CPC 2005(1)

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Recovering America's Vanishing Flora

Funds to help launch comprehensive review

The Center for Plant Conservation has received a grant from the Henry Luce Foundation that will help CPC launch an unprecedented and comprehensive review of native plants regulated under the Endangered Species Act.

Veteran botanist joins CPC national office

Bruce Rittenhouse has joined the Center for Plant Conservation as conservation programs manager. An endangered species botanist, Rittenhouse formerly worked for the National Park Service in Fort Collins, Colo. He has more than 20 years of experience working as a botanist with state and federal agencies.

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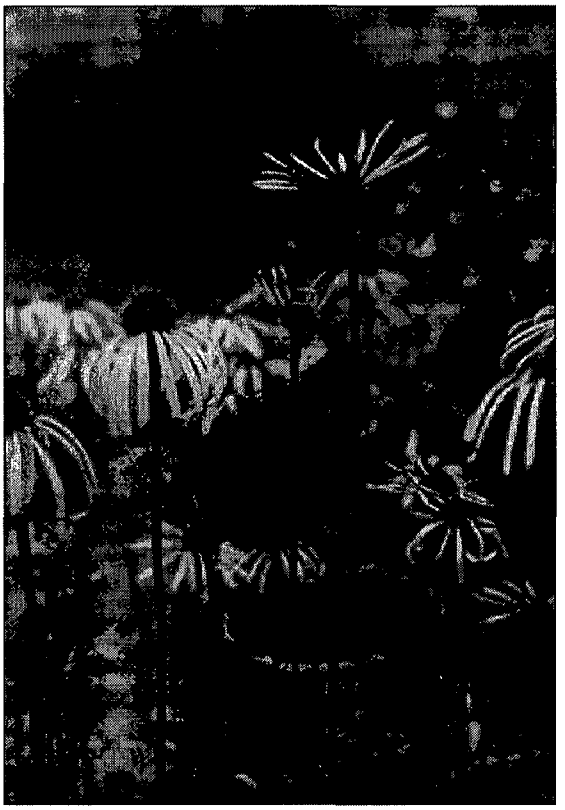

Saving our plants

We know plants and we know their value. One quarter of the native plants in the United States are of conservation concern. That's 5,000 different species. So we work to preserve and restore these native treasures.

Learn how you can fight invasives

Non-native, invasives species are the No. 2 threat to native plants in the United States. Our web directory can put you in touch with groups that fight these invaders.

Site hosted by the Missouri Botanical Garden

Created by the Center for Plant Conservation contact us: cpc@mobot.org

CHZ CPC 2005

Center for PLANT Conservation

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National Office Staff

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Center for PLANT Conservation

Restoring America's native plants

CPC National Collection Plant Profile

Amaranthus pumilus

Family: Amaranthaceae (Amaranth Family)
Common Names: Seabeach amaranth, Seabeach pigweed
Taxon Synonym: *Amaranthus pumulus*
Growth Habit: Annual
CPC Number: 100

Distribution
Protection
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Amaranthus pumilus is Fully Sponsored

Primary custodian for this plant in the CPC National Collection of Endangered Plants is:
North Carolina Botanical Garden

Amaranthus pumilus

The Seabeach amaranth is endemic to the Atlantic coastal plain beaches, where it is currently found in Maryland, New York, New Jersey, North Carolina, and South Carolina. It historically occurred in nine states, but is now extirpated from the states of Massachusetts, Rhode Island, Delaware, Virginia, and Connecticut. (USFWS 1993; Lea 1999) The primary reason for this species decline, and a continual threat to the survival of this species, is shoreline development. (Lea 1999)

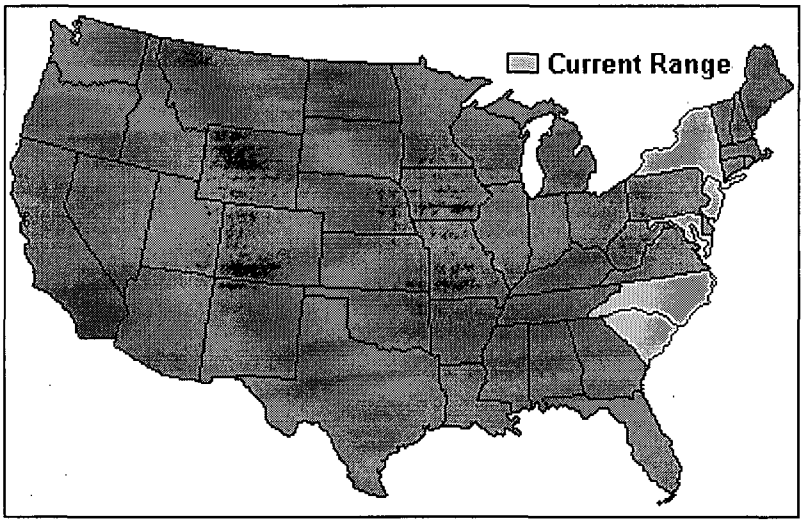
This species occurs on barrier island beaches in areas where there is low competition from other vegetation. This plant acts as a "sand binder", with a single large plant capable of creating a mini-dune up to 6 decimeters in height that contains up to 2 to 3 cubic meters of sand! (USFWS 1993)

Distribution & Occurrence

Top

State Range
Maryland
New Jersey
New York
North Carolina

South Carolina



Habitat

Overwash flats at accreting ends of coastal islands, lower foredunes, and upper strands of noneroding beaches (landward of the wrackline) (USFWS 1993)

