

Hoary frostweed; Bicknell's hoary rockrose (*Helianthemum bicknellii*; Cistaceae) PABS  
Endangered; G5 S2

The hoary frostweed, a member of the rockrose family, is characterized by slender stems growing to about one foot high, by the small, alternately arranged, hairy leaves, by the yellow, five-petaled flowers that are present in June and July, and by the capsular fruits that are clustered in the leaf axils. Except for the brightly-colored, but small and ephemeral, flowers, this species can be very inconspicuous and very easy to overlook (Figure 14).

The species grows in dry, usually open, places, such as rock outcrops, exposed banks, sunny slopes, barrens, and open forests, where the soil is generally thin and subject to dryness.

The hoary frostweed has a wide distribution in midwestern and eastern North America. In Pennsylvania, the historical records are widely scattered throughout the state (NatureServe 2006; PNHP 2006; Rhoads & Klein 1993).

Although the hoary frostweed is not considered to be of conservation concern on a global basis and does not have a federal rarity status, it is listed as a species of special concern in Pennsylvania as well as the neighboring states of Delaware, Maryland, New Jersey, Ohio, and West Virginia. In Pennsylvania, the species currently has an Endangered status, and has been documented by PNHP at fewer than ten extant occurrences. The possibility remains that the species may be more common than currently believed, because of its inconspicuous habit (NatureServe 2006; PNHP 2006).

The hoary frostweed was first documented by PNHP in 1991 in Gettysburg National Military Park and Eisenhower National Historic Site on the upper slope on the east side of Pardee Field (Figure 15). This occurrence was updated by PNHP in 1994, 1996, and again in 2004, and during this period of time consistently maintained a population of several hundred stems. This occurrence appears to be one of the largest and most viable occurrences of the species known to PNHP in the state (PNHP 2006).

The habitat at Pardee Field consisted of a dry, open, old field type habitat, characterized by a thin soil (occasionally with outcroppings of diabase bedrock) and relatively low-growing herbaceous and graminoid plants. The area appeared to receive an annual mowing in late summer. The vegetation association has been classified as Successional Old Field (Perles et al. 2006).

The main threat to this species appeared to be the establishment and spread of woody plants, primarily native species, that were not controlled by the annual mowing.

Unlike the successional grassland habitats that occur on seasonally or permanently wet soils (e.g, wet meadows), the successional grassland habitats that occur on well-drained soils, such as Pardee Field, appeared to have a lower threat from exotic species.

The occurrence of the hoary frostweed did not have any threats from deer browsing or impacts from tourists.

The current management of Pardee Field, consisting of mowing in the late summer after the peak of the tourist season, and augmented in spring and summer by the spot-herbiciding/mechanical

removal of woody plants that resist the mowing, has appeared to have been very effective in maintaining the occurrence of the hoary frostweed, as well as the surrounding vegetation association, for many years. It is recommended that the annual mowing schedule and the spot-herbicide of woody plants be continued, with the suggestion that the mowing be postponed until after the first killing frost of the autumn (typically late October or early November).



Figure 14. Hoary frostweed (*Helianthemum bicknellii*). Photograph by John Kunsman; taken in Gettysburg National Military Park.

