Bantam Lake

Litchfield, CT

State Listed Aquatic Plant Survey

2025

Prepared for the Bantam Lake Association

December 31, 2025

Gregory J. Bugbee and Riley S. Doherty

Department of Environmental Science and Forestry

CAES

The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875

Contents

Figure 1. Herbarium mounts of the state listed species water marigold (left) obtained in 2022 from Bantam Lake and slender watermilfoil (right) obtained in 2005 from West Side Pond.

Introduction

The Connecticut Agricultural Experiment Station Office of Aquatic Invasive Species (CAES OAIS) has surveyed and mapped the aquatic vegetation in nearly 400 waterbodies in Connecticut (CAES OAIS 2025). Many contain aquatic plants that are classified as endangered, rare, or species of special concern based on the number of sites they inhabit. These species are therefore protected by State statute. Among these are water marigold *(Bidens beckii, syn. Megalodonta beckii)* and slender watermilfoil *(Myriophyllum alterniflorum)* which have been documented in Bantam Lake. Water marigold is least rare and classified as "Special Concern" while alternate watermilfoil is extremely rare and classified as "Endangered" (CT DEEP 2025). CAES has found water marigold in seven lakes and slender watermilfoil in one (Figure 1). Additional records of both species can be found in UCONN's George Safford Torrey Herbarium (UCONN 2025). From 2002 – 2017 Northeast Aquatic Research (NEAR 2019) documented both species in Bantam Lake (Figure 2). In 2019 and 2022, aquatic plant surveys performed by CAES found a robust

population of water marigold but no slender watermilfoil (Bugbee and Stebbins 2019, 2022). These plants have been shown to inhabit the shallows along with a diverse plant community including invasive Eurasian watermilfoil (*Myriophyllum spicatum*), fanwort (*Cabomba caroliniana*), and European waterclover (*Marsilea quadrifolia*). This report is designed to meet the Connecticut Department of Energy and Environmental Protection (CT DEEP) Natural Diversity Database (NDDB) requirements for the conservation of state-listed species.

Methods

In 2025, on July 24, 25, and 28, and September 10 and 15, CAES OAIS surveyed Bantam Lake, the Bantam River, and Little Pond for water marigold and alternate watermilfoil. Fanwort and Eurasian watermilfoil locations were marked in the Bantam River, and Little Pond. Movement of boats up the Bantam River was impeded by three beaver dams (Figure 6). Observations of the general plant community were also noted. Survey techniques include slowly traveling by boat through the areas likely to support the species of concern and noting their locations with a global positioning system (GPS). In many cases shallow water and dense vegetation required the surveyor to walk the area while pulling the boat. In addition to visual observation, plants were collected with a rake to ensure identification was accurate. Locations of state-listed species, invasive species, and the boat path were recorded and mapped using a Bad Elf Flex Mini Extreme GPS receiver and the ESRI ArcGIS FieldMaps app on a rugged Samsung Galaxy Tab Active 4 Pro tablet (Figure 3). Plant identifications followed the taxonomy of Crow and Hellquist (2023).

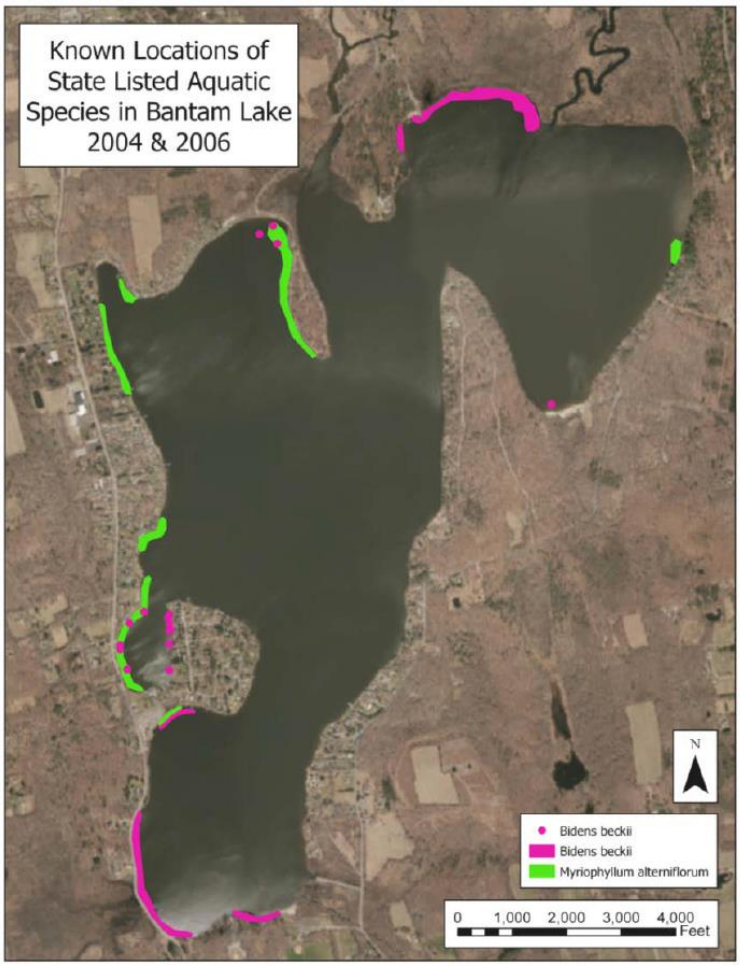


Figure 2. Locations of alternate watermilfoil and water marigold in 2004 and 2006 (NEAR 2019).

