Hairy Rattleweed
(*Baptisia arachnifera*)

5-Year Review:
Summary and Evaluation

Photo by Carol and Hugh Nourse

U. S. Fish and Wildlife Service
Southeast Region
Georgia Ecological Services Field Office
Athens, Georgia

5-YEAR REVIEW
Hairy Rattleweed (*Baptisia arachnifera*)

I. GENERAL INFORMATION

A. Methodology used to complete the review:

On May 7, 2018, the U.S. Fish and Wildlife Service (Service) published a notice in the *Federal Register* (83 FR 20092) announcing the next 5-year review of this plant and requested new information concerning the biology and status of this species. We did not receive any public comments during the 60-day comment period. We contacted Georgia Department of Natural Resources (GADNR) personnel, land managers, and knowledgeable biologists throughout the species range to make sure we had up-to-date information on populations, threats, and recovery activities related to this species.

This 5-year review was completed by the lead recovery biologist for hairy rattleweed (*Baptisia arachnifera*) in the Georgia Ecological Services Field Office (GAESFO). Our sources include the original listing rule for the species, the 1984 Recovery Plan, published and unpublished literature, and personal communications with or from biologists familiar with the species. Comments and suggestions from peer reviewers were incorporated as appropriate (see Appendix A). No part of this review was contracted to an outside party.

B. Reviewers

Lead Region: Kelly Bibb, Southeast Region, (404) 679-7132

Lead Field Office: Georgia Ecological Services Field Office, April Punsalan, 843-727-4707 extension 213.

C. Background

1. Federal Register Notice citation announcing initiation of this review:

May 7, 2018; 83 FR 20092

2. Species status:

Declining. Ninety percent of hairy rattleweed populations occur on private timberland where the overstocking of trees, fast stand rotation (harvesting pine trees every 20-40 years), and lack of fire management, continue to threaten the species.

3. Recovery achieved:

2 (26%-50% recovery objectives achieved). Although some of the main recovery objectives have not been met, such as protecting habitat and encouraging private landowners to protect existing stands, a concentrated effort has occurred to: 1 Encourage state and federal partners to protect land, 2. Alert Georgia Power Company of hairy rattleweed populations, 3. Monitor populations and their habitat, 4. Train

personnel to identify the species, 5. Preserve existing germplasm, and 6. Propagate the species.

4. Listing history:

Original Listing
FR notice: 43 FR 17910
Date listed: April 26, 1978
Entity listed: Species
Classification: Endangered

5. Associated rulemakings: N/A

6. Review History:

Recovery Plan: 1984
Each year, the Service reviews and updates listed species information for inclusion in the required Recovery Report to Congress. Through 2013, we did a recovery data call that included status recommendations such as "Declining" for this plant. We continue to show that species status recommendation as part of our 5-year reviews. The most recent evaluation for this plant was completed in 2019. Five-year review: hairy rattleweed has had several 5-year reviews (December 12, 1983, July 22, 1985, November 6, 1991, December 01, 2011).

7. Species' Recovery Priority Number at start of review (48 FR 43098):
Hairy ratttleweed was assigned a recovery priority of 5, based on (1) a high degree of threat, and (2) a low potential of achieving recovery.

8. Recovery Plan:

Name of Plan: Recovery Plan for Hairy Rattleweed (*Baptisia arachnifera*)
Date issued: March 19, 1984

II. REVIEW ANALYSIS

A. Application of the 1996 Distinct Population Segment (DPS) policy

The Act defines species as including any subspecies of fish, wildlife, or plants, and any DPS of any species of vertebrate wildlife. This definition limits listing DPSes to only vertebrate species of fish and wildlife. Because the species under review is a plant and the DPS policy is not applicable, the DPS policy to the species listing is not addressed further in this review.

B. Recovery Criteria

1. Does the species have a final, approved recovery plan containing objective, measurable criteria? Yes.

2. Adequacy of recovery criteria.

a. **Do the recovery criteria reflect the best available and most up-to-date information on the biology of the species and its habitat?**
No, the recovery criteria are 35 years old. Since the recovery plan was written, new information concerning the biology of this species has been collected, including populations trends, pollinator studies, and habitat information. However, the core threats that were identified as affecting hairy rattleweed's viability are the same threats that continue to threaten this species today (e.g. habitat destruction and modification: industrial timber production and development).

b. **Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?**
Yes.

