

Interim Core Map Documentation for Sensitive Joint-Vetch

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

Species Summary

The Sensitive Joint-Vetch (*Aeschynomene virginica*; Entity ID 875) is a dicotyledonous threatened plant found in the Eastern United States. The United States Fish and Wildlife Service (FWS) has not assigned designated critical habitat (DCH) for Sensitive Joint-Vetch. This species inhabits various wetlands but prefers the outer fringe of marshes or shores where there is a reduction in competition from other plant species. Additional habitat information is provided in **Appendix 1**.

EPA Review Notes

This core map was developed using EPA's 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 EPA'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 EPA's mapping process. This documentation was not prepared by EPA, but EPA may have edited this documentation for clarity, consistency, or other purposes. This document may contain 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 Sensitive Joint-Vetch is based on biological information, which was used to refine an extent of species range. The only recent document from FWS, the Recovery Plan, includes a textual description of habitats that were used to find usable geospatial data contributing to the core map.

The core map for the Sensitive Joint-Vetch is based on biological information, which was used to refine an extent defined as the species range. In North Carolina, the species habitat is represented using a model developed for the Sensitive Joint-Vetch by the North Carolina Department of Transportation (NCDOT), specifically areas considered "high" potential habitat. In New Jersey, a description of species habitat was matched to a subset of habitat types available from a national wetlands dataset, the National Wetlands

Inventory (NWI) (NWI 2023). Selections of water body types from NWI were informed by overlapping of water bodies with areas of high potential habitat according to the NCDOT model. In Delaware, Maryland, and Virginia, species range appears to be based on selected water bodies consistent with Sensitive Joint-Vetch habitat and was used unmodified in core map development. Appropriate wetland areas were clipped to the species range, and then contiguous cultivated areas > 25 acres (EPA 2025) were removed, using a spatial data layer developed by the United States Environmental Protection Agency (EPA), to develop the core map.

This core map spans 142,049 acres. 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 "moderate" (4) because assumptions were made when connecting species life history and/or biological needs (habitat preferences and water body descriptions) to a GIS dataset, in this case the NWI (NWI 2023). More information about this classification system and its definitions can be found in the core map process document (EPA 2024).

