

# Lake Redstone 2020 Aquatic Invasive Species Survey

On October 6, 2020, Cason & Associates, LLC conducted an Aquatic Invasive Species survey on Lake Redstone.

During the survey, Eurasian Watermilfoil (EWM) was the only aquatic invasive species observed and surveyed. The EWM acreages by density are outlined in the table below:

EWM Densities	Surveyed Area	Treatment Area
Highly Scattered	2.104	3.037
Scattered	2.901	4.071
Moderately Dense	6.067	8.448
Dense	0.776	1.108
Total Acreage:	11.848	16.664

Since the last survey back in the fall of 2018, EWM has expanded and developed in new locations. A few small clusters have taken root just south of the northern most boat launch along with a small highly scattered bed. Beginning on the eastern shoreline, EWM has increased in density, however not expanding to new locations on the northern section. As you go down the eastern shoreline to the southern section of Lake Redstone, you can see new beds of EWM forming around the southern boat launch down near the dam. Also, in this area, EWM has taken root around the beach as well. As for the western shoreline, from what was surveyed, the EWM beds have stayed roughly the same while new locations have been found and locations back in 2018 have disappeared.

Areas recommended for EWM treatment are areas with densities of dense, moderately dense, scattered, and highly scattered. These areas include a 15-foot buffer to alleviate herbicide concentration dissipation that may occur from treating small beds. All areas are noted in the Aquatic Invasive Species Survey Map as possible treatment areas. Small clusters can be managed with hand pulling efforts by members of the Lake Redstone Protection District or Cason & Associates at an hourly rate of \$125/hr. All possible treatment areas are labeled to assist in identification. The cost estimator includes all possible treatment areas, and the cost to treat each area to match your lake management budget.

The following deliverables are attached to this survey summary:

- 1. Aquatic Invasive Species Survey Maps, with EWM (Maps 1-5)
- 2. Cost Estimator for Navigate Spot Treatment
- 3. Cost Estimator for Aquastike Spot Treatment
- 4. Cost Estimator for Weedar 64 Spot Treatment
- 5. Cost Estimator for Chinook Spot Treatment

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Thank you for your business and for allowing us to perform this service for your association. If you have any questions, please contact me at 920-290-5256 or hunter@casonassociates.com.

