

ATTACHMENT SS2

*REGION 2 SENSITIVE SPECIES EVALUATION FORM*

Species: <i>Epipactis gigantea</i> Dougl. ex Hook. / Giant Helleborine, Stream Orchid / EPGI			
Criteria	Rank	Rationale	Literature Citations
1 Distribution within R2	A	Found in 27 scattered localities in Colorado, with only one location on FS administered land and at a single disjunct location in South Dakota. Listed as S1 in SD and WY and S2 in CO.  Confidence in Rank <b>High</b>	<ul style="list-style-type: none"> <li>• PLANTS, NRCS, 2001</li> <li>• NatureServe, 2001</li> <li>• Spackman et al, 1997</li> <li>• BHNF Sensitive Plant Monitoring, 2000, 2001</li> <li>• Burkhart and Ebbert, 2001</li> <li>• Fertig, Wyoming Rare Plant Field Guide</li> <li>• Hornbeck et al., 2002</li> </ul>
2 Distribution outside R2	B	Although <i>Epipactis gigantea</i> is widespread outside of Region 2, it tends to be localized in distribution and the populations are frequently small. Therefore, it is ranked B, even though it is found in most of the states west of Louisiana and in British Columbia, Canada. The population genetics studied to this point indicate that a large proportion of the genetic variation in the species occurs between populations. This indicates that each population acts essentially independently, and can be quite different from other populations. Confidence in Rank <b>High</b>	<ul style="list-style-type: none"> <li>• NatureServe, 2001</li> <li>• PLANTS, NRCS, 2001</li> <li>• Thornhill, 1996</li> </ul>
3 Dispersal Capability	B	Orchids produce small, lightweight seeds that can travel well over 1000 miles, but the appropriate habitats are limited in the Black Hills, and Colorado, and are apparently absent elsewhere in Region 2. It also can reproduce vegetatively by rhizomatous shoots that form large clonal raments. Seeds are probably dispersed by wind or water and require an endomycorrhizal symbiont for germination to occur. The closest locations to the SD population are several hundred miles to the NW in WY and over 400 miles to the SW in Colorado, therefore seed dispersal into and from these areas is probably limited.  Confidence in Rank <b>Medium</b>	<ul style="list-style-type: none"> <li>• Smith, 1993</li> <li>• Colorado Natural Heritage Program, 2001</li> <li>• Luer, 1975</li> <li>• Brunton, 1986</li> <li>• Dressler, 1981</li> <li>• Prendergast, 1994</li> <li>• Smith and Read, 1997</li> </ul>
4 Abundance in R2	A	The population in South Dakota is large, but is scattered along ~2 miles of wetlands along Cascade Creek, most of which is located on the Nature Conservancy's Whitney Preserve. The main concentration is located on FS administered land at Cascade Springs. An estimated 3,200 – 4000 plants were found at Cascade Springs in 2001. The size of the sites in Colorado is unknown but of the 27 sites only one population is located on FS administered land. Confidence in Rank <b>High</b>	<ul style="list-style-type: none"> <li>• BHNF Sensitive plant monitoring, 2000, 2001</li> <li>• Burkhart and Ebbert, 2001</li> <li>• Colorado Natural Heritage Program, 2001</li> </ul>

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5 Population Trend in R2	A/D	Specific population trends are not known. The South Dakota population is being monitored each year by the BBNF and monitoring has begun along Cascade Creek on Nature Conservancy owned lands as well. Noxious weed invasion and recreation are potential risks for the SD population. Confidence in Rank <b>High</b>	<ul style="list-style-type: none"> <li>• NatureServe, 2001</li> <li>• Burkhart and Ebbert, 2001</li> </ul>
6 Habitat Trend in R2	A	This plant is strongly associated with thermal springs in the mountainous and northern parts of its range, but it does occur in seeps and bogs that are subject to freezing on the Colorado Plateau. In the Black Hills it appears to prefer open, early to mid-successional flood bench habitats along the creek and moist open areas associated with the springs, the creek's steep, shady banks and sedge meadows. Any development that alters the water table or disturbs the habitat could be detrimental to the species. This site has had moderate disturbance by people using the springs for over 75 years and the population has persisted. Confidence in Rank <b>Medium</b>	<ul style="list-style-type: none"> <li>• NatureServe, 2001</li> <li>• BBNF Sensitive plant monitoring, 2000, 2001</li> <li>• Mancuso, 1991</li> <li>• Mantas, 1993</li> <li>• Fowler, 1995</li> <li>• Bessey, 1898</li> <li>• Hornbeck et al., 2002</li> </ul>

