

Interim Core Map Documentation for Fassett's Locoweed

Date Posted on EPA's GeoPlatform: July 2025

Interim Core Map Developer: Compliance Services International (CSI)

Species Summary

The Fassett's locoweed (*Oxytropis campestris* var. *chartacea*; Entity ID 977) is a dicotyledonous threatened plant found in Wisconsin. The U.S. Fish and Wildlife Service (FWS) has not assigned designated critical habitat for Fassett's locoweed. Fassett's locoweed occurs on sandy shorelines of land-locked seepage lakes; its persistence appears to be dependent upon periodic fluctuations in lake levels and maintenance of shoreline habitat. Additional habitat information is provided in **Appendix 1**.

EPA 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 interim 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 interim 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 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. All views expressed in this documentation are not necessarily the viewpoints of EPA or its staff.

The core map developed for this species is considered interim and can be used to develop pesticide use limitation areas (PULAs). This core map incorporates information developed by FWS and made available to the public; 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.

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 Fassett's locoweed is biological information type, based on the range modified to include only identified areas of extant population sites as of 2021. Sites were buffered by 300 meters to account for reliance on periodic fluctuations in lake levels. This distance is sufficiently inclusive of shorelines, even amid fluctuating environmental conditions. The extant population sites were obtained from the names of lakes identified in the Recovery Plan and two 5-Year Reviews (FWS 1991, FWS 2009, FWS 2013). Other available known location information from the Global Biodiversity Information Facility (GBIF), the iNaturalist database, and NatureServe Explorer were not used for core map development in favor of FWS's more specific and precise dataset.

The core map developed in this document for the Fassett's locoweed spans 1,898 acres (Figure 1). A summary of core map 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 largely comprises unaltered boundaries of lakes from the National Hydrography Dataset (NHD; USGS 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 Fassett's locoweed.

NLCD_Land_Cover_Class	Acres
Mixed Forest	491
Deciduous Forest	402
Open Water	370
Evergreen Forest	147
Developed, Open Space	142
Woody Wetlands	121
Cultivated Crops	53
Shrub/Scrub	52
Hay/Pasture	38
Developed, Low Intensity	29
Herbaceous	29
Emergent Herbaceous Wetlands	15
Developed, Medium Intensity	4
Developed, High Intensity	-

Table 1. Acres by National Land Cover Database (NLCD) class within the core map of the Fassett's locoweed. Total core map area (based on NLCD pixel count): 1,893 acres¹.

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 evaluated these four datasets before developing the core map. Overall, there were seven research-grade observations found in iNaturalist². The GBIF dataset comprised 15 georeferenced observations. Both datasets were useful as validation against other datasets, but did not otherwise contribute to the core map development process.

FWS location information includes extant location information that positively identifies areas of species presence, which can be brought into a Geographical Information System (GIS) and contribute to the core map development process. These locations are within the species range and represent a more refined area that identifies likely species locations.

NatureServe public element occurrence (EO) data were also evaluated and are considered by CSI to be as

¹ This acreage is slightly different from the core map acreage (1,898 acres) 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->).

robust as the iNaturalist and GBIF datasets for this species, but not as precise or useful as the locations identified in the Recovery Plan (FWS 2018). These data appear at a coarser resolution than could be obtained directly from FWS.

Approach Used to Create Core Map

The core map was developed using the process developed by EPA 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: 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 Fassett’s locoweed from FWS, as well as observation information available from various publicly available sources including iNaturalist, GBIF, and NatureServe. The information compiled for Fassett’s locoweed is included in **Appendix 1**. Influential information that impacted the development of the core map includes a description of the species habitat and locations from the FWS Recovery Plan:

- “Fassett’s locoweed occurs on sandy shorelines of land-locked seepage lakes. Its persistence appears to be dependent upon periodic fluctuations in lake levels and maintenance of the shoreline habitat” (FWS 1991).

