Species: *Platismatia lacunosa* (Ach.) W. L. Culb. & C. F. Culb., crinkled rag lichen

**Photo Source:** CalPhotos 2022

**Photo Credits:** Left and bottom right: Chris Wagner; top right: Scot Loring.
## Status

Table 1 summarizes the current status of this species or subspecies/variety by various ranking entities and defines the meaning of the status.

<table>
<thead>
<tr>
<th>Entity</th>
<th>Status</th>
<th>Status Definition</th>
</tr>
</thead>
</table>
| NatureServe\(^a\)                        | G4, S1 | G4: Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.  
S1: Critically Imperiled — Critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the nation or state/province. |
| California Rare Plant Rank\(^b\)          | 2B.3   | 2B: Rare and endangered in California, more common elsewhere.  
0.3: Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known). This taxon was added to the CNPS Inventory of Rare and Endangered Plants of California in 2022. |
| California State Listing\(^c\)             | Not listed |                                                                                     |
| USDA Forest Service\(^d\)                 | Survey and Manage Category E | Survey and Manage Category E: Manage all known sites; pre-disturbance surveys not required; carry out strategic surveys. |
| USDI FWS\(^e\)                            | Not listed |                                                                                     |
| USDI BLM\(^f\)                            | Not listed |                                                                                     |
| NatureServe OR\(^g\)                      | Not listed |                                                                                     |
| Oregon State Listing\(^h\)                | Not listed |                                                                                     |
| NatureServe NV\(^i\)                      | Not present |                                                                                     |
| Nevada State Listing\(^j\)                | Not present |                                                                                     |

\(^a\) California Natural Diversity Database, California Dept. of Fish & Wildlife [CNDDB 2022, 2022a]
\(^b\) California Native Plant Society [CNPS 2022]
\(^c\) California Department of Fish and Wildlife [CDFW 2022]
\(^d\) US Forest Service Region 5 Forester’s List [USDA 2013] and Pacific NW Survey and Manage [USDA & BLM 2014]
\(^e\) US Department of Interior Fish and Wildlife Service [USFWS 2022]
\(^f\) US Department of Interior Bureau of Land Management [BLM 2022]
\(^g\) Oregon Biodiversity Information Center [ORBIC 2019]
\(^h\) Oregon Department of Agriculture [ODA 2018]
\(^i\) Nevada Natural Heritage Program [NDNH 2022]
\(^j\) Nevada Division of Forestry [NDF 2012]

Note: Individual State Heritage Programs (ORBIC, NNHP) represent NatureServe and contain more up-to-date ranks for their state than NatureServe Explorer.
Distribution, abundance, and population trend on the planning unit

Table 2 summarizes the distribution and frequency of this species or subspecies/variety within National Forest System Lands in California. Table 4 in Appendix 1 lists all known occurrences of this species or subspecies/variety within California. Individual occurrences are defined as sites that contain an individual, population, or groups of populations of the plant that are located more than 1/4 (0.25) of a mile apart from each other as defined by the CNDDB.

<table>
<thead>
<tr>
<th>National Forest System (NFS) lands in California</th>
<th>Record #s (from Table 4)</th>
<th>CNDDB EOs</th>
<th>Non-CNDDB Records</th>
<th>Recent (seen in past 20 years)</th>
<th>Historical (not seen in past 20 years)</th>
<th>Most Recent Obs. Date</th>
<th>Total Records on NFS lands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six Rivers:</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>30-Jul-2003</td>
<td>1</td>
</tr>
<tr>
<td>Totals:</td>
<td>N/A</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>N/A</td>
<td>1</td>
</tr>
</tbody>
</table>

1 1909.12 Chapter 10, Section 12.53, components 2, 3, and 4.
At this writing, crinkled rag lichen has just recently been added to the California Native Plant Society Inventory of Rare Plants (and lichens) and will be tracked by the CNDDB (CNDDB 2022, CNPS 2022). Observation/specimen records for this species were not available online at the CCH2 (2022), Calflora (2022), or iNaturalist (2022) websites. Location records in Table 4 (Appendix 1) were obtained through searches of the Consortium of North American Lichen Herbaria portal (CNALH 2022) and NRIS (2020), as well as communication with lichenologists familiar with this species (Antoine 2021 pers. comm., Carlberg 2022 pers. comm.).

