

*Conservation Assessment
for
White thoroughwort (Eupatorium album L.)*



*W. H. Duncan, University of Georgia Herbarium,
Department of Botany, University of Georgia*

USDA Forest Service, Eastern Region

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Rebecca W. Dolan
Butler University
Friesner Herbarium
4600 Sunset Ave.
Indianapolis, IN 46208



This Conservation Assessment was prepared to compile the published and unpublished information on the subject taxon or community; or this document was prepared by another organization and provides information to serve as a Conservation Assessment for the Eastern Region of the Forest Service. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject taxon, please contact the Eastern Region of the Forest Service - Threatened and Endangered Species Program at 626 East Wisconsin Avenue, Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

White thoroughwort (*Eupatorium album* L.) is an herbaceous perennial in the Sunflower family. Not much is known about this plant. It grows in poor, sandy soil and prefers dry, open woodlands. It is found over the entire eastern United States, with the exception of northern New England. This species is extremely variable morphologically throughout its range. Three varieties are currently recognized, one common and widespread, one confined to the northeast, and one more common in the southeast. The common variety (var. *album*) is diploid. The others are polyploidy and frequently produce agamospermous seed.

The plant has a Global Conservation Rank of G5 and a National Rank of H5, indicating it is thought to be abundant, widespread, and secure globally and nationally. It is known from 21 states and is considered secure in eleven. It is listed as Endangered in IN and CT and as Threatened in OH. No varieties are indicated. The variety *E. album* var. *subvenosum* was recently listed as Threatened in NY.

It is a Regional Forester Sensitive species on the Hoosier National Forest in Indiana. Four occurrences are known. Habitats are old fields, barrens, road cuts, eroded slopes, dry open woods, generally in full sun. Fewer than 100 plants are known from each site.

Of 43 known occurrences of *Eupatorium album* in Heritage Databases from all states where the plant is tracked, 26 (60%) are on protected sites, 1 (2%) is known to be on private land, and 16 (37%) are on land of unknown ownership.

Populations of White thoroughwort are threatened by overshadowing by woody species as a result of succession and by competition with invasive exotic species. These threats are cited for several states.

Research to document the threats posed by canopy closure could provide specific management recommendations for use of selective cutting or prescribed burning. More research into the distribution of each of the varieties would be useful to help assess the rarity of each taxon.

ACKNOWLEDGEMENTS

I would like to thank Science Librarian Barb Howes at Butler University for tireless assistance with references, Marcia Moore, Herbarium Assistant for help in all things and Butler student Kathy Fidler for research and clerical assistance. I am grateful to Kirk Larson, Botanist on the Hoosier National Forest, and to all agency personnel who provided information.

NOMENCLATURE AND TAXONOMY

Eupatorium album L.

Published in: *Mantissa Plantarum* 1: 111. 1776.

Common names: White thoroughwort, White-bracted eupatorium, White boneset

Synonyms: None

Infraspecific taxonomy:

Eupatorium album var. *album* L.

= *Eupatorium album* var. *glandulosum* (Michx) DC.

= *Eupatorium petaloideum* Britt. Ex Small

Eupatorium album var. *subvenosum* Gray

Eupatorium album var. *vaseyi* (Porter) Cronquist

= *Eupatorium album* var. *monardifolium* Fern.

= *Eupatorium sessilifolium* var. *vaseyi* (Porter) Fern. & Grisc.

= *Eupatorium fernaldii* Godfrey

The treatment above is based on Gleason and Cronquist (1991) confirmed by Edward Schilling (pers. com.). It is the treatment that will be used in the up-coming Flora of North America volume on the Asteraceae (Kay Yatskievych, pers. com.). *E. album* var. *vaseyi* was apparently missed by Kartesz in his checklist (Kartesz 1994) (Kay Yatskievych, pers. com.) and does not appear in other treatments and applications based on his work.

Family: Asteraceae or Sunflower family

Most states do not indicate variety for the plant when it is listed. The Ohio Department of Natural Resources Element Stewardship Abstract for White thoroughwort states Ohio plants key out to the typical variety following Cronquist (1980) and at least one other variety. “Until this taxonomic situation is more clearly understood, *E. album* is treated as a single variable taxon” in Ohio.

