Interim Core Map Documentation for the American Chaffseed

Version 1

Review Completed: April 2026

Core Map Developer: Compliance Services International (CSI) on behalf of the National Corn Growers Association, reviewed by Center for Biological Diversity

Species Summary

The American chaffseed (*Schwalbea americana*; Entity ID 996) is a dicotyledonous endangered plant found in Alabama, Florida, Georgia, Louisiana, Massachusetts, New Jersey, North Carolina and South Carolina. The U.S. Fish and Wildlife Service (FWS) has not assigned designated critical habitat for the American chaffseed. This species inhabits pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. Additional habitat information is provided in **Appendix 1**.

Review Notes

The developers created this core map using the U.S. Environmental Protection Agency's (EPA) process available at: https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas. EPA reviewed the draft map and documentation and evaluated if: (1) the map and documentation are consistent with the agency's process; (2) areas included or excluded from the core map are consistent with the biology, habitat, and/or recovery needs of the species; (3) data sources are documented and appropriate; and (4) the Geographic Information System (GIS) data and mapping process are consistent with the stated intention of the developer. EPA agrees that this map is a reasonable depiction of core areas for this species based on the available information and was consistent with EPA's mapping process. This documentation was not prepared by EPA, and EPA may have edited this documentation for clarity or other purposes. Some views expressed in this documentation may not necessarily be the viewpoints of EPA or its staff.

The core map developed for this species can be used to develop pesticide use limitation areas (PULAs). This core map incorporates information developed by FWS and made available to the public. This core map may be revised in the future after FWS review of the core map or to incorporate additional information that becomes available for this species.

This core map does not replace or revise any range or designated critical habitat developed by FWS.

Description of Core Map

The core map for the American chaffseed is based on biological information, which was used to refine an extent determined by known observations. The species' 5-Year Review (FWS 2019a) includes a list of locations where extant occurrences have been documented and textual descriptions of habitats where the species is

known to occur. Known location information from the iNaturalist and Global Biodiversity Information Facility (GBIF) databases, and NatureServe, provided validation of the use of these sites as the outer boundary of core map extent but were not otherwise used in core map development.

Habitat areas were represented using the LANDFIRE Existing Vegetation Type (EVT) layer, with selected land cover types matching descriptions of species habitat (LANDFIRE 2024).

The core map developed in this document for the American chaffseed spans 191,651 acres (Figure 1). A summary of acreage by National Landcover Database (NLCD 2021) land use type is provided in

Table **1**.

Based on EPA's "best professional judgment classification" system, CSI has graded this core map as "moderate" (4) because assumptions were made when connecting species life history and/or biological needs (*i.e.* habitat preferences) to a Geographical Information System (GIS) dataset, in this case the LANDFIRE dataset (LANDFIRE 2024). These assumptions involved associating the species' primary habitat— pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems —with corresponding LANDFIRE classifications listed in **Appendix 2** Section 2.6. More information about the best professional judgment classification system and its definitions can be found in the core map process document (EPA 2024).

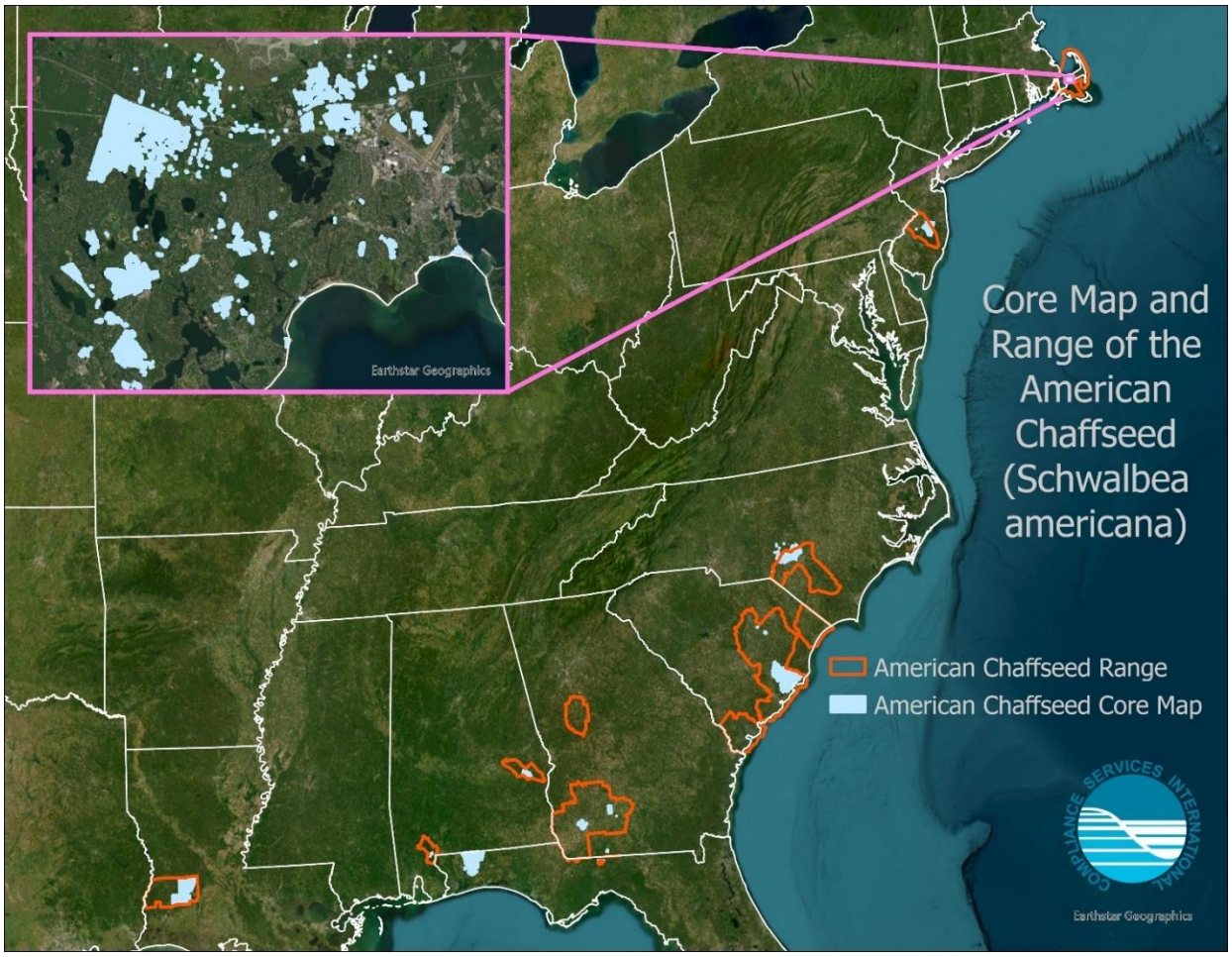

Figure 1. Interim core map for the American chaffseed (Schwalbea americana; Entity ID 996). The core map spans 191,651 acres, while the range is 14,482,885 acres.

Table 1. Acres by National Land cover Database (NLCD 2021) class within the core map of the American chaffseed. Total core map area (based on NLCD pixel count): 191,685 acres[1].

