Kept as California Rare Plant Rank 1B and changed threat rank from .1 to .3 in the CNPS Inventory on December 13, 2017

Rare Plant Status Review: Polygonum polygaloides subsp. esotericum
Proposed change from California Rare Plant Rank 1B.1 to 1B.33.2, and maintain as G4G5T3 / S3 to G4G5T3Q / S3
Kaitlyn Green (CNPS), Aaron E. Sims (CNPS), and Roxanne Bittman (CNDDB)
October 18, 2017

Changes made to the original document are in blue text.

Background
Polygonum polygaloides Meisn. subsp. esotericum (Wheeler) Hickman is an annual herb in the Polygonaceae known from Sierra to Modoc counties in California, and north to Oregon. It is included in The Jepson Manual (Went 1993), The Jepson Manual, Second Edition (Costea 2012), and Flora of North America (Freeman 2005). Polygonum polygaloides subsp. esotericum occurs in mesic areas of lower montane coniferous forests, Great Basin scrub, meadows and seep, and vernal pools, at an approximate elevation of 885 to 1,690 meters, and flowers between May and September.

The following notes occur in the Jepson eFlora (Costea 2017) for Polygonum polygaloides:

“Note: Highly variable; intermediates occur between all subspecies except Polygonum polygaloides subsp. polygaloides, of northwestern United States (except California), Alberta.

Unabridged Note: Alternatively, Polygonum polygaloides could be recognized in narrow sense, without infraspecific taxa, and the 3 subspecies in California could be treated as subspecies of a separate Polygonum kelloggii (earliest available name).”

The variability and intermediacy of the subspecies of Polygonum polygaloides is widely known by botanists, specifically in the Modoc Plateau region of California, where P. polygaloides subsp. esotericum readily and frequently forms intermediates with P. polygaloides subsp. confertiflorum, a common taxon. In discussions with Forest Gauna (pers. comm. 2012), determining P. polygaloides subsp. esotericum from other subspecies is not only difficult, but at times impossible due to the intermediacy at play. Allison Sanger (pers. comm. 2017) expressed the same views from her experience with the plant, explaining that it was not possible to positively identify subsp. esotericum due to its intermediacy with subsp. confertiflorum. Trends for this subspecies in Modoc National Forest are unknown, not because botanists haven’t been looking for it, but because they were unable to confirm reported occurrences to determine whether they were valid. In 2013, the Forest Service removed this taxon from its Region 5 California Sensitive Species list. “No one could identify it with certainty, so it could not be conserved effectively without also conserving its common relatives, which was thoroughly impractical on multiple-use public lands” (J. Nelson pers. comm. 2017). In contrast, Rob Preston (pers. comm. 2017), having studied subsp. esotericum in 2000, found certain characteristics, such as anther number as well as the shape of the
perianth and fruit, that were consistent within each subspecies allowing for accurate identification.

Many occurrences of *Polygonum polygaloides* subsp. *esotericum* have either not been relocated, or if located, determining the subspecies may not have been possible. Of the 42 occurrences, 31 of them are considered historical (occurrences not seen in over 20 years are considered historical by the CNDDB), and nearly half (5) of the occurrences considered current have noted signs of intermediacy. The high number of historical occurrences and the presence of intermediates warrants further study. According to Costea (2017), *P. polygaloides* subsp. *esotericum* is considered highly variable, with intermediates that occur between all subspecies, excluding *P. polygaloides* subsp. *polygaloides*. The key in the Costea provides in the Jepson eFlora indicates two separate paths that would key to *P. polygaloides* subsp. *esotericum*, indicating its stark similarity to both of the other subspecies (see Table 1 for comparison of characteristics).

Threats are indicated for only nine occurrences of *P. polygaloides* subsp. *esotericum* in the CNDDB, as follows: grazing (6 occurrences), trampling by wild horses (3 occurrences), road maintenance (1 occurrence), potential mining (1 occurrence), non-native plants (1 occurrence), and habitat construction for waterfowl (1 occurrence). Although grazing is the most indicated threat, it is unknown what the effects of grazing really have on this taxon.

Based on the available information, CNPS and CNDDB recommend changing *Polygonum polygaloides* subsp. *esotericum* from California Rare Plant Rank 1B.1 to 1B.33.2 in the CNPS Inventory. Since nine of its 42 occurrences have indicated threats (21%), we recommend a threat rank of .2 instead of .1 at this time. If knowledge on the validity, distribution, threats, or rarity status of *P. polygaloides* subsp. *esotericum* changes in the future, we will re-evaluate its status at that time.

**Recommended Actions**
CNPS: Change *Polygonum polygaloides* subsp. *esotericum* from CRPR 1B.1 to 1B.33.2
CNDDB: Keep Change *Polygonum polygaloides* subsp. *esotericum* as from G4G5T3 / S3 to G4G5T3Q / S3

**Current CNPS Inventory Record**
*Polygonum polygaloides* Meisn. subsp. *esotericum* (Wheeler) Hickman
Modoc County knotweed
Polygonaceae
CRPR 1B.1
Oregon
Lassen, Modoc, Plumas, Shasta, Sierra
Antelope Valley (571A) 3912063, Calpine (571B) 3912064, Reconnaissance Peak (587D) 3912073, Holbrook Canyon (675D) 4112015, Lookout (677B) 4112122, Burney Falls (679C) 4112116, Washington Mtn. (693B) 4112108, Crank Mountain (694B) 4112142, Whitehorse (695C) 4112134, Davis Creek (708A) 4112063, Whittemore Ridge (709B) 4112066, Boles Meadows East (710A) 4112067, Boles Meadows West (710B) 4112068, Ambrose (710C) 4112058, Jacks Butte (710D) 4112057, Rimrock

Sent to: MP, SN, M. Costea, J. Nelson, J. Ruygt on 10/18/2017
Great Basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools/mesic; elevation 885 - 1690 meters.
Annual herb. Blooms May to September.