For step 2, CSI used the compiled information including the species range and 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 publicly available known locations from larger databases (iNaturalist, GBIF, and NatureServe) were too limited in extent compared to the extant population sites identified by FWS to be used as more than validation in core map development. By contrast, known location information from FWS—specifically extant population sites—presented an opportunity for use in this effort. Sites were buffered by 300 m to account for fluctuating water levels and to ensure the Fassett’s locoweed population areas were captured with a sufficiently protective area. The Fassett’s locoweed was judged by CSI to be an “off-field” species. When weighing that information together, CSI selected the biological information core map type based on known locations as described by FWS. Compliance Services International used a combination of range, known observation/occurrence location data, and EPA’s Cultivated areas > 25 acres layer 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 modified range. Designated critical habitat was quickly eliminated as a core map type because the Fassett’s locoweed does not have critical habitat. CSI judged that there was known occurrence/location data that would best represent the current distribution of extant populations of the species and used these data to refine the extent of the core map. The core map was established using extant

population location sites across the species range. The NHD was queried for areas relevant to the Fassett's locoweed within its range to form the basis of core map areas. Finally, cultivated lands were removed from this area; this did not remove a substantial amount of area because the habitat-based areas excluded cultivated land. **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. For the Fassett's locoweed, the core map locations were precise enough that any additional refinement from those datasets risked decreasing, rather than increasing, confidence in the overall extent of the species. This is because 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, which consist entirely of easily identifiable lakes, provides sufficient refinement for the core map and precludes need to further refine with land cover.

Appendix 1. Information compiled for Fassett's Locoweed

1. Recent FWS documents

- 5-Year Review (2009): https://ecos.fws.gov/docs/five_year_review/doc2626.pdf.
- 5-Year Review (2013): https://ecos.fws.gov/docs/five_year_review/doc4338.pdf.
- Recovery Plan (1991): https://ecos.fws.gov/docs/recovery_plan/910329.pdf.
- Status Review (2021): https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3675.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: "Fassett's locoweed occurs on sandy shorelines of land-locked seepage lakes. Its persistence appears to be dependent upon periodic fluctuations in lake levels and maintenance of the shoreline habitat" (FWS 1991).
 - "Seeds with thicker seed coats will persist longer in the seed bank, and since Fassett's locoweed relies on an extensive seed bank to recover from population crashes, this adaptation likely heavily contributes to the persistence of the species" (FWS 2021).
 - Pollinators: "The pollinator(s) of Fassett's locoweed is unknown although W.S. Alverson collected a small, leafcutting bee which was seen foraging on the flowers. The specimen was later identified to be *Megachile* sp. nr. *melanophoea* Smith (female, Megachilidae). In addition, larger bees (*Bombus* sp.) have also been observed visiting flowers" (FWS 1991).
- Taxonomy
 - Wetland plant – The species *Oxytropis campestris* has been described as a 'polymorphic, circumboreal species, which ranges across North America, Asia, and Europe (Barneby 1952, p. 249). In North America, its range extends from eastern Canada and adjacent Maine west to northern Alaska and south to northern Oregon. Colorado, South Dakota, and Wisconsin. Barneby (1952) assigns eight varieties to this taxon, most of these restricted to the Rocky Mountains or Pacific Northwest of North America. (FWS 1991).
- Relevant Potential Pesticide Use Sites
 - "Mention is made of Fassett's Locoweed in proximity to agricultural areas that receive routine pesticide treatments. In addition, the potential for pesticide runoff is increased because the crops are irrigated and are located on sandy soils. In addition to potential adverse effects from pesticide use on agricultural land, pesticide runoff or drift may also occur from applications to lawns and non-crop areas by property owners (Plainfield, Huron, Weymouth lakes) and by county personnel (Parkland areas around Lake Huron). Many recently introduced herbicides are highly active on certain plant species at very low rates per acre, increasing their potential for off-target plant injury. As spray volumes and rates per acre are reduced, the potential for drift off-target during aerial application increases as well"

(FWS 1991, Appendix 2).

- Relevant Recovery Criteria and Actions
 - Recovery Criteria (FWS 2021)
 - Delisting may be considered for Fassett’s locoweed when all recovery criteria given in the recovery plan have been met. These criteria are.