Sincerely,

**Hunter Roose** 

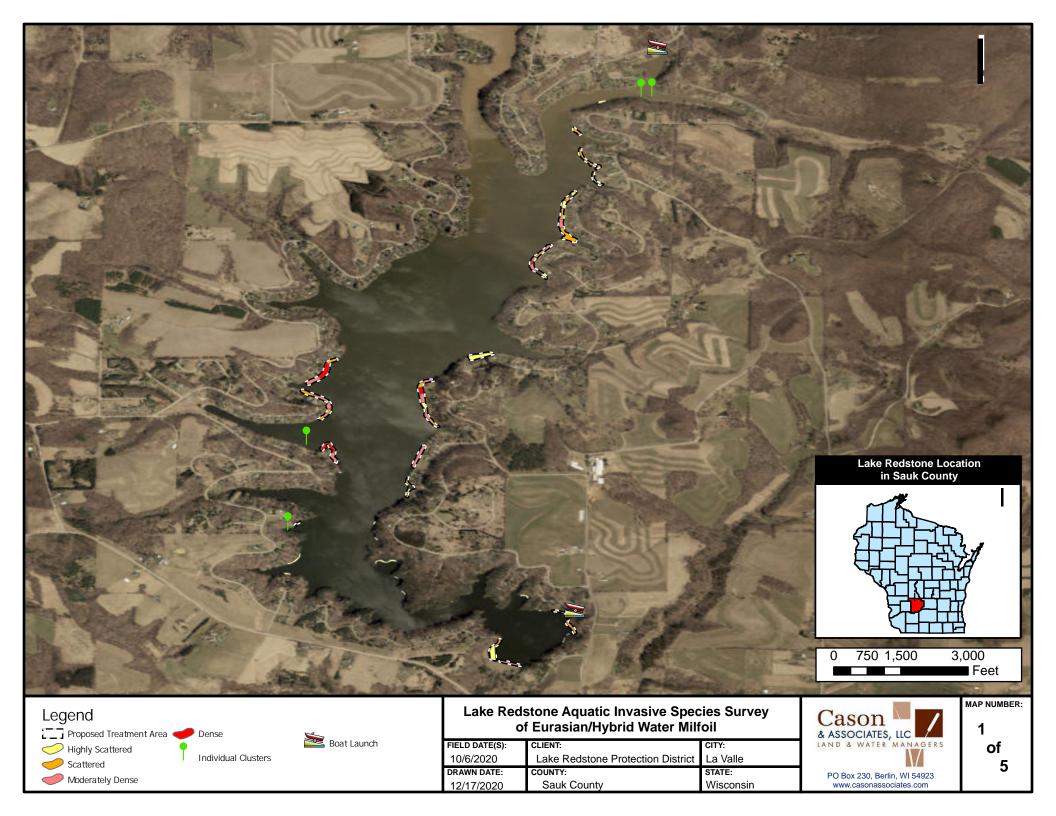


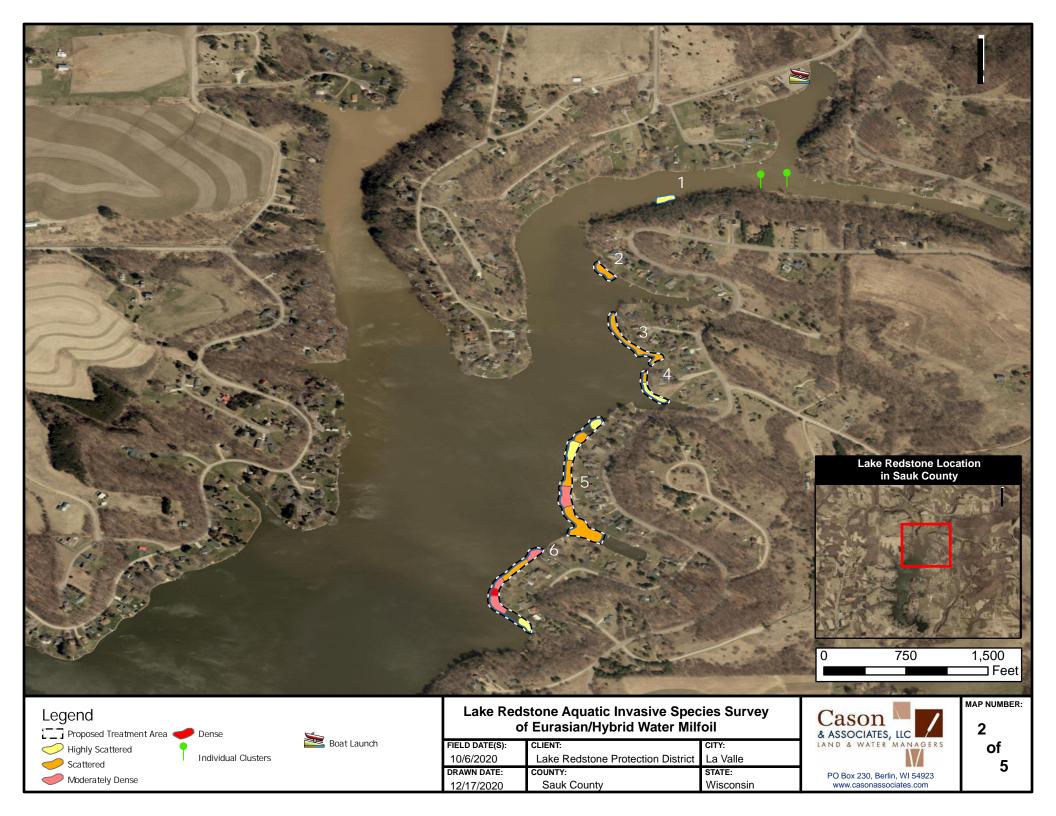
Bed ID	2020 Acreage	2020 Proposed Treatment Areas (acre)	Average Visual Density	Est. Rake Range/ Mean Rake Full.	Depth Range/ Mean Depth	Navigation Impairment	2020 Field Notes
1	0.156	N/A	Highly Scattered	0-1; 0.5	1-3; 2	none	A few clusters around a fallen tree and dock
2	0.171	0.278	Scattered	1-2; 1	2-5; 4	minor	Bed is encroaching on docks
3	0.469	0.770	Scattered	1-2; 2	2-5; 4	minor	Bed is encroaching on docks
4	0.219	0.396	Highly Scattered	0-2; 1	2-5; 4	minor	Bed is encroaching on docks
5	1.852	2.414	Scattered	0-3; 2	2-5; 4	minor	Bed extends across bay, could have future impairment issues
6	1.023	1.464	Moderately Dense	0-3; 2	3-5; 4	moderate	EWM could impair boats from leaving docks
7	0.741	0.957	Highly Scattered	0-1; 1	3-5; 3	none	Has potential to encroach on bay as the densest portion is near a dock.
8	1.546	2.124	Moderately Dense	1-3; 2	2-5; 5	minor	EWM could impair boats from leaving docks
9	0.570	0.838	Moderately Dense	1-3; 2	3-5; 4	minor	EWM could impair boats from leaving docks
10	0.389	0.638	Highly Scattered	1-1; 1	3-4; 3	minor	No plants detected in the bay however, later season presence could be possible
11	0.044	N/A	Highly Scattered	0-1; 1	3-5; 4	none	Group of small clusters, potential to form a larger bed
12	0.042	N/A	Highly Scattered	0-1; 1	3-5; 4	none	Group of small clusters, potential to form a larger bed
13	0.293	N/A	Highly Scattered	0-1; 1	4-5; 4	none	EWM could impair boats from leaving docks if the bed becomes more established
14	0.029	N/A	Highly Scattered	0-1; 1	3-5; 5	none	Close to shore
15	0.050	N/A	Highly Scattered	0-1; 1	5-6; 6	none	No natives were detected near the few clusters in this area
16	0.121	N/A	Highly Scattered	0-1; 1	4-6; 5	none	Healthy plants
17	0.026	N/A	Highly Scattered	0-1; 1	4-5; 5	none	N/A
18	0.133	0.245	Moderately Dense	2-3; 2	3-8; 6	minor	Near boat launch and resident docks, could spread easily.
19	0.326	0.502	Scattered	1-2; 2	4-7; 6	minor	EWM surrounds docks
20	0.022	N/A	Highly Scattered	0-1; 1	5-6; 5	none	N/A