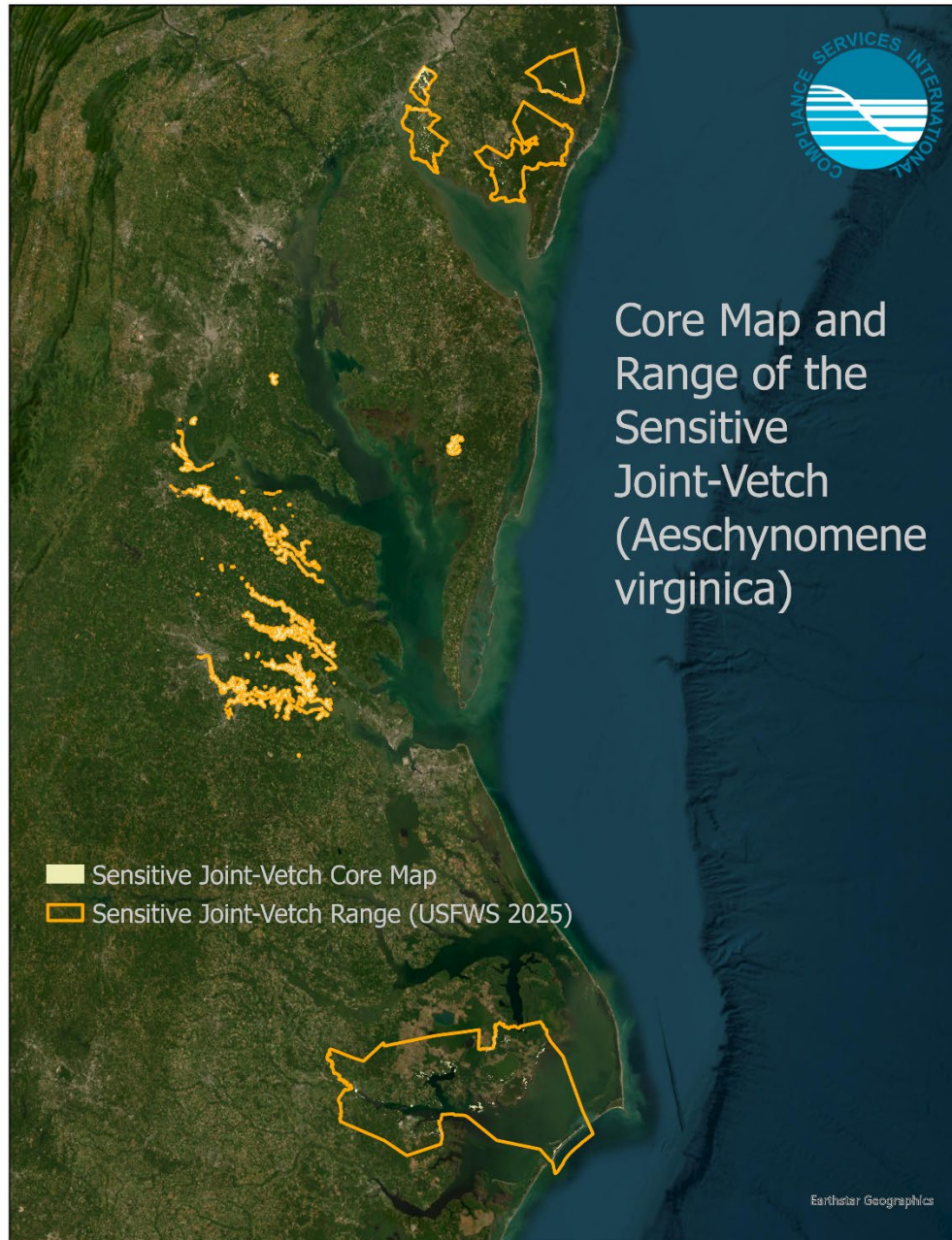


Figure 1. Interim core map for the Sensitive Joint-Vetch.

NLCD_Land_Cover_Class	Acres
Woody Wetlands	45,223
Emergent Herbaceous Wetlands	39,028
Open Water	21,921
Mixed Forest	11,406
Evergreen Forest	4,930
Deciduous Forest	4,584
Cultivated Crops	4,564
Developed, Open Space	4,030
Developed, Medium Intensity	1,136
Shrub/Scrub	873
Hay/Pasture	767
Herbaceous	728
Developed, High Intensity	433
Barren Land	213

Table 1. Acres by National Land Cover Database (NLCD) class within the core map of the Sensitive Joint-Vetch. Total core map area (based on NLCD pixel count): 142,061 acres¹.

¹ This acreage is slightly different from the core map acreage (142,049) due to the pixelation of NLCD land cover. The core map is not developed from raster data.

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

Compliance Services International (CSI) evaluated these four datasets before developing the core map. Overall, there were sixteen research-grade observations found in iNaturalist². The GBIF dataset comprised 11 georeferenced observations. Both datasets were useful as comparison against other datasets, but did not otherwise inform the core map.

The FWS location information includes extant population information that identifies some areas of relevant occupancy; however, these descriptions could not be easily identified or otherwise converted to geospatial information.

NatureServe public element occurrence (EO) data were also evaluated and are considered by CSI to be more robust than the iNaturalist and GBIF datasets for this species. These data were considered for refinement, but ultimately not used because habitat refinements to species range were sufficient.

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 DCH² (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: DCH, 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 Sensitive Joint-Vetch from FWS, as well as observation information available from various publicly available sources including iNaturalist, GBIF, and NatureServe. The information compiled for Sensitive Joint-Vetch is included in **Appendix 1**. Influential information that impacted the development of the core map includes a description of the species habitat from the FWS 5-Year Review:

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->).

- “The species occurs in fresh to slightly brackish tidal river systems, within the intertidal zone where populations are flooded twice daily. Its presence in a given marsh may be a factor of suppressed competition, hydrological conditions, salinity tolerances, and/or other parameters. *A. virginica* seems to favor microhabitats where there is a reduction in competition from other plant species. It typically occurs at the outer fringe of marshes or shores; its presence in marsh interiors may be a result of local nutrient deficiencies in the saturated organic soils, ice scouring, or muskrat herbivory. The sensitive joint-vetch is found in localities where plant diversity is high and annual species are prevalent. Bare to sparsely vegetated substrates appear to be a habitat feature of critical importance for establishment and growth of this species” (FWS 2012).

For step 2, CSI used the compiled information including the species range, known locations, and habitat location information to determine the core map type. The known location data were compared to the range and found that known locations from larger databases (iNaturalist and GBIF) were too limited in extent compared to the range to be used as more than validation in core map development. Known location information from FWS was not detailed or specific enough to be used as a refinement of core map extent from species range.

Review of the available data also suggested that the core map should exclude landcover types inconsistent with the Sensitive Joint-Vetch habitat. A national wetlands layer was used to represent reasonable potential habitat for this species. Additionally, the Sensitive Joint-Vetch would not be expected to be found on agricultural land. When weighing this information together, CSI selected the biological information core map type, limited to an extent of species range. A combination of range, habitat information, and EPA’s cultivated areas > 25 acres layer were used 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 the 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 Sensitive Joint-Vetch does not have a DCH. The range core map type was not used for the full species extent, but was used in Delaware, Maryland, and Virginia because that portion is a refined range that appears to have been developed with species habitat in mind.

In North Carolina, a species-specific model of low- and high-potential habitat for the Sensitive Joint-Vetch was developed by the North Carolina Department of Transportation. Areas of “high” potential habitat (approximately 15,600 acres) were selected to represent the core map for this state. Additionally, these records were used to identify relevant water bodies in other states. In New Jersey, the National Wetlands Inventory (NWI) dataset was queried for classes relevant to the Sensitive Joint-Vetch within its range. In Delaware, Maryland, and Virginia, the range itself was used.