1. “Protect the lake shorelines with Fassett’s locoweed at all sites with naturally occurring populations. This includes the 6 extant populations (extant in 1991 when the Fassett’s locoweed recovery plan was completed) as well as any new occurrences which might be found. Adequate protection will be accomplished not only through legal agreements with landowners but by increasing public awareness on the high-use lake shorelines. Where this is not possible, other methods should be pursued, including conservation easement and registry” (FWS 2013).

This criterion has not been met, though many steps have been taken. Since the completion of the recovery plan, the Wisconsin Department of Natural Resources (WDNR) State Natural Areas (SNA) Program has acquired large portions of the population sites in central Wisconsin, including portions of Pickerel, Plainfield, Second, Sherman, and Weymouth Lakes. Mountain Lake is owned completely by the United States Forest Service (USFS). Pigeon Lake is owned partly by the USFS, The Board of Commissioners of Public Lands, and the University of Wisconsin system. However, portions of Fassett’s locoweed sites are still privately owned, and Lake Huron is entirely private. Some landowners on Lake Huron have been actively protecting the Fassett’s locoweed on their property, such as caging plants or prohibiting vehicle access to sites. Others have not taken any protective measures” (FWS 2013).

2. “Protected populations will be monitored and the site managed to maintain Fassett’s locoweed. Management needs may include removal of nonnative plant species and other measures necessary to sustain shoreline habitat” (FWS 2013).

This criterion has not been met, due to its ongoing nature. Population surveys are being conducted every year at Plainfield, Pickerel, and Second (apart from 2019-2020 due to high regional water levels; see information below under Abundance, population trends, demographic features, or demographic trends). Surveys at other Fassett’s locoweed sites are conducted frequently (see information below under Abundance, population trends, demographic features, or demographic trends). Continued monitoring is still necessary to understand population dynamics and potential threats to the species” (FWS 2013).

3. “Removal of Fassett’s locoweed from the list of U.S. Endangered

and Threatened Species will be considered when 6 populations are permanently protected and managed, and monitoring indicates the populations to be self-sustaining” (FWS 2013).

This criterion has not been fully met. Frequent monitoring has been ongoing at many of the sites, including Plainfield, Pickerel, Second, Pigeon, and Mountain. However, it is unclear what constitutes a self-sustaining population of Fassett’s locoweed due to the species’ frequent population swings. Fassett’s locoweed is found along shorelines of seepage lakes fed by groundwater, which naturally have highly fluctuating water levels (FWS 2013). All populations are currently submerged and have been since 2018 (see information below under Abundance, population trends, demographic features, or demographic trends). Therefore, it is not known what will happen to the populations once the water level drops, though in previous submersion events the species has rebounded drastically once the shoreline becomes exposed again. However, we cannot conclude whether the populations are currently self-sustaining at this time” (FWS 2013).

