# Interim Core Map Documentation for the Decurrent False Aster

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**Draft Interim Core Map Developer**: Compliance Services International (CSI)

## Species Summary

The decurrent false aster (*Boltonia decurrens*; Entity ID 891) is a dicotyledonous threatened plant. The U.S. Fish & Wildlife Service (FWS) has not designated critical habitat for the decurrent false aster. This species is typically found along shores of lakes and banks of streams. Currently, it is most found in moist, sandy flood plains and prairie wetlands along the Illinois River (FWS 2025). Additional information is provided in **Appendix 1**.

## EPA Review Notes

This core map was developed 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 interim map and documentation and evaluated if: (1) the map and documentation are consistent with the agency's process; (2) areas added to or excluded from the interim core map are consistent with the species biology and/or recovery needs; (3) data sources are documented and appropriate; and (4) the 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 and was consistent with the agency's mapping process. This documentation was not prepared by EPA, but EPA may have edited this documentation for clarity or other purposes. This document may include some views not held by EPA or its staff.

The core map developed in this document for this species is considered interim. This core map incorporates information developed by FWS and made available to the public. EPA reviewed the core map; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate expert feedback from FWS.

## Description of Core Map

The core map for the decurrent false aster is based on a habitat/biological information, within a spatial extent determined by known location information for the species within its range (**Figure 1**). The extent of the core map is represented by occurrence data from NatureServe, clipped to the species range. Using FWS descriptions of the species' historical habitat, including "shores of lakes and banks of streams including the Illinois River" and its description as a "floodplain" species, the core map was developed from the Federal Emergency Management Agency (FEMA) national floodplains layer (FEMA 2025). Descriptions of species habitat and the methods used to develop the core map are given in **Appendix 1** and **Appendix 2**, respectively.

The core map developed in this document for the decurrent false aster spans 540,387 acres (**Figure 1**). A summary of acreage by National Landcover Database (NLCD) land use type is provided in **Table 1**.

Based on EPA's "best professional judgment classification" system, CSI has graded this core map as "limited"

because it comprises unaltered boundaries of a trusted dataset, the FEMA National Flood Hazard layer, within a customized extent based on georeferenced occurrence information. Biological information was used for this map, which can sometimes result in decreased confidence or certainty in a core map; however, CSI is confident that the spatial layer used sufficiently captures areas of potential species presence. More information about this classification system and its definitions can be found in the core map process document (EPA 2024).

When FWS reviews this interim core map, it may be possible to improve the confidence in this core map by revising population location information this analysis and may be further refined by including any other known areas that are observed from reliable and precise observational datasets. An additional consideration for refinement may include application of a different land cover filter to remove areas and habitats that are inconsistent with the FWS habitat descriptions for this species.

