Plant Species Evaluation Form

Micranthes howellii (Greene) Small

HOWELL'S SAXIFRAGE

Family: Saxifragaceae (CNPS 2018)

PLANTS Symbol: SAHO4 (USDA 2018)

Calif. Endemic: No (CNPS 2018)

Synonyms/Other Names: *Saxifraga howellii* Greene (Tropicos 2018).

Identification Issues: Intermediates common between some species (*M. integrifolia, M. nidifica, M. fragosa*, and *M. aprica*) (Park 2018).

Taxonomy:

Species In Genus: +- 80 species: North America, Eurasia, South America, especially cool temperate northern hemisphere. Etymology: (Latin: small flower) Note: Intermediates common between *Micranthes integrifolia, Micranthes nidifica, Micranthes fragosa, Micranthes aprica*; some may be vegetatively reproducing, sterile hybrids. Study needed.

Genus Description Habit: Plant generally +- hairy, often glandular; caudex or rhizome generally not woody, generally scaly. Leaf: basal (cauline); blade linear to (ob)ovate or +- round, base tapered to reniform, margin entire or toothed. Inflorescence: flowers few to many; bracts scale-like. Flower: generally radial; hypanthium free or +- fused to ovary; petals 5, white, sometimes with yellow spots at base; stamens 10, filaments flat or variously inflated; pistils 1 (chambers 2, placentas 2, axile or occasionally proximally axile and distally marginal) or 2, ovary superior to +- inferior (sometimes more superior in fruit), styles free throughout. Fruit: capsule or 2 follicles.

Species Description Habit: Plant 5--20 cm; caudex slender, generally producing short rhizomes; bulblets 0. Leaf: 2--6 cm; petiole 1--4 cm; blade oblong to ovate, base tapered, teeth coarse, round or sharp. Inflorescence: open to dense; flowers 5--15. Flower: sepals reflexed, < petals, elliptic to ovate; petals 2.5--4.5 mm, +- obovate; filaments inflated proximally; pistils 2, ovary superior. Fruit: 2 follicles. eFlora Treatment Author: Michael S. Park

Status:

Note: Federally recognized Endangered, Threatened, Proposed, or Candidate species under the Endangered Species Act are omitted as they do not meet the definition of a Species of Conservation Concern (FSH 1909.12 § 12.52).