NLCD_Land_Cover_Class	Acres	%
Evergreen Forest	68,986	36
Woody Wetlands	54,845	28.6
Herbaceous	18,981	9.9
Shrub/Scrub	18,821	9.8
Barren Land	8,388	4.4
Mixed Forest	7,768	4.1
Cultivated Crops	6,030	3.1
Emergent Herbaceous Wetland	2,540	1.3
Deciduous Forest	2,249	1.2
Developed, Open Space	1,134	0.6
Developed, Low Intensity	920	0.5
Open Water	489	0.3
Hay/Pasture	372	0.2
Developed, Medium Intensity	150	0.1
Developed, High Intensity	12	0

Evaluation of Known Location Information

There were four evaluated datasets with known location information:

- Descriptions of locations provided by FWS
- Occurrence locations in iNaturalist
- Occurrence locations in GBIF
- Occurrence locations in NatureServe

Compliance Services International evaluated these datasets before developing the core map. Overall, there were seventy-two usable research-grade observations found in iNaturalist[2]. The GBIF dataset comprised 102 georeferenced observations, 53 of which were considered usable based on the criteria described below. Both datasets were useful to identify extant population sites for the American chaffseed, but not precise enough to be used in core map development. These datasets were largely redundant because the iNaturalist observations comprised all the GBIF observations. NatureServe public element occurrence (EO) data were also evaluated and used for comparison purposes to the core map

[1] This acreage is slightly different from the core map acreage (191,651) due to the pixelation of NLCD land cover. The core map is not developed exclusively from raster data.

[2] According to iNaturalist, an observation is designated as "research grade" if it 1) is verifiable with date, coordinates, photos/sounds, and not captive; 2) achieves community agreement defined as "more than 2/3 of identifiers needs to agree on the species level ID or lower;" and 3) "must pass a data quality assessment, which includes checks for accurate date and location, evidence of a wild organism, and clear evidence of the organism itself" (https://help.inaturalist.org/en/support/solutions/articles/151000169936-what-is-the-data-quality-assessment-and-how-do-observations-qualify-to-become-research-grade-).

FWS location information comprised of 43 sites where the species is known to occur, which provided a significant refinement.

Approach Used to Create Core Map

The core map was developed using EPA's process for developing core maps for species listed by the FWS and their designated critical habitat (referred to as "the process"). This core map was developed by CSI using the four steps described in the process document:

1. Compile available information for a species
2. Identify core map type from among the following defined types: critical habitat, range, and biological information. From EPA, summaries of each core map type are provided below (EPA 2024).
3. Develop the core map for the species
4. Document the core map

For step 1, CSI compiled available information for the American chaffseed (*Schwalbea americana*) from FWS, as well as observation information available from various publicly available sources including iNaturalist, GBIF, and NatureServe. The information compiled for the American chaffseed (*Schwalbea americana*) is included in **Appendix 1**. Influential information includes a description of the species habitat from the Recovery Plan:

> o *'*Characteristically, *Schwalbea* occurs in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. The species is generally found in habitats described as pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems (Kral 1983). *Schwalbea* appears to be shade intolerant and, therefore, occurs in areas maintained in an open to partially open condition (FWS 1995).

For step 2, CSI used the compiled information including the species range, known locations, and habitat location information to determine the core map type. Compliance Services International compared the known location data to the range and found that known locations from FWS (extant populations listed by site name) were usable as a refinement of range in determining the core map extent. Other known location data from GBIF, iNaturalist, and NatureServe were not used to develop the core map.

Review of the available data also suggested that the core map should exclude landcover types inconsistent with American chaffseed habitat. To represent the species' habitat, the LANDFIRE dataset was used to identify habitat classes associated with the species habitat description above; using the "EVT_NAME" field. The resulting shapes were dissolved together, converted to a vector polygon feature class, dissolved into a single shape, and then had contiguous cultivated areas > 25 acres (EPA 2024) removed to develop the core map.

For step 3, CSI used the best-available data sources to generate the core map. Data sources are discussed in EPA's core map process document. For this interim core map, CSI followed EPA's decision framework to arrive at a core map type of biological information within an extent defined by known location data. Designated critical habitat was eliminated as a core map type because the American chaffseed does not have critical habitat. The range core map type was not selected because the species range is neither refined

nor endemic. **Appendix 2** provides more details on the GIS analysis and data used to generate the core map.

Discussion of Approaches and Data that were Considered but not Included in Core Map

Known Observation Datasets
Datasets such as iNaturalist, GBIF, and NatureServe were considered but not used to define the core map. A different refinement of the core map (not based directly on known observation locations) was selected as the outer extent and further refined with biological data.

Appendix 1. Information Compiled for the American Chaffseed

1. **Recent FWS documents**
   - 5-Year Review (2019a): https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2727.pdf
   - Recovery Plan (1995): https://ecos.fws.gov/docs/recovery_plan/950929c.pdf
   - Recovery Plan Amendment (2019b): https://ecos.fws.gov/docs/recovery_plan/Schwalbea%20americana%20Recovery%20Plan%20Amendment_1.pdf

2. **Background information**

- Status: Federally listed as endangered in 1992.
- Resiliency, redundancy, and representation (the 3Rs) were not evaluated for this species
- Habitat, Life History, and Ecology
  - Habitat: "Characteristically, *Schwalbea* occurs in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. The species is generally found in habitats described as pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems (Kral 1983). *Schwalbea* appears to be shade intolerant and, therefore, occurs in areas maintained in an open to partially open condition. In Georgia, *Schwalbea* occurs in ecotonal areas between freshwater wetlands and upland pine forests. In North Carolina, the species occurs in moist to dryish pine flatwoods, longleaf pine/wiregrass savannas, and on longleaf pine/oak sandhills composed of Upper Cretaceous deep, white sands, at the western edge of the coastal plain. In South Carolina, the predominant habitat is described as fire-maintained (or mowed, as under power lines), dry, well-drained, longleaf pine flatwoods. The soil is generally a sandy loam. In New Jersey, *Schwalbea* occurs in open areas that have been maintained by mowing within a pitch pine community. The site is next to a roadcut through a cedar swamp." (Recovery Plan, 1991). Maryland golden aster (*Chrysopsis mariana*) was identified as the host plant for this species.
  - "Parasitism: The root parasitic behavior of *Schwalbea* has been known since 1856 (Musselman and Mann 1977). *Schwalbea* exhibits hemiparasitic behavior. Hemiparasites (also called semiparasites) contain chlorophyll and can produce all or part of their own food, as opposed to holoparasites, which lack chlorophyll and are entirely dependent on host plants for food and water." (FWS 1995).
  - Pollinators: Insect pollinated (bees) (FWS 1995)
- Taxonomy
  - *'Schwalbea* is an erect herb with unbranched stems or stems branched only at the base, growing to a height of 3.0 to 6.0 decimeters (12 to 24 in). The plant is densely albeit minutely hairy throughout, including the flowers. The leaves are alternate, lance-shaped to elliptic, stalkless, 2.5 to 5.0 cm (0.8 to 2 in) long, and entire; the upper leaves are reduced to narrow bracts. The large, purplish-yellow, tubular flowers, 3.0 to 3.5 cm long (1.2 to 1.4 in) are borne singly on short stalks in the axils of the uppermost, reduced leaves (bracts) and form a many flowered, spike-like raceme. The showy flowers have a high degree of bilateral symmetry elaborated for pollination by bees (Pennell 1935). The fruit is a narrow capsule approximately 10 to 12 mm (0.4 to 0.5 in) long, with a septicidal dehiscence. The numerous seeds are pale greenish brown or yellowish-tan, narrowly linear, somewhat flattened or compressed, slightly curved, and enclosed in a loose-fitting, sac-like structure

that provides the basis for the common name, chaffseed (Musselman and Mann 1978). Flowering occurs from April to June in the southern part of the species' range, and from June to mid-July in the northern part of its range. Fruits mature from early summer in the South to October in the North (Johnson 1988)." (FWS 1995)

