STATUS REVIEW OF *Epipactis gigantea*

U.S.D.A. FOREST SERVICE - REGION 1

FLATHEAD NATIONAL FOREST

MONTANA

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I. SPECIES INFORMATION

A. CLASSIFICATION

1. SCIENTIFIC NAME: *Epipactis gigantea* Dougl. ex Hook.
2. COMMON NAME: giant helleborine, chatterbox.
3. FAMILY: *Orchidaceae* (Orchid Family).
4. GENUS: *Epipactis gigantea* is one of approximately a dozen species in the genus that occur in temperate areas. Two of these species occur in North America, while the rest are found in Eurasia. A species native to Europe, *Epipactis helleborine* (helleborine) has escaped cultivation and become established in both eastern and western North America (Williams and Williams, 1983). In the west it is found in Victoria, Vancouver Island, Canada and Lewis and Clark County Montana (Hitchcock et al., 1964).
5. SPECIES: *Epipactis gigantea* was first described by Douglas in 1839 as occurring in the subalpine regions of the Blue and Rocky Mountains of northwest North America (Hitchcock et al., 1964). It is found in seepage areas and along streambanks, and is predominantly associated with thermal waters (especially along the northern edge of its range). *Epipactis helleborine* is similar in form, but differs in having smaller flowers and a smaller, unlobed lip, and is established more often in disturbed areas.

B. PRESENT LEGAL OR OTHER FORMAL STATUS

1. FEDERAL STATUS

a. U.S. FISH AND WILDLIFE SERVICE: *Epipactis gigantea* currently has no designation.

b. U.S. FOREST SERVICE: The U.S. Forest Service list of sensitive species for Region 1 (Northern Region) currently includes *Epipactis gigantea* (USDA Forest Service, 1988). Objectives and policy of the U.S. Forest Service provide for the management and protection of sensitive species under sections 2670.22 and 2670.32 in the 1984 Forest Service Manual. Under these guidelines the Forest Service is to: (a) "(m)aintain viable populations of all native species of plants" (2670.22), and to (b) "(a)void or minimize impacts to species whose viability has been identified as a concern" (2670.32.3).
2. **STATE:** *Epipactis gigantea* is currently listed by the Montana Natural Heritage Program as "apparently secure globally, though it may be quite rare in parts of its range" (over 100 occurrences; global rank = G4). In Montana, it is listed as "endangered in state" (6-20 occurrences; state rank = S2). These Heritage Program ranks do not provide any direct legal protection for this species.

C. **DESCRIPTION**

1. **GENERAL NONTECHNICAL DESCRIPTION:** Giant helleborine (*Epipactis gigantea*) is a tall orchid with leafy stems, which reach 3 feet in height. Abundant sword-shaped leaves, to 8 inches long, clasp the tall, usually unbranched stems. Numerous flowers are borne in a leafy-bracted inflorescence at the tops of stems. Flowers have a sac-like lip petal that is reddish-brown. The two upper lance-shaped petals are also reddish brown, but with a greenish tinge. Three lance-shaped sepals subtend the flowers and are light green with a brownish tinge. *Epipactis gigantea* is a perennial plant that grows from a rhizome each year. In Montana this species usually flowers in June or July. Capsules ripen later in the season, and release many thousands of tiny seeds before the stems die back to the rhizomes to overwinter. See Section V, pp. 37-42, for color photos of plants and habitat.

2. **TECHNICAL DESCRIPTION:** Stems 1 to many from short rhizomes, mostly 3-7 (up to 12) dm. tall; leaves numerous, sheathing, the lowest blades almost lacking, gradually enlarged upwards, almost glabrous to scabridulous-puberulent, broadly elliptic-lanceolate, mostly 7-14 (19) cm. long and 1.5-5 (7) cm. broad; flowers 3-15, rather showy, raceme usually secund, bracts usually reduced upwards, but even the uppermost one usually exceeding the ovary; sepals coppery-green, lightly brownish-veined, 12-16 mm. long; petals similar to the sepals, but thinner, and (at least venation) more brownish-purple; lip 15-20 mm. long, the sac with prominent, raised, purplish lines leading to the base, three-lobed, outer (basal) lobes prominent, porrect, the blade (central lobe) about as long as the basal lobes, curved downward somewhat, triangular-ovate, tip flattened but with uprolled margins, greenish-yellow, basal portion much thickened, yellow, the margins thickened and erect, with
numerous linear callosities leading into the sac; column 6-9 mm. long; anther 4-5 mm. long; capsule reflexed, 2-3.5 cm. long (adapted from Hitchcock et al., 1964).

3. LOCAL FIELD CHARACTERS: Epipactis gigantea is distinguished by its tall leafy stems and numerous-flowered racemes. However, the reddish-green flowers blend in with background vegetation and are not easily noticed. Except for E. helleborine, no other species resembles E. gigantea.

As stated above, E. helleborine has escaped from cultivation and become established in Montana in Lewis and Clark County. It is distinguished from E. gigantea by its smaller flowers, and a smaller, unlobed lip.

D. GEOGRAPHICAL DISTRIBUTION

1. RANGE: Epipactis gigantea is widely distributed from British Columbia south to Baja California, east to the Rocky Mountains and south to Mexico (Brunton, 1986). However, populations within this large area are sparse. Within Region 1 of the U.S. Forest Service, it has been located on the Flathead National Forest in Montana. A distribution map for E. gigantea within Montana is in Figure 1, p. 4.

2. CURRENT SITES (MONTANA): The 1988 field surveys in Montana revealed five previously unknown occurrences for E. gigantea. This brings the total number of recently documented sites in Montana to ten. Six populations are recorded from Lake County, two from Flathead County, one from Carbon County, and one from Granite County. The legal descriptions, latitude and longitude, elevations, USGS topographic map names, and locations of sites in Montana are provided in Table 1, pp. 5-6. This table is broken down into sections; Table 1A contains those sites that occur wholly or partially on U.S. Forest Service lands, and Table 1B contains sites that occur on lands of other ownership. Complete Element Occurrence records on these sites are found in Section IV, pp. 19-29. Also, the exact locations are indicated on the maps provided in Section IV, pp. 30-36. Field surveys were conducted in 1984 by Peter Lesica (The Nature Conservancy) and by the author on 5-14 July 1988.

Throughout this report, the three-digit occurrence numbers are indicated in parentheses after the site
Figure 1. Distribution of Epipactis gigantea populations in Montana.

- ▲ = historical populations
- ● = extant populations (Note: Numbers are used where more than one population is represented by a dot.)
Table 1A. *Epipactis gigantea* locations wholly or partially occurring on U.S. Forest Service lands, Lake County, Montana.