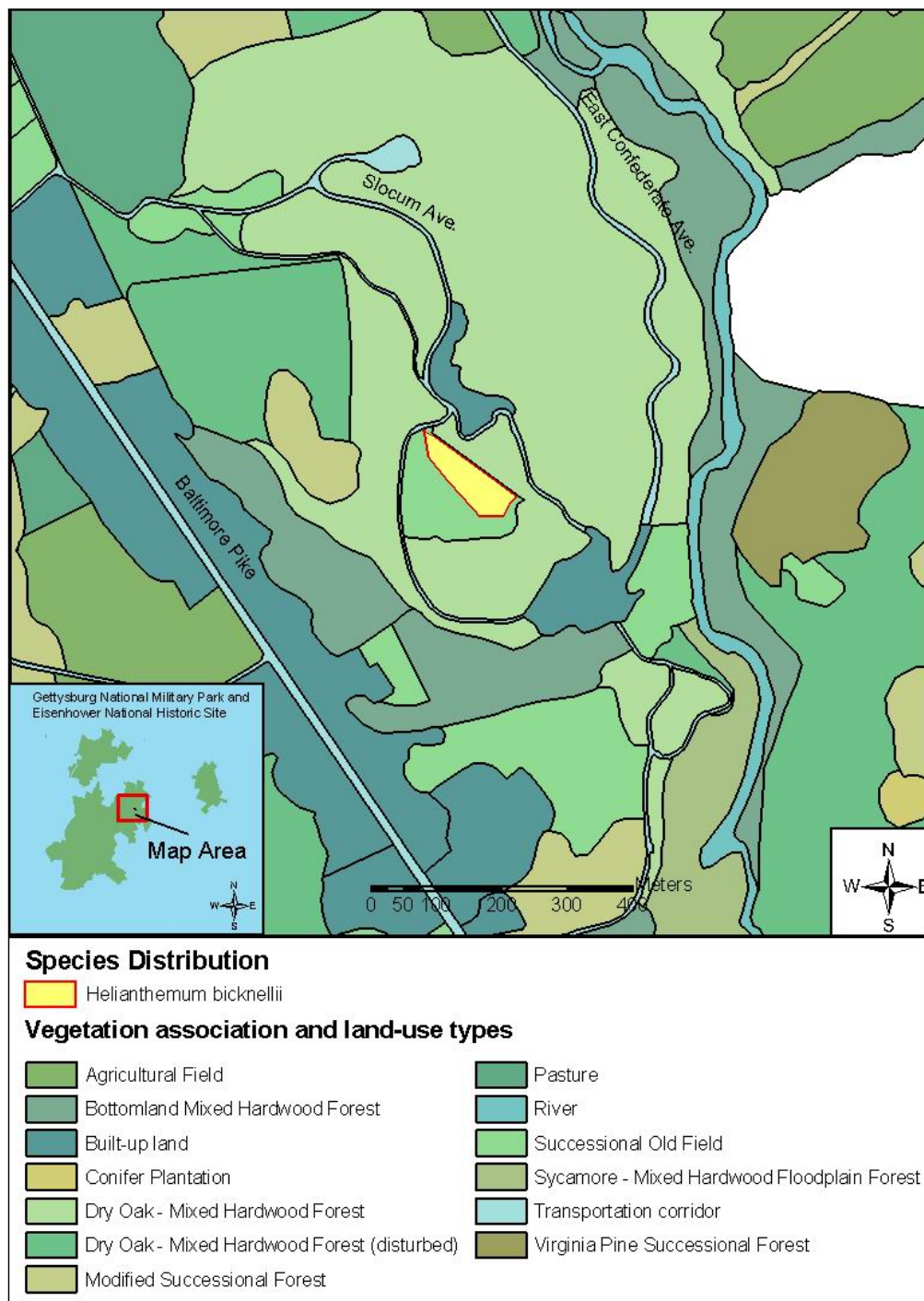


Figure 15. Species distribution of hoary frostweed (*Helianthemum bicknellii*).



Grass-leaved rush; bog rush (*Juncus biflorus*; Juncaceae) PABS Threatened; G5 S2

The grass-leaved rush, a member of the rush family, is characterized by its colonial growth habit with stems growing to about three feet in height, by the flat, grass-like leaves, and by the terminal clusters of small, reddish-brown capsule-like fruits that are most prominent in summer and early fall (Figure 16).

The species grows in permanently or seasonally damp or wet, open places, and seems to have an affinity for diabase-derived soil and certain types of soil disturbance. It often grows in association with another species of special concern, the short-fruited rush (*Juncus brachycarpus*). Both of these rush species appear to be somewhat short-lived, successional species, and individual plants may not persist for more than a few years even under optimal conditions.

The grass-leaved rush has a wide distribution in eastern North America. In Pennsylvania, it can be considered a southerly species, with the historical records being confined to the southcentral and southeastern counties (NatureServe 2006; PNHP 2006; Rhoads & Klein 1993).

Although the grass-leaved rush is not considered to be of conservation concern on a global basis and does not have a federal rarity status, it is listed as a species of special concern in Pennsylvania as well as the neighboring states of New York and West Virginia. In Pennsylvania, the species currently has a Threatened status, as it has been documented by PNHP at fewer than twenty occurrences. Recent field work in the state by PNHP and collaborators has cast some doubt on the current rarity status of the species, however, because of the increasing number of occurrences that have been discovered, and the ability of the species to disperse itself around to colonize new areas, including areas disturbed by certain types of human activity (NatureServe 2006; PNHP 2006).

The grass-leaved rush was first documented by PNHP in Gettysburg National Military Park and Eisenhower National Historic Site in 1991 in the Sedgwick Avenue Meadow, located north of Wheatfield Road and west of Sedgwick Avenue. This colony was updated by PNHP in 1994. In 2004 and 2005, this colony was seen again, and had obviously increased in size in the ten years since the previous update; in addition, several new colonies were observed in The Wheatfield, other parts of the Plum Run Valley, and Pardee Field (Figure 17). Over two thousand fruiting stems of grass-leaved rush were observed in total at the various colonies, making the occurrence of the species in Gettysburg National Military Park and Eisenhower National Historic Site one of the largest known to PNHP in the state (PNHP 2006).