Within California, crinkled rag lichen has a coastal distribution that includes the Klamath Ranges (KR) and North Coast (NCo) bioregions; currently, it is only known from Del Norte and Humboldt counties (Table 4). Outside of California, the stated distribution of crinkled rag lichen is the coastal zone of western North America from Oregon to the Aleutian Islands (Culberson and Culberson 1968, Ponzetti 2006, NatureServe 2022); thus, the California records are the southernmost for this species. The closest Oregon records are from the Rogue River-Siskiyou National Forest in the Grassy Knob Wilderness (CPNWH 2022). It should be noted that there are specimen records from Idaho, eastern North America, and Scandinavia which conflict with the stated distribution of this lichen and need their identifications checked (CNALH 2022, CPNWH 2022).

Of the four confirmed California records of this species, only one is located on U.S. National Forest land within the Siskiyou Wilderness of the Six Rivers National Forest. Of the other three records, two are located on California State Parks land, and one is on private timber land. Three of the records are recent, observed between 2003 and 2022, while one is historical (from 1930). An additional eight California location records of crinkled rag lichen were evaluated and not included in our final distribution map for this species (highlighted in pink in Table 4). These records have either been reidentified as another lichen species or have locations that are too vague to be georeferenced (Carlberg 2022 pers. comm.).

There is no standardized method for estimating the population size of most lichens, including crinkled rag lichen (Derr et al. 2002, Carlberg 2022 pers. comm.). In addition, there is no information on the number of individuals per population or population trends over time for any of the location records in Table 4. Observers of crinkled rag lichen in California have noted that it is uncommon where it was recorded (Antoine 2021 pers. comm.). One of the records (#1) was seen on a fallen alder tree (Alnus) and may no longer be extant, since the tree may have decayed (Antoine 2021 pers. comm.).

Brief description of natural history and key ecological functions

Crinkled rag lichen is a medium- to large-sized, pale grey-green to whitish, lobed, foliose lichen that is appressed to its substrate (Derr et al. 2002, Ponzetti 2006, McCune and Yang 2022). In California, this species is found in coastal areas (Carlberg 2003) and has been observed on the branches of alder trees from 200 to 2000 feet in elevation (Table 4). Elsewhere, crinkled rag

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2 Basis for other 1909.12 Chapter 10, Section 12.53 components.
lichens may grow on other hardwoods or conifers or rarely on mossy rocks (Derr et al. 2002, Ponzetti 2006, CNALH 2022, McCune and Yang 2022). In the Pacific Northwest, crinkled rag lichen is uncommon and usually found in moist, riparian forests or adjacent to wetlands or lakes in the Coast Range and Cascades from sea level to 3500 feet in elevation (Ponzetti 2006, McCune and Yang 2022). In that region, this species often occurs high in the tree canopy, usually on the upper side of branches. Its most common host is *Alnus rubra*, and it is sometimes associated with the lichens *Menegazzia terebrata* and *Hypotrachyna sinuosa* (Ponzetti 2006, McCune and Yang 2022). It is most common in mature to old-growth forest, but it does occur in second-growth forests with old-growth remnants or mature *Alnus rubra* (Ponzetti 2006).

Crinkled rag lichen is placed in the family Parmeliaceae, the largest family of macrolichens (Thell et al. 2002). *Platismatia* contains approximately 14 species, all confined to the Northern Hemisphere (Thell et al. 2002). Crinkled rag lichen is distinguished from other species within the genus by having a pale grey-green to white upper surface with a very prominent network of veins, no isidia or soredia, and a positive (orange-red) para-phenylenediamine reaction in the thallus medulla (Culberson and Culberson 1968, McCune and Yang 2022). The lower surface of the thallus is usually black near the center and brown near the edges, and there is often white, tan, or brown mottling (Culberson and Culberson 1968, Ponzetti 2006).

Dispersal in lichens can be carried out in several ways. One of the most convenient ways for lichens to disperse is by soredia and isidia, which are asexual structures that contain cells from both the algal and fungal symbiont (Lepp 2012). These structures are absent in crinkled rag lichen (McCune and Yang 2022). Pycnidia, which produce small asexual dispersal structures that only contain fungal cells (conidia) are present along the margin of the thallus (Culberson and Culberson 1968, Ponzetti 2006, Lepp 2012, McCune and Yang 2022). In addition, dark brown apothecia (sexual, spore-producing reproductive structures) are sometimes present (McCune and Yang 2022). However, these spores only disperse the fungal symbiont (Lepp 2012). Therefore, the spores produced by the apothecia and the conidia produced by the pycnidia are the most likely mode of dispersal for this species. In both cases, the fungal symbiont would need to find and capture the algal symbiont, in order to develop into crinkled rag lichen (Lepp 2012).