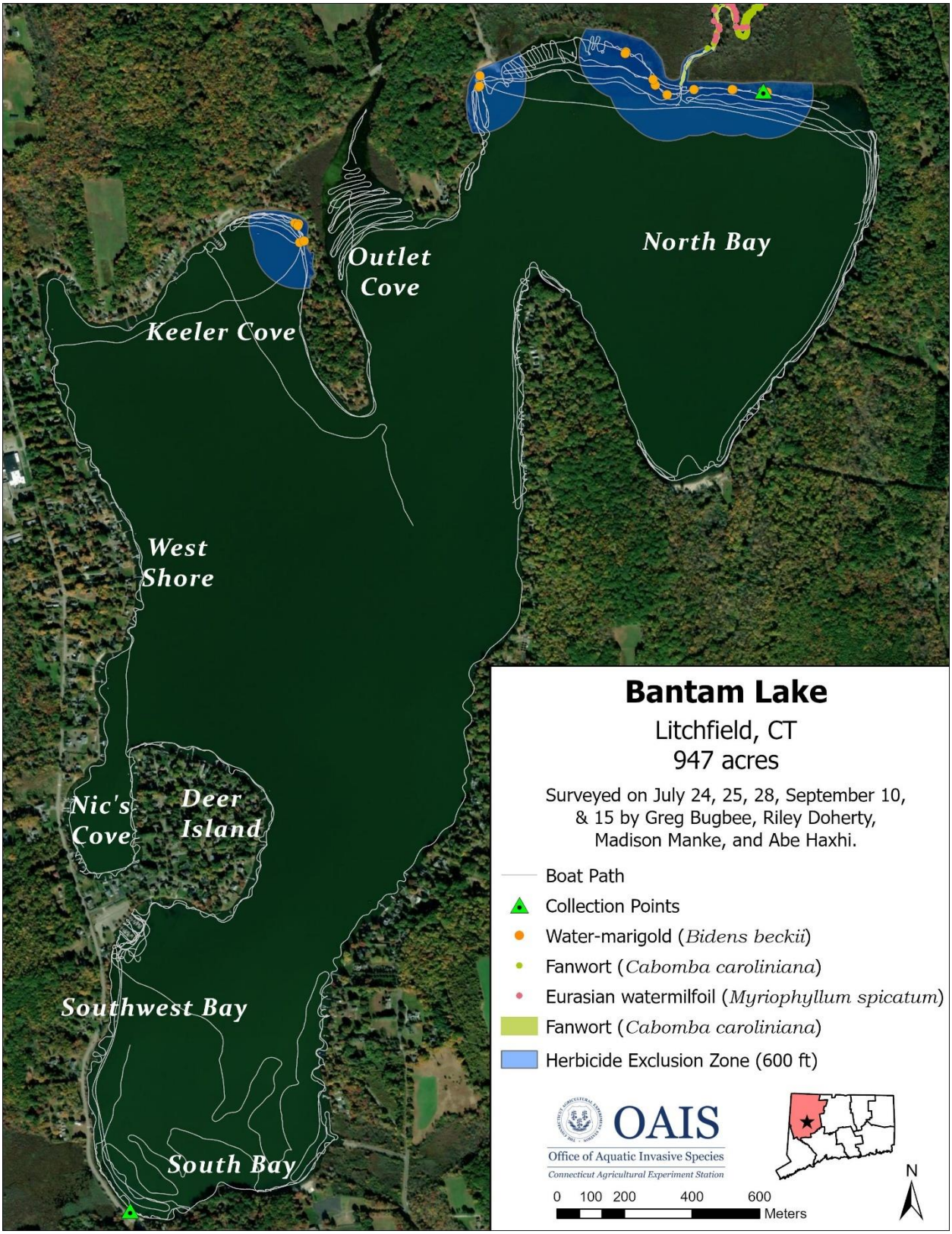


Figure 3. 2025 CAES state-listed plant survey of Bantam Lake and 600-foot herbicide exclusion zone.