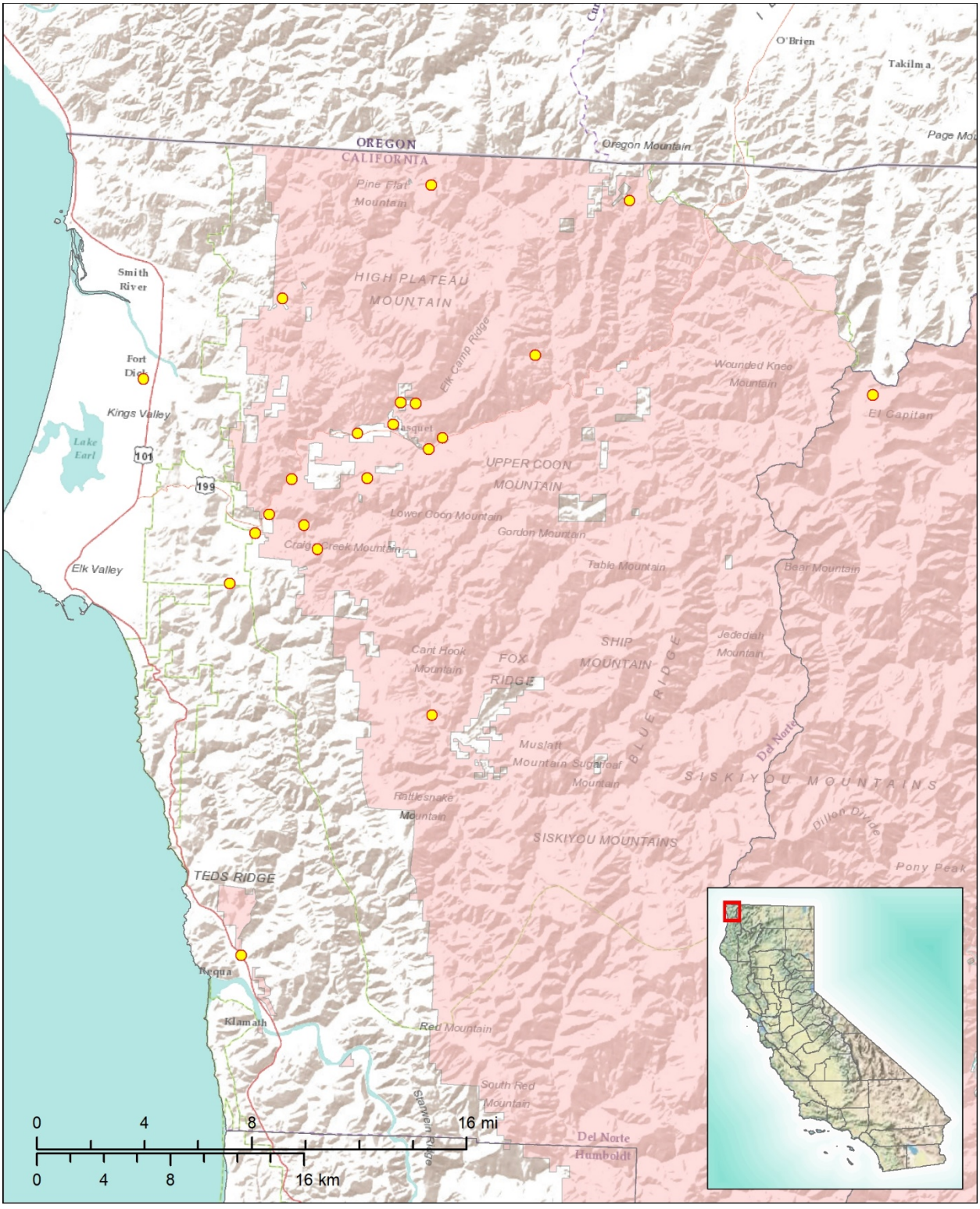
State Listing	G-rank	S-rank	CRPR	R5 FSS	NFP SM	CA BLM
CA: Not listed NV: Not listed OR: Not listed	G4	CA: S3 NV: Not listed OR: Not listed	4.3	Not listed	Not listed	Not listed

SWAP:	NNHP:	NNPS:	ORBIC:	OCS:	IUCN:
Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

Expanded abbreviations and citations: State Listing=California Endangered Species Act Listing (CDFW 2018b), Nevada Division of Forestry Fully Protected Plant Species (NAC 527) (NDF 2012), Oregon Department of Agriculture Listed Plants (ODA 2014); G-rank=Global Conservation Status (CDFW 2018a; NatureServe 2018); S-rank=Subnational (state or province-level) Conservation Status (CDFW 2018a; NatureServe 2018; NNHP 2017; ORBIC 2016); CRPR=California Rare Plant Rank (CNPS 2018); R5 FSS=USDA Forest Service Region 5 Regional Forester Sensitive Plant Species List (USDA 2013); NFP SM=Forest Service and Bureau of Land Management Northwest Forest Plan Survey and Manage Species (USDA 2001); CA BLM=California Bureau of Land Management Designated Sensitive Species (BLM 2010); SWAP=California State Wildlife

Action Plan Status (CDFW 2015); NNHP=Nevada Natural Heritage Program Status (NNHP 2017); NNPS=Nevada Native Plant Society Status (NNHP 2017); ORBIC=Oregon Biological Information Center Status (ORBIC 2016); OCS=Oregon Conservation Strategy Species (ODFW 2016); IUCN=International Union for Conservation of Nature Red List Status (IUCN 2017).