To further complicate issues, White thoroughwort consists of a widespread, common diploid phase (var.*album*) and two more sporadic or local polyploid phases that reflect

hybridization with *E. sessilifolium* and other species. The standard 2n chromosome number is 20, with polyploids having 30 or 40 (Gleason and Cronquist 1991).

DESCRIPTION OF SPECIES

This species is extremely variable morphologically throughout its range.

From Gleason and Cronquist (1991), Radford et al. (1968) and others:

Stems: erect or ascending, solid, mostly solitary from a crown or very short, stout rhizome, 4-10 dm, conspicuously spreading-villous at least below (except often in var. *vaseyi*), often merely villous-puberulent above.

Leaves: opposite, elliptic to elliptic-ovate, lance-elliptic, or elliptic-oblongate, sessile or nearly so, 4-13 x 1-4 cm, the larger ones seldom less than 1.5 cm wide except sometimes in var. *subvenosum*, glandular-punctate, evidently hairy to sometimes subglabrous, base cuneate, 2 lower lateral veins prominent and parallel with midrib, pubescent and resinous-dotted beneath, longest petioles to 6 mm long or leaves sessile.

Inflorescence: dense, corymbiform, +/- flat-topped, 0.6-2.5 dm broad, the branches pubescent.

Involucres: cylindrical, 8-11 mm, often with dark sessile glands, otherwise generally glabrous or only slightly hairy, its bracts imbricate, conspicuously white-scarious upward (especially the inner), all narrow and long-acuminate, or the inner with broader, more rounded, mucronate tip, corolla white.

Flowers: 5, the corolla white, 4-5.5 mm.

Fruits: nutlets 3-4 mm long, resinous-glandular, pappus white.

White thoroughwort resembles *Eupatorium altissimum*, but is distinguished by presence of acuminate bracts.

Varieties of *E. album* can be distinguished based on:

- a Leaves usually evidently pubescent, mostly coarsely serrate, tending to be obtuse or rounded at the tip. The larger ones seldom less than 1.5 cm wide; diploid; common and widespread, with the range of the species.....var. *album*
- a Leaves sparsely pubescent or subglabrous, serrate to subentire, often acute, sometimes less than 1.5 cm wide; apomictic polyploids, local, not abundant.
 - b Leaves small, mostly 4-7 x 1-2 cm, acute to obtuse, +/- trinerved, few-toothed, with up to 10 teeth per side, or even entire; s. NY to NJ and DE.....var. *subvenosum*
 - b Leaves larger, mostly 5-11 x 2-4 cm, acute or somewhat acuminate, more pinnately veined, rather closely toothed, with mostly 10-20 teeth per side; very probably originating through hybridization with *E. sessilifolium*; DC and MD, s. to the mts. of n. GA and n. AL.....var. *vaseyi*

This treatment is from Gleason and Cronquist (1991). Cronquist was the author of variety *vaseyi* and therefore very familiar with these plants. The draft of the treatment of *E. album* varieties for the Flora of North America Project also distinguishes the taxa based on features of the leaf margins, apices, sizes, and pubescence (Kay Yatskievych, pers. com.).

LIFE HISTORY

Eupatorium album is an herbaceous perennial.

Reproduction

The plant reproduces sexually via seeds and asexually via a short, stout rhizome (Gleason and Cronquist 1991). Flowers appear in late June through September. The species consists of a widespread, common diploid phase (var. *album*) and two more sporadic or local polyploid phases that reflect hybridization with *E. sessilifolium* and other species (Gleason and Cronquist 1991). Many polyploid populations are thought to be agamospermic, or to produce seeds asexually (Sullivan 1976; Gleason and Cronquist 1991).

Ecology

Little is known about this plant. No information was found.

Dispersal/Migration

Seeds bear a pappus and are presumably wind-dispersed like many other members of the family Asteraceae.

Obligate Associations

None known.

HABITAT

Range-wide

White thoroughwort grows in poor, sandy soil and prefers dry, open woodlands (Small 1913, Gleason and Cronquist 1991). Old fields, pine barrens and savannahs are cited by Radford et al. (1968).

It grows on dry sandy soil and moist dune hollows of the Coastal Plain in DE (Tatnall 1946). It is also found along roadsides and power line rights-of-way in the state (William McAvoy, pers. com.).

