

Changed from 1B.1 to 3.1 in CNPS Inventory on March 1, 2016

Rare Plant Status Review: *Lycium brevipes* var. *hassei*
Proposed ~~Change Deletion~~ from CRPR 1B.1 to 3.1, and Keep as G1Q / S1
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 January 29, 2016

Changes made to the original document are in blue text.

Background

Lycium brevipes Benth. var. *hassei* (Greene) Hitchc. is a deciduous shrub in the Solanaceae that has been included in the CNPS Inventory since the 1st Edition (Powell 1974) as an extinct plant (California Rare Plant Rank, CRPR, 1A) and later as a CRPR 1B (Skinner and Pavlik 1994). Treatments from *The Jepson Manual* (TJM; Nee 1993) and *The Jepson Manual, Second Edition* (TJM 2; Nee 2012) recognize var. *hassei* as a Channel Islands endemic. However, Nee (1993) treats mainland plants that key to var. *hassei* as cultivated in origin, while later Nee (2012) avoids mention of mainland var. *hassei* plants altogether. This plant was first described by Greene (1888) as *Lycium hassei*, known from a single occurrence on Santa Catalina Island. In later taxonomic revisions, the name was changed to *Lycium richii* var. *hassei* (Johnston 1924) and then to *Lycium brevipes* var. *hassei* (Hitchcock 1933). Although originally thought to be endemic to Santa Catalina Island, var. *hassei* was later expanded to include San Clemente Island within its range (Raven 1963). Additionally, the origin and native status of mainland plants that key to var. *hassei* has been a topic of debate for decades (e.g., Hitchcock 1932, Brinkmann-Busi n.d., Nee 1993). Recent study by several experienced botanists, as well as personal communications with *Lycium* expert F. Chiang, suggest that many mainland populations key to var. *hassei*, and that the variety does not have consistent taxonomic distinction from the common var. *brevipes*, and that they are also no longer considered allopatric.

A basic understanding of the morphological differences separating var. *hassei* from var. *brevipes* is essential to this review. The primary feature separating the two varieties is the length and shape of the calyx lobes. Multiple treatments agree that var. *hassei* has longer calyx lobes than var. *brevipes*, measured in relation to the calyx tube (Table 1). Variety *hassei* was originally described as having oblong or lanceolate calyx lobes (Greene 1888), but the calyx lobes were later described as being spatulate (Hitchcock 1932), spatulate to narrowly obovate (Riefner 2007), to only being narrowly obovate (Nee 1993, 2012), compared to the triangular to linear calyx lobes found in var. *brevipes* (Nee 1993, Riefner 2007, Nee 2012). Chiang-Cabrera (1981) also noted several other features in his dissertation, including a clambering habit and unarmed stems in var. *hassei*, versus a non-clambering habit, and armed stems in var. *brevipes*. Admittedly, however, Chiang-Cabrera (1981) only examined two specimens of var. *hassei* from Santa Catalina Island for his dissertation work (F. Chiang pers. comm. 2015). Alternatively, the original description describes var. *hassei* as being “compactly branching and somewhat spinescent” (Greene 1888), and sparsely armed stems are visible on images of the type (*H.E. Hasse* 4155, NY138738) and isotype (*H.E. Hasse*

4155, NY138739) specimens (NYBG 2016). The two varieties were also thought to have some degree of geographic separation, with var. *hassei* being restricted to the Channel Islands and (by some accounts) coastal southern California, while var. *brevipes* was thought to occupy this range and extend into the southwestern deserts (McMinn 1939). When F Chiang (pers. comm. 2014) was doing his dissertation study, the alleged distribution of var. *hassei* was restricted to coastal areas, and the coastal to desert distribution overlap now known would have been one more factor in his decision to not accept var. *hassei*.

When *L. hassei* was reduced to infrataxon status, researchers in the group began to notice more similarity of the island plants to several mainland occurrences. Hitchcock (1932) made the first mention of var. *hassei* occurring on the mainland, noting that plants from Los Angeles and Santa Barbara were “almost certainly cultivated”, while plants from San Diego “may occur as a member of the native flora”. McMinn (1939) treated the mainland plants in the same way as Hitchcock (1932), but neither author gave an explanation for the supposed cultivated origin of the mainland occurrences. Nee (1993) followed suit, treating all mainland var. *hassei* plants as cultivated in origin. When questioned about the reasoning for the treatment of the mainland plants as cultivated, M. Nee stated that he relied heavily on Hitchcock’s 1932 treatment (Brinkmann-Busi n.d.). It appears that little work has been done in the past to support cultivation as an explanation for the occurrence of var. *hassei* on the mainland.

