

Interim Core Map Documentation for the Florida Bonamia (*Bonamia grandiflora*)

Version 1

Review Completed: April 2026

Core Map Developer: U.S. Environmental Protection Agency (EPA) Office of Pesticide Programs (OPP)

Species Summary

The Florida bonamia (*Bonamia grandiflora*; Entity ID #892) is an endangered terrestrial plant (dicot). There is no designated critical habitat for this species. This species inhabits open sandy areas with an open canopy in full sunlight occurring on white and yellow sands. It is abundant in scrub and sandhill communities across six counties in Central Florida. The Florida bonamia relies on pollinators to ensure seed production by self- and cross-fertilization. Additional information is provided in **Appendix 1**.

Description of Core Map

The core map for the Florida bonamia is based on species range, which includes 6 counties across Central Florida (Highlands, Lake, Manatee, Marion, Orange, and Polk Counties). The species range is refined, well documented, and represents areas important for this species' conservation. There are 55 managed, secured populations and an additional 16 populations on unsecured or unmanaged lands. There is no designated critical habitat. **Figure 1** depicts the interim core map for the Florida bonamia. The core map represents approximately 153,000 acres across central Florida.

The Florida bonamia occupies xeric sandy soils in scrub and sandhills habitats endemic to central Florida ridges. Landcover categories within the core map area are included in **Table 1**. Landcover is predominately pasture/hay, woody wetlands, evergreen forest, and scrub/shrub, which are generally consistent with the habitat of this species.

The core map developed for the Florida bonamia is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include the Florida bonamia. 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 interim core map has a "none" (1) best professional classification because it consists of the species' range without additions or subtractions. This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.

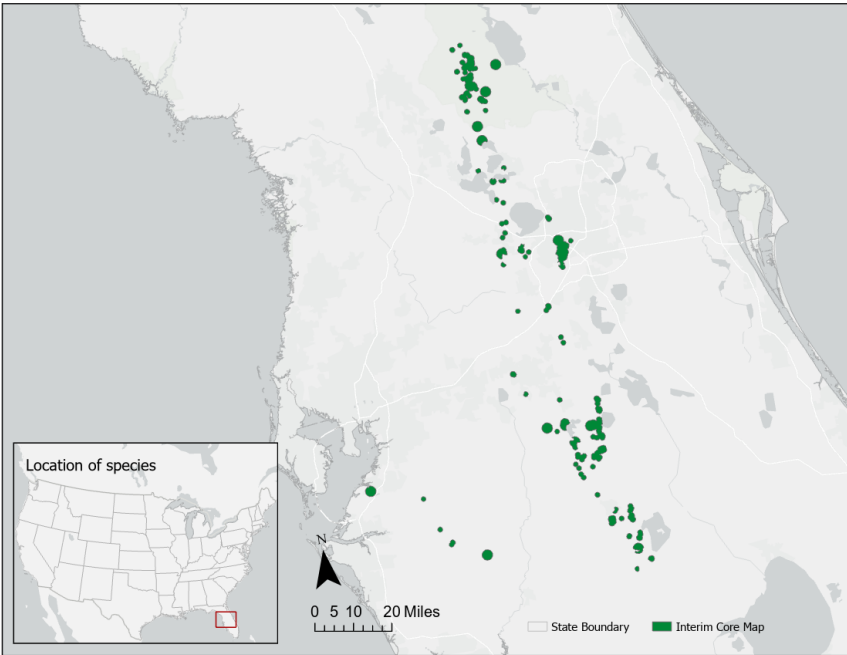


Figure 1. Interim core map for the Florida bonamia.