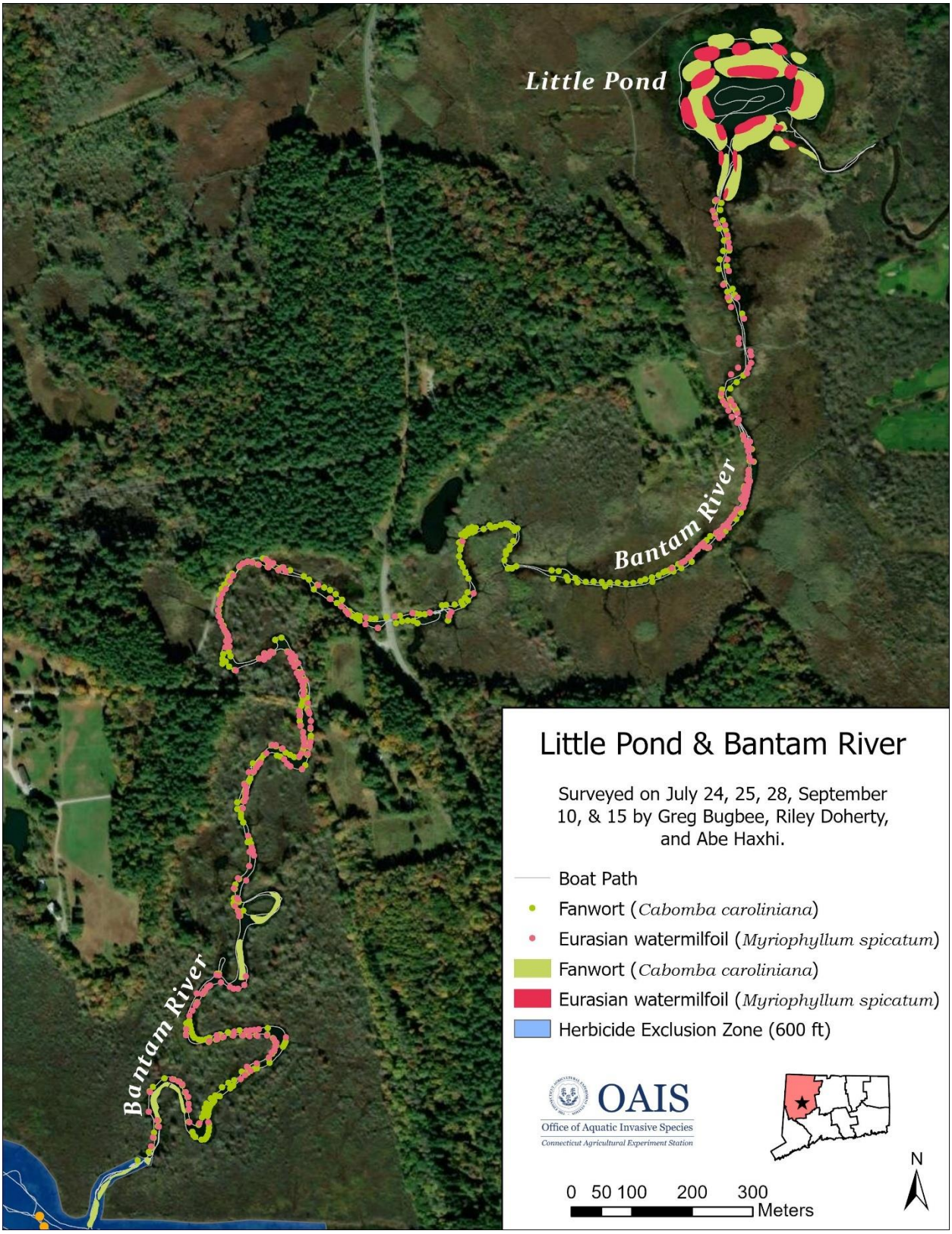


Figure 4. 2025 CAES state-listed, fanwort, and Eurasian watermilfoil plant survey of Bantam River and Little Pond.

Figure 5. Water marigold in Bantam Lake's North Cove in 2025. Blue arrow points to emersed flower.

Notable features of water marigold include a yellow flower and opposite fanlike foliage that does not have an elongated petiole like the often-comingled invasive fanwort. Features of alternate watermilfoil that distinguishes it from other watermilfoils is alternate flowers on emersed spikes. The shallow water habitat for these species was often covered with dense vegetation such as white and yellow waterlily (*Nymphaea odorata*, *Nuphar varigata*) (Figure 5). In northern Outlet Cove of Bantam Lake, the vegetation was so dense it limited our access. This increased the chances that species could be missed. Water clarity during this survey ranged from 3 – 6 feet (1 – 2 m) which was adequate to see most plants.

Results

Bantam Lake

Our 2025 survey of Bantam Lake found the abundance of water marigold to be very similar to 2022; however, the number of locations were reduced from 106 to 20. This was likely caused by lower water levels, increased competition from native and invasive plants, and the resulting greater difficulty in finding water marigold. The plant was most prolific in the North Bay and sparse in Keeler's Cove (Figure 3). Slender

Figure 6. Southernmost of three beaver dams along the Bantam River affecting habitat and making upstream access by boat difficult.

watermilfoil was not observed anywhere in Bantam Lake. A Rare Plant Survey Form was submitted to CT DEEP NDDB with a copy in the appendix of this report. Water marigold typically occurred in organic substrate at a depth of around 1- 3 feet (0.3 -1 m). The associated native plant community consisted of coontail (*Ceratophyllum demersum*), white waterlily, yellow waterlily, pickerelweed (*Pontederia cordata*), purple bladderwort (*Utricularia purpurea*), water stargrass (*Heteranthera dubia,* synonym *Zosterella dubia*), common bladderwort (*Utricularia vulgaris*), European waterclover (*Marsilea quadrifolia*), and white-water crowfoot. Invasive fanwort and to a lesser extent Eurasian watermilfoil often cohabitated with the water marigold.

Bantam River and Little Pond

Neither water marigold or alternate watermilfoil were observed in the Bantam River or Little Pond. Both locations, however, were populated with abundant Eurasian watermilfoil and fanwort (Figure 4). Long term control of Eurasian watermilfoil and fanwort in Bantam Lake would likely need the addressing of these upstream populations.