Element Occurrence (Ohio Natural Heritage Database 2004) records for one site in Ohio report the majority of plants are in successional habitat along lower slopes of a White oak forest. Herbaceous species include little bluestem, dominant, *Eupatorium rotundifolium*, *Hieraceum grovonii*, *Lespediza hirta*, and *Solidago hispida*. No plants were noted in adjacent closed canopy forest.

National Forests

On the Hoosier National Forest in Indiana, White thoroughwort is found in old fields, barrens, road cuts, eroded slopes, dry open woods, generally in full sun (Scott et al. 1996; Hedge et al. 2002). The diploid phase, *Eupatorium album* var. *album*, is what is found in Indiana (Mike Homoya, pers. com.).

Site Specific

On the Hoosier National Forest, the Indiana Natural Heritage Database (2002) lists four sites. One is on a roadside/barrens (Perry Co.), one midslope in open light on silt loam soils (Gobblers Knob), one is scattered in an old field, dry upper slope and a south-facing opening (Tincher Hollow), and one is in an old field and open woods (Clover Lick Barrens).

Co-occurring species reported include one site with an overstory of *Cornus florida* and an understory of *Eupatorium hyssopifolium*, *Houstonia purpurea*, *Solidago nemoralis*, *Lespedeza repens*, *Lespedeza intermedia*, *Hypericum hypericoides*, *Hypericum punctatum*, *Diodia teres*, *Danthonia spicata*, and *Aristida longespica*. A second locality lists *Eupatorium serotinum*, *Gerardia tenuifolia*, *Desmodium ciliare*, *Spiranthes cernua*, *Aster pilosus*, *Cassia nictitans*, and *Fimbristylis autumnalis*. A third site lists *Eupatorium rotundifolium*.