Finally, cultivated lands were removed from this area; this removed 7.3% of area. **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. NatureServe public EOs are viewable in their mapper as hexagons corresponding to locations where the species may have been

observed. The current range of the species encompasses the majority of occurrences based on visual inspection. Range was selected as the outer extent and further refined with biological data.

Appendix 1. Information compiled for Sensitive Joint-Vetch

1. Relevant FWS documents

- Recovery Plan (1995) https://ecos.fws.gov/docs/recovery_plan/950929b.pdf
- 5-Year Review (2012) https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2132.pdf

2. Background information

- Status: Federally listed as threatened in 1992.
- Resiliency, redundancy, and representation (the 3Rs) have not been determined for this species.
- Habitat, Life History, and Ecology
 - Habitat: “The species occurs in fresh to slightly brackish tidal river systems, within the intertidal zone where populations are flooded twice daily. Its presence in a given marsh may be a factor of suppressed competition, hydrological conditions, salinity tolerances, and/or other parameters. *A. virginica* seems to favor microhabitats where there is a reduction in competition from other plant species. It typically occurs at the outer fringe of marshes or shores; its presence in marsh interiors may be a result of local nutrient deficiencies in the saturated organic soils, ice scouring, or muskrat herbivory. The sensitive joint-vetch is found in localities where plant diversity is high and annual species are prevalent. Bare to sparsely vegetated substrates appear to be a habitat feature of critical importance for establishment and growth of this species.” (FWS 1995).
 - Soils: “In New Jersey, *A. virginica* occurs on peat in high marsh zones (Ferren and Schuyler 1980). In North Carolina, sensitive joint-vetch sites are disturbed, weedy habitats in low coastal ditches and corn fields adjacent to wetlands (Rawinski and Cassin 1986). In Virginia, the soils at sensitive joint-vetch sites are peaty muck from 10 to 20 inches deep, with sandy to silty clays below (Rouse 1994), although one site on the Mattaponi River occurs on stratified sands and loamy sands with a thin organic layer buried at approximately 18 inches below the surface (Rouse 1994). Testing of soil samples at *A. virginica* sites revealed generally medium to low concentrations of nutrients relative to recommended levels for agricultural applications; however, magnesium concentrations were high at five of the six study sites, which may be an indirect result of application of dolomitic limestone to nearby agricultural fields” (FWS 1995).
 - Pollinators: “Limited pollinator observations of small bumblebees have been made” (FWS 1995).
 - Reproduction: “*Aeschynomene virginica* plants flower from July through September (Davison and Bruderle 1984, Wieboldt 1984) and into October in some years (Hershner and Perry 1987). In autumn, senescence may be triggered by the drop in water temperature or by salinity intrusion due to a decrease in freshwater flow, and plants typically die back by late October. Greenhouse studies have shown that bagged flowers self-pollinated at the rate of 130/a, but outcrossing also occurred (Davison and Bruderle 1984). Morphological or behavioral features that would indicate asexual reproduction have not been observed” (FWS 1995).
- Taxonomy
 - Wetland Plant – “A robust annual legume that typically attains a height of 1.0-2.0 m in a single growing season, although it may grow as tall as 2.4 m. The stems are single,

sometimes branching near the top, with stiff or bristly hairs. The leaves are even-pinnate, 2.0-12.0 cm long, with entire, gland-dotted leaflets. Each leaf consists of 30-56 leaflets. Leaflets are 0.8-2.5 cm long and 0.2-0.4 cm wide. The leaves fold slightly when touched. Pedicles are 3.0-8.0 mm long, bearing toothed bractlets about 4.0 mm long and 2.0-3.0 mm wide immediately below the flowers. The yellow, irregular, legume-type flowers are 1.0-1.5 cm across, streaked with red, and grow in racemes 2.0-6.0 cm long. The flowers have uniformly shaped anthers. The fruit is a loment with 4-10 one-seeded segments, the lowest 5.0-7.0 mm wide, turning dark brown when ripe. Fruits are 3.0-7.0 cm long, on a stipe 10.0-25.0 mm in length, and shallowly scalloped along one side” (FWS 1995).

- Relevant Potential Pesticide Use Sites
 - North Carolina Natural Heritage cites the main threats to this species as being from anthropogenic factors including: changes in hydrology (ditching on private land, especially beside roads and farm fields) causing the habitat to dry out and support more aggressive early successional species that out-compete the SJV for habitat; herbicide use (beside roads, edges of farm fields, and in utility corridors) and right of way mowing (roadsides and utility corridors) that prevents the species from successfully setting seed” (FWS 2012).