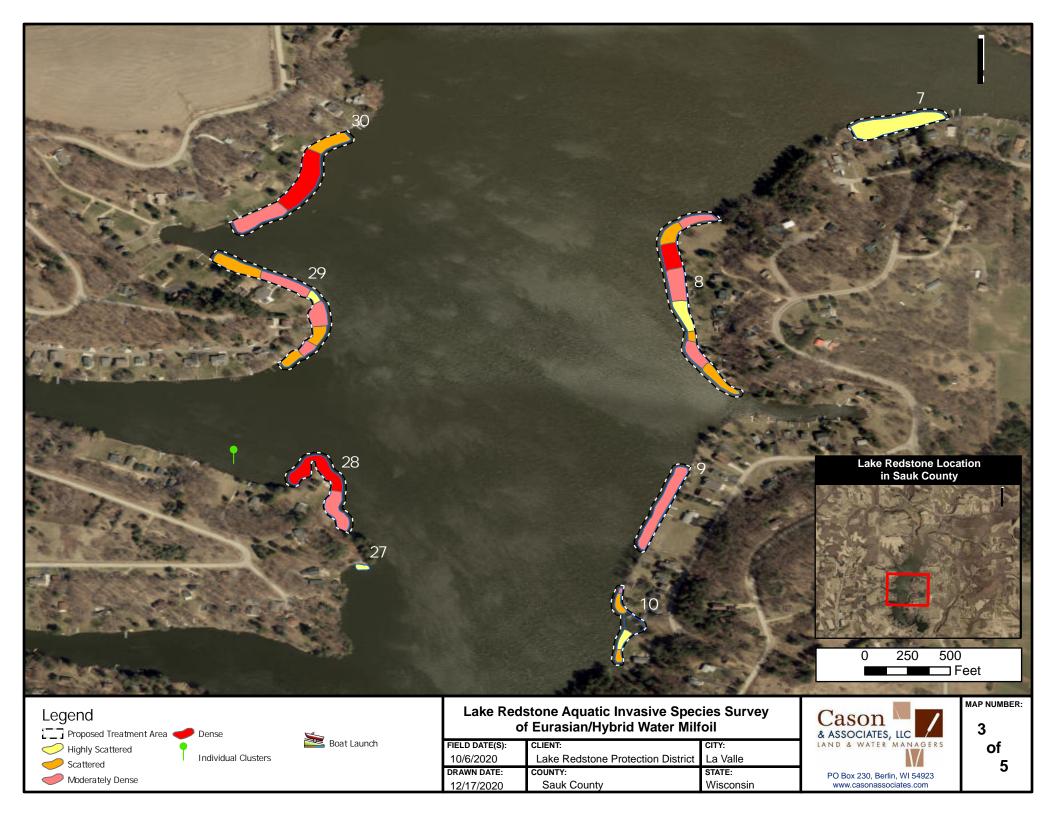
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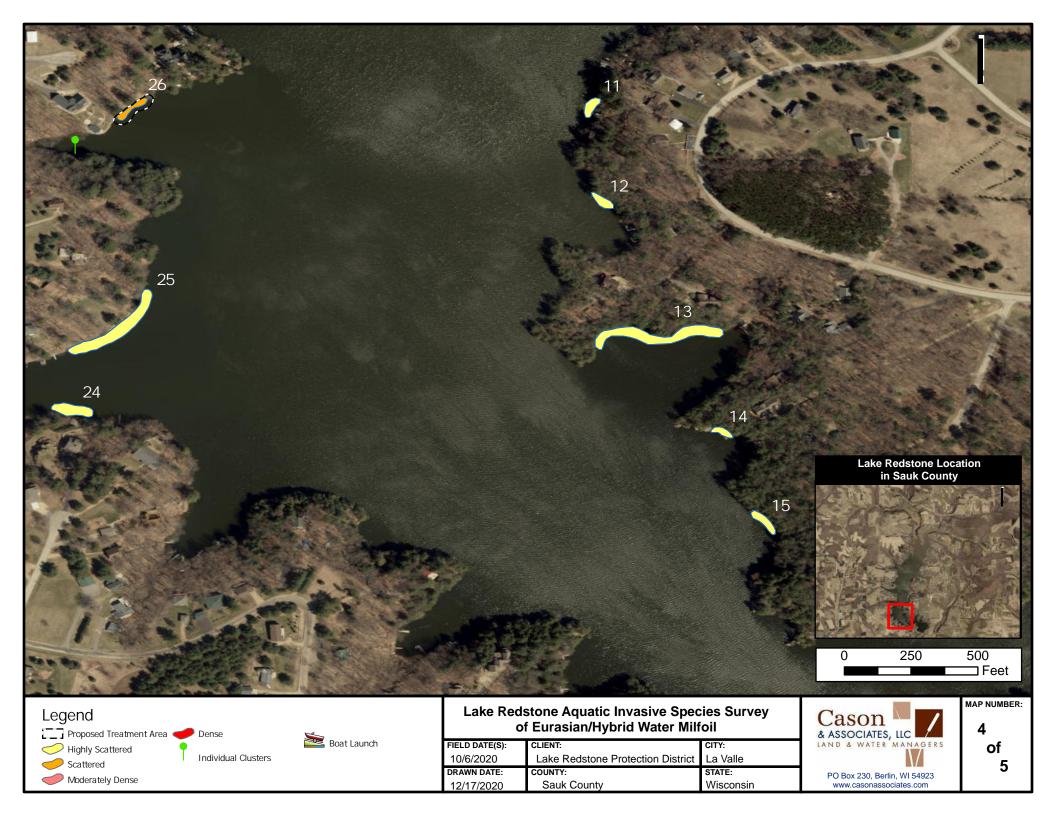


