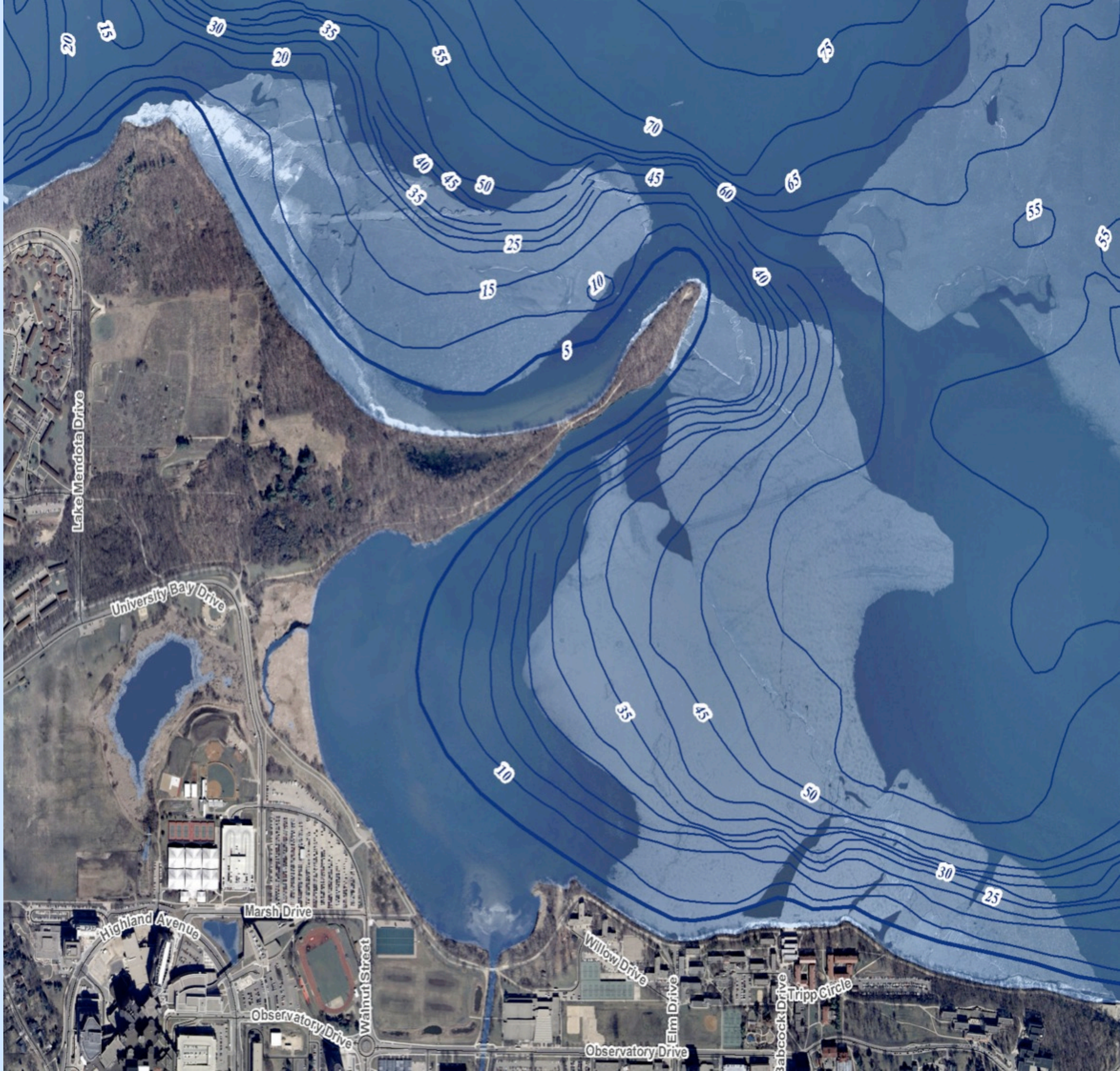
Green line = Natural shoreline (ca. 5 ft lower)

Yellow highlighted area = Recovered marsh or sandy beach



Picnic Point area

dark blue
contour line
=
natural shoreline,
after lake is lowered
about 5 ft



Courtesy Dane Co.
Planning Dept.