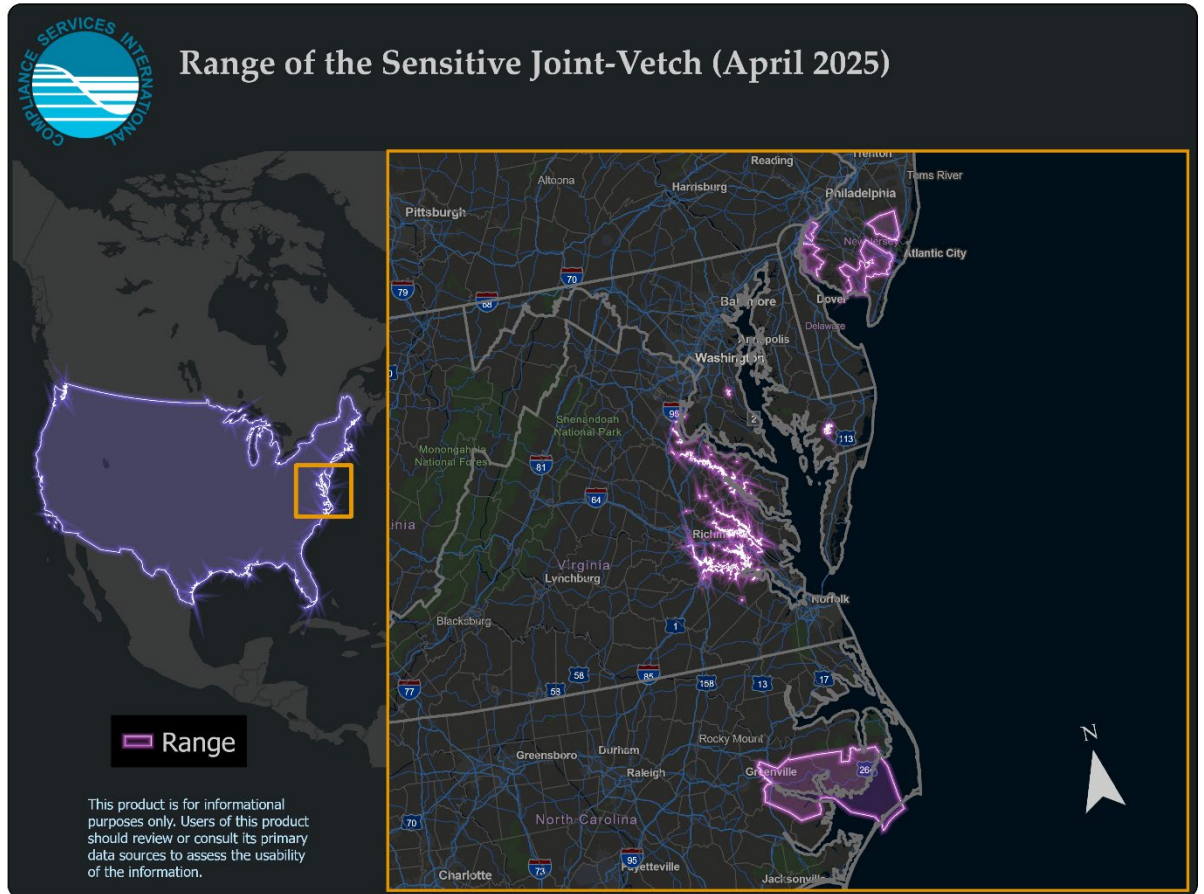
- Relevant Recovery Criteria and Actions
 - Recovery Plan (1995) – Delisting Criteria
 - The sensitive joint-vetch and the ecosystems upon which it depends are adequately protected within the following six watersheds: Manokin Creek in Maryland; Manumuskin River in New Jersey; and Rappahannock, Pamunkey, Mattaponi, and Chickahominy Rivers in Virginia;
 - Annual monitoring over a 10-year period shows that 20 representative populations are stable or increasing; and
 - Life history and ecological requirements are understood sufficiently to allow for effective protection, monitoring, and management.
 - Actions needed (FWS 1995)
 - Maintain the integrity of the tidal wetland systems upon which the sensitive joint-vetch depends.
 - Protect extant sensitive joint-vetch populations and sites.
 - Survey for additional populations.
 - Establish monitoring priorities, develop reliable monitoring techniques, and monitor populations accordingly.
 - Determine the ecological and distributional characteristics and requirements of the sensitive joint-vetch.
 - Develop an informational brochure on the importance of the sensitive joint-vetch and the tidal wetlands upon which it depends.

3. Description of Species Range

- Historic Range: “Tidal marshes of New Jersey, Pennsylvania, Delaware, Maryland, and Virginia, and ditches and agricultural fields in North Carolina” (FWS 2012).
- Critical Range: Current range includes New Jersey, Maryland, Virginia, North Carolina. Delaware and Pennsylvania occurrences have not been observed since the 1800s” (FWS 2012).

Year	Minimum Total Number of Plants Across the Range of SJV (many sites lack data in a given year)
1991	7,953
1992	2,790
1993	3,749
1994	12,200
1995	3,924
1996	24,073
1997	9,092
1998	4,582
1999	10,267
2000	6,702
2001	7,197
2002	8,549
2003	1,580
2004	8,622
2005	5,271
2006	3,253
2007	5,888
2008	5,932
2009	7,631
2010	7,402

Table 2. Estimated minimum number of SJV plants across the range of the species, 1991-2010. Copied from Table 1 of the Recovery Plan (FWS 2012).