Distribution

Maryland, New York, New Jersey, North Carolina, and South Carolina (USFWS 1993; Lea 1999)

Number Left

At the time of listing, this species was known from 13 populations in NY, 34 populations in NC and 8 populations in SC (USFWS 1993). In 1999, a plant was found in Maryland (Lea 1999)

Protection

Top

Global Rank:	G2	6/22/1990	Guide to Global Ranks
Federal Status:	LT	10/24/1996	Guide to Federal Status
Recovery Plan:	Yes	11/12/1996	

State/Area Protection

State/Area	Rank	Status	Date
Connecticut	SU	SC	
Delaware	SH		1/16/1992
Maryland	S1	E	4/30/2001
Massachusetts	SX	- H	6/2/1989
New Jersey	E		9/1/2001
New York	S2	E	5/1/2002
North Carolina	S2	T	1/1/2002
Rhode Island	SH	FT/SH	2/22/1990
South Carolina	S1		5/1/2000
Virginia	SH		10/23/1990

Conservation, Ecology & Research

Top

Ecological Relationships

Unknown.

Threats

- Beach stabilization structures
- Off-road vehicles
- Beach erosion and tidal inundation
- Storm-related erosion, dune movement
- Fragmentation-surviving patches of suitable habitat tend to be too far apart for seeds to travel and recolonize
- Predation by webworms (reducing the length of the reproductive season for the plant) (USFWS 1993)

Current Research Summary

Unknown.

Current Management Summary

The Maryland Department of Agriculture and the University of Kentucky have plans for an experimental restoration of this species in Maryland at the site it was discovered at in 1999. (Lea 1999)

Research Management Needs

Ex Situ Needs

References Top

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National Collection of Endangered Plants

CPC Home Page

Center for PLANT Conservation

Restoring America's native plants

CPC National Collection Plant Profile

Helonias bullata

Family: Liliaceae (Lily Family)
Common Name: swamp-pink
Author: Linnaeus 1753
Growth Habit: Perennial
CPC Number: 2210

Test part 2

Distribution
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References

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Helonias bullata is Partially Sponsored

Primary custodian for this plant in the CPC National Collection of Endangered Plants is:
The New York Botanical Garden

Helonias bullata

This beautiful plant is locally abundant in areas along the east coast. Despite this, most existing populations are unprotected and suffer from known direct threats to their existence. There is a great deal of public interest in this plant due to its attractive bright pink clusters of spring flowers that appear in April or early May and last through mid-June. Swamp pink grows in large dense patches creating magnificent displays that are easy to find at sites where it is present. Unfortunately this species has suffered from habitat destruction that has eradicated it from many Mid-Atlantic states and continues to suffer from similar threats. (Dowling 1999) Even when the land where a population is present is protected from development, the runoff caused by development on neighboring lands poses a severe threat to this species continued existence (NatureServe 2001). In addition, the destruction of habitat in the past has severely reduced the genetic variation in the species which continues to cause problems for their continued survival (Godt et al. 1995).

A perennial rhizomatous herb, the swamp pink usually is one of the first wildflowers to bloom in the spring, blooming from March to May. Its fragrant flowers are pink and occur in a cluster of 30 to 50. Its leaves are evergreen, lance-shaped, and parallel-veined. During the winter, the leaves often turn reddish brown but are often difficult to see because they lie flat on, or slightly raised, from the ground and so are often hidden by leaf litter. However, if you do find one of these beauties during the winter months, check for a large round bud in the center of the leaves--this represents next season's flower head. These leaves form a basal rosette from which arises from a stout, hollow stem. This stem can

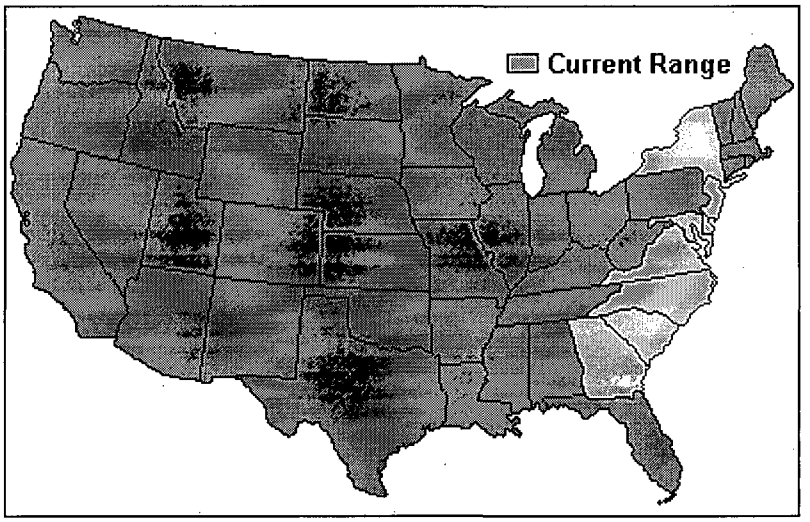
grow from a height of 2 to 9 decimeters during flowering, and to 1.5 meters during seed maturation. After flowering, a three-lobed fruit resembling an inverted heart forms, each with many ovules that open into six lobes. These lobes release linear-shaped seeds with fatty appendages on either end (presumably eliasomes, which are eaten by ants). (USFWS 1990; Peterson 1990).