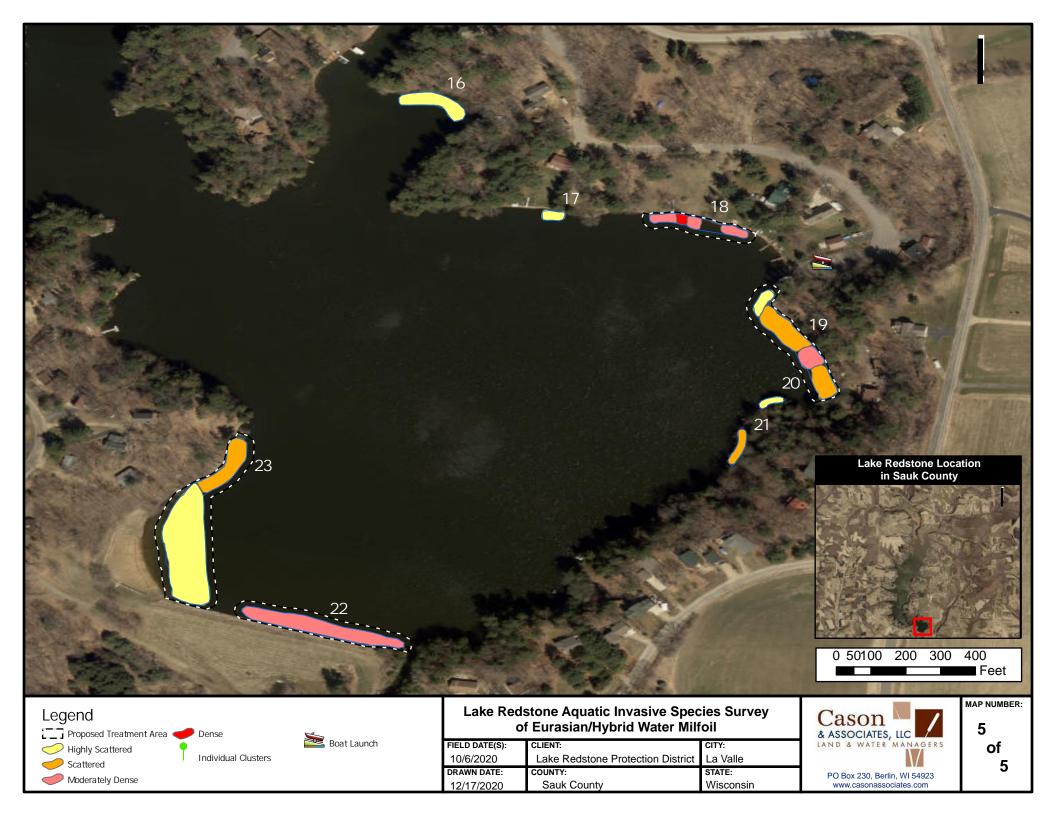
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21	0.040	N/A	Scattered	1-1; 1	5-6; 6	none	Might attach to Bed 20.
22	0.285	0.471	Moderately Dense	2-3; 3	3-8; 6	none	Steep Slope; EWM lines almost entire dam; Almost creating a surface reaching canopy.
23	0.716	1.046	Highly Scattered	1-2; 1	3-8; 6	minor	Encroaching on swimming beach; present where there is a drop off; extends to northern docks, possibly causing navigational impediments
24	0.093	N/A	Highly Scattered	0-1; 1	3-4; 4	none	N/A
25	0.257	N/A	Highly Scattered	0-1; 1	3-5; 4	none	Possible to encroach on docks during peak growing season with further establishment
26	0.043	0.107	Scattered	1-2; 1	3-5; 4	none	Future implications of dock encroachment
27	0.040	N/A	Highly Scattered	0-1; 1	4-6; 5	none	N/A
28	0.776	1.108	Dense	2-3; 3	3-6; 5	moderate	Surface matting surrounding docks, treat
29	1.183	1.626	Moderately Dense	1-3; 2	3-6; 5	moderate	Most dense portions are concentrated on the ends of docks forming a barrier to the lake. High potential for spreading
30	1.327	1.680	Moderately Dense	2-3; 3	3-6; 5	moderate	Moderately dense bed lines entire shoreline, prevents navigation to lake without spreading leaflets.
Totals	12.982ac.	16.664ac.					