Table 1. Percentage of Interim Core Map Represented by National Land Cover Database (NLCD) Land Covers and Associated Example Pesticide Use Sites/Types.

| Example pesticide use sites/types | NLCD Landcover (Value) | % of core map represented by landcover |
|-----------------------------------|-----------------------------------|--|
| Forestry | Deciduous Forest (41) | 1% |
| Forestry | Evergreen Forest (42) | 11% |
| Forestry | Mixed Forest (43) | 1% |
| Agriculture | Pasture/Hay (81) | 21% |
| Agriculture | Cultivated Crops (82) | 7% |
| Mosquito Adulticide, Residential | Open space, developed (21) | 7% |
| Mosquito Adulticide, Residential | Developed, Low intensity (22) | 6% |
| Mosquito Adulticide, Residential | Developed, Medium intensity (23) | 3% |
| Mosquito Adulticide, Residential | Developed, High intensity (24) | 1% |
| Invasive Species Control | Woody Wetlands (90) | 22% |
| Invasive Species Control | Emergent Herbaceous Wetlands (95) | 5% |
| Invasive Species Control | Open water (11) | 5% |
| Invasive Species Control | Grassland/herbaceous (71) | 2% |
| Invasive Species Control | Scrub/shrub (52) | 7% |
| Invasive Species Control | Barren land (rock/sand/clay; 31) | 0% |
| Total Acres | Interim Core Map Acres | 153,012 |

Evaluation of Known Location Information

There are four datasets with known location information for this species:

- Descriptions of locations provided by FWS
- Occurrence locations included in iNaturalist
- Occurrence locations included in the Global Biodiversity Information Facility (GBIF)
- Occurrence locations included in NatureServe

EPA evaluated these sets of data to inform or support the core map. FWS provided the most refined descriptions of the occurrence information and confirmed that all known locations of extant populations are located within the range. iNaturalist has 372 research grade observations, which are consistent with the FWS species range. GBIF's occurrence data consisted of 270 occurrences that had also been accounted for in iNaturalist and NatureServe. NatureServe included 20 documented areas that were consistent with the location of the species range. **Appendix 1** includes more information on the available known location information.

Approach Used to Create Core Map

The core map was developed using the "Process EPA Uses to Develop Core Maps for Draft Pesticide Use Limitation Areas for Species Listed by the U.S. Fish & Wildlife Service (FWS) and their Designated Critical Habitats³" (referred to as "the process"). This core map was developed by EPA using the 4 steps described in the process document:

1. Compile available information for a species
2. Identify core map type
3. Develop the core map for the species
4. Document the core map

For Step 1, EPA compiled available information for the Florida bonamia from FWS, as well as observation information available from various publicly available sources (including iNaturalist, GBIF, and NatureServe). The information compiled for the Florida bonamia is included in **Appendix 1**.

Influential information included:

- The species range is highly refined.
- There are 55 known populations in FWS documentation, all of which are within the species' range.
- Occurrence data from other sources are generally consistent with the species range location.

For Step 2, EPA used the compiled information to identify the core map type. Based on the narrow range that includes all occurrence data identified by FWS, EPA selected the range to use as the species core map. For step 3, EPA used the ECOS species range for the Florida bonamia.

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

EPA did not explore approaches other than those described in this documentation.

Appendix 1. Information Compiled for Species

1. Recent FWS Documents

- [Florida Scrub and High Pineland Plants \(19 spp.\) Recovery Plan \(1996\)](#)
- [Florida Bonamia \(*Bonamia grandiflora*\) 5-Year Review \(2008\)](#)
- [Florida Bonamia \(*Bonamia grandiflora*\) 5-Year Review \(2017\)](#)
- [Florida Bonamia \(*Bonamia grandiflora*\) 5-Year Review \(2023\)](#)

2. Background Information on Species

- **Status:** Federally listed as threatened in 1987 (5-Year Review 2008)
- **Taxonomy:** FWS identifies the Florida bonamia as a relatively long-lived perennial vine belonging to the morning-glory family (*Convolvulaceae*; 5-Year Review 2023).
- **Resiliency, Redundancy, and Representation (The 3Rs)**
 - **Resiliency:** “*Bonamia grandiflora* is a long-lived perennial and can self-pollinate and produce seeds without fertilization, which affords the species some natural ability to withstand year-to-year variation in conditions. The distribution of the species includes 55 populations over 6 counties on lands that are managed for appropriate habitat. Many of these populations are within contiguous tracts of land that provide for connectedness between populations. In one study habitat disturbance (e.g., fire and mechanical) resulted in greater plant density, stem densities, seedling recruitment, flowering, and seed production than in habitat that had not been disturbed recently and that was considered successional mature (Hartnett and Richardson 1989). Because of the disturbance-dependence of this species, some level of environmental stochasticity may not be detrimental and may be beneficial to the species. We believe these characteristics provide the species with sufficient and inherent resiliency (5-Year Review 2023).”
 - **Redundancy:** “The species is known to occur in 55 managed, secured populations across six counties in the state. In addition to known, managed populations, there are an additional 16 populations on unsecured or unmanaged lands. In addition to the known populations, the species’ condition in Ocala National Forest was described by USFS personnel as “widespread ... it is in every scrub stand essentially” (Jay Garcia, USFS pers. comm.). This indicates to the Service that the species is likely much more widespread than we know and may be similarly more widespread on other protected and private lands. Because of the widespread nature of the species and its general biological characteristic, a single catastrophic event is unlikely to impact all individuals in all populations. and should have sufficient redundancy to be viable in the foreseeable future (5-Year Review 2023).”

