

2019 Chelsea Hill Solar Rare Plant Monitoring Report

I. Introduction

As part of the environmental assessment for the proposed Chelsea Solar Project, Arrowwood Environmental (AE) assessed the proposed impacts on rare, threatened and endangered (RTE) plant species. An RTE plant inventory of the Project site was conducted on August 14th, 2014 and subsequently updated on October 11-12, 2017. In 2014, a population of arrow-leaved aster (*Symphotrichum urophyllum*) was discovered in the Project area. This plant is not listed as Threatened or Endangered in Vermont, but it is ranked as S1-very rare. Transplantation of the arrow-leaved aster into an established Conservation Area occurred in 2014 and 2017. The purpose of this report is to document the monitoring efforts that were undertaken in 2019 to assess those transplantation efforts.

II. Monitoring

A map of the Project site with the Conservation Area, plant locations and transplant plot locations is shown in Figure 1.

Monitoring of the transplant plots has occurred yearly since transplanting occurred in 2014. The monitoring in 2019 occurred on September 27. During each monitoring period, the number of basal rosettes and flowering stems in each plot was documented. The plots were weeded starting in 2017 and will continue to be weeded during each monitoring event. The focus of the weeding process is to decrease competition on the arrow-leaved aster plants. While most species other than the aster were removed, in order to minimize disturbance to the aster plants some species were left untouched. Table 2 lists the plot data from the four transplant plots.

Table 2. Vegetation data of *Symphyotrichum urophyllum* transplant plots

	# Of Plants 2014	# Of Plants 2015	# Of Plants 2016	# Of Plants 2017	# Of Plants 2018	# Of Plants 2019**
Plot 1	22	30	33	51	43	22 (54)
Plot 2	36	42	43	45	42	26 (4)
Plot 3	31	44	43	48	38	33 (24)
Plot 13*	NA	NA	NA	9	21	16 (10)
TOTAL	89	116	119	153	144	97 (92)
Change since transplantation		+27	+30	+55	+46	-1

*Plot 13 was established in 2017.

**Number of basal rosettes shown in parenthesis

As can be seen from this data, the overall success rate since transplantation is fairly good. While there is fluctuation throughout the years, five years after transplantation (2 years for plot 13), there is only one fewer plant than was transplanted. However, when looking at the change since transplantation for each year (bottom row in Table 2), it becomes apparent that the number of total plants in the plots is on the decline following the peak in 2017. The reason for this decline is not known.

Germination of the aster seeds appears to be good within the transplant plots. There is often a flush of recently germinated plants which survive for a single season and then die. Since these recently germinated basal rosettes look very different from the mature plants, this was not recognized until 2019. In 2019 the number of these basal rosettes was counted and the numbers of these presented in the 2019 column in parenthesis. Since the majority of these plants will die, it is unlikely that these numbers will represent a spike in the population. However, this information may be useful in understanding the local population dynamics in future years.

A photographic record of each plot during each monitoring event is attached. To comply with the Memorandum of Understanding established with the Vermont Agency of Natural Resources, monitoring will continue for three years post-construction. No project construction has yet occurred.