- Relevant Potential Pesticide Use Sites
    - Herbicide application is listed as a possible threat to this species (FWS 1995).
- Relevant Recovery Criteria and Actions
    - Criteria for Downlisting (FWS 1985)
        1. Long-term protection is achieved for 50 geographically distinct, self-sustaining populations.
        2. Management agreements or plans are developed for the 50 protected occurrence sites with the primary objective of ensuring that an ecosystem capable of supporting viable populations of *Schwalbea* will be permanently maintained.
        3. Management populations of *Schwalbea* are established at four sites in the northern portion of the species' range (Massachusetts to Virginia), preferably with genetic material from the only remaining northern population in New Jersey.
        4. Biennial Monitoring shows that the 50 protected populations are viable as well as stable or increasing over a 10-year period.
        5. Life history and ecological requirements are understood sufficiently to reliably predict the effectiveness of protection, management, and monitoring.
    - Criteria for Delisting (FWS 2019)
        1. Protection via a conservation mechanism is achieved for 50 geographically distinct, self- sustaining populations (Addresses listing factors A, D, and E.
        2. Protected populations will be distributed to include all the states currently supporting *Schwalbea*, and at least four populations in the northern portion of the species range (Massachusetts to Virginia) (Addresses listing factors A, D, and E).
        3. The land management plans or agreements for the 50 protected *Schwalbea* populations must include management objectives that abate threats to *Schwalbea* such as fire suppression, hog damage, and/or silviculture practices (Addresses listing factors A, D, and E.

3. Range

- "The range of *Schwalbea* has greatly constricted with the species only occurring in eight states along the Eastern seaboard and Gulf Coast. Further, most states only have 2-3 populations and only three states (NC, SC, and GA) contain more than five populations." (FWS 2019a).
- See **Figure *2*** for a map of the current range obtained from FWS ECOS (last updated 9/13/2023).

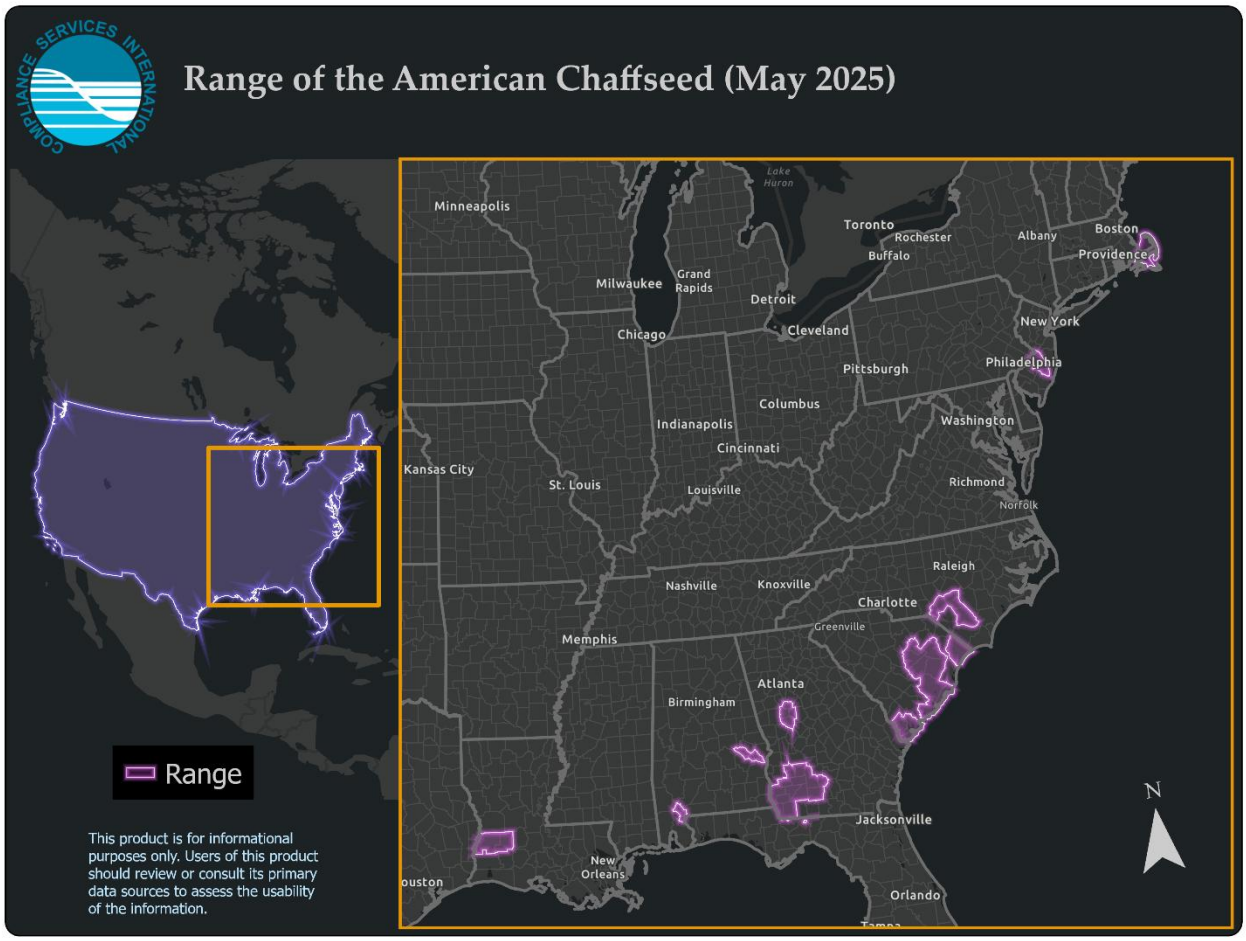

Figure 2. Range of the American chaffseed (FWS 2025).

4. Description of Critical Habitat

- Critical habitat has not been designated for this species.

5. Known Locations

- 'Currently there are 43 extant populations across the species range: Massachusetts (1), New Jersey (2), North Carolina (6), South Carolina (18), Georgia (9), Alabama (2), Florida (3), and Louisiana (2)" (FWS 2019a).