Distribution & Occurrence

Top

State Range

Delaware
Georgia
Maryland
New Jersey
New York
North Carolina
South Carolina
Virginia



Habitat

Swamp Pink occurs in a variety of wetland habitats. These include Atlantic white-cedar swamps; Blue Ridge swamps; swampy forested wetlands which border small streams; meadows, and spring seepage areas. The plant requires habitat which is saturated, but not flooded, with water. Swamp Pink is commonly associated with evergreen trees such as Atlantic white-cedar; pitch pine; American larch; and black spruce. The species appears to be somewhat shade tolerant and to need enough canopy to minimize competition with other more aggressive species. In areas with less canopy, deer are more likely to eat the plant's flowers, leaves, or shoots.

Swamp pink is found on the east coast in wetlands with closed canopies including Atlantic white cedar swamps, deciduous swamps, and mixed hardwood/evergreen swamps (Beacham et al. 1992). It is often found and thrives at stream sources with the abundant and moving water found in such places (Dowling 1999).

Distribution

• This species historically ranged from New York State to the southern Appalachian Mountains. The largest percentage of extant groups is found in New Jersey but the species is also locally abundant at other sites in the Mid-Atlantic region (NatureServe 2001).
• Found in Georgia, North Carolina, South Carolina, Delaware, Maryland, New Jersey, New York, and Virginia (WWF 1990)

Number Left

In 1990, there were over 65 populations confirmed (population sizes ranging from 1 to 5,000 rosettes) in New Jersey, the state with the highest concentration of populations remaining (Peterson 1990).

Protection

Top

Global Rank:	G3	7/13/1995	Guide to Global Ranks
Federal Status:	LT	10/24/1996	Guide to Federal Status

Recovery Plan: Yes 9/3/1991

State/Area Protection

State/Area	Rank	Status	Date
Delaware	S2		1/16/1990
Georgia	S1	T	7/13/1995
Maryland	S1	E	12/18/1991
New Jersey	E	E	12/12/1991
New York	SX	U	2/17/1989
North Carolina	S1	T-SC	
South Carolina	S1	B	6/4/1990
Virginia	S2	E	4/15/1991

Conservation, Ecology & Research

Top

Ecological Relationships

- Seeds have fatty appendages on them, assumed to be eliasomes, suggesting that ant dispersal (myrmechochory) may be a means of seed dispersal for the species. (Sutter 1982)

Threats

- Wetland draining and/or filling.
- *Water Pollution*
- Habitat loss to urban, agricultural and silvicultural development
- Habitat degradation from offsite disturbance (ex. siltation)
- Trampling
- Collection

(WWF 1990; North Carolina Ecological Services 2002)

Current Research Summary

- Godt et al. (1995) measured the genetic diversity of 15 populations and found greater diversity in some of the smallest ones suggesting that they might be relict groups.
- Sutter (1984) published a status report on the species in the southern Appalachians and described the species breeding system. Swamp pink is self-compatible with prolific seed production. However, browsing can reduce reproductive output and the poor dispersal and lack of suitable sites for germination severely restrict recruitment.

Current Management Summary

The recovery plan for this species was completed in 1991 and several tasks are in progress including research on genetics, habitat requirements, the impact of disturbances, the development of conservation plans, searches for additional sites and the enforcement of regulations protecting swamp pink habitat (North Carolina Ecological Services 2002). The USFWS and the EPA helped to protect a population from hazardous waste remediation activities at a Superfund site (North Carolina Ecological Services 2002). The Citizens United to Protect the Maurice River and its Tributaries. Inc. has funded research to locate populations near this NJ river (CU 2002). Baltimore Washington International Airport has altered forest management plans to protect a stand of swamp pink at the end of one of their runways (McCord 1985). Several government agencies and horticultural and nature groups have also been involved in monitoring populations.

Research Management Needs

Ex Situ Needs

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National Collection of Endangered Plants

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Center for PLANT Conservation

Restoring America's native plants

CPC National Collection Plant Profile

Narthecium americanum

Family: Liliaceae (Lily Family)
Common Names: bog asphodel, yellow asphodel
Taxon Synonyms: *Abama americanum*, *Abama montana*, *Narthecium ossifragum* var. *americanum*
Author: Ker-Gawl.
Growth Habit: Perennial
CPC Number: 2926

Distribution
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References

Profile Links
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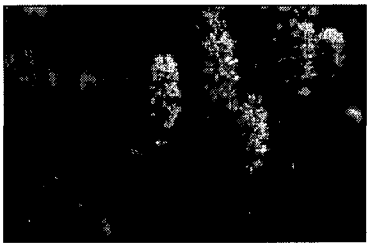


Narthecium americanum is Fully Sponsored

Primary custodian for this plant in the CPC National Collection of Endangered Plants is:
Brooklyn Botanic Garden

Elizabeth J. Farnsworth contributed to this Plant Profile.

Narthecium americanum

This perennial lily, growing up to half a meter tall, graces pine barrens bogs with its beautiful yellow flowers in June and July. The species' stronghold is in New Jersey, although a few far-flung populations are reported from the Carolinas and Delaware. A few dozen small populations are scattered around the New Jersey Pine Barrens, where they line the margins of streams, cedar swamps, and bog mats that are periodically flooded and flushed by moving water. These plants are threatened by activities that change the local water regime, including dam-building by people and beavers and the conversion of swamps to cranberry bogs.

Research and Management Summary:
A handful of individuals and institutions have studied this species and it's habitat. No information on management activities is available.

