Added to California Rare Plant Rank 4.2 of the CNPS Inventory on May 5, 2015

Rare Plant Status Review: *Lycium torreyi*
Proposed Addition to California Rare Plant Rank 4.2, G4G5 / S3

Aaron E. Sims (CNPS) and Roxanne Bittman (CNDDB)
March 30, 2015

Changes made to the original document appear in blue text.

Background

Lycium torreyi A. Gray is a perennial shrub in the Solanaceae known from the southern Mojave and Sonoran Deserts of California, extending eastward to Arizona, Utah, Nevada, New Mexico, and Texas, and southward into Mexico. It is included in *The Jepson Manual* (Nee 1993) and *The Jepson Manual, Second Edition* (Nee 2012). The Flora of North America treatment for Solanaceae is not yet available. Past combinations of *L. torreyi* include *L. andersonii* var. *wrightii* A. Gray, *L. berlandieri* subvar. *wrightii* (A. Gray) A. Terracc., *L. torreyi* var. *filiforme* M.E. Jones, and *L. torreyi* var. *wrightii* (A. Gray) Jeps. (Tropicos 2015); however, none of these combinations were accepted in subsequent major floristic treatments (McMinn 1939; Abrams 1951; Munz 1959; Shreve and Wiggins 1964; Wiggins 1980; Cronquist et al. 1984). *Lycium torreyi* is 1 to 4 meters tall, is more or less glabrous (except for hair-tufted leaf clusters), and has slender, more or less climbing twigs. It is most similar to *L. andersonii* and *L. brevipes* var. *brevipes,* but differs from the former in having woolly to ciliate corolla lobe margins (versus glabrous to finely straight-ciliate margins in *L. andersonii*), and in having narrowly oblanceolate to obovate leaves (versus more or less linear-oblanceolate leaves). In the Sonoran Desert, *L. torreyi* intergrades with *L. brevipes* var. *brevipes*, but differs in having corolla lobes that are less than 1/3 of the tube (versus 1/3 to equal to tube), smaller leaves (1-5 mm long versus 5-15 mm long), and other flower characteristics (Nee 2012).

In California, *L. torreyi* is known from sandy and rocky washes, streambanks, and desert valleys of Sonoran and Mojavean desert scrub (Munz 1959; Cronquist et al. 1984; McLaughlin et al. 1987, Nee 2012; Consortium of California Herbaria 2015), from approximately -54 meters in elevation in the Salton Sink of Imperial County, to approximately 1,220 meters in the Rodman Mountains of San Bernardino County (Consortium of California Herbaria 2015). *Lycium torreyi* flowers mostly in March and April, but may flower as early as January and as late as June, with potential flowering also in September to November (Consortium of California Herbaria 2015), which is likely dependent on fall monsoonal rain.

There are approximately 46 ~~53~~ occurrences of *L. torreyi* in 37 ~~41~~ different USGS 7.5" Quadrangles (see "Localities" tab of attached "NewAdd_LyciumTorreyi" spreadsheet for occurrence details). Some of the occurrences are too vague to adequately map, and over half (approximately 33) of the occurrences are considered historical, with 29 of the historical occurrences not having been seen in over 50 years. However, the historical status of its occurrences may not be significant; there has been little or no land use

change in its area of occupancy, so the probability of the plants still being present is considered to be high. Also, many of the historical occurrences are extremely vague, and could actually be in the same vicinity of some of the more recent occurrences that have been documented. According to J. Andre (pers. comm. 2010), most of the collection records away from the Colorado River are misidentifications, and it is actually quite limited to occurring only along the Colorado River in California. In 2010, A. Sanders (pers. comm.) noted that there are a lot of identification problems around *L. torreyi*; "The distinction from *brevipes* causes trouble, and I've seen *andersonii* labeled as *torreyi*." Sanders (pers. comm. 2011 and 2012) later went on to say that the application of names in *Lycium* is very confused and that the type specimen of *L. torreyi* from Fort Yuma (*G.H. Thomas s.n.*, GH77163) likely needs to be reviewed in order to solve the problem because people may have been referring back to literature rather than types when writing treatments. Andre (pers. comm. 2012) has also had trouble identifying it, particularly in southeastern San Bernardino County and northeastern Riverside County, where plants show considerable variation in characters. The occurrence of *L. torreyi* in San Diego County needs to be examined. In *A Flora of San Diego County, California* (Beauchamp 1986), the annotation for *L. torreyi* says "Rare, known in the county only at Carrizo Stage Station", but further research by L. Hendrickson (pers. comm. 2013) led to the conclusion that there may not actually be a voucher collection to support this occurrence. Hendrickson (pers. comm. 2013) made a recent collection of what he suspects to be *L. torreyi* from above Carrizo Creek adjacent to the ruins of the stage station. However, this specimen needs careful review as there is a historical collection from "Old Carrizo Station" that was annotated to *L. brevipes* var. *brevipes* by R.E. Riefner and S. Boyd in 2008 (*P.A. Munz 15776*, POM258642), and there is also a collection of *L. fremontii* from "Carrizo Creek" (*E.C. Jaeger s.n.*, DS265498 and DS265499) (Consortium of California Herbaria 2015). Lastly, there are four collections of *L. torreyi* from different locations in San Diego County (Consortium of California Herbaria 2015), and therefore more research is needed to determine the status of *L. torreyi* in San Diego County. The occurrence from "Carisso Creek" San Diego County (*Brandegee* UC174276) has been discounted as T. Chester (pers. comm. 2015) has looked at the extensive of *Lycium* in this area only to find *L. andersonii* and *L. fremontii*. We have included the full original description of *L. torreyi* (Gray 1862) in Appendix I for convenience in comparing type material and other material that needs annotation.

