

Narrative of activities to be completed at World's End to improve pollinator habitat 2021-2024.

To improve habitat for native pollinators, grassland birds and other native species, The Trustees are undertaking a multi-year pollinator habitat improvement project across the existing grassland/field habitats at World's End. This project was developed in partnership with the USDA Natural Resources Conservation Service with guidance from the Xerxes Society for Invertebrate Conservation. Native insects (including pollinators) are currently faced with a barrage of threats including habitat loss, pesticide use, non-native species, deer overabundance, and climate change.

A pollinator habitat enhancement plan is a site-specific conservation plan that outlines actions necessary for the improvement, restoration, enhancement, or expansion of flower-rich habitat that supports native pollinators. The fields at World's End are primarily cultural grasslands, surrounded by oak-hickory forest, maritime juniper woodland, salt marsh, shrub swamp and coastal beaches/bank. The Trustees have recognized the importance of the fields for wildlife including butterflies (approximately 50 species have been documented at World's End), regionally declining grassland birds, and uncommon plant species. Unfortunately, over time non-native invasive species as well as certain woody species have become dominant in the fields and are negatively impacting the habitats for native pollinators.

To address the habitat degradation of the fields for native pollinators and grassland dependent species, we will use a set of management practices within the current footprint of the fields at World's End. These management practices include the use of herbicide targeted to control undesirable vegetation, timing and frequency of mowing to encourage desirable vegetation, and augmentation/planting of pollinator friendly plants. The application of this set of techniques will be based on each field's current species composition, desired future condition, and a sensitivity to the recreational use of the property. The project activities will occur over four years (2021-2024) to gradually change the field conditions and ensuring appropriate recreational access to the property.

For hayfields and grassland bird fields (PH-1, PH-4A, WEo-1, WEo-2, PH-2, WEi-1), the general practice will be to use a selective herbicide to target invasive woody and forb species throughout the fields followed by augmenting with pollinator friendly forbs suitable for hay. Fields managed for native pollinator habitat (PiH-1, PiH-2, PiH-3, PH-4B, PH-5, PH-6, WEi-5, WEi-6) and fields managed for early successional habitat (PH-3, WEi-3, WEi-4), we will use a combination of spot treating invasive woody and forb species as well as creating strips of pollinator friendly vegetation with non-selective herbicide and mowing followed by planting. Planting will be accomplished using a no-till seed drill, which allows seeding into existing vegetation as well as prepared seed beds. Both selective and non-selective herbicides will be approved for use in wetland habitats. Where appropriate, cover crops or other erosion control best management practices may be used.

Details of the practices by field are highlighted in the following table (for fields that include wetland resource areas or buffers) and within the Pollinator Habitat Enhancement Plan for World's End (2019, for the whole property). Pollinator planting will entail multiple rounds of invasive plant control throughout the fields (spot treatments or spray treatments for large patches), followed by the creation of strips for planting beds for native pollinator seeds. These strips will be repeatedly mowed and herbicide used over a growing season to clear the strips of grasses and forbs to prepare a suitable seedbed for the plantings. The amount of work done will depend on how quickly we can eliminate the existing vegetation to have a clean planting bed (per Xerxes Society and NRCS recommendations). We will then use a no-till seed drill to plant the native wildflower and grass seed mix in the fall to allow for

cold stratification of the seed to increase germination success. Field sections within the 100-foot buffer of a wetland resource area will receive routine mowing and invasive plant control. The more intensive pollinator planting strips will be kept outside of the buffer zone.

Field locations under partial WPA and Hingham Conservation Commission jurisdiction with anticipated dates of work (dates may change due to weather conditions and other factors).

Location	Field Unit	Ecological target	Annual mowing practices	Planting ¹	Selective herbicide ²	Non-selective herbicide ³ .
Pine Hill	PIH-2	Pollinator	Late September	Fall 2024	May 2022, 2023	Fall 2023, 2024
	PIH-3	Pollinator	Late September	Fall 2024	May 2022	Fall 2023, 2024
	PIH-4	Pollinator/ Winter Hab.	Early May	Fall 2024	May 2022, 2023	Fall 2023, 2024
Planter's Hill	PH-4B	Pollinator	Early October	Fall 2024	May 2022, 2023	Fall 2023, 2024
World's End inner	WEi-3	Early successional	Every 2-3 years	Fall 2024	May 2021	Fall 2023, 2024
	WEi-5	Pollinator	Late September	Fall 2024	May 2022	Fall 2023, 2024
	WEi-6	Pollinator	Late September	Fall 2024	May 2022	Fall 2023, 2024
Damde Meadow	DM-1	Pollinator/ winter hab.	Early May	Fall 2024	May 2022	Fall 2023, 2024

¹Planting/ augmentation with native forbs and grasses using no-till seed drill or frost seeding.

²Selective herbicide targeting non-natives & woody species.