3. Range

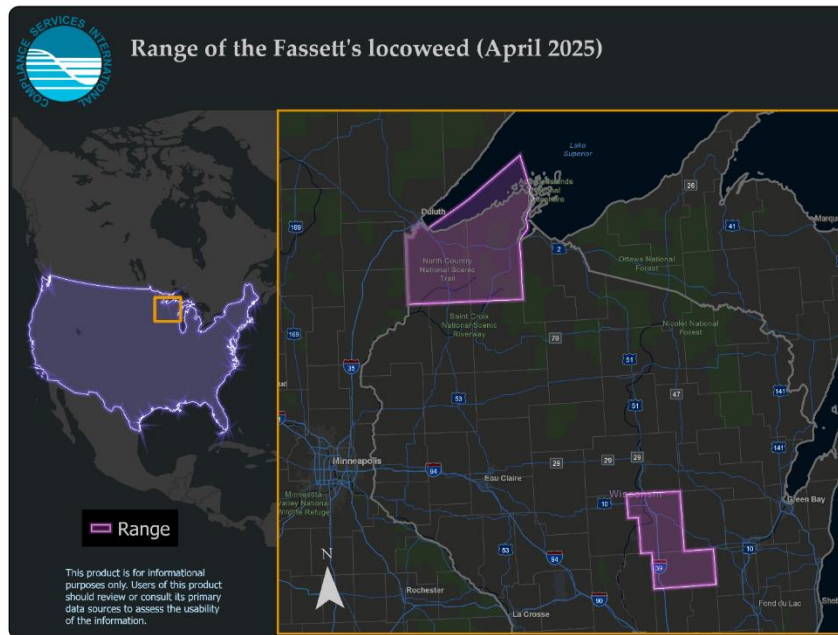


Figure 2. Range of the Fassett's locoweed (FWS 2025).

4. Critical Habitat

The Fassett’s locoweed does not have designated critical habitat.

5. Known Locations

- FWS

- Eight Fassett’s locoweed populations remain extant (FWS 2021). These observations are described relatively precisely in the “Site Description” field, although site feature types vary among points, lines, and polygons. However, each location is easily identifiable and therefore enables a precise rendering for use in core map development.

Site	Pigeon Lake ^b	Mountain Lake ^d	Pickerel Lake ^a	Plainfield Lake ^a	Second Lake ^a	Sherman (Marks) Lake ^{a,c}	Weymouth Lake ^a	Lake Huron ^a	Mud Lake ^b	Shumway Lake ^b
County	Bayfield	Bayfield	Portage	Waushara	Waushara	Waushara	Waushara	Waushara	Waushara	Waushara
Land Ownership	University of Wisconsin System, private. Additional potential habitat owned by FWS & other private property.	USFS-Chequamegon-Nicolet National Forest, private	WDNR (part of a State Natural Area), private	WDNR (part of a State Natural Area), private	WDNR (part of a State Natural Area), private	WDNR (part of a State Natural Area), private	Multiple Private	Multiple Private	Private	Private
Land Ownership Notes	Landowner contact should continue with adjacent private landowner.	All of population located on National Forest land. Contact should continue with adjacent private landowner.	Much of FL population is protected by SNA> A great number of plants remain in private property- a summer camp (Camp Helen Brachman) uses the beach where plants are located.		Part of Plainfield Lake Channel Lakes State Natural Area protected in 1990.	Part of Plainfield Lake Channel Lakes State Natural Area protected in 1990.	Permanent protection should be sought for this site. One landowner is very understanding and willing to protect the site (permanent protection is being sought). The adjoining landowner does not respond to correspondence.	Plants are monitored by the landowners around the lake. Plants are caged.		

Table 2. Summary Information on Fassett’s locoweed (FL) Sites in Wisconsin. Extant and historic occurrences of Fassett’s locoweed. Copied from part of Appendix A of the 2009 5-Year Review (FWS 2009).

Some historical sites no longer have populations of Fassett’s locoweed, although at least one such site has observed a recurrence. Currently there are eight lakes with known extant populations of the species, in two clusters in central and northwest Wisconsin.



Figure 1. Ten extant Fassett's locoweed sites in Wisconsin as of 2012. Copied from Figure 4 of the most recent 5-Year Review.³ (FWS 2013).

- iNaturalist:
https://www.inaturalist.org/observations?quality_grade=research&subview=map&taxon_id=241908

³ Presently, only 8 extant sites remain.

- Nineteen verifiable observations, all of which are research-grade with public coordinate data (Figure 3).
- These locations align well enough with species range and the known extant populations in FWS documentation.