<table>
<thead>
<tr>
<th>Occurrence number</th>
<th>Site name</th>
<th>COUNTY:</th>
<th>Township &amp; Range</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Elevation</th>
<th>USGS Quad</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>SWAN RIVER</td>
<td>LAKE</td>
<td>024N018W, Sec 01</td>
<td>47°51'48&quot;</td>
<td>113°52'09&quot;</td>
<td>3105</td>
<td>CILLY CREEK</td>
<td>SWAN RIVER VALLEY, 1.7 AIR MILES WEST OF ST. HWY 83, 0.35 AIR MILES SSE. OF PORCUPINE CREEK, CA. 4 MILES SSW. OF SWAN LAKE.</td>
</tr>
<tr>
<td>005</td>
<td>SWAN LAKE</td>
<td>LAKE</td>
<td>025N018W, Sec 11</td>
<td>47°56'23&quot;</td>
<td>113°51'02&quot;</td>
<td>3200</td>
<td>SWAN LAKE</td>
<td>NORTH END OF SWAN VALLEY, ABOUT 0.7-1.1 AIR MILES NORTHWEST TO NNE OF SWAN LAKE (TOWN), ADJACENT TO ST. HWY 83 AND FLATHEAD N.F. RD. 9508.</td>
</tr>
<tr>
<td>008</td>
<td>BOND CREEK</td>
<td>LAKE</td>
<td>025N017W, Sec 18</td>
<td>47°55'23&quot;</td>
<td>113°48'32&quot;</td>
<td>3400</td>
<td>SWAN LAKE</td>
<td>CA. 2 AIR MILES EAST OF SWAN LAKE, CA. 1.8 MILES EAST OF HIGHWAY 83 ON BOND CREEK TRAIL, EAST AND WEST OF TRAIL 0.1 MILE.</td>
</tr>
<tr>
<td>011</td>
<td>LOWER FATTY CREEK</td>
<td>LAKE</td>
<td>024N018W, Sec 11</td>
<td>47°50'53&quot;</td>
<td>113°51'45&quot;</td>
<td>3110</td>
<td>CILLY CREEK</td>
<td>CA. 5.3 AIR MILES SW OF SWAN LAKE, CA. 1.5 MILES WEST OF HIGHWAY 83 ON PORCUPINE CREEK ROAD, SOUTH 3.1 MILES ON LOWER FATTY CREEK ROAD; WEST OF ROAD.</td>
</tr>
</tbody>
</table>
Table 1B. *Epipactis gigantea* locations on areas other than U.S. Forest Service lands.

<table>
<thead>
<tr>
<th>Occurrence number</th>
<th>Site name</th>
<th>County</th>
<th>Township &amp; Range</th>
<th>Section</th>
<th>Subsection/additional sections</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Elevation</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>NIMROD WARM SPRINGS</td>
<td>GRANITE</td>
<td>011N015W</td>
<td>14</td>
<td>SW%</td>
<td>46.3219</td>
<td>113.2716</td>
<td>3760</td>
<td>NIMROD WARM SPRINGS, ALONG NORTH SIDE OF CLARK FORK RIVER CA. 30 MI. EAST OF MISSOULA (ADJACENT TO &quot;BYRNE&quot;-USGS MAP).</td>
</tr>
<tr>
<td>003</td>
<td>BLUEWATER SPRING</td>
<td>CARBON</td>
<td>006S024E</td>
<td>15</td>
<td>SW%</td>
<td>45.1840</td>
<td>108.4625</td>
<td>4100</td>
<td>ALONG NORTH FORK BLUEWATER CREEK AROUND BLUEWATER SPRING; ABOUT 2.0 AIR MILES SOUTHEAST OF BLUEWATER FISH HATCHERY AND 6 MILES EAST OF BRIDGER.</td>
</tr>
<tr>
<td>006</td>
<td>ECHO LAKE</td>
<td>FLATHEAD</td>
<td>028N019W</td>
<td>34</td>
<td>SW%</td>
<td>48.0823</td>
<td>113.5920</td>
<td>3120</td>
<td>ALONG ROAD TO JEWEL BASIN (FLATHEAD NF RD 5392), CA. 6.5 AIR MILES NE OF BIGFORK, CA. 2 MILES EAST OF ECHO LAKE.</td>
</tr>
<tr>
<td>007</td>
<td>LOWER GRASSY CREEK</td>
<td>LAKE</td>
<td>025N018W</td>
<td>13</td>
<td>SE%W%W%W%, NE%SW%W%</td>
<td>47.5556</td>
<td>113.4950</td>
<td>3260</td>
<td>CA. 0.6 MILE NE OF HIGHWAY 83 AT SWAN LAKE, ALONG THE GROOM CREEK ROAD, SE OF ROAD.</td>
</tr>
<tr>
<td>009</td>
<td>KRAUSE BASIN ROAD</td>
<td>FLATHEAD</td>
<td>028N019W</td>
<td>28</td>
<td>E%NE%</td>
<td>48.0951</td>
<td>114.0037</td>
<td>3260</td>
<td>CA. 14 AIR MILES EAST OF KALISPELL; CA. 1.8 MILES EAST OF FOOTHILL ROAD, ON LOWER KRAUSE BASIN ROAD, SOUTH OF ROAD.</td>
</tr>
<tr>
<td>010</td>
<td>STOPPER CREEK</td>
<td>LAKE</td>
<td>025N018W</td>
<td>27</td>
<td>SE%W%W%W%, NE%SW%W%</td>
<td>47.5416</td>
<td>113.5225</td>
<td>3100</td>
<td>CA. 2 AIR MILES SW OF SWAN LAKE. TRAVEL 1.5 MILES WEST OF HIGHWAY 83 ON PORCUPINE CREEK ROAD, CA. 1.3 MILES NORTH ON YEW CREEK ROAD.</td>
</tr>
</tbody>
</table>
names; these correspond to the occurrence numbers provided in the tables and computer print-outs.

3. **HISTORICAL SITES (MONTANA):** One location of *E. gigantea* is documented by a voucher specimen collected in 1912, and annotated by L.A. Mehrhoff in 1977. The existing data on this site, Yellow Bay (004), is summarized in Section IV, p. 22 (Element Occurrence records). Information on this record is incomplete, and only a general location is given. This record was unmappable as a specific point, but is marked as occurring on the USGS Woods Bay and Bull Island quadrangle maps. This historical location is indicated in Figure 1, p. 4.

Also, it has been reported as occurring in Glacier National Park (Lesica, 1985), but the exact location is unknown.

4. **AREAS SURVEYED BUT SPECIES NOT LOCATED:** The following areas in Lake and Flathead counties were searched in 1988, but no populations of *E. gigantea* were located. The actual areas surveyed were often smaller than the portions of the sections indicated. The list is organized by township, range and section number, and all sites are on Flathead National Forest land unless marked otherwise.