Table 1. Water marigold location, depth, abundance, and associated plant community.

Plant abundance is on a scale of 1 - 5: 1 = present but rare (1 plant), 2 = occasional (a few plants), 3 = common (more than a few plants), 4 = abundant, 5 = extremely abundant or dominant; nd = no data/present but abundance not collected													*Follow this link to convert decimal degrees into degrees minutes seconds https://www.fcc.gov/media/radio/dms-decimal							
Surveyor	Depth (m)	Notes	BidBec	CabCar	CerDem	EloCan	EloNut	MarQua	MyrSpi	NajFle	NupVar	NymOdo	PonCor	PotAmp	PotPer	UtrVul	ValAme	ZosDub	Date, Time	Latitude*	Longitude
Abe Haxhi	1-3		nd	nd	0	0	0	0	0	0	nd	nd	0	0	0	nd	0	0	7/25/25 10:14 AM	41.71614	-73.20827
Abe Haxhi	1-3		nd	nd	0	0	0	0	0	0	nd	nd	0	0	0	nd	0	0	7/25/25 10:15 AM	41.71616	-73.20831
Abe Haxhi	1-3		nd	nd	0	0	0	0	0	0	nd	nd	0	0	0	nd	0	0	7/25/25 10:21 AM	41.71622	-73.20947
Abe Haxhi	1-3	Likely RanLon	nd	0	nd	0	0	0	nd	nd	0	0	0	nd	0	nd	0	nd	7/25/25 12:02 PM	41.71655	-73.21847
Abe Haxhi	1-3	Likely RanLon	nd	0	0	0	0	0	0	0	nd	nd	0	nd	0	0	nd	0	7/25/25 12:12 PM	41.71625	-73.21852
Abe Haxhi	1-3	Likely RanLon	nd	0	0	0	0	0	0	0	nd	nd	0	nd	0	0	nd	0	7/25/25 12:12 PM	41.71627	-73.21849
Abe Haxhi	0-1		nd	0	0	0	nd	nd	nd	nd	nd	nd	nd	0	nd	0	nd	nd	7/28/25 12:57 PM	41.71260	-73.22503
Abe Haxhi	0-1		nd	0	0	0	nd	nd	nd	nd	nd	nd	nd	0	nd	0	nd	nd	7/28/25 12:58 PM	41.71258	-73.22491
Abe Haxhi	0-1		nd	0	0	0	nd	nd	nd	nd	nd	nd	nd	0	nd	0	nd	nd	7/28/25 12:59 PM	41.71253	-73.22493
Abe Haxhi	1-3		nd	0	0	0	0	0	0	0	0	2	0	nd	0	0	0	0	7/28/25 1:05 PM	41.71208	-73.22487
Riley Doherty	1-3	algae bloom	2	0	0	0	0	0	0	0	nd	nd	0	0	0	0	0	0	9/10/25 1:16 PM	41.71618	-73.20840
Riley Doherty	1-3		2	2	3	0	0	0	2	0	3	3	0	0	0	0	0	0	9/10/25 1:23 PM	41.71615	-73.20825
Riley Doherty	1-3		2	2	3	0	0	0	2	0	4	0	0	0	0	0	0	0	9/10/25 1:30 PM	41.71621	-73.20949
Riley Doherty	1-3		2	2	2	2	0	0	0	0	3	3	0	0	0	0	0	0	9/10/25 1:33 PM	41.71621	-73.21086
Riley Doherty	1.1		1	0	0	0	0	0	2	0	3	3	0	0	0	3	0	0	9/10/25 1:38 PM	41.71607	-73.21181
Riley Doherty	1.0	organic	2	0	0	0	0	0	2	0	3	3	0	0	0	2	0	0	9/10/25 1:41 PM	41.71633	-73.21223
Riley Doherty	1.0	organic	2	0	0	0	0	0	2	0	3	3	0	0	0	2	0	0	9/10/25 1:42 PM	41.71648	-73.21232
Riley Doherty	1-3	flowering	2	2	3	2	0	0	0	0	3	3	0	0	0	0	0	0	9/10/25 1:49 PM	41.71720	-73.21329
Riley Doherty	1-3	flowering	2	2	3	2	0	0	0	0	3	3	0	0	0	0	0	0	9/10/25 1:50 PM	41.71717	-73.21331
Riley Doherty	0.8		2	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	9/15/25 12:46 PM	41.71212	-73.22471

Conservation of State Listed Species and Future Management

Conservation of water marigold involves ensuring its habitat is protected and invasive aquatic plant management strategies avoid unintentional harm. Preventing habitat loss to invasive species such as fanwort and Eurasian watermilfoil is critical but must be weighed against potential damage from nuisance aquatic plant management. Because a significant population of water marigold exists in the North Bay, this area will need the greatest protection. Past herbicide treatments have allowed water marigold populations to remain strong, suggesting future use of the same regime will offer similar protection. Using short residual herbicides such as Diquat, Clipper® and ProcellaCOR® will likely cause little harm if an herbicide exclusion zone of at least 600 feet is provided between any herbicide application and the water marigold locations. If future studies show water marigold is more tolerant of other products they should be considered. Unfortunately, this will not protect the state listed species from habitat loss to invasive species, such as fanwort, Eurasian watermilfoil, or potential newcomers such as hydrilla. This leaves few options for assuring invasive species do not overtake water marigold areas other than harvesting, careful placement of benthic barriers, and/or the utilization of limnobarriers that prevent herbicide movement. Routine surveillance should be employed to document any expansion of invasive species into the water marigold

locations or decline in the water marigold population caused by nuisance aquatic plant management or other factors.