4. Critical Habitat

The Sensitive Joint-Vetch does not have DCH.

5. Known Locations

- FWS 5-Year Review (2012)
 - Maryland: The two subpopulations on the Eastern Shore are robust in numbers of plants with annual totals between the two as high as 4,463 and no lower than 846 (Tyndall 2011).
 - New Jersey: The one confirmed New Jersey occurrence has numbered as high as 20,000 plants in 1996 and as low as 132 plants in 2003, with numbers of at least 1,000 for 14 of the 21 years of monitoring (Creveling 2005). Plant counts are no longer conducted.
 - North Carolina: Population numbers at all sites have been low since 1995 and all are vulnerable to extirpation. The species is currently considered extremely imperiled in the state (M. Buchanan, North Carolina Department of Environment and Natural Resources, pers. comm. 2011).
 - Virginia: Only the Virginia subpopulation within TNC's Vandell Natural Area Preserve on the Pamunkey River has been consistently monitored with a standard sampling protocol from 1997 through 2010 (Dunscorn et al. 1997). This subpopulation with multiple colonies often numbers 1,000 or more plants, but displays the wide fluctuations in numbers typical of this species. The subpopulations on the Mattaponi River have been the next most

consistently monitored with surveys over seven years (FWS 2012).

- iNaturalist: https://www.inaturalist.org/observations?subview=map&taxon_id=158040
 - Seventeen verifiable observations, sixteen of which are research-grade with public coordinate data (Figure 3).
 - These locations do not align well enough with species range to be useful in core map development. These observations do not include any North Carolina range, where the species is known to occur.

Observations

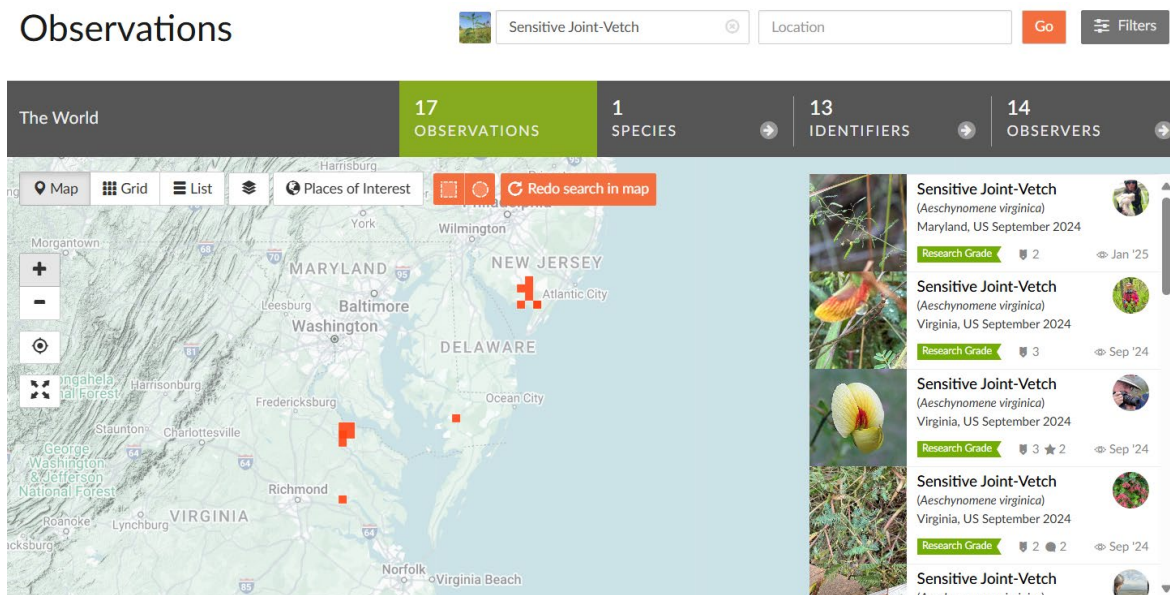


Figure 3. iNaturalist occurrences for the Sensitive Joint-Vetch.

- GBIF: <https://www.gbif.org/species/2949101>
 - GBIF includes 679 occurrence records; 75 of which are georeferenced. However, only 11 of these had usable coordinate data based on latitude/longitude precision (3+ decimal places) and relative recency (2010-present).
 - The usable coordinates are concentrated in a relatively small portion of the range, and only in Maryland, New Jersey and Virginia (but not Delaware or North Carolina). The full set of georeferenced coordinates include areas well outside of the species range, so were not deemed appropriate for core map development.