Plant Description:
This lily rises from a cluster of erect, basal leaves up to 20 cm long. The 4-9 mm-long, bright yellow flowers are crowded in a raceme at the top of the single stem and produce 1 cm-long, pointed fruits

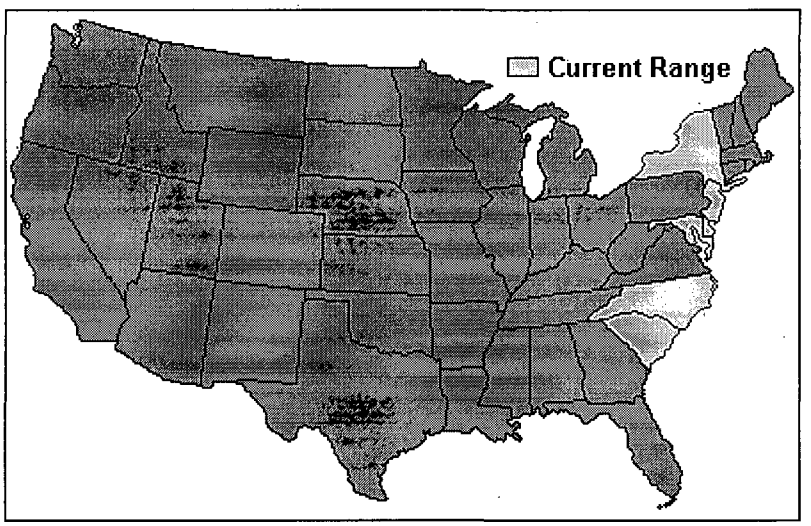
with 8 mm-long, elliptical seeds.

Distribution & Occurrence

Top

State Range

Delaware
Maryland
New Jersey
New York
North Carolina
South Carolina



Habitat

Stone (1911, 1912), in describing the species from New Jersey, identified its habitat as wet, sandy bogs, streams, and moist savannahs. Plants also inhabit quaking bog mats that are fed by "springy seeps" and the borders of white cedar swamps (Schuyler 1990). In general, Narthecium americanum grows in firm, sandy soils in areas that may be briefly flooded but do not accumulate deep standing water; Narthecium americanum does not tolerate stagnant water.

Associated herbaceous species include: Aster nemoralis, Calamagrostis pickeringii, Calamovilfa brevipilis, Juncus caesariensis, Lophiola americana, Muhlenbergia torreyana, Platanthera integra, Pogonia ophioglossoides, Rhynchospora oligantha, Schizaea pusilla, and Tofieldia racemosa (Stone 1912, Schuyler 1990); Sphagnum moss is also well-developed in these sites.

Distribution

Narthecium americanum is found in bogs and pine barrens of the coastal plain from New Jersey to South Carolina (Gleason and Cronquist 1991, NatureServe 2001). Tatnall (1946) reported two occurrences in Delaware, but the species is now considered extirpated there. Although Radford et al. (1968) reported Narthecium americanum from both North and South Carolina, recent data indicate that the species has been extirpated from these states (NatureServe 2001).

Number Left

35 extant populations (the only ones remaining of 60 historic occurrences) are known from New Jersey (NatureServe 2001). Since populations generally consist of fewer than 100 individual plants, the total world population is likely less than 3000.

Protection

Top

Global Rank:	G2	6/22/1990	Guide to Global Ranks
Federal Status:	C	10/1/1999	Guide to Federal Status
Recovery Plan:	No		

State/Area Protection

State/Area	Rank	Status	Date
Delaware	SX		2/1/2001
Maryland	SH		11/25/1987
New Jersey	S2	E	9/1/2001
New York	SRF	U	2/17/1989
North Carolina	SX	E	1/1/1999
South Carolina	SH		5/1/2000
Tennessee Valley Authority	S?		

Conservation, Ecology & Research

Top

Ecological Relationships

• Narthecium americanum reproduces both by seed and, more commonly, through vegetative propagation via rhizomes.

• Flowers appear in June and July, and form seed by a combination of selfing and cross-pollination via insect vectors (Summerfield 1974). Although copious amounts of seed may be produced and appear to germinate successfully, very few seedlings are found in wild populations of the plant (Schuyler 1990). This begs the question of whether seedling establishment is hindered by various ecological factors such as seed predation or seedling herbivory, but these factors have not been studied to date.

• A related lily, the rare swamp pink (Helonias bullata) suffers extensive herbivory by deer in similar Pine Barrens habitats (E. Farnsworth, personal observation); Narthecium americanum is impacted as well, and deer management is being promoted in New Jersey as a means to reduce herbivory on both species (Steve Eisenhauer, Natural Lands Trust, personal communication).

• Studies of the closely related congener, Narthecium ossifragum (Summerfield 1974), suggest that shading may inhibit both growth and reproduction of N. americanum. Low numbers of flowering stems are found in areas shaded by white cedar, where bogs are succeeding to forest (Schuyler 1990).

• Conversely, where stands of cedar have been killed by fire, locally dense patches of flowering Narthecium americanum have been observed, according to field forms from the New Jersey Natural Heritage Program. Therefore, Narthecium americanum may benefit from openings in the canopy.

• This species may also be somewhat fire-tolerant, if its rhizomes remain intact or it may recolonize following moderate burns. Work by Summerfield (1974) on N. ossifragum cautions that more extreme burns (which kill rhizomes) can greatly reduce the viability of populations, however.