Acknowledgments

The surveillance efforts of seasonal assistant Abraham Haxhi and volunteer Judith Hall are gratefully acknowledged. Information supplied by Constance Trolle of the Bantam Lake Protective Association is most appreciated.

References

Bugbee GJ, Stebbins SE, Barton ME, Wostbrock JA. 2022. Connecticut's Invasive Aquatic Plant, Clam, Mussel Identification Guide. 4th Ed. The Connecticut Agricultural Experiment Station. Bull. 1087. 54 pp. https://portal.ct.gov/-/media/CAES/DOCUMENTS/Publications/Bulletins/B1087.pdf

Bugbee GJ, Stebbins SE. 2019. Bantam Lake, Litchfield CT, State Listed Aquatic Plant Survey. Prepared for The Bantam Lake Protective Association. 18 pp.

Bugbee GJ, Stebbins SE. 2022. Bantam Lake, Litchfield CT, State Listed Aquatic Plant Survey. Prepared for The Bantam Lake Protective Association. 18 pp.

CAES OAIS. 2025. The Connecticut Agricultural Experiment Station Office of Aquatic Invasive Species (CAES OAIS). https://www.portal.ct.gov/caes-iapp. Retrieved December 31, 2025.

Crow, GE and Hellquist, CB. 2023. Aquatic and Wetland Plants of Northeastern North America. Second Edition. Madison, Wisconsin. The University of Wisconsin Press. 835 pp

CT DEEP. 2025. Endangered, Threatened, and Special Concern Plants. https://portal.ct.gov/DEEP/Endangered-Species/Endangered-Species-Listings/Endangered-Threatened--Special-Concern-Plants . Retrieved November 24, 2025.

Northeast Aquatic Research. 2019. Review of 13 years of herbicide treatments in Bantam Lake. Report to the Bantam Lake Protective Association. June 19, 2019. 57 pp.

UCONN. 2025. Biodiversity Research Collections. https://biodiversity.uconn.edu/herbarium/. Retrieved November 24, 2025.

Appendix

Rare Plant Survey Form

CTDEEP

Natural Diversity Database

OFFICE USE ONLY		EO#:
SNAME:	SITE:	SURVEY DATE:
	TOWN:	ENTERED BY:

☐ New record
☒ Update

RARE PLANT SURVEY FORM

Natural Diversity Data Base
Connecticut Department of Environmental Protection
79 Elm Street, 6th Floor
Hartford, CT 06106-5127

Please complete this form to the best of your ability.
Submit survey forms, maps, and all supporting documents to the address above or email to deep.nddbrequest@ct.gov

*SPECIES SCIENTIFIC NAME: Bidens beckii	Element Occurrence (EO) # (if known):

REPORTER INFORMATION	
Name(s): Greg Bugbee _ Office of Aquatic Invasive Species	
Address: 123 Huntington Street	Telephone No: 203 974-8512
New Haven CT 06511	E-mail address: gregory.bugbee@ct.gov

SURVEY/SITE INFORMATION	
Site Name: Bantum Lake	Survey Date(s): July 24,25,28 September 10,15 - 2025
Town(s): Litcfield	County: Litchfield

Directions to plant population, including best parking and access points. Please attach a map with boundaries drawn around observed plant populations (or surveyed area if plants not found).

See maps attached to this form

GPS Coordinates			Method Used to Determine Coordinates:	
Latitude	41.715974	N	☒ GPS Unit	GPS Make/Model: Bad Elf,Flex Mini Extreme
Longitude:	73.205807	W	☒ Mapping Software	Software: ESRI ArcGIS Maps
Coordinate system (NAD83 preferred):	NAD1983		☐ Online Maps	Online site:

POPULATION DATA

Population Size	
Actual No. Observed	NA
Estimated No./Range	200-1000

What was counted?
(e.g. stems, clumps, floating masses, etc.)
sporadic rooted plants, sometime to the surface, rarely with flowers

Population Area	
Length (units)	1500 ft
Width (units)	150 ft
Area (units)	5.1 acres (sporadic)

Evidence of disease, predation or injury? ☐ Yes ☐ No Explain:

Phenology			
100	% In leaf	0	% Mature fruit
1	% In flower bud	0	% Seed dispersing
0.5	% In flower	0	% Dormant
0	% Immature fruit	20	% Senescent

Age Structure	
0	% Seedlings
0	% Immature
80	% Mature (established)
20	% Senescent
☐	Age structure unknown

Vigor
☐ Very feeble
☐ Feeble
☒ Normal
☐ Vigorous
☐ Exceptionally vigorous

Comments on above:

