OKAUCHEE LAKE

CHEMICAL TREATMENT DEMONSTRATION PROJECT

In 2001, Okauchee Lake District received a Lake Planning Grant from the Wisconsin Department of Natural Resources (WDNR) to investigate the use of aquatic herbicides to control Eurasian watermilfoil in four specific areas of Okauchee Lake: Tierney Bay, Martinique Bay, Bay Five, and Pickerel Bay. The purpose of the grant was to determine if aquatic herbicides, primarily 2,4-D, could be used to control Eurasian watermilfoil in areas of the lake where harvesting is limited by depth or an abundance of native plants.

The aquatic plants were surveyed in each of the four areas prior to any treatment. Sample points are shown on the attached map. Sample points were established in each area and identified by GPS. Bay Five, Martinique Bay and Pickerel Bay were surveyed the first year, 2001, and again in 2004. Each of these three areas were also inspected for the presence/absence of Eurasian watermilfoil in 2002 and 2003, prior to any chemical treatment to verify the need for treatment. Tierney Bay was surveyed in each of the four years, 2001 through 2004. Survey results are provided below.

Shallow lake areas limit the use of aquatic plant harvesters to control nuisance plant conditions. These areas, especially small bays, tend to collect floating plant debris. Fragments of Eurasian watermilfoil and floating wild celery plants contribute to the spread of aquatic plants in the lake. Because of this, it is unlikely that chemical treatment will eliminate the nuisance conditions long term. However, chemical treatment can be effectively used to reduce nuisance conditions on a seasonal basis.

In Martinique, Pickerel and Bay Five, Eurasian watermilfoil was controlled by chemical treatment, but needed to be repeated annually. In Tierney Bay, an increase in native plants between 2001 and 2004 could be attributed to the control of Eurasian watermilfoil. Because Tierney Bay is more isolated from Okauchee Lake proper, it is less susceptible to floating plant debris. The principal means of re-invasion of Eurasian watermilfoil into Tierney Bay are boaters and the harvesters used to maintain access to the lake.

In summary:
- Chemical treatments may be used to provide effective, seasonal control of Eurasian watermilfoil.
- Chemical treatment may be a preferred management option when native plant growth is dominant and Eurasian watermilfoil begins to expand its range.
- Only selective herbicides should be used to protect native plant species.
- Chemical treatments require a permit from the WDNR.
- Permits should be provided to all residents in or adjacent to proposed treatment areas.
- Residents may elect to *not* have their shorelines chemically treated.
- Chemically treated areas should not be harvested although floating debris collection may take place.

SURVEY RESULTS

Tierney Bay:

Plant species in bay: Eurasian water milfoil, curly-leaf pondweed, wild celery, slender naiad, chara, sago pond-weed, large-leaf pondweed, floating-leaf pondweed, Richardson's pondweed, Illinois pondweed, white-stem pondweed, and elodea.
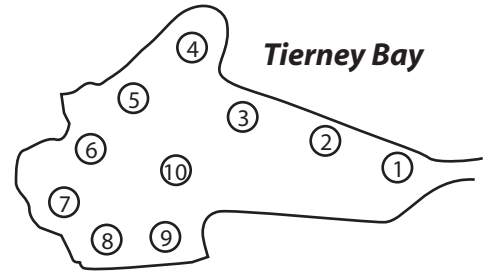
- Large-leaf pondweed and wild celery were the most dominant plants.
- Milfoil was found throughout the bay. Four sample sites showed decreased densities from 2001, three sites remained the same as 2001, and 1 site increased over that seen in 2001.
- The nearshore areas, from the outer pier line to shore, had plants to the surface. This contrasted significantly with the main bay areas, in which plants were 2 feet below the surface, and showed no signs of recent harvest. Surveys in past years found native plants to the surface throughout the bay.
- Sago pondweed and Illinois pondweed declined slightly since 2001. Wild celery, slender naiad, coontail, and large-leaf pondweed increased since 2001.
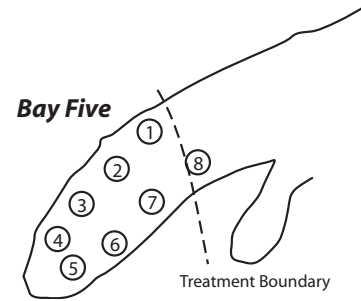
Table 1: Tierney Bay Plant Survey Data, 2001 — 2004