Even with annotations and examination of type material, *L. torreyi* is apparently too common for California Rare Plant Rank 2B. Without recognizing collections from outside the vicinity of the Colorado River, *L. torreyi* is still known from about 25 occurrences. Also, according to S. De Groot (pers. comm. 2010), it may be fairly widespread, but has either not been collected or has been misidentified. In her experience, many if not most of the desert *Lycium* species are difficult to tell apart without flowers, and most of the California deserts are botanical black holes when it comes to collections, so even without recent collections, *L. torreyi* may be doing just fine. Further research and annotations are necessary in order to determine the approximate distance *L. torreyi* occurs from the Colorado River in California, and additional surveys are necessary to determine its true distribution and range. NatureServe (2015) ranks *Lycium torreyi* as

S2 in Arizona, S4 in Nevada, and it is not ranked (SNR) by NatureServe in New Mexico, Texas, and Utah.

In at least part of its range, *L. torreyi* is threatened by desert solar energy development. A few occurrences are in the vicinity of Blythe, where a large solar energy project is slated for development. Other occurrences, particularly those that may occur within BLM lands, are potentially threatened by solar energy development projects as well. Based on the available information, CNPS and CNDDB recommend adding *Lycium torreyi* to CRPR 4.2. A lot of research is needed to determine the true distribution and conservation status of this species in California, and therefore CRPR 3 may seem more appropriate. However, the current information suggests that even with further review of herbarium material, additional surveys will likely show it is too common for CRPR 2B, and therefore CRPR 4 seems like the most suitable rank at this time. If more information on *L. torreyi* becomes available in the future, we will re-evaluate its status at that time.

Recommended Actions
CNPS: Add *Lycium torreyi* to CRPR 4.2
CNDDB: Add *Lycium torreyi* to G4G5 / S3

Draft CNPS Inventory Record
Lycium torreyi A. Gray
Torrey's box-thorn
Solanaceae
CRPR 4.2
Arizona, New Mexico, Nevada, Texas, Utah; Sonora, Mexico
Imperial, Inyo, ~~Los Angeles,~~ Riverside, San Bernardino, San Diego
Yuma West (001B) 3211466, Picacho Peak (012B) 3211486, Araz (012C) 3211476, Hedges (013A) 3211487, Kane Spring NE (030A) 3311527, Borrego Mountain SE (031D) 3311611, Tubb Canyon (032B) 3311624, Palo Verde (040B) 3311446, Borrego Palm Canyon (047C) 3311634, Blythe NE (058A) 3311465, Blythe (058D) 3311455, Sidewinder Well (060B) 3311562, Mortmar (063C) 331158, Mecca (064D) 3311651, Big Maria Mts NE (075A) 3311485, ~~Myoma (082D) 3311673, White Water (083B) 3311686, Palm Springs (083D) 3311675,~~ San Jacinto (084C) 3311678, Cross Roads (094B) 3411422, Parker (095A) 3411423, Parker NW (095B) 3411424, Parker SW (095C) 3411414, Vidal Junction (096A) 3411425, Vidal (096D) 3411415, Yucca Valley North (103B) 3411624, Gene Wash (120C) 3411432, Whipple Mts SW (121C) 3411434, Whipple Wash (121D) 3411433, Ludlow (153B) 3411662, Victorville (158D) 3411753, ~~Palmdale (161D) 3411851,~~ Needles (172D) 3411475, Daggett (181C) 3411678, Barstow (182A) 3411781, Hodge (182C) 3411772, Kramer Hills (183B) 3411784, Slate Range Crossing (280A) 3511783, Homewood Canyon (280B) 3511784, Dantes View (300B) 3611626, Ryan (323C) 3611636
Mojavean desert scrub, Sonoran desert scrub / sandy, rocky, washes, streambanks, desert valleys; elevation -50-1220 meters.
Perennial shrub. Blooms (January-February) March-June (September-November).