Distribution: Western North America – southwest Oregon (Coos, Curry, Douglas, Jackson, and Josephine counties) and northwest California. Occurrences in California are found in Del Norte (20/21; ~95%) and Siskiyou (1/21; ~5%) counties within the Klamath Ranges (KR) bioregion (CCH 2018; CPNWH 2018; Park 2018). A majority (14/21; ~67%) of California occurrences are located on NFS lands within Six Rivers NF (13/14; ~93%) and Klamath NF (1/14; ~7%). Questionable voucher records labelled as *M. howellii* have been collected on Modoc NF and Klamath NF (CCH 2018). Unreliable records are included on Excel location table and highlighted in pink.



Sources: *Distribution*: CCH 2017. *Layers*: USDA Forest Service, Pacific Southwest National Forests: CPAD 2016. California counties: CDF 2009. *Basemaps*: California inset map: © 2013 National Geographic Society, i-cubed (Esri 2017a). Main map: Esri, DeLorme, USGS, NPS (Esri 2012) and Esri, USGS, NOAA (Esri 2017b).

Locations within California:

Record numbers indicate sites that contain an individual, population, or groups of populations located within ¼ mile of each other, per the California Natural Diversity Database (CNDDB 2017) definition of Element Occurrences (EOs) in California. Official EO numbers for plants in California are determined solely by the CNDDB and are included within the Reference (Source) column for CNDDB data. Duplicate records from the same site are given the same record number and included in red. The Population Info column includes total number of individuals and total number and size of populations/sub-populations when provided. Elevations provided in meters from source have been converted to feet. If not provided in original source, Land Manager information was obtained using the California Protected Areas Database (CPAD 2016) and Quad information was obtained using 24K Quads, SDE Feature Class (CDFG 2013). All other information is directly from the Reference (Source) unless additional citation is given.

Rec. #	Locality	County	Quad	Reference (Source): CCH, Jan 2017	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
1	Hunter Creek, N of Requa.	Del Norte	Requa	HSC26846	13-Feb-1971				
2	South Fork Smith River Road (16N05), just N of Stevens Bridge.	Del Norte	Cant Hook Mtn.	HSC95998	2-Mar-2002			Six Rivers NF	
3	Near Smith River, S Fork, close to the town of Gasquet	Del Norte	Hiouchi	HSC50122	16-May-1979			Jedediah Smith Redwoods SP	152 m
4	South Fork Road.	Del Norte	Hiouchi	HSC100165	20-Feb-2010			Six Rivers NF	51 m
5	Smith River - Douglas Park, 8 miles east of Crescent City	Del Norte	Hiouchi	CAS-BOT-BC48144	21-Apr-1929				
6	South Fork of Smith River.	Del Norte	Hiouchi	HSC62418	26-Jan-1941			Six Rivers NF	
7	Along Craigs Creek Trail (1EO2) along South Fork of the Smith River.	Del Norte	Hiouchi	HSC100164	20-Feb-2010			Six Rivers NF	51 m
7	S Fork of the Smith River, S Fork Bridge	Del Norte	Hiouchi	HSC62479	6-Mar-1959				
7	mouth of Myrtle Creek (above Smith River, along Cal State Hwy #199)	Del Norte	Hiouchi	JEPS58567	23-Feb-1969			Six Rivers NF	106 m
8	North Fork Smith River, 5 miles S of Gasquet on Hwy 199	Del Norte	Hiouchi	RSA324475	21-Mar-1976			Six Rivers NF	76m
9	French Hill near Gasquet	Del Norte	Gasquet	CAS-BOT-BC48145	24-Apr-1907			Six Rivers NF	