3. **List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information.**

The Recovery Plan identifies that hairy rattleweed could be considered for delisting when the following conditions are met: (1) there are at least eight self-sustaining populations secured and maintained within its' historic or current range (eight would provide a reasonable degree of security against catastrophic loss and/or site alteration); (2) the number of individuals in the various populations has reached an optimum level or cover percentage and frequency population, as established by management studies; (3) its biology is sufficiently understood to allow perpetuation of the species should circumstances require immediate or drastic alteration of populations and/or sites; (4) continuing protection and management after delisting are assured (U.S. Fish and Wildlife Service 1984).

The Recovery Plan describes that reclassification of hairy rattleweed from federally endangered to threatened status could be considered when four self-sustaining populations are secured.

None of these criteria have been accomplished.

1. There are at least eight self-sustaining populations secured and maintained within its historic or current range.

While we have not met this criterion yet, we are looking for opportunities to work with our partners, including Georgia Department of Natural Resources (GADNR), Georgia Power, and Georgia Department of Transportation (GDOT), to assure a level of security for seven hairy rattleweed populations. Currently, only one hairy rattleweed population has permanent protection. This population occurs on the Lewis Tract in

Brantley, Georgia. The Nature Conservancy (TNC) holds the conservation easement for this property and manages this site with prescribed fire on a 2-3 year fire return interval. Due to such active management, this population appears stable (Hodges 2019, pers. comm.; Thompson 2019, pers. comm.).

To secure additional hairy rattleweed populations for recovery, populations within Georgia Power and along GDOT rights-of-way (ROWs), it requires working with landowners and the respective ROW manager. Currently, no hairy rattleweed populations along ROWs have formal protection; however, Georgia Power has designated the Needmore Road population as a Special Management Area, which provides additional conservation considerations. Seasonal mowing and spot herbicide treatment can occur pending review and permitting by a forester (Ozier 2019, pers. comm.). Further, Georgia Power has a note on file stating, "do not mow during flowering and fruiting period May to November, spot herbicide application should be avoided or well supervised" (Ozier 2019, pers. comm.).

The Georgia Power population on Needmore Road has retained 100% of its original population from 1986-2006 (98 individuals) (Leege 2007, pp 6-9). During recovery meetings among cooperators, the need for a memorandum of understanding (MOU) between the Service, landowner, GADNR, and Georgia Power, has been discussed in order to assure a minimum level of security for the Needmore Road population. Further, in 2018, approximately 500 individuals were located along Needmore road within ROWs managed by GDOT and GA Power (Thompson 2019, pers. comm.). The landowners include Rayonier and smaller landowners (Thompson 2019, pers. comm.). Georgia Power signage "needs to be updated and placed to reflect these areas" along Needmore Road (Thompson 2019, pers. comm.). Similar efforts to Georgia Power's Needmore Road population could be undertaken and achieved for hairy rattleweed populations along GDOT ROWs.

With the exception of the Lewis Tract, GA Power, and GADOT ROWs, the remaining hairy rattleweed populations occur on private industrial timberlands owned by Rayonier and Weyerhaeuser and smaller privately-owned parcels. These populations have no formal protection and have been in decline since the species was listed in 1984 (Leege 2007).

2. The number of individuals in the various populations has reached an optimum level of cover percentage and frequency population, as established by management studies.

This criterion has not been fully met, but could be met by studying the cover and density of the Lewis Tract and Needmore Road populations.

Both of these populations appear stable (Leege 2007). For example, the Needmore Road population retained 100% of its population from 1986-2006 and the Lewis Tract population retained 93% from 1997-2006.

3. Its biology is sufficiently understood to allow perpetuation of the species should circumstances require immediate or drastic alteration of populations and/or sites.