- GBIF: https://www.gbif.org/species/3172121
    - GBIF includes 733 occurrence records; 102 of which are georeferenced (Figure 3). Fifty-three of these had usable coordinate data based on these criteria:
        - U.S. only (excludes Mexico)
        - Latitude and longitude precision were both 3+ decimal places.
        - Coordinate uncertainty values no greater than 30 km.
        - Relative recency (2010-present)
            - Must include date information.
        - No "preserved specimen" observations; only "human observation."
    - The 53 usable coordinates were mapped against the species range to evaluate their utility in representing species extent (Figure 4). It was observed that all the usable GBIF

coordinates are originally sourced from iNaturalist, which also had more records. Therefore, the GBIF dataset was not used for core map development.

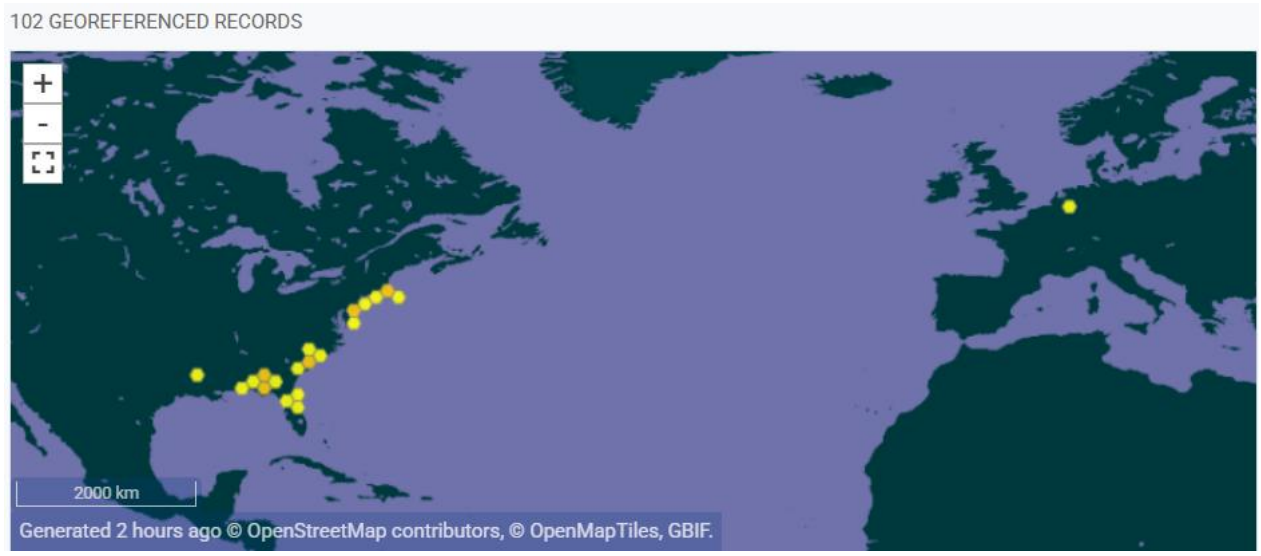

Figure 3. GBIF occurrences for the American chaffseed (GBIF 2025).

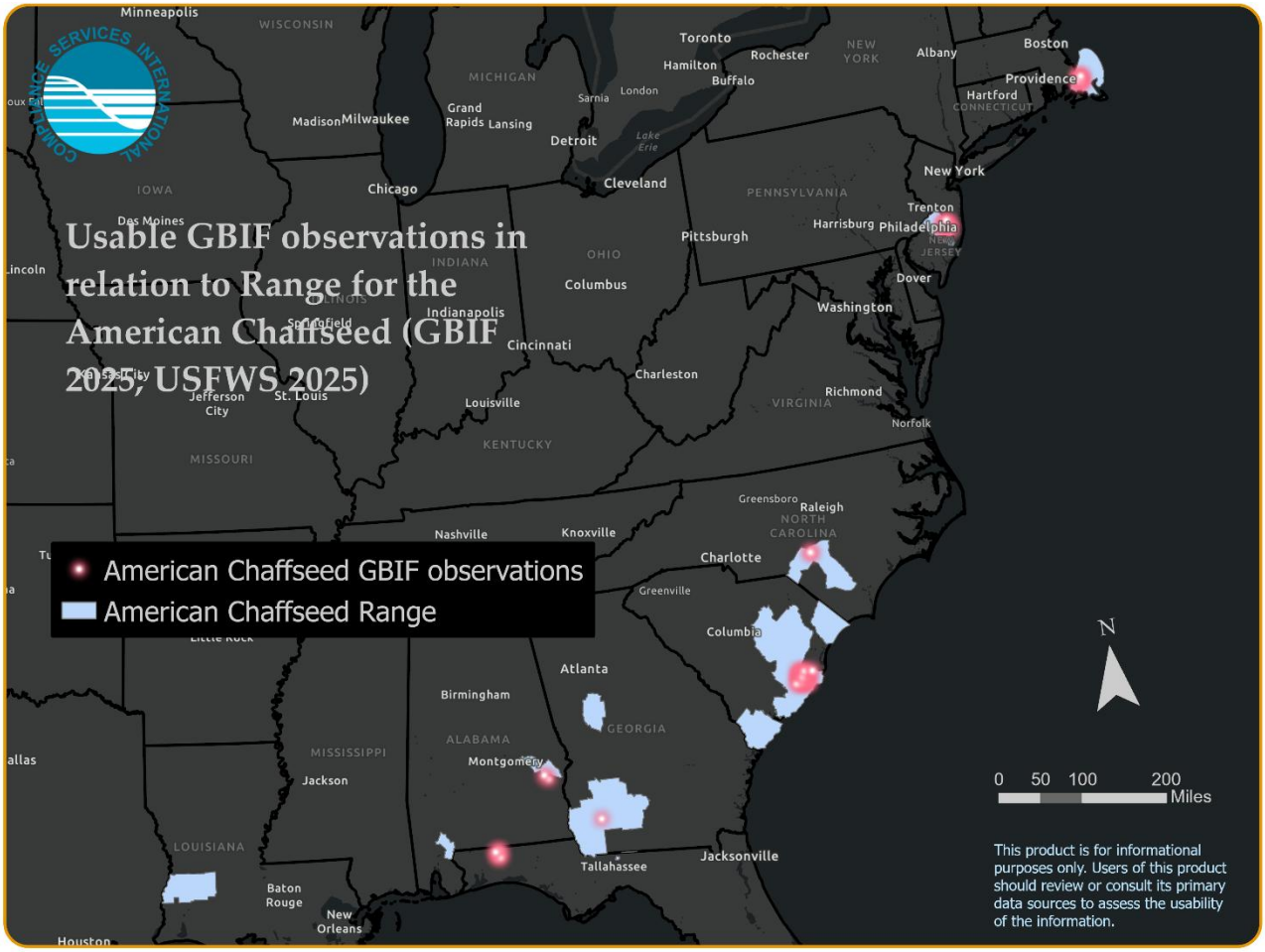

Figure 4. Usable GBIF occurrences (pink) in relation to the range of the American chaffseed (GBIF 2025; FWS 2025).