**LAKE COUNTY**

- T23N, R18W, SEC 13 SE¼ OF SW¼ (PRIVATE)
- T23N, R18W, SEC 24 NE¼ OF NW¼
- T23N, R18W, SEC 24 NW¼ OF NW¼ (STATE)
- T24N, R17W, SEC 20 SE¼ OF NE¼ (STATE)
- T24N, R17W, SEC 21 SE¼ OF SW¼ (STATE)
- T24N, R18W, SEC 13 NE¼ OF SW¼
- T25N, R17W, SEC 18 S½ OF NW¼
- T25N, R17W, SEC 30 NW¼
- T25N, R17W, SEC 31 SW¼ OF SE¼
- T25N, R17W, SEC 6 SW¼ OF SW¼
- T25N, R18W, SEC 13 SE¼ OF NE¼
- T25N, R18W, SEC 16 SW¼ OF SE¼
- T25N, R18W, SEC 21 E½ OF NE¼ (½ PRIVATE)
- T25N, R18W, SEC 22 SW¼ OF SW¼
- T25N, R18W, SEC 3 NE¼
- T25N, R18W, SEC 34 W½ OF SE¼
- T25N, R18W, SEC 4 SW¼ OF SW¼
- T25N, R18W, SEC 5 SE¼ OF NW¼
- T25N, R18W, SEC 6 NW¼ OF NE¼, NE¼ OF NW¼
- T26N, R18W, SEC 34 SW¼ OF SW¼
- T26N, R19W, SEC 30 SE¼ OF SE¼
- T26N, R19W, SEC 36 NE¼ OF NE¼
FLATHEAD COUNTY

T27N, R18W, SEC 19 NE 4 OF SW 4, SE 4 OF NW 4
T27N, R18W, SEC 30 S 4 OF SW 4
T27N, R19W, SEC 3 NW 4 OF NE 4 (STATE)
T28N, R19W, SEC 15 NW 4 OF SW 4
T28N, R19W, SEC 16 SE 4
T29N, R19W, SEC 2 NE 4 OF SE 4
T30N, R19W, SEC 16 NE 4 OF NE 4
T30N, R19W, SEC 25 NE 4 OF NE 4
T30N, R19W, SEC 26 SW 4 OF SW 4
T30N, R19W, SEC 27 NE 4 OF SE 4
T30N, R19W, SEC 9 SW 4 OF SE 4
T31N, R18W, SEC 6 NW 4 OF NW 4
T31N, R20W, SEC 19 E 4 OF NE 4
T31N, R20W, SEC 20 S 4 OF NE 4
T31N, R20W, SEC 3 NW 4; SEC 4 NE 4
T31N, R21W, SEC 13 SE 4 OF NW 4
T31N, R21W, SEC 24 NW 4 OF SE 4
T32N, R18W, SEC 31 SE 4 OF SW 4
T32N, R20W, SEC 31 NW 4
T32N, R20W, SEC 34 W 4
T32N, R20W, SEC 7 SW 4
T32N, R21W, SEC 36 SE 4 OF NE 4

E. HABITAT

1. ASSOCIATED VEGETATION: Epipactis gigantea usually occurs in moist seeps, sometimes in calcareous soils and, often in areas of high vegetation cover, but usually where overstory cover is low. These sites are highly variable with respect to vegetation components and associated species. For example, sites in the Swan Valley are surrounded by forests composed of Picea engelmannii and Betula papyrifera, while the Nimrod Warm Springs (001) site is surrounded by shrubland, with a sparse cover of Pinus ponderosa and Pseudotsuga menziesii (Douglas fir). Furthermore, the Bluewater Spring (003) site is surrounded by sagebrush grassland. A list of species found associated with E. gigantea at the various sites follows:

Alnus incana ...................... (thinleaf alder)
Aster occidentalis ............... (western aster)
Betula glandulosa ................ (bog birch)
Betula papyrifera .............. (paper birch)
Carex comosa ................. (bristly sedge)
Carex flava .................... (yellow sedge)
Centaurea maculosa ............ (spotted knapweed)
Cornus stolonifera ............ (red osier dogwood)
Equisetum arvense .......... (field horsetail)
Habenaria dilatata .......... (white bog-orchid)
Helianthus nuttallii ...... (Nuttall's sunflower)
Menyanthes trifoliata ...... (buckbean)
Mimulus guttatus .......... (common monkey-flower)
Picea engelmannii ....... (Engelman spruce)
Populus trichocarpa ....... (black cottonwood)
Rhamnus alnifolia ....... (alder buckthorn)
Rorippa nasturtium-aquaticum . (water cress)

Salix sp. .................. (willow)
Salix candida .............. (hoary willow)
Scirpus sp. ................ (bulrush)
Senecio triangularis ...... (arrowleaf groundsel)
Thalictrum sp. ............. (meadowrue)
Typha latifolia ........... (common cattail)
Zigadenus elegans .......... (glaucous zigadenus)

2. TOPOGRAPHY: In Montana, populations of E. gigantea are most often associated with warm springs, on level to gently sloping ground. One site was found on a steep slope; however, the plants at this site occurred in level zones on the slope. All slope aspects were represented. However, populations were often at least shaded for some parts of the day.

The sites in Montana range from 945 m. (3,100 ft.) to 1250 m. (4,100 ft.) in elevation.

3. SOIL RELATIONSHIPS: Epipactis gigantea is associated with spring seeps, and often occurs in the vicinity of warm springs as Luer (1975) suggests. Canada's largest known population is found along the margins of a hot spring, as were some recently extirpated populations in that country. The soils at these Canadian sites are calcareous, and are often composed of porous, exposed tufa or limestone bedrock (Brunton, 1986). Although not specifically tested, the soils underlying many of the Montana populations may also be somewhat calcareous, as was evidenced by whitish precipitates coating rocks in the running water. The Nimrod Warm Springs (001) site appears to be on travertine deposits.

4. REGIONAL CLIMATE: Epipactis gigantea is widely distributed across Montana, occurring in sagebrush grasslands in Carbon County and in spruce-fir forests in Lake County; thus, the sites have widely differing climatic conditions. The ability to tolerate a wide variety of conditions is further suggested by the wide range of the species, which extends from Canada to south-central Mexico (Luer, 1975). In the northern parts of its range, this plant appears to
depend on perennial, often thermal seepage areas, which may allow it to persist in colder climates.

F. POPULATION DEMOGRAPHY AND BIOLOGY

1. PHENOLOGY: This species flowers from March through August, depending on the latitude of the site (Luer, 1975). In Montana, mid-June is the earliest date recorded for flowering (Bluewater Spring (003)), and flowering may extend into August (Nimrod Warm Springs (001)).

2. POPULATION SIZE AND CONDITION (MONTANA): Populations of *E. gigantea* range in size from approximately 185 stems, up to 5,000+ stems. The average population size is approximately 1,000 stems. See Table 2., pp. 11-12, for information on population sizes and conditions in Montana.

The amount of area inhabited by this species is most likely influenced, at least in Montana, by the extent of mineral, warm water springs. The average area covered by a population is about two acres. Thus, although populations might have a large number of stems, the total area covered by this species in Montana amounts to only approximately 21 acres.

3. REPRODUCTIVE BIOLOGY

a. TYPE OF REPRODUCTION: *Epipactis gigantea* produces numerous flowers, and is known to be an outcrossing species (Brunton, 1986). It is also a perennial, and populations may enlarge by vegetative reproduction through extension of rhizomes.

b. POLLINATION BIOLOGY: All species in the genus *Epipactis* offer nectar as an insect reward, thus they may exploit relatively unspecialized pollinators (Burns-Balogh et al., 1987). A wide variety of insects are represented as pollinators; however, "the genus is regarded as 'wasp pollinated'" by Burns-Balogh et al. (1987). Syrphid flies are the known pollinators of *E. gigantea* (Luer, 1975; Brunton, 1986), but there may be others.

c. SEED DISPERSAL AND BIOLOGY: All orchids produce capsules filled with numerous minute seeds (Hitchcock et al., 1969), which are most often dispersed by wind. The capsules of *E. gigantea* are ellipsoid and pendent (Luer, 1975), which
Table 2. *Epipactis gigantea* population sizes and condition.