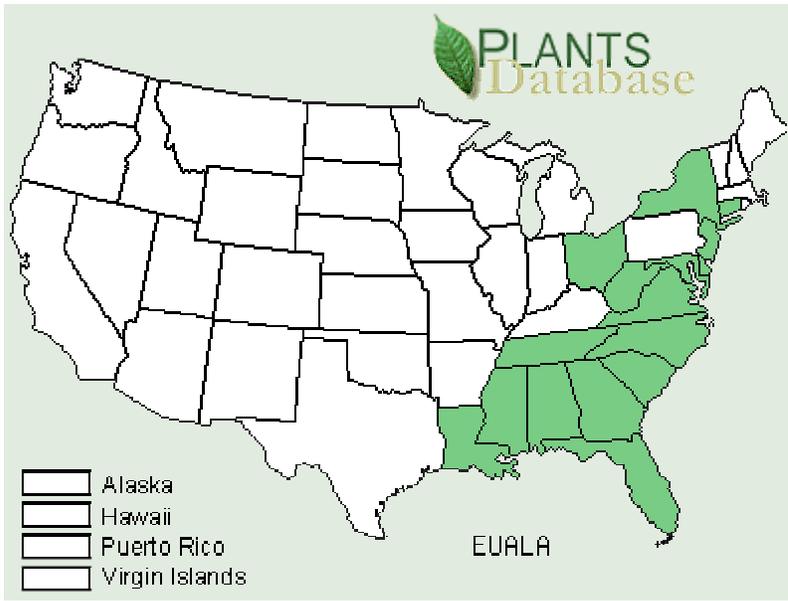
DISTRIBUTION AND ABUNDANCE

Range-wide Distribution

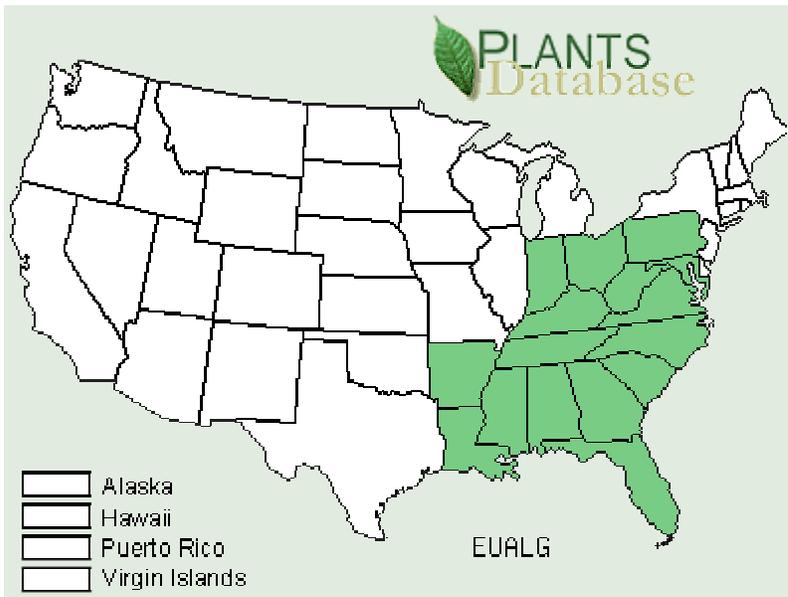
Eupatorium album is found over the entire eastern United States with the exception of the northern New England and western Great Lakes states. Gleason and Cronquist (1991) report it from coastal states from southern CT to central FL and west to MS, also inland in the mountain regions to southern OH and eastern KY and TN and in AR. It is reported as common in the Pine Barren, Coast, and Cape May districts of NJ (Stone 1973) and is common and widespread throughout the Coastal Plain province of DE (William McAvoy, pers. com.). It occurs across the state but is infrequent in KY (Deborah White, pers. com.). *Eupatorium album* is quite common in Georgia, and found in every physiographic province (Jim Allison, pers. com.). It grows abundantly in upland longleaf pine forest and on calcareous prairies in LA (Christopher Reid, pers. com.).

The USDA Plants website (W-17) has the following maps for distribution of the varieties of White thoroughwort:

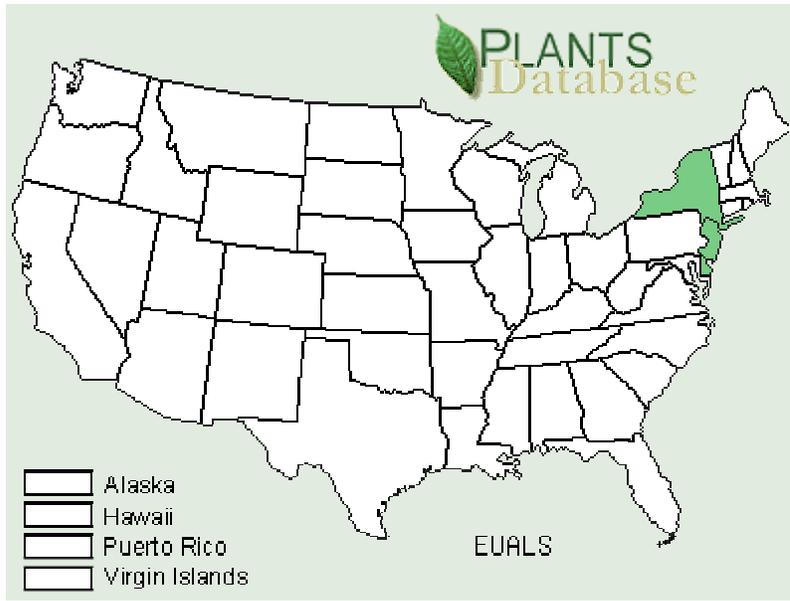
Eupatorium album var, *album*:



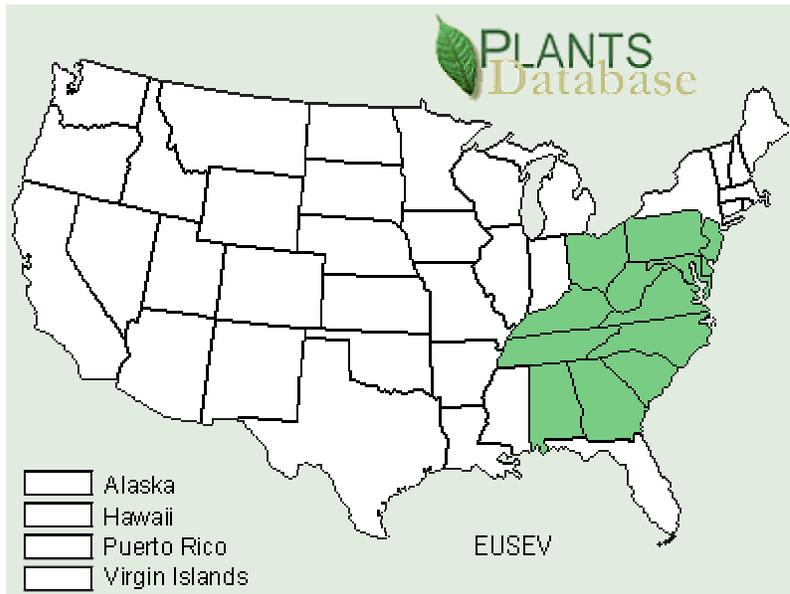
Eupatorium album var. *glandulosum* (now considered to be synonymous with the typical variety (Edward Schilling, pers. com.)).