75 GEOREFERENCED RECORDS

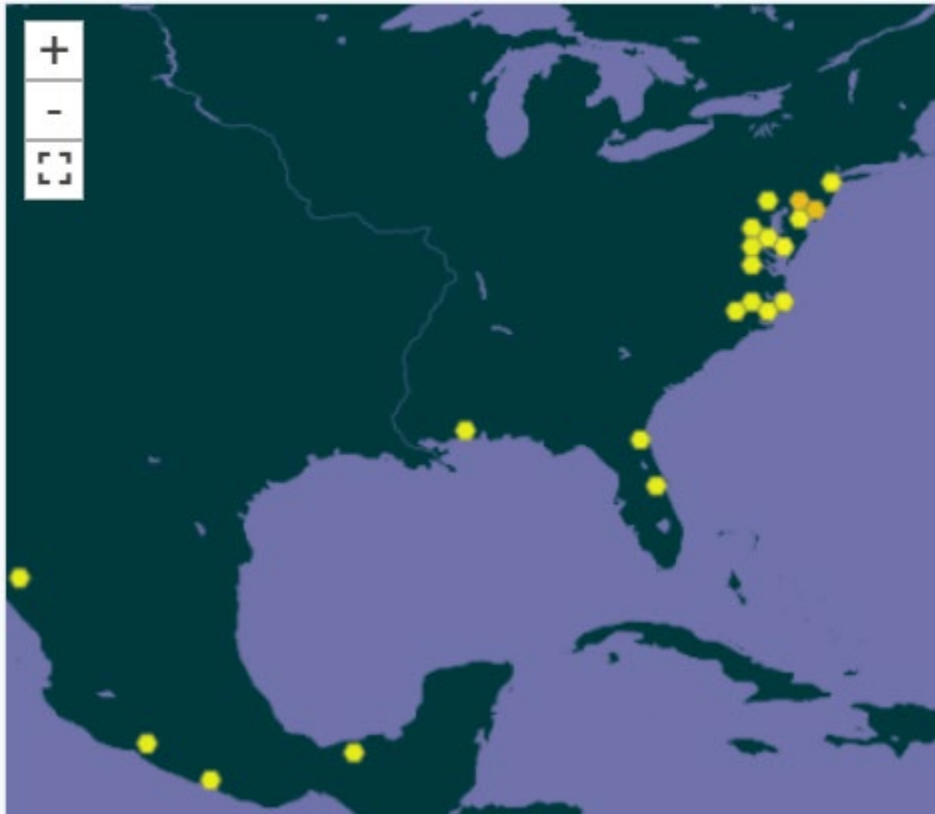


Figure 4. GBIF occurrences of the Sensitive Joint-Vetch.

- NatureServe Explorer: <https://explorer.natureserve.org/>
 - Available public EO information from NatureServe Explorer is generally consistent with FWS range, in that all three states in which the species is known to occur are represented. However, these occurrences do not include all areas where the species would reasonably be found to occur and so were not used in core map development.

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

The core map for this species is based on biological information, which includes the habitat used by this species found within a spatial extent of range. The core map identifies all areas within the range matching its habitat description provided in **Appendix 1** (FWS 2023). The NWI dataset is regarded as a high quality national-level dataset that is appropriate to identify aquatic habitat for plant species such as the Sensitive Joint-Vetch. Relevant water body type selections were partly informed by the waters intersecting known areas of high occupancy identified by the NCDOT.

1. References and Software

- National Wetlands Inventory: <https://www.fws.gov/program/national-wetlands-inventory>.
- North Carolina Department of Transportation: "Sensitive Joint Vetch - Potential Habitat, March 2021."
<https://xfer.services.ncdot.gov/gisdot/AtlasData/AtlasSpeciesModels/ATLASPlantMachineLearningModels/>.
- Software used: ArcGIS Pro version 3.2.
- EPA Modified Cultivated Layer:
<https://cdn.arcgis.com/home/item.html?id=159e70ce4c284f5b972c687037f8a668>.
- FWS Species Range: <https://ecos.fws.gov/ecp/species/855>.

2. Datasets Used in Core Map Development

2.1. Range

The range for this species was last updated on October 11, 2023. 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 875 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 rate of 0.000247105.
3. This shapefile was added to an ArcGIS Pro map and compared against the available known locations described in the FWS 5-Year Review, and the available occurrence information from the GBIF, iNaturalist, and NatureServe databases.

2.2. NCDOT ATLAS

Regions of suitable habitat were used to refine the core map based on biological information. The NCDOT completed a project named "ATLAS" in 2021 that categorized land within the range as low or high suitability for species habitat for the Sensitive Joint-Vetch. Ultimately, regions of Low suitability were excluded from the core map, while High suitability were included. Categories of "low" and "high" for this species are defined as follows:

- Low: Regions and sites where biologists would be very surprised to find this species and its habitat

(occurrence here should be extremely rare).

- High: Biologists expect to frequently encounter areas that look like potential habitat based on visible environmental and vegetation community characteristics (Figure 5, NCDOT 2021).