- **Representation:** “Because the species occurs in a limited range of habitats in central Florida, it may limit the species ability to adapt to changing conditions and therefore limit its representation. The species’ ability to seed without fertilization and self-pollinate may also limit genetic diversity. However, the self-pollination and setting seeds without fertilization allows the species to persist during times or in areas where additional plants will be unavailable for cross-pollination. *Bonamia grandiflora* has low genetic variability compared to other plants endemic to scrub in Florida, which is likely the result of a small initial gene pool and/or strong selection in the harsh scrub environment. Habitat fragmentation and population isolation in some cases may contribute to limitations in genetic diversity. Some of these characteristics may limit the species’ representation but also allow it to persist when there are few nearby plants for cross-pollination. However, we do not feel that these characteristics will impact the species’ viability in the foreseeable future (5-Year Review 2023).”
- **Habitat Description:**
 - “[The] Florida bonamia prefers open sandy areas with an open canopy in full sunlight occurring on white and yellow sands (5-Year Review 2023).”
 - “In Ocala National Forest, *B. grandiflora* is abundant in scrub and sandhill communities and along roadsides and rights-of-ways (5-Year Review 2023).”
 - “These plants occur on dry, nutrient poor soils; most occur primarily in Florida scrub vegetation dominated by scrubby evergreen oaks, sand pine, and/or Florida rosemary (Recovery Plan 1996).”
- **Pollinator/Reproduction:**
 - “Pollinators are essential to ensure substantial seed production by self- and cross-fertilization (5-Year Review 2023).”
 - “Fire stimulates seed production and germination as well as regrowth from clonal stems (5-Year Review 2023).”
 - Seedlings germinate throughout summer until September (5-Year Review 2023).”
- **Relevant Pesticide Use Sites:**
 - “The Forest Service, Lake George Ranger District, has developed bonamia management recommendations in this recovery plan’s narrative outline. The conservation measures concentrate on maintaining a reasonable amount of open, sunny habitat and preventing the invasion of such habitats by cogon grass (*Imperata spp.*), an exotic pest that has the potential to destroy scrub and high pineland habitats. The only available method to control cogon grass is by spot herbicide treatment, which may unavoidably kill a few bonamia plants. The benefit of pest control is far greater than the risk to the locally abundant bonamia (Recovery Plan 1996).”
- **Threats (5-Year Review 2023):**
 - “Habitat destruction, modification, and degradation still threaten populations on private lands.”
 - “Fire suppression and habitat conversion to urban uses continues to negatively affect species in non-protected habitat.”

- “This plant and other scrub species are relatively drought-resistant, but seasonal changes may affect seedling recruitment and general phenology of the species.”
- **Recovery Criteria/Objectives (5-Year Review 2023):**
 - **Objective** – “The South Florida Recovery objective can be achieved when: sites, within the historic range of *B. grandiflora*, are adequately protected from habitats loss, degradation, and fragmentation; when these sites are managed to maintain the seral stage of xeric oak scrub communities to support *B. grandiflora*; and when monitoring programs demonstrate that these sites support the appropriate numbers of self-sustaining populations, and those populations are stable throughout the historic range of the species. Currently, most protected *B. grandiflora* individuals are protected on the Ocala National Forest. To adequately conserve the species, protected sites are needed throughout its entire range, including South Florida.”
 - **Criteria #1** – “The species is secure in Ocala National Forest (Marion County). Low-intensity monitoring must continue after delisting.
 - **Criteria #2** – “Secure and monitor at least three (3) sites in Highlands County, at least three (3) Polk County, and at least two (2) in other counties.
 - **Criteria #3** – “Provide at least 5 years of demographic monitoring for each site, coupled with prescribed fire.
- **Recommended Future Activities (5-Year Review 2023):**
 - “Collaboration with conservation land managers to increase habitat suitability of occupied habitat by promoting beneficial management options to increase population persistence wherever additional opportunities present themselves.”
 - “Encourage landowners whose populations are under a habitat management plan to monitor occupied habitat increased data of long-term trends”

