

NAVAJO SEDGE

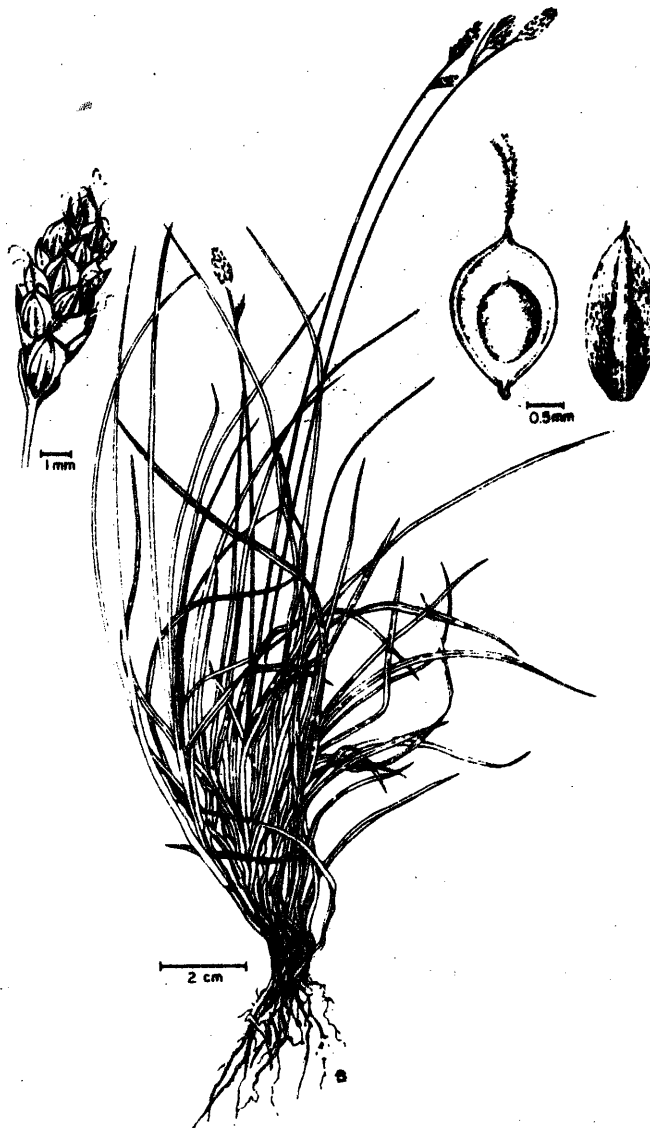
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(Carex speculicola)

RECOVERY PLAN

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U.S. Fish and Wildlife Service
 Albuquerque, New Mexico

1987

RECOVERY PLAN
for
Navajo Sedge
Carex specuicola J.T. Howell

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for
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SUMMARY

Goal: To remove the threatened Navajo sedge (Carex specuicola) from the Federal list of threatened and endangered species by managing its essential habitat to sustain natural populations in the wild.

Recovery Criteria: The criteria for delisting the Navajo sedge have not yet been determined. The implementation of studies in this recovery plan will provide the necessary data from which quantified delisting criteria can be established.

Actions Needed: Major steps to meet the objective of this recovery plan include: permanent protection of all known habitat; inventory of potential habitat; establishment of monitoring plots; development and implementation of a habitat management plan; reintroduction of Carex specuicola onto protected sites; documentation of hydrological potential in habitat area; and demonstration of long term stability of populations and habitat.

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PART I

INTRODUCTION

Brief Overview

The Navajo sedge, Carex specuicola J.T. Howell, was listed as a threatened species on June 7, 1985 (USFWS 1985) by the U.S. Fish and Wildlife Service. Carex specuicola is a member of the sedge family (Cyperaceae) and is the only species in this family that is Federally listed as threatened or endangered.

Carex specuicola is endemic to the Navajo Nation. The only two verified populations occur near Inscription House, Coconino County, Arizona (Figure 1). The species is now restricted to Navajo Sandstone seeps or hanging gardens.