HABITAT

Aspect	Slope	Light	Topographic Position	Moisture
☐ N ☐ NE	☐ 0-3%	■ Open	☐ Crest	■ Permanently Inundated
☐ E ☐ NW	☐ 3-8%	☐ Partial	☐ Upper Slope	☐ Seasonally Inundated/Exposed
☐ S ☐ SE	☐ 8-15%	☐ Filtered	☐ Mid-Slope	☐ Tidally Inundated/Exposed
☐ W ☐ SW	☐ 15-35%	☐ Shade	☐ Lower-Slope	☐ Saturated (Hydric)
☐ Flat	☐ 35% - vertical		☐ Bottom	☐ Moist (Mesic)
°re true N	Measured (° or %):		Other: Lake 0.5 -2m	☐ Dry-Mesic
°re mag N	Horizontal shape (as for next item):			☐ Dry-Xeric
	Vertical shape (ie. Convex, concave, straight, variable):			Other:

Elevation: 890 to 892 ■ feet ☐ meters

Soil/substrate name/description(give source): organic

Estimated # of acres of potential habitat in the immediate area: 20

Evidence of disturbance: ☐ fire ☐ logging ☐ disease ☐ insect damage ☐ windthrow ☐ invasives

Comments:

Associated natural/plant communities:

Coontail (Ceratophyllum demersum), White waterlily (Nymphaea odorata), yellow waterlily (Nuphar varigata), fanwort (Cabomba caroliniana), Eurasian watermilfoil (Myriophyllum spicatum), pickeralweed (Pontedaria cordata), purple bladderwort (Utricularia purperea) water stargrass (Heteranthera dubia), common bladderwort (Utricularia vulgaris), water shamrock (Marselia quadrifolia), White water crow foot (Ranunculus longirosttris)

Associated plant species (separated strata, e.g. tree, shrub, herb layers):

IDENTIFICATION

Photograph taken?	■ Yes	☐ No	Photo ID:	
Specimen taken*	☐ Yes	■ No	If yes, provide:	Collector:
				Repository:
				Collection #:
Identification problems?	■ Yes	☐ No	Explain:	Sometimes confused with fanwort and white water crowfoot

*DEP Scientific Collection Permit is needed to collect specimens

CONSERVATION

Owner info: State of CT

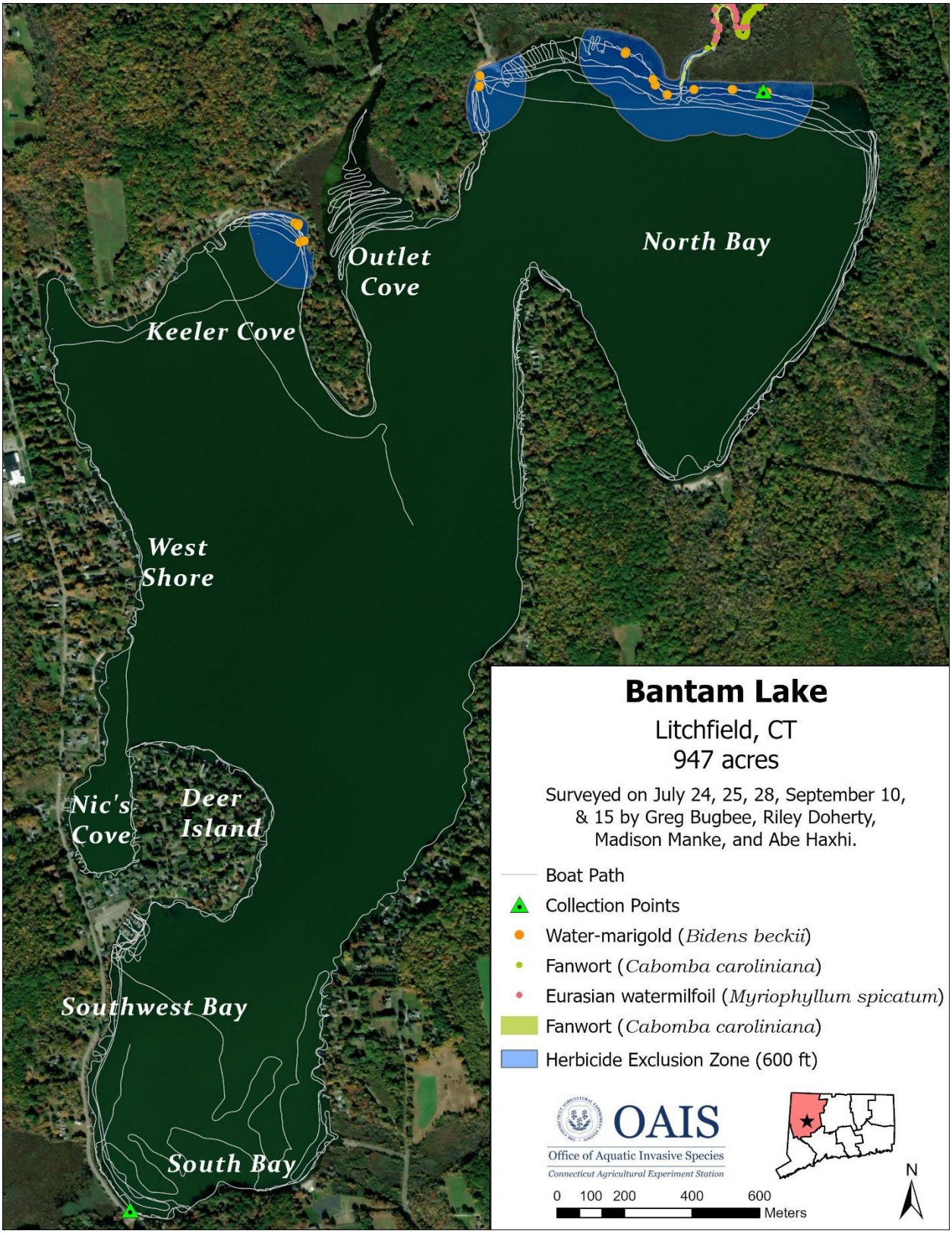
Owner aware of EO? ☐ Yes ☐ No ☐ Unknown Owner protecting EO? ■ Yes ☐ No ☐ Unknown