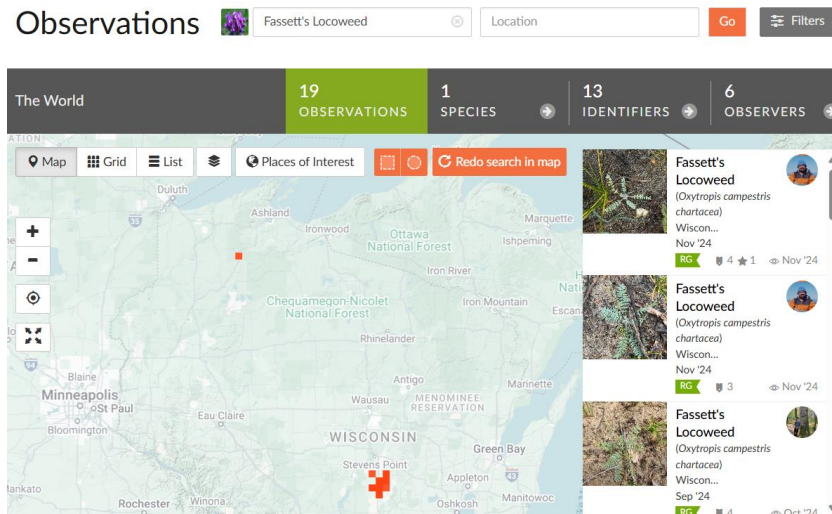


Figure 3. iNaturalist occurrences for the Fasset's Locoweed.

- GBIF: <https://www.gbif.org/species/5361546>
 - GBIF includes 116 occurrence records; 19 of which are georeferenced. 18 of these had usable coordinate data based on latitude/longitude precision (3+ decimal places) and relative recency (2010-present).
 - These point observations are mostly comprehensive in central Wisconsin but, as with the iNaturalist dataset, there is also an observation in northwest Wisconsin. These data are consistent with extant sites listed by FWS.

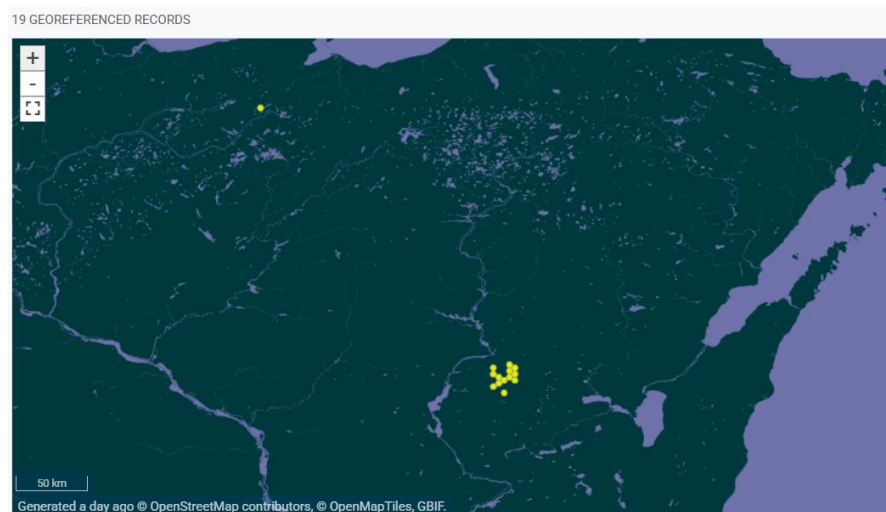


Figure 4. GBIF occurrences of the Fasset's locoweed.

- NatureServe Explorer: <https://explorer.natureserve.org/>

- NatureServe public EO information from NatureServe Explorer is consistent with iNaturalist, the GBIF database and FWS extant sites.

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

The core map for this species is based on descriptions of known observations. The core map identifies extant population areas (lakes) from the NHD (USGS 2023). The NHD dataset is regarded as a high quality national-level dataset that is appropriate to identify aquatic habitat for plant species such as the Fassett’s locoweed. These lakes were buffered by 300 m to ensure that terrestrial areas matching descriptions of the species’ habitat (notably lakeshores) were captured. Finally, cultivated areas of at least 25 acres were removed from the core map.

1. References and Software

- Esri. *Basemap*. <https://developers.arcgis.com/documentation/mapping-and-location-services/mapping/basemap-layers>.
- Google. *Google Maps*. Accessed May 3, 2025. <https://maps.google.com/>
- National Hydrography Dataset (NHD Plus v. 2): <https://www.usgs.gov/national-hydrography/access-national-hydrography-products>.
- 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/209>.