<table>
<thead>
<tr>
<th>Occurrence number</th>
<th>Site name</th>
<th>Acreage</th>
<th>Population size and condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>NIMROD WARM SPRINGS</td>
<td>2</td>
<td>LARGE POPULATION, 101-1000 PLANTS; RHIZOMATOUS; WET AREAS RIGHT BY SPRING ARE IN FAIRLY GOOD SHAPE, THOUGH SURROUNDING AREA IS THREATENED BY SWIMMERS, DEVELOPMENT, AND HIGHWAY IMPROVEMENT.</td>
</tr>
<tr>
<td>002</td>
<td>SWAN RIVER</td>
<td>1</td>
<td>101-1000 INDIVIDUALS, IN FLOWER.</td>
</tr>
<tr>
<td>003</td>
<td>BLUEWATER SPRING</td>
<td>0</td>
<td>COMMON; EXCELLENT SITE, TWO GOOD SUBPOPULATIONS.</td>
</tr>
<tr>
<td>004</td>
<td>YELLOW BAY</td>
<td>0</td>
<td>THE NATURE CONSERVANCY, FIELD CHECKED IN 1984 - COULD NOT BE LOCATED; POSSIBLY EXIRPTATED.</td>
</tr>
<tr>
<td>005</td>
<td>SWAN LAKE</td>
<td>10</td>
<td>FOUR SUBPOPULATIONS, EST. 2500-4000 STEMS TOTAL; BEST POPULATION (LARGEST POPULATION IS ON MARGIN OF MEADOW BETWEEN UPPER (9508) AND LOWER ROADS; SOIL IS CALCAREOUS, AREA MAY HAVE BEEN THERMALLY ACTIVE; HWY SITE IS SPRAYED.</td>
</tr>
<tr>
<td>006</td>
<td>ECHO LAKE</td>
<td>1</td>
<td>EST. 200-300 PLANTS, FLOWERING; SEVERAL PLANTS GRAZED.</td>
</tr>
<tr>
<td>007</td>
<td>LOWER GRASSY CREEK</td>
<td>1</td>
<td>CA. 200 PLANTS, FLOWERING.</td>
</tr>
<tr>
<td>008</td>
<td>BOND CREEK</td>
<td>2</td>
<td>255 PLANTS IN 3 SUBPOPULATIONS, FEW FLOWERING.</td>
</tr>
<tr>
<td>Occurrence number</td>
<td>Site name</td>
<td>Acreage</td>
<td>Population size and condition</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------</td>
<td>---------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>009</td>
<td>KRAUSE BASIN ROAD</td>
<td>2</td>
<td>CA. 5,000 PLANTS; FLOWERING.</td>
</tr>
<tr>
<td>010</td>
<td>STOPPER CREEK</td>
<td>1</td>
<td>CA. 185 PLANTS IN TWO SUBPOPULATIONS, FLOWERING.</td>
</tr>
<tr>
<td>011</td>
<td>LOWER FATTY CREEK ROAD</td>
<td>1</td>
<td>CA. 200 PLANTS, FLOWERING AND FRUITING.</td>
</tr>
</tbody>
</table>
could facilitate seed dispersal.

G. POPULATION ECOLOGY

1. BIOLOGICAL INTERACTIONS

a. COMPETITION: Based on observations of known populations in Canada (where sites had low herbaceous vegetation cover), Brunton (1986) felt that *E. gigantea* was a poor competitor. However, in Montana, many sites had very high herbaceous vegetation cover (see photographs, Section V, pp. 37-42). It is the belief of the author that this species is tolerant of interspecific competition, and instead is limited by chemical, edaphic, or hydrological factors at sites where it occurs. For several subpopulations (Bond Creek (008)) where overstory shading was high, the number of flowering stems was reduced; thus, this species may not flower well in such habitats.

b. HERBIVORY: The Montana populations are quite localized, and grazing does not currently appear to have affected them. There is no documentation on the effects of insect predation or disease in this species (Brunton, 1986).

H. LAND OWNERSHIP (MONTANA)

1. The land ownership for the 10 currently known populations in Montana is given below. The exact locations are provided in Table 1, pp. 5-6.

a. U.S. Forest Service (Flathead National Forest):

   Swan Lake Ranger District

   Cilly Creek (002)
   Swan Lake (005)
   Bond Creek (008)
   Lower Fatty Creek Road (011)

b. Department of State Lands:

   Krause Basin Road (009)
   Echo Lake (006)

c. Private Land:

   Nimrod Warm Springs (001)
   Bluewater Spring (003)
II. ASSESSMENT AND MANAGEMENT RECOMMENDATIONS

A. THREATS TO CURRENTLY KNOWN POPULATIONS:

1. GRAZING: Both of the sites on State of Montana land (Echo Lake (006) and Krause Basin Road (009)) are included in grazing allotments. Neither site appeared to be severely impacted by grazing; however, there is a well used cattle trail just east of the latter population.

2. TIMBER HARVESTING: *Epipactis gigantea* is likely to be impacted by timber harvesting through overstory removal and road building, either of which result in a modification of the hydrology of an area. Several sites (Echo Lake (006), Stopper Creek (010), Lower Fatty Creek Road (011)) have populations present in barrow pits along Forest Service roads. It is suspected that the Forest Service roadways were cut through areas previously populated by this species, but which then diverted the water flow to barrow pits. These populations may have been more extensive prior to road building activities.

3. WEED CONTROL ACTIVITIES: The same three populations listed above under timber harvesting, plus Swan Lake (005) and Nimrod Warm Springs (001) sites, are likely to be influenced by weed control owing to their proximity to Forest roadways or highways. *Centaurea maculosa* is currently invading the Nimrod Warm Springs site (001).

4. RECREATIONAL ACTIVITIES: The Nimrod Warm Springs site (001) is a popular area for swimmers, and this population may be threatened by their activities.

B. MANAGEMENT PRACTICES AND RESPONSE: As stated previously, populations of *Epipactis gigantea* appear to be restricted (at least in Montana) to warm water spring areas. This may be due in part to edaphic or chemical factors that are only found at these types of sites. Because of this restriction, it is necessary to limit any development at or near these sites that might change the water regime in the area. For example, of twelve previously known sites in Canada, three sites have already been lost to resort development, and another is threatened (Brunton, 1986).

One site is within the proposed Swan River Research Natural Area (Swan River (002)), and as such, is likely to
be adequately protected unless the surrounding forests are considered for logging.

C. RECOMMENDATIONS FOR MAINTAINING VIABLE POPULATIONS:

1. **Protection of natural habitats that currently support large populations.** The following populations on U.S. Forest Service lands should be considered in any habitat alteration projects that may occur in or near these sites (especially logging and road-building or expansion):

   - Swan River (002)
   - Swan Lake (005)
   - Bond Creek (008)
   - Lower Fatty Creek Road (011)

   Any proposed management actions within or near any of these sites should be preceded by detailed surveys of the populations in these areas; mitigation measures should be developed to reduce or eliminate the impacts of these activities.