- iNaturalist: https://www.inaturalist.org/observations?taxon_id=168637
    - iNaturalist includes 92 total observations (Figure 5), 72 of which are research-grade with usable coordinate data based on these criteria:
        - U.S. only (excludes Canada)
        - Latitude and longitude precision were both 3+ decimal places
        - Relative recency (2010-present)
        - Observation description did not include the text "intentionally incorrect"
        - Public positional accuracy (PPA) value no greater than 30 km [3]
            - This did not result in the exclusion of any records.
    - Locations are consistent with GBIF, which is expected because all the GBIF observations are imported from iNaturalist.
    - Some iNaturalist data are outside of the range of the American chaffseed; this occurs in southern Alabama and is not due to the public positional accuracy (PPA) uncertainty value associated with those observations. Additionally, three distinct areas of range are not at all represented in the iNaturalist dataset (Figure 6).
    - The iNaturalist data are neither comprehensive nor precise enough to be used in core map development. However, these data may provide insight into where the species is more commonly found.

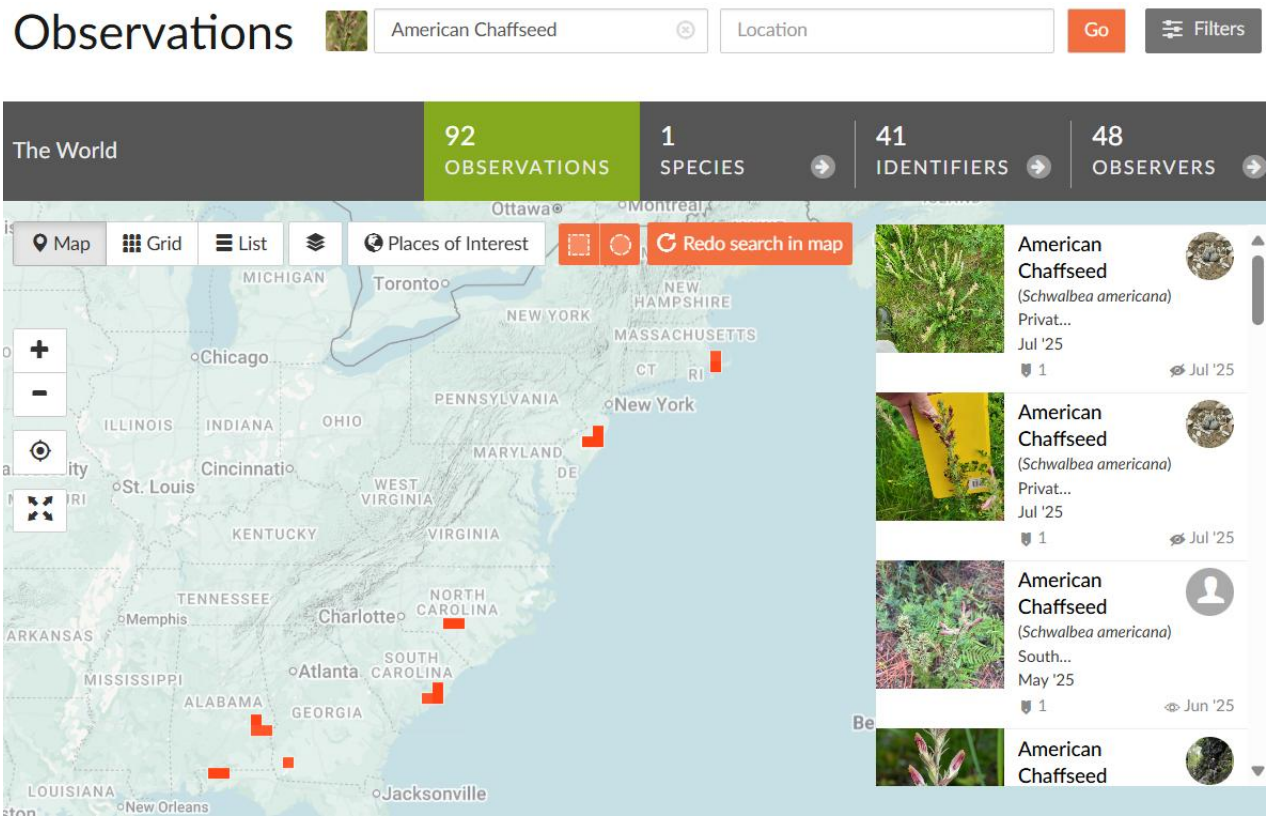

Figure 5. iNaturalist occurrences for the American chaffseed (iNaturalist 2025).

[3] For "obscured" observations, public positional accuracy (PPA) represents the diagonal of a 0.2 x 0.2 arc cell. See the iNaturalist geoprivacy page for more details on this and related terms What is geoprivacy? What does it mean for an observation to be obscured? : iNaturalist Help.