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## **Treatment Cost Estimator for Eurasian Watermilfoil**

FOR: Lake Redstone Protection District LOCATION: Lake Redstone, Sauk County

WATERBODY SIZE: 650 Acres

PRODUCT: Navigate (Granular, 2,4-D)

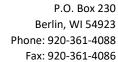
TARGET CONCENTRATION: 4 PPM

#### **Product Costs**

Treatment Area		Acroago	Average Depth	Volume	Amount of	Pro	oduct Unit	Total Cost
Heatment Area		Acreage	(ft)	(ac ft)	Product (lb)	(	Cost (lb)	Total Cost
	2	0.278	4	1.112	50	\$	4.75 \$	237.50
	3	0.770	4	3.08	175	\$	4.75 \$	831.25
	4	0.396	4	1.584	100	\$	4.75 \$	475.00
	5	2.414	4	9.656	550	\$	4.75 \$	2,612.50
	6	1.464	4	5.856	325	\$	4.75 \$	1,543.75
	7	0.957	3	2.871	150	\$	4.75 \$	712.50
	8	2.124	5	10.62	600	\$	4.75 \$	2,850.00
	9	0.838	4	3.352	200	\$	4.75 \$	950.00
	10	0.638	3	1.914	100	\$	4.75 \$	475.00
	18	0.245	6	1.47	75	\$	4.75 \$	356.25
	19	0.502	6	3.012	175	\$	4.75 \$	831.25
	22	0.471	6	2.826	150	\$	4.75 \$	712.50
	23	1.046	6	6.276	350	\$	4.75 \$	1,662.50
	26	0.107	4	0.428	25	\$	4.75 \$	118.75
	28	1.108	5	5.54	325	\$	4.75 \$	1,543.75
	29	1.626	5	8.13	450	\$	4.75 \$	2,137.50
	30	1.680	5	8.4	475	\$	4.75 \$	2,256.25
	TOTALS:	16.664	N/A	76.13	4275		N/A \$	20,306.25

## **Total Project Costs**

Expense	Cost Typ	e Cost		Total Cost
Setup	Fixed	N/A	\$	565.00
Application Labor	Variable	\$105/acre	\$	1,785.00
Product	Variable	\$4.75/lb	\$	20,306.25
	,	Total Project Co	st: \$	22,656.25



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## **Treatment Cost Estimator for Eurasian Watermilfoil**

FOR: Lake Redstone Protection District

LOCATION: Lake Redstone, Sauk County

WATERBODY SIZE: 650 Acres

PRODUCT: Aquastrike (Diquat, Endothall)

TARGET CONCENTRATION: 1.5 PPM Endothall 0.3 PPM Diquat

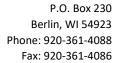
#### **Product Costs**

Treatment Area	(2) Acreage	Average Depth	Volume (ac	Amount of Proc		oduct Unit	Total Cost	
Treatment Area (2)		Acreage	(ft)	ft)	Product		Cost	Total Cost
Aquastrike		0.278	4	1.112	1.50	\$	105.00	\$ 157.50
PondZilla		0.278			0.5	\$	104.00	\$ 52.00
AquaSticker		0.278			1	\$	17.00	\$ 17.00
Polyan		0.278			0.1	\$	65.00	\$ 6.50
	TOTALS:	0.278	N/A	0.00	3.10		N/A	\$ 233.00

Treatment Area	a (3) Acreage		Average Depth	Volume (ac	Amount of	Pr	roduct Unit		Total Cost	
Treatment Area (3)	(5)	Acreage	(ft)	ft)	Product		Cost		Total Cost	
Aquastrike		0.770	4	3.08	4.20	\$	105.00	\$	441.00	
PondZilla		0.770			1.5	\$	104.00	\$	156.00	
AquaSticker		0.770			1	\$	17.00	\$	17.00	
Polyan		0.770			0.1	\$	65.00	\$	6.50	
	TOTALS:	0.770	N/A	0.00	6.80		N/A	\$	620.50	

