

## BROOKSVILLE BELLFLOWER

*Campanula robinsiae*



Photo of Brooksville Bellflower. Photo courtesy Mimi Williams.

## COOLEY'S WATER WILLOW

*Justicia cooleyi*



Photo of Cooley's Water Willow. Photo courtesy of Bruce Hansen.

**FAMILY:** Brooksville bellflower - Campanulaceae (Bellflower family)  
Cooley's water willow - Acanthaceae (Acanthus family)

**STATUS:** Endangered (*Federal Register*, July 27, 1989)

**DESCRIPTIONS:** Brooksville bellflower, an annual herb, has a slender taproot and slender, four-angled stems 0.4 to 6 inches (1 to 15 centimeters) tall. Its largest leaves, ovate to elliptic, are at the base of the plant. Leaves are narrower and shorter closer to the top. Many of this plant's flowers are closed, self-pollinating, and inconspicuous. Those that are open and cross-pollinating are solitary, with .04 to .10-inch long sepals and a deep purple, bell-shaped corolla. Flowering occurs in the spring during March and April. The seeds produced by this species are the smallest of any North American bellflower (Shetler and Morin 1986).

Cooley's water willow is a short, rhizomatous, perennial herb. Less than 16 inches (40 centimeters) tall, this herb has upright, quadrangular, stems and leaves up to 2 inches (5 centimeters) long. Flowers are borne on forked, zigzag branches which are slightly longer than the leaves. The petals are fused into a two-lipped corolla with a slightly longer lower lip. This lower lip is mottled lavender and white. The rest of the corolla is bright lavender-rose. Flowering takes place from August to December. An 0.47-inch (1.2-centimeter) capsule is the fruit (Kral 1983; Perkins 1979).

**RANGE AND POPULATION LEVEL:** Both plants are native to the Brooksville Ridge, in north central Hernando County, Florida. Although Brooksville bellflower was first collected near Mascotte in Lake County, all subsequent collections have been from the Ridge. There are now only two known populations of Brooksville bellflower. Cooley's water willow now has over a dozen documented populations including on recently acquired land for Withlacoochee State Forest near Richloam and has also been located on two sites in Sumter County.

These two species had occurred with each other at one site, a seepage area of a cattle pasture on Chinsegut Hill, but neither has been found at this site in at least the last 10 years. They both occur at the USDA, ARS, Subtropical Agricultural Research station but at separate locations.

**HABITAT:** Brooksville bellflower is found in a wet prairie and along the edges of ponds near pastureland. The number of plants seems to vary yearly, perhaps depending on water levels. Most Cooley's water willow populations are located in hardwood forests on uplands or hills; some are situated on low rises in wet hammocks or swamps. The upland hardwood forests contain southern magnolias, blackgums, sweetgums, live oaks, laurel oaks, pignut hickories, cabbage palms, flowering dogwoods, and yaupon hollies. The forest understory may contain many ferns, woodland grasses, and sedges (Kral 1983). Two known waterwillow populations are located in modified forest habitats. One population occurs on a wide highway right-of-way among a group of trees.

Brooksville Ridge, the area to which both plants are endemic, has the most irregular surface of any comparably-sized area in peninsular Florida. Its limestone rock outcrops are unique in the peninsula, and its sinkholes have especially rich fern floras. The Ridge has few surface streams, and most drainage goes to ponds, prairies, and sinkholes.

**REASONS FOR CURRENT STATUS:** Both plants are primarily threatened by residential and agricultural development. Hernando County, where these plants occur, continues to grow at a rapid rate and in the recent past it was one of the fastest growing counties in the nation. Development threatens Cooley's water willow because of the direct loss of its forest habitat. With continued land acquisition programs to secure habitat, the species primary problem may now be invasive exotics, such as *Ardisia* and skunkvine. Brooksville bellflower is being indirectly threatened by the resulting changes in land use within prairie watersheds. As development increases, so does the potential for runoff. Runoff increases pond water levels and higher water levels mean decreased bellflower populations. Also, runoff from developed areas may be contaminated by petroleum, fertilizers, and herbicides. Cooley's water willow is also being affected by limestone mining, while Brooksville bellflower is subject to collecting and vandalism.

**MANAGEMENT AND PROTECTION:** Because Brooksville bellflower inhabits wetlands, it benefits from measures to protect wetlands. Steps should be taken to protect bellflower populations from increased water runoff. The sites where it is known need special attention to assure that they are not damaged, and a systematic search needs to continue to locate additional sites. For Cooley's water willow, a coordinated program to protect hardwood forest habitat is needed, and continue to assess and monitor its distribution and abundance.

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