

ATTACHMENT SS2

REGION 2 SENSITIVE SPECIES EVALUATION FORM

Species: *Botrychium lunaria* / Common Moonwort, Moonwort Grapefern

Criteria	Rank	Rationale	Literature Citations
<p>1 Distribution within R2</p>	B	<p>Common Moonwort occurs widely, but sporadically in the mountains of Colorado and Wyoming, and is known historically from the Black Hills of South Dakota (Great Plains Flora Assoc. 1986). In Colorado, Common moonwort is from Archuleta, Chaffee, Clear Creek, Conejos, Eagle, El Paso, Garfield, Grand, Hinsdale, Jackson, Lake, Larimer, Mineral, Montezuma, Park, San Juna, Summit, and Teller counties. Weber (1990) considers this species to be the most common one in its genus in Colorado. In Wyoming, <i>B. lunaria</i> is known from at least 16 populations in Albany, Big Horn, Johnson, Park, Sheridan, and Sublette counties. Most of these occurrences are in Shoshone, Bighorn, and Medicine Bow National Forests. Reports from the Black Hills NF in Wyoming have since proven to belong to <i>B. campestre</i>.</p> <p>Wyoming populations are often found in rock slides and high subalpine meadows. It is also found in <i>Picea</i> forests, <i>Abies lasiocarpa</i> forests, along stream margins, and at the edge of wet meadows growing out of moss under <i>Picea glauca</i>. Such habitats represent a variety of substrates and vegetation types that are extensive although discontinuous on the landscape, resulting in a patchy distribution, commonly found between 7000-11,200 feet in elevation.</p> <p>Note: Dorn (1992) included <i>B. minganense</i> as a variety of <i>B. lunaria</i> (var. <i>onondagense</i>), but treats these two taxa as separate in his 2001 flora (Dorn 2001).</p> <p>Confidence in Rank Medium</p>	<ul style="list-style-type: none"> • Colorado Natural Heritage Program 1999 • Dorn 1992 • Dorn 2001 • Great Plains Flora Assoc. 1986 • Hitchcock et al. 1969 • University of Wyoming 2001 • Weber 1990
<p>2 Distribution outside R2</p>	C	<p>Common moonwort ranges from Alaska to Greenland and south to California, northern Arizona, western Colorado, Alberta, Minnesota, and Pennsylvania (Wagner and Wagner 1993).</p> <p>Confidence in Rank High</p>	<ul style="list-style-type: none"> • Lellinger 1985 • Wagner and Wagner 1993
<p>3 Dispersal Capability</p>	C	<p><i>Botrychium</i> spp. reproduce by wind-borne spores. Common moonwort occurs in less specialized habitats than many other moonworts and may be less limited by habitat barriers.</p> <p>Confidence in Rank LOW</p>	<ul style="list-style-type: none"> • -

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4 Abundance in R2	B	This species is known from at least 16 locations in Wyoming, of which twelve are within the Rocky Mountain Region. Common moonwort is ranked S2 in Wyoming, but is no longer tracked as a species of special concern by the state heritage program. Like many moonworts, this species can be difficult to locate without experience and populations may be larger or more widely distributed than presently suspected. It is ranked S2S3 in Colorado (Colorado Natural Heritage Program 1999). Confidence in Rank LOW	<ul style="list-style-type: none"> • Colorado Natural Heritage Program 1999 • University of Wyoming 1998 • WYNDD 2002
5 Population Trend in R2	D	Not known. Confidence in Rank High	<ul style="list-style-type: none"> • -
6 Habitat Trend in R2	BA	The wet, open habitats ranging from mid to high elevations for this plant are most likely fairly stable. The lower elevation riparian habitats are vulnerable to effects from human activity in the watershed, including overgrazing, timber management, fragmentation from roads, and degradation due to human recreation. Confidence in Rank LOW	<ul style="list-style-type: none"> • University of Wyoming 2002
7 Habitat Vulnerability or Modification	BC	In Wyoming, most populations are secure due to their presence in remote areas and high elevations. At least 8 occurrences in Wyoming are protected within wilderness areas or RNAs. Habitats elsewhere within USFS R2 could be vulnerable to high recreation use, water development projects, grazing, or other habitat alterations. Confidence in Rank Medium	<ul style="list-style-type: none"> • University of Wyoming 2002

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Criteria	Rank	Rationale	Literature Citations
8 Life History and Demographics	D	<p>Common Moonwort is an herbaceous perennial that produces one vegetative leaf blade (frond) and one fertile frond joined to it. The sporangia produce spores that germinate to produce the gametophyte, a haploid life cycle stage.</p> <p>Members of the Ophioglossales are generally mycorrhizal, and many have been shown to exhibit season-long dormancy in which above-ground plant material is not produced each year. Members of the <i>Botrychium</i> subgenus <i>Botrychium</i> have often been shown to occur in "genus communities" of different species, further complicating demographic analysis. Many moonwort species are considered rare because of their limited distribution and habitat specificity, although in some cases this rarity may be an artifact of the difficulty inherent in locating and identifying these low-growing plants.</p> <p>Additional information on the species, including population structure, longevity, and mortality, are not available.</p> <p>Confidence in Rank High</p>	<ul style="list-style-type: none"> Wagner and Wagner 1983
Initial Evaluator(s): Bonnie Heidel, Walter Fertig and Scott Laursen			Date: February 7, 2002

National Forests in the Rocky Mountain Region where species is KNOWN (K) or LIKELY(L)¹ to occur:

¹ Likely is defined as more likely to occur than not occur on the National Forest or Grassland. This generally can be thought of as having a 50% chance or greater of appearing on NFS lands.

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<u>Colorado NF/NG</u>	Known	Likely	<u>Kansas NF/NG</u>	Known	Likely	<u>Nebraska NF/NG</u>	Known	Likely	<u>South Dakota NF/NG</u>	Known	Likely	<u>Wyoming NF/NG</u>	Known	Likely
Arapaho-Roosevelt NF	X		Cimmaron NG			Samuel R. McKelvie NF			Black Hills NF			Shoshone NF	X	
White River NF						Halsey NF			Buffalo Gap NG			Bighorn NF	X	
Routt NF	X					Nebraska NF			Ft. Pierre NG			Black Hills NF		
Grand Mesa, Uncompahgre, Gunnison NF	X					Ogalala NG						Medicine Bow NF	X	
San Juan NF	X											Thunder Basin NG		
Rio Grande NF	X													
Pike-San Isabel NF														
Comanche NG														

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