Carex specuicola was first collected by J.T. Howell in June 1948, along the Inscription House Ruin Trail. No specimens of this species are known to have been collected from 1948 until 1980, when Phillips et al. (1981) discovered the species and provided data that indicated that Carex specuicola was rare. The population along the trail was found in 1980 to comprise three subpopulations, and in 1986 Navajo Natural Heritage Program personnel verified an additional population in Toenleshushe Canyon and identified five potential habitat sites.

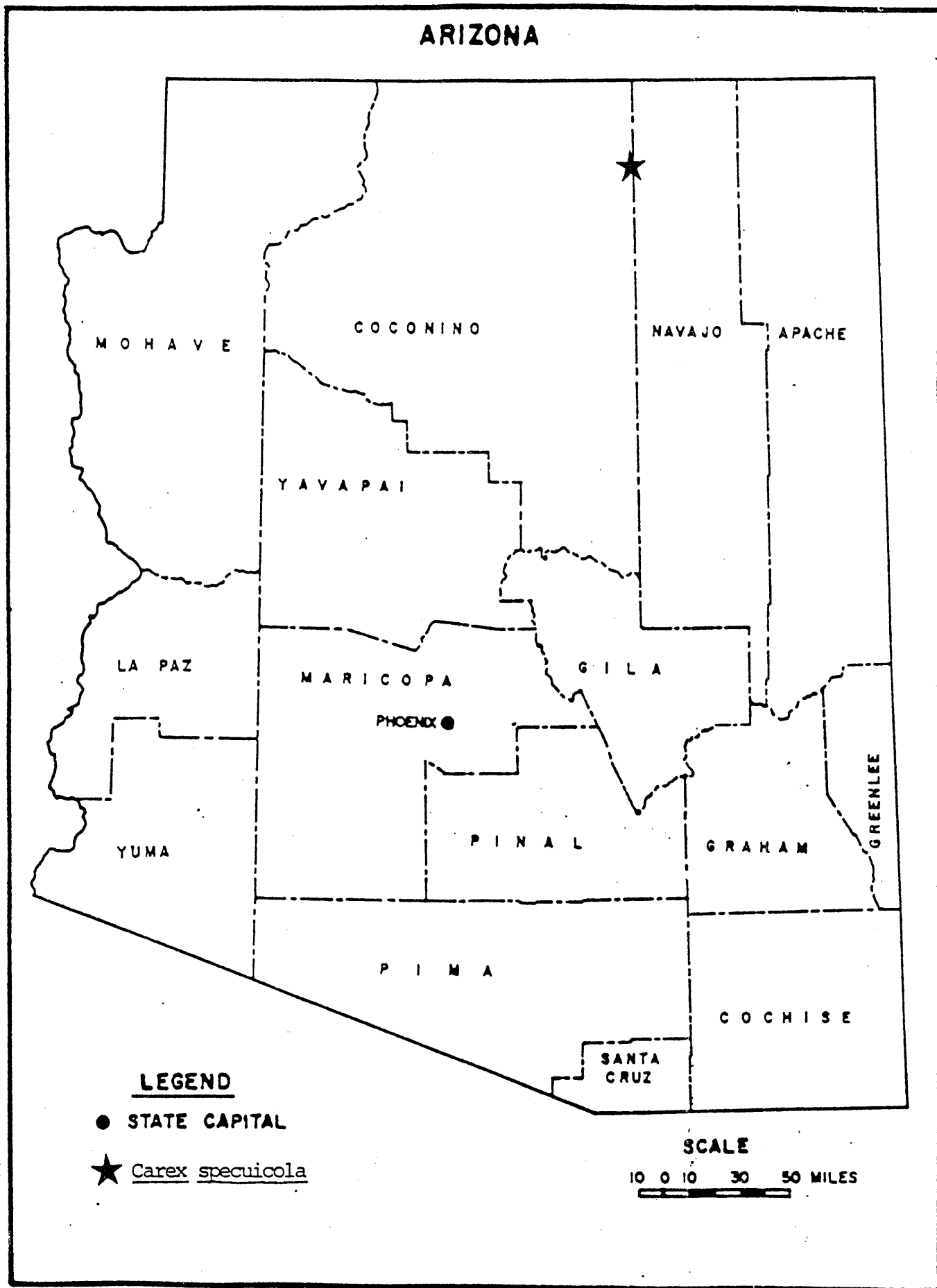


Figure 1. Distribution of Carex specuicola in Arizona.