Threats

• Hydrological change -- Narthecium americanum is primarily threatened by changes to the local hydrologic regime. Increased inundation caused by beaver impoundments or by conversion of swamp habitat to cranberry bogs or recreational lakes has exterminated populations (Schuyler 1990, NatureServe 2001). Alteration of drainages that prevent swamps from being regularly flushed (i.e., through road-building or water diversion) leads to build-up of stagnant waters that kill Narthecium americanum.
• Trampling of plants by off-road vehicles has also been cited as a threat (NatureServe 2001).

Current Research Summary

• Links between water chemistry, ecosystem function and plant community composition are being studied as of June 2000 in the Pine Barrens by Matthew Palmer, graduate student at Rutgers University, New Brunswick, New Jersey (thesis advisor: Dr. Joan Ehrenfeld).

• The New England Wild Flower Society (Framingham, Massachusetts) has successfully germinated seeds of N. americanum. Dried seed will germinate without refrigeration, but chilling improves germination. Stored seed remains viable for at least 7 years.

• Leslie Duthie at Norcross Sanctuary (Monson, Massachusetts) has propagated the plants from cuttings.

Current Management Summary

• No information is available on specific management activities addressing Narthecium americanum.

Research Management Needs

• Field and greenhouse studies to identify factors that inhibit seedling establishment
• Long-term studies to determine how long populations can persist using only vegetative reproduction
• Population viability analysis from multi-year studies of several populations
• Field studies to quantify the prevalence of herbivory in populations and the degree to which this threatens viability
• Controlled-burn studies to determine thresholds of fire tolerance and the ecophysiology of seed germination and seedling colonization following fire
• Canopy removal studies that document the responses of plants to clearing and removal of shade
• Surveys of suitable swamp habitat in Delaware, Maryland, and the Carolinas to potentially identify more populations of the plant
• Molecular phylogenetic studies to determine relatedness of Narthecium americanum to the congeners N. asiaticum, N. ossifragum, and N. californicum.

Ex Situ Needs

• Seed longevity studies to determine whether propagules are recalcitrant or tolerant of storage
• If storage is feasible, seed should be collected from marginal or threatened populations
• Seed bank and survival of plants following germination

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National Collection of Endangered Plants

CPC Home Page

Center for PLANT Conservation

Restoring America's native plants

CPC National Collection Plant Profile

Rhynchospora knieskernii

Family: Cyperaceae (Sedge Family)
Common Names: Kneiskern's beaked sedge, Knieskern's beaked rush
Taxon Synonym: *Phaeocephalum knieskernii*
Author: Carey
Growth Habit: Annual
CPC Number: 3751

Distribution
Protection
Conservation
References

Profile Links
ITIS
Tropicos
PLANTS
Fish & Wildlife

Rhynchospora knieskernii is Fully Sponsored

Primary custodian for this plant in the CPC National Collection of Endangered Plants is:
Brooklyn Botanic Garden

Elizabeth J. Farnsworth contributed to this Plant Profile.

Rhynchospora knieskernii

Rhynchospora kneiskernii is a grass-like plant of the Sedge family that grows only in the Pinelands of New Jersey. A short-lived perennial, the plant inhabits disturbed, open, early-successional wet areas in gravel and clay pits, power-line and railroad rights-of-way, recent burns, muddy swales, and cleared areas. The largest populations occur on natural bog iron deposits in the Pine Barrens. Periodic disturbances and fluctuating groundwater levels appear necessary to perpetuate its existence, as it is a poor competitor with other plants. Thus, succession to shrubs and forest threaten the plant, as well as irreversible disturbances brought by land development, trampling and soil compaction cause by intensive off-road vehicle use, and lowered water levels caused by water withdrawal and drought.

Research and Management Summary:
While little research has been performed directly on this species, a recovery plan has been written for this federally threatened plant. Unfortunately, most populations of this plant are located on private land. However, the U.S. Fish and Wildlife Service has been working to maintain the health of the species through management of federally-owned lands where it is found.

Plant Description:

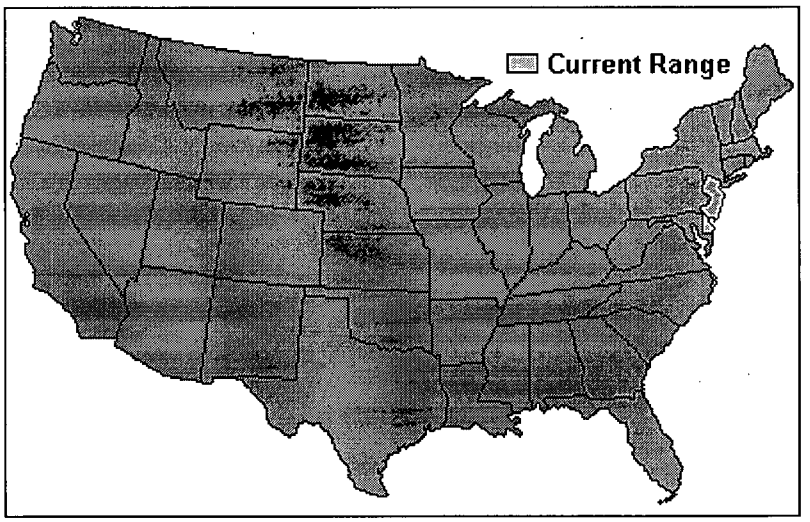
Rhynchospora kneiskernii grows to 60 cm in height, with many slender stems issuing from the base. Its narrow leaves (only 1 to 2 mm wide) often roll inward. Numerous small spikelets of flowers occur at widely separated intervals along the stem. The plant is called "beaked-rush" because the beak at the base of the persistent style is nearly half as long as the 1.3 mm-long fruit (achene) itself.