2. Datasets Used in Core Map Development

2.1. Range

The range for this species was last updated on August 18, 2021. 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 977 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 Species Status Assessment (SSA), and the available occurrence information from the GBIF, iNaturalist, and NatureServe databases.

2.2. FWS Documents: 5-Year Reviews (2009 and 2013) and Status Review (2021)

The 2009 5-Year Review of the Fassett’s locoweed identifies all the sites where the species had been observed. These were: Lake Huron, Mountain Lake, Mud Lake, Pickerel Lake, Pigeon Lake, Plainfield Lake, Second Lake, Sherman (Marks) Lake, Shumway Lake, and Weymouth Lake. Three sites were noted to be

historic; monitoring efforts confirmed the species no longer inhabits the Mud Lake or Shumway Lake areas, whereas the species was rediscovered at Pigeon Lake. The subsequent 2013 5-Year Review identifies two additional sites: Deer Print Lake and Wolf Lake. However, these sites were revised to no longer be considered extant in the 2021 Status Review.

The remaining eight extant sites were used for core map development: Lake Huron, Mountain Lake, Pickerel Lake, Pigeon Lake, Plainfield Lake, Second Lake, Sherman (Marks) Lake, and Weymouth Lake.

2.3. National Hydrography Dataset (NHD)

The NHD dataset was used to export polygons for each of the extant lakes described above. Sites were found in Google Maps and ESRI Basemaps, and each was easily identifiable as a polygon from the NHD high resolution dataset ("NHDWaterbody").

2.4. 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 Fassett's locoweed, 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 only 2.8% of area but is considered a reasonable refinement for core map development for off-field species.

3. Creating the Core Map

3.1. Identifying/Exporting Polygons

The Fassett's locoweed core map type is based loosely on range, modified to include only the eight known extant populations, each corresponding to a lake, within the range. The extent was established for each of the species' known extant locations as follows:

1. Search for the site in Google Maps using its name and county.
2. Set a pin in the middle of the lake to obtain a decimal coordinate pair.
3. Copy the coordinates and paste into ArcGIS Pro using the "Go To XY" tool. Pan to the coordinates.
4. Use the Select tool to select the corresponding shape from the NHDWaterbody layer of the NHD high resolution dataset. Export as a standalone layer named after the lake.

Lake Huron



Figure 5. Google Maps (left) and NHD shape (right) for Lake Huron (Google 2025; USGS 2023).

Mountain Lake



Figure 6. Google Maps (left) and NHD shape (right) for Mountain Lake (Google 2025; USGS 2023).

Pickerel Lake



Figure 7. Google Maps (left) and NHD shape (right) for Pickerel Lake (Google 2025; USGS 2023).

Pigeon Lake



Figure 8. Google Maps (left) and NHD shape (right) for Pigeon Lake (Google 2025; USGS 2023).

Plainfield Lake



Figure 9. Google Maps (left) and NHD shape (right) for Plainfield Lake (Google 2025; USGS 2023).

Second Lake



Figure 10. Google Maps (left) and NHD shape (right) for Second Lake (Google 2025; USGS 2023).

Sherman (Marks) Lake



Figure 11. Google Maps (left) and NHD shape (right) for Sherman (Marks) Lake (Google 2025; USGS 2023).

Weymouth Lake



Figure 12. Google Maps (left) and NHD shape (right) for Weymouth Lake (Google 2025; USGS 2023).

3.2. Combining Extent

The polygons created in the previous step were aggregated and processed to produce a core map extent according to the steps below.

1. Use the Merge tool to merge polygons developed above representing each of the eight extant populations. Save as a new layer ("FL_polygon_merge").
 - a. Lake Huron
 - b. Mountain Lake
 - c. Pickerel Lake
 - d. Pigeon Lake
 - e. Plainfield Lake
 - f. Second Lake
 - g. Sherman (Marks) Lake
 - h. Weymouth Lake
2. Use the Pairwise Dissolve tool to dissolve the previous layer ("FL_polygon_merge") into a single polygon feature. Save as a new layer ("FL_polygon_merge_pd").
3. Use the Pairwise Buffer tool to buffer the previous layer ("FL_polygon_merge_pd") by 300 m. Save as a new layer ("FL_polygon_merge_pd_pb300m").