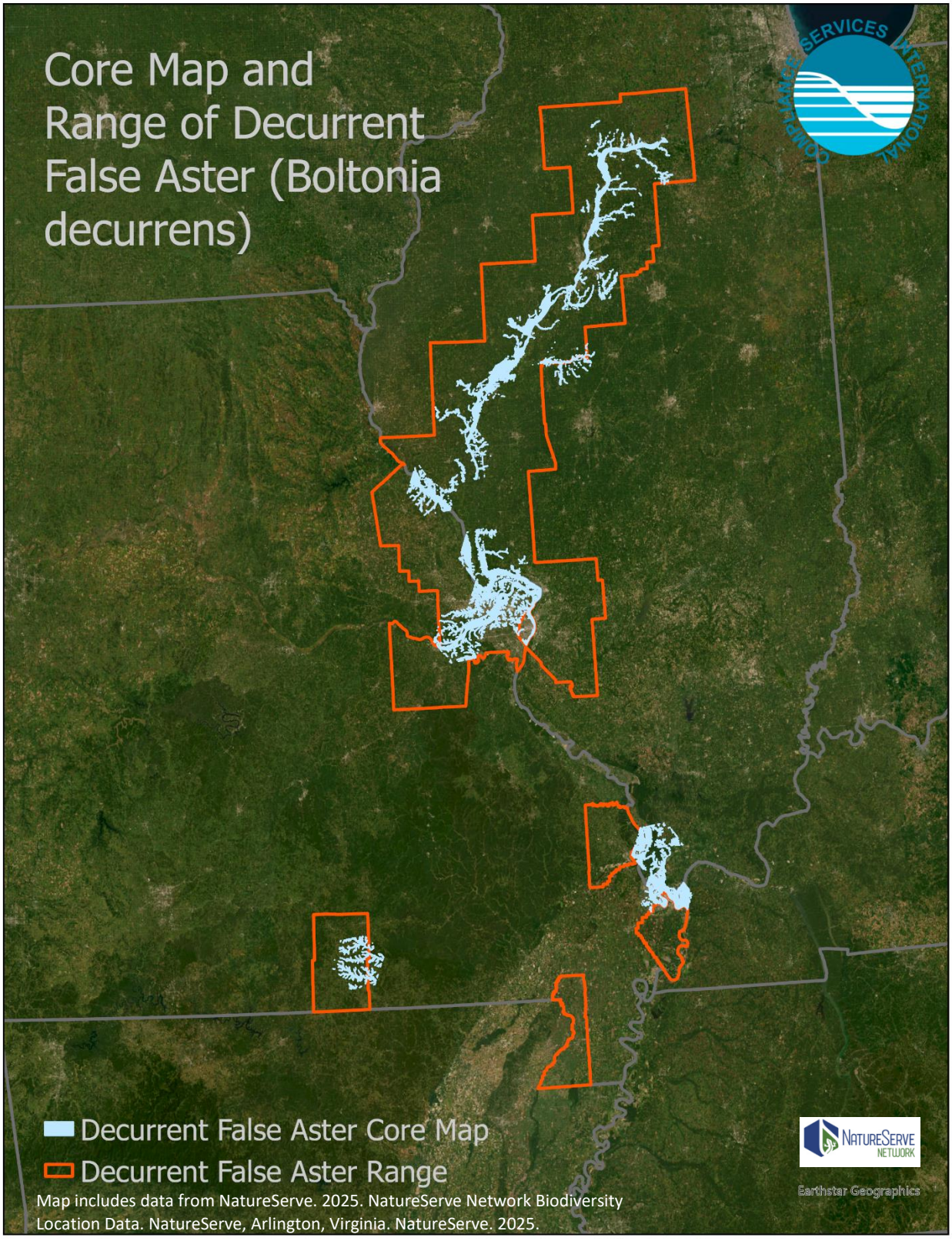


*Figure 1. Interim core map for the decurrent false aster.*

| NLCD_Land_Cover_Class | Acres |
|---|---|
| Open Water | 164,497 |
| Woody Wetlands | 157,588 |
| Emergent Herbaceous Wetlands | 53,959 |
| Deciduous Forest | 36,241 |
| Cultivated Crops | 32,906 |
| Hay/Pasture | 26,807 |
| Developed, Low Intensity | 17,700 |
| Developed, Open Space | 14,125 |
| Developed, Medium Intensity | 13,434 |
| Developed, High Intensity | 10,186 |
| Mixed Forest | 4,628 |
| Barren Land | 3,966 |
| Herbaceous | 3,834 |
| Shrub/Scrub | 301 |
| Evergreen Forest | 101 |

*Table 1. Acres by National Land cover Database (NLCD) class within the core map of the decurrent false aster. Total core map area (based on NLCD pixel count) is 540,273 acres[1].*

## Evaluation of Known Location Information

There are three datasets with spatially delineated known location information:

- Occurrence locations in iNaturalist;
- Occurrence locations in Global Biodiversity Information Facility (GBIF); and
- Occurrence locations in NatureServe.

Compliance Services International (CSI) evaluated these three datasets before developing the core map. The descriptions of locations provided by FWS were generally easily identifiable and comprise a full catalogue of the known observational areas with extant populations. In general, these observations corroborated the current extent of range for the species, but did not enable meaningful refinement of that range.

There were 97 research grade observations found in iNaturalist[2]. These locations were generally consistent with other datasets. These observations were more abundant than occurrences in the GBIF database, which had 50 observations with usable coordinates. **Appendices 1 and 2** include more information on the available known location information.

Public Element Occurrences (EOs) obtained from NatureServe (2025b) not only corroborated range

[1] This acreage is slightly different from the core map acreage (540,387) due to the pixelation of NLCD land cover. The core map is not developed 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-).

information for the species but were also used to determine the species extent in core map development. These observations are distributed along the Illinois and Mississippi Rivers in a manner consistent with descriptions of the species' historical habitat. Public occurrence data were received from NatureServe and processed according to an approach detailed in **Appendix 2**.

## Approach Used to Create Core Map

The core map was developed using the process EPA uses to develop core maps for draft PULAs for species listed by the FWS and their designated critical habitats (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: Designated 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; and
4. Document the core map.

For step 1, CSI compiled available information for the decurrent false aster from FWS, as well as observation information available from various sources (including iNaturalist, GBIF, and NatureServe). The information compiled for the decurrent false aster is included in **Appendix 1**. Influential information that impacted the development of the core map includes descriptions of the species habitat from multiple FWS sources:

- "...*B. decurrens'* natural habitat was the shores of lakes and banks of streams including the Illinois River. It currently is most common in lowland areas where it appears to be dependent on disturbance for survival" (FWS 1990).
- The decurrent false aster is threatened species. It is a perennial plant found in moist, sandy floodplains and prairie wetlands along the Illinois River. Although not very tolerant to prolonged flooding, this plant relies on periodic flooding to scour away other plants that compete for the same habitat (FWS 2025).

Additionally, the most recent 5-Year Review document describes the species as "a floodplain plant" and "a floodplain, moist-soil species" (FWS 2020).

For step 2, CSI used the compiled information including the species range, known locations, and habitat location information to determine the core map type. CSI compared the known location data to the range and found that known locations were generally consistent with the range. Review of the available data suggested that the species is likely located in smaller areas within the extent (based on known observations). Finally, the species has specific habitat requirements that are not located everywhere within this extent. When weighing that information together for the decurrent false aster, CSI selected the biological information core map type, limited to an extent more refined than its range. CSI used a combination of range, known observation/occurrence location data, and habitat information to derive this 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. Designated critical habitat was quickly eliminated as a core map type because the decurrent false aster does not have critical habitat. The range core map type was not

selected because the species range is neither refined nor endemic. However, CSI judged that there was known occurrence/location data that would better represent the current distribution of extant populations of the species and used these data to refine the extent of the core map to an area smaller than the species range. That extent was established using data from FWS and NatureServe. The FEMA national floodplains layer was clipped to the extent referred to above. **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

**NLCD, LANDFIRE, and other land cover datasets**

Typically, it would be reasonable to refine a core map for a species with a large and/or unrefined range based on descriptions of its habitat, which can be mapped to land cover datasets such as NLCD, LANDFIRE, and others. Because the decurrent false aster is considered by FWS to be a "floodplain" species and floodplains are themselves a type of land cover, the core map's reliance on the FEMA floodplain layer was considered sufficiently refined without a need for refinement from other land cover layers. Additionally, at small scales, NLCD and LANDFIRE integrate multiple datasets including satellite imagery, field data, and ecological models; therefore, local validation is limited in some areas, leading to potential inaccuracies when applied at small scales. This is a frequent problem for most national level land cover datasets.

In CSI's opinion, the accuracy of delineating occupied areas using a trusted national spatial floodplains layer provides sufficient accuracy for the core map.

**Soil Survey Geographic Database (SSURGO)**

The USGS the Soil Survey Geographic (SSURGO) database could have been used to find areas with soils conducive to decurrent false aster habitat, but the species habitat was better-defined by land cover descriptions that could be matched to habitat type. Specifically, SSURGO could be used as a further refinement of the core map layer.

The Soil Survey Geographic Database indirectly contributes to LANDFIRE's Existing Vegetation Type (EVT) classifications. It provides detailed soil characteristics, which influence vegetation patterns and ecosystem dynamics. While LANDFIRE EVT is primarily derived from remote sensing, field plot data, and ecological models, SSURGO data can be incorporated into predictive models to refine vegetation mapping, especially in areas where soil properties strongly determine vegetation types (*e.g.*, wetlands, grasslands, and forested ecosystems). Additionally, SSURGO-derived variables like soil texture, drainage, and organic matter can support LANDFIRE's Biophysical Settings (BpS) and Environmental Site Potential (ESP) layers, which, in turn, inform EVT classifications. However, SSURGO is not a direct input to EVT mapping in LANDFIRE's core methodology.