Rec. #	Locality	County	Quad	Reference (Source): CCH, Jan 2017	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
9	French Hill, Gasquet	Unknown	Gasquet	GH381157	24-Apr-2007			Six Rivers NF	
10	Darlingonia, Smith River District - In rocks of steep ridge at junction of North and Middle Forks of Smith River	Del Norte	Gasquet	CAS-BOT-BC48143	15-Mar-1939			Six Rivers NF	91 m
10	1.5 mi. E of Gasquet, along Smith River.	Del Norte	Gasquet	HSC31764	4-Apr-1974				152 m
10	Smith River District Darlingtonia ("Kelly Jump Off" Trail, at junction of North and Middle Forks of Smith River); jct of North and Middle Forks of Smith River	Del Norte	Gasquet	JEPS22795	15-Mar-1939			Six Rivers NF	91 m
10	At jct. of North and Middle Forks of Smith River, at Darlingtonia, Smith River District	Del Norte	Gasquet	RSA23328	15-Mar-1939			Six Rivers NF	91m
10	Darlingtonia, Smith River, on "Kelly Jump-Off" Trail Smith River; Darlingtonia, Smith River	Del Norte	Gasquet	UC1052455	15-Mar-1939			Six Rivers NF	121 m
10	Darlingtonia, Smith River Smith River; Darlingtonia, Smith River	Del Norte	Gasquet	UC1541285	1-Mar-1939			Six Rivers NF	
11	Six Rivers National Forest, Panther Flat Campground, Smith River	Del Norte	Gasquet	HSC64853	13-Apr-1975			Six Rivers NF	152 m
12	Near Adams Station Waldo-Crescent City Road	Del Norte	Gasquet	CAS-BOT-BC48142	1-Apr-1927				
13	steep ridge at junction of North and Middle Forks of Smith River, at Darlingtonia, Smith River District	Unknown	Gasquet	GH381155	15-Mar-1939				91 m
13	near Gasquet (not far from Smith River)	Del Norte	Gasquet	JEPS24661	4-Mar-1936			Six Rivers NF	
13	Gasquet, Smith River Smith River; Gasquet, Smith River	Del Norte	Gasquet	UC1212181	4-Mar-1936			Six Rivers NF	

Rec. #	Locality	County	Quad	Reference (Source): CCH, Jan 2017	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
13	French Hill near Gasquet; French Hill	Del Norte	Gasquet	UC858755	24-Apr-1907			Six Rivers NF	
14	1 mi. N of Gasquet, E slope of Stony Creek.	Del Norte	Gasquet	HSC32788	13-Apr-1974			Six Rivers NF	244 m
15	Along Stony Creek, E from its junction with N Fork of the Smith River.	Del Norte	Gasquet	HSC1913	9-Apr-1970				
15	1 mi. N of Gasquet, Stony Creek bog.	Del Norte	Gasquet	HSC31767	13-Apr-1974				
15	Stony Creek Bog, 1 mi. N of Gasquet, N Fork Smith River.	Del Norte	Gasquet	HSC31784	13-Apr-1974				198 m
16	near Fort Dick	Del Norte	Crescent City	JEPS22310	15-Apr-1937				
17	Klamath National Forest, Siskiyou Wilderness, ca 4.5 km N of Preston Peak, Bell Echo Camp	Siskiyou	Polar Bear Mtn.	CAS-BOT-BC334234	14-Jun-2013			Klamath NF	1440 m
17	Bell Echo (Bell Echo Camp) in Youngs Valley.	Siskiyou	Polar Bear Mtn.	HSC60781	8-Jul-1968			Klamath NF	
18	Junction of 12-mile Creek and Old Gasquet Toll Rd.	Del Norte	Shelly Creek Ridge	HSC65175	11-Apr-1979			Six Rivers NF	
19	Low Divide Rd	Del Norte	High Divide	UCR138749	5-Apr-1997			Six Rivers NF	640 m
20	mouth of Patrick's Creek (at Smith River, along Cal. State Hwy #199); Smith River, Patrick's Creek	Del Norte	Shelly Creek Ridge	JEPS58566	23-Feb-1969			Six Rivers NF	121 m
21	Near Wimer Rd., close to the town of Gasquet.	Del Norte	High Plateau Mtn.	HSC50420	18-May-1979			Six Rivers NF	777 m

Distribution on National Forest System (NFS) Lands:

(Please see Reference column of Locations table above for references pertaining to Record Numbers indicated on NFS lands.)