The habitat was similar at all of the colonies, consisting of grassland or meadow that received abundant sunlight, had a seasonally or permanently wet substrate, and associated vegetation consisting of graminoid and herbaceous species. The vegetation associations at grass-leaved rush colonies were classified as Successional Old Field, Wet Meadow, and Successional Old Field/Wet Meadow (Perles et al. 2006).

A major threat to the colonies of this species - succession toward a habitat more dominated by woody plant species - has been greatly lowered by the annual mowing schedule and the spot-

herbiciding/mechanical removal of woody plants. There remains the problem of controlling invasive, exotic species such as stilt grass (*Microstegium vimineum*), small carpgrass (*Arthraxon hispidus*), and to a lesser extent the weedy native reed canary grass (*Phalaris arundinacea*), which constitute an increasing threat to these grassland-type habitats.

The occurrence of the grass-leaved rush did not have any threats from deer browsing or impacts from tourists.

This species would appear to be a beneficiary of the “if the habitat is there, they will come” strategy of management discussed on pages 15-16. As a result, the general practice of mowing the open grassland and meadow habitats in Gettysburg National Military Park and Eisenhower National Historic Site in late summer or early fall after the main tourist season, and augmented in spring and summer by control of woody plants that resist the mowing, has appeared to be very beneficial for the grass-leaved rush and its habitat. It is recommended that this management activity be continued, with the suggestion that the mowing be done several weeks later in the year (typically late October or early November), after the first heavy frost or first freeze has killed the herbaceous vegetation.

The control of the invasive species mentioned above is strongly recommended at all colonies of the grass-leaved rush.



Figure 16. Grass-leaved rush (*Juncus biflorus*). Photograph by John Kunsman; taken in Gettysburg National Military Park.