# Appendix 1. Information compiled for Decurrent False Aster

1. **Recent FWS documents**
   - 5 Year Review (2020) https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2980.pdf
   - 5 Year Review (2012) https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1950.pdf
   - Recovery Plan (1990) https://ecos.fws.gov/docs/recovery_plan/900928c.pdf
2. **Background information**

- Status: Federally listed as threatened in 1988.
- Resiliency, redundancy, and representation (the 3Rs)
  - The 3 Rs were not specifically described in the species recovery plan or most recent 5-year review for this species and there is no species status assessment.

- Habitat, Life History, and Ecology
  - Habitat: "Analysis of 19th century habitat data indicates that *B. decurrens*' natural habitat was the shores of lakes and banks of streams including the Illinois River. It currently is most common in lowland areas where it appears to be dependent on disturbance for survival. The reasons for the decline in this species seem to be related to habitat destruction and modification." (Recovery Plan, 1990).
  - "floodplain, moist-soil species." (5-Year Review, 2020).
  - Pollinators: Not specified
- Taxonomy
  - Wetland plant – A member of the Aster family, it was recognized as a species distinct from *B. asteroides* by Schwegman and Nyboer (1985). *Boltonia decurrens* is separated from *B. asteroides* var. *recognita* by its decurrent leaves and absence of rhizomes. It also has a strong tendency to have larger flowers that more frequently have violet colored rays (Recovery Plan, 1990)
- Relevant Potential Pesticide Use Sites
  - "*Boltonia decurrens* populations may also be vulnerable to destruction by discing and herbicide use in low-lying marginal lands for crop weed control. Nearly all stands are in habitats kept open by occasional cropping. Future weed control efforts may destroy many of these plants or they may disappear due to habitat succession if cropping is stopped" (Recovery Plan, 1990)
- Relevant Recovery Criteria and Actions
  - 5-Year Review (2020) – Delisting Criteria (delisting will be considered when the following recovery criteria have been met)
    1. A basic research program to determine the requirements of a naturally reproducing population must be completed.

       The first criterion has been met.

    2. Twelve geographically distinct self-sustaining natural or established populations of the species must be protected through purchase in fee, easement or by cooperative management agreements.

A cooperative agreement with the ILDNR to promote species-specific management of several sites to fulfill part of recovery criterion 2 has been drafted but not completed.

"Surveys indicate that more than twelve geographically distinct populations exist on lands already owned and permanently protected by the Illinois Department of Natural Resources (ILDNR) and the Service (USFWS, unpublished data). However, not all of these populations are managed specifically to promote the growth and expansion of *B. decurrens*. A draft cooperative management agreement to facilitate the protection and specific management of *B. decurrens* populations on ILDNR and National Wildlife Refuge lands has been written. This document will articulate a commitment by land managers to promote habitat conditions that facilitate *B. decurrens* growth and expansion. It is anticipated that the document will be signed in 2012. Depending on the final number of sites included in the cooperative management agreement, this criterion may be met on signing of the document" (5-Year Review, 2012).

3. Populations must be monitored for a period of five years to determine if they are self— sustaining. Self-sustaining is defined, for recovery purposes, as a population which is found to be stable or expanding during the 5-year monitoring period.

   A clear trend is difficult to discern for any given 5-year period; therefore, we cannot confirm that the third delisting criteria has been met.

   "Forty-three populations of *B. decurrens* have been monitored intermittently for more than 20 years, and population numbers have appeared to increase and decrease according to environmental conditions (Smith et. al. 2005). Floodplain conditions and late-season high water precluded monitoring on many long-term monitoring sites for three of the last five years, and sites that were checked did not contain *B. decurrens*. Surveys in 2011 at 19 of the 43 historical sites show that *B. decurrens* has recolonized previously vacant areas, and total population numbers approach the peak numbers observed in the early 2000's. A graph of population trends on the Illinois River (in Illinois) over time constructed with available data can be found in **Appendix A**. Given the difficulty in monitoring the species over the past five years, there is insufficient information to determine with certainty if this criterion has been met at this time" (5-Year Review, 2012).

**3. Range**

- Size: 10,984,419 acres

**4. Description of Critical Habitat**

This species does not have designated critical habitat.

**5. Known Locations**

"Decurrent False Aster continues to occur throughout most of its known range, which includes the Peoria, LaGrange, and Alton Pools of the Illinois River, as well as some areas along the Mississippi River immediately south of the confluence of the Illinois and Mississippi Rivers. Four isolated locations from southeastern Missouri have been documented in the past, but their status is

currently unknown. See **Appendix A**, Figure 1. To make this determination, we reviewed new abundance and distribution records from 2012-2018, which consist of reports submitted to the USFWS and the Illinois Natural Heritage Database records. More specifically, the previous 5-year review of this species was completed in July of 2012, and fall 2019 survey results were not available at the time of this writing. Therefore, the new records incorporated into this review span 2012 through 2018. Of the 68 known sites with at least one documented occurrence of decurrent false aster since 1984, 41 (60%) were surveyed at least once since the last 5-year review was conducted in 2012. Decurrent false aster was present at 31 of those 41 sites (75%), and those sites were located throughout the species' range. By comparison, during the previous 7-year period (2005-2011), 37 out of 68 sites were surveyed. Of those, decurrent false aster was present at 29 of those 37 sites (78%). It should be noted that the 2005- 2011 dataset may not include all records of sites that were visited but did not have plants present. Therefore, the percent of sites that were surveyed and occupied could be lower than 78%" (5-Year Review 2020).