Transect No.	GPS Location	Plant Species	Density (Max = 5)				Common Names
			2001	2002	2003	2004	
1	N43 06.911 W088 25.665	MYSPI	2	0	0	2	Milfoil
		NAJFL	2	0	3	4	Slender naiad
		STUPE	2	1	1	1	Sago pondweed
		CHARA	3	4	3	4	Chara
		POTAM	3	2	3	4	Large-leaf pondweed
		VALAM	2	4	2	4	Wild celery
		ELOCA	0	0	2	0	Elodea
2	N43 06.924 W088 25.734	MYSPI	1	0	1	1	Milfoil
		CHARA	4	4	4	2	Chara
		POTAM	2	2	4	3	Large-leaf pondweed
		VALAM	1	4	1	3	Wild celery
		POTIL	2	3	2	3	Illinois pondweed
		NAJFL	0	0	0	4	Slender naiad
3	N43 06.933 W088 25.766	NAJFL	3	4	2	4	Slender naiad
		CHARA	4	4	4	4	Chara
		POTIL	2	3	3	1	Illinois pondweed
		CERDE	1	0	0	1	Coontail
		MYSPI	0	2	2	3	Milfoil
		POTAM	0	0	3	3	Large-leaf pondweed
		VALAM	0	0	4	0	Wild celery
4	N43 06.955 W088 25.782	MYSPI	4	0	1	4	Milfoil
		NAJFL	3	4	3	3	Slender naiad
		CERDE	4	3	3	1	Coontail
		CHARA	3	5	4	4	Chara
		POTIL	2	4	3	1	Illinois pondweed
		POTRI	0	0	2	0	Richardsons pondweed
		POTAM	0	0	0	3	Large-leaf Pondweed
		VALAM	0	0	0	2	Wild celery

Tierney Bay

Table 1: Tierney Bay Plant Survey Data, 2001 — 2004

Transect No.	GPS Location	Plant Species	Density (Max = 5)				Common Names
			2001	2002	2003	2004	
5	N43 06.943 W088 25.805	MYSPI	4	1	2	0	Milfoil
		NAJFL	4	4	4	4	Slender naiad
		STUPE	1	0	0	0	Sago pondweed
		CHARA	4	4	4	3	Chara
		POTIL	4	4	2	1	Illinois pondweed
		CERDE	1	3	1	0	Coontail
		POTAM	0	3	4	4	Large-leaf pondweed
6	N43 06.925 W088 25.844	MYSPI	3	0	3	1	Milfoil
		NAJFL	3	4	3	4	Slender naiad
		STUPE	1	0	1	0	Sago pondweed
		CHARA	1	4	3	3	Chara
		POTAM	1	3	4	4	Large-leaf pondweed
		CERDE	2	5	2	4	Coontail
7	N43 06.897 W088 25.883	MYSPI	3	0	0	0	Milfoil
		STUPE	1	0	1	0	Sago pondweed
		CHARA	4	4	4	4	Chara
		POTAM	4	3	5	4	Large-leaf pondweed
		NAJFL	0	3	2	3	Slender naiad
		POTIL	0	2	1	0	Illinois pondweed
		VALAM	0	0	2	4	Wild celery
		CERDE	0	0	0	1	Coontail
8	N43 06.871 W088 25.859	MYSPI	4	0	2	0	Milfoil
		NAJFL	4	3	2	4	Slender naiad
		CHARA	4	3	1	4	Chara
		POTAM	1	4	5	4	Large-leaf pondweed
		CERDE	1	1	0	1	Coontail
		POTIL	0	0	3	0	Illinois pondweed
		VALAM	0	0	0	4	Wild celery
9	N43 06.863 W088 25.812	MYSPI	4	0	0	2	Milfoil
		NAJFL	1	4	3	4	Slender naiad
		CHARA	4	4	4	3	Chara
		POTIL	3	3	1	1	Illinois pondweed
		CERDE	1	0	3	2	Coontail
		POTAM	0	3	4	3	Large-leaf pondweed
		VALAM	0	0	2	2	Wild celery
10	N43 06.891 W088 25.803	MYSPI	4	0	0	1	Milfoil
		NAJFL	4	4	4	3	Slender naiad
		CHARA	3	4	2	4	Chara
		POTAM	3	4	3	4	Large-leaf pondweed
		POTIL	3	3	3	3	Illinois pondweed
		CERDE	1	3	2	2	Coontail
		UTRVU	0	1	0	0	Bladderwort
		STUPE	0	0	0	2	Sago pondweed