Treatment Area (4)	Acreage	Average Depth	Volume (ac	Amount of	Pr	Product Unit		Total Cost
Treatment Area (4)	Acreage	(ft)	ft)	Product		Cost		Total Cost
Aquastrike	0.396	4	1.584	2.20	\$	105.00	\$	231.00
PondZilla	0.396			0.8	\$	104.00	\$	83.20
AquaSticker	0.396			1	\$	17.00	\$	17.00
Polyan	0.396			0.1	\$	65.00	\$	6.50
то	TALS: 0.396	N/A	0.00	4.10		N/A	\$	337.70

Treatment Area (F)	Леновая	Average Depth	Volume (ac	Amount of	Amount of Product Unit			Total Cost	
Treatment Area (5)	Acreage	(ft)	ft)	Product		Cost		Total Cost	
Aquastrike	2.414	4	9.656	13.20	\$	105.00	\$	1,386.00	
PondZilla	2.414			4.8	\$	104.00	\$	499.20	
AquaSticker	2.414			4	\$	17.00	\$	68.00	
Polyan	2.414			0.1	\$	65.00	\$	6.50	
тот	ALS: 2.414	N/A	0	22.10		N/A	\$	1,959.70	





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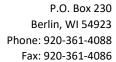
Treatment Area (6)	Acrosso	Average Depth	Volume (ac	Amount of	Pr	oduct Unit	Total Cost
Treatment Area (6)	Acreage	(ft)	ft)	Product		Cost	TOTAL COST
Aquastrike	1.464	4	5.856	8.00	\$	105.00	\$ 840.00
PondZilla	1.464			2.9	\$	104.00	\$ 301.60
AquaSticker	1.464			2	\$	17.00	\$ 34.00
Polyan	1.464			0.1	\$	65.00	\$ 6.50
TOTA	ALS: 1.464	N/A	0	13.00		N/A	\$ 1,182.10

Treatment Area (7)	Acrosco	Average Depth	Volume (ac	Amount of	Product Unit		Total Cost	
Treatment Area (7)	Acreage	(ft)	ft)	Product		Cost	Total Cost	
Aquastrike	0.957	3	2.871	3.90	\$	105.00	\$ 409.50	
PondZilla	0.957			1.9	\$	104.00	\$ 197.60	
AquaSticker	0.957			1	\$	17.00	\$ 17.00	
Polyan	0.957			0.1	\$	65.00	\$ 6.50	
TO	TALS: 0.957	N/A	0	6.90		N/A	\$ 630.60	

Treatment Area (8)	Acreage	Average Depth	Volume (ac	Amount of	Pr	oduct Unit	Total Cost	
Treatment Area (6)	Acreage	(ft)	ft)	Product		Cost	Total Cost	
Aquastrike	2.124	5	10.62	14.60	\$	105.00	\$ 1,533.00	
PondZilla	2.124			4.25	\$	104.00	\$ 442.00	
AquaSticker	2.124			4	\$	17.00	\$ 68.00	
Polyan	2.124			0.1	\$	65.00	\$ 6.50	
TOTA	LS: 2.124	N/A	0	22.95		N/A	\$ 2,049.50	

Treatment Area (9)		A 040000	<b>Average Depth</b>	Volume (ac	Amount of	Pr	oduct Unit	Cost         105.00       \$         104.00       \$         17.00       \$	Total Cost
Treatment Area	(9)	Acreage	(ft)	ft)	Product		Cost		Total Cost
Aquastrike		0.838	4	3.352	4.60	\$	105.00	\$	483.00
PondZilla		0.838			1.6	\$	104.00	\$	166.40
AquaSticker		0.838			1	\$	17.00	\$	17.00
Polyan		0.838			0.1	\$	65.00	\$	6.50
	TOTALS:	0.838	N/A	0	7.30		N/A	\$	672.90

Treatment Area (10)	Acreage	Average Depth	Volume (ac	Amount of	Pr	oduct Unit	Total Cost	
Treatment Area (10)	Acreage	(ft)	ft)	Product		Cost	Total Cost	
Aquastrike	0.638	3	1.914	2.60	\$	105.00	\$ 273.00	
PondZilla	0.638			1.2	\$	104.00	\$ 124.80	
AquaSticker	0.638			1	\$	17.00	\$ 17.00	
Polyan	0.638			0.1	\$	65.00	\$ 6.50	
TOTAL	LS: 0.638	N/A	0	4.90		N/A	\$ 421.30	