Eupatorium album var. *subvenosum*:



E. album var. *vaseyi* (= *Eupatorium sessilifolium* var. *vaseyi*):



Gleason and Cronquist (1991) state *E. album* var. *album* is common and widespread with the range of the species. They state var. *subvenosum* is local and not abundant, being found only from southern New York to New Jersey and Delaware. Var. *vaseyi* is stated to be of hybrid origin (“very probably originating by hybridization with *E. sessilifolium*”) and to occur in Washington D. C.,

Maryland, south to the mountains of northern Georgia and Alabama. No statement is made about abundance.

The species is apparently extending its range northward (Scott et al. 1996) and westward. Deam (1940) did not report this plant from Indiana. It was first recorded for Connecticut in 1987 (Tucker 1987). It was first reported for Texas in 1998 (Singhurst 1998).

National Forest Distribution

The only Forest in the USDA Forest Service Region 9 for which White thoroughwort is reported is the Hoosier National Forest (W-13). Most of the populations in Indiana are on the Hoosier National Forest (4 of 6) (Hedge et al. 2002).

The four sites on National Forest System land are reported to have 50, 3, 10-50 plants, and 50+, respectively (Indiana Natural Heritage Database 2002).

RANGE WIDE STATUS

White thoroughwort has a Global Heritage Status Rank of G5. This rank indicates the species is demonstrably widespread, abundant, and secure globally (W-9). Its national rank is N5, indicating it is secure nationally as well.

The plant is listed as a Regional Forester Sensitive Species on the Hoosier National Forest in Indiana.

Eupatorium album is ranked SR (reported from the state, but without persuasive documentation that would provide a basis for either accepting or rejecting the species) in eleven states, S?(not enough information available to assess at this time, more field studies and/or specimen identification is needed) in two. See the Appendix for details and a complete state listing.

It is ranked demonstrably secure (S5) in KY and NC, S3 (rare to uncommon; typically 21 to 50 known occurrences; S3 ranked species are not yet susceptible to becoming extirpated in the state but may be if additional populations are destroyed) in DE and OH and S2S3 in NY. S2 ranking indicates a plant is considered very rare; typically between 6 and 20 known occurrences and that it may be susceptible to becoming extirpated. A rank of S2S3 means the plant falls between the two ranks.

CT and IN rank White thoroughwort S1. This means the plant is extremely rare; typically 5 or fewer known occurrences in the state, or only a few remaining individuals may be especially vulnerable to extirpation. Believed extirpated in PA, it was last collected in 1964 (Rhoads and Klein 1993, Pennsylvania Natural Heritage Database 2004).

Eupatorium album is listed as Endangered in IN and CT and as Threatened in OH. No varieties are indicated. The variety *E. album* var. *subvenosum* was recently listed as Threatened in NY.

The species is being considered for a change of status in Indiana from State Endangered (5 or fewer occurrences) to State Threatened (6-10 occurrences), based on being slightly more common than previously thought (Homoya, pers. com.). The plant was similarly “down-listed” in Ohio in 1982 and “there are very likely more populations of this species in southeastern Ohio” (W-9).

POPULATION BIOLOGY AND VIABILITY

Polyploidy and agamospermy occur in some populations of the species (var. *subvenosum* and var. *vaseyi*). These phenomena will limit genetic variation and likely influence viability of populations. However, for sites in NY (var. *subvenosum*) based on population size and habitat features, 2 occurrences are considered to have excellent estimated viability, 4 good, and 6 fair (New York Natural Heritage Database 2004).