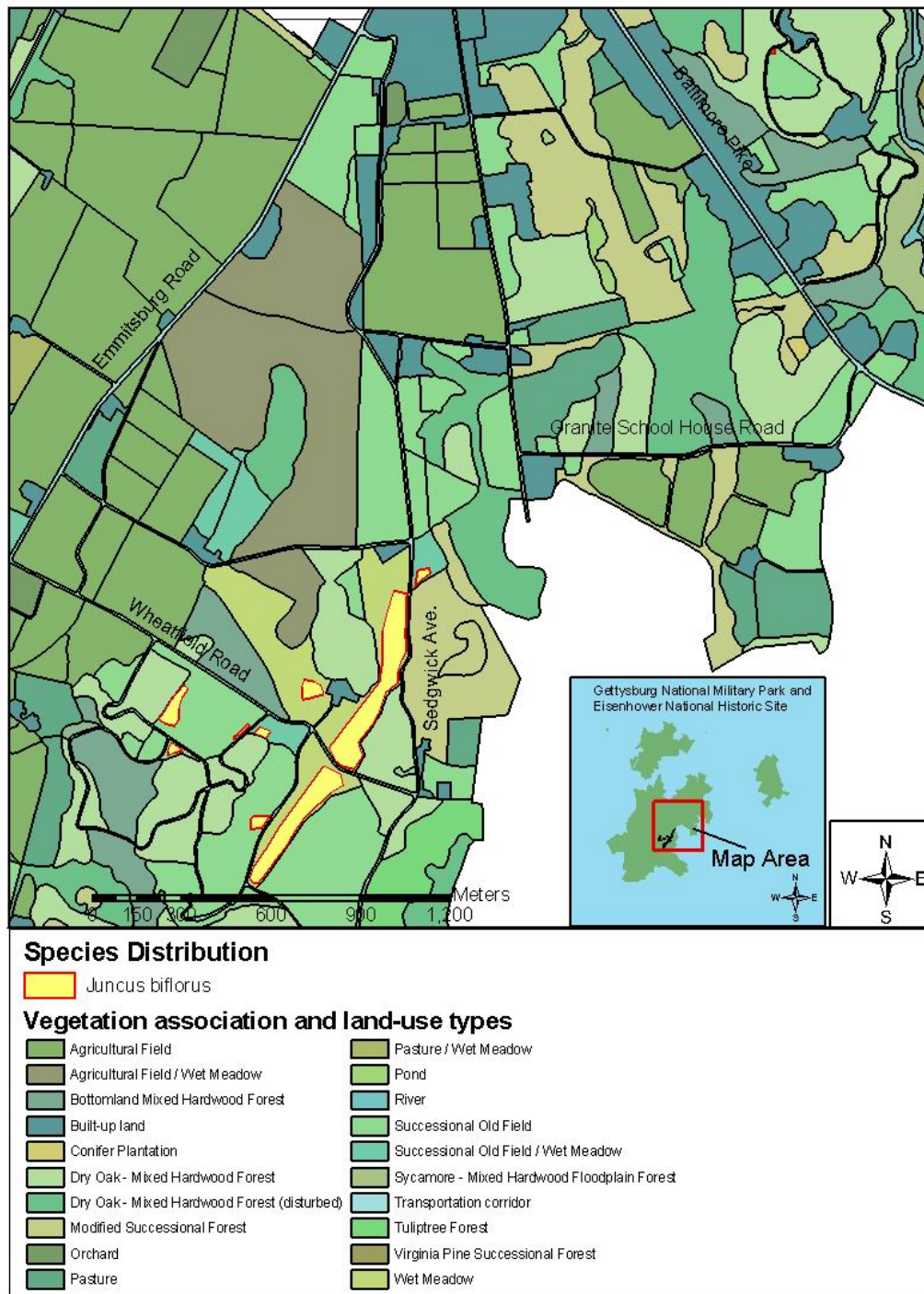


Figure 17. Species distribution of grass-leaved rush (*Juncus biflorus*).



Short-fruited rush; whiteroot rush (*Juncus brachycarpus*; Juncaceae) PABS Endangered; G4G5 S1

The short-fruited rush, a member of the rush family, is characterized by its colonial growth habit with stems growing to about three feet in height, by the narrow, grass-like leaves, and by the terminal clusters of small, bur-like, capsule-like fruits that are most prominent in summer and early fall (Figure 18).

The species grows in permanently or seasonally damp or wet, open places, and seems to have an affinity for diabase-derived soil and certain types of soil disturbance. The short-fruited rush often grows in association with another species of special concern, the grass-leaved rush (*Juncus biflorus*). Both of these rush species appear to be somewhat short-lived, successional species, and individual plants may not persist for more than a few years even under optimal conditions.

The short-fruited rush is a wide-ranging species of eastern North America. In Pennsylvania, it is somewhat of a southerly species, with the few current records known to PNHP being restricted to the southcentral counties of Adams, Franklin and York (NatureServe 2006; PNHP 2006; Rhoads & Klein 1993).

Although the short-fruited rush is not considered to be of conservation concern on a global basis and does not have a federal rarity status, it is listed as a species of special concern in Pennsylvania as well as the neighboring states of New Jersey, New York and West Virginia. In Pennsylvania, the species currently has an Endangered status, as it has been documented by PNHP at only three occurrences; however, the successional nature of the species and its ability to colonize areas that have been disturbed by certain types human activity have led some botanists to question this high-ranking status (NatureServe 2006; PNHP 2006).

The short-fruited rush was first documented by PNHP in Gettysburg National Military Park and Eisenhower National Historic Site in 1987 in the Sedgwick Avenue Meadow, located north of Wheatfield Road and west of Sedgwick Avenue. This occurrence was updated by PNHP in 1994. During the surveys of 2004 and 2005, this original colony was confirmed, and additional colonies were found in The Wheatfield and other parts of the Plum Run Valley (Figure 19). Several hundred fruiting stems were observed in total at the various colonies, the largest being at Sedgwick Avenue Meadow, making this occurrence of short-fruited rush the largest and most viable occurrence known to PNHP in the state (PNHP 2006).

The habitat was similar at all of the colonies, consisting of grassland or meadow that received abundant sunlight, had a seasonally or permanently wet substrate, and predominantly herbaceous vegetation. The vegetation associations at the short-fruited rush colonies were classified as Successional Old Field, Wet Meadow, and Successional Old Field/Wet Meadow (Perles et al. 2006).

A major threat to the colonies of this species - succession toward a habitat more dominated by woody plant species – has been greatly lowered by the annual mowing schedule and the spot-herbicide/mechanical control of woody plants. There remains the problem of controlling invasive, exotic species such as stilt grass (*Microstegium vimineum*), small carpgrass (*Arthraxon*

*hispidus*), and to a lesser extent the weedy native reed canary grass (*Phalaris arundinacea*), which constitute an increasing threat to these grassland-type habitats.

The occurrence of the short-fruited rush did not have any threats from deer browsing or impact from tourists.

This species would appear to be a beneficiary of the “if the habitat is there, they will come” strategy of management discussed on pages 15-16. As a result, the general practice of mowing the open grassland and meadow habitats in Gettysburg National Military Park and Eisenhower National Historic Site in late summer or early fall after the main tourist season, and augmented in spring and summer by the control of woody plants that resist the mowing, has appeared to be very beneficial for the short-fruited rush and its habitat. It is recommended that this management activity be continued, with the suggestion that the mowing be done several weeks later in the year (typically late October or early November), after the first heavy frost or first freeze has killed the herbaceous vegetation.