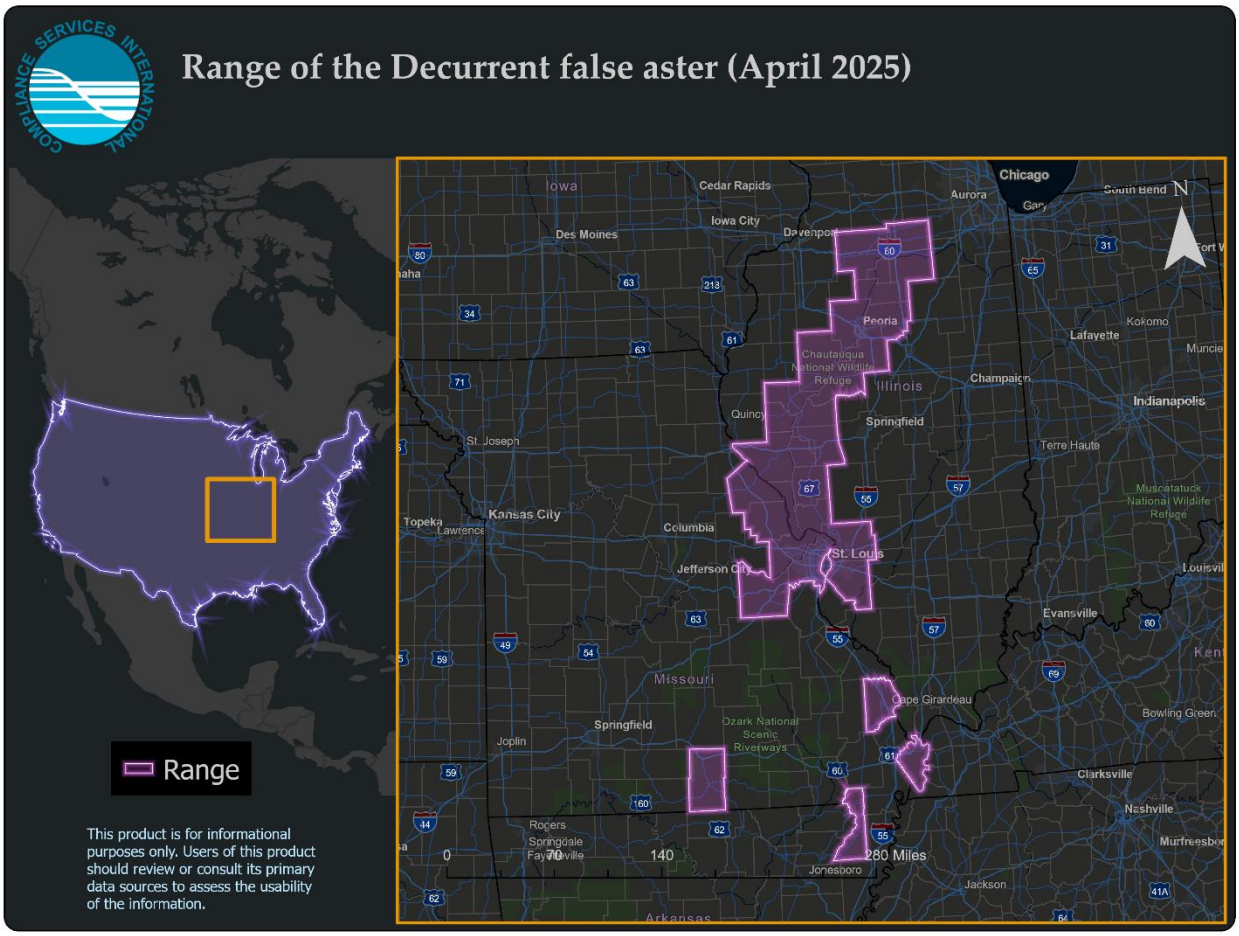


*Figure 2. Range of the decurrent false aster.*

- GBIF: https://https://www.gbif.org/species/5393595
    - GBIF includes 76 georeferenced records, 50 of which had usable coordinate data based on latitude/longitude precision (3+ decimal places) and relative recency (2010-present).
    - Some of these observations extended well north of the species range, and one in Oregon; there was little validation from other resources, including FWS documentation, to support their use as supplements to the core map extent.

*Figure 3. GBIF occurrences for the decurrent false aster (GBIF 2025).*

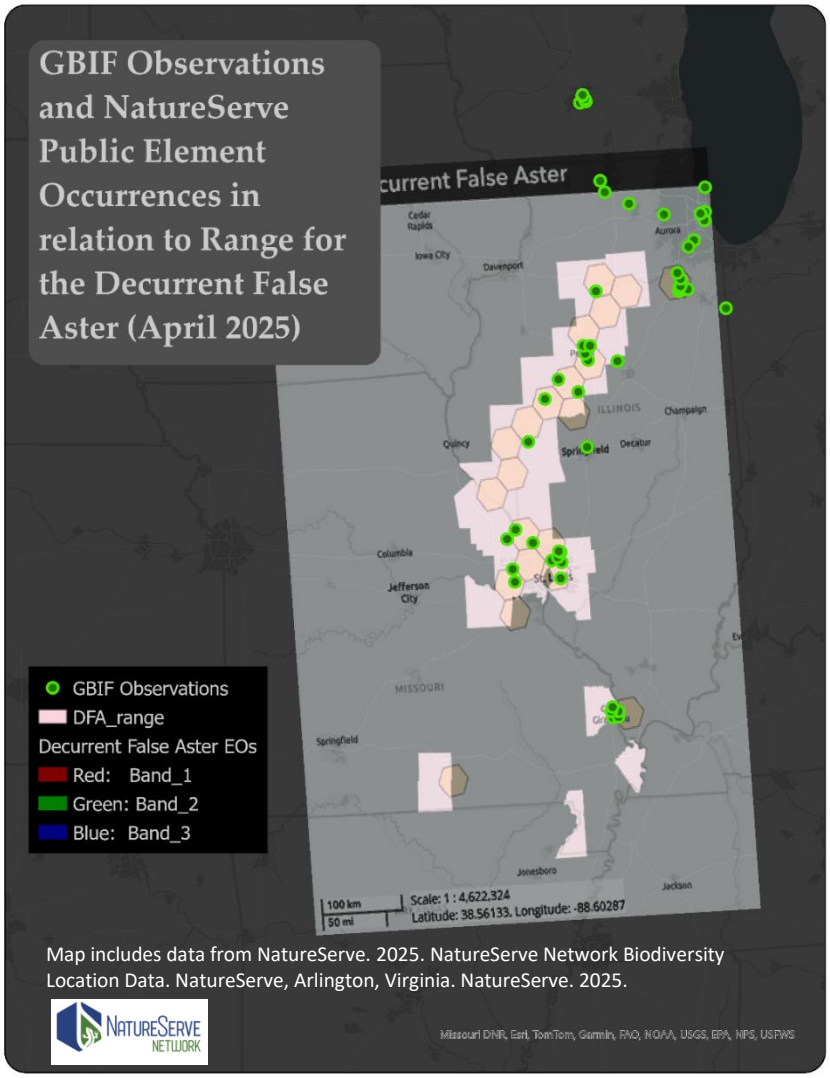


*Figure 4. GBIF occurrences in relation to NatureServe element occurrences and range of the decurrent false aster (GBIF 2025; NatureServe 2025b).*