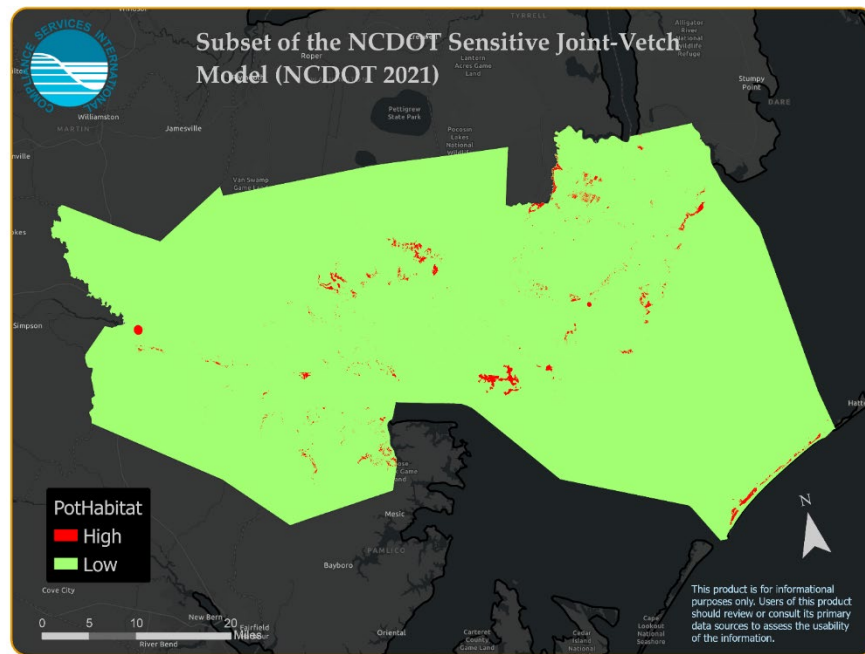


Figure 5. Areas of low and high habitat suitability for a subset of the Sensitive Joint-Vetch range (NCDOT 2021).

2.3. National Wetlands Inventory

The NWI dataset was preliminarily vetted to determine its appropriateness in representing aquatic areas matching descriptions of the Sensitive Joint-Vetch habitat. The Sensitive Joint-Vetch inhabits different types of wetland areas as described above, all of which are included in the NWI dataset.

The NWI is publicly available as state-level downloads. As a preliminary step, the North Carolina dataset was clipped to the areas of high potential habitat from the NCDOT to help reviewers identify water body types of notable importance to the species. The New Jersey dataset was clipped to species range using the Pairwise Clip tool and exported as a new layer, "NWI_NJ_pcRange." The resulting attribute table was exported to Excel and queried for water body types associated with the Sensitive Joint-Vetch. These selections are summarized below and in Figure 8.

- Riverine systems included only the "Tidal" subsystem. The resulting "ATTRIBUTE" classes were the following:
 - "R1UBV','R1UBVx','R1EM2Q','R1EM2T','R1US3Q','R1US3/EM2Q','R1EM2Th','R1UBVh'

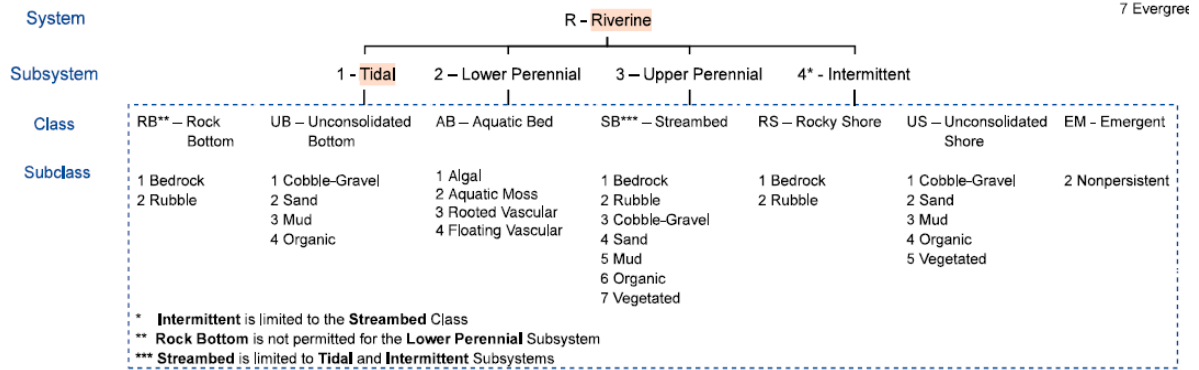


Figure 6. National Wetlands Inventory (NWI) attributes matched to Sensitive Joint-Vetch habitat description (highlighted, FWS 2013).

2.4. EPA Cultivated Lands Layer

The EPA has developed and published its own cultivated layer for use in core map development as a potential refinement of extent. For the Sensitive Joint-Vetch, 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 removed 7.3% of area, but is considered a reasonable refinement for core map development for off-field species.

3. Creating the Core Map

3.1. Habitat-Based Core Map Development

The Sensitive Joint-Vetch core map type is based on biological information/habitat. The approach used varied by state, as described below.

Delaware, Maryland, Virginia

1. Load a layer of U.S. states and select Delaware, Maryland, and Virginia.
2. Use the Pairwise Clip tool to clip the species range by the county layer selected for just these states, and save as a new layer, “SJV_range_pCDMV.”