Although we do not know the complete life history of this species, we do have two decades of monitoring data (1987-2006) collected from eight plots at eight different populations. These data indicate that hairy rattleweed populations will persist in managed habitat (managed either with prescribed fire, such as the Lewis Tract population, or through manual removal of woody vegetation, such as the Needmore Road population). The remaining populations that occur in dense timber stands are in decline. For example, seven of the monitoring plots within dense timber stands experienced a "serious decline" (Leege 2007). Research is needed to understand the "window of opportunity" or regeneration window for hairy rattleweed. Given that hairy rattleweed occurs in a "fire forest" seed germination and recruitment may depend upon fire prescription. The one population, Lewis Tract Population, that has increased in overall numbers occurs in a natural area with a prescribed fire program. These data suggest that fire prescription can provide habitat conditions suitable for hairy rattleweed recruitment. Plans are underway to survey the old monitoring plot at the Lewis Tract to determine if natural recruitment occurred (Hodges 2019, pers. comm.). Further, new plots could be established and monitored pre and post fire to see if fire helps aid recruitment.

4. Continuing protection and management after delisting are assured.

Currently, 95% of extant populations occur on privately owned land managed for timber production. Many of these populations (66%) occur along powerline or roadside ROWs where they receive sufficient light for growth and reproduction and escape disturbance from timber management (e.g. harvesting and bedding practices). The status of both the protection and management of hairy rattleweed populations has remained largely the same since the 1984 recovery plan. For example, the 1984 recovery plan states under population status and trends- "once-thriving populations are now reduced to a few individual plants along access roads, highway rights-of-way, or other less disturbed sites" (USFWS 1984. Further, the 2011 5-year review mentions that "at least 60% of the populations are in intensively-managed pine plantations, along roads or powerline rights-of-way, which has likely affected plant vigor and influence field observations (USFWS 2011). To date, 66% of hairy rattleweed populations occur along ROWs adjacent to timberland. Land acquisition and protection

followed by active management with prescribed fire or mowing needs to happen to improve the status of hairy rattleweed

C. Updated Information and Current Species Status

1. Biology and Habitat

A new pollination study revealed that *Megachile georgica* commonly forages on hairy rattleweed flowers for pollen. The bee forages from the base of the inflorescence to the top and travels in a nonlinear fashion among plants (Chowdhury 2019, pers. comm.). Further, non-foraging male bees were observed during the study, suggesting that hairy rattleweed's flowering period could coincide with *M. georgica's* breeding season (Chowdhury 2019, pers. comm.). These solitary bees generally nest in abandoned beetle holes in trees and within powerline ROWs. Other studies have found similar results, noting that Megachilid bees in the genus *Megachile* (452 of 458 visits) are the principal pollinators (Pascarella 2019, pers. comm.). Other pollinators observed include *Polistes* wasps (Chowdhury 2019, pers. comm.) and Halicted bees (Pascarella 2019, pers. comm.).

a. Taxonomic classification or changes in nomenclature: None.

b. **Genetics, genetic variation, or trends in genetic variation:** No new information since the 2011 5-year review.

c. **Spatial distribution, trends in spatial distribution, or historic range (e.g., corrections to the historical range, change in distribution of the species' within its historic range, etc.):**

There are 35 hairy rattleweed element occurrence records in the GADNR Biotics Database (Georgia Department of Natural Resources 2019) (Appendix B). Element occurrence records were referred to as populations in both the 1984 recovery plan and 2011 5-year review. As such, for the purposes of this review, we have maintained the use of element occurrence records as populations. Twenty-eight (80%) of the 36 known populations are extant (Figure 1). In 2017, Jacob Thompson with GADNR identified three new hairy ratttleweed populations on Southern Power Property. As a result, the known range of hairy rattleweed expanded to the east (Thompson 2019, pers. comm.).

Rayonier did not grant permission to survey populations on their property and these populations were not visited during the 2017 surveys (these populations were last surveyed in 2009 (Rickard 2019, pers. comm.)).

Six populations have an unknown status (Figure 1). Element occurrence records that have not been visited in 20+ years, but are not ranked as historical by GDNR, are considered to have unknown status by the Service. The majority of these populations occur on Rayonier property, making accessibility difficult. Because surveys have not been conducted for these populations in 20 years, we do not know if they are extant or historical. Only one population has an historical status in the GADNR Biotics Database.