- iNaturalist: https://www.inaturalist.org/taxa/159307-Boltonia-decurrens
    - 97 research-grade observations with public coordinate data (Figure 5).
    - These locations align well with species range. However, as point location data with unknown accuracy, these were only used to support other datasets used in core map development.

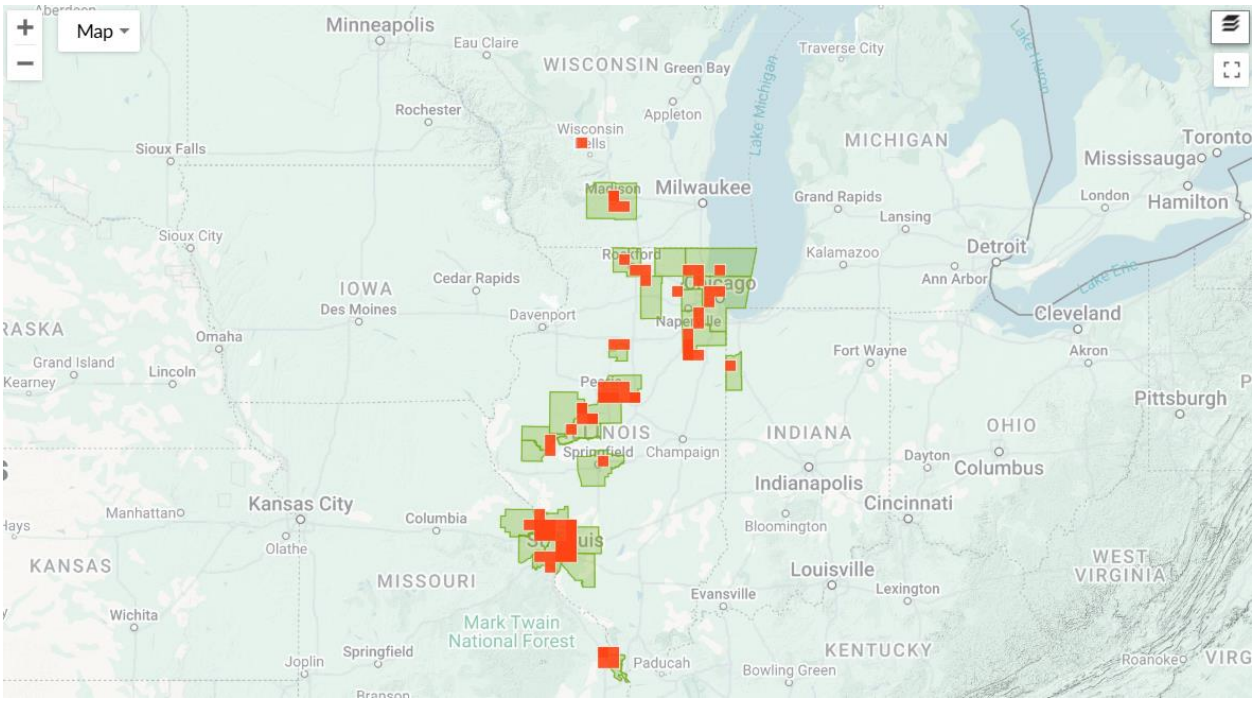

*Figure 5. iNaturalist occurrences for the decurrent false aster (iNaturalist 2025).*

iNaturalist data were compared against range and NatureServe EO data and found to be in general agreement. However, their unknown or high uncertainty in point observation data precision made the iNaturalist dataset useful only as a check on other methods than a contribution to the spatial extent of the core map.

- NatureServe:
    - Available public occurrence information from NatureServe Explorer (NatureServe 2025a) aligns with the information from iNaturalist and GBIF (**Figure 4**).