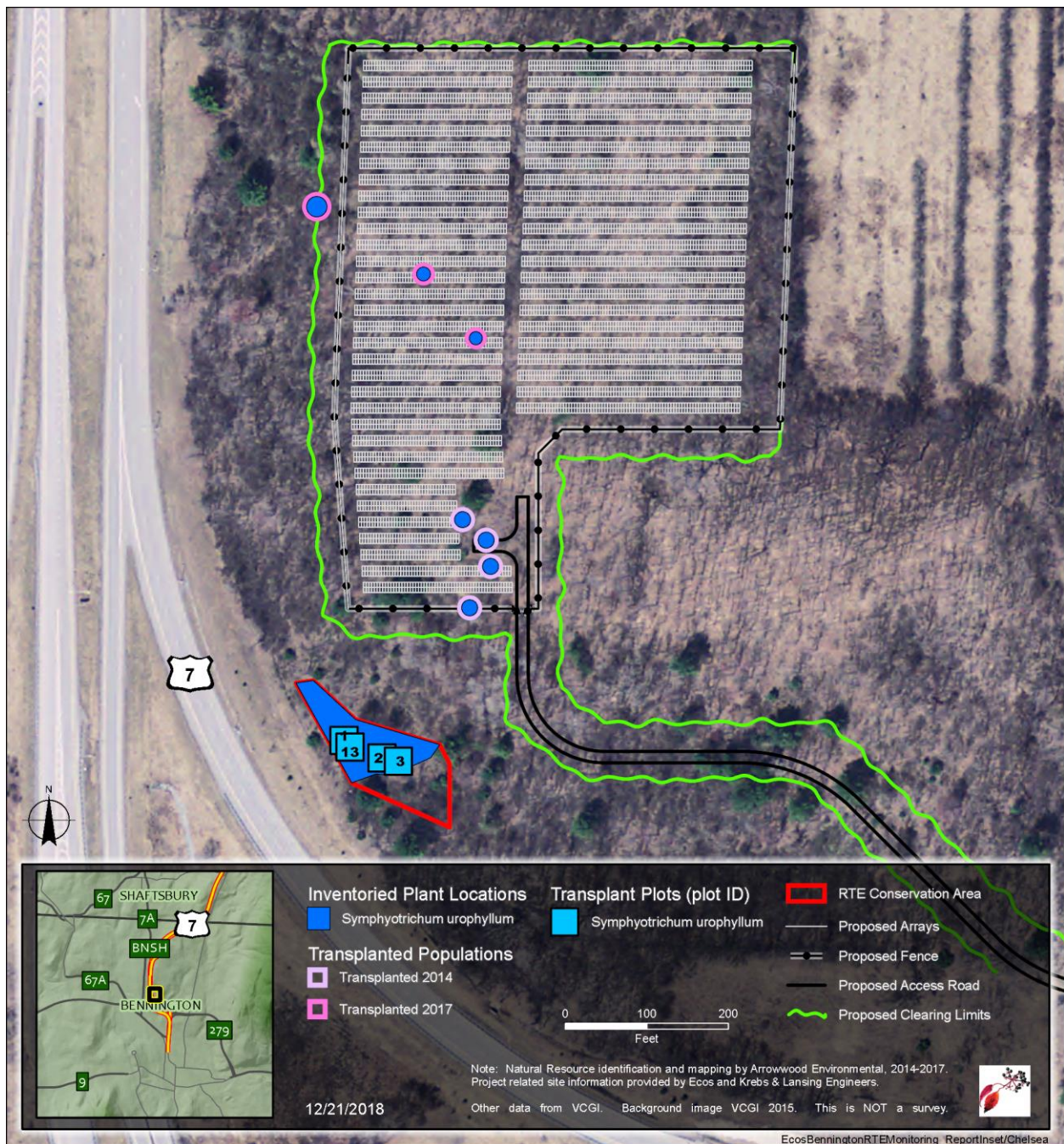


Figure 1. Map of rare plant populations and transplant plots

Appendix 1:

Photo Documentation of *Symphyotrichum urophyllum* transplant plots

Plot 1



Plot 1 10/12/2014



Plot 1 10/7/2015



Plot 1 9/13/2016



Plot 1 10/12/2017

Plot 1 (con't)

	
Plot 1 10/17/2018	Plot 1 9/27/2019

Plot 2



Plot 2 10/12/2014



Plot 2 10/7/2015



Plot 2 9/13/2016



Plot 2 10/12/2017

Plot 2 (con't)

	
Plot 2 10/17/2018	Plot 2 9/27/2019

Plot 3



Plot 3 10/12/2014



Plot 3 10/7/2015



Plot 3 9/13/2016



Plot 3 10/12/2017

Plot 3 (con't)



Plot 3 10/17/2018



Plot 3 9/27/19

Plot 13



Plot 13 11/28/2017



Plot 13 10/17/2018



Plot 13 9/27/2019