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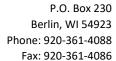
Treatment Area (18)	Acreage	Average Depth	Volume (ac	Amount of	Pr	oduct Unit	Total Cost
Treatment Area (16)	Acreage	(ft)	ft)	Product		Cost	Total Cost
Aquastrike	0.245	6	1.47	2.00	\$	105.00	\$ 210.00
PondZilla	0.245			0.5	\$	104.00	\$ 52.00
AquaSticker	0.245			1	\$	17.00	\$ 17.00
Polyan	0.245			0.1	\$	65.00	\$ 6.50
тот	ALS: 0.245	N/A	0	3.60		N/A	\$ 285.50

Treatment Area (19)	Acrosco	Average Depth	Volume (ac	Amount of	Pr	oduct Unit	Total Cost
Treatment Area (19)	Acreage	(ft)	ft)	Product		Cost	Total Cost
Aquastrike	0.502	6	3.012	4.10	\$	105.00	\$ 430.50
PondZilla	0.502			1	\$	104.00	\$ 104.00
AquaSticker	0.502			1	\$	17.00	\$ 17.00
Polyan	0.502			0.1	\$	65.00	\$ 6.50
TOTAL	.S: 0.502	N/A	0	6.20		N/A	\$ 558.00

Treatment Area (22)	Acreage	Average Depth	•		Pr	oduct Unit	\$ \$ \$	Total Cost
` ,		(ft)	ft)	Product		Cost		
Aquastrike	0.471	6	2.826	3.90	\$	105.00	\$	409.50
PondZilla	0.471			0.9	\$	104.00	\$	93.60
AquaSticker	0.471			1	\$	17.00	\$	17.00
Polyan	0.471			0.1	\$	65.00	\$	6.50
TOTAL	S: 0.471	N/A	0	5.90		N/A	\$	526.60

Treatment Area (23)			<b>Average Depth</b>	Volume (ac	Amount of	Pr	Cost 105.00 \$ 104.00 \$	Total Cost	
Treatment Area (	25) A	Acreage	(ft)	ft)	Product		Cost		Total Cost
Aquastrike		1.046	6	6.276	8.60	\$	105.00	\$	903.00
PondZilla		1.046			2	\$	104.00	\$	208.00
AquaSticker		1.046			2	\$	17.00	\$	34.00
Polyan		1.046			0.1	\$	65.00	\$	6.50
•	TOTALS:	1.046	N/A	0	12.70		N/A	\$	1,151.50

Treatment Area (26)	Acreage	Average Depth	Volume (ac	Amount of	Pro	oduct Unit	0 \$ 0 \$ 0 \$	Total Cost
Treatment Area (26)	Acreage	(ft)	ft)	Product		Cost		Total Cost
Aquastrike	0.107	4	0.428	0.60	\$	105.00	\$	63.00
PondZilla	0.107			0.2	\$	104.00	\$	20.80
AquaSticker	0.107			1	\$	17.00	\$	17.00
Polyan	0.107			0.1	\$	65.00	\$	6.50
TOTALS	S: 0.107	N/A	0	1.90		N/A	\$	107.30



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Treatment Area (20)	Acreage	<b>Average Depth</b>	Volume (ac	Amount of	Pro	oduct Unit	Total Cost
Treatment Area (28)	Acreage	(ft)	ft)	Product		Cost	Total Cost
Aquastrike	1.108	5	5.54	7.60	\$	105.00	\$ 798.00
PondZilla	1.108			1.9	\$	104.00	\$ 197.60
AquaSticker	1.108			2	\$	17.00	\$ 34.00
Polyan	1.108			0.1	\$	65.00	\$ 6.50
тоти	ALS: 1.108	N/A	0	11.60		N/A	\$ 1,036.10

Treatment Area (29)	Acrosco	Average Depth	Volume (ac	Amount of	Pro	oduct Unit	ost 105.00 \$	Total Cost
Treatment Area (29)	Acreage	(ft)	ft)	Product		Cost		Total Cost
Aquastrike	1.626	5	8.13	11.10	\$	105.00	\$	1,165.50
PondZilla	1.626			3.25	\$	104.00	\$	338.00
AquaSticker	1.626			3	\$	17.00	\$	51.00
Polyan	1.626			0.1	\$	65.00	\$	6.50
TOTALS	S: 1.626	N/A	0	17.45		N/A	\$	1,561.00

Treatment Area (30)	Acreage	Average Depth	Volume (ac	Amount of Product	Pr	oduct Unit Cost	Total Cost
		(ft)	11)	Product		Cost	
Aquastrike	1.680	5	8.4	11.50	\$	105.00	\$ 1,207.50
PondZilla	1.680			3.3	\$	104.00	\$ 343.20
AquaSticker	1.680			3	\$	17.00	\$ 51.00
Polyan	1.680			0.1	\$	65.00	\$ 6.50
TOTAL	.S: 1.680	N/A	0	17.90		N/A	\$ 1,608.20