Like all lichens, this species becomes dormant when dry and grows and photosynthesizes when moist or wet. Therefore, its growth and productivity are linked to moisture in its environment (Naesborg 2021 pers. comm.). A major concern for this lichen species during its growth phase is air pollution sensitivity. It is considered a clean air indicator lichen and is not present in areas with high nitrogen air pollution. It is also considered an indicator of cool, maritime climate in western Oregon and Washington (Geiser and Neitlich 2007).

**Overview of ecological conditions for recovery, conservation, and viability** including Threats and Risk Factors

In California, this species has been found in areas with cool, coastal influence in the Klamath Ranges and North Coast bioregions in Del Norte and Humboldt counties (Carlberg 2003). None

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1909.12 Chapter 10, Section 12.53, components 7, 9, 10, 11 and 12, as appropriate.
of the four location records have a site quality (habitat quality) ranking. Crinkled rag lichen is the rarest *Platismatia* species in the Pacific Northwest, and in that region, it is never abundant in the locations where it occurs (Ponzetti 2006, NatureServe 2022). It is also uncommon in the few locations where it has been observed in California (Table 4). Based on the stability of the populations in the northern part of its distribution, crinkled rag lichen has a Global Rarity Rank of G4 (secure) (NatureServe 2022). In California, it has been assigned a State Rank of S1 (Stone 2003, ORBIC 2004, CNDDB 2022).

As three of the four known California occurrences are on public lands, the threat to this species is not considered high (Carlberg 2022 pers. comm., Dean et al. 2022). The most immediate threat to this species in the Pacific Northwest is the removal of its primary tree substrate, *Alnus rubra*, which is often cut or burned during forest management activities (Ponzetti 2006); known populations could be protected by restricting removal of host trees in nearby habitat (Carlberg 2022 pers. comm.). In addition, this species is sensitive to air pollution, although the locations where it has been observed in California are not close to major population centers with high levels of air pollution (Table 4). Another important long-term threat to crinkled rag lichen in California is climate change, which may cause decreased coastal summer fog while increasing coastal temperatures and fire frequency and severity (Fried et al. 2004, Torregrosa et al. 2014). As the coolest climate zones shrink, species such as this one may lose populations in the southernmost portion of their range (Geiser and Neitlich 2007). Predicted increases in fire frequency, especially in species-rich, old-growth stands, would worsen threats from climate warming and pollution (Geiser and Neitlich 2007).

**Taxonomy**

Table 3 summarizes this species or subspecies/variety’s name status in key literature.

<table>
<thead>
<tr>
<th>Entity</th>
<th>Name Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNDDB and CNPS</td>
<td>This species not included</td>
</tr>
<tr>
<td>USDA NRCS* PLANTS</td>
<td><em>Platismatia lacunosa</em> (Ach.) W. L. Culb. &amp; C. F. Culb.</td>
</tr>
</tbody>
</table>

\* Natural Resources Conservation Service [NRCS 2022]


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4 1909.12, Chapter 10, Section 12.53, component 1.
Species Account: *Platismatia lacunosa*


**Key literature**


**Literature cited**


[CCH2] Consortium of California Herbaria Portal 2. 2022. Data provided by the participants of the Consortium of California Herbaria and the California Phenology Thematic Collections


Species Account: *Platismatia lacunosa*


Species Account: *Platismatia lacunosa*


**Persons Contacted**
Carlberg, Tom. 2022. Lichenologist, Research Associate, California Academy of Sciences, and Botanist Six Rivers National Forest. Email correspondence regarding survey methods for lichens, locations and population sizes of *Platismatia lacunosa*, and CALS Sponsorship for *Platismatia lacunosa*. Personal communication 13 April 2021, 26 April 2021, and numerous times between February and August, 2022.