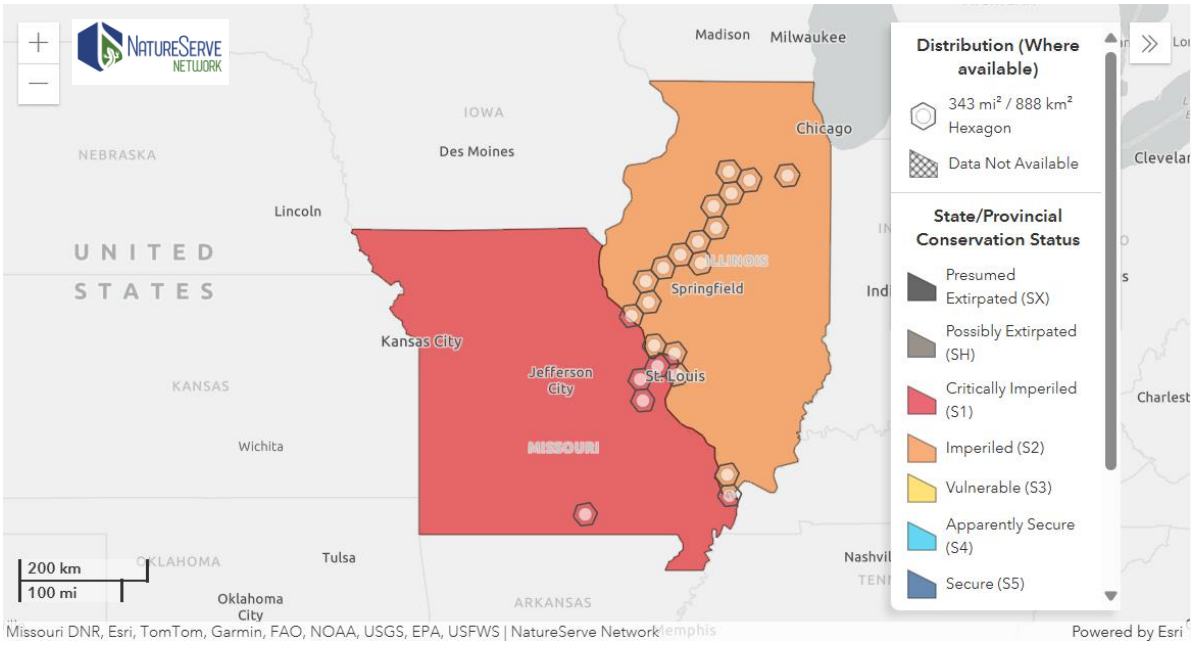


*Figure 6. NatureServe Explorer occurrences for the decurrent false aster (NatureServe 2025b).*

- CSI requested and received from NatureServe a feature layer that included 343 mi$^2$ hexagons viewable in the public version of the Explorer mapper (NatureServe, 2025b). These were examined relative to range and iNaturalist occurrences (**Figure 7**). NatureServe public hexagons were used as a modest refinement of species extent. NatureServe notes that "If ground-disturbing activities are proposed on a site, the appropriate NatureServe Network Program should be contacted for a site-specific review of the project area. For contact information, go to the NatureServe Network Directory at: https://www.natureserve.org/ns-network-directory."

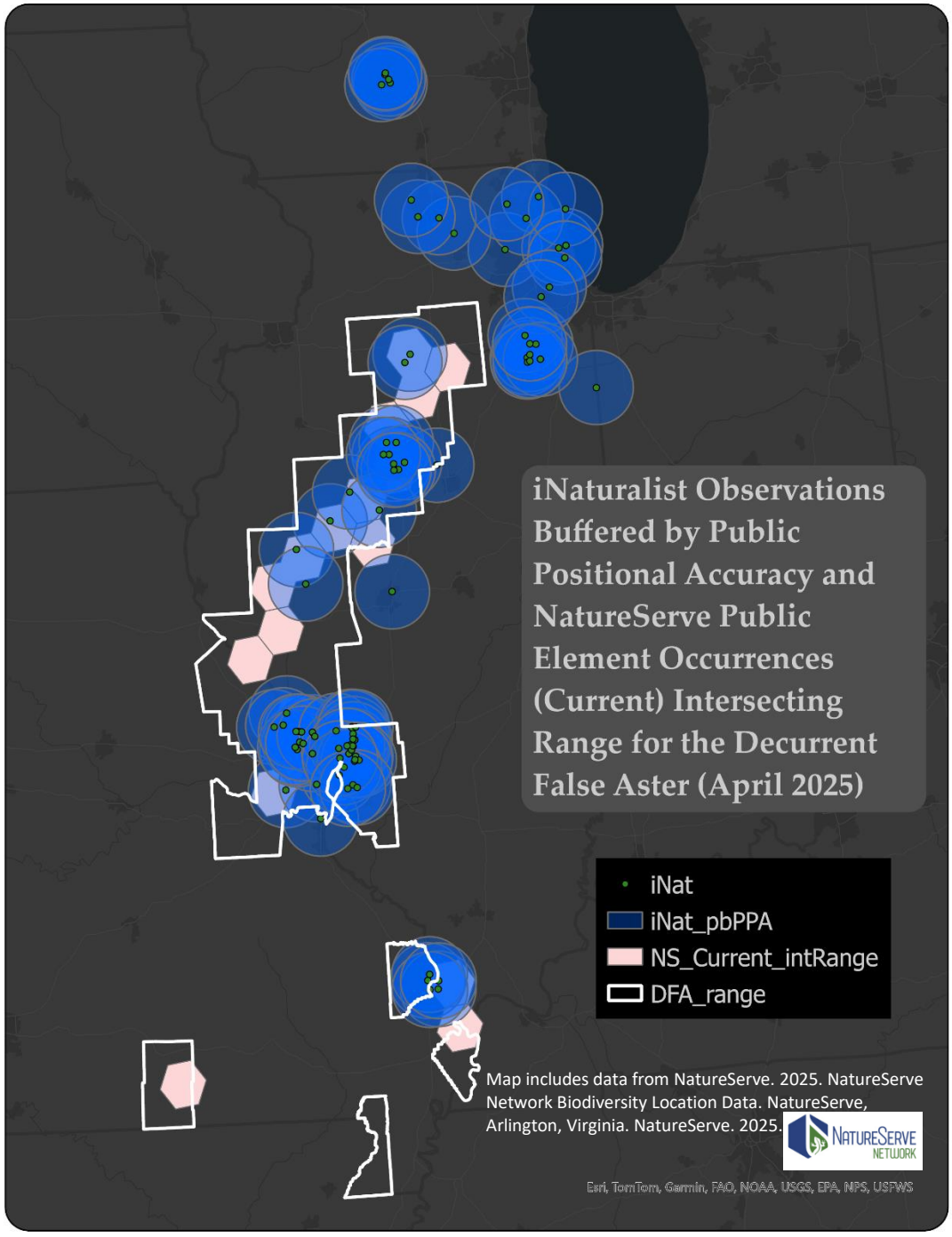


*Figure 7. iNaturalist observations (green) buffered by public positional accuracy (blue) and NatureServe public element occurrences (current, pink) intersecting range for the decurrent false aster (iNaturalist 2025; NatureServe 2025b; FWS 2025).*

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

The core map for this species is based on biological information, with extent limited to areas within the species range and the perimeter boundary of georeferenced NatureServe public element occurrences. The core map identifies all areas within the extent (described below), further refined to exclude areas of cultivated land > 25 acres.