The control of the invasive species mentioned above is strongly recommended at all colonies of the short-fruited rush.



Figure 18. Short-fruited rush (*Juncus brachycarpus*). Photograph by John Kunsman; taken in Gettysburg National Military Park.

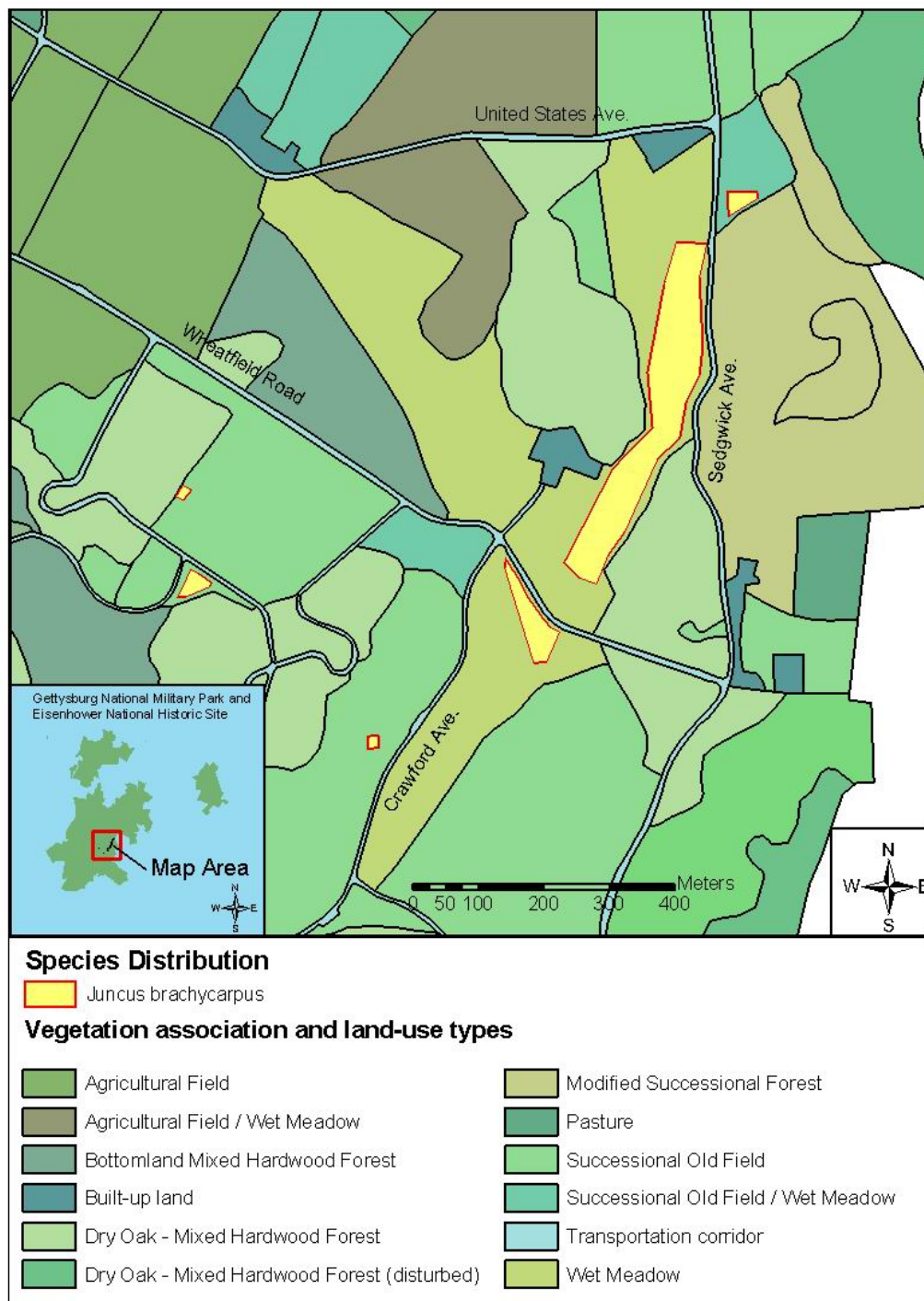


Figure 19. Species distribution of short-fruited rush (*Juncus brachycarpus*).

Hoary puccoon (*Lithospermum canescens*; Boraginaceae) PABS Undetermined; G5 S2

The hoary puccoon, a member of the borage family, is characterized by a hairy stem to about one foot in height, by the alternate, entire and hairy leaves, and by the yellow to orange, five-lobed flowers that appear in a terminal cluster in May (Figure 20).

