**Holmgren owl clover – *Orthocarpus holmgreniorum (T. I. Chuang and Heckard) L. M. Shultz & F. J. Smith***

**Broom-rape family – Orobanchaceae**

Account written by Stephen L. Love, 12 Oct 2021

Edited by SI RPWG 13 Oct 2021

Taxonomic binomial updated by Stephen L. Love, 14 Feb 2022

Presented at the Idaho RPC by Stephen L. Love, 28 Feb 2022

**Current Conservation Status:**

NatureServe: G4T3? SH

2009 INPS rank²: Not listed.

BLM: None.

FS Reg 1: None.

FS Reg 4: None.

FS Reg 6: None.

FWS: None.

**Taxonomy:**

*Synonyms:* *Orthocarpus tolmiei* Hook. And Arn. ssp. *holmgreniorum*T. I. Chuang & Heckard

*Other Subspecies/Varieties, if applicable:*  *Orthocarpus tolmiei* ssp. *tolmiei* also occurs in Idaho (G4 SNR).

*Type Locality:* Cache County, Utah; along Tony Grove Lake Road, Bear River Range, Wasatch Mountains; about 2 miles from US Hwy 89 in Logan Canyon; coordinates 41.876447 N, 111.573029 W. Collected 2 Aug 1984.

*Taxonomic changes:* First published by Chuang and Heckard in 1992 as *Orthocarpus tolmiei* var. *holmgreniorum* within the “A taxonomic revision of *Orthocarpus* “. In Shultz’ 2018 article, wherein this taxon was elevated to species level, she documents a personal communication with Heckard stating that the initial intent was to designate a new species but sufficient information to justify this action was not available at that time.

*Taxonomic key(s):*

Intermountain flora (not listed as separate from *O. tolmiei* but mentioned as a violet or purple flowered variant.

A Utah Flora (2016 Ed.) (mentioned peripherally as *O. tolmiei* ssp. *holgremiorum*).

USDA Plants Database (listed as *O. tolmiei* ssp. *holgremiorum*).

**Species Description:**

Pinkish purple flowers (as opposed to *Orthocarpus tolmiei* with yellow flowers), narrowly branched inflorescence, glandular-pubescent galea, densely glandular calyx, and dark green leaves.

**Biology:**

Annual; root hemi-parasitic forb; reproduces by seed.

**Similar species:**

*Orthocarpus tolmiei* ssp. *tolmiei, Orthocarpus purpureo-albus*

**Habitat:** (Idaho habitat) Elevation 6,450 ft in a vernally damp site that dries in summer; plant communities: growing with *Artemisia arbuscula, Helianthella uniflora, Wyethia amplexicaulis, Achillea millefolium,* sparse *Amelanchier alnifolia,* sparse grasses, and occasional lupines; substrate: shallow, rocky soils.

*\*֎Environmental Specificity10:* Moderate.

**Cultural and commercial values:**

None documented.

**Landownership:**

Two of the historical sites are on federal lands: USFS: Mill Canyon is Cache National Forest, administered by Caribou-Targhee NF; Elk Valley is Caribou NF. One historical site near Ovid, Idaho is on private agricultural land. The recent 2021 collection site located near Liberty, Idaho near the federal/private interface, but ownership of the site appears to be private.

**Distribution:**

*Global Range*: US states of Utah and Idaho.

*\*Range Extent Descriptor6:* Subregional endemic limited to the northern Wasatch Mountains and Bear River Range of northern Utah and southeastern Idaho. Idaho is peripheral.

֎*Rank Calculator Idaho Range Extent:* In Idaho, range is limited to the Bear River Range which is located in Franklin, Bear Lake, and Caribou Counties. Idaho portion of the Bear River Range consists of approximately 860 sq. mi. (Range size taken from Idaho-A Climbing Guide). However, it is likely that this species grows only within a few small areas in this mountain range. Evidence for this is found by inspecting the 37 specimens of *Orthocarpus tolmiei* listed in the Consortium of Pacific Northwest Herbaria. Twenty-seven of these specimens were collected within the three counties that are assumed to be feasible sites for ssp. *holmgreniorum* populations (ditto for 4 specimens in NYBG and 9 specimens listed in the Consortium of Intermountain Herbaria). None of these specimens are listed as ssp *holmgreniorum* and none include notes descriptive of the unique characteristics of this taxon. Also, 25 of these 27 specimens display yellow flowers, the color characteristic of ssp. *tolmiei* while *holmgreniorum* has purple flowers. Given the significantly large number of specimens collected within the area that could contain populations of *O. holmgreniorum*, but are only inclusive of *tolmiei*, it is very likely the species of interest is rare in this region. Four specimens of *holmgreniorum* (three historical, one recently confirmed) have been documented in southern Idaho. One of the historical populations (Ovid in Bear Lake County, was collected within a few miles of the recently collected population. One historical collection site (Mill Canyon in Franklin County) has not been subject to a confirmation search. The last historical specimen population (Elk Valley in Caribou County) remains unconfirmed after two fairly extensive searches. Given the current state of knowledge, we felt it appropriate to include the newly confirmed population site, the Ovid site, and the Mill Canyon site in the range extent calculations. Rank calculator category for Idaho is A= <100 sq. km.