Distribution & Occurrence

Top

State Range

Delaware
New Jersey



Habitat

Rhynchospora kneiskernii occurs in groundwater-influenced, constantly fluctuating, successional environments (USFWS 1993). The plant was once thought to be closely associated with natural bog iron deposits in the Pinelands (Stone 1911), but has now been found in a wider variety of environments. Bog iron forms when slow-moving, acidic stream water leaches iron from the Cretaceous outwash soils characteristic of the Pinelands. Upon contact with oxygen and oxidizing bacteria, the iron mobilizes and is re-deposited in hard layers of "iron stone" in streambeds and adjacent floodplain wetlands. Continual stream erosion and challenging soil chemistry tend to inhibit growth of trees and shrubs that would normally shade out Rhynchospora kneiskernii (USFWS 1997). Six of the 38 known extant populations of the plant occur on this unusual substrate.

Most of the populations, however, have opportunistically colonized newly-disturbed wet areas, including: the edges of abandoned pits and gravel, clay, and sand mines; unpaved roads; railroad beds; utility rights-of-way, and ditches (USFWS 1990). Plant species associated with Knieskern's beaked-rush include: poverty grass (Aristida longispica), warty panic-grass (Panicum verrucosum), and spatulate-leaved sundew (Drosera intermedia), species characteristic of temporarily inundated mineral soils and open areas (Gordon 1993).

Because Rhynchospora kneiskernii typically occurs within wet openings of pitch-pine forest -- a community type established and maintained by fire -- it may be fire-dependent (USFWS 1993). Because fires are now suppressed in much of its habitat, the future of the species and these types of communities is uncertain.

Distribution

Rhynchospora kneiskernii is known only from New Jersey in Atlantic, Burlington, Camden, Monmouth, and Ocean Counties in the heart of the Pinelands. Populations were previously known from Camden County, New Jersey, but no longer occur there (USFWS 1991). Two collections were made from Sussex County in Delaware; however, the species has not been observed there since 1875, despite a decade of concerted searches on the part of botanists in appropriate habitat (USFWS 1993, NatureServe 2001). Thus, the species is presumed extirpated in Delaware.

Number Left

38 extant populations of Rhynchospora kneiskernii are reported in New Jersey (USFWS 1993). An additional 14 occurrences are considered historic. Population sizes vary from a dozen or so culms to groups covering two acres, and plant numbers vary dramatically year to year, especially as water levels fluctuate in the wetlands they inhabit (USFWS 1991). Thus, the total population level of Rhynchospora kneiskernii is extremely difficult to estimate.

Protection

Top

Global Rank:	G1	1/1/1991	Guide to Global Ranks
Federal Status:	LT	10/24/1996	Guide to Federal Status
Recovery Plan:	Yes	12/31/1993	

State/Area Protection

State/Area	Rank	Status	Date
Delaware	SX		12/14/2001
New Jersey	S1	E	9/1/2001

Conservation, Ecology & Research

Top

Ecological Relationships

• Despite interest in its rarity, ecological interactions of this species with other plants and animals do not appear to have been studied (or published in the scientific literature).

• Rhynchospora kneiskernii behaves as an annual or a short-lived perennial (U. S. Fish and Wildlife Service 1997). Therefore, its population numbers can fluctuate greatly from year to year.

• The plant is a wetland obligate (USDA 2001) and highly intolerant of drought; populations crashed in 1985, a very dry year (USFWS 1991). It thrives best in groundwater-controlled wetlands that undergo period changes in water level, where other plant species are sparse.

• This species may benefit from fire, which can revert a wetland to an early successional state and simultaneously provide a flush of carbon and nutrients to otherwise infertile soils.

• The U. S. Fish and Wildlife Service (USFWS 1991) reports that pathogens and herbivores are not known to attack Rhynchospora kneiskernii. Foliar silica is produced in a variety of Rhynchospora species and other monocots, and may inhibit browsing by animals.

• With small, inconspicuous flowers, the species is likely wind-pollinated. The inflated achenes may be water-dispersed, but this has yet to be substantiated.

Threats

As identified by U. S. Fish and Wildlife Service 1991 & 1993, threats include:

• Any activities that threaten wetland habitat, hydrology, and water quality in the Pinelands, including: land development, water diversion, road-building, sewage disposal, land-fill creation, and agricultural expansion
• Natural succession to shrub or forested wetland, especially if hastened by lowered water table or not arrested by fire
• Drought
• Intensive off-road vehicle use
• The location of a majority of all populations on private property, where illegal collecting is difficult to control

Current Research Summary

• The New England Wild Flower Society (Framingham, Massachusetts), has conducted seed germination trials on this species. Moist, cold stratification enhances germination. Seed sown after collection in 1991 germinated and produced plants. These plants flowered in two consecutive years, confirming that the plant can be a short-lived perennial. Seed dried and stored under seed bank conditions for four years between 1991 and 1995 germinated successfully in 1995, demonstrating that the species is capable of seed-banking.

Current Management Summary

• According to the U. S. Fish and Wildlife Service (1991, 1993), conservation and management of R. knieskernii involves integrated site protection and habitat manipulation to maintain early plant succession. Protection efforts focus on reducing known threats to plants, land acquisition, landowner agreements, and management of habitats to maintain conditions conducive to the species establishment and maintenance.

• The U. S. Fish and Wildlife Service has also established agreements with the U. S. Department of the Navy, Federal Aviation Administration, and the New Jersey Division of Fish, Game and Wildlife to protect known occurrences of Rhynchospora kneiskernii (USFWS 1993).