Members of the Inscription House Chapter of the Navajo Nation know this plant as "yellow hay" and "food for the animals" and are aware that it is a riparian plant. They say that the species was once widespread, even in the lowlands, wherever water was abundant. Although traditional uses of the Navajo sedge have not yet been identified, potential uses deserve investigation.

Taxonomy and Morphology

The type locality for Carex specuicola is along the Inscription House Ruin Trail to Navajo National Monument, Arizona. The species was described by J.T. Howell (1949) in the Leaflets of Western Botany. The type specimen is housed at the California Academy of Sciences Herbarium.

Carex specuicola is unusual in having both two-branched styles with lenticular achenes, and three-branched styles with trigonous achenes. In Section Atratae of the Cyperaceae, Carex specuicola resembles Carex heteroneura in having small, greenish-white perigynia and in having conspicuously nerved scales, but it differs from that species in its strongly papillose and serrulate perigynia and beaks. In those characters, Carex specuicola resembles Carex atrata L. and closely related species, a group that is well developed in the Rocky Mountains (Phillips et al. 1981).

Carex specuicola is a slender, perennial forb, 2.5 to 4.5 dm (10 to 18 inches) high. The triangular stem extends from an

elongate, slender rhizome. The leaves are pale green, 1 to 2 mm mm (<0.1 inch) wide, 12 to 20 cm (about 5 to 8 inches) long, and are clustered near the plant's base. The flowers are concentrated in 2 to 4 groups or spikes. The terminal spike has both male and female flowers, with the female flowers situated above the male flowers. The flowers are reduced and inconspicuous; they consist of small green-brown, scale-like parts 2 to 3 mm (<0.12 inch) long and 1 to 1.5 mm (<0.06 inch) wide. Flowering and fruit set occur from spring through summer, but most reproduction appears to be vegetative (Hermann 1970).

Current Status

Present and Past Distribution and Abundance

This rare endemic species is currently limited in distribution to only two known populations: one in the Inscription House Ruin area and the second in Toenleshushe Canyon (Table 1). The historic distribution is not known because of the remoteness of the populations; however, the species may have occurred on lower riparian lands and in other canyons on the Navajo Nation (C. Dayzie and E. Benally, pers. comm. 1986).

The population along Inscription House Ruin Trail comprises three subpopulations (Table 1) that occur along the same canyon and seep. The site of subpopulation 1A has a developed water well and a corral; Carex specuicola is matted along the side of

Table 1

Carex specuicola

Occurence, Size, and Ownership of Population Sites

SITE NAME	LOCATION	NO. OF INDIVIDUALS		LAND STATUS
		1986	1980	
Population 1	Inscription House Ruin			
Subpopulation 1A		300	300	Navajo Trust Lands
Subpopulation 1B		< 30	200	Navajo Trust Lands
Subpopulation 1C		100	100	Navajo Trust Lands
Population 2	Toenleshushe Canyon			
Subpopulation 2A		75	NS*	Navajo Trust Lands
Potential Subpopulation 2B		Unknown	NS	Navajo Trust Lands
Potential Subpopulation 2C		Unknown	NS	Navajo Trust Lands
Potential Population 3	Geshi Canyon	Unknown	NS	Navajo Trust Lands
Potential Population 4	Geshi Canyon	Unknown	NS	Navajo Trust Lands
Potential Population 5	Geshi Canyon	Unknown	NS	Navajo Trust Lands

*NS means Not Surveyed

the well and corral, and extends along the canyon where it becomes inaccessible. This subpopulation contains an estimated 300 individuals. The well and corral locations have been grazed and trampled by livestock.