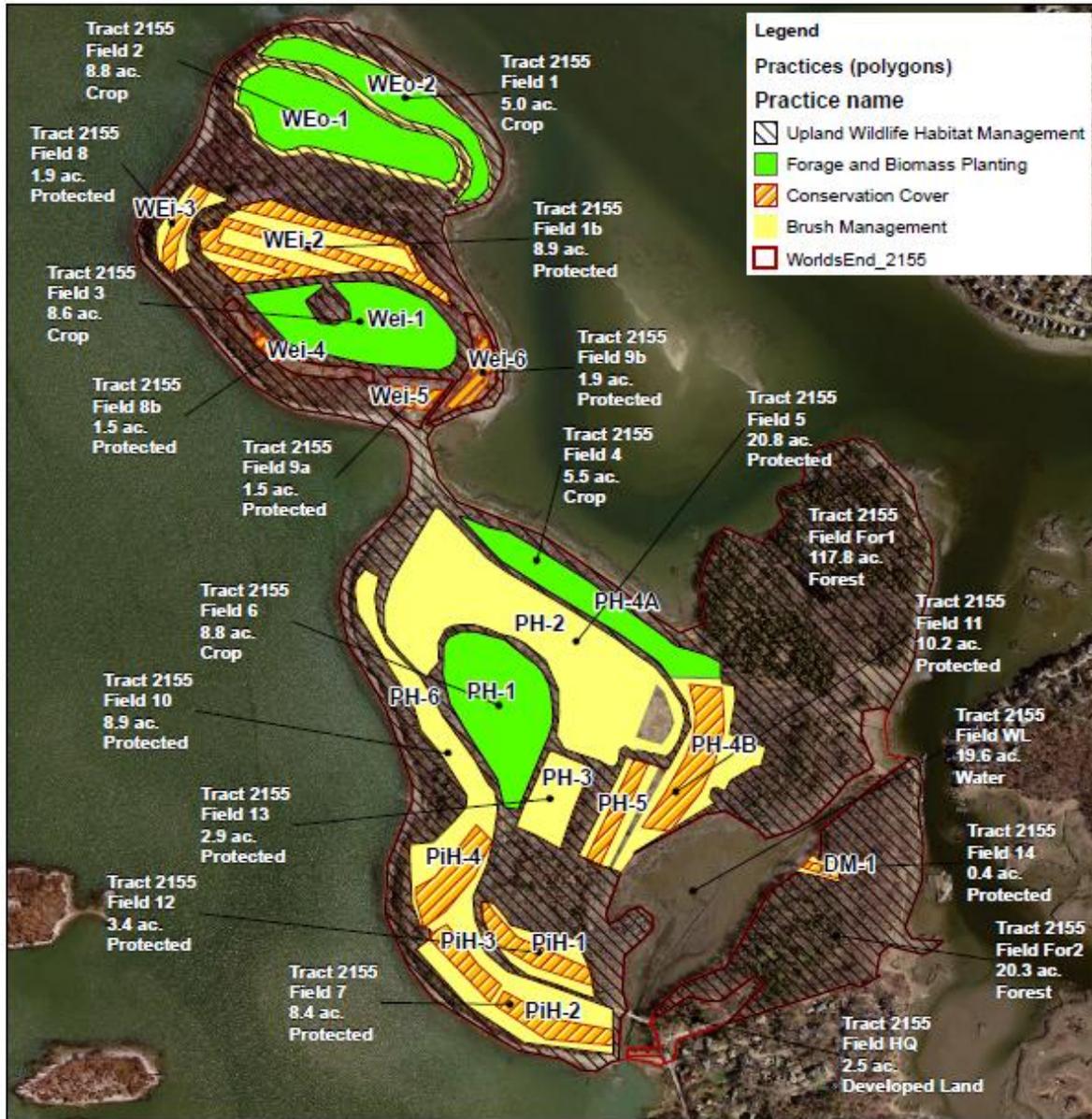
³Non-selective herbicide strip treatment and planting of native species and grasses. Treated strips to be outside of the 100 foot buffer zone.

Implementation of the Pollinator Habitat Management Plan will occur from 2021-2024, with initial activities being spot invasive treatment and hayfield improvement, followed by creation of strips for replanting with native pollinator plants. The chart above indicates dates for some of the activities, but these may change depending on weather conditions and capacity to complete the project using either contractors or preferably self-performing. We are planning on trialing the strip method on at least one interior field before using it within fields that are closer to wetland resource areas. This will give us an opportunity to see how local conditions may affect the success of this practice at World's End and highlight any changes necessary before expanding more broadly to the other fields. We do not anticipate erosion impacting habitats outside of the fields as vegetative cover will be maintained along field edges throughout the project.

Conservation Plan Map

Customer(s): TRUSTEES OF RESERVATIONS
 District: PLYMOUTH CONSERVATION DISTRICT
 Date: 1/31/2020
 State and County: MA, Plymouth County; Martins Lane, Hingham

Field Office: WEST WAREHAM SERVICE CENTER
 Agency: USDA-NRCS
 Assisted By: LISA PETRUSKI
 Land Units: Farm 2040 Tract 2155



Prepared with assistance from USDA-Natural Resources Conservation Service

