

(1960) suggested that the taxon was subspecifically distinct, but still synonymized the taxon with *Galium catalinense*. Thirteen years later, Dempster (1973) reestablished the taxon as a separate species based on differences in the nutlet hairs between it and *Galium catalinense*.

*Galium buxifolium* is a small, stout woody shrub in the bedstraw (Rubiaceae) family. The plant grows to 12 decimeters (dm) (4 ft) in height, and has swollen nodes bearing numerous leafy branches. The leaves are larger than those of most other *Galium* taxa, and have conspicuous lateral veins with stout hairs on the lower surface (Dempster 1973). The relatively broad leaves and the tiny upward-curved hairs that cover the fruits are unique characteristics that distinguish it from the six other species of *Galium* that occur on the islands (Hochberg *et al.* 1980b).

A putative collection of *Galium buxifolium* was made from the "Torrey Pine grove, Santa Rosa Island," in 1941 by Reid Moran; apparently this was a misidentified collection of *Galium nuttallii* (York, in litt. 1987). Therefore no known collections of this taxon are known from Santa Rosa Island. *Galium buxifolium* is currently known from Santa Cruz and San Miguel Islands where it occurs on north-facing sea cliffs. Eight populations occur on TNC lands on Santa Cruz Island. In 1980, Hochberg *et al.* (1980b) noted that 2 of these populations comprised fewer than 50 individuals each, and the remaining populations comprised less than 6 individuals each. Two populations were located on San Miguel Island in 1993, 1 comprising about 200 individuals, and 1 comprising fewer than 10. Five other historical collections have been made from the island, but none have been seen for almost 30 years.

The plant occurs on "bluffs and rocky slopes" (Dempster 1973) in coastal sage scrub and island pine forest. Threats to *Galium buxifolium* are soil loss, habitat alteration, and predation caused by feral pig rooting and sheep grazing. Because of the small numbers of isolated populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire. Small numbers of populations and individuals also make the taxon vulnerable to reduced reproductive vigor.

Hoffmann's slender-flowered gilia (*Gilia tenuiflora* var. *hoffmannii*) was first described as *Gilia hoffmannii* by Alice Eastwood in 1940 based on collections made by Ralph Hoffmann "in sandy soil at East Point" on Santa Rosa Island ten years earlier (Eastwood

1940). Eastwood remarked that, although the taxon is related to *Gilia tenuiflora*, no variation of the latter included the leafy stems and terminal congested inflorescence of *Gilia hoffmannii* (Eastwood 1940). Nevertheless, Jepson (1943) included the taxon in the description of *Gilia tenuiflora* var. *tenuiflora* in his flora of California, as did Abrams (1951) in his flora of the Pacific states. In 1959, Munz renamed the varieties of *tenuiflora* as subspecies, including ssp. *hoffmannii* (Munz and Keck 1973). This nomenclature has been upheld in the latest treatment of the genus (Day 1993). Of the four subspecies of *Gilia tenuiflora*, the subspecies *hoffmannii* is the only one that occurs in southern California. Two other *Gilia* species occur on Santa Rosa Island; *Gilia tenuiflora* ssp. *hoffmannii* is distinguished from them by the presence of arachnoid woolly pubescence at the base of the stem.

*Gilia tenuiflora* ssp. *hoffmannii* is a small, erect annual herb in the phlox (Polemoniaceae) family. The central stem grows 6 to 12 cm (2.4 to 4.7 in) tall, arising from a rosette of densely hairy, strap-shaped, short-lobed leaves. The flowers are purplish and funnel-shaped below, widening to five pinkish corolla lobes.

*Gilia tenuiflora* ssp. *hoffmannii* has only been collected from two locations on Santa Rosa Island. A collection was made by Reid Moran from the "arroyo between Ranch and Carrington Point" in 1941 (Rutherford and Thomas 1994); however, numerous surveys conducted in recent years have failed to relocate the plant at this location. This location most likely falls within the parcel of property, adjacent to the ranchhouse, that has been heavily disturbed by cattle ranching operations. The only currently extant population occurs at the type locality near East Point on Santa Rosa Island. Here, it occurs as a component of dune scrub vegetation with sand verbena (*Abronia maritima*), silver beach-weed (*Ambrosia chamissonis*), saltgrass (*Distichlis spicata*), miniature lupine (*Lupinus bicolor*), plantain (*Plantago erecta*), and sand-dune bluegrass (*Poa douglasii*) (T. Thomas, in litt. 1993). The population consists of several hundred individuals and occupies an area of not more than 0.8 hectares (2 acres). Threats to *Gilia tenuiflora* ssp. *hoffmannii* are soil loss, habitat alteration and predation caused by cattle grazing, and elk and deer browsing. A sandy service road used by NPS and ranchers bisects the population. Because the taxon is restricted to one population, it is also vulnerable to stochastic extinction by

such events as storms, drought, or fire. The single population and limited number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Island rush-rose (*Helianthemum Greenei*) was first described by Robinson as *Helianthemum Greenei* in 1895 (Abrams 1951). The type locality is described as "a dry summit near the central part of the island of Santa Cruz" (Abrams 1951). This nomenclature has been upheld in the most recent treatment for the genus (McClintock 1993).

*Helianthemum Greenei* is a small shrub in the rock-rose (Cistaceae) family. The plant grows to 0.5 m (18 in) tall and has alternate leaves covered with star-shaped hairs. The reddish, glandular stalks support yellow-petalled flowers to 2.5 cm (1 in) wide. The fruit is a pointed capsule 0.6 cm (0.25 in) long. A more abundant species found on the islands, *Helianthemum scoparium*, is similar in appearance, but is not glandular-hairy and has greenish stalks and smaller fruits (Hochberg 1980b).

McMinn (1951) and later Thorne (1967) report seeing *Helianthemum Greenei* on San Miguel Island, but there are no collections in island herbaria (Hochberg *et al.* 1980b, Wallace n.d.). Two collections of the plant were made from Santa Rosa Island by Epling and Erickson and Dunn in the 1930's (Wallace 1985); however, no collections on Santa Rosa Island have been made since that time, despite recent surveys. *Helianthemum Greenei* was reported from the northeast side of Black Jack Mountain on Santa Catalina Island by Thorne (1967) in 1966; no collections have been made since then, but a population of three individuals was recently reported from this location (Janet Takara, Catalina Island Conservancy, pers. comm. 1994). Habitat for the plant on Santa Catalina Island is being grazed by goats, mule deer, and bison, and is being rooted by pigs.

In addition to the one population on Santa Catalina Island, *Helianthemum Greenei* is currently known from ten populations on Santa Cruz Island. The taxon is found in open, exposed areas in chaparral, coastal sage scrub, and island pine forest. In 1980, prior to sheep removal from TNC lands on Santa Cruz Island, Hochberg *et al.* (1980b) found that, of ten populations, only two comprised several dozen individuals, and six others comprised less than six individuals. Hochberg *et al.* (1980b) indicated that the plant is eliminated by intense feral animal disturbance, and noted that the population recorded by Abrams and Wiggins in 1930 at Pelican