POTENTIAL THREATS

Present or Threatened Risks to Habitat

On the Hoosier National Forest, White thoroughwort is threatened by woody succession in barrens and old field habitat and competition from invasive exotic species (Hedge et al 2002).

These threats are reported in other states, too. Overshading by woody species as a result of succession is considered a threat in Ohio (*E. album* element Abstract, Ohio Department of Natural Resources 2004). Connecticut Element Occurrence records (Connecticut Natural Heritage Database 2004) cite woody succession, development, and canopy closure in the absence of fire as threats to *Eupatorium album*. The New York Natural Heritage Database (2004) cites threats from exotic species, including *Phragmites*.

Over utilization

No information found.

Disease or Predation

No information found.

Inadequacy of Existing Regulatory Mechanisms

No information found.

Other Natural or Human Factors

White thoroughwort has a fairly common and broad habitat range and is tolerant of disturbance.

SUMMARY OF LAND OWNERSHIP & EXISTING HABITAT PROTECTION

Of 43 known occurrences of *Eupatorium album* in Heritage Databases from all states where the species is tracked, 26 (60%) are on protected sites, 1 (2%) is known to be on private land, and 16 (37%) are on land of unknown ownership.

IN: 6 occurrences: 4 sites on the Hoosier National Forest, 1 private, 1 unknown (all last observed. 1992-2000)

CT: 2 occurrences: protected status unknown, 33 genets and 17 genets, 100-125 ramets in 1998. One is on the edge of a cemetery, apparently maintained by clearing and maintenance, the other is on the edge of a bedrock outcrop in a forested area (Ken Metzler, pers. com.).

NY, var. *subvenosum*: 12 occurrences, most first observed in the 1980's on roadsides, mowed areas, and disturbed sites. One site is listed as protected. Most sites with 5-10 stems, one with 500-1,000.

OH: 23 occurrences: 21 protected on the Shawnee State Forest, 2 ownership not known, but not reported as managed. Numbers of plants small at each locality, mostly 1-10, one site with 25.

SUMMARY OF EXISTING MANAGEMENT ACTIVITIES

None were identified.

PAST AND CURRENT CONSERVATION ACTIVITIES

None were identified.

RESEARCH AND MONITORING

Existing Surveys, Monitoring, and Research

None were identified.

Survey Protocol

N/A

Research Priorities

Research to document the threats posed by canopy closure could provide specific management recommendations for use of selective cutting or prescribed burning. More research into the distribution of each of the varieties would be useful to help assess the rarity of each taxon.

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W-2. Illinois Natural History Survey Herbarium Collection Database Search Results. <http://ellipse.inhs.uiuc.edu:591/INHSCollections/FMPro>.

W-3. Institute for Systematic Botany, Atlas of Florida Vascular Plants. <http://www.plantatlas.usf.edu/images>.

W-4. Integrated Taxonomic Information System (ITIS) on-line database. <http://www.itis.usda.gov>.

- W-5. Lake Michigan Monitoring Coordination Council (LMMCC) – Wildlife Work Group: summary of priority species for relevant states and agencies.
<http://wi.water.usgs.gov/lmmcc/workgroups/wildlife/plants.pdf>.
- W-6. Missouri Botanical Garden. http://mobot.mobot.org/cgi-bin/search_vast.
- W-7. NatureServe Explorer: An online encyclopedia of life.
<http://www.natureserve.org/explorer>.
- W-8. New York Flora Atlas. http://www.nyflora.org/atlas/maps/_Asteridae/Asteraceae/Eupatorium_album.htm.
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<http://www.dnr.state.oh.us/odnr/dnap/Abstracts/E-F/eupaalbu.htm>.
- W-10. Perry, Leonard – Professor, University of Vermont.
<http://pss.uvm.edu/pss123/wmuepat.html>.
- W-11. Plants of the New Jersey Pine Barrens. http://www.mikebaker.com/plants/traits/Eupatorium_album.html.
- W-12. Regional forester sensitive plants. USDA Forest Service, Region 9.
http://www.fs.fed.us/r9/wildlife/tes/docs/rfss_plants_083002.pdf.
- W-13. Regional Forester summary of effects of RFSS Plant and Animal Species.
http://fs.fed.us/r9/hoosier/project_docs/eas/braun_ea_predec_app_e.pdf.
- W-14. The University of Arkansas Herbarium, The Biota of North America Program, and The Texas A&M Bioinformatics Working Group.
<http://www.csd.tamu.edu/FLORA>.
- W-15. University of Georgia.
<http://www.discoverlife.org/nh/tx/Plant...tyledoneae/Asteraceae/Eupatorium/album>.
- W-16. University of South Carolina. <http://cricket.biol.sc.edu/herb/E/0389.jpg>.
- W-17. USDA and NRCS PLANTS Database. <http://www.plants.usda.gov>.
- W-18. USGS – Patuxent Wildlife Research Center.
http://www.pwrc.usgs.gov/history/herbarium/eupatorium_album.htm.