**Author(s) and Date:**
Ellen A. Dean, California Native Plant Society, Rare Plant Botanist, 30 September 2022

**Reviewer(s) and Date:**
R. Douglas Stone, California Native Plant Society, Associate Rare Plant Botanist, 27 April 2021;
Molly Wiebush, California Native Plant Society, Rare Plant Botanist Coordinator, 27 April 2021; Adam J. Searcy, California Native Plant Society, Rare Plant Scientific Coordinator, 28 September 2022.

**Formatting:** Form is set up as 508 compliant. Please use the “styles” if further formatting is necessary.

**Purpose:** This is to maintain the best available science on a species that could be used by the Forest Service in a variety of functions. Specifically, there would be additional steps and evaluations to determine whether or not this species would be considered a Species of
Conservation Concern under the 2012 Planning Rule or a Sensitive Species under the 1982 Planning Rule.
## Appendix 1: Known Occurrences

Table 4. Known Occurrences of crinkled rag lichen within California.

Duplicate records from the same site are given the same record number and are included in red. Rows containing questionable records are highlighted in pink.

<table>
<thead>
<tr>
<th>Rec. #</th>
<th>Locality</th>
<th>County</th>
<th>Quad</th>
<th>Ref. (Source)</th>
<th>Date Last Obs’d</th>
<th>Population Info</th>
<th>Threats</th>
<th>Land Mgr.</th>
<th>Elev. (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Six Rivers NF</td>
<td>Del Norte</td>
<td>Blue Creek Mtn. Quad (4112347)</td>
<td>NRIS 2020 (0510_52_PLLA6_2003_3); Carlberg 2022 pers. comm.</td>
<td>30-Jul-2003</td>
<td>Growing on alder litterfall. Collected from the ground. Unable to assess population size.</td>
<td></td>
<td>Six Rivers NF (Siskiyou Wilderness)</td>
<td>2000</td>
</tr>
<tr>
<td>4</td>
<td>&quot;Laurence Creek&quot; or Lawrence Creek [Lawrence Creek, 3.5 miles E of Headwaters Forest Reserve.]</td>
<td>Humboldt</td>
<td>Iaqua Buttes (4012368)</td>
<td>UC-JEPS Specimen Portal, Aug 2022 (UC1894067, UC977950); T. Carlberg 2022 pers. comm.</td>
<td>15-Sep-1930</td>
<td>On fir and alder trees.</td>
<td></td>
<td>Green Diamond Resource Company (Carlberg 2022 pers. comm.)</td>
<td>1100</td>
</tr>
</tbody>
</table>
Duplicate records from the same site are given the same record number and are included in red. Rows containing questionable records are highlighted in pink.

<table>
<thead>
<tr>
<th>Rec. #</th>
<th>Locality</th>
<th>County</th>
<th>Quad</th>
<th>Ref. (Source)</th>
<th>Date Last Obs’d</th>
<th>Population Info</th>
<th>Threats</th>
<th>Land Mgr.</th>
<th>Elev. (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Six Rivers NF [Data entry error. This is not <em>Platismatia lacunosa</em>]</td>
<td>Del Norte</td>
<td>Lonesome Ridge Quad (4112346)</td>
<td>NRIS 2020 (051052PLL A6_2003_3) ; Carlberg 2022 pers. comm.</td>
<td>30-Jul-2003</td>
<td>Six Rivers NF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Santa Cruz Mts.; Devil's Cañon [Devils Canyon] [This has been redetermined to <em>Cetraria stenophylla</em> by T. Carlberg (2022 pers. comm.)]</td>
<td>Santa Clara</td>
<td>CNALH, Aug. 2022 (WVA-L-0008212)</td>
<td></td>
<td>April 1930</td>
<td></td>
<td></td>
<td>2300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Castle Rock Ridge, Santa Cruz Mts. [This has been redetermined to <em>Cetraria stenophylla</em> by T. Carlberg (2022 pers. comm.)]</td>
<td>Santa Cruz</td>
<td>CNALH, Aug. 2022 (BUT-L-0800022)</td>
<td></td>
<td>1-Mar-1932</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No locality. [This has been redetermined by J. Lendemer at NY to &quot;not <em>Platismatia lacunosa</em>&quot; (T. Carlberg 2022, pers. comm.)]</td>
<td>Sierra Co.</td>
<td>CNALH, Aug. 2022 (NY3034094)</td>
<td></td>
<td>1874</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>John Minney Ranch near Etna, California. [This was a data entry error. The specimen is actually <em>Parmotrema crinita</em>.]</td>
<td>Siskiyou</td>
<td>CNALH, Aug. 2022 (F-C1005874F)</td>
<td></td>
<td>7-Nov-1945</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Duplicate records from the same site are given the same record number and are included in red. Rows containing questionable records are highlighted in pink.