Plants in CA outside vicinity of Colorado River are likely ~~may be~~ misidentifications; needs further study. Many occurrences historical; needs field surveys. Potentially threatened by solar energy development. Often confused with *L. andersonii* and *L. brevipes* var. *brevipes*. See *Proceedings of the American Academy of Arts and Sciences* 6:47 (1862) for original description.

Literature Cited

Abrams, L. 1951. Illustrated Flora of the Pacific States: Vol. III: Geraniaceae to Scrophulariaceae. Stanford University Press, Stanford. 866 pp.

Beauchamp, R.M. 1986. A flora of San Diego County, California. National City, CA, 241 pp.

Consortium of California Herbaria, CCH. 2015. Data provided by the participants of the Consortium of California Herbaria. Regents of the University of California, Berkeley. Website http://ucjeps.berkeley.edu/consortium/ [accessed 26 March 2015].

Cronquist, A., A.H. Holmgren, N.H. Holmgren, J.L. Reveal, and P.K. Holmgren. 1984. Intermountain Flora: Vascular Plants of the Intermountain West, U.S.A. Vol. 4: Subclass Asteridae (Except Asteraceae). New York Botanical Garden, New York. 573 pp.

Gray, A. 1862. Characters of some new or obscure species of plants, of monopetalous orders, in the collection of the United States South Pacific exploring expedition under Captain Charles Wilkes, U.S.N. With various notes and remarks. Proceedings of the American Academy of Arts and Sciences 6:47.

McLaughlin, S.P., J.E. Bowers, K.R.F. Hall. 1987. Vascular plants of eastern Imperial County, California. Madroño 34(4):359-378.

McMinn, H.E. 1939. An Illustrated Manual of California Shrubs. University of California Press, Berkeley and Los Angeles, 663 pp.

Munz, P.A. 1959. A California Flora with Supplement. University of California Press, Berkeley and Los Angeles. 1681 pp.

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Website http://explorer.natureserve.org/ [accessed 26 March 2015].

Nee, M.H. 1993. *Lycium.* Pp. 1070-1071 in Hickman, J.C. (ed.), The Jepson Manual: Higher Plants of California. University of California Press, Berkeley.

___. 2012. *Lycium*. Pp. 1252-1253 in Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.), The Jepson Manual: Vascular Plants of California, Second Edition. University of California Press, Berkeley and Los Angeles.

Shreve, F. and I. Wiggins. 1964. Vegetation and Flora of the Sonoran Desert Vol. 2. Stanford University Press, Stanford. Pp. 841-1740.

Tropicos. 2015. Tropicos.org. Missouri Botanical Garden. Website http://www.tropicos.org [accessed 26 March 2015].

Wiggins, I.L. 1980. Flora of Baja California. Stanford University Press, Stanford. 1025 pp.

Appendix I:

Original description of *L. torreyi* from A. Gray (1862):

> "L. Torreyi (*L. barbinode,* Torr. in Pacif. R. R. Exped. 5, p. 363, & Bot. Mex. Bound. p. 154, non Miers, Monogr.): foliis lanceolato-spathulatis crassiusculis (semi-subsesquipollicaribus); pedicellis fasciculatis (2-5 lin. longis); floribus pentameris; corolla tubuloso-infundibuliformi (5-6 lin. longa) calyce subaequaliter 5-dentato quadruplo longiori, lobis suis tomentoso-ciliatis. – Texas, on the Rio Grande, to Fort Yuma, interior of California, along the Mexican boundary, collected by Fremont, Major Thomas, Thurber, Bigelow, Schott, and Wright (1609, in herb. Gray, probably an error, as *L. puberulum* bears this number also: 1604 and 1608 in herb. Torr., but I have no *Lycium* under the former number). Calyx campanulate; the teeth about a third or more of the length of the tube, often tomentulose-ciliate. Lobes of the "blue or purple" corolla always bordered by a fine white tomentum, the throat or portion above the insertion of the stamens elongated and narrow, very gradually enlarging upwards, about one third of the length of the tube, nearly equalling the stamens. The flowers abundantly distinguish this species from the next, - for which, however, Mr. Miers mistook an insufficient specimen in herb. Torrey. We now have it in great abundance."