2. **Regulation of livestock grazing in native habitats supporting large populations.** Grazing does not currently threaten any of the sites on Forest Service land; however, the state-owned Krause Basin Road (009) population is part of a grazing allotment, and near a heavily used cattle trail. This site should be monitored if management recommendations change in the future.

D. RECOMMENDATIONS FOR FURTHER ASSESSMENT:

1. **Establishment of monitoring studies on U.S. Forest Service lands.** The Swan River (002) site would be appropriate for establishing monitoring transects to study the life-history traits of this species. Other potential studies might include an analysis of plant tissue and spring water to determine if specific minerals might be involved in the restriction of the plants to these sites. An analysis of thermal regimes at various sites, and tests to determine the ability of rhizomes to endure freezing conditions, might also provide some insight into the ecology of this orchid.

   Warm water seeps, or springs are potential sites for *E. gigantea*, and these should be checked for the orchids prescence. Glacier National Park may possibly harbor populations of this orchid.
E. SUMMARY

Although *Epipactis gigantea* is a widely distributed species, it is rare throughout its range because of its restriction to very specialized sites. Edaphic or chemical factors, as well as the presence of perennial water seepage, may be important in determining its distribution. Field surveys in Montana in 1988 revealed five previously unrecorded occurrences of this species, all within the lower Swan River Valley. Two of these sites are on Flathead National Forest lands, one is on State of Montana land and three are on private land. It is currently included on the sensitive species list for Region 1 (Northern Region) of the U.S. Forest Service. The species appears to be restricted to warm water springs across Montana, in a wide variety of vegetation types. This restriction, and the fact that several of the sites in Canada have been lost, and another is threatened by development, indicates a need to monitor populations. Several of the sites in Montana are also along National Forest roadways. Thus, it is important to take these areas into consideration when planning land use activities that may affect these populations.
III. LITERATURE CITED


IV. ELEMENT OCCURRENCE PRINT-OUTS AND MAPS
ELEMENT OCCURRENCE RECORD

EOCODE: PMORC11001.001
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
MARGINUM: 2 TENTEN: 2.2 IDENT: Y EORANK: BC
SURVEYSITE: NIMROD WARM SPRINGS
EORANKCOMM: FAIRLY LARGE POPULATION; HABITAT ADJACENT TO EXPRESSWAY
SRANK: S1 STATE: MT COUNTYNAME: MTGRAN
QUADCODE: 4611364 QUADNAME: BEARMOUTH (15)
LAT: 464219 LONG: 1132716 S: 0 N: 0 E: 0 W: 0
TOWNRANGE: 011N015S SECTION: 14 MERIDIAN: PR TRSCOMM: SW4
PHYSPROV: NR WATERSHED: 17010201 RIVERREACH: 1701020100700.00
DIRECTIONS: NIMROD WARM SPRINGS, ALONG NORTH SIDE OF CLARK FORK RIVER CA. 30 MI. EAST OF MISSOULA (ADJACENT TO "BYRNE"-USGS MAP).
GENDESC: AROUND WARM SPRINGS, ON SOUTH-FACING SLOPE; WHOLE AREA IS ON TRAVERTINE DEPOSITS; WITH HELIANTHUS NUTTALLII, THALICTRUM, MIMULUS GUTTATUS.
ELEV: 3760 SIZE: 2
EODATA: LARGE POPULATION, 101-1000 PLANTS; RHIZOMATOUS; WET AREAS RIGHT BY SPRING ARE IN FAIRLY GOOD SHAPE, THOUGH SURROUNDING AREA IS THREATENED BY SWIMMERS, DEVELOPMENT, AND HIGHWAY IMPROVEMENT.
COMMENTS: AREA SURROUNDING SITE INVADED BY CENTAUREA SP. (KNAPEWEED) AND CIRSIUM SP. (THISTLE). LESICA, P. (3229), 1984, MONTU.
MORENAM: NIMROD WARM SPRINGS
OWNER: VASIL & KAETHE CZORNY
OWNERCOMM: 2400 MARSHALL RD., MISSOULA, MT 59801; (406) 258-6275.
PROTCOMM: SITE IS REGISTERED BY TNC BIG SKY FIELD OFFICE.
MGMTCOMM:
MONITOR:
BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT. (3229). 1984. SPECIMEN #07479 UM.
SOURCECODE: PNDLES01MTUS S84LESUMMTUS U85LES02MTUS S68DOLUMMTUS PNDSTEO1MTUS
DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO:
UPDATE: 88-12-01 LAS
ELEMENT OCCURRENCE RECORD

EDCODE: PMORCI1010.002
NAME: EPIPIACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
MARGINUM: 2 TENTEN: 1,1 IDENT: Y EORANK: A

SURVEYSITE: SWAN RIVER
EORANKCOMM: GOOD SITE-HARD TO ACCESS
SRANK: SI STATE: MT COUNTYNAME: MTLAKE
QUADCODE: 4711377 QUADNAME: CILLY CREEK
LAT: 475148 LONG: 1135209 S: Ø N: Ø E: Ø W: Ø
TOWNFRANGE: 024N018W SECTION: 02 MERIDIAN: PR TRSCOMM: SW4

PHYSPROV: NR WATERSHED: 17010211 RIVERREACH: 1701021100900.00
DIRECTIONS: SWAN RIVER VALLEY, 1.7 AIR MILES WEST OF ST. HWY. 83, 0.35
AIR MILES SSE. OF PORCUPINE CREEK, CA. 4 MILES SSW. OF SWAN LAKE.

GENDESC: LARGE MEADOW IN A SHALLOW GLACIAL BASIN; CENTER OF MEADOW IS
OPEN WATER, WITH NUPHAR, POTAMOGETON, SCIRPUS, SUR围绕ED BY
A FLOATING SEDGE MAT WITH DROSERA SPP., CAREX SPP. (CONT.)
ELEV: 3105 SIZE: 1
EDDATA: 101-1000 INDIVIDUALS, IN FLOWER;
GENDESC (CONT.): SCATTERED SPhAGNUM CLUMPS, MENYANTHES, BETULA GLANDULOSA,
ZIGADENUS ELEGANS, TYPHA LATIFOLIA, PARNASSIA, SALIX CANDIDA.

COMMENTS: VOUCHER PIERCE, J. (1320), 1985, SPECIMEN #102540 UM.

MACODE1: FFSPLSWAN1MTUS CONTAINED1: N MACODE2: FFSNFFLAT9MTUS CONTAINED2: Y
MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: F SITECODE:
SITENAME:
OWNER: FLATHEAD N.F.
OWNERCOMM:
PROTCOMM: SWAN RIVER PROPOSED RESEARCH NATURAL AREA.
MGMTCOMM:
MONITOR: 
BESTSOURCE: PIERCE, JOHN. 737 LOCUST ST., MISSOULA, MT.