Overall, the range of this species in the northern portion of Wayne County has decreased, with three unknown and one historical population. Most populations in the southern portion of the species range in Brantley and Wayne counties have remained extant and three new populations were found in 2017 (Thompson 2019, pers. comm.).

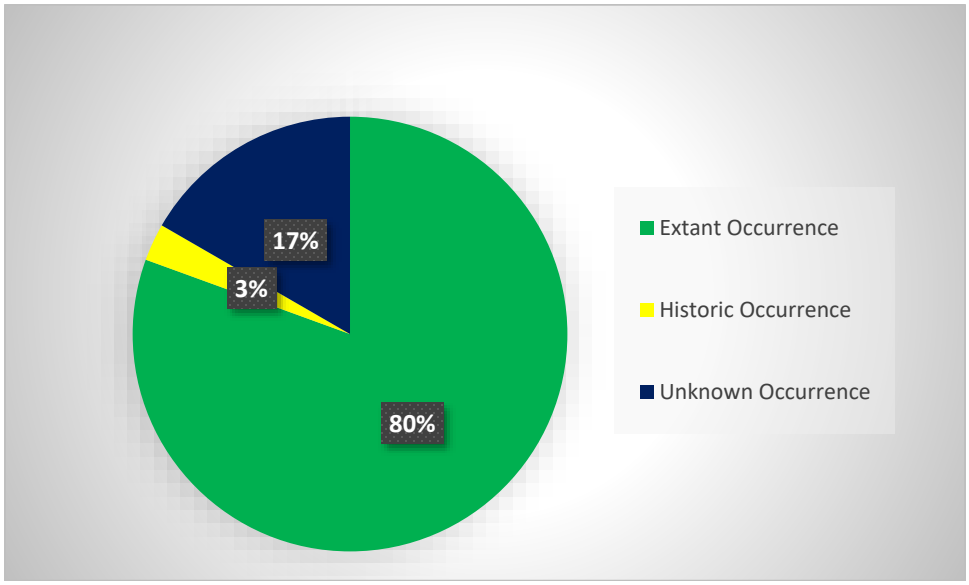

Figure 1. The status of 35 hairy rattleweed populations in Wayne and Brantley Counties, Georgia (GADNR 2019 data).

d. Habitat or ecosystem conditions

Currently, we know that hairy rattleweed occurs predominately on sandy roadsides, powerline ROWs, old fields, open pine flatwoods, and plantations. This species naturally occurred in pine-saw palmetto flatwoods where frequent fire (approximately 1-3 year return interval) maintained open conditions. Fire no longer moves across the landscape as it once did pre-European settlement (Frost 1993). As such, hairy rattleweed is now restricted to open conditions found within the powerline rights-of-way, roadsides, open fields, and young pine plantations (USFWS, 2011 5-year review).

Only one hairy rattleweed population, the Lewis Tract, is maintained by prescribed fire. This population has increased since the last 5-year review (Hodges, TNC, 2019, pers. comm.). This indicates that prescribed fire can have a positive effect on hairy rattleweed populations. We do not know if the population increase was due to recruitment or new individuals becoming more noticeable post fire (Hodges 2019, pers. comm.). Pascarella (2017) found that dormant season burns do not negatively impact young plants, while early growing season burns (i.e., May) can kill young plants. The effects of late growing season burns (i.e., July-August) on hairy rattleweed populations are unknown.

e. Propagation and Safeguarding:

The State Botanical Garden of Georgia, in Athens, has propagated and safeguarded hairy rattleweed for several years; however, the plants do not perform well at this north Georgia garden. Plants typically do not reach full maturity or grow to a large size, while reproductively mature plants produce few seeds. Since hairy rattleweed occurs in the coastal plain, the poor performance at the garden may be attributed to the different soils, climate, and lack of native pollinators (e.g., *Megachile georgica*) in the piedmont region of Georgia (Ceska 2019, SBG, pers. comm.).