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7 Habitat Vulnerability or Modification	A	<p>Habitat in SD limited to one location. The occurrence in the Black Hills is probably due to the presence of constant moisture provided by the springs, therefore it is unlikely to survive anywhere else in the Black Hills, though potential habitats may occur in bogs, seeps and springs elsewhere in the region. Primary risks are recreation, weed invasion and erosion. Developments that alter the availability of surface water are also potential risks. Seasonal and episodic flooding of Cascade Springs and downstream habitats along Cascade Creek can dislodge streamside vegetation, scour streamside terraces, collapse stream banks and reroute portions of the creek. Development along private property to the north and south of Cascade Springs, such as development of subdivisions, housing or roads and any resulting pollution and/or erosion could adversely affect the orchids habitat. Risks from recreation include, new road and trail construction, trampling, bank destabilization, harmful weed control and mowing in the riparian zone. Recreation has occurred in this area for over 75 years and the plants have persisted. Recent management has redesigned facilities to direct human activities away from sensitive species and fragile riparian areas (Poppert, pers. com.). Although this species has persisted during periods of heavy human use in the past and may even benefit from intense episodic disturbance it is not likely to persist with ongoing disruption of its habitat. In 2001, West Hell Canyon fire burned 10,547 acres of forest and grassland 3 to 9 miles NW of Cascade Creek and could cause erosion of the areas highly erosive soils and increase siltation into the creek during subsequent spring flood events. Collecting orchids is popular, and over collecting of <i>Epipactis gigantea</i> may pose a risk to the plants survival (this practice has not been observed at the SD site in 2000 or 2001). Noxious weeds are also a risk in this area and in 2000 an integrated weed management program was implemented to curtail weed expansion. Although this species is widespread and locally abundant in CO, it is generally in decline due to habitat loss from alteration of riparian areas, seeps and springs.</p> <p>Confidence in Rank <b>Medium</b></p>	<ul style="list-style-type: none"> <li>• NatureServe, 2001</li> <li>• Ode in Expert Interview Summary, 2000</li> <li>• Colorado Natural Heritage Program, 2001</li> <li>• Hornbeck et al., 2002</li> <li>• Marriot, 1993</li> </ul>
8 Life History and Demographics	A	<p>This species can reproduce by seed and vegetatively by rhizomatous shoots. The pattern of genetic diversity in <i>Epipactis gigantea</i> indicates that each population is evolving and reproducing independently – there appears to be little genetic interaction between populations. This may prohibit or restrict the success of reestablishment of a population if it is extirpated, and the loss of any given population may reduce the overall genetic diversity of the species. Mutualistic relationships between the orchid and insect pollinators and mycorrhizal fungi likely occur in the SD population and impacts to its pollinators or fungal associates could negatively affect the populations.</p> <p>Confidence in Rank <b>High</b></p>	<ul style="list-style-type: none"> <li>• Thornhill, 1996</li> <li>• Hornbeck et al., 2002</li> </ul>

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Evaluator(s):		Reed Wight Crook – Botanist, Black Hills National Forest Darcie J. Bacon – Botanist, Black Hills National Forest	Date: 27 Nov. 2001 Updated July 26, 2002

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

Species Name: <i>Epipactis gigantea</i> Dougl. ex Hook. / Giant Helleborine, Stream Orchid / EPGI											
<u>Colorado NF/NG</u>		<u>Kansas NF/NG</u>		<u>Nebraska NF/NG</u>		<u>South Dakota NF/NG</u>		<u>Wyoming NF/NG</u>			
Known	Likely	Known	Likely	Known	Likely	Known	Likely	Known	Likely	Known	Likely
		Cimarron NG				Samuel R. McKelvie NF		X		Shoshone NF	
						Halsey NF				Bighorn NF	
						Nebraska NF				Black Hills NF	
	X					Ogalala NG				Medicine Bow NF	
	X									Thunder Basin NG	

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References

Bessey, Charles E. 1898. The southern maidenhair fern in the Black Hills of South Dakota. Botanical Gazette. September 1898: 211.