Threats to EO:	Invasive species, aquatic plant management, climate change
Conservation/ management needs:	Population monitoring, buffer zone from aquatic plant management
Research needs:	Resistance to herbicides

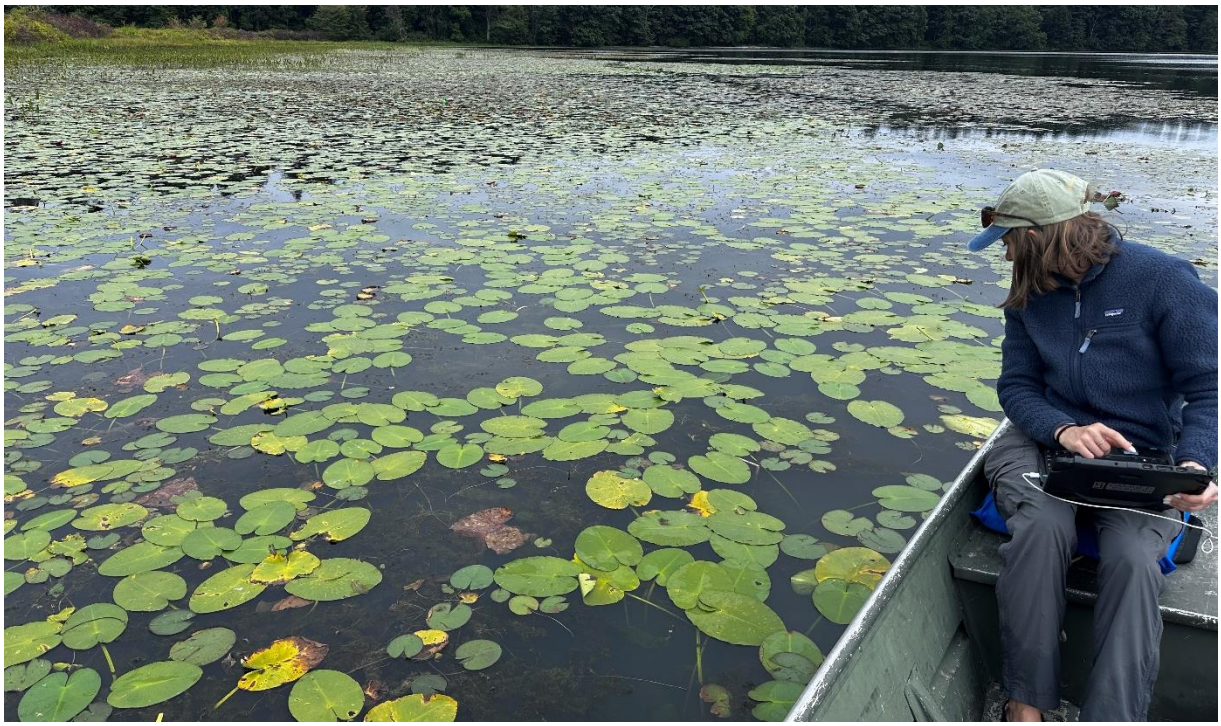
SUPPORTING DOCUMENTS (please attach)

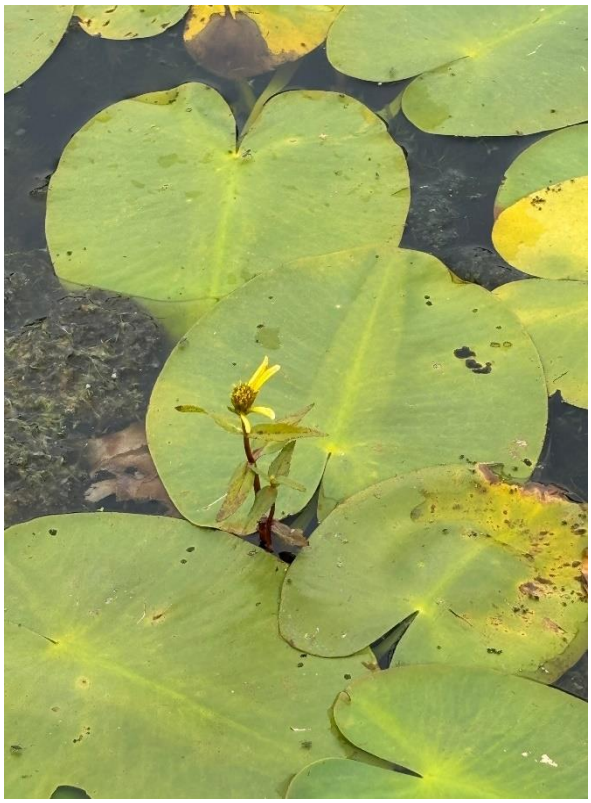
☐ Sketch map (showing finer detail than topo or aerial photo)
■ Aerial photo map
☐ Topographic map, or street or parcel map
☐ Cross section of topography/habitat (include scale, direction, element position, description, and sub-occurrence ID[s], if needed)
■ Photos ■ GPS/GIS data ☐ Field notes ■ Route of survey map