To date, germination studies have revealed that hairy rattleweed seeds germinate to 90% after cold stratification. Without cold stratification, 50% seed germination occurs after 3-5 weeks. Seeds start to germinate after 10 days in the greenhouse and germination ceases after 17 weeks. Seed collection for future reintroductions should occur soon after pods mature to limit weevil and fungal infection (Estep 2011).

Ex situ (off-site) reintroductions of hairy rattleweed in the coastal plain of Georgia are apparently most successful with 1-to-2-year old seedlings compared with direct seeding (Pascarella 2017). Two-year old seedlings reach reproductive maturity after two years and after three years for 1-year old seedlings (Pascarella 2017).

2. Five-Factor Analysis

a. Present or threatened destruction, modification or curtailment of its habitat or range:

Threats identified in the 2011 5-year review continue to negatively impact hairy rattleweed's habitat throughout its range, including incompatible silvicultural practices (e.g., beddings, high stocking densities, timber harvesting), development (rural housing

development), fire suppression, and non-selective herbicide application within powerline and road ROWs. Herbicide application within a powerline ROW, south of the Needmore Road population, negatively impacted a few individuals (Ozier 2019, pers. comm.). No additional habitat threats beyond the ones listed in the 2011 5-year review and the 1984 Recovery Plan are known.

b. Over utilization for commercial, recreational, scientific, or educational purposes:
Not currently known to threaten hairy rattleweed.

c. Disease or predation:
Caterpillars and weevils negatively impact hairy rattleweed vegetation and seeds, respectively (Estep 2011; Durden et al. 2011; Chowdhury 2019, pers. comm.; Pascarella 2017; Ceska 2019, pers. comm.). *Uresiphita reversalis* caterpillars defoliate young hairy rattleweed leaves (Figure 2), but do not have a negative impact on older vegetation. These caterpillars specialize on plants with a high alkaloid content in their leaves. Genista moth caterpillars (*Urisephita* sp.) defoliated hairy rattleweed leaves at the State Botanical Garden of Georgia in 2017 and 2018 (Ceska 2019, pers. comm.). In addition, *U. reversalis* caterpillars were found on hairy rattleweed plants in the field where they formed loose webs on the leaves and stems (Durden et al. 2011).

Female weevils deposit eggs in the young flowers of hairy rattleweed. The weevils have been found inside seed pods. Hairy rattleweed populations "with high rates of weevil infestation display lower seed sets and lower rates of germination" (Durden et al. 20116). However, no seed predators were found during 2017-2018 field studies and seed set was present (Chowdhury 2019, pers. comm.).

Figure 2. Images of *Uresiphita reversalis* caterpillar and leaf defoliation From left to right: 1. *U. reversalis*

on young hairy rattleweed plant (photo credit: John Pascarella); 2. leaf defoliation (photo credit: John Pascarella); 3. *U. reversalis* caterpillar on hairy rattleweed plant (photo credit: Bashira Chowdhury); 4. *U. reversalis* caterpillar (photo credit: Bashira Chowdhury).

d. Inadequacy of existing regulatory mechanisms:
We have no new information on the inadequacy of existing regulatory mechanisms for protecting hairy rattleweed. Since over 90% of the species' known populations occur on private land, recovering this species continues to be a challenge because plants do not receive protection on private land under the Endangered Species Act. The species is protected by the State under the Georgia Wildflower Preservation Act on State land (Georgia Wildflower Preservation 1973).

e. Other natural or manmade factors affecting its continued existence:
There are no other natural or manmade events with known impacts to hairy rattleweed's existence; however, it is expected that severe drought could threaten small populations and would likely reduce recruitment into the population.

D. Synthesis

Historically, hairy rattleweed populations were likely contiguous and functionally connected by pollinators. Currently, the northern and southern portions of the species range are separated, not contiguous. Further, many populations occur in unsuitable habitat (i.e., timberland), where reproduction and pollinator visitation may be hindered by silvicultural practices.

Overall, there are 28 extant hairy rattleweed populations, 1 historical population, and 6 populations of unknown status (Figure 1). Only two populations, the Lewis Tract and Needmore Road, are apparently stable or increasing. The remaining 18 populations are likely declining due to incompatible silvicultural practices (e.g. bedding and timber harvesting).