The species grows on dry, rocky slopes, open woods, and barrens, particularly on limestone and diabase substrates.

The hoary puccoon is a wide-ranging species of eastern North America. In Pennsylvania, the historical records are mostly in the southern half of the state, particularly in the southcentral counties (NatureServe 2006; PNHP 2006; Rhoads & Klein 1993).

Although the hoary puccoon is not considered to be of conservation concern on a global basis and does not have a federal rarity status, it is listed as a species of special concern in Pennsylvania as well as the neighboring states of Delaware, New Jersey, New York and West Virginia. In Pennsylvania, the species currently has an Undetermined status, which means that although the species appears to be deserving of being a species of special concern, more information is required before a more definitive status can be assigned. At present, about ten extant occurrences have documented by PNHP in the state, but much additional work is needed (NatureServe 2006; PNHP 2006).

The hoary puccoon had not been documented by PNHP in Gettysburg National Military Park and Eisenhower National Historic Site prior to 2004. In May 2004, approximately three dozen individuals were discovered in a small opening, covering about eighty feet by forty feet, just west of Pardee Field (Figure 21).

Except for the presence of scattered trees, this opening had a resemblance to the upper slope on the east side of nearby Pardee Field, which supports species of special concern such as the hoary frostweed, Heller's panic grass, and pencilflower, in having a well-drained, thin soil (occasionally with outcroppings of diabase bedrock) and relatively low-growing herbaceous and graminoid plants. The vegetation association at the hoary puccoon occurrence has been classified as Modified Successional Forest (Perles et al. 2006).

Various exotic species were present at this occurrence, but did not appear to represent an imminent threat. Unlike the successional grassland habitats that occur on seasonally or permanently damp/wet soils (e.g, wet meadows), the successional grassland habitats that occur on very well-drained soils appeared to have a lower threat from exotic species.

The occurrence of the hoary puccoon did not have any threats from deer browsing or impacts from tourists.

The small colony of hoary puccoon appeared to be relatively secure for the present because of the slow pace of succession on the very thin soil, but may eventually require some control – chemical or mechanical - of the competing vegetation, particularly shrubs.



Figure 20. Hoary puccoon (*Lithospermum canescens*). Photograph by Greg Podniesinski; taken in Gettysburg National Military Park.