SOURCECODE: PNDPIE01MTUS S85PIE7MTUS AB1JDH01MTUS U85LES02MTUS PNDSC02MTUS
PNDMOR01MTUS
DATASENS: BOUNDARIES: N PHOTOS: 
OWNERINFO:
TRANSCRIBR: 86-03-20 JSS CDREV: Y MAPPER: 86-03-20 JSS QC: Y
UPDATE: 88-12-02 LAS
ELEMENT OCCURRENCE RECORD

EOCODE: PMORCI1010.003
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
MARGNUM: 3 TENTEN: 9,6 IDENT: Y EORANK: A
SURVEYSITE: BLUEWATER SPRING
EORANKCOMM: EXCELLENT SITE, TWO GOOD SUBPOPULATIONS.
SRANK: S1 STATE: MT COUNTYNAME: MTCARB
QUADCODE: 4510837
QUADNAME: BLUEWATER
LAT: 451840 LONG: 1084625 S: 0 N: 0 E: 0 W: 0
TOWNRANGE: 0065024E SECTION: 15 MERIDIAN: PR TRSCOMM: SW4
PHYSPROV: MB WATERSHED: 10070006 RIVERREACH:
DIRECTIONS: ALONG NORTH FORK BLUEWATER CREEK AROUND BLUEWATER SPRING;
ABOUT 2.0 AIR MILES SOUTHEAST OF BLUEWATER FISH HATCHERY AND
6 MILES EAST OF BRIDGER.
GENDESC: IN WET MARLY SOIL; SAGEBRUSH GRASSLAND AREA, WITH MIMULUS
GUTTATUS, RORIPPA NASTURTIIUM-AQUATICUM.
ELEV: 4100 SIZE: 0
EODATA: COMMON; "EXCELLENT SITE, TWO GOOD SUBPOPULATIONS" (FIELD
OFFICE SCORECARD).

COMMENTS: LESICA, P. (3000), 1984, SPECIMEN #05922 UM.

MACODE1: PRIVATEOWNMTUS CONTAINED1: Y MACODE2: CONTAINED2: 
MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT: 
MOREMGMT: F SITECODE: 
SITENAME: 
OWNER: TOM AND FERN LESTER
OWNERCOMM: 
PROTCOMM: 
MGMTCOMM: 
MONITOR: 
BESTSOURCE: LESICA, P., AND S. MOLINA. 1985. AN INVENTORY OF SIGNIFICANT
BOTANICAL FEATURES ALONG MT RIVERS. PNW RIVERS STUDY. 54 PP.
SOURCECODE: U85LES02MTUS PNDLES01MTUS 584LESUMMTUS 
DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO: 
UPDATE: 88-12-02 LAS
ELEMENT OCCURRENCE RECORD

EPCODE: PMORC11010.004
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
MARGNUM: 3 TENTEN: 8,10 IDENT: Y EORANK:
SURVEYSITE: YELLOW BAY
EORANKCOMM:
SURVEYDATE: 1984- LASTOBS: 1912-07-12 FIRSTOBS: 1912 GRANK: 64
SRANK: SI STATE: MT COUNTYNAME: MTLAKE
QUADCODE: 4711481 4711471
QUADNAME: WOODS BAY, BULL ISLAND
LAT: 475230 LONG: 1140140 S: 0 N: 0 E: 0 W: 0
TOWNRANGE: 024N019W SECTION: 04 MERIDIAN: PR TRSCOMM: NE4
PHYSPROV: NR WATERSHED: 17010208 RIVERREACH: 1701020800200.00
DIRECTIONS: YELLOW BAY (ALONG E. SHORE OF FLATHEAD LAKE).

GENDESC: UNKNOWN

ELEV: 2900 SIZE: 0
EODATA: TNC FIELD CHECK IN 1984 - COULD NOT BE LOCATED; POSSIBLY EXTIRPATED.

MACODE1: SUMSPYELL1MTUS CONTAINED1: MACODE2: SFWSPEYELL1MTUS CONTAINED2:
MACODE3: FBIIRFLAT1MTUS CONTAINED3: Y ADLMAS: N MORELAN: MOREPROT:
MOREMGMT: F SITECODE:
OWNER:
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR:
MONITORNUM:
BESTSOURCE: LESICA, P., AND S. MOLINA. 1985. AN INVENTORY OF SIGNIFICANT BOTANICAL FEATURES ALONG MT RIVERS. PNW RIVERS STUDY. 54 PP
SOURCECODE: U85LES02MTUS PNDLES01MTUS S12XXXUMMTUS
DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO:
ELEMENT OCCURRENCE RECORD

**ECODE:** PMORC11010.005  
**NAME:** EPIPIACTIS GIGANTEA  
**COMNAME:** GIANT HELLEBORINE  
**MARGNUM:** 4  
**TENTEN:** 3,5  
**IDENT:** Y  
**EORANK:** A

**SURVEYSITE:** SWAN LAKE  
**SURVEYDATE:** 1987-06-24  
**LASTOBS:** 1988-07-04  
**FIRSTOBS:** 1905  
**GRANK:** 64  
**S1 STATE:** MT  
**COUNTYNAME:** MTLAKE

**QUADCODE:** 4711387  
**QUADNAME:** SWAN LAKE  
**LAT:** 475623  
**LONG:** 1135102  
**S:** 475614  
**N:** 475640  
**E:** 1135029  
**W:** 1135120  
**SECTION:** 11  
**MERIDIAN:** PR  
**TRSCOMM:** SW, S2NE4  
**PHYSPROV:** NR  
**WATERSHED:** 17010211  
**RIVERREACH:**

**DIRECTIONS:** NORTH END OF SWAN VALLEY, ABOUT 0.7-1.1 AIR MILES NORTHWEST TO NNE OF SWAN LAKE (TOWN), ADJACENT TO ST. HWY 83 AND FLATHEAD N.F. RD. 9508.

**GENDESC:** UNDISTURBED, SEEPY MEADOW AREAS, AND ROADSIDES; PIEN/POTR/BETULA PAPYRIFERA, WITH RHAMNUS ALNIFOLIA, CORNUS STOLONIFERA, CAREX FLAVA, ALNUS INCANA.

**ELEV:** 3200  
**SIZE:** 10

**EODATA:** FOUR SUBPOPULATIONS, EST. 2500-4000 STEMS TOTAL; BEST POPULATION (=CENTRUM) IS ON MARGIN OF MEADOW BETWEEN UPPER (9508) AND LOWER ROADS; SOIL IS CALCAREOUS, AREA MAY HAVE BEEN THERMALLY ACTIVE; HWY SITE IS SPRAYED.

**COMMENTS:** VOUCHER-SHELLY, J.S. (1345), 1987, UM; PROBABLE RELOCATION OF NORTON, 1906, SPECIMEN #77929 UM & SELLOWAY, 1905.

**MACODE1:** FFSNFFLAT9MTUS  
**CONTAINED1:** Y  
**MACODE2:** CONTENT2:  
**MACODE3:** 
**CONTAINED3:**  
**ADLMAS:** MOREGTM: F  
**SITECODE:**  
**SITENAME:**  
**OWNER:** FLATHEAD NATIONAL FOREST

**OWNERCOMM:**  
**PROTCOMM:**  
**MGMTCOMM:**  
**MONITOR:**  
**BESTSOURCE:** SHELLEY, J.S. 1907. FIELD SURVEYS IN LAKE AND MISSOULA COUNTIES OF 23-26 & 30 JUNE, 1-17 & 28-30 JULY.