National Forest System (NFS) lands	Record #s (from Locations table above)	CNDDB EOs	Non-CNDDB Records	Recent (seen in past 20 yrs.)	Historic (not seen in past 20 yrs.)	Most Recent Obs.	EOs/ Recs. (5 mile buffer)	Total Records on NFS lands
Angeles:	-	-	-	-	-	-	-	0
Cleveland:	-	-	-	-	-	-	-	0
Eldorado:	-	-	-	-	-	-	-	0
Inyo:	-	-	-	-	-	-	-	0
Klamath:	17	0	1	1	-	14-Jun-2013	-	1
Lake Tahoe Basin MU:	-	-	-	-	-	-	-	0
Lassen:	-	-	-	-	-	-	-	0
Los Padres:	-	-	-	-	-	-	-	0
Mendocino:	-	-	-	-	-	-	-	0
Modoc:	-	-	-	-	-	-	-	0
Plumas:	-	-	-	-	-	-	-	0
San Bernardino:	-	-	-	-	-	-	-	0
Sequoia:	-	-	-	-	-	-	-	0
Shasta-Trinity:	-	-	-	-	-	-	-	0
Sierra:	-	-	-	-	-	-	-	0
Six Rivers:	2, 4, 6, 7, 8, 9, 10, 11, 14, 18, 19, 20, 21	0	13	3	10	15-Mar-1939	8	13
Stanislaus:	-	-	-	-	-	-	-	0
Tahoe:	-	-	-	-	-	-	-	0
Totals:	N/A	0	14	4	10	N/A	8	14

Demographic and Population Trends: Total number of occurrences for this taxon were estimated using GIS tools and methods described by Green and Sims (2018). Population count and size estimate data are lacking for this taxon. All but four California occurrence records (17/21; 81%) are historic and have not been documented in the last 20 years (CCH 2017). Abundance and improved locality information are needed (CNPS 2018).

Life History: Perennial herb that blooms from March through May (CNPS 2018). Plants have basal leaves, are caudiciform, and short-rhizomatous (Park 2018). One source indicates that caudices of *M. howellii* are accompanied by small bulbils (Brouillet and Elvander 2009). Plants in the genus *Micranthes* are insect pollinated (CPC 2018).

Diversity: *Micranthes* is one of the largest genera (~75 species) in Heucheroideae (incl. *Boykinia, Darmera, Huechera, Jepsonia, Tellima, Tolmiea, Lithofragma, Mitella* and others) (Stevens 2001). The genus *Micranthes* is sorted among eight sections corresponding to separate lineages within its respective clade, as determined by combined ITS and cpDNA sequence data.

Micranthes howellii is a member of the nominotypical section *Micranthes* alongside *M. californica, M. integrifolia, M. marshallii, M. nidifica, M. oregana*, and others (Tkach et al. 2015).

Habitat: Moist rocky ledges and crevices in montane woodlands – sometimes associated with serpentine (Brouillet and Elvander 2009; CNPS 2018; Park 2018). Collection records indicate that *M. howellii* has a preference for seeping rock-faces, northerly facing slopes, rocky and open streamsides, wet and moss-covered rocks, shady forests, moist canyon walls, moss mats, sandstone cliffs, and road cuts (CPNWH 2018).

Habitat Status or Trend: Ecological niche modelling of *Micranthes* taxa confirms the hypothesis that arctic and alpine plants are more susceptible to the adverse impacts of climate change (Stubbs et al. 2018). Although *M. howellii* is not a high elevation or arctic taxon, most low elevation and range restricted taxa included in the study are projected to assume smaller distributions under future climate change scenarios (Brouillet and Elvander 2009; Park 2018; Stubbs et al. 2018; Stubbs pers. comm. 2018).

Capacity for the Species to Disperse: Dispersal capacity of *M. howellii* is unknown. Some *Micranthes* taxa with similar characteristics are circumpolar or circumboreal (i.e. *M. foliolosa*, *M. hieraciifolia*, and *M. nelsoniana*) in distribution (Brouillet and Elvander 2009; Stubbs et al. 2018).

Threats: High severity wildfire is a threat, resulting in canopy/shade removal and potentially incinerating moss and duff layer. Extended drought may also cause mortality (Kierstead pers. comm. 2021).

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Julie A. Kierstead, USDA Forest Service Region 5 Ecosystem Planning, 19 January 2021.

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.

Additional Considerations at the Forest Level: Habitat amount and juxtaposition of both the species and habitat locations.