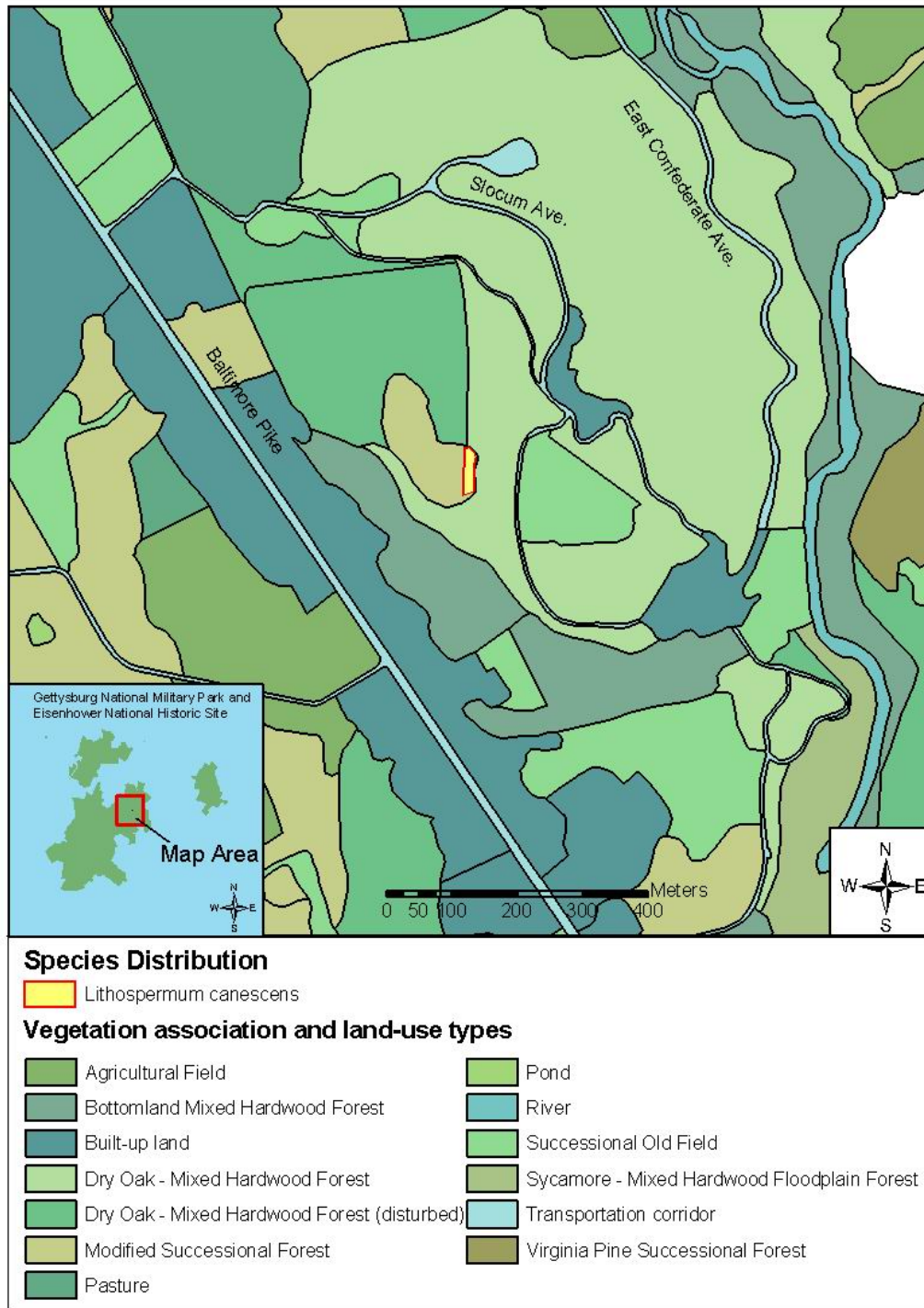


Figure 21. Species distribution of hoary puccoon (*Lithospermum canescens*).



Heller's panic grass; Scribner's rosette grass (*Panicum oligosanthos*; Poaceae) PABS  
Undetermined; G5 S3

Heller's panic grass, a member of the grass family, is characterized by its hairy stems to about two feet in height, by its hairy leaves, and by the terminal clusters of small, rounded, prominently-veined spikelets that are most evident in June and July, but can be separated with certainty from other species of the genus *Panicum* – several of which occur in Gettysburg National Military Park and Eisenhower National Historic Site - only by more microscopic, technical characters (Figure 22).

The species grows in dry, open places, such as old fields, clearings, dry slopes and banks, and barrens, particularly on limestone and diabase substrates.

Heller's panic grass is a very wide ranging species of North America. In Pennsylvania, the historical records occur mostly in the eastern half of the state, particularly along the Delaware River counties (NatureServe 2006; PNHP 2006; Rhoads & Klein 1993).

Although the Heller's panic grass is not considered to be of conservation concern on a global basis and does not have a federal rarity status, it is listed as a species of special concern in Pennsylvania. In Pennsylvania, the species currently has an Undetermined status, which means that although the species appears to be deserving of being a species of special concern, more information is required before a more definitive status can be assigned. At present, only a few extant occurrences have documented by PNHP in the state, but more are expected as additional field work is conducted (NatureServe 2006; PNHP 2006).

Heller's panic grass was first documented by PNHP in 1991 in Gettysburg National Military Park and Eisenhower National Historic Site on the upper slope on the east side of Pardee Field. This colony was updated in 1994, 1996, and again in 2004, and seemed to maintain a relatively uniform population of several hundred stems. In 2004 and 2005, additional colonies were observed south of McMillan Woods on Seminary Ridge, on the west side of Crawford Avenue, and in The Wheatfield (Figure 23). The latter colony contained a few hundred stems, while the former two had less than one hundred stems.

The habitat for this species at the various colonies consisted of sunny fields, characterized by well-drained, often thin soil and relatively low-growing herbaceous and graminoid plants. All of the colonies appeared to receive an annual mowing in late summer. The vegetation associations at the colonies were classified as Agricultural Field (the field south of McMillan Woods) and Successional Old Field (Perles et al. 2006).

Additional colonies of Heller's panic grass are very likely to be found in Gettysburg National Military Park and Eisenhower National Historic Site.

The main threat to this species appeared to be the establishment and spread of woody plants, primarily native species, that were not controlled by the annual mowing.

Unlike the successional grassland habitats that occur on seasonally or permanently wet soils (e.g, wet meadows), the successional grassland habitats that occur on well-drained soils, such as those occupied by Heller's panic grass, appeared to have a lower threat from exotic species.

The colonies of Heller's panic grass did not have any threats from deer browsing or impacts from tourists.