**SOURCECODE:** FB7SHE03MTUS PND5HE01MTUS S875HEUMMTUS PND05MOR01MTUS S06NDORUMMTUS S08BONUMMTUS U85LES02MTUS S05SELUMMTUS PNDLAS02MTUS

**DATASENS:** N  
**BOUNDARIES:** Y  
**PHOTOS:** Y  
**OWNERINFO:**  
**TRANSCRIBR:** 87-08-20 JSS  
**CDREV:** Y  
**MAPPER:** 87-08-21 JEG  
**OC:** Y  
**UPDATE:** 88-12-02 LAS
ELEMENT OCCURRENCE RECORD

EPCODE: PMORC11010.006
NAME: EPIPACTIS GIANTANEA
COMNAME: GIANT HELLEBORINE
MARGNUM: 1 TENTEN: 1,9 IDENT: Y EORANK: C
SURVEYSITE: ECHO LAKE
EORANKCOMM: MARGINAL QUALITY SITE, ADJACENT TO GRAVEL ROAD.
SRANK: SI STATE: MT COUNTYNAME: MTFLAT
QUADCODE: 4811328
QUADNAME: JEWEL BASIN PRECISION: SC
LAT: 480823 LONG: 1135920 S: 0 N: 0 E: 0 W: 0
TOWNRANGE: 028N019W SECTION: 34 MERIDIAN: PR TRSCOMM: SE4
PHYSPROV: NR WATERSHED: 17010211 RIVERREACH:
DIRECTIONS: ALONG ROAD TO JEWEL BASIN (FLATHEAD NF RD 5392), CA. 6.5 AIR MILES NE OF BIGFORK, CA. 2 MILES EAST OF ECHO LAKE.

GENDESC: ALONG ROAD AND POND EDGE, ON MARGIN OF A SPRUCE SWAMP WITH A NUMBER OF SPRINGS; WITH EQUISETUM ARVENSE, CAREX COMOSA, C. FLAVA, ASTER OCCIDENTALIS.
ELEV: 3120 SIZE: 1
EODATA: EST. 200-300 PLANTS, FLOWERING; SEVERAL PLANTS GRAZED.

COMMENTS: LESICA, P. (3955), 1986, SPECIMEN #104447 MONTU.

MACODE1: SSLGNXXXX1MTUS CONTAINED1: Y MACODE2: CONTAINED2:
MACODE3: CONTAINED3: MORELAM: MORELAN: MOREPROT:
MOREMGMT: F SITECODE:
SITENAME:
OWNER:
OWNERCOMM:
PROTCOMM: FLATHEAD CO. MAY MANAGE ROAD RIGHT-OF-WAY.
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: SCHASSBERGER, L.A. 1988 FIELD SURVEYS OF LAKE AND FLATHEAD COUNTIES.
SOURCECODE: F88SCH05MTUS S86LESUMMTUS PNDSC02MTUS
DATASENS: N BOUNDARIES: Y PHOTOS: N OWNERINFO:
ELEMENT OCCURRENCE RECORD

EOCODE: PMORC11010.007
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLLEBORINE
MARGNUM: 1
TENTEN: 4,6
IDENT: Y
EORANK: AB
SURVEYSITE: LOWER GRASSY CREEK
EORANKCOMM: PRIVately OWNED, POSSIBLY SOME GRAZING
SURVEYDATE: 1988-07-05
LASTOBS: 1988-07-05
FIRSTOBS: 1988
GRANK: G4
SRANK: S1
STATE: MT
COUNTYNAME: MTLAKE
QUADC: 4711387
QUADNAME: SWAN LAKE
LAT: 475556
LONG: 1134950
S: 0
N: 0
E: 0
W: 0
TOWN: Ø25NØ18W
SECTION: 13
MERIDIAN: PR
TRSCOMM: SE4NW4NW4, NE4SW4
PHYSPROV: NR
WATERSHED: 17010211
RIVERREACH: 1701021100000.00
DIRECTIONS: CA. 0.6 MILE NE OF HIGHWAY 83 AT SWAN LAKE, ALONG THE GROOM CREEK ROAD, SE OF ROAD.
GENDESC: BOGGY SEEP AREA IN CREEK DRAINAGE; BENEATH PICEA ENGELMANNII AND RHAMNUS ALNIFOLIA, WITH SENECIO TRIANGULARIS AND HABENARIA DILATATA.
ELEV: 3260
SIZE: 1
EODATA: CA. 200 PLANTS, FLOWERING.

MACODE1: PRIVATEOWNMTUS
MACODE2: CONTAINED1: Y
MACODE3: CONTAINED2: Y
MACODE3: CONTAINED3: Y
ADLMAS: MORELAN: MOREPROT:
SITENAME:
OWNER:
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR:
BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN FLATHEAD AND LAKE COS. OF 5-14 JULY.
SOURCECODE: F88SCH05MTUS PNDSCH02MTUS S88SCH0MTUS
DATASENS: N
BOUNDARIES: Y
PHOTOS: Y
OWNERINFO:
TRANSCRIBER: 88-06-04 LAS
CDREV: Y
MAPPER: 88-09-29 MEZ
QC: Y
UPDATE: 88-10-13 MEZ
ELEMENT OCCURRENCE RECORD

EOCODE: PMORC11010.008
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
MARGNUM: 11 TENTEN: 5,7 IDENT: Y EORANK: AB
SURVEYSITE: BOND CREEK
EORANKCOMM: GOOD SITE, SMALL POPULATION
SRANK: S1 STATE: MT COUNTRYNAME: MTLAKE
QUADCODE: 4711387
QUADNAME: SWAN LAKE
TOWNRANGE: 023N017W SECTION: 18 MERIDIAN: PR TRSCOMM: NE4SW4SW4.SW4
PHYSPROV: NR WATERSHED: 17010211 RIVERREACH: 1701021105900.00
DIRECTIONS: ALSO: T25N18W: 24E2NE4NE4. CA. 2 AIR MILES EAST OF SWAN LAKE, CA. 1.8 MILES EAST OF HIGHWAY 83 ON BOND CREEK TRAIL, EAST AND WEST OF TRAIL 0.1 MILE.
GENDESC: IN SEEPS WHICH EVENTUALLY FEED BOND CREEK; BENEATH PICEA ENGELMANNII AND BETULA PAPYRIFERA, WITH SENECIO TRIANGULARIS AND HABENARIA DILATATA.
ELEV: 3400 SIZE: 2
EODATA: 255 PLANTS IN 3 SUBPOPULATIONS, FEW FLOWERING.

COMMENTS: VOUCHER, SCHASSBERGER, L.A. (243), 1988. MONTU; SEE GMF FOR BASE MAP SHOWING POPULATION.