**1. References and Software**

- Software used: ArcGIS Pro version 3.2.
- Federal Emergency Management Agency (FEMA) Floodplains: https://services.arcgis.com/P3ePLMYs2RVChkJx/arcgis/rest/services/USA_Flood_Hazard_Reduced_Set_gdb/FeatureServer
- NatureServe. 2025a. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: April 22, 2025).
- NatureServe. 2025b. NatureServe Network Biodiversity Location Data. NatureServe, Arlington, Virginia. NatureServe. 2025.
- EPA Modified Cultivated Layer: https://cdn.arcgis.com/home/item.html?id=159e70ce4c284f5b972c687037f8a668.
- FWS Species Range: https://ecos.fws.gov/ecp/species/7705.

**2. Datasets Used in Core Map Development**

**2.1. Range**

The range for this species was last updated by UWS on Nov. 19, 2020. A shapefile including species range for all listed species was downloaded from the FWS ECOS website on January 24, 2025. The shapefile was converted to a feature class stored in a file geodatabase and reprojected to WKID #4269 ("North America Albers Equal Area Conic").

1. Using an ArcGIS Web Map the species was queried based on the ECOS listed "Entity ID" of 891 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 available known locations described in the FWS 5-year review. This range and known occurrence information from NatureServe were used to establish the extent of the core map.

**2.2. NatureServe**

NatureServe Explorer was used to identify public EOs for decurrent false aster and spatial data were obtained from NatureServe representing these public EOs (NatureServe 2025a, 2025b). These were compared with iNaturalist coordinates buffered to their respective public positional accuracy uncertainty distances, typically on the order of 28 km for this species (all coordinates had uncertainties of 27-29 km). It was observed that EO data were more precise (smaller area), so current EOs (described below) were

adopted as the extent for the decurrent false aster.

Current element occurrences were defined by CSI as those without a historical EO rank designation (SQL query: EORANK_CD IN ('H','X')) or a last observed date older than Jan. 1, 2000. This resulted in the exclusion of 18 out of 67 EOs; however, this did not result in a proportionate reduction in extent area, as sometimes historical EOs occupy the same area as current EOs. EOs comprising the core map extent were further constrained to those intersecting species range.

The public NatureServe EOs (NatureServe, 2025b) were used to determine the core map extent according to the procedure detailed in Section 3 and are being provided to EPA as part of this core map documentation. *Disclaimer: CSI hereby informs EPA of their obligation to adhere to the NatureServe data use terms (https://explorer.natureserve.org/AboutTheData/UseGuidelinesCitations). Per those terms, EPA may not redistribute the data unless written permission is requested and provided by NatureServe.*

### 2.3. FEMA Floodplains

The FEMA floodplains data layer provides information on flood hazard areas as part of the National Flood Insurance Program. This feature layer includes Special Flood Hazard Areas (SFHAs) and other flood zones, which are used for issues related to floodplain management and flood insurance. The dataset covers the entire United States and its territories.

The dataset was clipped to the range of the decurrent false aster. This did not eliminate any of the floodplain types from the original download:

- 0.2% Annual Chance Flood Hazard
- 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Regulatory Floodway
- Special Floodway

The description of the decurrent false aster's habitat does not distinguish among floodplain types, so each of these types contributed to core map development. Further details on how this layer was used in geoprocessing are given in Section 3 below.

### 2.4. EPA Cultivated Lands > 25 Acres

EPA has developed and published its own cultivated layer for use in core map development as a potential refinement of extent. For the Decurrent False Aster, 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 "off-field." This removed a substantial fraction of the area of FEMA floodplains within the decurrent false aster extent (46%) 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 for the decurrent false aster was developed using NatureServe public EOs as the extent within which habitat refinements were considered. CSI received from NatureServe a feature class ("NatureServe_PublicEOs_343sqmi_forCSI_20250502") containing usable EO boundaries for a few select species, including the decurrent false aster. These EOs were queried and processed as follows:

1. Use the Select by Attributes tool to select EOs corresponding to just the decurrent false aster (SQL query: BLD_EO_SPECIES_GCOMNAME = 'Decurrent False Aster'). Export selected features to a new feature class named "NS".

2. Use the Select by Attributes tool to select historical EOs from “NS” (SQL query: BLD_EO_SPECIES_EORANK_CD IN ('H', 'X') Or BLD_EO_SPECIES_LASTOBS_D IN ('1885-04-25', '1887-08', '1902-07-10', '1905-11-25', '1914-10-02', '1933-08-28', '1936-06-30', '1945-08-15', '1953-08-14', '1956-08-28', '1969-08-30', '1971-08', '1979-06-01', '1981-08-15', '1985-06-28', '1987-09-22', '1990-08-20', '1990-08-21', '1990-08-22', '1992-06-04', '1991-08-08', '1993-08-03', '1994-07-14', '1994-07-15', '1994-SU', '2000')).
3. Use the Switch tool to switch the selection of EOs in the previous step. This identifies EOs that are considered “current” and thus appropriate for core map development. Export selected features from “NS” to a new feature class named “NS_current”.
4. Use the Select by Location tool to select features from the previous layer (“NS_current”) that intersect with the species range “DFA_range” and export selected features as a new layer named “NS_current_intRange”.
5. Use the Pairwise Dissolve tool to dissolve the previous layer (“NS_current_intRange”) into a single feature and save as a new layer named “NS_current_intRange_pd”.
6. (Optional) Export the previous layer (“NS_current_intRange_pd”) as a new layer with a name easily recognized as the extent of the decurrent false aster core map, “DFA_extent”.

### 3.2. Refinement based on Biological Information

The total extent of the decurrent false aster core map—which comprises selected NatureServe EOs intersecting species range—includes a significant area and number of different land cover types that do not align with descriptions of decurrent false aster habitat. To improve confidence in the core map, a refinement based on biological information was applied to extent.

The best-available dataset for suitable species habitat was found to be the FEMA national floodplains layer. This dataset was used as a refinement of core map area as follows:

1. Using an Application Programming Interface (API), access the FEMA national floodplains dataset through ArcGIS Pro by connecting to the source data website: https://www.arcgis.com/home/item.html?id=2b245b7f816044d7a779a61a5844be23.
2. Use the Pairwise Clip tool to clip all FEMA floodplain polygons by the decurrent false aster extent (“DFA_extent”). Assign the output projection to WKID #4269 and save as a new layer (“FEMA_floodplains_pcExtent”).
3. Use the Pairwise Dissolve tool to dissolve features from the previous layer (“FEMA_floodplains_pcExtent”) into a feature class with a single feature. Save as a new layer named, “FEMA_floodplains_pcExtent_pd”.