3. Description of Species Range

- “The Florida Natural Areas Inventory’s (FNAI) Element of Occurrence Records (EO) database listed 95 populations from nine counties in 2022 (e.g., Hardee, Highlands, Hillsborough, Lake, Manatee, Marion, Orange, Osceola, and Polk; 5-Year Review 2023).”
- “Approximately 21 of the EOs occur in Ocala National Forest; however, this is an extreme underestimate of the actual number of populations in the Forest, since not all known occurrences have been reported to the FNAI database (5-Year Review 2023).”

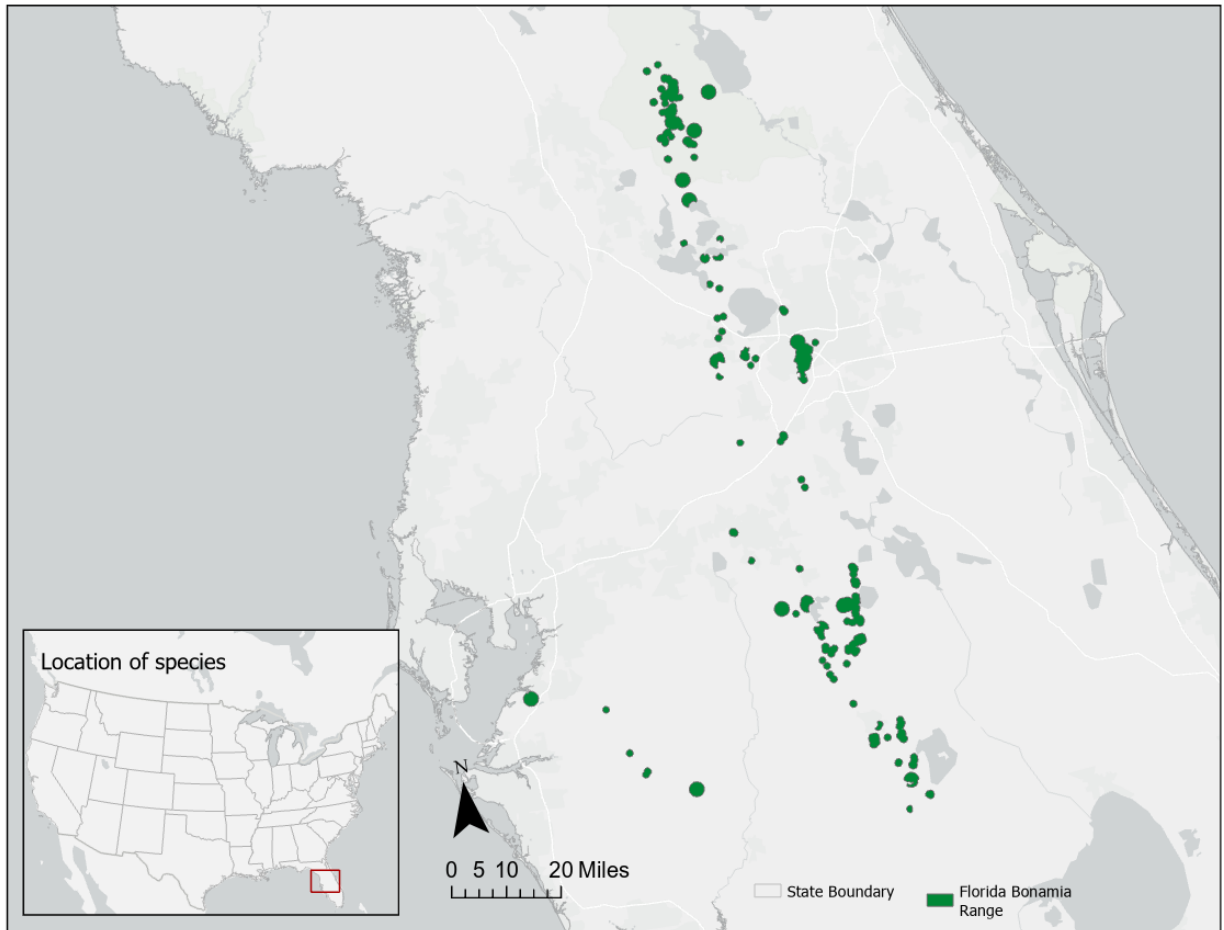


Figure A1-1. FWS range for the Florida bonamia.

4. Critical Habitat

- The Florida bonamia does not have a designated critical habitat.

5. Known Locations

• **Known Locations Described in FWS Documents**

“When assessing the species, there are currently 55 extant populations in six counties where they occur on managed, conservation lands (e.g., Highlands, Lake, Manatee, Marion, Orange, and Polk Counties; 5-Year Review 2023).”

○ Highlands County

- Lake Wales Ridge National Wildlife Refuge: Flamingo Villas NWR
- Lake Wales Ridge – WEA (FWC): Lake Apthorpe, Carter Creek – Bass Ranch, Royce Ranch, Holmes Avenue

○ Lake County

- Lake County Water Authority: Crooked River, Palatlahaha River Park
- Florida Forest Service – Seminole State Forest: Warea Tract (Flat Lake)
- LWR Ecosystem – Warea Archipelago: Ferndale Ridge
- FL Dept. of Environmental Protection: Lake Louisa State Park
- FL Dept. of Transportation: US 441 at Jct 19A

- Manatee County
 - FL Dept of Environmental Protection: Beker-Wingate Creek State Park
 - Manatee County: Duette Preserve & Moody Branch WEA (FWC)
- Marion County
 - U.S. Forest Service: Ocala National Forest
- Orange County
 - Orange County: Shadow Bay Park
 - City of Orlando: Bill Fredrick Park at Turkey Lake & Eagles Nest Park