Bay Five:

Plant species in treatment area: Eurasian water milfoil, curly-leaf pondweed, wild celery, slender naiad, chara, sago pondweed, large-leaf pondweed, white stem pondweed, coontail, and Richardson's pondweed.
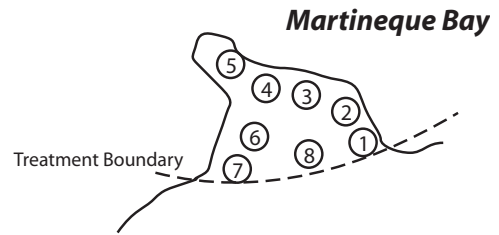

Bay Five

Treatment Boundary

Transect No.	GPS Location	Plant Species	Density (Max = 5)		Common Names
			2001	2004	
1	N43 06.963 W088 26.946	MYRSP	4	2	Milfoil
		CHARA	2	4	Chara
		VALAM	3	4	Wild celery
		STUPE	1	1	Sago pondweed
		POTRI	0	1	Richardson's pondweed
		NAJFL	0	1	Slender naiad
2	N43 06.913 W088 26.780	MYRSP	4	0	Milfoil
		CHARA	3	3	Chara
		VALAM	4	4	Wild celery
		POTAM	2	0	Large-leaf pondweed
		CERDE	0	2	Coontail
		NAJFL	0	2	Slender naiad
3	N43 06.900 W088 26.796	MYRSP	4	3	Milfoil
		HETDU	1	0	Water stargrass
		VALAM	2	4	Wild celery
		STUPE	1	1	Sago pondweed
4	N43 06.920 W088 26.769	MYRSP	4	3	Milfoil
		ELOCA	2	1	Elodea
		NAJFL	4	0	Slender naiad
		CERDE	2	0	Coontail
		POTPR	2	0	White-stem pondweed
		STUPE	1	1	Sago pondweed
		HETDU	1	0	Water stargrass
		VALAM	0	4	Wild celery
		POTRI	0	2	Richardson's pondweed
		CHARA	0	4	Chara
		POTAM	0	2	Large-leaf pondweed
5	N43 06.928 W088 26.747	MYRSP	4	3	Milfoil
		CHARA	2	0	Chara
		VALAM	1	4	Wild celery
		HETDU	2	0	Water stargrass
		NAJFL	1	0	Slender naiad
		STUPE	1	1	Sago pondweed
		ELOCA	0	1	Elodea
		POTRI	0	1	Richardson's pondweed

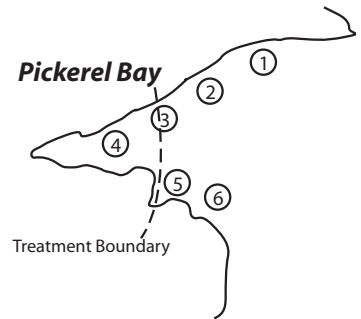| Transect No.	GPS Location	Plant Species	Density (Max = 5)		Common Names
			2001	2004	
6	N43 06.957 W088 26.729	MYRSP CERDE VALAM POTAM ELOCA STUPE HETDU CHARA POTRI	4 4 2 2 2 1 1 0 0	2 0 4 0 2 0 0 2 2	Milfoil Coontail Wild celery Large-leaf pondweed Elodea Sago pondweed Water stargrass Chara Richardsons' pondweed
7	N43 06.986 W088 26.676	MYRSP VALAM CHARA NAJFL ELOCA STUPE	2 3 2 3 2 2	3 1 3 1 0 1	Milfoil Wild celery Chara Slender naiad Elodea Sago pondweed
8	N43 07.004 W088 26.615	MYRSP CHARA VALAM STUPE	4 1 1 1	3 4 2 2	Milfoil Chara Wild celery Sago pondweed

Martineque Bay:

Plant species in treatment area: Eurasian water milfoil, curly-leaf pondweed, wild celery, slender naiad, chara, sago pondweed, large-leaf pondweed, whitestem pondweed, Richardson's pondweed, variable pondweed, elodea, duckweed.