MACODE1: FFSNFFLAT9MTUS CONTAINED1: Y MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMNT: F SITECODE:
SITENAME:
OWNER: FLATHEAD NATIONAL FOREST
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR:
MONITORENUM:
BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN FLATHEAD AND LAKE COS. OF 5-14 JULY.
SOURCECODE: F88SCH05MTUS PNDSCH02MTUS S88SCHUMMTUS

DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:
TRANSOIBR: 88-08-04 LAS CDREV: Y MAPPER: 88-09-30 MEZ QC: Y
UPDATE: 88-10-13 MEZ
ELEMENT OCCURRENCE RECORD

EOCODE: PMORC11010.009
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
MARGNUM: 2 TENTEN: 9,7 IDENT: Y EORANK: A
SURVEYSITE: KRAUSE BASIN ROAD
EORANKCOMM: EXCELLENT SITE
SRANK: S1 STATE: MT COUNTYNAME: MTFLAT
QUADCODE: 4811421
QUADNAME: HASH MOUNTAIN
LAT: 480951 LONG: 1140037 S: 0 N: 0 E: 0 W: 0
TOWNRANGE: 02BN019W SECTION: 28 MERIDIAN: PR TRSCOMM: E2NE4
PHYSPROV: NR WATERSHED: 17010200 RIVERREACH: 170102080000.00
DIRECTIONS: CA. 14 AIR MILES EAST OF KALISPELL; CA. 1.8 MILES EAST OF
FOOTHILL ROAD, ON LOWER KRAUSE BASIN ROAD, SOUTH OF ROAD.
GENDESC: INTERMITTENT CREEK, TYPHA SWAMP SURROUNDED BY PICEA
ENGELMANNII, WITH TYPHA LATIFOLIA AND SCIRPUS SPP.
ELEV: 3260 SIZE: 2
EODATA: CA. 5,000 PLANTS; FLOWERING.

BASE MAP SHOWING POPULATION.
MACODE1: SSLGNXXXXXMTUS CONTAINED1: Y MACODE2: CONTAINED2:
MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: F SITECODE:
SITENAME:
OWNER: STATE OF MONTANA
OWNERCOMM:
PROTCOMM:
MGTCOMM:
MONITOR:
BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN FLATHEAD AND LAKE
COS. OF 5-14 JULY.
SOURCECODE: F88SCH05MTUS PNDSCH02MTUS S88SCHUMMTUS
DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:
TRANSCRIBR: 88-08-04 LAS CDREV: Y MAPPER: 88-09-30 MEZ QC: Y
UPDATE: 88-10-13 MEZ
ELEMENT OCCURRENCE RECORD

ECODE: PMORC11010.010
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
Margnum: 12 Tenten: 1.8 Ident: Y Eorank: CD
Surveysite: STOPPER CREEK
Eorankcomm: SMALL POPULATIONS, CLOSE TO ROAD.
Sranch: S1 State: MT Countyname: MTlake
Quadcode: 4711387
Quadname: SWAN LAKE
Townrange: ß25N018W Section: 27 Meridian: PR Trscomm: SE4NW4NW4,NE
45W4NW4
Physprov: NR Watershed: 17010211 Riverreach: 1701021100700.00
Directions: Ca. 2 AIR MILES SW OF SWAN LAKE. TRAVEL 1.5 MILES WEST OF HIGHWAY 83 ON PORCUPINE CREEK ROAD, CA. 1.3 MILES NORTH ON YEW CREEK ROAD.
Gendesc: IN BORROW PIT NEXT TO ROAD AND BELOW ROAD 300 YDS. ON EDGE OF WET MEADOW, WITH SALIX SPP., HABENARIA DILATATA, SENECIOT RIANGULARIS.
Elev: 3100 Size: 1
Eodata: CA. 185 PLANTS IN TWO SUBPOPULATIONS, FLOWERING.

Macode1: PRIVATEOWNMTUS Contained1: Macode2: FFWWRSWANIMTUS Contained2:
Macode3: Contained3: ADLMA: MORELAN: MOREPROT:
Moremgmt: F Sitecode:
Owner:
Ownercomm:
Protcomm:
Mgmtcomm:
Monitor:
Bestsource: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN FLATHEAD AND LAKE COS. OF 5-14 JULY.
Sourcecode: F88SCH05MTUS PNDSC02MTUS S88SCHUMMTUS
Datasesn: N Boundaries: Y Photos: Y Ownerinfo:
Transcribr: 88-08-04 Las Cdrev: Y Mapper: 88-09-30 Mez Oc: Y
Update: 88-10-13 Mez
ELEMENT OCCURRENCE RECORD

EOCODE: PMORCl1010.011
NAME: EPIPACTIS GIGANTEA
COMNAME: GIANT HELLEBORINE
MARGNUM: 15 TENTEN: 1,3 IDENT: Y EORANK: C
SURVEYSITE: LOWER FATTY CREEK ROAD
EORANKCOMM: THREE FEET FROM HEAVILY USED LOGGING ROAD.
SRANK: S1 STATE: MT COUNTYNAME: MTLAKE
QUADCODE: 4711377 QUADNAME: CILLY CREEK
PRECISION: SC
TOWNRANGE: 024N018W SECTION: 11 MERIDIAN: PR TRSCOMM: SW4SE4,14NW4 NE4
PHYSPROV: NR WATERSHED: 17010211 RIVERREACH: 1701021100000.00
DIRECTIONS: CA. 5.3 AIR MILES SW OF SWAN LAKE, CA. 1.5 MILES WEST OF
HIGHWAY 83 ON PORCUPINE CREEK ROAD, SOUTH 3.1 MILES ON LOWER
FATTY CREEK ROAD; WEST OF ROAD.
GENDESC: IN SEEPS OF BORROW PIT; WITH HABENARIA DILATATA AND SALIX
SPP., NEAR THUJA PLICATA AND BETULA PAPYRIFERA.
ELEV: 3110 SIZE: 1 EODATA: CA. 200 PLANTS, FLOWERING AND FRUITING.

BASE MAP SHOWING SUBPOPULATIONS.
MACODE1: FFSNFFLAT9MTUS CONTAINED1: Y MACODE2: CONTAINED2:
MACODE3:
MOREMGMT: F SITECODE:
SITENAME:
OWNER: FLATHEAD NATIONAL FOREST
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR:
MONITORNUM:
BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN FLATHEAD AND LAKE
COS. OF 5-14 JULY.
SOURCECODE: FB85CH05MTUS PNDSC02MTUS S808CHUMTUS
DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:
TRANSCRIBR: 88-08-04 LAS CDREV: Y MAPPER: 88-09-30 MEZ QC: Y
UPDATE: 88-12-02 LAS
USGS Bearmouth Quadrangle (15')
Nimrod Warm Springs (001)

Epipactis gigantea
USGS Cilly Creek Quadrangle (7.5')

Epipactis gigantea
USGS Bluewater Quadrangle (7.5')

Epipactis gigantea

Bluewater Spring (003)
USGS Jewel Basin Quadrangle (7.5')  
Epipactis gigantea  
Echo Lake (006)
USGS Swan Lake Quadrangle (7.5')

Epipactis gigantea

Lower Grassy Creek (007)
Bond Creek (008)
USGS Hash Mountain (7.5')
Krause Basin Road (009)

Epipactis gigantea
V. PHOTOGRAPHS
A. *Epipactis gigantea* - habit, Flahead N.F.
Epipactis gigantea - habitat, Flathead N.F.