**Revised CNPS Inventory Record**

*Polygonum polygaloides* Meisn. subsp. *esotericum* (Wheeler) Hickman

Modoc County knotweed
Polygonaceae
CRPR 1B.33.2
Oregon
Lassen, Modoc, Plumas, Shasta, Sierra
Antelope Valley (571A) 3912063, Calpine (571B) 3912064, Reconnaissance Peak (587D) 3912073, Holbrook Canyon (675D) 4112015, Lookout (677B) 4112122, Burney Falls (679C) 4112116, Washington Mtn. (693B) 4112048, Crank Mountain (694B) 4112142, Whitehorse (695C) 4112134, Davis Creek (708A) 4112063, Whittemore Ridge (709B) 4112066, Boles Meadows East (710A) 4112067, Boles Meadows West (710B) 4112068, Ambrose (710C) 4112058, Jacks Butte (710D) 4112057, Rimrock Lake (711B) 4112162, Spaulding Butte (711C) 4112152, Knobcone Butte (711D) 4112151, Lake Annie (724A) 4112081, Mt. Bidwell (724B) 4112082, Pease Flat (726A) 4112085, Beaver Mtn. (726B) 4112086, South Mtn. (726C) 4112076, McGinty Reservoir (726D) 4112075

Great Basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools/mesic; elevation 885 - 1690 meters.
Annual herb. Blooms May to September.

Change from 1B.1 to 1B.33.2 on 2017-XX-XX

**Move to 1B?** Possibly threatened by grazing, trampling, road maintenance, and non-native plants. Intermediates to ssp. *confertiflorum* are common, especially on Modoc Plateau to OR. Difficult or not possible to distinguish pure stands of ssp. *esotericum* in CA; needs further study. Only occurrences that mostly contain *P. p. ssp. esotericum* are recognized. Possibly threatened by grazing, trampling, road maintenance, and non-native plants. See *Rhodora* 40(476):310-312 (1938) for original description, and *Madroño* 31(4):251 (1984) for revised nomenclature.

**Literature Cited**


Sent to: MP, SN, M. Costea, J. Nelson, J. Ruygt on 10/18/2017


# Appendix I: Tables

<table>
<thead>
<tr>
<th>Character</th>
<th>Polygonum polygaloides subsp. esotericum</th>
<th>Polygonum polygaloides subsp. confertiflorum</th>
<th>Polygonum polygaloides subsp. kelloggii</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stems</strong></td>
<td>5--12 cm</td>
<td>2--15 mm</td>
<td>1--15 cm</td>
</tr>
<tr>
<td><strong>Inflorescence</strong></td>
<td>continuous from stem bases, 2--10 mm, 5--7 mm wide, narrowly cylindric; bracts appressed, 4--8 mm, lance-elliptic, rigid, margin flat, green, if white then scarious border 0.1--0.2 mm wide; veins prominent adaxially</td>
<td>generally distal, rarely also continuous from stem bases, 7--40 mm, 5--10 mm wide, ovoid to cylindric; bracts ascending to appressed, 4--11 mm, linear to lance-linear, +- rigid, margin rolled under, white, scarious border 0.25--0.4 mm wide, midvein +- heavily thickened, branches obscure</td>
<td>generally terminal, 3--15 mm, 5--15 mm wide, ovoid, or continuous from stem bases; bracts +- spreading, 7--25 mm, linear to lance-linear, soft, margin flat or rolled under, green, not scarious; veins obscure</td>
</tr>
<tr>
<td><strong>Flower</strong></td>
<td>perianth 2.1--2.9 mm, white or pink, tube 29--40% of length, tube and base of lobes smooth; stamens 5--8</td>
<td>perianth 1.8--2.2(2.4) mm, white or red, tube 22--30% of length, tube and base of lobes smooth or papillate; stamens 3</td>
<td>perianth 1.5--2.3 mm, pink or white, tube 19--34% of length, tube and base of lobes smooth; stamens 3</td>
</tr>
<tr>
<td><strong>Fruit</strong></td>
<td>2--2.5 mm, lanceolate, dark-brown, dull, net-like to +- smooth</td>
<td>1.3--2.1 mm, lance-ovate to ovate, brown to dark-brown, dull, net-like with longitudinal ridges</td>
<td>1.3--1.7 mm, ovate, light-yellow to green-brown, shiny, smooth to obscurely longitudinally net-like</td>
</tr>
<tr>
<td><strong>Ecology</strong></td>
<td>Vernal pools, seasonally wet places, pinyon/juniper woodland</td>
<td>Vernal pools, wet meadows</td>
<td>Mtn meadows, seeps, rainpools</td>
</tr>
<tr>
<td><strong>Elevation</strong></td>
<td>+- 1500 m</td>
<td>500--1900 m</td>
<td>1500--3300 m</td>
</tr>
<tr>
<td><strong>Bioregional Distribution</strong></td>
<td>MP (near Goose Lake, Modoc Co.; Sierra Valley, s Plumas Co.)</td>
<td>NW, CaR, n SN, MP; Outside CA: to Saskatchewan, Montana, Wyoming</td>
<td>NW, CaR, SN, TR, PR; Outside CA: to British Columbia, Montana, Colorado, Arizona</td>
</tr>
<tr>
<td><strong>Flowering Time</strong></td>
<td>Jun--Aug</td>
<td>May--Aug</td>
<td>Jun--Sep</td>
</tr>
</tbody>
</table>

Table 1. Comparison of characteristics between the California subspecies of *Polygonum polygaloides* from the Jepson eFlora (Costea 2017).