Research Management Needs

• Quantification of demography and reproduction, especially in small and marginal populations, to inform a systematic population viability analysis
• Studies of seed bank dynamics, seed viability, dispersal, and seedling establishment to determine how new populations are initiated and the optimal habitat conditions for plant growth
• Controlled burns of selected areas (with appropriate experimental controls) to assess the role of fire in maintaining populations

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Ex Situ Needs

• Methods for ex situ cultivation appear to be relatively well-established for this taxon.

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National Collection of Endangered Plants

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Center for PLANT Conservation

Restoring America's native plants

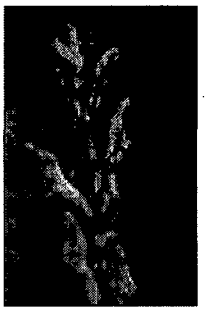
CPC National Collection Plant Profile

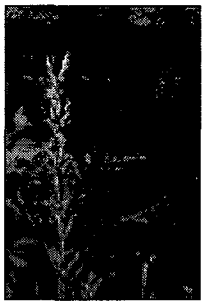
Schwalbea americana

Family: Scrophulariaceae (Figwort Family)
Common Names: American chaffseed, Chaffseed
Taxon Synonyms: *Schwalbea americana* var. *australis*, *Schwalbea australis*
Growth Habit: Perennial
CPC Number: 3877

Distribution
Protection
Conservation
References

Profile Links
ITIS
Tropicos
PLANTS
Fish & Wildlife





Schwalbea americana is Fully Sponsored

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Brooklyn Botanic Garden

Elizabeth J. Farnsworth contributed to this Plant Profile.

Schwalbea americana

A tall, perennial herb in the figwort family, this plant is distinguished by its large, purplish-yellow, tubular flowers. Schwalbea americana is a hemiparasite that feeds from the roots of a range of associated woody species. Once known historically from the coastal plain extending from Massachusetts to Florida, the species now only occurs at 51 sites and 15 distinct populations in New Jersey, the Carolinas, Georgia, Florida, and Mississippi, where it is threatened by residential development, road-building, inappropriate mowing regimes, over-collection, and fire suppression.

Research and Management Summary:
A number of individuals and institutions have studied many aspects of the ecology of this plant, including how to best manage for the species where it occurs.

Plant Description:
Schwalbea americana is an erect, perennial herb with unbranched stems that grows to a height of 80 cm (30 inches). It is densely but minutely hairy throughout, including the flowers. The alternate, 2-4 cm-long leaves are lance-shaped, untoothed, and clasp the stem. The irregular, tubular flowers, which are yellow-purple and 15-22 mm long, subtended by two small leaves (bracts) and borne singly on short stalks (pedicels). The fruit is a stout capsule 10-12 mm long, enclosed in a loose-fitting sac-like

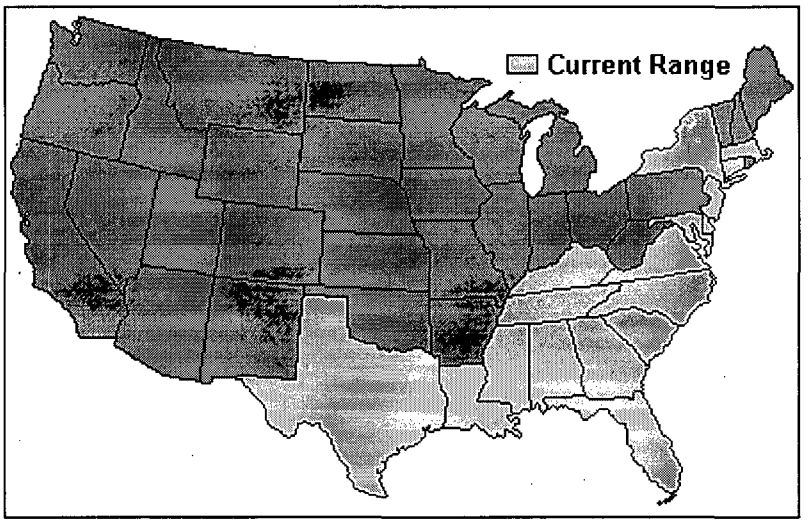
structure that gives the plant its common name, chaffseed. The green seeds are 2-6 mm long, straight, and narrow (Small 1933, Pennell 1935, Musselman and Mann 1978, Vincent 1982, Kral 1983, Gleason and Cronquist 1991).

Distribution & Occurrence

Top

State Range

Alabama
Connecticut
Delaware
Florida
Georgia
Kentucky
Louisiana
Maryland
Massachusetts
Mississippi
New Jersey
New York
North Carolina
South Carolina
Tennessee
Texas
Virginia



Habitat

Schwalbea americana occurs in acidic, sandy or peaty soils in open pine flatwoods, longleaf pine/oak sandhills, streamhead pocosins, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, in ecotonal areas between peaty wetlands and xeric sandy soils (NatureServe 2001). Historically, the species is known from inland sandplains in Albany, New York and central Massachusetts. The species is regarded as a facultative wetland plant (USDA Plants National Database 2001); individual plants sometimes occur in drier upland communities, but rarely inhabit inundated wetlands (Rawinski and Cassin 1986).