Martineque Bay

Treatment Boundary

Transect No.	GPS Location	Plant Species	Density (MAx = 5)		Common Name
			2001	2004	
1	N43 08.153 W088 26.611	MYSPI	3	4	Milfoil
		STUPE	1	0	Sago pondweed
		CHARA	4	5	Chara
		NAJFL	0	2	Slender naiad
		VALAM	0	3	Wild celery
2	N43 08.175 W088 26.609	MYSPI	4	4	Milfoil
		CHARA	4	4	Chara
		NAJFL	3	2	Slender naiad
		VALAM	2	4	Wild celery
		STUPE	1	1	Sago pondweed
		POTRI	0	2	Richardson's pondweed
3	N43 08.192 W088 26.644	NAJFL	5	0	Slender naiad
		CHARA	2	4	Chara
		POTPR	1	0	White-stem pondweed
		MYSPI	0	3	Milfoil
		STUPE	0	1	Sago pondweed
		POTGR	0	1	Variable pondweed
		VALAM	0	3	Wild celery
4	N43 08.230 W088 26.703	MYSPI	4		MIlfoil
		CERDE	2	0	Coontail
		LEMMI	1	0	Duckweed
		VALAM	0	3	Wild celery
		CHARA	0	1	Chara
		NAJFL	0	2	Slender naiad
		ELOCA	0	1	Elodea
5	N43 08.212 W088 26.691	MYSPI	4	2	Milfoil
		ELOCA	4	0	Elodea
		CHARA	1	1	Chara
		VALAM	0	4	Wild celery
		STUPE	0	1	Sago pondweed
6	N43 08.178 W088 26.673	MYSPI	4	2	Milfoil
		VALAM	3	4	Wild celery
		NAJFL	0	4	Slender naiad
		CHARA	0	4	Chara
7	N43 08.163 W088 26.653	MYSPI	4	3	Milfoil
		STUPE	2	1	Sago pondweed
		CHARA	4	4	Chara
		VALAM	3	4	Wild celery
		POTGR	0	2	Variable pondweed
8	N43 08.150 W088 26.682	MYSPI	4	3	Milfoil
		NAJFL	2	0	Slender naiad
		VALAM	2	4	Wild celery
		CHARA	0	4	Chara
		NAJFL	0	1	Slender naiad
		STUPE	0	1	Sago pondweed

Pickerel Bay:

Plant species: Eurasian watermilfoil, curly-leaf pondweed,
wild celery, chara, sago pondweed, Slender naiad.

Transect No.	GPS Location	Plant Species	Density (Max = 5)		Common Name
			2001	**2004**	
1	N43 07.322 W088 25.869	MYSPI STUPE CHARA VALAM	3 2 3 2	0 0 5 3	Milfoil Sago pondweed Chara Wild celery
2	N43 07.308 W088 25.921	MYSPI CHARA VALAM	4 2 3	3 4 4	Milfoil Chara Wild celery
3	N43 07.297 W088 25.964	MYSPI VALAM CHARA	3 1 3	3 0 3	Milfoil Wild celery Chara
4	N43 07.293 W088 25.994	MYSPI VALAM CHARA POTCR ELOCA NAJFL	4 2 1 1 0 0	3 4 2 0 1 1	Milfoil Wild celery Chara Curly-leaf pondweed Elodea Slender naiad
5	N43 07.296 W088 25.935	MYSPI VALAM CHARA STUPE	4 4 0 0	4 4 1 1	Milfoil Wild celery Chara Sago pondweed
6	N43 07.289 W088 25.888	MYSPI VALAM CHARA	4 3 0	2 4 3	Milfoil Wild celery Chara