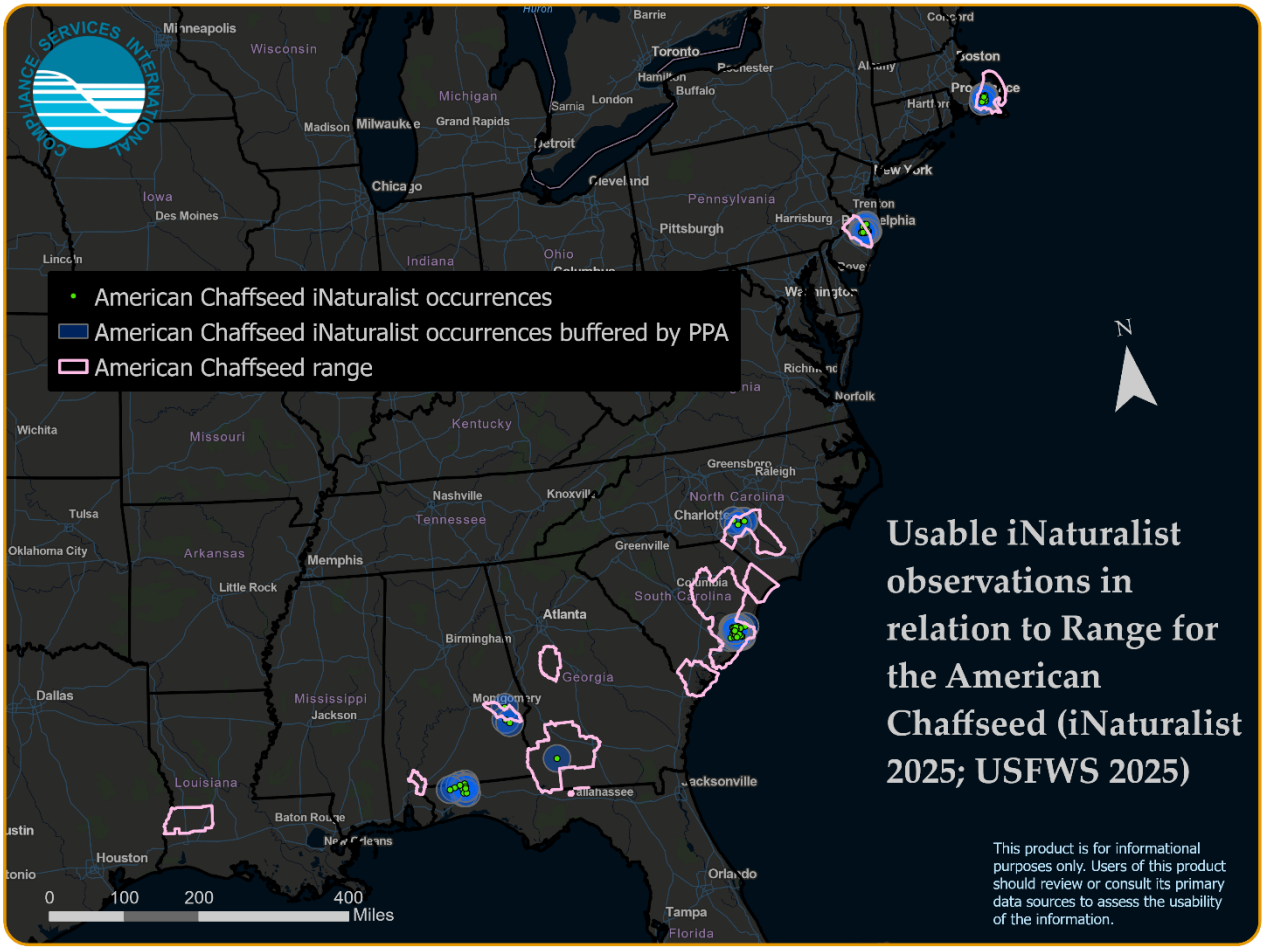

Figure 6. Usable iNaturalist observations, buffered by PPA, for the American chaffseed in relation to species range (iNaturalist 2025; FWS 2025).

- NatureServe Explorer: https://explorer.natureserve.org/
    - Available public occurrence information from NatureServe Explorer aligns with the range and improves on information from iNaturalist and GBIF in that it also contains element occurrence data in the westernmost part of the current range, mostly in Louisiana.

Appendix 2. GIS Data Review and Method to Develop Core Map

The core map for this species is based on biological information, which includes a land cover based refinement of locations identified in the Protected Areas Database of the United States (PAD-US), National Hydrography Dataset Plus (NHD Plus), the Georgia Department of Natural Resources (GDNR), and the Cape Code Commission Open Data Portal. Additionally, the core map was further refined to exclude areas of contiguous cultivated land > 25 acres according to a spatial layer developed by EPA.

1. References and Software

- Software used: ArcGIS Pro version 3.5.2.
- FWS Species Range: https://ecos.fws.gov/ecp/species/1286.
- Massachusetts Executive Office of Energy and Environmental Affairs / Cape Cod Commission Open Data Portal: https://arcgisserver.digital.mass.gov/arcgisserver/rest/services/AGOL/openspace/FeatureServer/0
- PAD-US v. 4.1 (USGS 2024): https://www.sciencebase.gov/catalog/item/652d4fc5d34e44db0e2ee45e.
- Georgia Department of Natural Resources (GDNR) Biodiversity Portal: https://georgiabiodiversity.org/portal/rangemaps?es_id=17526.
- National Hydrography Dataset (NHD high-resolution): https://www.usgs.gov/national-hydrography/access-national-hydrography-products.

2. Datasets Used in Core Map Development

2.1. Range

The range for this species was last updated by FWS on September 13, 2023. A shapefile including species range for all listed species was downloaded from the FWS ECOS website on May 5, 2025, and the species profile for this species was checked on August 18, 2025, for any updates. The shapefile was converted to a feature class stored in a file geodatabase and reprojected to WKID #102008 ("North America Albers Equal Area Conic").

1. Using an ArcGIS Web Map the species was queried based on the ECOS listed "Entity ID" of 996 and exported as a feature class to a temporary file geodatabase as a standalone Entity ID-specific layer.
2. The area of the range was calculated automatically by loading it into the software (ArcGIS Pro version 3.2) and reading its area from the attribute table ("Shape_Area"), then converting its units (square meters) into acres with a conversion factor of 0.000247105.

This shapefile was added to an ArcGIS Pro map and compared against the known observation datasets. The range was used for comparison purposes only. Commonly, the range represents the outer boundary of core map development; however, there were multiple sites—including the sizable Blackwater River State Forest—where the species is known to occur and that extend beyond the range spatial data developed in 2023.

2.2. U.S. Geological Survey (USGS) Protected Areas Database of the United States (PAD-US)

The individual populations of the American chaffseed are catalogued in the species' 5-Year Review document (FWS 2019a). Most of these populations inhabit nature preserves, conservation easements, or similar types of public lands that are identifiable by name in the USGS PAD-US dataset.

Table *2* lists the populations that were found this way, including the queries that were used from PAD-US version 4.1. Several queries identified multiple polygons, all of which were included in the core map extent.

Three populations were not positively identified in the PAD-US dataset:

- The lone population in Massachusetts, which resides on municipally-owned land
- Jefford's Plantation in Georgia
- Calcasieu Pine Savanna Mitigation Bank in Louisiana

Table 2. American chaffseed population sites obtained from PAD-US version 4.1, and the queries used to find corresponding shapes (USGS 2024).

State	Site Name	Query
AL	Splinter Hill Bog	Unit_Nm LIKE '% Splinter Hill Bog%' And State_Nm = 'AL'
AL	Enon-Sehoy Plantations	(Unit_Nm LIKE '% Enon%' OR Unit_Nm LIKE "% Sehoy%' And State_Nm = 'AL'
FL	Blackwater River State Forest	Unit_Nm LIKE '% Blackwater River State Forest%' And State_Nm = 'FL'
FL	Horseshoe Plantation	Unit_Nm LIKE '% Horseshoe Plantation%' And State_Nm = 'FL'
GA	Joseph Jones Ecological Center	Unit_Nm LIKE '% Joseph Jones%' And State_Nm = 'GA'
GA	Quail Ridge	Unit_Nm LIKE '% Quail Ridge%' And State_Nm = 'GA'
GA	Arcadia	Unit_Nm LIKE '% Arcadia%' And State_Nm = 'GA'
LA	CC Road Savannas	Unit_Nm LIKE '% Cc Road Savannas%' And State_Nm = 'LA'
NJ	Whitesbog	Unit_Nm LIKE '% Brendan T. Byrne State Forest%' And State_Nm = 'NJ'
NJ	Franklin Parker	Unit_Nm LIKE '% Franklin Parker%' And State_Nm = 'NJ'
NC	Fort Bragg	Unit_Nm LIKE '% Fort Bragg%' And State_Nm = 'NC'
SC	Francis Marion	Unit_Nm LIKE '% Francis Marion National Forest%' And State_Nm = 'SC'
SC	Lynchburg Savanna	Unit_Nm LIKE '% Lynchburg Savanna%' And State_Nm = 'SC'
SC	Woods Bay	Unit_Nm LIKE '% Woods Bay%' And State_Nm = 'SC'

2.3. Georgia Department of Natural Resources (GDNR) Biodiversity Portal

The GDNR Biodiversity Portal includes a mapping tool that was used to query and download known location information for the American chaffseed. A shapefile of the most detailed dataset available, "Quarter Quads," was exported to a file geodatabase and queried for recent observations (less than or equal to 25 years old), according to the procedure detailed in Section 3. The resulting shapes were ultimately used to represent the extent of the core map of the American chaffseed in Georgia, for areas not already captured by the PAD-US dataset.