Associated plant communities are typically species-rich, and dominated by grasses and sedges. Plant genera reported to occur with Schwalbea americana in the Southeast include grass species of Andropogon, Aristida, Panicum, and Paspalum; sedge species of Carex, Dichromena, Fimbristylis, Rhynchospora, Scleria; monocot species of Aletris, Calopogon, Eriocaulon, Juncus, Lachnocaulon, Xyris; and dicot species of Asclepias, Buchnera, Erigeron, Eryngium, Helenium, Heterotheca, Orbexilum, Phlox, and Polygala. In wetter habitats, species of Cliftonia, Gaylussacia, Ilex, Lyonia, Leucothoe, Myrica, and Vaccinium occur as associates (Fernald 1939, Kral 1983, NatureServe 2001).

Distribution

Schwalbea americana is formerly known from the Atlantic and Gulf coastal plain extending from Cape Cod, Massachusetts south to Texas. Inland sandplain populations are also historically reported from interior Massachusetts, New York, and Kentucky. Currently, the species is restricted to Florida, Georgia, North and South Carolina, and New Jersey.

Number Left

51 populations are extant, according to NatureServe (2001), composed of 1 in New Jersey, 18 in North Carolina, 26 in South Carolina, 5 in Georgia, and 1 in Florida. Many of these populations have been discovered in the past decade. However, this number is only a fraction of the 68 or more populations recorded historically (U. S. Fish and Wildlife Service 1992, NatureServe 2001). At least twelve of the populations in 1992 had less than 100 plants present (U. S. Fish and Wildlife Service 1992); thus, the total North American population probably ranges from 1,000 to 10,000 plants at most.

Protection

Top

Global Rank:	G2	1/7/1997	Guide to Global Ranks
Federal Status:	LE	9/29/1992	Guide to Federal Status
Recovery Plan:	Yes	9/29/1995	

State/Area Protection

State/Area	Rank	Status	Date
Alabama	S1		10/3/1991
Connecticut		SH	8/29/1983
Delaware	SX		12/14/2001
Florida	S1	E	4/1/1998
Georgia	S1	E	10/1/2001
Kentucky	SH		1/1/2000
Louisiana	SH		7/6/1996
Maryland	SX	X	4/30/2001
Massachusetts	SX		6/2/1989
Mississippi	S1		1/1/2000
New Jersey	S1	E	9/1/2001
New York	SX	U	4/1/2001
North Carolina	S1	E	1/1/1999
South Carolina	S2	E	5/1/2000
Tennessee	SX		4/1/2001
Texas	SR		6/15/1992
Virginia	SH		3/1/2001

Conservation, Ecology & Research

Top

Ecological Relationships

• Schwalbea americana is a perennial species that can persist permanently in an area, provided the habitat is kept relatively open by fire, mowing, artillery fire (at one military base), and other periodic disturbance (USFWS 1992).

• Like many members of its family, the species is a hemiparasite, forming haustorial connections to the roots of living plants and deriving nutrients from them (Musselman and Mann 1977, Kirkman and Musselman 2000).

• The plant flowers from April to June in the southern states and from June to mid-July in New Jersey (Johnson 1988), and fruits mature from mid-summer to October.

• Bees are likely pollinators of this taxon, given the tubular structure and color of its flowers (Pennell 1935).

Threats

As articulated by the U. S. Fish and Wildlife Service (1992):

• Conversion of coastal plain habitat for residential and agricultural development
• Inappropriate mowing regimes (timed poorly with respect to flowering time), especially at the one existing site in New Jersey
• Fire suppression, leading to succession by woody vegetation that outcompetes Schwalbea americana for light
• Over-collection and trampling by botanical enthusiasts

Current Research Summary

• The effects of prescribed burns on Schwalbea americana have been investigated by Kirkman et al. (1998).

• Hemiparasitic relationships and haustorial anatomy have been elucidated by Musselman and Mann (1977, 1978) and Kirkman and Musselman (2000).

• Seed anatomy has been documented by Musselman and Mann (1976).

• Extensive field surveys have been undertaken to locate previously unknown populations of the plant (Rawinski and Cassin 1986), and several new occurrences have been noted since the original listing of the species in 1992. However, it is clear that the species occupies only a fraction of historical and available habitat.

• The New England Wild Flower Society has germinated limited numbers of seed from Schwalbea americana during trials in 1982. Seed sown on the soil surface and overwintered outdoors showed the best germination rate. However, seedlings grown without host plants did not survive (Brumback 1989), and survival has been poor in plantings even with a potential host plant, little bluestem.

• Propagation and reintroduction of Schwalbea americana is described by Obee and Cartica (1997), but appears to have also met with mixed success.

• The Chattahoochee Nature Center (Roswell, Georgia) maintains Schwalbea americana in their greenhouse.

Current Management Summary

• The effectiveness of using controlled burns to foster Schwalbea americana is being explored at several sites throughout its range (Kirkman et al. 1998).

• Improved mowing regimes are being developed in New Jersey (USFWS 1992) and New Jersey (Rawinski and Cassin 1986).

• Jordan et al. (1995) present a review of recommended management for the red-cockaded woodpecker and the associated rare species (including Schwalbea americana) that co-occur in its habitat.

• Obee (1993) describes monitoring and seed collection of Scwalbea americana at one site in New Jersey.

Research Management Needs

A number of studies are needed, including:

• Studies of pollination and other facets of reproduction that could influence population persistence.
• Studies to determine ecological factors that limit recruitment and establishment of populations.
• Increased intensity and frequency of population monitoring (NatureServe 2001) in order to understand demographics and reasons for the decline of protected populations.

Ex Situ Needs

• Improved methods for germination and maintaining viable plants need to be developed.

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