APPENDIX

Heritage Status Ranks by State (from W-7).

Alabama	SR	Mississippi	SR
Arkansas	SR	New Jersey	SR
Connecticut	S1	New York	S?
Delaware	S3	North Carolina	S5
District of Columbia	S?	Ohio	S3
Florida	SR	Pennsylvania	SH
Georgia	SR	South Carolina	SR
Indiana	S1	Tennessee	SR
Kentucky	S5	Virginia	SR
Louisiana	SR	West Virginia	S?
Maryland	SR		

S1: Extremely rare; typically 5 or fewer known occurrences in the state, or only a few remaining individuals may be especially vulnerable to extirpation.

S2: Very rare; typically between 6 and 20 known occurrences; may be susceptible to becoming extirpated.

S3: Rare to uncommon; typically 21 to 50 known occurrences; S3 ranked species are not yet susceptible to becoming extirpated in the state but may be if additional populations are destroyed.

S4: Common; apparently secure under present conditions; typically 51 or more known occurrences, but may be fewer with many large populations; usually not susceptible to immediate threats.

S5: Very common; demonstrably secure under present conditions.

SX: Species has been determined or presumed to be extirpated. All historical occurrences have been searched, or all known sites have been destroyed and a thorough search of potential habitat has been completed.

SR: Reported from the state, but without persuasive documentation that would provide a basis for either accepting or rejecting the species.

S?: Not enough information available to assess at this time, more field studies and/or specimen identification is needed.

SH: Possibly extirpated (historical); occurred historically and there is some expectation that it may be rediscovered. Its presence may not have been verified in the past 20 years.

SU: Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

HYB: Unranked because it represents an interspecific hybrid, not a species.

LIST OF CONTACTS

Information Requests

CT: Ken Metzler, Connecticut Natural Heritage Program.
kenneth.metzler@po.state.ct.us

DE: William A. McAvoy, Botanist, Delaware Natural Heritage Program.
william.mcavoy@state.de.us.

GA: Jim Allison, Botanist, Georgia Natural Heritage Program.
Jim_Allison@dnr.stste.ga.us.

IN: Kirk Larson, Botanist, Hoosier National Forest. kwl Larson@fs.fed.us.

Mike Homoya, Botanist, Division of Nature Preserves, Indiana Department of Natural Resources. mhomoya@dnr.state.in.us.

Steve Olson, Botanist, Pike and San Isabel National Forests,
Comanche and Cimarron National Grasslands. solson01@fs.fed.us

KY: Deborah White. Botanist and Heritage Branch Manager. Kentucky State Nature Preserves Commission. Deborah.White@ky.gov.

LA: Christopher Reid, Botanist, Louisiana Natural Heritage Program.
Reid_cs@wlf.state.la.us.

NC: Misty Franklin, Botanist, North Carolina Natural Heritage Program.
misty.franklin@ncmail.net.

NY: Nick Conrad, New York Natural Heritage Database, New York Department of Conservation. nbconrad@gw.dec.state.ny.us.

Troy Weldy, Botanist, New York Natural Heritage Program New York
Department of Conservation. twweldy@gw.dec.state.ny.us.

OH: Jim McCormack, Botanist, Fish and Wildlife Division, Ohio Department of Natural Resources. 614-265-6440.

Taxonomy experts:

Edward Schilling, Department of Botany, University of Tennessee, Knoxville.
eschilling@utk.edu.

Kay Yatskievych, Editor, Flora of North America. Kay.yatskievych@mobot.org.

Review Requests

Steve Olson, Botanist, Pike and San Isabel National Forests,
Comanche and Cimarron National Grasslands. solson01@fs.fed.us