This species would appear to be a beneficiary of the "if the habitat is there, they will come" strategy of management discussed on pages 15-16. As a result, the current management of the grassland-type habitats in Gettysburg National Military Park and Eisenhower National Historic Site, consisting of mowing in the late summer after the peak of the tourist season, and augmented in spring and summer by the spot-herbiciding/mechanical control of woody plants that resist the mowing, would appear to be very effective in maintaining the colonies of Heller's panic grass, as well as the surrounding vegetation association. It is recommended that the annual mowing schedule and the control of woody plants be continued, with the suggestion that the mowing be postponed until after the first killing frost of the autumn (typically late October or early November).



Figure 22. Heller's panic grass (*Panicum oligoanthos*). Photograph by John Kunsman; specimen collected from Gettysburg National Military Park.

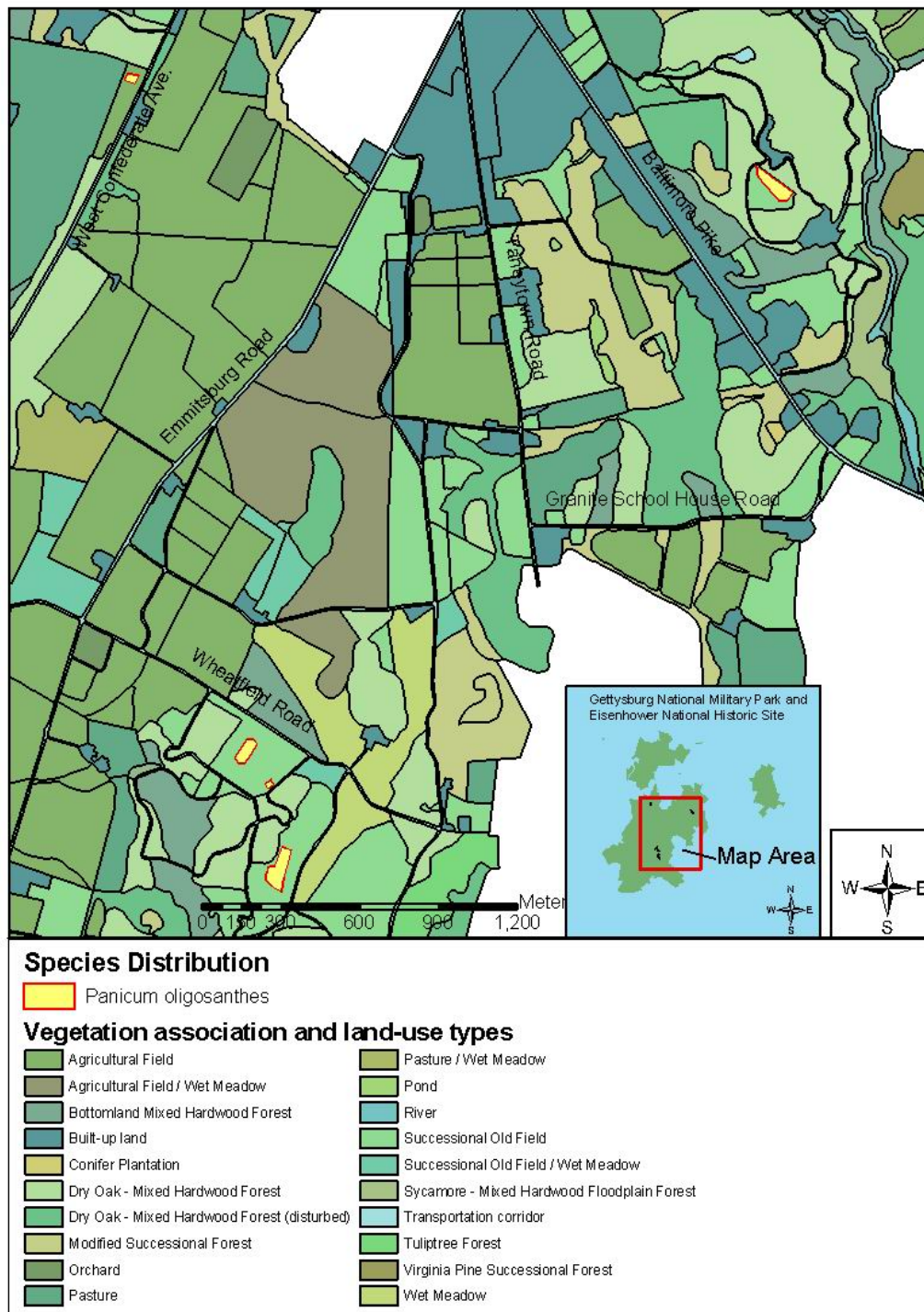


Figure 23. Species distribution of Heller's panic grass (*Panicum oligosanthes*).