Consideration was given to using only the PAD-US sites identified in Georgia for that state; however, this did not include the Jefford's Plantation, which has the largest known population of the American chaffseed in the state (FWS 2019a). Other sites in Georgia found in PAD-US are consistent with the GDNR quarter quad data. To represent the Jefford's Plantation, CSI reached out to GDNR for permission to know and use the associated quarter quad to represent its location for this core mapping effort. In response, GDNR agreed to provide the quad the plantation is in, naming it as the "Tempy" quad. This quad includes two quarter quads in the GDNR species distribution, so both quarter quads were used to represent this part of the extent in Georgia.

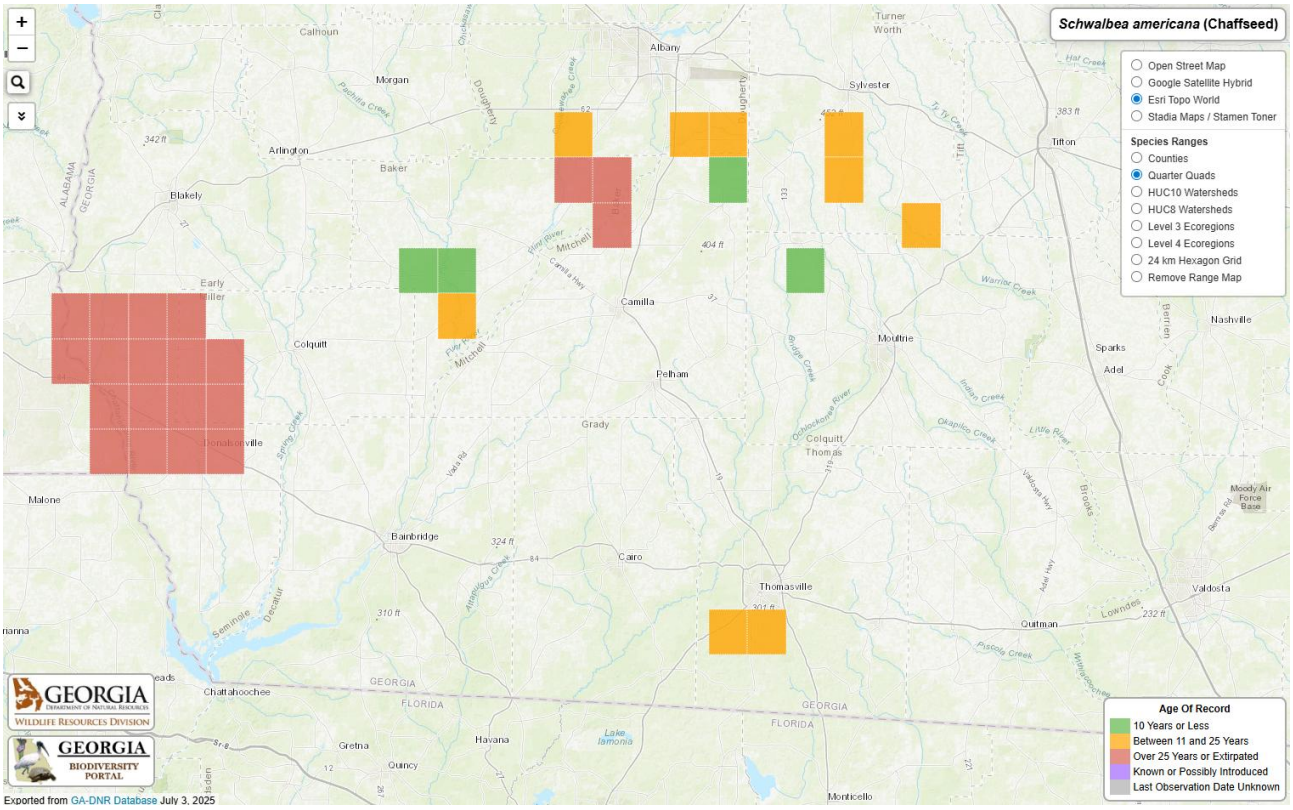

Figure 7. Quarter Quads of the American chaffseed. Additional quarter-quads over 25 years old or extirpated are not shown (GDNR 2025).

2.4. Massachusetts Executive Office of Energy and Environmental Affairs / Cape Cod Commission

The American chaffseed distribution in Massachusetts is limited to a single population in a sandhill grassland in Barnstable County. The site is described as an "open area" owned by the Town of Barnstable (FWS 2019a). While the actual site is not named or otherwise readily identifiable, the core map shape in Massachusetts was refined from range based on this information.

The Cape Cod Commission maintains a GIS open data portal that includes a layer of "Protected and Recreational OpenSpace (Polygons)" developed by the Massachusetts Executive Office of Energy and Environmental Affairs. This layer contains the boundaries of conservation lands and outdoor recreational facilities in Massachusetts, including land ownership information. The layer was queried for land owned by the town of Barnstable (SQL query: "FEE_OWNER IN ('Town of Barnstable')"). 628 records were found; these were dissolved into a single shape representing the extent of the American chaffseed in Massachusetts.

2.5. National Hydrography Dataset (NHD)

The population of the American chaffseed that resides in the Calcasieu Pine Savanna Mitigation Bank could not be found in PAD-US. To represent its distribution, select land cover types from the LANDFIRE dataset (discussed below) were selected from an extent determined in part by watershed boundaries in the region. According to the mitigation project's website (https://ecosystempartners.com/project/calcasieu-pine-savanna/), the site resides in Allen Parish, Louisiana and spans the following four Hydrologic Unit Code (HUC)-8 watersheds:

- Upper Calcasieu River (08080203) subbasin
- Whiskey Chitto (08080204) subbasin

- West Fork Calcasieu (08080205) subbasin
- Lower Calcasieu (08080206) subbasin;

The NHD dataset includes spatial layers of watershed boundaries, at various scales that include the HUC-8 level of the subbasins listed above. These subbasins were queried for and clipped to Allen Parish to determine the extent of the core map area for the species in the Calcasieu Pine Savannah Mitigation Bank. This extent also encompasses the area of the other Louisiana population, the "CC Road Savannas" location.

2.6. LANDFIRE

Once the species extent was established using the most recent 5-Year Review document, the LANDFIRE 2024 database was used to identify areas within the extent corresponding to the habitat of the American chaffseed in all regions. This is because the 5-Year Review states that the species is found on "sandhill grassland," a land cover description that is easily matched the land cover classes in the LANDFIRE dataset. The EVT layer was clipped to the core map extent and professional judgment was used to identify land cover types associated with the species' habitat. Land cover selections for the American chaffseed are listed in **Error! Reference source not found.**.