The site of subpopulation 1B also has a corral and is along the trail to Inscription House Ruin. In 1981 an estimated 200 individuals existed there (Phillips et al. 1981) and in 1985-1986 Navajo Natural Heritage Program personnel observed no individuals in the corral but estimated less than 30 next to the corral. This subpopulation has been severely grazed by livestock.

Subpopulation 1C is located at the same elevation as the other seeps and is inaccessible. In 1985-86 Navajo Natural Heritage Program personnel observed no impacts on this subpopulation and estimated 100 individuals. Grazing by goats may be the only threat to this subpopulation.

The other Carex specuicola population is located in Toenleshushe Canyon and was found by the Navajo Natural Heritage Program personnel in 1986 and consists of only about 75 individuals. Two additional potential subpopulation sites were located in 1985 in this canyon but are as yet unsurveyed.

In 1986 Navajo Natural Heritage Program personnel located three potential sites for Carex specuicola in Geshi Canyon (Table 1). Because these sites are on sheer cliff faces, access is difficult and they have yet to be surveyed.

Habitat and Dominant Associated Species

Carex specuicola occurs in hanging gardens within the Great Basin Conifer Woodland (Brown and Lowe 1980). The seep-spring pockets are on Navajo Sandstone Formation bedrock at an elevation of 1740 to 1824 m (5710 to 5980 feet). Carex specuicola grows in a variety of situations on Navajo Sandstone, ranging from almost inaccessible sheer cliff faces to accessible alcoves. The annual precipitation is approximately 194 mm (7.6 inches) (Sellers and Hill 1974).

The dominant associated species that are found with Carex specuicola include Mimulus Eastwoodiae (monkey flower), Epipactis gigantea (helleborine), Agrostis semiverticillata (water bentgrass), Andropogon hallii (sand bluestem), Cirsium sp. (thistle), Hordeum jubatum (foxtail barley) and Phragmites communis (common reed) (Phillips et al. 1981). Although Hordeum jubatum was noted by Phillips et al. (1981), it was not observed in the 1986 field season by Navajo Natural Heritage Program personnel.

Impacts and Threats

Most species of Carex are palatable to livestock and, although the forage value of Carex specuicola is unknown, it is suspected that domestic livestock (horses, sheep, goats and cows) and wildlife graze the plants. The two major threats to Carex specuicola are grazing of accessible sites and lowering of the water table by water development. Three of the four subpopulations are accessible to domestic livestock and two of these three subpopulations have been significantly impacted by grazing and trampling. Subpopulation 1B in Inscription House Ruin area has drastically declined from an estimated 200 individuals in 1980 (Phillips et al. 1981) to less than 30 individuals observed by Navajo Natural Heritage Program personnel in 1986. This dramatic decline was due to grazing within a corral that was inadvertently constructed around the subpopulation. Inside the corral, a few monkey flowers, inaccessible to grazing, occur and thistles now dominate the seep. Microhabitat changes owing to the loss of cover from these plants may threaten the continued existence of the Navajo sedge at this site. Grazing has also occurred in subpopulation 1A although the impacts are not as severe as in subpopulation 1B.

Water is vital to the survival of the Navajo sedge; thus, any change in the water table level will have an effect on the populations. Water development (e.g. for wells, troughs) has already affected subpopulation 1A. This water development has

caused livestock to congregate in the area and forage on Carex specuicola. Additional factors and potential threats including water source improvement, capturing free-flowing water, reduction of flows, channelization of flows and seasonal interference of flows will be investigated to determine their impacts on the Navajo sedge and its habitat.

Accessible habitat in and around Inscription House Ruin Trail may develop off-road vehicle (ORV) problems. In 1985, Navajo Natural Heritage Program personnel observed ORV tracks along Inscription House Ruin Trail. Motorcycles are replacing horses for herding livestock and are being used more frequently for recreational access to the ruins.

The endemism and rarity of Carex specuicola make it vulnerable to collection. Collection by scientists, and other interested parties could affect the species' populations.