The debate over the origin and identity of mainland plants became more prominent in the early 1990s, when A. Sanders (pers. comm. 1994) claimed to have found var. *hassei* plants on the Palos Verdes Peninsula of Los Angeles County in 1976. Specimens from this occurrence were reviewed by M. Nee and confirmed to be var. *hassei*. Their native status, however, was brought into question, because of both the earlier treatments that recognized mainland plants as cultivated, as well as the status of the site as a homestead that had been partially developed and landscaped, then abandoned (Brinkmann-Busi n.d.). The origin of these plants was investigated, and they were determined to most likely be native in origin, based on several lines of reasoning: 1) other near-endemics to the Channel Islands occur on the Palos Verdes Peninsula, 2) no other native plants were used in the landscaping at the site, nor were known to be grown by the nursery that supplied the plants, and 3) *L. brevipes* var. *hassei* is not particularly attractive as an ornamental plant (Brinkmann-Busi n.d.). The Palos Verdes Peninsula occurrence was subsequently added to the CNDDDB (EO #4), and the plant was moved to CRPR 1B, as it was no longer thought to be extinct.

Skinner et al. (1995) brought up the issue of the uncertain distinction of *L. brevipes* var. *hassei* from the typical variety, and more recent work by R. Riefner (2007, pers. comm. 2015) and S. Boyd makes the argument for recognition of var. *hassei* tenuous at best. Riefner (2007) first reported on occurrences that keyed to var. *hassei* in coastal Orange County. Later, R. Riefner and S. Boyd examined many specimens of *L. brevipes*, and determined many specimens to var. *hassei* from throughout the range of the species (Consortium of California Herbaria 2015). These determinations were made using both Chiang’s (1982) and Nee’s (1993) keys to *Lycium*. They also note that many botanists

have experienced considerable trouble in determining plants to variety. Some shrubs even show a high degree of variation in the calyx characters on the same plant (R. Riefner pers. comm. 2015). In other cases, plants that key to var. *hassei* have been found in close proximity (within 2 miles or less) of var. *brevipes* plants (R. Riefner pers. comm. 2001). *Lycium* expert F. Chiang (pers. comm. 2015) was made aware of the recent work of R. Riefner and S. Boyd, and concluded: "if I had been able to study all of the specimens now available of *Lycium brevipes*, I would most probably have concluded that the calyx lobe length and shape are highly variable, from lobes shorter than the tube to 1-3 times longer than it, all falling within the range of the variation of the species, no explanation needed for 'intermediate forms', and would not have accepted var. *hassei* as good". Chiang (pers. comm. 2015) previously recognized var. *hassei* in his 1981 dissertation on the genus *Lycium*, but he had only studied two specimens of var. *hassei* from Santa Catalina Island for this publication. When asked for comment on the recent findings by R. Riefner and S. Boyd regarding the taxonomic validity of var. *hassei*, M. Nee (pers. comm. 2016) was glad to see that people are actively researching these plants at the local level, but that he only has access to scattered herbarium specimens, and not being a specialist in *Lycium*, he couldn't make any additional comments beyond what he has already expressed.

Although all of the current available evidence suggests that var. *hassei* does not merit taxonomic recognition, further research could be done to provide a more definitive answer. The Palos Verdes Peninsula plants, for example, are an extreme variant with calyx lobes greater than four times the length of the calyx tubes, a feature not seen in any other occurrences. Although Chiang (pers. comm. 2015) said that he would likely not have recognized var. *hassei* if he had the information currently available, he also stated that a more definitive answer to the taxonomic question in this species could be obtained through molecular studies. Riefner (pers. comm. 2015) also contacted J. Miller, who has done genetic studies on the genus *Lycium*. She stated that such research could be difficult, because the genetic markers currently available do not show enough variation.

Based on the available information, CNPS and CNDDDB recommend **changing** ~~deleting~~ *Lycium brevipes* var. *hassei* from CRPR 1B.1 to **3.1 in** of the CNPS Inventory ~~and placing it on the Considered But Rejected list~~. The characters to describe var. *hassei* evidently do not hold up and we ~~do not~~ feel it **may not be** is taxonomically distinct enough to warrant taxonomic recognition at this time. Furthermore, we **feel** ~~accept~~ that mainland populations identified as var. *hassei* are **likely** native and not cultivated in origin based on the evidence presented here, and as such, ~~even~~ if accepted as being taxonomically distinct, we feel it **would be** is too common to warrant CRPR 1B status at this time.