The Georgia Power Needmore Road population is currently considered secure, since it is a Special Management Area. As such, it is currently considered a recovery population along with TNC's Lewis Tract population, bringing the total number of secure populations to two.

III. RESULTS

A. Recommended Classification

Hairy rattleweed is endangered. No change in status is recommended at this time.

B. New Recovery Priority Number

No change is needed for the existing Recovery Priority Number of 5.

IV. RECOMMENDATIONS FOR FUTURE ACTIONS

I. *Conservation/Management Strategies*

1. Secure funding for land acquisition to facilitate permanent protection for the recovery of hairy rattleweed populations.

2. Partner with Georgia Department of Transportation, Georgia Power, and the respective landowners to secure hairy rattleweed populations along rights-of way.

3. Work with timber companies on alternative management strategies that will promote hairy rattleweed populations, such as creating buffers along roadsides where populations occur.

4. Survey unknown populations.

5. Implement conservation easements on private land.

6. Work with public and private schools in Wayne and Brantley Counties to educate the youth about the endangerment of hairy rattleweed and to foster future recovery.

7. Reintroduce fire on select industrial timberland sites.

8. Create demonstration sites to establish effective hairy rattleweed habitat management (reflective of management guidelines that will be established and further researched).

9. Investigate and provide incentives for hairy rattleweed management on private lands (e.g., appropriate mowing regimes or other management options).

10. Collaborate with the Georgia Plant Conservation Alliance to propagate this species at botanical gardens or arboreta along the Coastal Plain of Georgia to help with future reintroduction efforts.

II. *Research Priorities*

1. Re-survey long-term monitoring plots and GPS each site to document status across the range of hairy rattleweed.

2. Determine canopy cover relationships to vigor of plants and reproduction.

3. Characterize the vegetation and habitat requirements of hairy rattleweed.

4. Conduct additional inventory/surveys to more accurately predict the size of occupied polygons and the distribution of the species.

5. Characterize hydrology of hairy rattleweed sites.

V. REFERENCES

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Hairy Rattleweed (*Baptisia arachnifera*)

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

_X_ No change in status needed

REVIEW CONDUCTED BY: April Punsalan, Georgia Ecological Services Field Office, Athens, Georgia.

FIELD OFFICE APPROVAL:

Donald W. Imm, PhD., Georgia Field Office

Approve:_____Date: ___30 August 2019____

Appendix A. Summary of peer review for the 5-year review of hairy rattleweed (*Baptisia arachnifera*)

A. **Peer Review Method:** Peer review was coordinated by the Service's Mississippi Ecological Services Field Office in Jackson, Mississippi. Five peer reviewers knowledgeable about the biology and ecology of *Schwalbea* were selected by the Service to peer review the draft 5-year review. Individual responses were received from all five reviewers.

Peer Reviewers: Jimmy Rickard, U.S. Forest Service, Dr. John Pascarella, Sam Houston State University; Jennifer Ceska, State Botanical Garden of Georgia; Jacob Thompson, GADNR, and Mincy Moffett, GADNR.

B. **Peer Review Charge:** See attached text from the peer review invitation letter.

C. **Summary of Peer Review Comments/Report:** All reviewers reported that the 5-year review accurately assessed the current status of the species. Two reviewers provided updates on the status of several populations, which changed several populations from an unknown status to extant. One reviewer submitted new literature to include in the review, which was integrated into the review.

D. **Response to Peer Review:** Updated information received from the peer reviewers was incorporated into the 5-year review: number of individuals within populations, status of populations (e.g., extant or unknown), herbivory concerns, and safeguarding and propagation results. Further, language within the 5-year review was refined to ensure that scientific findings were not over or understated.

Peer Review Invitation Letter Text

On May 7, 2018, the US Fish and Wildlife Service published a notice in the Federal Register (83 FR 20092) announcing a five-year review of 35 federally listed species, including hairy rattleweed (*Baptisia arachnifera*). The purpose of five-year reviews is to ensure that the

classification of species as threatened or endangered is accurate and reflects the best available information.