Table 3. LANDFIRE EVT classes associated with the habitat of the American chaffseed within its extent (LANDFIRE 2024).

VALUE	EVT_NAME
7248	Northern Atlantic Coastal Plain Dune and Swale Grassland
7355	Northern Atlantic Coastal Plain Pitch Pine Barrens
7356	Florida Longleaf Pine Sandhill
7399	Northern Atlantic Coastal Plain Grassland
7429	West Gulf Coastal Plain Southern Calcareous Prairie
7449	Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods
7450	Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods
7451	West Gulf Coastal Plain Wet Longleaf Pine Savanna and Flatwoods
7516	Atlantic Coastal Plain Sandhill Seep
9077	East Gulf Coastal Plain Depression Pondshore
9318	Northern & Central Ruderal Wet Meadow & Marsh
9324	Southeastern Ruderal Wet Meadow & Marsh
9817	Northern & Central Ruderal Meadow
9823	Southeastern Ruderal Grassland

The "Value" field associated with these land cover classes was used during the reclassification process stage in Step 2 of the "Refinement Based on Biological Information" procedure given in **Appendix 2**, Section 3.2.

2.7. EPA Cultivated Lands Layer

EPA has developed and published its own cultivated layer for use in core map development as a potential refinement of extent. For the American chaffseed, extent was refined by this layer using the Pairwise Erase tool to remove significant areas of agriculture because the species habitat is not consistent with cultivated

land and is therefore considered by CSI to be an “off-field” species. This decision was based on an overall interpretation of the following statements from recent EPA documents:

- “This species is unlikely to establish on agricultural fields as it grows in pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems” (Bicyclopyrone; EPA 2025a).
- “On Ag Field Default: No” (Glufosinate-P; EPA 2025b).

This removed only 0.62% of area (1,188 acres) but is considered a reasonable refinement for core map development for off-field species.

3. Creating the Core Map

3.1. Defining Extent

The core map extent for the American chaffseed was developed from multiple sources including the PAD-US dataset, GDNR, NHD HUC-8 boundaries, county boundaries, and a layer of properties owned by the town of Barnstable, Massachusetts.

PAD-US Locations

The core map extent for most locations of the American chaffseed was determined by sites found in the PAD-US dataset. The extent used for core map development using PAD-US was created as follows:

1. Load a layer of PAD-US polygons from USGS into a GIS. Verify that this layer, and all subsequent layers used in geoprocessing, is in the preferred projection of WKID #102008.

Use the Select by Attributes tool to select the polygons associated with the populations of the American chaffseed, using the queries listed in

2. **Table *2***. For each population, export selected features to a layer name recognizable as that population location.
3. (Optional) Use the Pairwise Dissolve tool to dissolve the previous layers into a feature class with a single shape, with a layer name recognizable as the union of PAD-US locations, “AC_PADUS”.

Calcasieu Pine Savanna Mitigation Bank (CPSMB)

The CPSMB was not identified in PAD-US, so was spatially rendered using the publicly available information about the site, namely that it exists in Allen Parish, Louisiana and is within the HUC-8 watersheds listed in **Appendix 2** Section 2.5. The core map extent was developed as follows:

1. Load a layer of HUC-8 polygons from the NHD dataset into a GIS.
2. Use the Select by Attributes tool to select HUC-8 boundaries that contain the CPSMB, using the following query:
   - HUC_8 IN ('08080203','08080204','08080205','08080206')
3. Use the Select by Attributes tool to select Allen Parish from a layer of U.S. counties.
4. Use the Pairwise Clip tool to clip the selected HUC-8 layers from the NHD dataset by the selected Allen Parish county boundary; save as a standalone layer, “CPSMB_selHUC8_pcAllen”.

Barnstable, Massachusetts

The lone American chaffseed population in Barnstable, Massachusetts was not identified in the PAD-US

dataset. However, the 5-Year Review document notes that it occurs on land owned by the town of Barnstable. This part of the core map extent was developed as follows:

1. Load the MassGIS layer of "Open_Space_-_Level_of_Protection" into a GIS.
2. Use the Select by Attributes tool to select features that are owned by the town of Barnstable, using the following query:
    - FEE_OWNER IN ('Town of Barnstable')
3. Use the Pairwise Dissolve tool to dissolve the selected features from the MassGIS dataset into a feature class with a single shape; save as a standalone layer, "Barnstable".

Jefford's Plantation

The American chaffseed population residing on the Jefford's Plantation was represented using quarter quad data from GDNR. CSI contacted GDNR for permission to know and use quarter quad data corresponding to the population for this core map project. GDNR subsequently informed CSI that the population resides in the "Tempy" quad. Observing that two of GDNR's recent (< 25 years) quarter quads occurred in the Tempy quad, those two quarter quads were selected and exported as a standalone layer, named "Tempy."

Combining Extent Elements

The following intermediate spatial layers were merged into a single feature class using the Merge tool, saved as "AC_extent".

- AC_PADUS
- Barnstable
- CPSMB_selHUC8_pcAllen
- Tempy

3.2. Refinement Based on Biological Information

The total extent of the American chaffseed core map—which comprises PAD-US locations and other datasets listed above—includes some area and land cover types that do not align with descriptions of American chaffseed habitat. To improve confidence in the core map, a refinement based on biological information was applied to all core map extent areas. The best-available dataset for suitable species habitat was found to be the LANDFIRE dataset. This spatial layer was used as a refinement of the core map area as follows:

1. Use the Clip Raster tool to clip the 2024 LANDFIRE EVT raster by the core map extent ("AC_extent") and save as a new layer, "LF_crExtent".
2. Use the Reclassify tool to reclassify the previous layer ("LF_crExtent") according to the land cover classes listed in **Error! Reference source not found.**. These land cover types are assigned a value of 1, while all others are assigned a value of "NODATA." Save as a new layer, "LF_crExtent_rec".
3. Use the Raster to Polygon tool to convert the previous layer ("LF_crExtent_rec") into a polygonal feature class. Uncheck the default "Simplify Polygons" option in geoprocessing. Save as a new layer, "LF_crExtent_rec_r2p".
4. Use the Pairwise Dissolve tool to dissolve features from the previous layer ("LF_crExtent_rec_r2p") into a layer with a single feature, saved as "LF_crExtent_rec_r2p_pd".

3.3. Cultivated Lands-based Refinement

The American chaffseed is not expected to be found in agricultural areas, so a refinement to exclude areas of agriculture was applied. Here agricultural areas are represented by EPA's modified cultivated layer, which

includes areas spanning at least 25 acres. This was done as follows:

1. Use the Pairwise Erase tool to exclude cultivated areas > 25 acres from the previous layer ("LF_crExtent_rec_r2p_pd") according to a layer developed by EPA ("CultivatedAreas_Over25acres"). Save as a new layer ("LF_crExtent_rec_r2p_pd_peCultivated25ac").
2. (Optional) Export features from the previous layer ("LF_crExtent_rec_r2p_pd_peCultivated25ac") into a new layer recognizable as the American chaffseed core map, "American_Chaffseed_CoreMap".

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