Brunton, Daniel F. 1986. Status of the Giant Helleborine, *Epipactis gigantea* (Orchidaceae) in Canada. Canadian Field-Naturalist. 100(3): 414-417.

Burkhart, B. and Ebbert, E. 2001. Monitoring Plan Development and implementation for Selected Sensitive Species along Cascade Creek. Prepared for the South Dakota Department of Game, Fish and Parks.

<sup>1</sup> 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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- Colorado Natural Heritage Program. 2001. *Epipactis gigantea* Element Occurrence and Plant Characterization Abstracts as of 13 June 2001. Fayette, K; Adair, C. (eds.). Fort Collins, CO: Colorado Natural Heritage Program. 10 p.
- Dressler, R. 1981. The Orchids: Natural History and Classification. Cambridge, Massachusetts: Harvard University Press. X p.
- Fertig, Walter. 1994. Wyoming rare plant guide. The Wyoming Rare Plant Technical Committee. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/tools/wyplant/wyplant.htm> (Version 16JUL97).
- Fowler, James F. 1995. Biogeography of hanging gardens on the Colorado Plateau. Laramie, Wyoming: University of Wyoming. 209 pages plus abstract, pages i-v and appendices. Dissertation.
- Hornbeck, J.; Reyher, D; Sieg, C.H. 2002. Species Assessment Stream Orchid (*Epipactis gigantea* Dougl. Ex Hook) in the Black Hills National Forest. Prepared for the USDA Forest Service, Black Hills National Forest.
- Luer, Carlyle A. 1975. The native orchids of the United States and Canada excluding Florida. New York: New York Botanical Garden. X p.
- Mancuso, Michael. 1991. Field investigation of *Epipactis gigantea* (giant helleborine), a region 4 sensitive species, on the Payette National Forest. Unpublished report on file at the Idaho Department of Fish and Game, Conservation Data Center, Boise. 12 p. plus appendices.
- Mantas, Maria. 1993. Ecology and reproductive biology of *Epipactis gigantea* Dougl. (Orchidaceae) in northwestern Montana. Moscow, Idaho: University of Idaho. 73 p. Thesis.
- Marriott, Hollis J. January 12, 1993. Letter from the Nature Conservancy, Wyoming Field Office to Roberta Moltzen, Black Hills National Forest Supervisor. Laramie, Wyoming: Wyoming Nature Conservancy. 7 leaves. On file at: U.S. Department of Agriculture, Forest Service, Black Hills National Forest, Custer, SD.
- Nature Serve Explorer: An online encyclopedia of life [web application]. 2001. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: <http://www.natureserve.org/explorer>. Accessed between (November 20, 2001 and December 10, 2001).
- Prendergast, G. 1994. Growing *Epipactis* species from seeds at Kew. The Orchid Review. 102: 199-203.
- Smith, S. E.; Read, D. J. 1997. Mycorrhizal symbiosis. San Diego, California: Academic Press. X p.
- Smith, W.R. 1993. Orchids of Minnesota. University of Minnesota Press. Minneapolis, MN.
- Spackman, S., Jennings, B., Coles, J., Dawson, C., Minton, M., Kratz, A., and Spurrier, C. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish and Wildlife service by the Colorado natural Heritage Program.
- Thornhill, A.D. 1996. Species and population-level patterns of genetic variation in *Epipactis gigantea* (Orchidaceae), with examination of local genetic and clonal structure in riparian and bog populations inferred from allozyme analysis. Irvine, California: University of California. Dissertation. 73p.

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USDA Forest Service. 2000. Expert Interview Summary for the Black Hills National Forest Land and Resource Management Plan Amendment. Custer, SD.

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