Recommended Actions

CNPS: **Change** ~~Delete~~ *Lycium brevipes* var. *hassei* from CRPR 1B.1 to **3.1**

CNDDDB: **Keep** ~~Delete~~ *Lycium brevipes* var. *hassei* **as** from G1Q / S1

Current CNPS Inventory Record

Lycium brevipes Benth. var. *hassei* (Greene) Hitchc.

Santa Catalina Island desert-thorn

Solanaceae

CRPR 1B.1

Los Angeles, Orange, San Clement Island, Santa Catalina Island

San Clemente (052A) 33117D5, San Pedro (073A) 33118F3, San Clemente Island

Central (SCMC) 32118G4, San Clemente Island North (SCMN)* 32118H5, Santa

Catalina East (SCTE)* 33118C3

Coastal bluff scrub, coastal scrub; elevation -65-300 meters.

Perennial deciduous shrub. Blooms June to August.

Rediscovered on the Palos Verdes Peninsula (LAX Co.) by A. Sanders in 1976. Only a few plants are known; the occurrence was diminished by grading in the 1930's. Only two wild specimens were known from the Channel Islands; one died in 1908, the other in 1936. See *Pittonia* 1:222 (1888) for original description, and *Annals of the Missouri Botanical Garden* 19:256-257 (1932) for taxonomic treatment.

Available online at <http://www.rareplants.cnps.org/detail/1045.html>

Revised CNPS Inventory Record

Lycium brevipes Benth. var. *hassei* (Greene) Hitchc.

Santa Catalina Island desert-thorn

Solanaceae

CRPR 3.1

Los Angeles, Orange, San Clement Island, Santa Catalina Island

San Clemente (052A) 33117D5, San Pedro (073A) 33118F3, San Clemente Island

Central (SCMC) 32118G4, San Clemente Island North (SCMN)* 32118H5, Santa

Catalina East (SCTE)* 33118C3

Coastal bluff scrub, coastal scrub; elevation 65-300 meters.

Perennial deciduous shrub. Blooms June to August.

Previously CRPR 1B.1; taxonomic distinctiveness from var. *brevipes* is uncertain.

Originally treated as a Channel Islands endemic, CRPR 1A plant, but plants determined to be var. *hassei* have recently been found throughout the range of the species; needs further study. Rediscovered on the Palos Verdes Peninsula (LAX Co.) by A. Sanders in 1976, where plants are an extreme variant and only a few remain; the occurrence was diminished by grading in the 1930's. Rediscovered on SCM Is. in 2005, where previously only known from a single wild specimen that died in 1908. The only other wild specimen known from the Channel Islands (SCT Is.) died in 1936. See *Pittonia* 1:222 (1888) for original description, and *Annals of the Missouri Botanical Garden* 19:256-257 (1932) for taxonomic treatment.

~~*Lycium brevipes* Benth. var. *hassei* (Greene) Hitchc.~~

~~Considered But Rejected: Previously CRPR 1B.1; not taxonomically distinct from *L. brevipes* var. *hassei*. Originally treated as a Channel Islands endemic, but plants verified as var. *hassei* have been found throughout the range of the species.~~

Literature Cited

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Appendix I - Tables

Treatments	<i>var. brevipes</i>	<i>var. hassei</i>
TJM 2	Calyx lobes 1/3 to = tube, triangular to linear	Calyx lobes 1-3 x tube, narrowly obovate
TJM 1993	Calyx lobes 1/3 to = tube, triangular to linear	Calyx lobes 1-3 x tube, narrowly obovate
Riefner 2007	Calyx lobes 1/3 to = tube, triangular to linear	Calyx lobes 1-3 x tube, spatulate to narrowly obovate
Hitchcock 1932		Calyx lobes 1-3 x tube, spatulate
Chiang 1982 Dissertation (and pers. comm. 2015)	Calyx lobes < tube, or if > than tube, not more than 2 x tube, the habit not clambering, plants armed	Calyx lobes 1-3 x tube, plants with an almost clambering habit, unarmed, branches slender, flexuous
McMinn 1939	Calyx lobes usually shorter than the tube	Calyx lobes usually longer than the tube
Greene 1888 (original description)		Calyx lobes oblong or lanceolate, unequal, much longer than the tube, plants glabrous but slightly viscid, compactly branching and somewhat spinescent

Table 1. Description of calyx lobes of *Lycium brevipes* *var. brevipes* and *var. hassei* from various treatments.