<table>
<thead>
<tr>
<th>Rec. #</th>
<th>Locality</th>
<th>County</th>
<th>Quad</th>
<th>Ref. (Source)</th>
<th>Date Last Obs’d</th>
<th>Population Info</th>
<th>Threats</th>
<th>Land Mgr.</th>
<th>Elev. (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sisson [Mt. Shasta City]. [This has been redetermined as Esslingeriana idahoensis (T. Carlberg 2022 pers. comm.).]</td>
<td>Siskiyou</td>
<td></td>
<td>CNALH, Aug. 2022 (F-C1009309F)</td>
<td>27 Jul 1894</td>
<td>Bark of Betula; thallus black beneath.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>East Fork Public Camp [Six Rivers National Forest] [This has been redetermined by T. Carlberg as mix of Esslingeriana idahoensis and Platismatia norvegica (Carlberg 2022 pers. comm.).]</td>
<td>Trinity</td>
<td></td>
<td>CNALH, Aug. 2022 (F-C1009297F)</td>
<td>22-Jun-1939</td>
<td>On Pseudotsuga taxifolia</td>
<td></td>
<td>Six Rivers NF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>California [This location is too vague to be georeferenced]</td>
<td>unknown</td>
<td></td>
<td>CNALH, Aug. 2022 (O-143397)</td>
<td>1864</td>
<td>On trees</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2: Additional Considerations at the Forest Level

<This section, including the next 5 subheadings, would be filled out by Forest Service botanists.>

<Forest Name>

Geographic distribution within the Forest

A. Scarce or isolated
B. Patchy or gaps
C. Contiguous

<Select a geographic distribution rank and provide references or cite ‘specialist expertise, <name>’ where appropriate.>

Abundance of the species on the Forest

A. Rare – current abundance is low enough that stochastic and other factors could lead to potential imperilment.
B. Uncommon – current abundance is large enough that demographic stochasticity is not likely to lead to rapid local extinction, but, in combination with highly variable environmental factors, could pose a threat.
C. Common – current abundance is large enough that species persistence is not threatened by demographic stochasticity in combination with environmental variation.
D. Insufficient information to draw inferences about criterion.

<Select a species abundance rank and provide references or cite ‘specialist expertise, <name>’ where appropriate.>

Population trend on the Forest

A. Significant downward or suspected downward population trend.
B. Stable population.
C. Upward population trend.
D. Insufficient information to draw inferences about criterion.

<Select a population trend rank and provide references or cite ‘specialist expertise, <name>’ where appropriate.>

Habitat trend on the Forest

A. Decline in habitat quality or quantity.
B. Stable amounts of suitable or potential habitat, relatively unchanged habitat quality.
C. Improving habitat quality or increasing amounts of suitable or potential habitat.
D. Insufficient information to draw inferences about criterion.

<Select a habitat trend rank and provide references or cite ‘specialist expertise, <name>’ where appropriate.>
Vulnerability of habitat on the Forest

A. Substantial modification of habitat has occurred or is anticipated with conditions departing from expectations based on NRV, and/or habitat is impacted by modern stressors such as drought, climate change, high intensity wildfire and wildfire suppression disturbances, loss of natural openings due to historical wildfire suppression, nonnative invasive species, water impoundments and diversions, and recreation, etc.

B. Habitat modification is likely to result in ecological patterns similar to the range of historical conditions, but is being impacted by modern stressors.

C. Habitat resilient, changes are similar in frequency and intensity to those expected from NRV, and modern stressors not significant.

D. Insufficient information to draw inferences about criterion.

<Select a habitat vulnerability rank and provide references or cite ‘specialist expertise, <name>’ where appropriate.>

Additional Forest specific information related to the SCC determination

<This section is provided for Forest botanists to add additional Forest specific information that is not captured in the section above, if necessary. Provide a narrative description here of the additional relevant information. State “No additional information” if this section is not used.>