֎*Area of Occupancy:* Confirmed and non-searched historical populations sum to three 4-sq. km grids (=B).

*\*Idaho Counties9:* Historically known from Bear Lake, Caribou, and Franklin Counties. The historical population site in Caribou County was searched and plants were not found. One unconfirmed site resided in Franklin County. The one confirmed population is in Bear Lake County.

*Idaho Specimens:* The two oldest herbarium specimens representing collections from historical, unconfirmed populations are held by the US Forest Service. Two duplicate specimens representing historical, unconfirmed populations (listed as *Orthocarpus purpureoalbus*) collected in 1945 are housed in the Stillinger Herbarium at the University of Idaho.

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| **Record source (Herbarium, IFWIS, person)** | **Date observed/ collected** | **Observer** | **County** | **Location** | **Abundance, threats, habitat condition** |
| USFS | 1922\* | Cronemiller | Caribou | Elk Valley | Unknown |
| USFS | 1916\* | Grazing reconnaissance | Franklin | Mill Canyon | Unknown |
| Ray J Davis | 1945 | Watson | Bear Lake | Ovid | Unknown |
| Ray J Davis  (duplicate) | 1945 | Watson | Bear Lake | Ovid | Unknown |
| Ray J Davis  Stillinger  Intermountain | 2021 | Love  2021-1 | Bear Lake | Liberty | Low (<200)  Agriculture  Grazing  Weeds |

\*Collection dates based on other collections from those collectors at those locations

Duplicate specimens from the 2021 collection by Love were recently submitted to Ray J. Davis (ISU), Stillinger (UI), and Intermountain Herbariums.

*Literature Records:*

Shultz LM, Smith JS. 2018. Novelties in Musineon (Apiaceae) and Orthocarpus (Orobanchaceae) in the northern Wasatch Mountains of Utah and Idaho. Madroño 65:60-64.

*Databases/Herbaria consulted (and query date):*

Intermountain Herbarium (10 Oct 2019) – Utah specimens only

S.L. Herbarium (BYU) (10 Oct 2019) – Utah specimens only

New York Botanical Garden (10 Oct 2019) – Utah specimens only

Arizona State University Vascular Plant Herbarium (10 Oct 2019) – Utah specimens only

*Research Notes:*  No erroneous reports detected.

**Abundance:**

*\*֎Number of Occurrences8:* Four, based on three historical and one 2021 confirmed population.

*֎Population Size:* <200 individuals.

*֎Number of Occurrences with Good Viability:* One confirmed.

**Conservation concerns:**

*֎Threats (include scope, severity and timing, if known):* Two historical populations (Mill Canyon and Elk Valley) were collected on USFS land and have some inherent protections, if they still exist. One historical population Ovid) was collected in an area that has been converted to farmland and is likely extirpated. The one confirmed population exists on the interface between Forest Service and private agricultural land, with risks inherent in the location, namely grazing, recreation, agriculture, and infringing weeds. Being an annual, climate change may present a future threat to this species if moisture availability is lessened. Although immediate threats are not apparent, the situation dictates risk level be considered as moderate to high.

SIRPWG: Grazing, recreation, agriculture, weeds.

*\*֎Overall Threat Rank11:* High-Medium

*֎Intrinsic Vulnerability:* (Optional; Used only if Threats unknown. A= highly, B=moderately, C=not intrinsically vulnerable.):

**Population trend:**

*֎Short:* The one confirmed, small population is probably stable but long-term surveys have not been conducted.

*֎Long:* Under current conditions, probably stable but the situation could quickly change.

**Proposed rank information:**

*\*Date Ranked5:* 10/13/2021 by SI RPWG. Calculated rank = S1.

*\*Proposed Rank:* S1

*\*Proposed INPS Status2:* Maintain on the rare plant list as an Idaho S1.

*\*Comments12:* Concerted efforts are needed for this species to document additional occurrences.

**\*Recommended actions13:** Dedicate resources to define the range extent of this species.

Revisit the area near Preston labeled as Mill Canyon. Search sites closer to the Utah border, especially in the Franklin Basin area.