## **Total Project Costs**

Expense	Cost T	Cost Type Cost						
Setup	Fixed	Per Visit	\$	565.00				
Application Labor	Variable	\$105/acre	\$	1,785.00				
Product	Variable	see table	\$	14,941.50				
		Total Project Co	st: \$	17,291.50				



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### **Treatment Cost Estimator for Eurasian Watermilfoil**

FOR: Lake Redstone Protection District LOCATION: Lake Redstone, Sauk County

WATERBODY SIZE: 650 Acres

PRODUCT: Weedar 64 (Liquid, 2,4-D)

TARGET CONCENTRATION: 0.35PPM

#### **Product Costs**

Tuesdan and Auge		A	Average	Volume	Amount of	Pr	oduct Unit	Total Coat
Treatment Area		Acreage	Depth (ft)	(ac ft) *	Product (gal)	(	Cost (gal)	Total Cost
	2	0.278	4	1.112	3.1	\$	28.00	\$ 86.80
	3	0.770	4	3.08	8.7	\$	28.00	\$ 243.60
	4	0.396	4	1.584	4.5	\$	28.00	\$ 126.00
	5	2.414	4	9.656	27.4	\$	28.00	\$ 767.20
	6	1.464	4	5.856	16.6	\$	28.00	\$ 464.80
	7	0.957	3	2.871	8.1	\$	28.00	\$ 226.80
	8	2.124	5	10.62	30.1	\$	28.00	\$ 842.80
	9	0.838	4	3.352	9.5	\$	28.00	\$ 266.00
	10	0.638	3	1.914	5.4	\$	28.00	\$ 151.20
	18	0.245	6	1.47	4.1	\$	28.00	\$ 114.80
	19	0.502	6	3.012	8.5	\$	28.00	\$ 238.00
	22	0.471	6	2.826	8	\$	28.00	\$ 224.00
	23	1.046	6	6.276	17.8	\$	28.00	\$ 498.40
	26	0.107	4	0.428	1.2	\$	28.00	\$ 33.60
	28	1.108	5	5.54	15.7	\$	28.00	\$ 439.60
	29	1.626	5	8.13	23	\$	28.00	\$ 644.00
	30	1.680	5	8.4	23.8	\$	28.00	\$ 666.40
TOTA	LS:	16.664	N/A	76.13	215.5		N/A	\$ 6,034.00

### **Total Treatment Costs**

Expense	Cost Typ	e Cost		Total Cost		
Setup	Fixed	N/A	\$	565.00		
Application Labor	Variable	\$105/acre	\$	1,785.00		
Product	Variable	\$28/gal	\$	6,034.00		
	<b>Total Treatment Cost:</b>			8,384.00		



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### **Treatment Cost Estimator**

FOR: Lake Redstone Protection District LOCATION: Lake Redstone, Sauk County

WATERBODY SIZE: 650 Acres

PRODUCT: Chinook (Liquid, 2,4-D/Endothall)

TARGET CONCENTRATION: 1.6/4.0 PPM

#### **Product Costs**

Treatment Area	Acreage	Average Depth (ft)	Volume (ac ft)	Amount of Product (Gal)	Product Unit Cost (Gal)	Total Cost
2	0.278	4	1.112	10.50	\$ 54.00	\$ 567.00
3	0.770	4	3.08	29.20	\$ 54.00	\$ 1,576.80
4	0.396	4	1.584	15.00	\$ 54.00	\$ 810.00
5	2.414	4	9.656	91.70	\$ 54.00	\$ 4,951.80
6	1.464	4	5.856	55.60	\$ 54.00	\$ 3,002.40
7	0.957	3	2.871	27.20	\$ 54.00	\$ 1,468.80
8	2.124	5	10.62	100.80	\$ 54.00	\$ 5,443.20
9	0.838	4	3.352	31.80	\$ 54.00	\$ 1,717.20
10	0.638	3	1.914	18.10	\$ 54.00	\$ 977.40
18	0.245	6	1.47	14.00	\$ 54.00	\$ 756.00
19	0.502	6	3.012	28.60	\$ 54.00	\$ 1,544.40
22	0.471	6	2.826	26.80	\$ 54.00	\$ 1,447.20
23	1.046	6	6.276	59.60	\$ 54.00	\$ 3,218.40
26	0.107	4	0.428	4.00	\$ 54.00	\$ 216.00
28	1.108	5	5.54	52.60	\$ 54.00	\$ 2,840.40
29	1.626	5	8.13	77.20	\$ 54.00	\$ 4,168.80
30	1.680	5	8.4	79.80	\$ 54.00	\$ 4,309.20
TOTALS:	16.66	N/A	76.13	723	N/A	\$ 39,015.00

# **Total Project Costs**

Expense	Cost T	Total Cost		
Setup	Fixed	N/A	\$	565.00
Application Labor	Variable	\$105/acre	\$	1,785.00
Product	Variable	\$54.00/Gal	\$	39,015.00
		Total Project Cost	: \$	41,365.00