Following current Service policy and guidelines on the process to conduct independent peer review, the Mississippi Field Office is assisting the Georgia Ecological Services Field Office to complete peer review of the science in the 5-year review for hairy rattleweed. You have provided data used to review the status of the species and/or are knowledgeable about it. Therefore, in order to ensure that the best available information has been used to conduct this five-year review, we now request your peer review of the attached document. Specifically, we ask for comments on:

• Have we assembled the best available scientific and commercial information?
• Is our analysis of this information correct and properly applied?
• Can you identify any additional new information that has not been considered in this review?

Please note that we are not seeking your opinion of the legal status of this species, but rather that the best available data and analyses were considered in reassessing its status.

We appreciate your interest in furthering the conservation of rare plants and animals by becoming directly involved in the review process of our Nation's threatened and endangered species. Your review and comments will become a part of the administrative record for this species, and you can be certain that your information, comments, and recommendations will receive serious consideration.

We hope that you view this peer review process as a worthwhile undertaking. Please call (228-475-0765 x104) or send me an e-mail () if you have any questions about this peer review. Please share your response by email or letter (M. Scott Wiggers, U.S. Fish and Wildlife Service, Coastal Resources Center, 6005 Bayou Heron Rd, Moss Point, MS 39562) by **May 3, 2019**. Thank you in advance for your assistance.

Appendix B: *Baptisia arachnifera* (hairy rattleweed) element occurrence data					
EO #	**Site Name**	**County**	**First Observation**	**Last Observation**	**Status**
1	Sansavilla WMA	Wayne	1982	2017	Extant
2	Browntown Rd.	Brantley | Wayne	1982	2018	Extant
3	Needmore Flatwoods	Brantley	1982	2019	Extant
4	Lower Long Branch	Wayne	1986	2007	Extant
5	Upper Long Branch	Wayne	1986	2006	Extant
6	Lower Crooked Rd.	Wayne	1986	1987-06	Unknown
7	Straight Rd.	Wayne | Brantley	1986	2006-07-28	Extant
8	Upper Crooked Rd.	Wayne	1986	1987-06	Unknown
9	Philadelphia Church Flatwoods	Wayne | Brantley	1986	2018	Extant
10	Hortense Hwy. 32 No. 1	Brantley	1987-?	2001-06-13	Extant
11	McKinnon/Oil Well Rd.	Wayne	1942	2017-08	Extant
12	Oil Well/Fendig Intersection	Wayne	1980	2009	Extant
13	32 Rd. No. 1	Wayne	1986	1987-06	Unknown
14	Penholoway Bay	Wayne	1986	2009	Extant
15	Hanger Rd.	Wayne	1986	2009	Extant
16	32 Rd. No. 2	Wayne	1986	2009	Extant
17	32 Rd. No. 3	Wayne	1986	2009	Extant
18	NE of Needmore	Wayne | Brantley	1987	1987-06	Unknown

19	Palmetto Island	Wayne	1987-06-Pre	1987-06	Unknown
20	Strickland Island	Wayne	1987	2009	Extant
21	Pendarvis	Wayne	1980-Pre	1980	Historical
22	Hortense Hwy. 32 No. 2	Brantley	1984-07-13-Pre	2009	Extant
23	Paul Lewis Property	Brantley	1991	2007-08-01	Extant
24	Hopkin's Property	Wayne		1994-08-28	Unknown
26	E of Honey Camp Branch	Wayne	1994-08-28	2009	Extant
27	At GA 32 Crossing of Mill Branch	Brantley	2000-03-01	2000-03-01	Extant
28	Hwy 110	Brantley	1986-?	2006-07-28	Extant
29	Wire Rd.	Wayne	2007-Sum	2007-Sum	Extant
30	Lewis Property	Brantley	2008-07-07	2008-07-07	Extant
31	Southern Power No. 1	Wayne	2014-08-13	2014-08-13	Extant
32	Mt Pleasant Road & Southern Power	Wayne			Extant
33	Southern Power No. 2	Brantley			Extant
34	N of Browntown Road	Brantley			Extant
35	Ten Mile Rd.	Brantley			Extant
36	Needmore Powerlines	Wayne			Extant