Locations of Water Marigold in Bantam Lake – 2025



Water marigold in flower in Bantam Lake mixed with white/yellow waterlily





Locations of Water Marigold in Keeler Cove and North Bay

Bantam Lake, Litchfield

***Bidens beckii* Locations**

Surveyed by Greg Bugbee, Riley Doherty, and Abe Haxhi

Plant abundance is on a scale of 1 - 5: 1 = present but rare (1 plant), 2 = occasional (a few plants), 3 = common (more than a few plants), 4 = abundant, 5 = extremely abundant or dominant; nd = no data/present but abundance not collected

*Follow this link to convert decimal degrees into degrees minutes seconds https://www.fcc.gov/media/radio/dms-decimal

Surveyor	Depth (m)	Notes	BidBec	CabCar	CerDem	EloCan	EloNut	MarQua	MyrSpi	NajFle	NupVar	NymOdo	PonCor	PotAmp	PotPer	UtrVul	ValAme	ZosDub	Date, Time	Latitude*	Longitude
Abe Haxhi	1-3		nd	nd	0	0	0	0	0	0	nd	nd	0	0	0	nd	0	0	7/25/25 10:14 AM	41.71614	-73.20827
Abe Haxhi	1-3		nd	nd	0	0	0	0	0	0	nd	nd	0	0	0	nd	0	0	7/25/25 10:15 AM	41.71616	-73.20831
Abe Haxhi	1-3		nd	nd	0	0	0	0	0	0	nd	nd	0	0	0	nd	0	0	7/25/25 10:21 AM	41.71622	-73.20947
Abe Haxhi	1-3	Likely RanLon	nd	0	nd	0	0	0	nd	nd	0	0	0	nd	0	nd	0	nd	7/25/25 12:02 PM	41.71655	-73.21847
Abe Haxhi	1-3	Likely RanLon	nd	0	0	0	0	0	0	0	nd	nd	0	nd	0	0	nd	0	7/25/25 12:12 PM	41.71625	-73.21852
Abe Haxhi	1-3	Likely RanLon	nd	0	0	0	0	0	0	0	nd	nd	0	nd	0	0	nd	0	7/25/25 12:12 PM	41.71627	-73.21849
Abe Haxhi	0-1		nd	0	0	0	nd	nd	nd	nd	nd	nd	nd	0	nd	0	nd	nd	7/28/25 12:57 PM	41.71260	-73.22503
Abe Haxhi	0-1		nd	0	0	0	nd	nd	nd	nd	nd	nd	nd	0	nd	0	nd	nd	7/28/25 12:58 PM	41.71258	-73.22491
Abe Haxhi	0-1		nd	0	0	0	nd	nd	nd	nd	nd	nd	nd	0	nd	0	nd	nd	7/28/25 12:59 PM	41.71253	-73.22493
Abe Haxhi	1-3		nd	0	0	0	0	0	0	0	0	2	0	nd	0	0	0	0	7/28/25 1:05 PM	41.71208	-73.22487
Riley Doherty	1-3	algae bloom	2	0	0	0	0	0	0	0	nd	nd	0	0	0	0	0	0	9/10/25 1:16 PM	41.71618	-73.20840
Riley Doherty	1-3		2	2	3	0	0	0	2	0	3	3	0	0	0	0	0	0	9/10/25 1:23 PM	41.71615	-73.20825
Riley Doherty	1-3		2	2	3	0	0	0	2	0	4	0	0	0	0	0	0	0	9/10/25 1:30 PM	41.71621	-73.20949
Riley Doherty	1-3		2	2	2	2	0	0	0	0	3	3	0	0	0	0	0	0	9/10/25 1:33 PM	41.71621	-73.21086
Riley Doherty	1.1		1	0	0	0	0	0	2	0	3	3	0	0	0	3	0	0	9/10/25 1:38 PM	41.71607	-73.21181
Riley Doherty	1.0	organic	2	0	0	0	0	0	2	0	3	3	0	0	0	2	0	0	9/10/25 1:41 PM	41.71633	-73.21223
Riley Doherty	1.0	organic	2	0	0	0	0	0	2	0	3	3	0	0	0	2	0	0	9/10/25 1:42 PM	41.71648	-73.21232
Riley Doherty	1-3	flowering	2	2	3	2	0	0	0	0	3	3	0	0	0	0	0	0	9/10/25 1:49 PM	41.71720	-73.21329
Riley Doherty	1-3	flowering	2	2	3	2	0	0	0	0	3	3	0	0	0	0	0	0	9/10/25 1:50 PM	41.71717	-73.21331
Riley Doherty	0.8		2	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	9/15/25 12:46 PM	41.71212	-73.22471