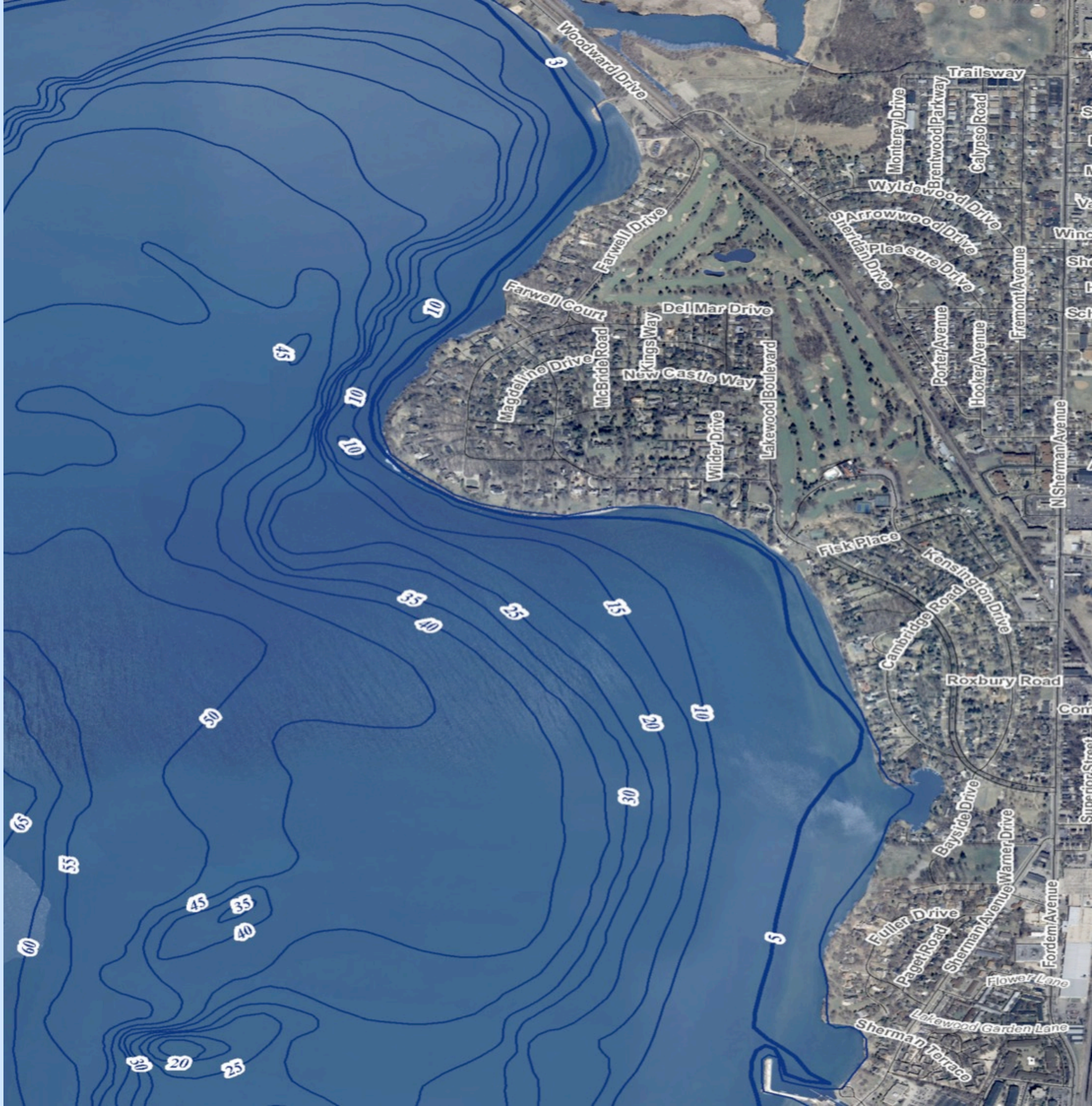
UW Campus to Edgewater area

dark blue contour line = natural shoreline, after lake is lowered about 5 ft

Courtesy Dane Co. Planning Dept.

Tenney Park pier, northward to Warner Park lagoons

dark blue
contour line
=
natural shoreline,
after lake is lowered
about 5 ft



Courtesy Dane Co. Planning Dept.

Governors Island area

dark blue
contour line
=
natural shoreline,
after lake is lowered
about 5 ft

Courtesy Dane Co.
Planning Dept.

Yahara Estuary

dark blue
contour line
=
natural shoreline,
after lake is lowered
about 5 ft

Courtesy Dane Co.
Planning Dept.

Toward a Natural Lake Mendota

PHASE 1: STOPPING THE DAMAGE

No later than MAR 2013, lower the 1979 Lake Order summer targets by 6". Adjust the winter 2013-14 target to equal the new summer minimum target.

PHASE 2: RESTORATION FOR A MORE NATURAL LAKE

By JAN 2014, complete all studies and public participation necessary to begin further lowering the summer targets 2" per year, starting in summer 2014, until the natural level is achieved (~58" total). Annually adjust the Winter target to match the preceding summer's minimum target.

CONCURRENT LAND USE MANAGEMENT

Require that all future development in the Lake Mendota sub-watershed recreates natural hydrological conditions, while also retrofitting existing development insofar as possible toward this standard, to assure that Lake Mendota is not utilized as a detention facility for unnatural stormwater runoff.

How Natural Lakes Look

Let's paddle together back to the future, creating a gift for generations to come!

PHOTO: Jan Axelson

Capital Region Advocacy Network for Environmental Sustainability
CRANES