 - Water Conservation II – Site 1 and Site 2
 - Orange County National Golf Center: Conservation Area Phase I
- Polk County
 - Polk County: Hickory Lake Scrub Park
 - Lake Wales Ridge State Forest (FFS): Sullivan Tract, Livingston Creek Scrub, Ready Creek Scrub, Hesperides West – Flaming Arrow Scrub
 - Lake Wales Ridge – WEA (FWC): Mountain Lake Cutoff, Sun Ray Scrub – Hickory Lake South, Lake Blue
 - Upper Lakes Basin Watershed (SFWMD): Horse Creek Scrub & Snell Creek Scrub
- **Occurrences Included in Public Databases**
 - EPA queried iNaturalist, GBIF, and NatureServe. The occurrence data from iNaturalist, GBIF, and NatureServe are consistent with the range identified by FWS (<https://ecos.fws.gov/ecp/species/2230>), with all the occurrences falling within the FWS range.
 - iNaturalist (available [here](#)) had 372 research grade observations for this species. All 372 observations are within the range identified by FWS.
 - GBIF (available [here](#)) included 267 human observations (from 2015-2025) with 251 observations having coordinates. 9 of the human observations came from NatureServe and the rest are from iNaturalist. All human observations are within the range identified by FWS.
 - Occurrence in NatureServe were consistent with other occurrence data (linked [here](#)) for 20 documented distributions that are within the FWS range.

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

This core map (file name “FloridaBonamia_CoreMap.ppkx”) was created based on the species range. Based on the FWS, the Florida bonamia (*Bonamia grandiflora*) occurs in xeric sandy soils in scrub and sandhill habitats across six counties in central Florida.

Dataset References and Software

- **ArcGIS Pro**
 - o Software used: ArcGIS Pro 3.5.2

- **FWS Species Range**
 - o From ECOS (<https://ecos.fws.gov/ecp/species/2230>)
 - o Last updated on 12/12/2022