### 3.3. Cultivated Lands-based Refinement

The species is not considered to be “on-field.” That is, it is unlikely the species would be found in agricultural fields and its natural habitat— along shores of lakes and banks of streams —does not account for this land use type. To account for off-field species like the decurrent false aster, EPA developed and published its own cultivated layer for use in core map development as a potential refinement of extent, comprising areas of agriculture > 25 acres (USEPA 2025). This refinement was applied using the Pairwise Erase tool on the previous layer “FEMA_floodplains_pcExtent_pd” and saving to a file geodatabase as a finalized core map layer (“DFA_CoreMap”). This step removed about 46% of the area from the core map area. The resulting core map layer spans 540,387 acres.

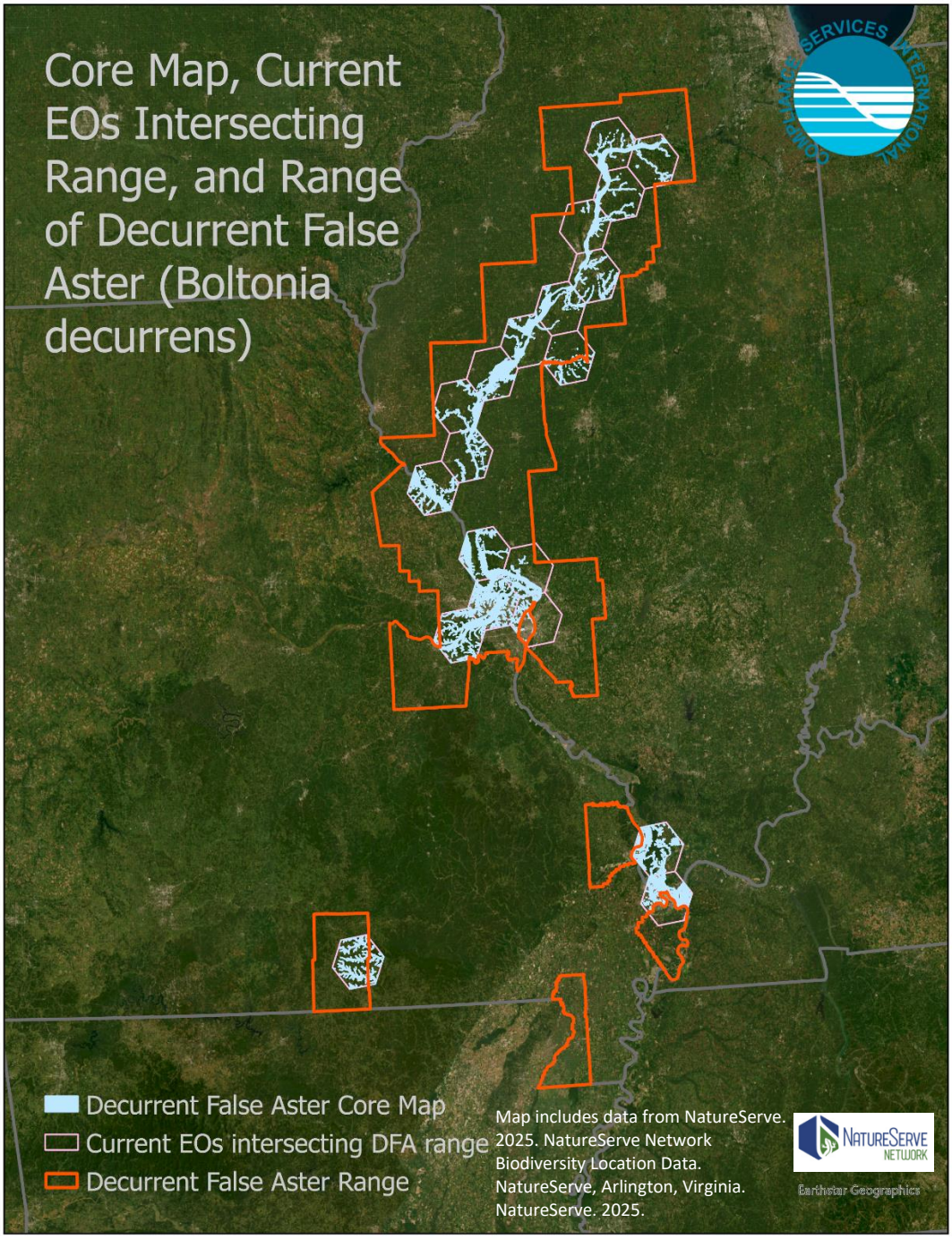


*Figure 8. Core map, current EOs intersecting range, and range of the decurrent false aster (NatureServe 2025b; FEMA 2025; FWS 2025).*

## 4. Datasets Considered but Not Used in Core Map Development

### 4.1. NLCD, LANDFIRE, and other land cover datasets

Typically, it would be reasonable to refine a core map for a species with a large and/or unrefined range based on descriptions of its habitat, which can be mapped to land cover datasets such as NLCD, LANDFIRE, and

others. Because the decurrent false aster is considered by FWS to be a “floodplain” species and floodplains are themselves a type of land cover, the core map’s reliance on the FEMA floodplain layer was considered sufficiently refined without a need for refinement from other land cover layers. Additionally, at small scales, NLCD and LANDFIRE integrate multiple datasets including satellite imagery, field data, and ecological models; therefore, local validation is limited in some areas, leading to potential inaccuracies when applied at small scales. This is a frequent problem for most national level land cover datasets.

In CSI’s opinion, the accuracy of delineating occupied areas using a trusted national spatial floodplains layer provides sufficient accuracy for the core map.

### 4.2. SSURGO

Habitat descriptions for the decurrent false aster in its most recent 5-Year Review and Recovery Plan include specific references to “hydric” or moist soils. The Soil Survey Geographic Database is a spatial dataset that can be queried for individual polygons within the decurrent false aster’s range corresponding to hydric soils, specifically using an attribute from its “component” table. However, CSI determined that it would be redundant with the existing floodplain dataset and did not use SSURGO for core map development.

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