North Carolina

1. Download the potential habitat model for the Sensitive Joint-Vetch from the NCDOT website.
2. Project the downloaded shapefile to WKID #4269 and save as a new layer named “NCDOT.”
3. Query the “NCDOT” layer for just areas of High potential habitat (the extent is all either High or Low) using this SQL query: PotHabitat = 'High'. Export selected data as a new layer, “NCDOT_high.”

New Jersey

1. Download the state-level NWI dataset for New Jersey. Inspect that its extent spans the entirety of the portion of the Sensitive Joint-Vetch range in New Jersey (it does).
2. Use the Pairwise Clip tool to clip the NWI data by the species range (“SJV_range”) and save as a new layer, “NWI_NJ_pcRange.”
3. Use the Select by Attributes tool to select from the previous layer (“NWI_NJ_pcRange”) only the wetland types listed in Section 2.3. These are the wetlands consistent with the habitat of the Sensitive Joint-Vetch.

- a. ATTRIBUTE IN ('R1UBV','R1UBVx','R1EM2Q','R1EM2T','R1US3Q','R1US3/EM2Q','R1EM2Th','R1UBVh')
4. Use the Pairwise Dissolve tool to dissolve the selected features in “NWI_NJ_pcRange” into a single feature, named “NWI_NJ_pcRange_pd.”
5. Use the Pairwise Buffer tool to buffer the previous layer (“NWI_BJ_pcRange_pd”) by 100 meters. This step is to account for uncertainty in the plants’ position relative to the water bodies. Select the option to dissolve all output features into a single feature. Save as a new layer (“NWI_NJ_pcRange_pd_pb100m”).

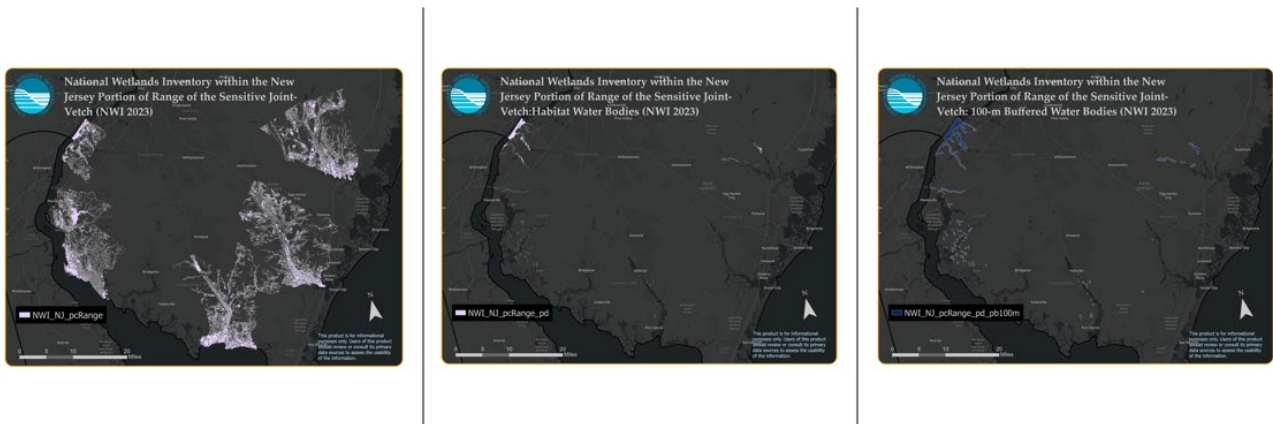


Figure 7. Development of the core map habitat of the Sensitive Joint-Vetch in New Jersey. NWI streams were clipped to the species range, queried for types relevant to the Sensitive Joint-Vetch and dissolved into a single shape, and buffered by 100 meters.

3.2. Merging Habitat Layers

The layers developed in the previous section for each of the three states interesting the species range were merged according to this procedure:

1. Use the Merge tool to merge the three state-wide habitat datasets (listed below) into a single layer, named “SJV_habitat.”
 - a. SJV_range_pcDMV
 - b. NCDOT_high
 - c. NWI_NJ_pcRange_pd_pb100m
2. Use the Pairwise Dissolve tool to dissolve the previous layer (“SJV_habitat”) into a single feature, named “SJV_habitat_pd.”

3.3. Cultivated Lands-based Refinement

The Sensitive Joint-Vetch 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 according to a layer developed by EPA (“CultivatedAreas_Over25acres”). Save as a new layer (“SJV_habitat_pd_peCultivated25ac”).
2. Export previous layer as a new layer identifiable as the species core map (“SJV_CoreMap”).

4. Datasets Considered but Not Used in Core Map Development

4.1. Known Observation Datasets

Datasets such as iNaturalist, GBIF, and NatureServe were considered but not used. NatureServe public EOs are viewable in their mapper as hexagons corresponding to locations where the species may have been observed. The current range of the species encompasses the majority of occurrences based on visual inspection. Range was selected as the outer extent and further refined with biological data.

References

Documents

- U.S. Environmental Protection Agency. 2024. Process EPA Uses to Develop Core Maps for Pesticide Use Limitation Areas. Accessed May 2, 2025. <https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas>.
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Spatial Data & Software

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