3.3. Cultivated Lands-based Refinement and Finalization of Interim Core Map

EPA has developed and published its own cultivated layer for use in core map development as a potential refinement of extent. For the Fassett's locoweed, 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 relatively little area but is considered a reasonable refinement for core map development for off-field species

1. Use the Pairwise Erase tool to erase areas of cultivated land > 25 acres from EPA’s Modified Cultivated Areas from the previous layer (“FL_polygon_merge_pd_pb300m”) and save as a new layer, “FL_polygon_merge_pd_pb300m_peCultivated25ac.” Finally, export this layer as an easily identifiable finalized interim core map layer (“FL_CoreMap”).

4. Datasets Considered but Not Used in Core Map Development

a. 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. For the Fassett’s locoweed, the core map locations were precise enough that any additional refinement from those datasets risked decreasing, rather than increasing, confidence in the overall extent of the species. This is because 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, which consist entirely of easily identifiable lakes, provides sufficient refinement for the core map and precludes need to further refine with land cover.

References

Documents

- U.S. Environmental Protection Agency. 2024. Process EPA Uses to Develop Core Maps for Pesticide Use Limitation Areas. Accessed May 3, 2025. <https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas>.
- U.S. Fish and Wildlife Service. 1991. *Fassett's Locoweed Recovery Plan*. Accessed May 3, 2025. https://ecos.fws.gov/docs/recovery_plan/910329.pdf.
- U.S. Fish and Wildlife Service. 2009. *Fassett's Locoweed (Oxytropis campestris var. chartacea) 5-Year Review: Summary and Evaluation*. Accessed May 3, 2025. https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1246.pdf.
- U.S. Fish and Wildlife Service. 2013. *Fassett's Locoweed (Oxytropis campestris var. chartacea) 5-Year Review: Summary and Evaluation*. Accessed May 3, 2025. https://ecos.fws.gov/docs/five_year_review/doc4338.pdf
- U.S. Fish and Wildlife Service. 2021. *Fassett's Locoweed (Oxytropis campestris var. chartacea) Status Review: Summary and Evaluation*. Accessed May 3, 2025. https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3810.pdf.
- U.S. Fish and Wildlife Service. 2025. *Fassett's Locoweed (Oxytropis campestris var. chartacea)*. Accessed May 3, 2025. <https://ecos.fws.gov/ecp/species/209>.

Spatial Data & Software

- Esri. *Basemap*. Accessed March 1, 2025. <https://developers.arcgis.com/documentation/mapping-and-location-services/mapping/basemap-layers>.
- GBIF Secretariat. "*Oxytropis campestris var. chartacea* (Fassett Barneby)." *GBIF Backbone Taxonomy*. Accessed May 3, 2025. <https://www.gbif.org/species/5361546>.
- Google. *Google Maps*. Accessed May 3, 2025. <https://maps.google.com/>
- iNaturalist. "*Fassett's Locoweed (Oxytropis campestris var. chartacea)*." Accessed May 3, 2025. https://www.inaturalist.org/observations?quality_grade=research&subview=map&taxon_id=241908.
- NatureServe. 2025. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available <https://explorer.natureserve.org/>. Accessed May 2, 2025.
- Software used: ArcGIS Pro version 3.2.
- U.S. Environmental Protection Agency. 2025. Modified Cultivated Layer. Accessed April 1, 2025. <https://cdn.arcgis.com/home/item.html?id=159e70ce4c284f5b972c687037f8a668>.
- U.S. Geological Survey. 2023. National Hydrography Dataset (High Resolution). Accessed May 3, 2025. <https://www.usgs.gov/national-hydrography/access-national-hydrography-products>.